

# START

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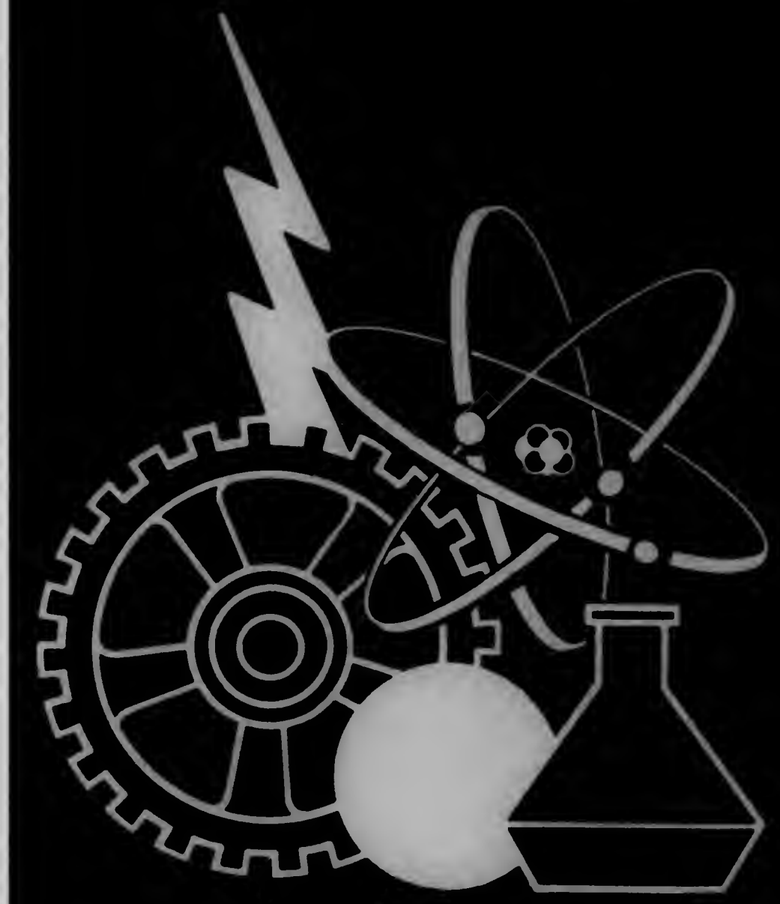
# OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

April 21, 1998



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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**Patent Cooperation Treaty (PCT) Information**

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1205 O.G. 4, on December 2, 1997.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was increased, effective January 1, 1998, and was announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

International fees were changed, effective on May 1, 1997, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1197 O.G. 69, on April 22, 1997. The basic fee and the designation fee were further changed effective January 1, 1998 and were announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1997, and were announced in the *Official Gazette* at 1201 O.G. 63, on August 19, 1997.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1998, is as follows:

| | |
|---|---|
| International Application (PCT Chapter I) fees: | |
| Transmittal fee | 240.00 |
| Search Fee | |
| U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA) | |
| — No corresponding prior U.S. national application filed under 35 U.S.C. 111(a) | 700.00 |
| — Corresponding prior U.S. national application filed under 35 U.S.C. 111(a) | 450.00 |
| — Supplemental search fee, per additional invention (payable only upon invitation) | 210.00 |
| European Patent Office as ISA | 1250.00 |
| International fees | |
| Basic fee | 455.00 |
| Basic supplemental fee (for each page over 30) | 10.00 |
| Designation fee per country or region | |
| — For the first 11 national or regional offices designated | 105.00 |
| — For each designation in excess of 11 offices | No Charge |
| Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5) | |
| — Designation fee | 105.00 |
| — Confirmation fee | 52.50 |
| International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination: | |
| Handling fee | 162.00 |
| Preliminary examination fee | |
| USPTO as International Preliminary Examining Authority (IPEA) | |
| — USPTO was ISA in PCT Chapter I | 490.00 |
| — Additional examination fee, per additional invention (payable only upon invitation) | 140.00 |
| — USPTO was not ISA in PCT Chapter I | 750.00 |
| — Additional examination fee, per additional invention (payable only upon invitation) | 270.00 |

| U.S. National Stage Fees | Small Entity | Regular |
|---|---|---|
| Basic National fee | | |
| USPTO was IPEA | | |
| — All claims presented satisfied provisions of PCT Article 33(2) to (4) | 49.00 | 98.00 |
| — All claims presented did not satisfy provisions of PCT Article 33(2) to (4) | 360.00 | 720.00 |
| USPTO was ISA but not IPEA | 395.00 | 790.00 |
| USPTO was neither ISA nor IPEA | | |
| — Search report has not been prepared by the European Patent Office or the Japanese Patent Office | 535.00 | 1070.00 |
| — Search report has been prepared by the European Patent Office or the Japanese Patent Office | 465.00 | 930.00 |
| Other National fees | | |
| — For each independent claim in excess of 3 | 41.00 | 82.00 |
| — For each claim in excess of 20 | 11.00 | 22.00 |
| — For each application containing a multiple dependent claim | 135.00 | 270.00 |
| — Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1) | 65.00 | 130.00 |
| — Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1) | 130.00 | 130.00 |

Nov. 10, 1997

BRUCE A. LEHMAN
*Assistant Secretary of Commerce and Commissioner of Patents and Trademarks*

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**Notice of Maintenance Fees Payable**

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on April 18, 1995 for which maintenance fees due at 3 years and six

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months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,406,645 through 5,408,699
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 16, 1991 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,007,108 through 5,008,958
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 14, 1987 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,656,667 through 4,658,440
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1997, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $525.00
By other than a small entity ..... $1,050.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $1,050.00
By other than a small entity ..... $2,100.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $1,580.00
By other than a small entity ..... $3,160.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) ..... $65.00
By other than a small entity ..... $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable ..... $700.00
(2) unintentional ..... $1,640.00

## Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

*PATENTS WHICH EXPIRED February 11, 1998*
*DUE TO FAILURE TO PAY MAINTENANCE FEES*

| Patent Number | Serial Number | Issue Date |
|---|---|---|
| Re. 32,918 | 06/930,101 | 05/09/89 |
| (4,569,198) | (06/735,301) | (02/11/86) |
| Re. 33,324 | 07/049,382 | 09/04/90 |
| (4,569,561) | (06/607,067) | (02/11/86) |
| Re. 33,835 | 07/605,559 | 03/03/92 |
| (4,898,333) | (07/238,630) | (02/06/90) |
| 4,569,098 | 06/604,703 | 02/11/86 |
| 4,569,109 | 06/627,028 | 02/11/86 |
| 4,569,112 | 06/611,971 | 02/11/86 |
| 4,569,115 | 06/529,480 | 02/11/86 |
| 4,569,135 | 06/564,326 | 02/11/86 |
| 4,569,154 | 06/675,208 | 02/11/86 |
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### Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

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**5,494,297**, Re. S.N. 09/030,702, Feb. 25, 1998, Cl. 273/326, LACROSSE STICK HEAD, Ronald J. MacNeil, Owner of Record: *Shamrock Lacrosse Inc., Summit, N.J.,* Attorney or Agent: Scott J. Fields, Ex. Gp.: 3304



**5,496,150**, Re. S.N. 09/034,313, Mar. 4, 1998, Cl. 415/229, FIELD-SERVICEABLE SOLIDS-HANDLING VERTICAL TURBINE PUMP, Ernest J. Claxton, III, et. al., Owner of Record: *Patterson Pump Co., Toccoa, Ga.,* Attorney or Agent: Terrell C. Birch, Ex. Gp.: 3401

**5,496,348**, Re. S.N. 09/033,020, Mar. 2, 1998, Cl. 606/232, SUTURE ANCHOR, Peter M. Bonutti, Owner of Record: *Inventor,* Attorney or Agent: Calvin G. Covell, Ex. Gp.: 3309

**5,498,630**, Re. S.N. 09/041,113, Mar. 11, 1998, Cl. 514/443, FUNGICIDES FOR THE CONTROL OF TAKE-ALL DISEASE OF PLANTS, Dennis P. Phillion, et. al., Owner of Record: *Monsanto Co., St. Louis, Mo.,* Attorney or Agent: Mary Jo Boldingh, Ex. Gp.: 1205

**5,607,128**, Re. S.N. 09/035,127, Mar. 5, 1998, Cl. 248/096, DETACHABLE GOLF BAG LEG STAND, Young J. Suk, Owner of Record: *Inventor,* Attorney or Agent: Myron Amer, Ex. Gp.: 3505

**5,651,481**, Re. S.N. 09/030,253, Feb. 25, 1998, Cl. 222/566, DRIP-CATCHER, Brian Vang Jensen, Owner of Record: *Inventor,* Attorney or Agent: Donald E. Stout, Ex. Gp.: 3104

### Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**5,143,335**, Reexam. No. 90/004,921, Feb. 20, 1998, Cl. 248/215, HANDLE SUPPORT ASSEMBLY, Gail B. Frankel, Owner of Record: *Kel-Gar, Inc., Dallas, Tex.,* Attorney or Agent: Michael S. Bush, Johnson and Gibbs, Dallas, Tex., Ex. Gp.: 3632, Requester: Children on the Go, c/o Michael A. Hierl, Olson and Hierl, Ltd., Chicago, Ill.

**5,400,990**, Reexam. No. 90/004,922, Feb. 20, 1998, Cl. 248/215, HANDLE SUPPORT ASSEMBLY, Gail B. Frankel, Owner of Record: *Kel-Gar, Inc., Dallas, Tex.,* Attorney or Agent: Michael S. Bush, Johnson and Gibbs, Dallas, Tex., Ex. Gp.: 3632, Requester: Children on the Go, c/o Michael A. Hierl, Olson and Hierl, Ltd., Chicago, Ill.

**5,505,494**, Reexam. No. 90/004,918, Feb. 17, 1998, Cl. 283/075, SYSTEM FOR PRODUCING A PERSONAL ID CARD, Barry P. Belluci, et. al., Owner of Record: *Bell Data Software Corp.; Bell Data Network Communications, both of Ann Arbor, Mich.,* Attorney or Agent: Gifford Krass Groh Sprinkle Patmore Anderson and Citkowski, Birmingham, Mich., Ex. Gp.: 3206, Requester: Owner, Morgan and Finnegan, New York, N.Y.

**5,617,706**, Reexam. No. 90/004,920, Feb. 18, 1998, Cl. 053/435, ACCUMULATOR AND COLLATOR FOR PACKAGING APPARATUS, Donn A. Hartman, et. al., Owner of Record: *Cloud Corp., Des Plaines, Ill.,* Attorney or Agent: Robert Jambor, Dorn McEachran Jambor and Keating, Chicago, Ill., Ex. Gp.: 3201, Requester: Owner

**5,635,012**, Reexam. No. 90/004,919, Feb. 17, 1998, Cl. 156/277, SYSTEM FOR PRODUCING A PERSONAL ID CARD, Barry P. Belluci, et. al., Owner of Record: *Bell Data Software Corp.; Bell Data Network Communications, both of Ann Arbor, Mich.,* Attorney or Agent: Gifford Krass Groh Sprinkle Patmore Anderson and Citkowski, Birmingham, Mich., Ex. Gp.: 1304, Requester: Owner, Morgan and Finnegan, New York, N.Y.

**5,646,611**, Reexam. No. 90/004,923, Feb. 20, 1998, Cl. 340/853.6, SYSTEM AND METHOD FOR INDIRECTLY DETERMINING INCLINATION AT THE BIT, Patrick E. Dailey, et. al., Owner of Record: *Halliburton Energy Services, Inc., Houston, Tex.,* Attorney or Agent: Robert Gray, Conley Rose and Tayon, Houston, Tex., Ex. Gp.: 2735, Requester: Owner

### Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration maybe renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED FEBRUARY 23, 1998 DUE TO FAILURE TO RENEW

| Reg. Number | Serial Number | Reg. Date |
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| 346,066 | 71/372,966 | 05/18/1937 |
| 346,081 | 71/380,651 | 05/18/1937 |
| 346,103 | 71/383,651 | 05/18/1937 |
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| 346,136 | 71/385,793 | 05/18/1937 |
| 346,143 | 71/386,058 | 05/18/1937 |
| 346,149 | 71/386,246 | 05/18/1937 |
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| 346,180 | 71/386,796 | 05/18/1937 |
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| 1,027,706 | 73/023,286 | 12/23/1975 |

### Notice Regarding Technical Center Box Issue Fee Mailings

The Office will begin mailing address labels with the PTOL-85, "Notice of Allowance and Issue Fee Due" for patent applications allowed in all Technology Centers. These address labels should be used to ensure proper routing of post-allowance correspondence. This directive supersedes the "Special Boxes for Patent Mail" instruction. Any Notice of Allowance and Issue Fee Due received without the accompanying address labels should continue to be addressed to Box Issue Fee.

March 11, 1998

NICHOLAS P. GODICI
*Deputy Assistant Commissioner for Patents (Acting)*

### Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrants at their last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Stony Creek Knitting Mills, Inc., Rocky Mount, N.C., Reg. No. 1,292,377, for the mark "STONY CREEK KNITTING MILLS", Canc. 26,594.

Armando J. Guerra, Miami, Fla., Reg. Nos. 1,721,280 and 1,721,281, for the marks "HINDS" and design and "HINDS", Canc. 27,098.

Plus Products, Irvine, Calif., Reg. No. 1,096,407, for the mark "PLUS AND DESIGN", Canc. 27,156.

Kangaroos U.S.A., Chesterfield, Mo., Reg. No. 1,190,069, for the mark "ASPEN", Canc. 26,292.

JEAN BROWN
*Technical Support Manager,*
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
*Deputy Assistant Commissioner for Trademarks*

### Registration to Practice

The results of the examination for registration to practice before the United States Patent and Trademark Office held on August 27, 1997, were mailed to 3,162 candidates. There were 1,838 persons who successfully passed the examination. The following list contains the names of those persons who passed the examination and have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 CFR 10.7(a). Accordingly, any information tending to affect the eligibility of any of the following persons on moral, ethical, or other grounds should be furnished to the Director of Enrollment and Discipline on or before June 5, 1998.

March 20, 1998

Karen L. Bovard, *Director*
Office of Enrollment and Discipline

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**37 CFR § 1.47 Notice by Publication**

Notice is hereby given of the filing of the following applications with a petition under 37 CFR § 1.47 requesting the acceptance of the application without the signature of all inventors or, if the inventor is deceased, the legal representative of the deceased inventor. The petition in each application has been granted. A notice has been sent to the last known address of the non-signing inventor or legal representative. The inventors or legal representatives whose signatures are missing may join in the application by promptly filing an oath or declaration complying with 37 CFR § 1.63.

| Application No. | Filing Date | Non-Signing Inventor(s) or Legal Representative(s) | Title of Invention |
|---|---|---|---|
| 29/071,684 | June 4, 1997 | William Scott Portzline | Bottle |
| 29/071,704 | June 4, 1997 | William Scott Portzline | Bottle |
| 29/072,878 | June 4, 1997 | William Scott Portzline | Bottle |
| 08/633,400 | April 16, 1996 | Matthew S. McMaster | Vehicle Seat With Integral Child Restraint Seat |
| 08/685,311 | July 23, 1996 | George B. Cervasco | Power Service Unit With Automated Dialer and Other Enhancements |
| 08/735,467 | Oct. 23, 1996 | Yook Chan<br>Joseph P. Law | Strain Relief Bushing for Large Apertures |
| 08/755,523 | Nov. 22, 1996 | Joseph S. Christie<br>Jean M. Christie | Broadband Telecommunications System |
| 08/762,709 | Dec. 9, 1996 | Michael W. Patrick | Method and Apparatus for Assignment of IP Addresses |
| 08/763,011 | Dec. 6, 1996 | Yoosang Hwang | High Temperature Electrode-Barriers for Ferroelectric and Other Capacitor Structures |
| 08/766,842 | Dec. 13, 1996 | Richard P. Welle | Stable Isotope Taggants |
| 08/770,795 | Dec. 20, 1996 | Barry Yuen | A Data Transfer and Communication Network |
| 08/862,844 | May 23, 1997 | Philip L. Jackson | Low Profile Modular Revenue Meter |

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### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of a national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Jean-Yves Boutillier) may join in the application by promptly filing an appropriate oath or declaration complying with 37 CFR 1.497. The international application number is PCT/FR95/01459 and was filed on 07 November 1995, in the names of Jean-Marc Sarat and Jean-Yves Boutillier for the invention entitled **Method For Certifying a Copy of a Document Such as a Fax.** The national stage application number is 08/849,100 and has a 35 U.S.C. 371(c) date of 20 October 1997.

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### Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,797,228, Yasuyuki Goto. Shigeru Sugimori, Tetsuya Ogawa, CYCLOHEXANE DERIVATIVE AND LIQUID CRYSTAL COMPOSITION CONTAINING SAME, Interference No. 103,888, final judgment adverse to the patentees rendered December 22, 1997, as to claims 1, 2, 4 and 5.

Patent No. 4,978,031, Max Lembke, DISPENSER SYSTEM FOR RAZOR BLADE, Interference No. 103,362, final judgment adverse to the patentee rendered October 22, 1997, as to claims 1-18.

Patent No. 5,143,905, Natarajan Sivasubramanian, Brian A. Federici, METHOD AND MEANS FOR EXTENDING THE HOST RANGE OF INSECTICIDAL PROTEINS, Interference No. 103,766, final judgment adverse to the patentees rendered December 11, 1997, as to claims 1-13, 19/1,20 and 21.

Patent No. 5,188,323, Henry B. David, AMBULATORY SUPPORT APPARATUS, Interference No. 103,755, final judgment adverse to the patentee rendered October 24, 1997, as to claims 1-6.

Patent No. 5,238,541, Marco A. Marquez, Jose C. Gonzalez, PROCESS FOR PRODUCTION OF AN ETHER-RICH ADDITIVE, Interference No. 103,668, final judgment adverse to patentees rendered October 15, 1997, as to claims 1-10.

Patent No. 5,277,721, Willen Ooms, METHOD FOR MAKING MICROPOROUS MARKING STRUCTURES, Interference No. 103,810, final judgment adverse to patentee rendered January 8, 1998, as to claims 9, 15-18 and 20.

Patent No. 5,296,489, David K. Donald, Mark Furber, Martin E. Cooper, IMMUNO SUPPRESSIVE MACROCYCLIC COMPOUNDS, Interference No. 103,831, final judgment adverse to patentees rendered November 19, 1997, as to claims 1-9.

Patent No. 5,304,530, Geoffrey R. Cliff, Ian C. Richards, ACRYLATE FUNGICIDES, Interference No. 103,905, final judgment adverse to the patentees rendered December 9, 1997, as to claims 1-16.

Patent No. 5,360,656, Jan Rexfelt, Sven-Arne Svensson, PRESS FELT AND METHOD OF MANUFACTURING IT, Interference No. 103,686, final judgment adverse to patentees rendered October 7, 1997, as to claims 1-6 and 9-18.

Patent No. 5,373,069, John W. Rehfuss, Walter H. Ohrbom, CURABLE CARBAMATE-FUNCTIONAL POLYMERS, Interference No. 103,798, final judgment adverse to patentees rendered February 18, 1998, as to claims 1-13.

Patent No. 5,378,800, Steven L. Mok, Rolando U. Pagilagan, TEREPHTHALIC ACID COPOLYAMIDES, Interference No. 103,693, final judgment adverse to patentees rendered December 2, 1997, as to claims 1-11.

Patent No. 5,406,117, Joseph J. Dlugokocki, Joseph R. Florian, RADIATION SHIELDING FOR INTEGRATED CIRCUIT DEVICES USING RECONSTRUCTED PLASTIC PACKAGES, Interference No. 103,953, final judgment adverse to patentees rendered February 11, 1998, as to claims 1-27.

Patent No. 5,460,695, Yasuo Kato, METHOD OF DEINKING WASTE PAPER FOR RECLAMATION THEREOF, Interference No. 104,052, final judgment adverse to the patentee rendered January 9, 1998, as to claims 1-5.

Patent No. 5,525,622, Johannes Kanellakopulos, Rainer Fuchs, Christoph Erdelen, SUBSTITUTED PYRAZOLINES, Interference No. 103,975, final judgment adverse to the patentees rendered December 8, 1997, as to claims 1-10.

Patent No. 5,555,620, Antonius M. Kies, METHOD OF MAKING ELECTRICAL CONNECTORS, Interference No. 103,940, final judgment adverse to the patentee rendered November 4, 1997, as to claims 1-14.

DORIS L. RODGERS, *Chief Clerk*
Board of Patent Appeals &
Interferences
(703) 308-9797

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### Errata

"All reference to Patent No. 5,730,482 to Kerner Wolfgang, et. al., of Bondorf, Germany for CENTER CONSOLE FOR A MOTOR VEHICLE appearing in the Official Gazette of March 24, 1998, should be deleted since no patent was granted."

"All reference to Patent No. 5,730,699 to Theodore P. Adams, et. al., of Edina, Minn., for IMPLANTABLE HEARING SYSTEM HAVING MULTIPLE TRANSDUCERS appearing in the Official Gazette of March 24, 1998, should be deleted since no patent was granted."

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### Certificates of Correction for April 21, 1998

| | | | |
|---|---|---|---|
| B1-5,437,466 | 5,495,246 | 5,591,619 | 5,633,129 |
| D. 371,701 | 5,501,727 | 5,596,028 | 5,634,281 |
| D. 376,385 | 5,506,653 | 5,599,113 | 5,635,365 |
| D. 382,048 | 5,509,047 | 5,600,028 | 5,636,170 |
| D. 385,909 | 5,512,910 | 5,601,042 | 5,639,394 |
| D. 388,106 | 5,513,133 | 5,602,500 | 5,639,593 |
| D. 390,421 | 5,520,128 | 5,603,652 | 5,640,190 |
| Re. 35,364 | 5,527,974 | 5,604,356 | 5,643,732 |
| Re. 35,674 | 5,530,680 | 5,605,488 | 5,644,407 |
| 4,753,873 | 5,538,873 | 5,605,840 | 5,644,583 |
| 5,181,364 | 5,539,352 | 5,609,142 | 5,645,836 |
| 5,239,062 | 5,542,436 | 5,609,695 | 5,646,032 |
| 5,288,726 | 5,543,065 | 5,609,701 | 5,646,283 |
| 5,310,408 | 5,543,636 | 5,612,745 | 5,646,397 |
| 5,338,860 | 5,556,779 | 5,612,881 | 5,646,514 |
| 5,395,407 | 5,560,916 | 5,613,784 | 5,646,546 |
| 5,411,711 | 5,561,033 | 5,613,935 | 5,647,906 |
| 5,446,798 | 5,565,543 | 5,614,826 | 5,648,229 |
| 5,450,279 | 5,566,042 | 5,620,654 | 5,648,300 |
| 5,451,125 | 5,567,855 | 5,622,857 | 5,649,076 |
| 5,454,607 | 5,569,800 | 5,624,989 | 5,650,004 |
| 5,457,091 | 5,570,236 | 5,625,870 | 5,650,019 |
| 5,463,620 | 5,573,831 | 5,627,181 | 5,650,381 |
| 5,472,843 | 5,576,194 | 5,628,596 | 5,650,626 |
| 5,488,751 | 5,576,905 | 5,629,251 | 5,650,660 |
| 5,492,894 | 5,578,380 | 5,629,411 | 5,651,151 |
| 5,495,000 | 5,591,048 | 5,631,489 | 5,652,700 |



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5,652,762 | 5,669,878 | 5,686,178 | 5,693,187 | 5,701,068 | 5,705,262 | 5,709,625 | 5,713,757 |
| 5,653,791 | 5,671,927 | 5,686,502 | 5,693,280 | 5,702,243 | 5,705,280 | 5,709,778 | 5,713,893 |
| 5,654,423 | 5,673,538 | 5,687,029 | 5,694,013 | 5,702,244 | 5,705,525 | 5,710,237 | 5,714,045 |
| 5,655,181 | 5,674,867 | 5,687,126 | 5,694,015 | 5,702,339 | 5,705,538 | 5,710,245 | 5,714,055 |
| 5,655,417 | 5,674,994 | 5,687,794 | 5,695,156 | 5,702,494 | 5,705,721 | 5,710,278 | 5,714,477 |
| 5,656,568 | 5,675,411 | 5,688,146 | 5,696,718 | 5,702,657 | 5,705,918 | 5,710,331 | 5,714,782 |
| 5,658,567 | 5,675,549 | 5,688,276 | 5,696,750 | 5,702,739 | 5,706,174 | 5,710,493 | 5,714,897 |
| 5,658,764 | 5,676,478 | 5,688,302 | 5,696,800 | 5,702,990 | 5,706,795 | 5,710,552 | 5,715,280 |
| 5,658,935 | 5,676,650 | 5,688,627 | 5,696,970 | 5,703,131 | 5,706,930 | 5,710,903 | 5,715,425 |
| 5,658,974 | 5,676,931 | 5,688,637 | 5,697,056 | 5,703,148 | 5,706,956 | 5,711,006 | 5,715,585 |
| 5,659,384 | 5,678,284 | 5,689,092 | 5,697,109 | 5,703,250 | 5,707,283 | 5,711,028 | 5,715,672 |
| 5,661,073 | 5,678,395 | 5,689,158 | 5,697,962 | 5,703,262 | 5,707,454 | 5,711,180 | 5,715,687 |
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| 5,661,597 | 5,679,176 | 5,689,821 | 5,698,111 | 5,703,800 | 5,707,684 | 5,711,765 | 5,716,287 |
| 5,661,701 | 5,679,201 | 5,689,987 | 5,698,679 | 5,703,910 | 5,707,854 | 5,711,814 | 5,716,795 |
| 5,661,950 | 5,679,964 | 5,690,336 | 5,699,438 | 5,704,031 | 5,708,016 | 5,711,923 | 5,717,046 |
| 5,662,007 | 5,681,511 | 5,690,659 | 5,699,538 | 5,704,275 | 5,708,092 | 5,712,044 | 5,717,060 |
| 5,666,005 | 5,681,688 | 5,690,736 | 5,699,715 | 5,704,518 | 5,708,292 | 5,712,196 | 5,717,360 |
| 5,666,207 | 5,682,564 | 5,690,799 | 5,700,027 | 5,704,727 | 5,708,295 | 5,712,379 | 5,718,244 |
| 5,666,318 | 5,682,839 | 5,691,061 | 5,700,072 | 5,704,886 | 5,708,383 | 5,712,562 | 5,718,286 |
| 5,668,396 | 5,683,519 | 5,691,222 | 5,700,186 | 5,705,006 | 5,708,430 | 5,712,725 | 5,718,818 |
| 5,668,551 | 5,684,612 | 5,691,483 | 5,700,266 | 5,705,071 | 5,708,561 | 5,713,113 | 5,719,516 |
| 5,668,972 | 5,684,687 | 5,692,345 | 5,700,281 | 5,705,091 | 5,708,574 | 5,713,153 | 5,720,860 |
| 5,669,482 | 5,685,363 | 5,692,809 | 5,700,327 | 5,705,172 | 5,709,260 | 5,713,480 | 5,723,159 |
| 5,669,623 | 5,686,094 | 5,693,086 | 5,700,459 | 5,705,176 | 5,709,440 | 5,713,594 | |

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**Summary of Final Decisions**

**Issued by the**

**Trademark Trial and Appeal Board**

**March 2-6, 1998**

| Date Issued | Type of Case[1] | Proceeding or App'n No. | Party/Parties | Issue | TTAB Decision | Opposer's/ Petitioner's Mark and Goods/Services | Applicant's/ Respondent's Mark and Goods/Services | Mark and Goods Cited by Examining Attorney | Citable as Precedent of TTAB |
|---|---|---|---|---|---|---|---|---|---|
| 3-5 | EX | 74/510,469 | HemaSure Inc. | 2(e)(1) | Refusal Affirmed | | "CELLWASHER" [filter for removing excess fluids from a blood supply] | | No |
| 3-5 | EX | 74/651,842 | Valley Dental, Inc. | whether, as evidenced by the specimens of record, the matter sought to be registered is being used as a service mark for the services recited in the application | Refusal Affirmed | | "TOMMY TOOTHBRUSH" [promoting dental health to children] | | No |
| 3-6 | EX | 74/651,840 | Valley Dental, Inc. | whether, as evidenced by the specimens of record, the matter sought to be registered is being used as a service mark for the services recited in the application; whether a more definite recitation of services is required | Refusal Affirmed as to requirement for specimens showing service mark use (but refusal reversed as to requirement for amendment to recitation of services) | | "SUGAR BUGS" [promoting dental health to children] | | No |

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ FOR RECONSIDERATION; (MD) = MOTION TO DISMISS; (MR) = MOTION TO REOPEN



| Date Issued | Type of Case[1] | Proceeding or App'n No. | Party/Parties | Issue | TTAB Decision | Opposer's/ Petitioner's Mark and Goods/Services | Applicant's/ Respondent's Mark and Goods/Services | Mark and Goods Cited by Examining Attorney | Citable as Precedent of TTAB |
|---|---|---|---|---|---|---|---|---|---|
| 3-6 | EX | 74/553,009 | BAB Holdings, Inc. | 2(d) | Refusal Reversed | | "BAGEL YUMMIES" [bagels and bagel holes, sold exclusively through applicant's restaurant locations] | "YUMMY" (and chef's head design) [breads]; "YUMMIES" (and heart design) [candy and baked goods, namely, cookies and crackers for consumption on and off the premises] | No |
| 3-6 | CANC | 22,837 | Eastern Foods, Inc. v. TCCD Int'l., Inc. | 2(d) | Petition to Cancel Denied | "NATURALLY FRESH" [salad dressing and an egg and dairy based mix to be used as a filling for quiche; sauces, excluding apple sauce and cranberry sauce]; "NATURALLY FRESH" (and design) [salad dressings and an egg and dairy based mix to be used as a filling for quiche and as an omelette mix; sauces excluding apple sauce and cranberry sauce] | "NATURALLY FRESH DEODORANT CRYSTAL" [personal deodorants] | | No |

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION; (MD) = MOTION TO DISMISS; (MR) = MOTION TO REOPEN

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| PATENT EXAMINING GROUPS | Phone number Area Code 703 | New Case Date* |
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| GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—THEODORE MORRIS, Director | 308-0661 | 01/05/96 |
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| TELECOMMUNICATIONS, GROUP 2600—JIN F. NG, Director | 305-3900 | 06/08/95 |
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| MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director | 308-0858 | 01/10/96 |
| SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director | 308-0861 | 01/16/96 |
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*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
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However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.



## TRADEMARK OPERATION

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**Condition of Trademark Applications as of March 1, 1998**

| Law Office | Oldest Date New* | Oldest Date Amendment Filed |
|---|---|---|
| Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 09/19/97 | 12/29/97 |
| Law Office 102—Thomas Shaw, Acting Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/22/97 | 01/05/98 |
| Law Office 103—Michael A. Szoke, Acting Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/17/97 | 03/06/98 |
| Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 06/09/97 | 12/15/97 |
| Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/24/97 | 12/10/97 |
| Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/22/97 | 11/06/97 |
| Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 10/09/97 | 12/09/97 |
| Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 06/16/97 | 11/14/97 |
| Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 06/30/97 | 01/05/98 |
| **Collective Marks—Class 200 | | |
| **Certification Marks—Classes A & B | | |
| Office of Trademark Services—Terron Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126 | | |
| Affidavits Under Sections 8 & 15 (All Classes) | 01/16/98 | —0— |
| Renewals (All Classes) | 01/16/98 | —0— |
| Section 12(c) Publications (All Classes) | 12/31/97 | —0— |

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

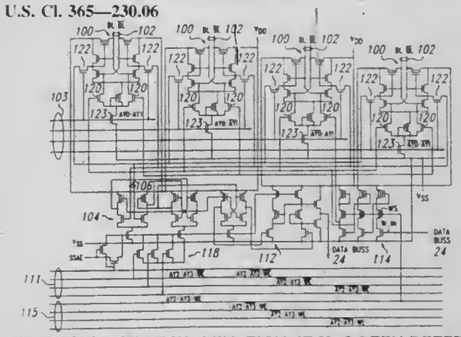
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# REEXAMINATIONS

APRIL 21, 1998

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 4,723,228 (3497th)**
**MEMORY DECODING CIRCUITRY**
**Ashwin H. Shah; James D. Gallia, and Shivaling S. Mahant-Shetti, all of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**
**Reexamination Request No. 90/004,534, Jan. 31, 1997.**
**Reexamination Certificate for Patent 4,723,228, issued Feb. 2, 1988, Ser. No. 528,205, Aug. 31, 1983.**
**Int. Cl.[6] G11C** *8/00*
**U.S. Cl. 365—230.06**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2** and **4** are cancelled.

Claims **1**, **6** and **7** are determined to be patentable as amended.

Claims **3** and **5**, dependent on an amended claim, are determined to be patentable.

New claims **8–50** and **51** are added and determined to be patentable.

**1**. A random access memory *having a plurality of bit positions for producing an external output signal which is more than one bit wide, the memory*comprising:

an array of memory cells arranged in rows and columns, *the array of memory cells being organized into the plurality of bit positions wherein each bit position includes a portion of the array of memory cells, each bit position for producing one bit of data to be output from the memory*;

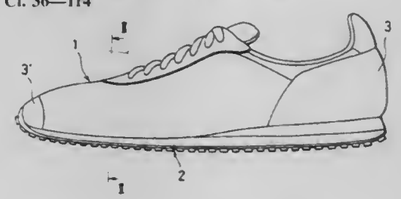
a column address decoder for receiving a column address signal, said decoder providing first and second *decoder* output signals in response to said column address signal;

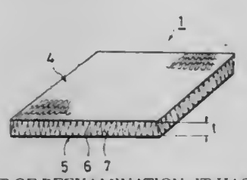
a plurality of primary sense amplifiers *for each bit position*, each of said columns of said memory cells of said array being connected to one of said primary sense amplifiers, said primary sense amplifiers being grouped in a plurality of subsets [of said plurality] of primary sense amplifiers, one of said primary sense amplifiers in each subset [of said plurality of subsets of said plurality of primary sense amplifiers] being selectively activated in response to said first *decoder* output signal; [and]

a plurality of secondary sense amplifiers *for each bit position*, each of said secondary sense amplifiers having an input connected to the outputs of [one of said primary sense amplifiers from] each *primary sense amplifier of a subset* of said subsets [of said plurality] of primary sense amplifiers, *one of* said secondary sense amplifiers *for each bit position* being selectively activated in response to said second *decoder* output signal, [said plurality of] *each of said selectively activated* secondary sense amplifiers providing a data output signal in response to [the] *a data* signal sensed by the selected primary and secondary sense amplifiers, *the data output signal from each bit position corresponding to a data bit in a multi-bit external data output signal.*

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**B1 4,785,558 (3498th)**
**SHOE UPPER OF INTERKNITTED OUTER AND INNER KNIT LAYERS**
**Kazuhiko Shiomura, Osaka, Japan, assignor to Toray Industries, Inc., Tokyo, Japan**
**Reexamination Request No. 90/004,167, Mar. 5, 1996.**
**Reexamination Certificate for Patent 4,785,558, issued Nov. 22, 1988, Ser. No. 76,443, Jul. 22, 1987.**
**Claims priority, application Japan, Jul. 31, 1986, 61-118269**
**U**
**Int. Cl.[6] A43B** *5/00;23/00*
**U.S. Cl. 36—114**





AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–7** are cancelled.

**[1**. A shoe comprising a sole and a shoe upper attached to said sole, wherein said shoe upper is comprised of an outer knit fabric layer, an inner knit fabric layer provided opposite to said outer knit fabric layer through a space having a thickness of 1 to 10 mm, and a crossing thread which is interknitted to be bound into said outer and inner knit fabric layers and crosses said space, said crossing thread being provided at a density of 500 to 4500 threads per square inch and having a single yarn fineness of 3 to 50 denier.**]**

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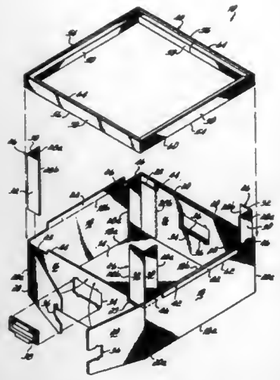
**B1 5,295,632 (3499th)**
**TOTE BOX WITH SELF LOCKING TOP RAIL**
**Robert M. Zink, Grand Haven; Judson A. Bradford, Holland, and Donald J. Bazany, Grand Haven, all of Mich., assignors to Bradford Company, Holland, Mich.**
**Reexamination Request No. 90/004,703, Jul. 25, 1997.**
**Reexamination Certificate for Patent 5,295,632, issued Mar. 22, 1994, Ser. No. 992,562, Dec. 18, 1992.**
**Int. Cl.[6] B65D** *5/44*
**U.S. Cl. 229—198**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **24–34** is confirmed.

Claims **2**, **7** and **9–18** are cancelled.

Claims **1**, **3**, **5** and **19** are determined to be patentable as amended.



Claims **4**, **6**, **8** and **20–23**, dependent on an amended claim, are determined to be patentable.

New claim **35** is added and determined to be patentable.

**1**. A tote box with self-locking top rail comprising:

a box formed from a uniform thickness foldable box blank and having a bottom, two upstanding end walls, two upstanding side walls, and four end flaps which are extensions of said side walls, said side walls and end walls having upper edges which form a top edge of said box, said side walls having tabs on said upper edges thereof which are downwardly folded on said side walls; **[**and**]**

a unitary top rail extending around the top edge of said box, said top rail having a downwardly open channel formed between a pair of channel side walls, said channel being fitted over said upper edge of each said side wall, each said end wall, and each of said end flaps, said open channel having a width of approximately twice the thickness of said box blank so as to fit over said end walls and said end flaps and said side walls and said downwardly folded tabs, said open channel having at least one inwardly extending hook on a bottom edge of at least one of said channel side walls, each said hook engaging one of said tabs and locking said top rail onto said top edge of said erected end and side walls**[**.**]**; *and*

*four corner enhancers, one of which resides in each inside corner of said box such that a first leg of each said corner enhancer is sandwiched between each said end wall and said end flaps and a second leg of each said corner enhancer resides against an inside surface of said side wall.*

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**B1 5,401,504 (3500th)**

**USE OF TUMERIC IN WOUND HEALING**

**Suman K. Das, and Hari har P. Cohly, both of Jackson, Miss., assignors to The University of Mississippi Medical Center, Jackson, Miss.**

**Reexamination Request No. 90/004,433, Oct. 28, 1996.**

**Reexamination Certificate for Patent 5,401,504, issued Mar. 28, 1995, Ser. No. 174,363, Dec. 28, 1993.**

**Int. Cl.**[6] **A61K** *35/78*

**U.S. Cl. 424—195.1**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–6** are cancelled.

**1**. A method of promoting healing of a wound in a patient, which consists essentially of administering a wound-healing agent consisting of an effective amount of turmeric powder to said patient.

**B1 5,465,206 (3501st)**

**ELECTRONIC BILL PAY SYSTEM**

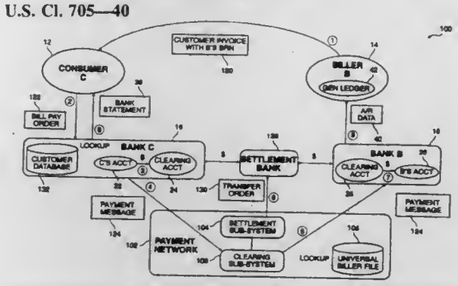
**James J. Hilt, Daly City; Ron Hodges, San Ramon; Stephen W. Pardue, Half Moon Bay, and William L. Powar, Palo Alto, all of Calif., assignors to Visa International Service Association, Foster City, Calif.**

**Reexamination Request No. 90/004,516, Jan. 13, 1997.**

**Reexamination Certificate for Patent 5,465,206, issued Nov. 7, 1995, Ser. No. 146,515, Nov. 1, 1993.**

**Int. Cl.**[6] **G06F** *157/00*

**U.S. Cl. 705—40**




AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–30** is confirmed.

**1**. An electronic funds transfer network for transferring funds from a consumer account to a biller account, wherein a funds transfer from the consumer account occurs when a first transaction processor applies a debit portion of an accounting transaction to the consumer account and a funds transfer to the biller account occurs where a second transaction processor applies a credit portion of a resulting accounting transaction to the biller account, comprising:

order input means for consumer input of a bill pay order, said bill pay order including at least a reference to a biller identification (biller ID), a payment amount, and an identifier of a consumer-biller account to be credited, wherein said consumer-biller account is used to determine amounts owed to a biller by a consumer;

a first transaction processor, configured to at least maintain a balance of the consumer account and process debit portions of accounting transactions against the consumer account, said first transaction processor being a computer operated for a consumer financial institution with whom the consumer maintains the consumer account;

means for transmitting said bill pay order from said order input means to said first transaction processor;

payment data packet generation means, controlled by said first transaction processor, for generating a payment data packet based on said bill pay order, said payment data packet comprising at least data fields indicating said biller ID, said payment amount and said consumer-biller account identifier;

an electronic packet transfer network which electronically couples said payment data packet generation means at an originating node to a plurality of similar nodes, wherein each node is uniquely identified by a financial institution identifier (BID), said electronic packet transfer network including destination translation means for translating said biller ID field of said payment data packet into a pointer to a destination node;

a second transaction processor located at said destination node, configured to at least maintain a balance of the biller account and process credit portions of accounting transactions against the biller account, said second transaction processor being a computer operated for the biller financial institution with whom a biller maintains the biller account;



payment data packet accepting means, coupled to said electronic packet transfer network and to said second transaction processor, for accepting said payment data packet from said electronic packet transfer network and applying a credit transaction to the biller account according to said payment amount field of said payment data packet; and

a biller accounts receivable data processor, coupled to one of said electronic packet transfer network or said payment data packet accepting means, which processes biller data included in said payment data packet and provides said biller data in a form used by said biller to update said consumer-biller account to reflect a credit based on to said payment amount.

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Re. 35,772

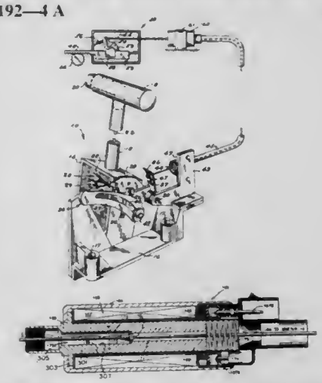
## SOLENOID SYSTEM FOR, FOR EXAMPLE, A BRAKE/SHIFT INTERLOCK FOR VEHICULAR TRANSMISSION CONTROL

**Richard Ratke, Dearborn, and Donald E. Ellison, Clemens, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.**

**Original No. 5,078,242, dated Jan. 7, 1992, Ser. No. 614,415, Dec. 24, 1990. Division of Ser. No. 440,554, Nov. 20, 1989, Pat. No. 5,027,929, which is a continuation-in-part of Ser. No. 206,255, Jun. 13, 1988, Pat. No. 4,887,702. Application for reissue Jan. 6, 1994, Ser. No. 178,047**

**Int. Cl.[6] B60K** *41/26;41/04;* **H01F** *7/08*

**U.S. Cl. 192—4 A** **36 Claims**



1. In a brake/shift interlock for use in a vehicle having a shift control mechanism for an automatic transmission, the transmission having a "Park" mode and modes other than Park, the shift control mechanism having a shift lever for controlling selection of the transmission modes, a detent mechanism having a latch and latch plate, the latch being adapted to be in detented engagement with respective detent notches in the latch plate, one of said detent [notch] *notches* coinciding with a Park position of the shift [leer] *lever*, and the latch being selectively, manually actuable out of said detented engagement with a respective detent notch, and a Park/Lock member actuable to lock the latch in the Park position detent notch, the vehicle having an ignition switch having "Off" and "Run" positions, an ignition lock mechanism associated with the ignition switch and connected with the Park/Lock member for actuating the Park/Lock member to a "Lock" position to maintain the latch locked in the Park position detent notch when the ignition switch is in its Off position, and a brake switch connected in an electrical power circuit, and adapted to be actuated in conjunction with the actuation of the vehicle brakes, an improvement in the brake/shift interlock, comprising:

an electromagnetic actuator including a solenoid having a plunger, *a housing and a spool*, said plunger having a stepped, axial opening through it;

electrical means for connecting said electro-magnetic actuator electrically into the power circuit including the brake switch to control operation of said actuator as a function of the actuation of the brake switch;

the ignition lock mechanism including a *first* substantially inelastic line connected to the Park/Lock member;

a *second* substantially inelastic, mechanical connecting line mechanically connecting said plunger of said electromagnetic actuator in line with the movement of the Park/Lock member, said electromagnetic actuator being energizable for placing said *second* connecting line in tension and urging the Park/Lock member toward the Lock position, said *second* connecting line extending through said axial opening in said plunger and having a laterally extended element engaging the stepped portion of said axial opening, causing said line and said plunger to move in unison due to the stepped engagement between said laterally extended element and said plunger, said *second* substantially inelastic line being a cable, and said laterally extended element being a mushroom-shaped button member affixed to said cable; *and*

*a stop member having a flange extending thereabout, said flange disposed between said housing and said spool, a portion of said plunger abutting against said stop member when said electromagnetic actuator is energized.*

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Re. 35,773

## ELECTRORHELOGICAL FLUID

**Izuho Okada, Tsukubashi; Yoshinobu Asako, Tsuchiura; Kiyomi Arimatsu, Moriyamachi; Minoru Kobayashi, Tsukuba; Satoru Ono, Tsukuha, and Ryuji Aizawa, Tsukuba, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka-fu, Japan**

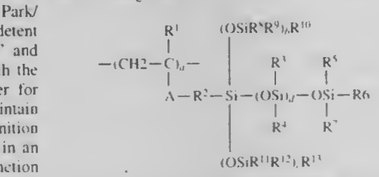
**Original No. 5,376,294, dated Dec. 27, 1994, Ser. No. 89,126, Jul. 9, 1993. Continuation-in-part of Ser. No. 810,496, Dec. 19, 1991, abandoned. Application for reissue Jun. 20, 1996, Ser. No. 627,025**

**Claims priority, application Japan, Aug. 29, 1991, 3-218227; Oct. 21, 1991, 3-272212; Dec. 9, 1992, 4-329115; Dec. 15, 1992, 4-334562; Feb. 22, 1993, 5-031518; Feb. 22, 1993, 5-031519; Feb. 22, 1993, 5-031520; Feb. 25, 1993, 5-036323; Feb. 25, 1993, 5-036324; Feb. 25, 1993, 5-036325; Feb. 25, 1993, 5-036326**

**Int. Cl.[6] C10M** *169/04;171/00*

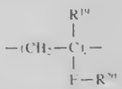
**U.S. Cl. 252—78.3** **13 Claims**

1. An electrorheological fluid comprising a dispersed phase made of a dielectric particle, a dispersing medium made of an insulating liquid, and an additive, said additive being substantially insoluble in said dispersing medium, and being a composite containing a polysiloxane-containing structural unit (A) represented by the following formula (1):



(1)

wherein A is —COO—; $R^1$ a hydrogen atom or methyl group, $R^2$ an alkylene group of 1–6 carbon atoms, $R^3$–$R^{13}$ are the same or different aryl groups, alkyl groups of 1–6 carbon atoms, or alkoxy groups of 1–10 carbon atoms, a an integer, b and c the same or different integers of 0–10, d an integer of 0–200, and at least one dispersed phase adsorbing chain-containing structural unit (B) selected from the group consisting of a long hydrocarbon chain-containing structural unit (B-3) represented by the following formula 4:



(4)

wherein E is —COO— or phenylene group, $R^{19}$ a hydrogen atom or methyl group, $R^{20}$ an alkyl group of 4–30 carbon atoms, and i an integer.

Re. 35,774

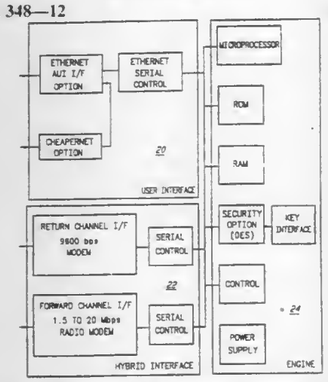
## REMOTE LINK ADAPTER FOR USE IN TV BROADCAST DATA TRANSMISSION SYSTEM

**Eduardo J. Moura, San Jose, and James C. Long, Sunnyvale, both of Calif., assignors to Hybrid Networks, Inc., Cupertino, Calif.**

**Original No. 5,347,304, dated Sep. 13, 1994, Ser. No. 98,764, Jul. 28, 1993. Continuation of Ser. No. 757,151, Sep. 10, 1991, abandoned. Application for reissue Nov. 16, 1994, Ser. No. 340,733**

**Int. Cl.[6] H04H *1/00***

**U.S. Cl. 348—12** **55 Claims**




*10. In a high speed digital information transmission system in which multi megabit per second digital data is transmitted using continuous transmissions that include address information in any portion of bandwidth a television channel to a remote site, said system comprising a remote computer and a remote link adapter for interconnecting said remote computer to an asymmetric network, said adapter comprising:*

*a hybrid interface for demodulating a multi megabit per second digitally encoded signal to obtain transmitted digital data, said hybrid interface providing a two way asymmetric network connection which is constructed of independent transmission channels in two directions,*

*a user interface for providing digital data from said digitally encoded signal to said remote computer,*

*a microprocessor controller for controlling said hybrid interface to control the flow of digital data in the transmission channels,*

*a bus interconnecting said remote computer, user interface, said hybrid interface and said microprocessor controller, and*

*said digitally encoded signal includes address information associated with said remote computer and said microprocessor controller controls the flow of digital data in accordance with said address information.*

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Re. 35,775

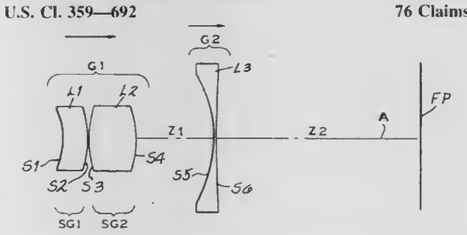
## ZOOM LENS WITH SHORT BACK FOCAL LENGTH

**Ellis I. Betensky, Redding, Conn.; Melvyn H. Kreitzer, and Jacob Moskovich, both of Cincinnati, Ohio**

**Original No. 4,936,661, dated Jun. 26, 1990, Ser. No. 288,429, Dec. 22, 1988. Continuation-in-part of Ser. No. 76,893, Jul. 23, 1987, abandoned. Application for reissue Jun. 25, 1992, Ser. No. 904,373**

**Int. Cl.[6] G02B *15/14;13/18***

**U.S. Cl. 359—692** **76 Claims**




*60. A zoom lens comprising, from the object end:*

*a first lens unit of overall positive power, and a second lens unit of negative power;*

*both of the lens units being axially movable to vary the equivalent focal length of the lens;*

*the first lens unit comprising, from the object end, first and second subunits, the first subunit being of negative power and having a negative lens as the object side lens, and the second subunit being of positive power;*

*the second lens unit having a greater magnification ratio than the second subunit and, upon movement, providing the majority of change of overall lens power.*

# PLANT PATENTS

## GRANTED APRIL 21, 1998

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

10,333

### MINIATURE ROSE PLANT NAMED 'KELDAZ'

**Martin W. Kelly, High Falls, N.Y., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.**

**Filed Mar. 26, 1997, Ser. No. 824,909**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—7.1** **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described.

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10,334

### FLORIBUNDA ROSE PLANT NAMED 'WEKCALROC'

**Thomas F. Carruth, Altadena, Calif., assignor to Weeks Wholesale Rose Grower, Inc., Upland, Calif.**

**Filed Mar. 13, 1997, Ser. No. 816,868**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—22** **1 Claim**

1. A new and distinct variety of Floribunda rose plant substantially as described and illustrated herein.

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10,335

### *TAXUS CUSPIDATA* CV. 'MONLOO'

**Roberts LeBoutillier, Exton, Pa., assignor to Monrovia Nursery Company, Azusa, Calif.**

**Filed Sep. 26, 1996; Ser. No. 710,932**

**Int. Cl.[6] A01N *5/00***

**U.S. Cl. Plt.—50.3** **1 Claim**

1. A new and distinct selection of *Taxus cuspidata* plant as substantially shown and described herein, that is characterized particularly as a novelty by the unique combination of small dense needles and a symmetrical low growth and shorter rigid branching and a comparatively overall enhanced denser appearance.

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10,336

### OSTEOSPERMUM PLANT NAMED 'CAPE DAISY ZIMBA'

**Carl Aksel Kragh Sorensen, Åbyhoj, Denmark, assignor to Paul Ecke Ranch, Encinitas, Calif.**

**Filed Aug. 9, 1996, Ser. No. 695,341**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—68.1** **1 Claim**

1. A new and distinct cultivar of Osteospermum plant named 'Cape Daisy Zimba', as illustrated and described.

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10,337

### OSTEOSPERMUM PLANT NAMED 'CAPE DAISY LUSAKA'

**Carl Aksel Kragh Sorensen, Åbyhoj, Denmark, assignor to Paul Ecke Ranch, Encinitas, Calif.**

**Filed Aug. 9, 1996, Ser. No. 695,342**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—68.1** **1 Claim**

1. A new and distinct cultivar of Osteospermum plant named 'Cape Daisy Lusaka', as illustrated and described.

10,338

### OSTEOSPERMUM PLANT NAMED 'CAPE DAISY VOLTA'

**Carl Aksel Kragh Sorenson, Aabyhöj, Denmark, assignor to Paul Ecke Ranch, Encinitas, Calif.**

**Filed Aug. 9, 1996, Ser. No. 696,316**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—68.1** **1 Claim**

1. A new and distinct cultivar of Osteospermum plant named 'Cape Daisy Volta', as illustrated and described.

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10,339

### OSTEOSPERMUM PLANT NAMED 'SUNNY GIRL'

**Bjarne Larsen, Odense, Denmark, assignor to Paul Ecke Ranch, Encinitas, Calif.**

**Filed Aug. 15, 1996, Ser. No. 698,337**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—68.1** **1 Claim**

1. A new and distinct cultivar of Osteospermum plant named 'Sunny Girl' as illustrated and described.

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10,340

### OSTEOSPERMUM PLANT NAMED 'CAPE DAISY NAIROBI'

**Carl Aksel Kragh Sorensen, Åbyhoj, Denmark, assignor to Paul Ecke Ranch, Encinitas, Calif.**

**Filed Aug. 15, 1996, Ser. No. 698,341**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—68.1** **1 Claim**

1. A new and distinct cultivar of Osteospermum plant named 'Cape Daisy Nairobi', as illustrated and described.

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10,341

### OSTEOSPERMUM PLANT NAMED 'SUNNY SONJA'

**Bjarne Larsen, Odense, Denmark, assignor to Paul Ecke Ranch, Encinitas, Calif.**

**Filed Aug. 15, 1996, Ser. No. 698,342**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—68.1** **1 Claim**

1. A new and distinct cultivar of Osteospermum plant named 'Sunny Sonja' as illustrated and described.

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10,342

### OSTEOSPERMUM PLANT NAMED 'CAPE DAISY CONGO'

**Carl Aksel Kragh Sorensen, Åbyhoj, Denmark, assignor to Paul Ecke Ranch, Encinitas, Calif.**

**Filed Aug. 9, 1996, Ser. No. 700,657**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—68.1** **1 Claim**

1. A new and distinct cultivar of Osteospermum plant named 'Cape Daisy Congo' as illustrated and described.



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10,343
**BRACHYCOME PLANT NAMED 'TOUCAN TANGO'**
**Garry Henry Grueber, Mainz, Germany, assignor to Innovaplant GmbH & Co. KG, Gensingen, Germany**
**Filed Sep. 17, 1996, Ser. No. 710,304**
**Int. Cl.[6] A01H** *5/00*
**U.S. Cl. Plt.—68.1** **1 Claim**

1. A new and distinct Brachycome plant named 'Toucan Tango', as illustrated and described.

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10,344
**CARNATION PLANT NAMED 'CFPC HALO'**
**Walter H. Jessel, Jr., Gonzales, Calif., assignor to California Florida Plant Co., L.P., Salinas, Calif.**
**Filed Sep. 10, 1996, Ser. No. 711,034**
**Int. Cl.[6] A01H** *5/00*
**U.S. Cl. Plt.—70.2** **1 Claim**

1. A new and distinct variety of carnation plant substantially as shown and described.

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10,345
**DOUBLE IMPATIENS PLANT NAMED 'TIOGA WHITE'**
**Harlan B. Cosner, and Sue L. Cosner, both of P.O. Box 173, Broadbent, Oreg. 97414**
**Filed Aug. 8, 1996, Ser. No. 694,161**
**Int. Cl.[6] A01H** *5/00*
**U.S. Cl. Plt.—87.6** **1 Claim**

1. A new and distinct Double Impatiens plant named 'Tioga White', as illustrated and described.

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10,346
**ALSTROEMERIA PLANT VARIETY NAMED 'STAPRIZSA'**
**Jacob van Andel, Aalsmeer, Netherlands, assignor to Van Staaveren B.V., Aalsmeer, Netherlands**
**Filed Sep. 16, 1996, Ser. No. 716,484**
**Int. Cl.[6] A01M** *5/00*
**U.S. Cl. Plt.—87.1** **1 Claim**

1. A new variety of Alstroemeria plant substantially as herein shown and described, suitable for growing in pots.

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10,347
**ALSTROEMERIA PLANT VARIETY NAMED 'STAPRIMIL'**
**Jacob van Andel, Aalsmeer, Netherlands, assignor to Van Staaveren B.V., Aalsmeer, Netherlands**
**Filed Sep. 16, 1996, Ser. No. 716,498**
**Int. Cl.[6] A01H** *5/00*
**U.S. Cl. Plt.—87.1** **1 Claim**

1. A new variety of Alstroemeria plant substantially as herein shown and described, suitable for growing in pots.

10,348
**ALSTROEMERIA PLANT NAMED 'STRAPRIMON'**
**Jacob van Andel, Aalsmeer, Netherlands, assignor to Van Staaveren B.V., Aalsmeer, Netherlands**
**Filed Sep. 16, 1996, Ser. No. 716,500**
**Int. Cl.[6] A01H** *5/00*
**U.S. Cl. Plt.—87.1** **1 Claim**

1. A new variety of Alstroemeria plant substantially as herein shown and described, suitable for growing in pots.

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10,349
**GERANIUM NAMED 'CLIPS LIGHT LAV'**
**Mitchell Eugene Hanes, Morgan Hill, Calif., assignor to Goldsmith Seeds, Inc., Gilroy, Calif.**
**Filed Nov. 13, 1996, Ser. No. 748,266**
**Int. Cl.[6] A01H** *5/00*
**U.S. Cl. Plt.—87.12** **1 Claim**

1. A new and distinct cultivar of geranium plant, substantially as herein shown and described, named 'Clips Light Lav', that is characterized by: dark green foliage, light bluish pink flower color, and semi-double flowers on large umbels, fast rooting and a vigorous growth habit.

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10,350
**GERANIUM PLANT NAMED 'FISPUR'**
**Angelika Utecht, Montabaur, Germany, assignor to Florfis AG, Binningen, Switzerland**
**Filed Nov. 22, 1996, Ser. No. 754,364**
**Int. Cl.[6] A01H** *5/00*
**U.S. Cl. Plt.—87.12** **1 Claim**

1. A new and distinct cultivar of geranium plant named 'Fispur', as illustrated and described.

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10,351
**BROMELIAD PLANT NAMED 'GUZ 218'**
**Jeffrey C. Kent, Vista, Calif., assignor to Kent's Bromeliad Nursery, Inc., Vista, Calif.**
**Filed Jul. 26, 1996, Ser. No. 686,656**
**Int. Cl.[6] A01H** *5/00*
**U.S. Cl. Plt.—88.8** **1 Claim**

1. A new and distinct Guzmania plant as shown and described herein, characterized particularly as to novelty by the bright red coloration of the bracts, with the lower and uppermost bracts ascending and the intermediately positioned bracts splayed relative to the axis of the spike.

# PATENTS

## GRANTED April 21, 1998

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 004–620 | 5,740,569 |
| 084–661 | 5,740,993 |
| 296–146 | 5,741,138 |
| 433–216 | 5,741,139 |
| 433–220 | 5,741,275 |
| 604–143 | 5,741,284 |
| 604–160 | 5,741,293 |
| 600–198 | 5,741,753 |
| 502–226 | 5,741,760 |
| 510–365 | 5,741,828 |
| 524–501 | 5,741,832 |
| 023–132 | 5,742,135 |
| 375–354 | 5,742,768 |
| 295–200 | 5,742,850 |
| 396–072 | 5,742,850 |

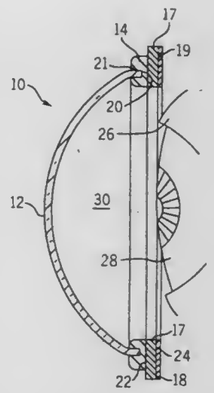
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# PATENTS

GRANTED APRIL 21, 1998

## GENERAL AND MECHANICAL

**5,740,550**
**MEMBRANE SHIELD FOR EYES**
**Edward Q. Yavitz, 3828 Spring Creek Rd., Rockford, Ill. 61114**
**Continuation-in-part of Ser. No. 709,473, Sep. 5, 1996, abandoned. This application Jun. 2, 1997, Ser. No. 867,122**
**Int. Cl.[6] A61F** *9/04*
**U.S. Cl. 2—15** **20 Claims**






1. A moisture shield for application to a mammalian face to retain moisture in a mammalian eye, comprising:
a window having a perimeter region, wherein the window comprises a lens;
a base to which the perimeter region is sealingly attached, the base adjoining a flexible collar extending outwardly from the perimeter region and being impermeable to the passage of water vapor therethrough; and
an adhesive layer disposed on the flexible collar to permit attachment of the moisture shield to the mammalian face about the mammalian eye.

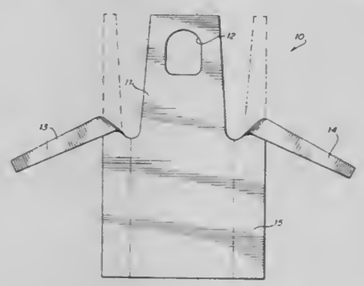
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**5,740,551**
**MULTI-LAYERED BARRIER GLOVE**
**Philip E. Walker, Wilmington, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.**
**Filed Jun. 10, 1996, Ser. No. 661,275**
**Int. Cl.[6] A41D** *13/10*
**U.S. Cl. 2—16** **2 Claims**

1. A multi-layered barrier glove comprising:
an outer shell fabricated at least in part from aramid fibers; and
a barrier insert disposed underneath the shell and fabricated from a gas permeable, liquid impermeable laminate having a membrane fabricated from porous PTFE, said membrane having a first side with a co-polyester nonwoven layer bonded thereto and said membrane having a second, opposite side with a nylon nonwoven layer bonded thereto.

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**5,740,552**
**DISPOSABLE APRONS**
**Dennis B. Smith, 708 Higgins Rd., Champaign, Ill. 61821**
**Filed Feb. 26, 1997, Ser. No. 806,900**
**Int. Cl.[6] A41B** *13/10*
**U.S. Cl. 2—48** **16 Claims**



1. A roll of disposable aprons of the type with a neck opening and two waist tie straps, the roll comprising an elongated strip of plastic film having:
(a) a portion of the strip along each side longitudinally folded over upon the remaining portion of the strip, each folded-over portion being about 1/10 to ¼ the total width of the strip; and
(b) a plurality of latitudinal perforations at spaced intervals of about ½ to 2 meters to enable the strip to be readily separated into discrete sheets; each sheet having:
(i) a cut-out portion located near the top and centered latitudinally in the sheet; and
(ii) a cut-away portion on each side of the cut-out portion, each cut-away portion beginning at a first point at the top and outside edge of the sheet, then running inward along the perforation to a second point at least about 1 cm from the inside edge of the folded-over portion, then running longitudinally downward a distance of about ¼ to substantially the entire length of the sheet, and then running

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outwardly to the outside edge of the sheet, each cut-away portion being cut from both the folded-over portion and the remaining portion;

such that each discrete sheet constitutes a disposable apron with the cut-out portion defining a neck opening and the two strips of the folded-over portions adjacent and inward of the cut-away portions defining two waist tie straps.

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**5,740,553**

**GARMENT HAVING A CURVED SEW LINE**

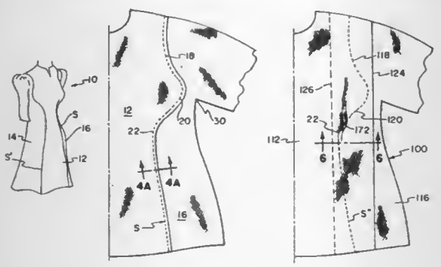
**Barbara Knapp, Pasadeba, Calif., assignor to Belle Classic Line, LLC, Pasadena, Calif.**

**PCT No. PCT/US94/14413, § 371 Date Jun. 7, 1996, § 102(e) Date Jun. 7, 1996, PCT Pub. No. WO95/15700, PCT Pub. Date Jun. 15, 1995**

**Continuation-in-part of Ser. No. 165,248, Dec. 10, 1993, Pat. No. 5,459,876. This PCT application Dec. 10, 1994, Ser. No. 656,275**

**Int. Cl.[6] A41D** *1/22*

**U.S. Cl. 2—74** **15 Claims**



1. A garment comprising:

a center front fabric having at least one bust line defined thereon, wherein a bust line extends vertically over and bisects one of the wearer's breasts; and

at least one side front fabric being sewn to said center front fabric along a curved sew line, said curved sew line comprising a first section, a second convex section and a third section, said second convex section being disposed between said first and said third sections and pointing away from said center front fabric, said at least one side front fabric having an underarm portion which extends beneath a wearers arm, said second convex section having an apex point that is disposed between 25% and 100% of the distance between a central point on said bust line and said underarm portion, where 0% of the distance corresponds to said central point and 100% of the distance corresponds to said underarm portion.

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**5,740,554**

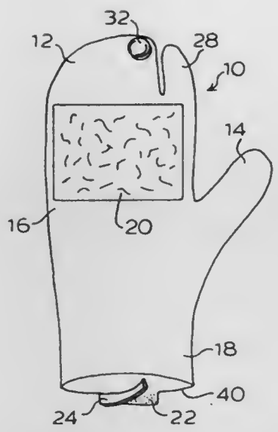
**DEVICE FOR SANITARY TAMPON REMOVAL AND DISPOSAL**

**B. Bernetiae Reed, 2711 McConnell Rd., Greensboro, N.C. 27401**

**Continuation-in-part of Ser. No. 573,957, Dec. 15, 1995, abandoned. This application Apr. 28, 1997, Ser. No. 848,142**

**Int. Cl.[6] A41D** *19/00*

**U.S. Cl. 2—158** **4 Claims**



1. An invertible mitten serviceable prior to inversion as a device for removing a tampon of the type having a string attached thereto and after inversion being serviceable as a device for encasing the removed tampon and any string attached thereto within the mitten for sanitary disposal, comprising:

a. a mitten formed of a relatively thin, highly flexible, impermeable, opaque material and adapted to fit over a selected hand and wrist of the wearer, said mitten having:

(i) a front side;

(ii) a back side;

(iii) a unitary finger portion adapted to substantially enclose all but the thumb and a selected outer portion of the index finger of the wearer;

(iv) a thumb portion integrally formed with said unitary finger portion and adapted to enclose the thumb of the wearer;

(v) an index finger portion integrally formed with said unitary finger portion and adapted to enclose only a selected outer portion substantially equal to half the length of the index finger of the wearer, thereby enabling the enclosed said selected outer portion to move independently of said unitary finger portion;

(vi) a mid-section located outwardly of said unitary finger portion; and

(vii) a cuff portion surrounding an opening into said mitten;

b. an absorbent pad affixed to said mid-section, on the front side of said mitten and inwardly of said index finger portion;

c. string grasping means secured to an outer extremity of said unitary finger portion on the said front side of said unitary finger portion and proximate said index finger portion and adapted to receive an outer end portion of the string attached to said tampon and effectively grasp said string such that when said mitten is worn by said wearer, and prior to its inversion, said tampon can be removed from a body cavity of the wearer by pulling on said string grasped by said means;

d. an adhesive tab mounted on said cuff portion, and having a peel-off protector which when removed exposes a pressure sensitive adhesive; and

e. said mitten being further formed to permit said tampon after being removed from said body cavity to be grasped within said mitten adjacent said absorbent pad and held by the enclosed fingers of said wearer and the thinness and flexibility of the material forming said mitten permitting the entire said mitten including said unitary finger, thumb and index finger portion to be inverted and after inversion to permit said mitten to be rolled and said removed tampon and any string attached thereto encased within said inverted mitten and to be secured as a roll by attachment of said adhesive to a selected outer surface of said inverted mitten preparatory for disposal.



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**5,740,555**

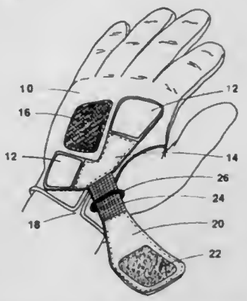
**GLOVE DESIGN FOR IMPROVED FIT AND UTILITY**

**Robert M. Renegar, 304 Black Bear Trail, Murfreesboro, Tenn. 37127**

**Filed Dec. 3, 1996, Ser. No. 759,344**

**Int. Cl.[6] A41D** *19/00*

**U.S. Cl. 2—161.2** **7 Claims**



1. A glove for sports and utility comprising a palm having a proximal region and a distal region, a back having a proximal region and a distal region, individual finger portions each having a base, a thumb portion having a base, and a wrist portion; said wrist portion joining the base of the thumb portion at a point of juncture; said glove further comprising an adjustable tensioning means; said tensioning means including a Y-shaped strap member extending obliquely from the distal region of the back portion, across the proximal region of the back portion, to the point of juncture, said strap means providing at least one primary tensile force disposed obliquely along a line across the back of said glove substantially between the area of the most proximal knuckle at the base of the little finger portion to the point of juncture and extending obliquely across the proximal palm portion to the distal palm portion adjacent the little finger portion thereby providing an adjustable fit in the fingers and palm areas of the glove.

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**5,740,556**

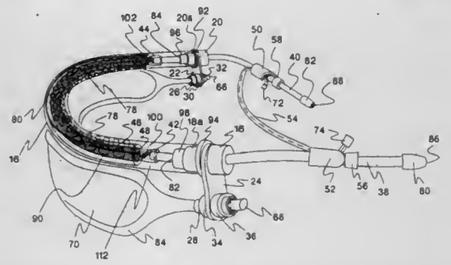
**FOREHEAD PERSPIRATION COLLECTOR/ DISCHARGER**

**Robert L. Brown, 4800 W. Anton Rd., Tucson, Ariz. 85746**

**Continuation-in-part of Ser. No. 565,831, Dec. 1, 1995, abandoned. This application Aug. 26, 1996, Ser. No. 697,479**

**Int. Cl.[6] A41D** *20/00;* **A61F** *9/02*

**U.S. Cl. 2—181** **16 Claims**



1. Headgear device for accumulating and discharging forehead perspiration including head engaging means for removably securing said device on a wearer's head and a means for attaching an eye wear lens frame,

a forehead section carried by said head engaging means in a position to extend across and upon the forehead of a wearer's head, said forehead section being substantially tubular having a longitudinal internal canal being inclusive of an opening at each end thereof, said forehead section having disposed longitudinally through a wall therein a plurality of apertures arranged in a predetermined pattern, said section having a longitudinal separation of a predetermined length through a wall of said forehead section and said section having an external fluid barrier means;

an elongated tubular cover member being substantially flexible having a plurality of apertures arranged around its circumference in a predetermined pattern, said cover having a means to contain an absorbent material;

a pair of fluid discharging assemblies, each assembly having a number of members to include an elongated conduit and a plug, said plug having a plurality of diametrically sized surfaces, said surfaces to include a stem end and a head end, said stem end having a fastening means and said head end having a diameter larger in circumference than said stem end, each said plug having a central opening extending through its length, each said opening being fitted over said conduit so that a degree of conduit extends out of said plug from the opposite end so that a fluid collector sleeve can be fitted over each intake end of said conduit and a means for embodying a fluid retaining seal to said head end of said plug;

a pair of slidable cord retainers being substantially tubular with an angular terminus on one end and having around its internal surface a plurality of longitudinal channels extending around a central opening, said opening being fitted over the external surface of each said conduit member and a length of elastic cord being threaded through one channel of each said cord retainer so that said conduit assemblies are joined and an annular keeper sleeve being fitted over said conduits to become in contact with said cord retainer, said keeper being resistive to cord retainer movement, and a pair of tubular nozzles each being affixed in position to said conduits' discharge ends;

support means for connective eyewear lens frame being inclusive of a pair of flat retaining supports each having a width and a length, said length having an arched terminus on each end, said support being substantially thin having two circular openings being arranged in opposition on a singular plane.

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**5,740,557**

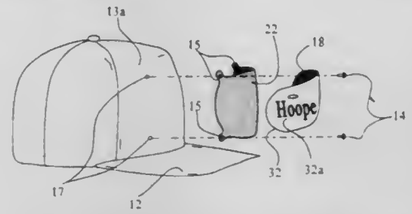
**MAGNETIC IMAGE-DISPLAY SYSTEM FOR APPAREL**

**Gregory Reid, 3466 Armourdale Ave., Long Beach, Calif. 90808, and John Burge, 19816 Blythe St., Canoga Park, Calif. 91306**

**Filed Mar. 15, 1996, Ser. No. 616,227**

**Int. Cl.[6] A42B** *1/24*

**U.S. Cl. 2—209.13** **19 Claims**

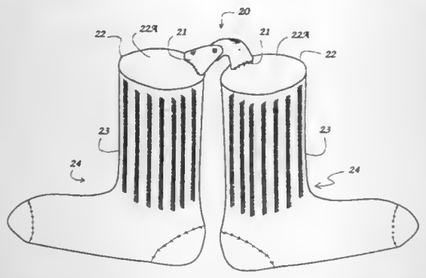



1. An article of apparel, wherein a portion of said article of apparel is comprised of a metal plate capable of attracting a magnet, said metal plate having inner and outer surfaces, said inner surface being mounted facing said article of apparel by a non-magnetic means, and said outer surface facing away from said article of apparel such that at least a portion of said outer surface of said metal plate comprises an exterior surface of said article of apparel whereby said portion of said outer surface of said metal plate may be visible to public view while said article of apparel is being worn.

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**5,740,558**
**MEANS FOR ATTACHING ARTICLES TOGETHER**
**Robert F. Messman, 600 S. Monroe Way, Denver, Colo. 80209-3521**
**Filed Mar. 7, 1996, Ser. No. 612,488**
**Int. Cl.[6] A41D** *27/08*
**U.S. Cl. 2—239** **17 Claims**

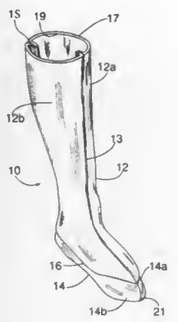


**1**. A system for attaching a pair of separate flexible clothing items together during laundering, each of the clothing items having an edge, the system comprising:

an elongated flexible strip, the strip having a first end and a second end, the first end having a substantially straight sewable edge and the second end having a fastening means, the fastening means covering an area on said second end that is smaller that said first end, so that at least two flexible strips may be attached through the sewable edge on the first end of each flexible strip to the edge of the flexible clothing item and so that the second end of each flexible strip is adapted to extend from the edge of the flexible clothing item and may be fastened to the second end of another flexible strip in a flexible lap joint configuration, providing a generally triangularly shaped load path between the fastening means and the first end of the flexible strip and so that the clothing items may be secured together when they are being laundered.

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**5,740,559**
**FOOTWEAR ACCESSORY FOR USE WITH A SHOE TO SIMULATE THE APPEARANCE OF A BOOT**
**Ingeborg Thiel, 1435 Bedford St. 3P, Stamford, Conn. 06905**
**Filed Nov. 15, 1996, Ser. No. 749,541**
**Int. Cl.[6] A41B** *11/00*
**U.S. Cl. 2—239** **20 Claims**



**1**. A footwear accessory for use with a shoe, comprising:

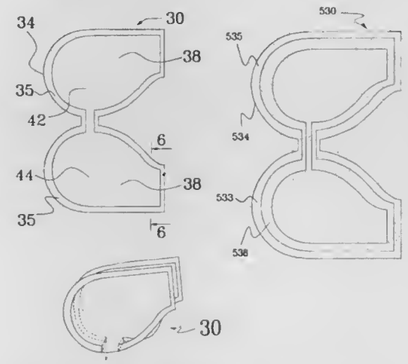
a) an upper portion made of a first boot material which is dimensioned to cover an instep, an ankle and a portion of a leg; and

b) a lower portion made of a second material which is dimensioned to cover at least a portion of a foot, said upper portion and said lower portion being coupled to each other to form a stocking structure and said lower portion being dimensioned to be substantially concealed by a pump shoe worn over said lower portion, wherein

said upper portion is made of a first boot material thereby simulating a boot leg.

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**5,740,560**
**NON-FOULING EYEWEAR FOR HIGH POLLUTION ENVIRONMENTS**
**Frank J. Muoio, 88 Maple St., Darien, Conn. 06820**
**Filed Jul. 7, 1995, Ser. No. 499,767**
**Int. Cl.[6] A61F** *9/02*; **G02C** *9/00*
**U.S. Cl. 2—434** **14 Claims**



**1**. Protective goggles, comprising:

(a) a transparent protective member, said transparent member comprising:

(i) a transparent lens, having opposite sides,

(ii) a support structure, said support structure configured and dimensioned to support said lens in front of the eyes of a user;

(b) a plurality of bendable transparent anti-fouling members which are bendable along a bend line and dimensioned to allow said anti-fouling members to be folded around and overlie said opposite sides of said lens; and

c) an adhesive disposed on both sides of said bend line of said bendable transparent anti-fouling members, thereby allowing said transparent anti-fouling members to be adhered to both sides of said transparent protective member.

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**5,740,561**
**WATER-SAVING STRUCTURE OF TOILET BOWL WATER TANK**
**Yao-Sen Lin, P.O. Box 2103, Taichung City, Taiwan**
**Filed Oct. 11, 1996, Ser. No. 728,912**
**Int. Cl.[6] E03D** *1/14*
**U.S. Cl. 4—326** **15 Claims**

**1**. A water-conserving flush system for a toilet water tank of a predetermined water capacity having a water inlet and a water outlet, said flush system comprising:

(a) an outlet valve assembly disposed in said toilet water tank, said outlet valve assembly including:

(1) a tube structure having a high level tube portion, a low level tube portion, and an overflow tube portion in open communication one with the others, said tube structure having an outlet portion connected to said water outlet of said toilet water tank, each of said tube portions having an opening, said opening of said high level tube portion being disposed relative to a height dimension within said toilet water tank at a position intermediate the position of the full water level when said toilet water tank is filled to said predetermined water capacity and the position of said water outlet, said opening of said low level tube portion being disposed relative to said height dimension at a position intermediate said position of said high level tube portion opening and said position of said water outlet, said opening of said overflow tube portion being disposed relative to said height dimension at a position above said full water level position; and,

(2) first and second actuable valves coupled respectively to said high and low level tube portions adjacent said openings thereof, said first and second valves releasably sealing said high and low level tube portion openings; and,

(b) an actuation assembly coupled to said outlet valve assembly for selectively actuating the release of water from said toilet water tank through said outlet valve assembly, said actuation assembly including:

(1) a flush handle coupled to the exterior of said toilet water tank, said flush handle having a shaft rod portion extending along an axis into said toilet water tank;

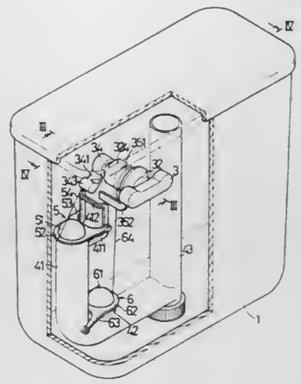
(2) a shaft seat coupled to said toilet water tank, said shaft seat coaxially receiving therethrough said flush handle shaft rod portion;

(3) V-shaped pulling lever mounted on said flush handle shaft rod portion, said pulling lever having first and second pulling arms extending radially outwardly and downwardly therefrom, said pulling lever being pivotally displaceable about said axis of said flush handle shaft rod portion responsive to actuation of said flush handle;

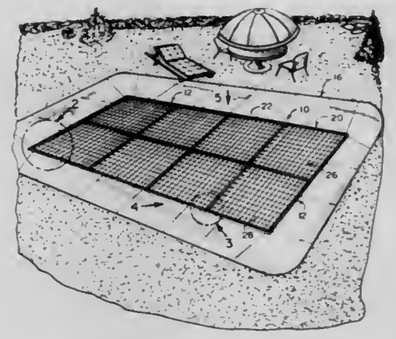
(4) a stopper body coupled to said shaft seat, said stopper body having a lever arm extending therefrom, said lever arm extending between said first and second pulling arms of said pulling lever for limiting said pivotal displacement of said pulling arms to a displacement range of approximately 45 degrees; in either direction from a rest position and,

(5) first and second cords for connecting respectively said first and second pulling arms of said pulling lever respectively to said first and second actuable valves of said outlet valve assembly, whereby said first and second actuable valves are respectively actuated in predetermined manner responsive to said pivotal displacements of said first and second pulling arms.





**5,740,562**
**POOL PROTECTOR DEVICE**
**Cathy J. Nickalo, 6904 Glen Ridge Cir., Apt. B1, Glen Burnie, Md. 21061**
**Filed May 23, 1996, Ser. No. 652,268**
**Int. Cl.[6] E04H** *4/00*
**U.S. Cl. 4—504** **16 Claims**



**1**. A pool protector device which comprises:

a) a plurality of panels;

b) means for interlocking said panels together in side by side relationships to form a larger covering, including outermost panels, which will extend across a swimming pool and be elevated above water therein, said interlocking means including:

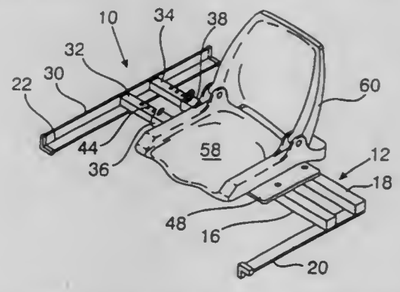
i) a hook flange integral with each side of said panel, so that two said hook flanges will engage with each other to maintain two said panels together; and

ii) a plurality of lock pins, in which each said lock pin can be inserted horizontally through said two hook flanges on the sides of two said panels that are engaged with each other to keep said panels together; and

c) means for securing edges of said outermost panels onto sidewalls of the swimming pool, so as to prevent access to the water in the swimming pool, eliminating accidental drowning when the swimming pool is left unattended.

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**5,740,563**
**BATH CARE OFFSET SWIVEL CHAIR**
**Victor J. Gaddy, 7436 Nationsford Rd., Charlotte, N.C. 28210**
**Filed Sep. 27, 1996, Ser. No. 721,477**
**Int. Cl.[6] A47K** *3/12*
**U.S. Cl. 4—579** **21 Claims**



**1**. A bath and shower seat assembly for use in combination with a bath tub, comprising:

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a support means for spanning the width of a bath tub and having a first side and a second side, a generally L-shaped tub engaging member having a top of the tub engagement surface and a tub sidewall engagement surface, and a generally L-shaped wall engaging member having a top of the tub engagement surface and a wall engagement surface;

pivot means pivotally attached to said first side of said support means for spanning the width of a bath tub;

a rotatable member having a first section, a second section extending beyond said first section, a first side and a second side, said first side of said first section being attached to said pivot means; and

a seat assembly fixed to said second side of both said first section and said second section of said rotatable member;

whereby the seat is effectively mounted for offset rotation.

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**5,740,564**

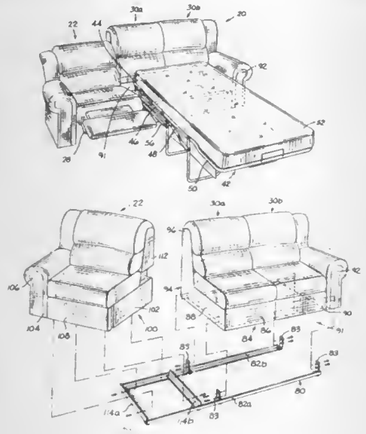
**SOFA HAVING RECLINING SECTION AND FOLDABLE BED**

**J. Doug Hankins, and Lance Foster, both of Tupelo, Miss., assignors to Action Industries, Inc., Verona, Miss.**

**Filed Jan. 28, 1997, Ser. No. 789,279**

**Int. Cl.[6] A47C** *17/04;1/037*

**U.S. Cl. 5—12.1** **31 Claims**



**1**. A unit of furniture comprising:

a sofa frame;

a plurality of seating sections connected to and associated with said sofa frame, each of said seating sections including a corresponding generally horizontally disposed seat portion and a corresponding generally upright backrest portion positioned above said seat section;

a first one of said plurality of seating sections being a reclining seating section which includes a reclining mechanism attached to said sofa frame, said seat portion and said backrest portion of said first seating section, said reclining mechanism being configured to move said seat portion and said backrest portion between upright and reclined positions, wherein in the upright position, said backrest portion defines a first angle relative to an underlying surface, and in said reclined position, said backrest portion is reclined relative to said sofa frame to define a second angle relative to the underlying surface that is less than said first angle; and

a foldable bed comprising a bed frame, a mattress, and a folding mechanism, said folding mechanism being attached to said bed frame and connected with said sofa frame, said bed frame comprising serially interconnected body, cavity, and seat sections, said folding mechanism being configured to move said bed frame between folded and unfolded positions, wherein in the unfolded position, said body, cavity and seat sections are generally horizontally disposed and aligned and are positioned to support said mattress, and in the folded position, said seat and body sections are generally horizontally disposed, said cavity section is generally vertically disposed between said body and seat sections, and said mattress is folded upon itself;

said foldable bed being positioned in the folded position beneath at least a second one of said plurality of seating sections.

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**5,740,565**

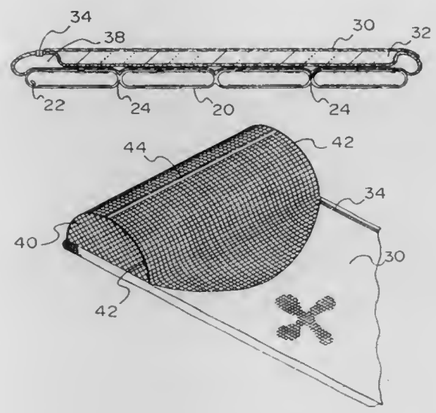
**INFLATABLE SLEEPING BAG SYSTEM WITH NETTING MEMBER**

**John Patrick McDade, Trasna Island, Lisnaskea, Co. Fermanagh, Northern Ireland, BT92 OAJ**

**Filed Mar. 5, 1997, Ser. No. 812,357**

**Int. Cl.[6] A47G** *9/08;* **A47C** *27/10*

**U.S. Cl. 5—413 AM** **4 Claims**



**1**. An inflatable sleeping bag system comprising:

an inflatable mattress having a pillow portion disposed from an end of a planar portion, the planar portion and the pillow portion being in fluid communication to form an air chamber, the mattress further having at least one sealable valve adapted to introduce air into the air chamber:

the planar portion further having a number of longitudinal dividers therein to provide structural support to the air chamber;

a cover flap disposed from the mattress along a first side of the mattress and a bottom side of the mattress, the cover flap having a distal edge corresponding to a second side of the mattress opposite the first side of the mattress;

a zipper detachably coupling the distal edge of the cover flap to the second side of the mattress whereby a cavity is formed;

a pair of semi-rigid support arches coupled to the mattress proximate the pillow portion, the support arches positioned opposite each other on the first and second sides of the mattress with their apexes spaced above the top surface of the mattress;

a netting member coupled to the mattress, the netting positionable over the support arches to prevent debris and fauna from entering the cavity.



**5,740,566**

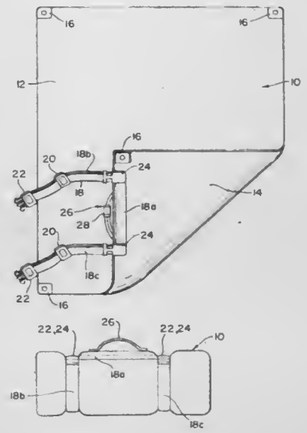
**COMBINATION TARPAULIN-BLANKET CONSTRUCTION**

**Murray Stacy, 5418 Woodville, Spring, Tex. 77379**

**Filed Sep. 27, 1996, Ser. No. 722,772**

**Int. Cl.[6] A47G** *9/06*

**U.S. Cl. 5—420** **17 Claims**



**1**. A combination tarpaulin-blanket construction comprising:

a first, tarpaulin layer of a material selected from the group consisting of a cotton canvas, a cotton duck and a cellulose acetate synthetic yarn, said first layer covered by a protective covering of a waterproof and windproof laminated plastic,

a second, blanket layer of a material selected from the group consisting of synthetic fleece and a wool, said second layer being sewn to a major surface of the first layer to form a tarpaulin-blanket unit of a rectangular shape having corners,

a grommet at each of the corners of said tarpaulin-blanket unit for enabling the unit to be secured in place;

securing straps, affixed to one edge of said tarpaulin-blanket unit, for encircling the unit, when the unit is in a rolled-up state, so as to retain the unit in said rolled up state, said securing straps comprising free ends of an elongate element having a central portion secured to said one edge, and said elongate element comprising a length of a synthetic webbing; and

a carrying handle, secured to said one edge of said unit between said straps, for enabling carrying of the unit in said rolled-up state.

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**5,740,567**

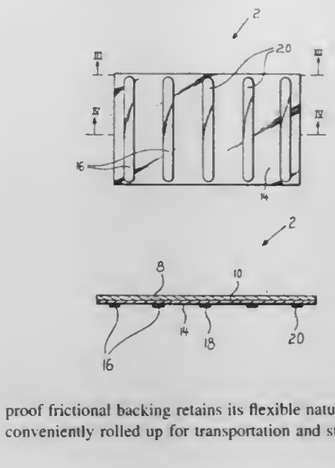
**BLANKET WITH WATERPROOF FRICTIONAL BACKING**

**Kimberly E. Mitchell, 917 Pineapple Rd., South Daytona, Fla. 32119**

**Filed Mar. 24, 1997, Ser. No. 822,786**

**Int. Cl.[6] A47G** *9/06*

**U.S. Cl. 5—420** **8 Claims**



proof frictional backing retains its flexible nature and may be conveniently rolled up for transportation and storage.

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**5,740,568**

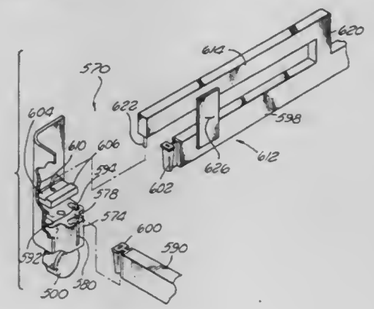
**SNAP-TOGETHER BED**

**Franklin E. Elliott, Culver City, Calif., assignor to Maxwell Products, Inc., Cerritos, Calif.**

**Division of Ser. No. 404,326, Mar. 15, 1995, Pat. No. 5,577,280, which is a continuation-in-part of Ser. No. 213,675, Mar. 15, 1994, Pat. No. 5,537,701. This application Sep. 5, 1996, Ser. No. 707,651**

**Int. Cl.[6] A47C** *19/02;* **A61G** *7/015*

**U.S. Cl. 5—620** **2 Claims**



**1**. A knock-down bed, comprising:

a support frame including support posts, head and foot cross members, and opposite longitudinal members;

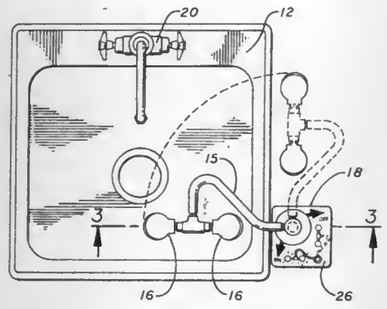
wherein each said support post includes a straight-pin receiving opening and first and second wedge-shaped pin receiving openings, each said longitudinal member includes at each opposite end thereof a downwardly-disposed straight pin for disposition in a respective said straight-pin receiving opening and a downwardly-disposed wedge-shaped pin for disposition in a respective said first wedge-shaped pin receiving opening, and each said cross member includes at each opposite end thereof a downwardly-disposed wedge-shaped pin for disposition in a respective said second wedge-shaped pin receiving opening; and

a mattress foundation assembly supported by said frame.

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**5,740,569**
**EMERGENCY EYEWASH UNIT**
**Albert G. Gurries, II, Reno, and Sam T. Hong, Sparks, both of Nev., assignors to Haws Company, Sparks, Nev.**
**Filed Feb. 25, 1997, Ser. No. 805,929**
**Int. Cl.[6] A61H** *33/00*
**U.S. Cl. 4—620** **14 Claims**




**11**. An emergency eyewash unit for mounting on a counter top at a selected one of the left- and right-hand sides of a sink, said eyewash unit comprising:

a control valve assembly including a valve body having an inlet fitting adapted for connection to a water supply line, means for connecting said valve body to a counter top, and a valve spool rotatably mounted within said valve body and having a radially open inlet port formed therein, said valve spool being rotatable within said valve body to an open position with said inlet port generally aligned with said inlet fitting to permit water flow from said inlet fitting through said inlet port into said valve spool, and a closed position with said inlet port misaligned with said inlet fitting to prevent water flow from said inlet fitting into said valve spool; a tubular swing arm having one end connected in flow communication with said valve spool to receive water flow therefrom, and an opposite end having at least one spray head mounted thereon; and

cam means for limiting the rotational range of movement of said valve spool within said valve body, said cam means including a pair of arcuate part-circle cam tracks formed in said valve spool, a pair of threaded set screw ports formed in said valve body in respective alignment with said pair of cam tracks, and at least one set screw for threaded mounting in a selected one of said set screw ports and threaded advancement therein to protrude into the associated selected one of said cam tracks, whereby opposite ends of the associated selected one of said cam tracks are engageable with said protruding set screw to define opposite end limits of rotation for said valve spool, and further wherein each of said cam tracks permits rotation of said valve spool to said open position.

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**5,740,570**
**COLLAPSIBLE HAMMOCK**
**Wan-Lai Hsieh, Suite 2, 7F, No. 95-8, Chang Ping Road, Sec. 1, Taichung, Taiwan**
**Filed Aug. 12, 1996, Ser. No. 695,808**
**Int. Cl.[6] A45F** *3/24*
**U.S. Cl. 5—129** **9 Claims**

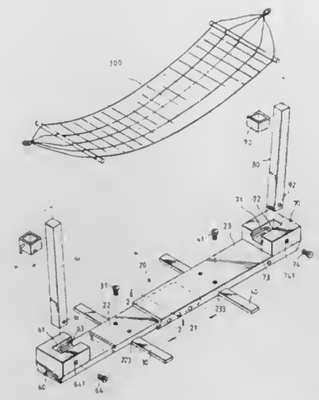
**1**. A collapsible hammock comprising:

an elongate telescopic stand of dovetail section and open bottom including a first portion slidably receivable in a second portion and detained by a first retaining device in a free end of said first portion, said first retaining device comprising a cylinder body connected on two ends to an inward surface of lateral walls of said first portion, a cavity formed in each of said end aligned with a first recess in one of the lateral walls of said first portion for receiving a first compression spring and a steel ball biased in said first recess by said spring, and a plurality of second recesses formed spaced apart in each of the lateral walls of said second portion and made in registry with said first recess of said first portion;

a pair of rectangular slots formed in bottom of the opposite lateral wall of said first and second portions for releasably securing a pair of supports by means of screws;

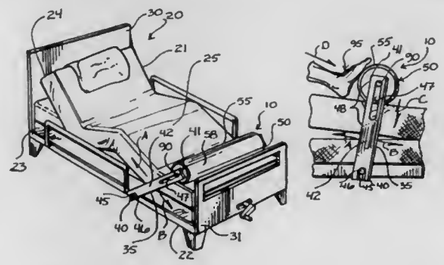
a rectangular socket member projected upward from other end of said first and second portion, said socket member comprising a rectangular groove centrally formed having an opening toward inward relative to the hammock, a square cavity extended downward from an inner bottom of said groove and a pair of L-shaped guide slots extended horizontally along a center of lateral walls of said groove and then extended continuously downward along a center of lateral walls of said square cavity and terminated at a bottom of said square cavity;

a pair of rectangular posts of a square section equal to that of said square cavity and a width of said groove having a pair of axle rods made in registry with said L-shaped guide slots of said groove for facilitating said posts slidably and pivotally anchored in the groove and in addition to the square cavity of said rectangular sockets projected outward from lower lateral surfaces thereof and a pair of square caps sleeved on a top of said posts each having a hook means projected outward a lateral surface for suspending from a suspension bed therebetween.



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**5,740,571**
**FOOT SUPPORT APPARATUS**
**Dorsey Raymond Tyra, Central Islip, N.Y., assignor to Fern Tyra, Central Islip, N.Y., and Gary Tyra, Phoenix, Ariz.**
**Filed Mar. 21, 1996, Ser. No. 619,195**
**Int. Cl.[6] A47C** *20/02*
**U.S. Cl. 5—624** **23 Claims**




**1**. A support apparatus for supporting the feet of an individual residing in a bed, said bed including a mattress having an upper surface for receiving said individual thereon and supported by a frame, said support apparatus comprising:

a generally cylindrical foot support member selectively positionable proximate the feet of said individual, said foot support member including a substantially pliant padding layer having a bearing surface for receiving the feet of said individual so that said individual may reposition himself or herself while residing upon said mattress of said bed, and for exercising said feet thereagainst said bearing surface for inhibiting physiologically adverse effects to said individual resulting from said individual's prolonged confinement to said bed;

support means, cooperative with said padding layer for providing structural integrity and strength to said foot support member;

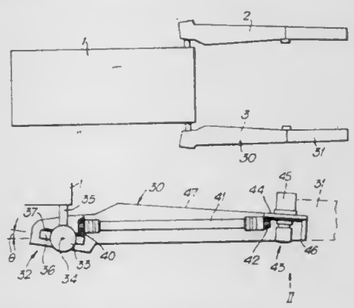
a substantially rigid first elongate bracket element having a lower end coupled to portions of said frame, and an upper end coupled to portions of said support means; and

a substantially rigid second elongate bracket element spaced apart from said first elongate bracket element, said second elongate bracket element having a lower end coupled to portions of said frame, and an upper end coupled to portions of said support means.



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**5,740,572**
**PATIENT SUPPORT TABLES WITH ARTICULATED LEG SUPPORT SECTIONS**
**Keith Hannant, Rustington, England, assignor to Smiths Industries Public Limited Company, London, England**
**Filed Mar. 26, 1997, Ser. No. 824,546**
**Claims priority, application United Kingdom, Apr. 12, 1996, 9607595**
**Int. Cl.[6] A61G** *13/08;13/00*
**U.S. Cl. 5—624** **5 Claims**

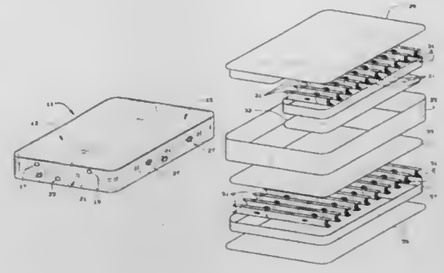



**1**. A patient support table comprising: an articulated limb section (**2,3**), said limb section having a rotatable shaft (**41**) extending along its length, said shaft having a first gear (**40**) at one end of the shaft; a main section (**1**) of the table, said main section (**1**) having a second gear (**36**), said second gear engaging with said first gear (**40**) such that raising or lowering said limb section (**2,3**) causes said shaft (**41**) to rotate; and an energy-storage device (**60**) connected with said shaft such that, when said limb section is lowered, said shaft (**41**) is rotated and energy is stored in the energy-storage device (**60**) to counteract at least in part the weight of said limb section (**2, 3**).

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**5,740,573**
**AIR BED WITH CIRCUMFERENTIAL BELT**
**Dennis Boyd, 14457 Rouge River, Chesterfield, Mo. 63017**
**Filed Jul. 15, 1997, Ser. No. 892,926**
**Int. Cl.[6] A47C** *27/10;27/08*
**U.S. Cl. 5—711** **16 Claims**

**1**. An air bed comprising:



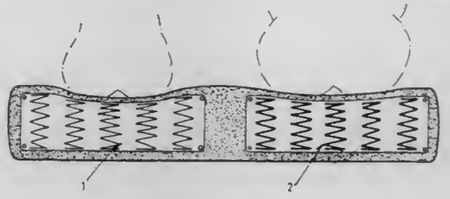
first and second air-tight enclosures disposed side by side in a first plane, each of the first and second air-tight enclosures being independently inflatable and having substantially the same length and width, the first and second air-tight enclosures together having a first cross-sectional area in the first plane;

an inflatable foundation disposed below said first and second air-tight enclosures in a second plane substantially parallel to said first plane, said inflatable foundation having a cross-sectional area in the second plane at least as great as the first cross-sectional area, said foundation being independently inflatable with respect to the first and second air-tight enclosures;

means for securing the first and second air-tight enclosures and the inflatable foundation together with the first and second air-tight enclosures fixed in place with respect to the inflatable foundation, said securing means including a circumferential belt having a height sufficient to extend from the bottom of the inflatable foundation to the top of the first and second air-tight enclosures.

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**5,740,574**
**HYBRID MATTRESS HAVING PORTIONS WITH DIFFERENT SUPPORT CHARACTERISTICS**
**Mario Piraino, 5 Nolan Close, East Doncaster, Victoria 3109, Australia**
**Filed Dec. 13, 1996, Ser. No. 767,226**
**Claims priority, application Australia, Dec. 13, 1995, 75321/96**
**Int. Cl.[6] A47C** *27/05;27/00*
**U.S. Cl. 5—727** **3 Claims**




**1**. A hybrid mattress comprising

a plurality of individual, resilient support means (**1**, **2**) for supporting a recumbent human body, each of said support means having an upper body support surface, a lower support surface and peripheral edges, said support means having different deflection coefficients;

comfort means comprising a casing structure (**5**) comprising

a plurality of internal pouches, equal in number to the number of support means, each said pouch being dimensioned to snugly receive one of said support means, one of said support means in each said pouch, a continuous top surface member (**7**), a continuous bottom surface member (**8**), an edge member (**9**) and an internal interface member (**10**) forming a barrier between said pouches, said interface

VOL 1209 ISS 3 AP 21 1998 UMI

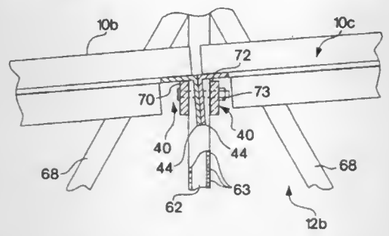


member (**10**) being formed integrally with said top and bottom surface members, said interface member having a deflection coefficient substantially equal to a mean value of deflection coefficients of said individual support means; and

said pouches being aligned with each other so as to hold said plurality of support means with said upper body support surfaces in substantially a single plane, thereby forming a continuous mattress having two or more distinct load bearing characteristics.

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**5,740,575**
**RAMP SYSTEMS**
**Julian D. Gordon, 8 Trager Rd., Marblehead, Mass. 02127**
**Filed Sep. 29, 1995, Ser. No. 536,425**
**Int. Cl.[6] E01D** *19/00*
**U.S. Cl. 14—69.5** **14 Claims**




**1**. A modular ramp system comprising:

a pair of ramp sections, each ramp section including side and end frame members and a deck supported by the frame members, each of the ramp sections including a mounting bracket on at least one end frame member; and

a stand including a pair of independently functioning rail, one rail adapted to engage and releasably hold the mounting bracket on one ramp section and the other rail adapted to engage and releasably hold the mounting bracket on the other ramp section, the rails being arranged so that the ends of the ramp sections may be supported and retained closely adjacent one another to substantially reduce the spacing between the ramp sections and form a substantially continuous deck from the one ramp section to the other ramp section.

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**5,740,576**
**DEVICE FOR DISLODGING A SUBMERSIBLE SWIMMING POOL CLEANER**
**Pavel Sebor, Heathrow, and Brian H. Phillipson, Longwood, both of Fla., assignors to Wattatec, L.P., Heathrow, Fla.**
**Filed Sep. 19, 1996, Ser. No. 715,715**
**Int. Cl.[6] E04H** *4/16;* **A47L** *1/00;* **B60S** *1/00*
**U.S. Cl. 15—1.7** **24 Claims**

**1**. A swimming pool cleaner comprising:

a hose;

a cleaner housing;

a connector rotatably carried by the housing, the connector in fluid communication with the hose;

a chamber formed within the housing, the chamber in fluid communication with the connector;

an oscillator carried within the chamber such that fluid flow through the chamber to the connector provides a vibratory motion to the oscillator;

gear means communicating between the connector and the oscillator for providing a rotational movement to the connector;

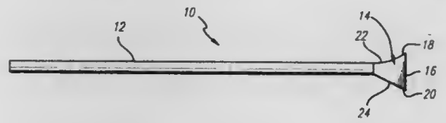
a fitting carried by the connector;

multiple elongated rods radially extending from the fitting, each rod having a proximal end attached to the fitting for extending the rod radially outward from the connector, each rod having a length dimension for extending a rod distal end beyond a perimeter plane of the cleaner housing for preventing the housing from contacting a pool side wall surface during movement of the cleaner over a pool bottom wall surface; and

wherein the gear means rotates the connector and thus the fitting for rotating the rods about the connector, the rod distal end engaging the pool side wall for biasing the rod distal end against the side wall thus turning the cleaner.

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**5,740,577**
**TOOL FOR CLEANING CRACKS AND GROOVES IN PAVEMENT**
**Stanley Wade, 10245 4th Ave., Los Angeles, Calif. 90303**
**Filed Feb. 18, 1997, Ser. No. 802,439**
**Int. Cl.[6] A47L** *25/00*
**U.S. Cl. 15—104.001** **2 Claims**



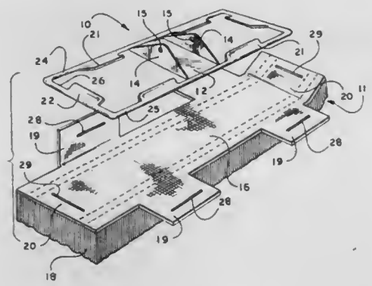

**2**. A tool for cleaning cracks, grooves, channels and spacings in pavement including:

an elongate pole having a longitudinal axis and

a flat blade having a first edge extending along an axis transverse to the longitudinal axis of said pole with first and second vertices at opposing ends thereof, said blade including a second edge which is concavely curved along its entire length from said first vertex to said pole and a third edge which is straight and extends from said second vertex, said blade being disposed at one end of said pole whereby one of said vertices may engage the ground when said pole is held at a predetermined angle with respect to said ground.

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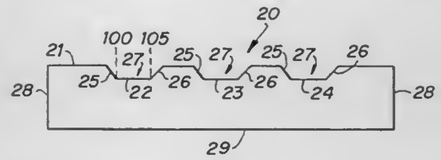
**5,740,578**
**DUST MOP**
**Terry D. Moore, 2415 Hinton Rd., Dacula, Ga. 30211**
**Filed Apr. 12, 1996, Ser. No. 631,357**
**Int. Cl.[6] A47L** *13/24*
**U.S. Cl. 15—147.2** **13 Claims**




**1**. A dust mop comprising a mop frame and a mop head, said mop frame selectively carrying said mop head, said mop head comprising a backing, a plurality of pile yarns fixed to said backing, and a plurality of flaps extending from said backing, said mop frame including front and rear frame members, and attaching means fixed to said front and rear frame members and comprising a plurality of tongues for selectively securing said plurality of flaps to said mop frame, said plurality of flaps being received by said plurality of tongues.



**5,740,579**
**BRUSH FOR IMPROVED TUFT RETENTION AND ANCHOR WIRE THEREFOR**
**Manfred Fassler, Morristown, Tenn., assignor to Anchor Advanced Products, Inc., Morristown, Tenn.**
**Continuation of Ser. No. 489,607, Jun. 12, 1995, abandoned. This application Apr. 30, 1997, Ser. No. 846,952**
**Int. Cl.[6] A46B** *3/16*
**U.S. Cl. 15—190** **20 Claims**




**1**. A brush with improved tuft retention comprising:

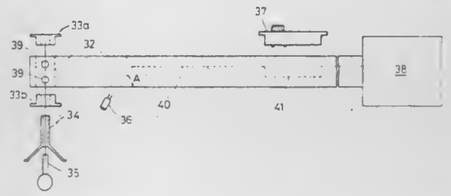
a handle;

a head made from a material subject to cold flow, connected to said handle, and having a plurality of tuft holes therein;

at least one bristle anchored in each said tuft hole with a multi-sided staple, wherein each said staple has at least one longitudinal groove in at least one side, each groove extending substantially along the entire length of the staple, wherein each said staple is oriented such that at least one groove in each said staple is transverse to the longitudinal axis of the bristles when said staple is used to anchor bristles in one of said plurality of tuft holes, and wherein said head material cold flows into at least one of said plurality of longitudinal grooves.

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**5,740,580**
**STEPPER VACUUM CHUCK WIPER**
**Chung-Chien Leu; Hsi-Huang Lee, and En-Tien Tan, all of Hsinchu, Taiwan, assignors to United Microelectronics Corporation, Taiwan**
**Filed Nov. 29, 1996, Ser. No. 757,679**
**Claims priority, application Taiwan, Oct. 11, 1996, 85112455**
**Int. Cl.[6] A47L** *25/00*
**U.S. Cl. 15—210.1** **8 Claims**




**1**. A stepper vacuum chuck wiper for cleaning a stepper vacuum chuck, which comprises of:

a rod frame having a first end and a through hole at said first end;

a bearing device having an outside diameter and being sleeved inside of the through hole;

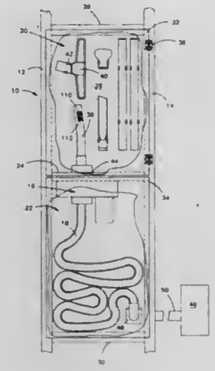
a flare type soft shield with a lower end having a flare opening, sleeved inside the bearing device, wherein the flare opening has a diameter larger than the outside diameter of the bearing device;

a wiping stick sleeved inside the flare type soft shield; and

an illuminating device for illuminating the stepper vacuum chuck, including a light source, a battery set coupled to a second end of the rod frame to provide electricity to the light source, and a switch coupled between the battery set and the light source to control the illumination of the light source, and the light source and the switch being disposed on the rod frame.

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**5,740,581**
**FREESTANDING CENTRAL VACUUM SYSTEM**
**Clyde W. Harrelson, II, Burgaw, N.C., assignor to VACS America, Inc., Burgaw, N.C.**
**Continuation-in-part of Ser. No. 667,436, Jun. 21, 1996, abandoned. This application Dec. 31, 1996, Ser. No. 775,163**
**Int. Cl.[6] A47L** *5/38*
**U.S. Cl. 15—314** **17 Claims**



**1**. A central vacuum system mountable between adjacent studs of a wall comprising:

a) a cabinet having a top wall, side walls, a rear wall, a movable front wall, an upper dividing wall extending beneath said side walls, a lower dividing wall extending between said side walls beneath said upper dividing wall, said walls together forming an enclosure with a handle storage compartment, a hose storage compartment and a vacuum source compartment;

b) a hose extendable between a retracted position in said hose storage compartment, and an extended position extending from said hose storage compartment;

c) reversible drive means within said cabinet to move said hose between said retracted and extended positions; and

d) a vacuum source mounted in said vacuum source compartment, said hose having an inner end communicating with said vacuum source.

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**5,740,582**
**CENTRAL VACUUM HOSE STORAGE SYSTEM**
**Clyde W. Harrelson, II, Burgaw, N.C., assignor to Vacs America, Inc., Burgaw, N.C.**
**Filed Jun. 21, 1996, Ser. No. 667,436**
**Int. Cl.[6] B65H** *75/34*
**U.S. Cl. 15—315** **20 Claims**

**1**. An apparatus for extending and retracting a vacuum cleaner hose comprising:

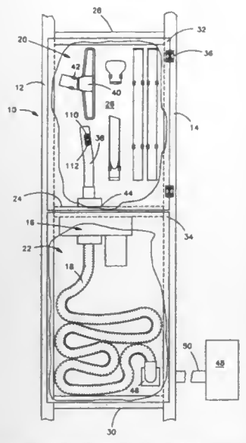
a) first and second spaced hose guides, said guides having axially aligned hose receiving orifices;

b) first and second opposed hose drive rollers, said rollers having concave faces together defining a hose receiving nip axially aligned with the orifices of said guides;

c) drive means for reversibly rotating said rollers in opposite directions; and

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(d) a pivotable mount supporting said first drive roller, and a mount release, whereby said roller is pivotable between an engaged position and a release position.

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**5,740,583**

**ELECTRIC VACUUM CLEANER**

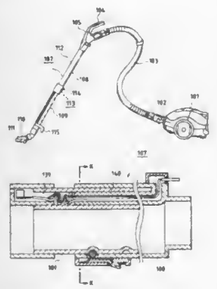
**Sadahiro Shimada; Akihiro Hirano, both of Yokaichi; Yuichi Shimizu, Omihachiman; Hidenori Kitamura, Shiga-ken; Kazuma Suoh, Kusatsu, and Masakazu Onda, Yokaichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Apr. 22, 1996, Ser. No. 636,791**

**Claims priority, application Japan, Apr. 21, 1995, 7-096383; May 9, 1995, 7-110435**

**Int. Cl.[6] A47L** *9/04*

**U.S. Cl. 15—377** **12 Claims**



**1**. An electric vacuum cleaner comprising:

a main body;

a hose connected to the main body;

a floor nozzle;

a motor-drive brush provided in the floor nozzle;

an extension pipe connecting the floor nozzle and one end of the hose; and

an electric conductor located in the extension pipe;

wherein the extension pipe comprises an outer tube, an inner tube, a first electric connection terminal provided on one end of the outer tube, a second electric connection terminal provided on one end of the inner tube, the inner tube slidably extending into the outer tube, a flexible electric conductor connected between the first electric connection terminal and the second electric connection terminal, the flexible electric conductor being accommodated in a first conductor casing and a second conductor casing, the first conductor casing being provided on the exterior of the outer tube, the second conductor casing being provided on the exterior of the inner tube, the outer tube having a dust suction passage, the inner tube having a dust suction passage, the first conductor casing having an interior isolated from the dust suction passage in the outer tube, the second conductor casing having an interior isolated from the dust suction passage in the inner tube, said flexible conductor folding and unfolding to accommodate sliding of the inner tube within the outer tube.

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**5,740,584**

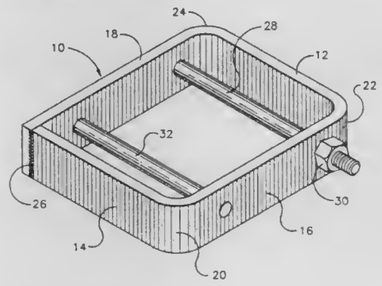
**RELEASABLE CASTER HOLDER**

**Allan M. Hodge, and Anthony A. Hodge, both of San Diego, Calif., assignors to Hodge Products, Inc., El Cajon, Calif.**

**Filed Aug. 12, 1996, Ser. No. 695,714**

**Int. Cl.[6] B60B** *33/00*

**U.S. Cl. 16—30** **12 Claims**



**1**. A caster holder, consisting of:

a frame having a first end wall, a second end wall, a first side wall and a second side wall;

a first retaining means adjacent said first end wall and extending at least part of the distance between said first and second side walls for retaining a first end of a caster plate; and

a second retaining means adjacent said second end wall and extending at least part of the distance between said first and second side walls for retaining a second end of a caster plate.

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**5,740,585**

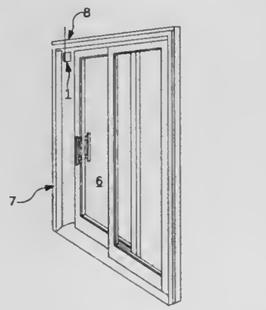
**CHILD SAFETY DEVICE**

**Harold L. Shapiro, 5812 Jane Way, Alexandria, Va. 22310**

**Filed Jan. 14, 1994, Ser. No. 181,075**

**Int. Cl.[6] E05C** *17/60*

**U.S. Cl. 16—82** **16 Claims**



**1**. In a sliding closure assembly including a frame and a sliding closure member which is slidable in said frame between an open position and a closed position, the improvement comprising a child safety device which includes:

a blocking member having two parallel opposed sides; and



an attachment member comprising a strap having a width and opposed ends, said attachment member being attached to said blocking member at one of said opposed ends, the other of said opposed ends of said attachment member being attached to said frame, whereby as said sliding member is moved from said closed position to an open position, said blocking member is urged into an operable position between said sliding member and said frame so as to prevent said sliding member from being slid into said closed position.

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**5,740,586**

**TOOL HANDLE**

**Herve Gomas, Evry, France, assignor to Facom, Morangis Cedex, France**

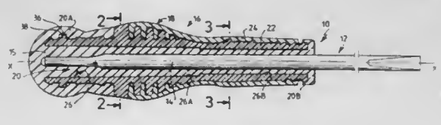
**PCT No. PCT/FR95/00003, § 371 Date Aug. 4, 1995, § 102(e) Date Aug. 4, 1995, PCT Pub. No. WO95/18701, PCT Pub. Date Jul. 13, 1995**

**PCT Filed Jan. 3, 1995, Ser. No. 495,637**

**Claims priority, application France, Jan. 11, 1994, 94 00217**

**Int. Cl.[6] A47B** *95/02*

**U.S. Cl. 16—111 R** **21 Claims**



**1**. A tool handle to be applied over a portion of a tool, said tool handle comprising, over at least part of a length thereof:

a carrier sleeve to be positioned about the tool portion, said carrier sleeve consisting of a material based on a hard grade polyester elastomer; and

an outer sheath fixed to said carrier sleeve outwardly thereof, said outer sheath consisting essentially of a flexible grade polyester elastomer, fixation of said outer sheath to said carrier sleeve resulting from said outer sheath being overmolded onto said carrier sleeve.

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**5,740,587**

**DOOR HANDLE DEVICE**

**Shinya Onai, Tamamura-machi, and Kenji Sato, Ota, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan**

**Filed Dec. 20, 1996, Ser. No. 770,956**

**Claims priority, application Japan, Dec. 27, 1995, 7-340990**

**Int. Cl.[6] A47B** *95/02*

**U.S. Cl. 16—111 R** **8 Claims**

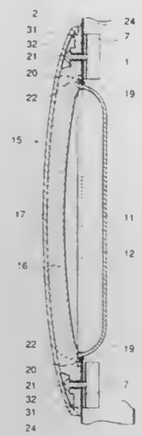
**1**. The combination of a door and a handle device comprising:

a handle base which closes a cutout in a face of said door and which forms a depression in said face;

a handle body provided over said handle base; and

a body cover which covers said handle body and which is attached thereto;

wherein a part of said handle body abuts against said handle base and another part thereof is in contact with said door face, and said handle body being directly attached to said door with a fixture at the contacted part.



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**5,740,588**

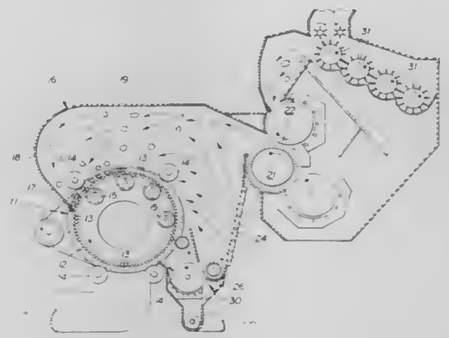
**CAGE GIN FEEDING APPARATUS AND METHOD**

**Leo Strick, Greenville, S.C., assignor to Lummus Corporation, Columbus, Ga.**

**Filed Dec. 30, 1994, Ser. No. 366,620**

**Int. Cl.[6] D01B** *1/06*

**U.S. Cl. 19—48 R** **21 Claims**



**1**. In a cage gin for separating fibers from seed cotton wherein an annulus of closely spaced rollers is driven about an axis of said annulus and a suction means within said annulus for drawing air between said closely spaced rollers in combination with at least one nip roller abutting the interior of said annulus to engage fibers from said seed cotton between said nip roller and said closely spaced rollers to remove the fibers from the seed, the improvement comprising:

(a) a housing defining a plenum about said annulus and defining means for selectively admitting air into said plenum; and,

(b) means for injecting seed cotton into said plenum along a ballistic trajectory which carries said seed cotton over the uppermost portion of said annulus to disperse said seed cotton on said annulus.

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**5,740,589**

## MEANS FOR CLASPING THE EXTREMITIES OF THE METAL SHEET FORMING TIE-BANDS

**Ramón Palau Dominguez, Sabadell, Spain, assignor to Mikalor, S.A., Sabadell, Spain**

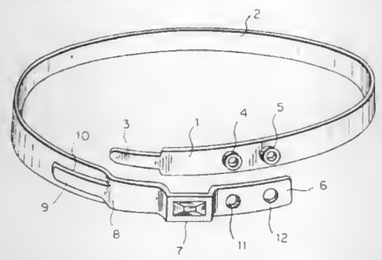
**PCT No. PCT/ES96/00099, § 371 Date Jan. 16, 1997, § 102(e) Date Jan. 16, 1997, PCT Pub. No. WO96/37722, PCT Pub. Date Nov. 28, 1996**

**PCT Filed May 7, 1996, Ser. No. 765,440**

**Claims priority, application Spain, May 26, 1995, 9501014**

**Int. Cl.[6] B65D** *63/00;* **F16L** *47/00*

**U.S. Cl. 24—20 CW** **3 Claims**




1. In a means for fastening opposed overlapping ends of a sheet metal clip made of a unitary metal strip of predetermined length which forms a body and opposed first and second ends of the clip, a guide tongue integral with and defined on said first end for obtaining correct alignment, a chamber for housing said tongue defined by an integral offset portion adjacent said second end, said offset portion forming a depression receiving said tongue; the improvement characterized in that on a portion of said clip adjacent said first end, two perpendicular, projecting columns, integrally formed from said metal strip, are aligned one behind the other, said opposed second end having two through holes formed therein and dimensioned to conform to and closely receive said columns when said ends are overlapped wherein said columns inserted in said holes retain the overlapped ends against both longitudinal shifting and rotational movements.

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**5,740,590**

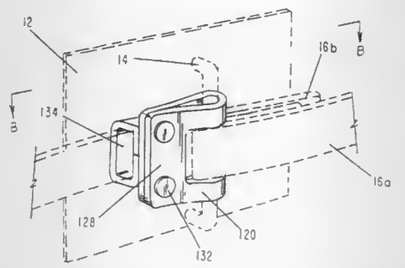
## ALIGNMENT DEVICE

**Donald C. Mohr, HC 67 Box 9, Nogal, N. Mex. 88341**

**Continuation-in-part of Ser. No. 369,156, Jan. 5, 1995, Pat. No. 5,592,718. This application Sep. 9, 1996, Ser. No. 709,637**

**Int. Cl.[6] A44B** *11/22*

**U.S. Cl. 24—265 BC** **9 Claims**




1. An alignment device for use with a belt buckle having a U-shaped mount of a first transverse dimension and having opposed upper and lower portions, and for use with a belt of a second transverse dimension substantially less than the first transverse dimension of the U-shaped mount, to substantially center the belt on the U-shaped mount, the alignment device comprising:

(a) a foldable web including a pair of upper spacing webs of a third transverse dimension and a pair of lower spacing webs of a fourth transverse dimension which are extendable between the belt and the respectively opposed upper and lower portions of the U-shaped mount, the sum of the second transverse dimension, the third transverse dimension and the fourth transverse dimension being substantially equal to the first transverse dimension, the foldable web including a stabilizer web disposed substantially between the upper spacing web pairs and the lower spacing web pairs;

(b) securing web portions interposed between the lower spacing webs and the upper spacing webs, and

(c) securing means coupled to the securing web portions for joining the securing web portions together about the U-shaped mount, to substantially center the belt relative to the U-shaped mount of the belt buckle.

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**5,740,591**

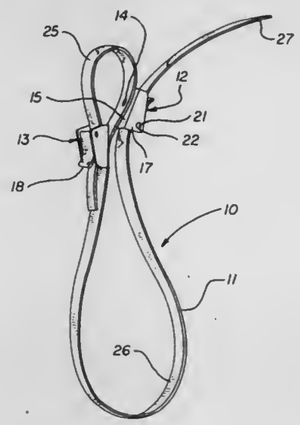
## QUICK RELEASE LOCKING STRAP

**William K. Hopkins, San Clemente, Calif., assignor to Fastening Solutions, Inc., Burbank, Calif.**

**Filed Jan. 2, 1997, Ser. No. 735,437**

**Int. Cl.[6] A44B** *11/00*

**U.S. Cl. 24—302** **7 Claims**




1. A quick release locking strap comprising:

a single integral elongated strap portion of flexible material;

a first clamp fixedly secured to said strap portion remote from one end thereof; and

a second clamp mounted on said strap portion spaced from said first clamp, each of said clamps having a base portion, each of said base portions having a forward end and a rearward end, each of said clamps having a locking lever pivotally mounted thereon adjacent the forward end of its respective clamp, each of said locking levers being spaced from its respective base portion with said strap portion being disposed between said locking lever and said base portion, each of said locking levers having camming means thereon movable between a first position allowing said strap portion to slide through said clamp to a second position abutting against said strap portion thereby locking said clamp to said strap portion, said first clamp being closer to one end of said strap portion than the other with a first loop formed in said strap portion with said camming means of said first clamp abutting against said strap portion, said second clamp being fixed to said strap portion on the side of said strap portion opposite where said first clamp is fixed to said strap portion, the front ends of each of said clamps extending in opposite directions and disposed adjacent each other and including a second loop bigger in inner diameter than said first loop formed in said strap portion with said camming means of said second clamp abutting against said strap portion.



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**5,740,592**

## COFFINS

**Chung Keong Lau, Singapore, Singapore, assignor to Excel Machine Tools Ltd., Singapore, Singapore**

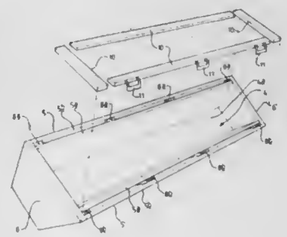
**PCT No. PCT/IB95/00972, § 371 Date Nov. 19, 1996, § 102(e) Date Nov. 19, 1996, PCT Pub. No. WO96/15754, PCT Pub. Date May 30, 1996**

**PCT Filed Nov. 7, 1995, Ser. No. 696,856**

**Claims priority, application United Kingdom, Nov. 22, 1994, 9423535**

**Int. Cl.[6] A61G** *17/013*

**U.S. Cl. 27—4** **15 Claims**



1. A coffin comprising an open receptacle assembly for receiving a corpse and a cover assembly for closing the receptacle assembly, in which coffin at least one of the receptacle assembly and the cover assembly is constructed from corrugated cardboard panels fixed to a skeletal frame structure, the corrugated cardboard panels comprising a sandwich of a plurality of layers of corrugated cardboard with a foil layer disposed between adjacent corrugated cardboard layers.

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**5,740,593**

## PROCESS FOR FORMING FIBROUS PREFORM STRUCTURES

**Philip William Sheehan, Pueblo West, and Ronnie Sze-Heng Liew, Pueblo, both of Colo., assignors to The B. F. Goodrich Company, Richfield, Ohio**

**Division of Ser. No. 604,554, Feb. 21, 1996, Pat. No. 5,581,857, which is a division of Ser. No. 279,608, Jul. 25, 1994, Pat. No. 5,515,585. This application Oct. 10, 1996, Ser. No. 728,593**

**Int. Cl.[6] B32B** *5/06;* **D04H** *1/46;3/10;5/02*

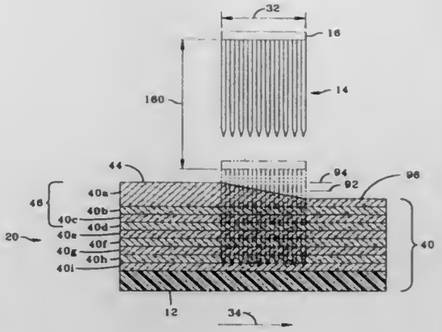
**U.S. Cl. 28—113** **21 Claims**

1. A process for forming a fibrous preform structure, comprising the steps of:

tracking a position of an exposed surface of a fibrous structure during a needling process in which fiber is transported within said fibrous structure by repeatedly driving a multitude of felting needles into said exposed surface;

determining a desired fiber transport depth relative to said position; and,

transporting fiber to said desired fiber transport depth by said needling process.




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**5,740,594**

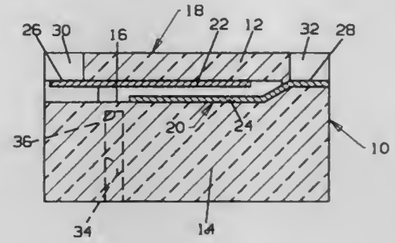
## METHOD FOR MAKING A FLUID PRESSURE TRANSDUCER

**Stanley J. Lukasiewicz; Vishwa N. Shukla, both of North Attleboro, Mass., and Allan J. Siuzdak, Cumberland, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jul. 22, 1996, Ser. No. 681,252**

**Int. Cl.[6] H01G** *5/16*

**U.S. Cl. 29—25.41** **13 Claims**




1. A process for making a fluid pressure responsive capacitive transducer unit comprising the steps of

taking a mixture of ceramic particles, glass particles and an organic binder capable of being sintered in an air atmosphere,

pressing the mixture into a first relatively thick base and a second relatively thin diaphragm with a recess formed in an outer surface of at least one of the base and diaphragm which interfaces with the other of the base and diaphragm,

taking an electrically conductive metallic ink comprising palladium oxide particles and silver particles in an organic vehicle and applying a layer having a selected pattern of the ink on a surface of the base and the diaphragm including the recess to form opposing capacitor plates,

pressing the base and the diaphragm together to form a transducer unit with the ink forming the opposing capacitor plates being in overlying, spaced relation with each other, and

raising the temperature of the transducer unit to a presintering temperature for sufficient time to turn any organic material in the transducer unit into a gas and allow the gas to escape from the transducer unit and then to a sintering temperature to allow the ceramic particles and the metallic particles of the ink to sinter forming a closed pore, monolithic structure and then allowing the transducer to cool to ambient temperature, the ratio of the palladium oxide particles to silver particles in the ink being selected by identifying a first ratio which will

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cause a separate, second diaphragm comprising the said mixture with a coating of the said metallic ink to sinter with essentially no warpage of the second diaphragm and then selecting and using a second ratio for the metallic ink which is applied to the base and the diaphragm by slightly decreasing the amount of palladium oxide to decrease the temperature at which palladium oxide reduces so that oxygen will be evolved while pores of the ceramic material are open as well as after the pores have closed to create a gas cushion in the recess when raising the temperature of the transducer unit through the reduction temperature range of the palladium oxide up to the sintering temperature, the gas cushion being sufficient to prevent movement of the diaphragm into the gap but insufficient to cause the diaphragm to significantly bow away from the base.

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**5,740,595**

## COMPOSITE LONGITUDINAL VIBRATION MECHANICAL FILTER'S METHOD OF MANUFACTURING INCLUDING UNDESIRED VIBRATION ABSORBER

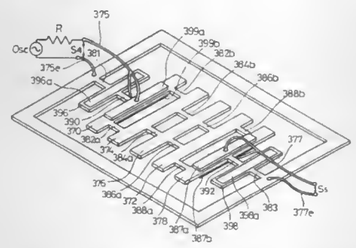
**Kazuo Yamashita; Yoshihiko Takeuchi, and Masahiro Watanabe, all of Mitaka, Japan, assignors to Nihon Musen Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 276,649, Jul. 19, 1994, Pat. No. 5,528,806, which is a continuation of Ser. No. 971,481, Nov. 4, 1992, abandoned, which is a division of Ser. No. 483,454, Feb. 21, 1990, Pat. No. 5,187,458. This application Jan. 3, 1996, Ser. No. 582,585**

**Claims priority, application Japan, Sep. 21, 1989, 1-247396; Sep. 21, 1989, 1-247397; Sep. 21, 1989, 1-247398; Sep. 21, 1989, 1-247399; Oct. 16, 1989, 1-269807; Oct. 16, 1989, 1-269808; Oct. 16, 1989, 1-269809; Oct. 16, 1989, 1-269810**

**Int. Cl.[6] H04R** *17/00*

**U.S. Cl. 29—25.35** **3 Claims**



1. A method of manufacturing a composite longitudinal vibration mechanical filter that vibrates at a preselected central frequency in a high frequency range, wherein the filter comprises:

a plurality of vibratable bodies, said plurality of vibratable bodies including input and output vibratable bodies with respective piezoelectric members superposed thereon, each of said vibratable bodies having a respective predetermined length;

respective coupling elements which couple the plurality of vibratable bodies to each other;

a holder for supporting said vibratable bodies through a plurality of supporting elements, said supporting elements being disposed respectively between said input and output vibratable bodies and said holder; and

means for eliminating unnecessary vibrations produced in said mechanical filter, said means being disposed between at least one of said vibratable bodies and said holder and across at least one of said supporting elements,

said method comprising the steps of:

forming, at the same time, an integral body comprising said plurality of vibratable bodies, including at least said input and output vibratable bodies, said coupling elements, said supporting elements, said holder and said means for eliminating unnecessary vibrations, wherein said means for eliminating unnecessary vibrations comprises a vibration absorbing body holder disposed between at least one of said input and output vibratable bodies and said holder; and a vibration absorbing body fixedly mounted on said vibration absorbing body holder, said means for eliminating unnecessary vibrations being disposed so as to absorb unnecessary vibrations which are transmitted to said output vibratable body, and to reduce unnecessary spurious responses occurring outside of a bandpass region of said filter;

said piezoelectric members being superposed fixedly on the input and output vibratable bodies in sandwiching relation thereto; and

connecting respective electrodes to said piezoelectric members.

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**5,740,596**

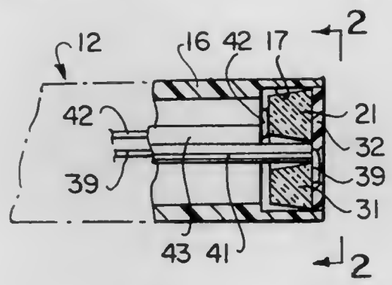
## METHOD OF MAKING A MINIATURE, HIGH EFFICIENCY DUAL FREQUENCY ULTRASONIC TRANSDUCER

**Paul D. Corl, Palo Alto; Michael C. Pao, San Jose; Vincent A. Barletta, Sunnyvale, and Victor Chechelski, Mountain View, all of Calif., assignors to Cardiometrics, Incorporated, Rancho Cordova, Calif.**

**Continuation of Ser. No. 447,993, May 23, 1995, Pat. No. 5,581,144, which is a continuation of Ser. No. 178,081, Jan. 6, 1994, abandoned. This application Dec. 2, 1996, Ser. No. 759,054**

**Int. Cl.[6] H01L** *41/22*

**U.S. Cl. 29—25.35** **10 Claims**



1. In a method of manufacturing a miniature ultrasonic transducer for use in a liquid carrying vessel, the steps of: forming a body of piezoelectric material in the shape of an annulus having a central opening, an outer diameter D no greater than about 0.018 inch, and a pair of annular end surfaces of width W separated by a thickness T, dimensioning the diameter D and an aspect ratio D/T to provide a strong low frequency resonant mode of operation, and dimensioning the thickness T and an aspect ratio W/T to provide a strong high frequency resonant mode of operation.

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**5,740,597**

## POCKET COIL SPRING PRODUCING APPARATUS

**Hiroyuki Eto, Tokyo, Japan, assignor to Matsushita Industrial Co., Ltd., Osaka, Japan**

**Filed Sep. 5, 1996, Ser. No. 708,417**

**Claims priority, application Japan, Dec. 25, 1995, 7-337202**

**Int. Cl.[6] B65B** *9/06*

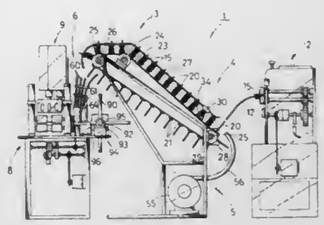
**U.S. Cl. 29—33 E** **5 Claims**

1. A pocket coil spring producing apparatus comprising:

a sheet supplying mechanism for folding a sheet material in two and feeding the same;

a joining mechanism for joining the thus folded sheet material to form a row of substantially rectangular pouches;





a coil spring forming mechanism for forming coil springs;

a hardening mechanism for hardening the coil springs fed from said coil spring forming mechanism;

a conveyor mechanism for cooling and conveying the thus hardened coil springs; and

a compress inserting mechanism for compressing and inserting the coil springs conveyed by said conveyor mechanism into respective pouches of the sheet material, said compress inserting mechanism comprising a pair of coil spring guides mounted at a position to receive a coil spring from said conveyor mechanism, said guides being spaced from each other to define therebetween a coil spring compressing slit, compressing bars for compressing respective coil springs received between said guides by passing through said coil spring compressing slit between said guides, a pair of guide plates for guiding and transferring the compressed coil springs while holding radial sides thereof, and a feeder mechanism for feeding the compressed coil springs to between said guide plates.

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**5,740,598**

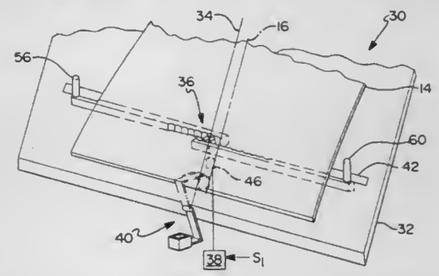
## METHOD FOR CENTERING A LOCATING FEATURE ON A WORKPIECE

**Paul J. Sauve, Warren, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.**

**Division of Ser. No. 324,302, Oct. 17, 1994, Pat. No. 5,522,128. This application Feb. 5, 1996, Ser. No. 596,537**

**Int. Cl.[6] B23Q** *17/00*

**U.S. Cl. 29—407.1** **4 Claims**



1. A method for centering a locating feature on a workpiece using a fixture having a longitudinal axis, and a support adapted to receive the workpiece, comprising the steps of:

(A) placing the workpiece on the support between a pair of centering members;

(B) moving the centering members toward each other such that each centering member maintains an equal distance from the axis;

(C) discontinuing the motion of the centering members when a center line of the workpiece is substantially aligned with the axis; and

(D) moving the locating feature in a plane containing the axis and the workpiece center line onto the workpiece to thereby permanently mount the locating feature onto the workpiece substantially along the center line of the workpiece.

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**5,740,599**

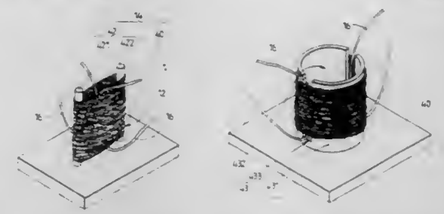
## METHOD OF MAKING A CLEANING SCRUBBER

**James Chang, No. 82-2, Wung Yuann Rd., Ta-Tao Li, Pei-Dou Cheng, Chang Hau Hsien, Taiwan**

**Filed Jan. 3, 1996, Ser. No. 580,971**

**Int. Cl.[6] B23P** *11/02*

**U.S. Cl. 29—446** **5 Claims**



1. A method of making a cleaning scrubber, said method comprising the steps of:

(a) preparing an elastic and reticulate tube of a predetermined length;

(b) expanding said elastic and reticulate tube over two spaced apart support elements fixed on a molding tool;

(c) inserting two resilient cords between said two spaced apart support elements at an interval of 180 degrees such that said resilient cords form a ring located between an inner side and an outer side of said tube;

(d) tightening said two resilient cords to compress the tube axially and produce pleats on a periphery of said tube;

(e) removing the compressed tube from the two spaced apart support elements; and

(f) releasing said tube to allow said periphery of said tube to expand around an axis between said two tightened resilient cords.

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**5,740,600**

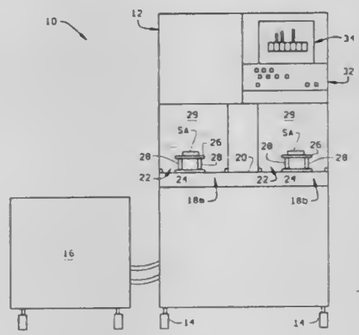
## ELECTRIC MOTOR STATOR WINDING BONDING APPARATUS AND METHOD THEREFORE

**Tom H. Rasberry, Kennett, Mo., assignor to Emerson Electric Co., St. Louis, Mo.**

**Filed Sep. 26, 1995, Ser. No. 533,752**

**Int. Cl.[6] H02K** *15/04*

**U.S. Cl. 29—596** **33 Claims**



24. A method of bonding together coils of an electrical wire forming windings of a stator assembly employed in the construction of a dynamoelectric machine, the method comprising:

installing the stator assembly in a fixture;

electrically connecting the stator windings to an energy source;

performing a surge test on the stator windings using electrical energy provided by said energy source and providing an indication if the surge test is successful;

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electrically connecting the stator windings to a power supply means, the stator winding being connected to said power supply means using a common electrical connection with said energy source;

supplying said indication of a successful completion of the surge test to the power supply means, said power supply means being responsive to the indication that the windings have successfully passed the surge test to apply a predetermined voltage to the stator windings;

measuring the current flowing through the stator windings as a result of the applied voltage; calculating the resistance in the windings as a result of the applied voltage and measured current; and,

adjusting the applied voltage from said power supply means to a desired level at which a predetermined current flows through the windings to heat the windings to a temperature at which a temperature activated adhesive material applied to the wires is activated, the material, when so activated, bonding the wires together.

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**5,740,601**

## METHOD OF MANUFACTURING AN IMPEDANCE DETECTOR

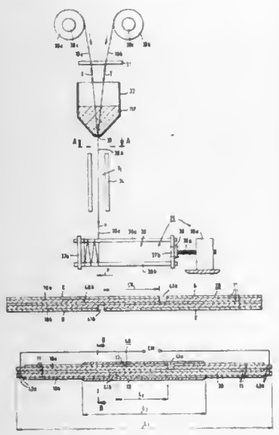
**Veijo Antikainen, Vantaa; Osmo Reittu, Espoo; Ingmar Stuns, Helsinki; Simo Tammela, Espoo, and Heikki Turtiainen, Vantaa, all of Finland, assignors to Vaisala Oy, Vantaa, Finland**

**Filed Dec. 8, 1995, Ser. No. 569,867**

**Claims priority, application Finland, Dec. 28, 1994, 946117**

**Int. Cl.[6] H01C** *17/00;* **H01R** *43/00*

**U.S. Cl. 29—610.1** **14 Claims**



**13**. A process for manufacture of electrical impedance detectors (**40**), said detector (**40**) being intended for measurement of a predetermined physical quantity, in which process a detector filament (**20**) is manufactured as a continuous drawing process by using an electrically conductive pair of electrode wires (**10***a*,**10***b*) as a carrier wire and as a drawing means; and coating said pair of electrode wires (**10***a*,**10***b*) with an active material (**11'**) whose impedance properties are a function of the physical quantity to be measured, and, out of the detector filament (**20**) obtained in the steps defined above, cutting off pieces of a length suitable for the purpose of use, the electrode wires (**10***a*,**10***b*) being uncovered from both ends of said filament pieces so as to form electrical contact points (**42***a*,**42***b*) for the detector (**40**), characterized in that:

the detector filament is wound on a flat frame (**35**),

steps of treatment and processing applied to the pair of electrode wires (**10***a*,**10***b*) coated with the active material layer (**11'**) in the detector filament (**20**) are carried out while the detector filament is in place on the frame (**35**) onto which the detector filament (**20**) is wound from the step of coating, and that;

after the steps of treatment and processing, the windings of the electrode wires (**10***a*,**10***b*) comprising the detector filament are cut off from both ends located at sides (**36***a*,**36***b*) of said frame, whereby substantially finished detectors (**40**) are formed.

**14**. A process for manufacturing an electrical impedance detector for measuring either temperature or humidity, comprising the steps of:

forming a continuous detector filament (**20**) by coating a pair of electrically conductive electrode wires (**10***a*,**10***b*) with an active material (**11**) whose impedance properties are a function either of temperature or humidity, so that the active material is on and between the electrode wires; and then

separating from the continuous filament at least one detector having opposite ends by cutting the pair of electrode wires (**10***a*,**10***b*) at different points (**41***a*,**41***b*) compared with one another, between the opposite ends, so that the impedance to be measured is formed in an area (CV) between the cutting locations of the electrode wires.

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**5,740,602**

## WIRE HARNESS ASSEMBLY SYSTEM

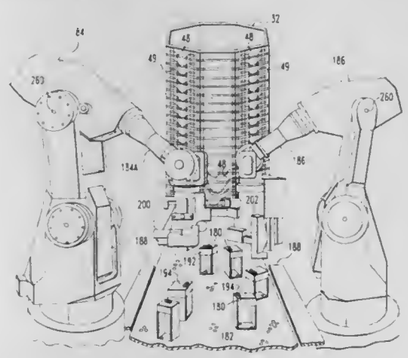
**Eric C. Peterson, Leon Valley; Alex H. Damalas, San Antonio; Glynn R. Bartlett, San Antonio; Steven B. Farmer, San Antonio; Leslie B. Hoffman, Boerne, all of Tex.; Tak Kameoka, Sakura, Japan; Horace H. Wacaser, Stuttgart, Germany, and Paul B. Wood, San Antonio, Tex., assignors to Alcoa Fujikura Limited, Brentwood, Tenn.**

**Division of Ser. No. 382,541, Feb. 1, 1995, Pat. No. 5,537,741.**

**This application Jun. 4, 1996, Ser. No. 658,075**

**Int. Cl.[6] H01R** *43/052;43/055;43/20*

**U.S. Cl. 29—748** **11 Claims**



**1**. Apparatus for making wire harness, comprising:

a sequential wire processor for fabricating single wire circuits of finite lengths and opposed ends, and for providing at least one of each of said opposed ends with crimped terminals for subsequent insertion into connector cavities,

a computer and software interfaced with the wire processor for controlling its circuit making and terminal crimping functions,

a multi-sided carousel,

means for transferring the circuits from said wire processor to the sides of said carousel, said transfer means including jaws that orient the crimped terminals for disposing said crimped terminals into clips provided on the sides of the carousel,

said clips maintaining the orientation of the terminals provided by the transfer means,

said computer being interfaced with components of the transfer means and carousel for controlling the transfer of the circuits from the transfer means to the carousel, and for controlling the carousel and clips in a manner that substantially fills the sides and clips of the carousel with circuits, and



means permitting movement of the carousel from the transfer means to an inspection station, and from said station to a robotic station,

said robotic station having two robots with respective end effectors for removing the circuits from the carousel and for transporting said circuits to a formboard containing thereon connectors having circuit receiving cavities,

said robots and end effectors being effective to insert the circuit terminals into the cavities of the connectors, and to test insertion and retention of the terminals in the cavities.

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**5,740,603**

## METHOD FOR MANUFACTURING LOW DIELECTRIC CONSTANT MULTIPLE LAYER CERAMIC CIRCUIT BOARD

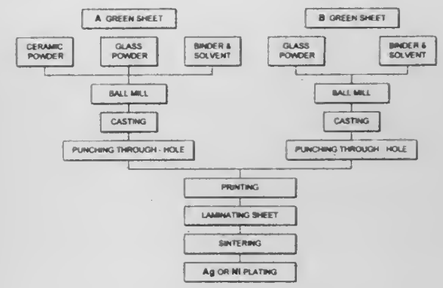
**Chul-Ho Kim, Kyongki-do, Rep. of Korea, assignor to Samsung Electro-Mechanics Co., Ltd., Suwon, Rep. of Korea**

**Filed Jul. 26, 1996, Ser. No. 687,838**

**Claims priority, application Rep. of Korea, Jul. 31, 1995, 1995-23552; Jul. 31, 1995, 1995-23553**

**Int. Cl.[6] H05K** *1/03;1/14*

**U.S. Cl. 29—830** **12 Claims**




**1**. A method for manufacturing multiple layer ceramic circuit board comprising:

a step for mixing 30–70 wt % of Pb—Zn—B glass powder made of 50–90 wt % of a powder being 9–20 μm of average granular diameter and 10–50 wt % of a powder of less than 3 μm of average granular diameter, and 30–70 wt % of ceramic powder;

a step for manufacturing slurry of less than 3000 cps in viscosity by uniformly dispersing the mixture mixed as above and an organic binder into solvent;

a step for forming a green sheet by casting said slurry;

a step for forming a though hole at a predetermined position of said green sheet and then, injecting a conductor electrode, and printing a conductor electrode on sheet surface;

a step for pressure heat-sealing after piling a circuit board printed with conductor electrode; and

a step for firing at 650°–750° C. after de-binding the heat-sealed sheet.

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**5,740,604**

## COMPONENT-MOUNTING APPARATUS AND METHOD

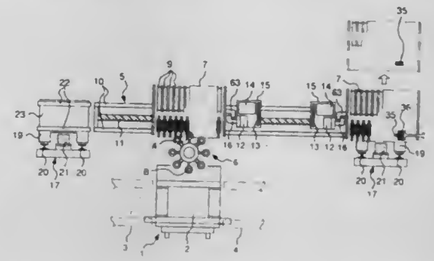
**Naoyuki Kitamura, Hirakata; Hiroshi Ohta, Moriguchi; Muneyoshi Fujiwara, Katano, and Wataru Hirai, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan**

**Filed Aug. 3, 1995, Ser. No. 510,679**

**Claims priority, application Japan, Aug. 3, 1994, 6-182020**

**Int. Cl.[6] H05K** *3/30;* **B23P** *19/00*

**U.S. Cl. 29—832** **21 Claims**



**1**. A method for mounting components on circuit boards, the method comprising:

supplying components to be mounted on a circuit board, by a component supply mechanism;

placing in position the circuit board on which the components are to be mounted, by a circuit board positioning device; and

taking one of the components out of the component supply mechanism at a predetermined component take-out position of the component supply mechanism, by a component mounting head, and mounting the component on the circuit board,

wherein said supplying of the components includes:

moving, by a driving device, a plurality of supply tables, on which a plurality of component supply devices have been arranged at predetermined intervals, in a direction in which the component supply devices have been arranged, thus placing a desired component supply device at the predetermined component take-out position;

placing the supply tables on a table exchange mechanism which has an elevator and is provided at one end of a movable range of the supply tables;

switching a position of a first desired supply table by the driving device, including moving the first desired supply table vertically in the elevator.

**8**. A component-mounting apparatus comprising:

an apparatus body;

a component supply mechanism provided on said body for supplying components to be mounted on a circuit board;

a circuit board positioning device provided on said body for placing the circuit board, on which the components are to be mounted, in position; and

a component mounting head provided on said body for taking one of the components out of the component supply mechanism at a predetermined component take-out position of the component supply mechanism and mounting the component on the circuit board;

wherein said component supply mechanism comprises:

a plurality of supply tables on which a plurality of component supply devices can be arranged at predetermined intervals;

a driving device for moving said supply tables over a range and in a direction in which the component supply devices can be arranged, thus placing a desired component supply device at the predetermined component take-out position; and

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a table exchange mechanism provided at least one end of the moveable range of said supply tables for receiving the supply tables thereon and for allowing a position of a desired one of said supply tables to be switched by said driving device;

wherein said table exchange mechanism has an elevator which is vertically moveable between at least two positions.

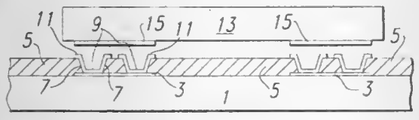
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**5,740,605**

## BONDED Z-AXIS INTERFACE

**Robert K. Peterson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jul. 25, 1996, Ser. No. 685,888**
**Int. Cl.[6] H05K** *3/42;3/36;3/46*
**U.S. Cl. 29—840** **20 Claims**




1. A method of forming a z-axis interface comprising the steps of:

(a) providing a device having a first electrically conductive pad thereon;

(b) forming a layer of resilient electrically insulating material, capable of being made rigid, over a surface of said device, said layer of resilient electrically insulating material having a via with sidewalls extending to said first electrically conductive pad;

(c) forming a layer of electrically conductive material on said sidewalls extending to said first pad and also extending out of said via and over said first layer of electrically insulating material;

(d) applying under pressure to the portion of said electrically conductive material extending out of said via a second electrically conductive member to deform said electrically conductive material; and

(e) then causing said electrically insulating material to become rigid.

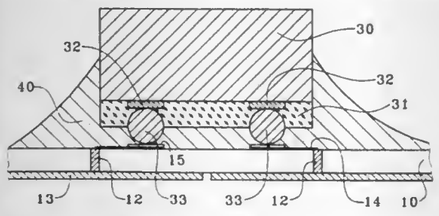
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**5,740,606**

## METHOD OF MANUFACTURING A SET OF ELECTRONIC MODULES FOR ELECTRONIC MEMORY CARDS

**Rene Rose, Voisin-le-Bretonneux, France, assignor to Schlumberger Industries, Montrouge, France**

**Filed Nov. 4, 1996, Ser. No. 743,546**
**Claims priority, application France, Nov. 3, 1995, 95 13120**
**Int. Cl.[6] H05K** *3/34*
**U.S. Cl. 29—840** **10 Claims**




1. A method of manufacturing a set of electronic modules for electronic memory cards, using integrated circuits having projections, the method comprising the steps of:

a) forming a plurality of groups of regularly spaced apart through holes in an insulating sheet substrate, each group of holes being associated with an electronic module, and said through holes being provided to receive a conductive material in order to provide electrical continuity between first and second faces of the insulating substrate, said faces being respectively provided to receive, for each electronic module, firstly electrical contacts for connection with an external connector, and secondly interconnection patterns onto which the integrated circuit having projections is to be mounted;

b) a first silkscreening operation for making said electrical contacts by depositing a conductive ink on the first face of the insulating sheet substrate, said holes being partially filled with said ink;

c) a second silkscreening operation for making said interconnection patterns by depositing a conductive ink on the second face of the sheet of substrate, said holes being filled up with said ink; and

d) mounting integrated circuits having projections on the interconnection patterns on said second face of the insulating substrate.

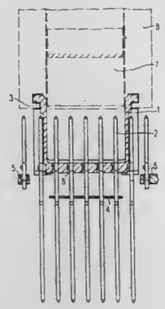
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**5,740,607**

## METHOD FOR EQUIPPING A WIRING BACKPLANE

**Karl Zell, Niederpoecking, and Peter Seidel, Groebenzell, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Jun. 20, 1995, Ser. No. 492,864**
**Claims priority, application Germany, Jun. 30, 1994, 44 23 010.9**
**Int. Cl.[6] H05K** *3/00*
**U.S. Cl. 29—845** **10 Claims**




1. A method for equipping a wiring backplane with contact blades, comprising the steps of:

providing the contact blades with press-in zones;

providing a blade holder having a press-in die;

introducing the press-in zones of the contact blades into the blade holder in a predetermined arrangement of contact blades;

pressing the contact blades into the wiring backplane from the blade holder with the press-in die; and

retracting the press-in die, the blade holder thereby being pulled off of the contact blades.

4. A blade holder system for use in equipping a wiring backplane with contact blades, comprising:

a blade holder having a press-in die;

a pull-off tool having lateral undercuts for engaging the blade holder;

the contact blades having press-in zones for engaging acceptance slots in the blade holder; and

wherein the contact blades have their press-in zones introduced into the blade holder in a predetermined aligned arrangement of contact blades, wherein the contact blades introduced into the blade holder are pressed into the wiring backplane from the blade holder with the press-in die, and wherein upon retraction of the press-in die, the blade holder is pulled off from the contact blades by the pull-off tool.



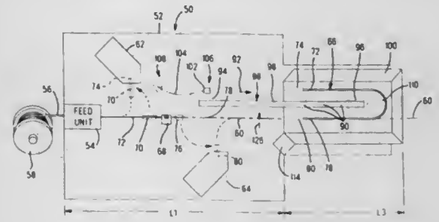
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**5,740,608**

## METHOD OF MAKING AND STACKING ELECTRICAL LEADS

**Alden Owen Long, Carlisle, Pa., assignor to The Whitaker Corporation, Wilmington, Del.**

**Filed Mar. 1, 1996, Ser. No. 609,703**
**Int. Cl.[6] H01R** *43/052;43/28*
**U.S. Cl. 29—863** **14 Claims**




1. In an automated machine having a wire feed unit, a wire cutting unit, a wire lead stacking tray, and a substantially linear wire path extending from said wire feed unit through said wire cutting unit,

an automated method of making and stacking a plurality of electrical leads from a continuous supply of wire, each said lead having a first end, a second end, and a predetermined length comprising the steps:

(a) feeding said wire along said wire path to said wire cutting unit;

(b) cutting said wire thereby forming said first end of a said lead;

(c) grasping said first end and moving it out of alignment with said wire path;

(d) while said first end is out of said alignment with said wire path feeding said wire through said wire cutting unit along said wire path while pivoting said first end so that said wire forms a U-shaped portion;

(e) cutting said wire thereby forming said second end of said lead and forming a first end of another lead; then

(f) moving said lead in a first direction to said stacking tray by engaging and moving said U-shaped portion while both said first and second ends of said lead trail behind said U-shaped portion.

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**5,740,609**

## METHOD OF MAKING ONE-PIECE VEHICLE WHEELS AND THE LIKE

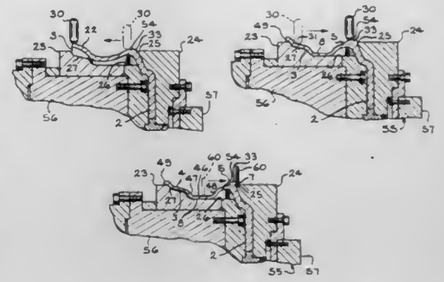
**Kevin D. Jurus, Lansing, Mich., assignor to Motor Wheel Corporation, Okemos, Mich.**

**Filed Dec. 8, 1995, Ser. No. 569,499**
**Int. Cl.[6] B21H** *1/02;1/04*
**U.S. Cl. 29—894.324** **36 Claims**

27. In a method of forming a vehicle wheel of the type having a disc portion and a rim portion with inboard and outboard bead seats and retaining flanges and a rim well therebetween, comprising:

providing a generally circular blank having a center portion with the final shape of at least a portion of the disc portion of the wheel, and a peripheral portion for spin shaping the final shape of at least a portion of the rim portion of the wheel;

positioning the blank between inner and outer mandrels, wherein the inner mandrel has a fixed outboard surface, and an inboard shaping surface which conforms to the final shape of at least a portion of the rim well and the inboard bead seat and flange;




spin forming an inboard section of the blank peripheral portion against the inboard shaping surface of the inner mandrel to form the final shape of at least a portion of the rim well and the inboard bead seat and flange;

spin forming an outboard section of the blank peripheral portion by engaging the same with a forming roller while the blank peripheral portion remains spaced apart from and unsupported by the fixed outboard surface of the inner mandrel to form the final shape of at least a portion of the outboard bead seat.

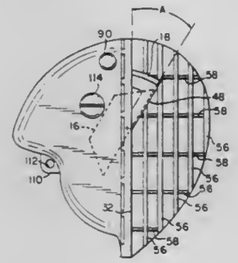
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**5,740,610**

## CARTON OPENER

**Kylle R. Ayer, Watebury; Tom Zamecnir, Clinton; Lloyd Ayer, Bethany, all of Conn., and Attila Bodnar, Cliffside Park, N.J., assignors to General Housewares Corp., Terre Haute, Ind.**

**Filed Aug. 23, 1993, Ser. No. 110,567**
**Int. Cl.[6] B26B** *3/08*
**U.S. Cl. 30—2** **1 Claim**




1. A carton opener comprising:

a body member,

a first guiding surface formed on said body member,

a second guiding surface formed on said body member with said first and said second guiding surfaces forming an angle,

a blade member with said blade member projecting from said first guiding surface and with said blade member defining a plane and with said blade member having a cutting edge and with said body member having a curved portion disposed forward of said cutting edge, further comprising

a blade guard with said blade guard pivotally connected to said body member and capable of a first position covering said blade,

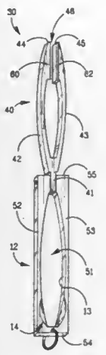
locking means mounted on said body member and disposed to lock said blade guard in said first position, and

release button means capable of releasing said blade guard.

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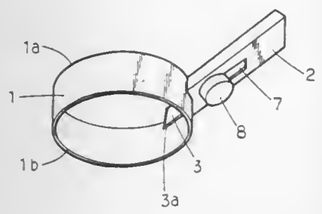
**5,740,611**
**GROOMING DEVICE**
**Caroline M. Schloss, 1925 Wilroy Rd., Suffolk, Va. 23434-2307**
**Continuation-in-part of Ser. No. 351,934, Dec. 8, 1994, abandoned. This application Jul. 2, 1996, Ser. No. 677,329**
**Int. Cl.[6] B25B** *9/00*
**U.S. Cl. 30—29.5** **12 Claims**



1. A grooming tool comprising:
a tweezer-scissor member having a single stem,
a first arm and a second arm extending from one end of the single stem, the first and second arms each having a first and second end surface respectively, a first flat **25** surface and a second flat surface integral with the first and second end surface respectively,
a blade extending from the second arm adjacent to the second flat surface, the first arm having an angled surface adjacent the first flat surface, wherein the first and second flat surfaces come in contact with each other when a force is exerted on the first and second arms and wherein the blade slides past the angled surface when a force is exerted on the first and second arms thereby performing a cutting function; and
a housing case member having a first long side and a second long side, a first short side and second short side, and an opening, a pin affixing the stem to the housing case member, the opening configured such that the stem and first and second arms fit inside the opening.

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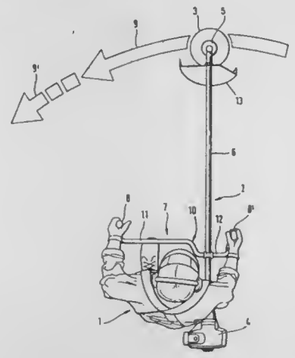
**5,740,612**
**PLASTIC BOTTLE CUTTING IMPLEMENT**
**Sotoshi Takeshita, and Toshimichi Kotani, both of Takaoka, Japan, assignors to Koeitsusho Kabushiki Kaisha, Toyama, Japan**
**Filed Sep. 30, 1996, Ser. No. 723,090**
**Claims priority, application Japan, Oct. 7, 1995, 7-296348**
**Int. Cl.[6] B26B** *29/06*
**U.S. Cl. 30—115** **6 Claims**



1. A plastic bottle cutting implement comprising:
a cylindrical covering member;
a blade projecting from an inside surface of the cylindrical covering member, the blade projecting in a direct intersecting at any angle other than perpendicular and parallel to an imaginary center axis of the cylindrical covering member; and,
a hand holdable grip member attached to an outer side of the cylindrical covering member, wherein the blade which projects from said inside surface of the cylindrical covering member is retractably received into the grip member;
and wherein:
the grip member is substantially bar-shaped and is mounted projecting from the outer side of the cylindrical covering member;
the grip member has a hollow part inside the grip member and connecting with the inside surface of the covering member;
a sliding fitting is arranged inside the hollow part so as to be slidable inside the hollow part and so as to be fixable in any position inside the hollow part; and
the blade has one end thereof attached to the sliding fitting.

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**5,740,613**
**TRIMMING DEVICE WITH ERGONOMIC HANDLE BAR**
**Helmut Swistun, Kernen; Gerhard Stoll, Winnenden, and Martin Lambe, Kernen, all of Germany, assignors to Andreas Stihl, Waiblingen, Germany**
**Filed Aug. 2, 1996, Ser. No. 691,265**
**Claims priority, application Germany, Aug. 2, 1995, 195 28 358.9**
**Int. Cl.[6] A01D** *34/68*
**U.S. Cl. 30—276** **8 Claims**

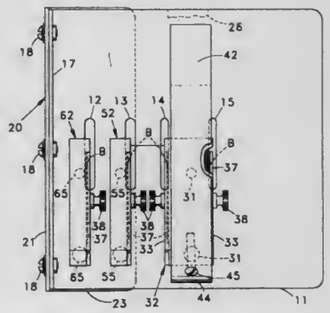


1. A trimmer comprising:
a drive motor;
a cutting tool;
a drive shaft connecting said drive motor to said cutting tool;
a protective tube enclosing said drive shaft;
a connector;
a handle bar having a first and a second section extending parallel to one another, said first section connected by said connector to said protective tube so as to extend perpendicular to said protective tube;
said first section having a first free end extending therefrom with a first handle on said first free end and said second section having a second free end extending therefrom with a second handle on said second free end;
said handle bar positioned asymmetrically relative to a longitudinal axis of said protective tube;
said handle bar having a bent portion, comprising a first and a second bend, connecting said first section to said second section, said bent portion positioned adjacent to said connector;
wherein, in an operating position of said trimmer, said first section and said first free end define a first plane and said second section and said second free and define a second plane, and wherein said first plane is displaced relative to said second plane in a direction of said longitudinal axis of said protective tube.



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**5,740,614**
**TOOL FOR CUTTING ELONGATE STRIPS FROM CARPET**
**William E. Carder, 4 Spyglass Hill, Fairport, N.Y. 14450, and Timothy Carder, 310 Cromwell Dr., Roch, N.Y. 14610**
**Filed Oct. 25, 1996, Ser. No. 738,089**
**Int. Cl.[6] B26B** *5/00;29/06*
**U.S. Cl. 30—293** **13 Claims**

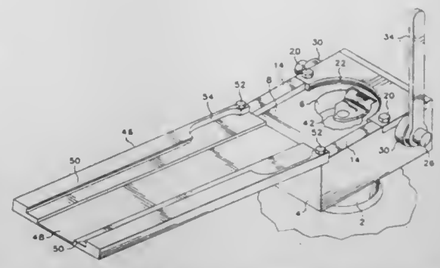


1. A tool for simultaneously cutting a plurality of strips of carpet from a section thereof, comprising
a base plate having an upper surface and a lower surface, and having therethrough a plurality of spaced, parallel slots,
a plurality of blade supporting blocks each having a lower end thereof secured to said upper surface of said plate, each of said blocks having therein at least one elongate blade accommodating recess opening at one end thereof upon and registering with one of said slots in said base plate,
means for adjustably securing one of a plurality of cutting blades in each of said recesses with a sharp cutting end of each of said blades disposed to extend adjustably beyond said one end of its associated recess and through the registering slot in said base plate,
a handle operatively secured at opposite ends thereof to said base plate and having intermediate its ends a band grip portion thereof overlying said upper surface of said base plate and extending parallel to said slots, and
an elongate guide strip secured to said lower surface of said base plate and having at least one longitudinal side edge thereof extending parallel to said slots.

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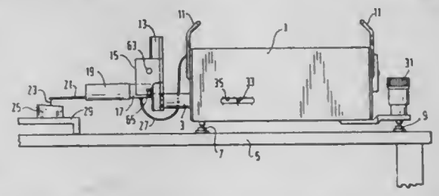
**5,740,615**
**DEVICE FOR PUNCTURING AEROSOL CANS**
**Gustav Treske, 3860 Rose Park Dr., West Linn, Oreg. 97068**
**Filed Mar. 12, 1997, Ser. No. 815,799**
**Int. Cl.[6] B67B** *7/48*
**U.S. Cl. 30—448** **7 Claims**

1. A device for puncturing an aerosol can having a base, comprising:
a receiver member defining a seat for receiving the aerosol can with its base downward against the seat, the receiver member being formed with a passage extending downward from the seat,
a pivot rod fitted in the receiver member below the seat,
a tool bit attached to the pivot rod and projecting from the pivot rod into the passage, such that when the pivot rod is rotated in a first sense a tip of the tool bit moves upward along an arcuate path from a relatively withdrawn position in which the can can be placed on the seat over the passage without interference with the tool bit, to a relatively extended position in which the tool bit extends upward of the seat and penetrates the base of the can.



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**5,740,616**
**METROLOGICAL INSTRUMENT WITH STYLUS FOR TRAVERSING WORKPIECE**
**Peter Seddon; Alan John Coleman, both of Leicester; Dean Onyon, Loughborough, and Trevor Dixey, Leicester, all of England, assignors to Taylor Hobson Limited, England**
**PCT No. PCT/GB94/02007, § 371 Date May 12, 1995, § 102(e) Date May 12, 1995, PCT Pub. No. WO95/08096, PCT Pub. Date Mar. 23, 1995**
**PCT Filed Sep. 14, 1994, Ser. No. 433,496**
**Claims priority, application United Kingdom, Sep. 14, 1993, 9319037**
**Int. Cl.[6] G01B** *5/20;7/28*
**U.S. Cl. 33—554** **41 Claims**



1. A metrological instrument for measuring a characteristic of a surface, the instrument comprising: an arm for holding a stylus and traversing the stylus over a workpiece; an electronic circuit means for connection to a coil of an inductive transducer arranged so that movement of a tip of a stylus held by said arm causes relative movement between the coil of the transducer and a core for the coil, the circuit means comprising a component which is adjustable in response to a control signal so as to alter a parameter of the component and thereby affect the operation of the circuit means, and the metrological instrument having a mode of operation in which it generates the aforementioned control signal in response to an error in the operation of the circuit means, thereby to adjust the component automatically so as to reduce the error.

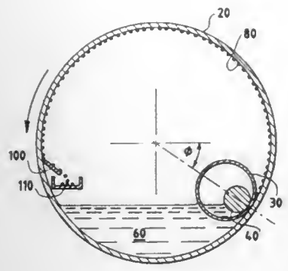
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**5,740,617**
**ROTARY DRUM DRYER**
**Norman P. Rittenhouse, 1001 N. First St., Fairbury, Ill. 61739**
**Filed Apr. 23, 1997, Ser. No. 842,389**
**Int. Cl.[6] F26B** *7/00*
**U.S. Cl. 34—381** **10 Claims**

1. A method of drying a slurry into discrete solid masses, the method comprising:
(a) introducing a slurry having a solids content of about 5 to 75 weight percent into a rotary drum dryer, the rotary drum dryer comprising: (i) a long horizontal outer cylinder with a smooth interior wall surface adapted to hold a quantity of a slurry at a

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particular level in its lower portion; (ii) a long horizontal perforated cylinder inside the outer cylinder, the longitudinal axis of the perforated cylinder being parallel to the longitudinal axis of the outer cylinder, a distance away from the outer cylinder of about the radius of the perforated cylinder so that little or no gap exists between the perforated cylinder and the outer cylinder, and in a plane defined by the longitudinal axis of the outer cylinder and the line formed by the intersection of the top of the slurry and the outer cylinder; and (iii) a long horizontal inner cylinder with a smooth exterior wall surface inside the perforated cylinder, the longitudinal axis of the inner cylinder being parallel to the longitudinal axes of the outer cylinder and the perforated cylinder, a distance away from the perforated cylinder of about the radius of the inner cylinder so that little or no gap exists between the inner cylinder and the perforated cylinder, and in a plane defined by the longitudinal axis of the outer cylinder and the line formed by the intersection of the top of the slurry and the outer cylinder;

(b) rotating the outer cylinder, the perforated cylinder, and the inner cylinder to compress the slurry through the perforations in the perforated cylinder and to deposit the compressed slurry as discrete masses on the interior wall surface of the outer cylinder;

(c) passing hot, dry air through the outer cylinder;

(d) removing the dried discrete masses from the interior wall surface of the outer cylinder; and

(e) transporting the dried, removed discrete solid masses from the outer cylinder.

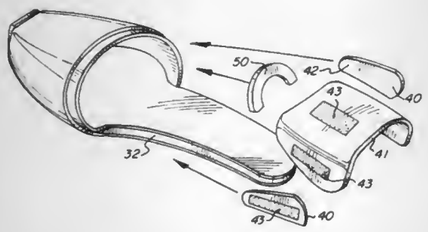
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**5,740,618**

**DYNAMIC TOE SHOE BOX LINER FOR A POINTE SHOE**

**Elizabeth Gaynor Minden, 140 West 16th St., Apt. 5W, New York, N.Y. 10011**

**Filed Sep. 20, 1995, Ser. No. 531,245**
**Int. Cl.[6] A43B** *5/12;19/00*
**U.S. Cl. 36—8.3** **22 Claims**




1. A dance shoe, comprising:

a toe box having an inner surface including a top surface and left and right side surfaces;

a shank joined with and extending rearwardly from said toe box, an upper surface of said shank forming a bottom inner surface of said toe box;

a dynamic foam pad located in at least one of said left and right side surfaces of said toe box and not being located on said bottom inner surface of said toe box, said dynamic foam pad having a low compression set providing a fast resilient characteristic wherein said foam pad is compressed by a dancer's foot when the foot is in the flat standing position and said foam pad expands to support the dancer's foot upon narrowing of the dancer's foot when the dancer is standing en pointe.

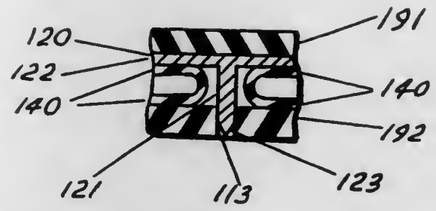
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**5,740,619**

**RETRACTABLE STUD**

**Morris H. Broder, 701-160 Tuxedo Avenue, Wpg, Canada, R3P 1B2**

**Continuation of Ser. No. 349,422, Dec. 5, 1994, abandoned, which is a division of Ser. No. 215,640, Mar. 22, 1994, abandoned. This application Sep. 16, 1997, Ser. No. 931,576**
**Int. Cl.[6] A43C** *15/00*
**U.S. Cl. 36—61** **1 Claim**




1. An athletic shoe comprising:

(a) an athletic shoe sole having an inner sole and an outer sole, said outer sole having a passsageway for a stud;

(b) a backing plate intermediate said inner sole and said outer sole, said backing plate having a plurality of studs adapted to move through said passageway in said outer sole;

(c) an air bladder intermediate said backing plate and said outer sole, said air bladder comprising a hollow tube to permit the passage of air into and out of said bladder and a plurality of sealed circular passageways closely surrounding the studs, said air bladder adapted to be pressurized and depressurized to permit movement of said studs through said passageway of said outer sole;

(d) a pneumatic valve connected to said tube and adapted to be connected to a hand pump, whereby said bladder may be pressurized and depressurized, said bladder in a pressurized configuration holding said backing plate sufficiently away from said outer sole so that the point of said studs is held entirely within said outer sole, the weight of the wearer of the athletic shoe sole with said bladder in a depressurized configuration forcing the end of said stud outboard of said outer sole.

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**5,740,620**

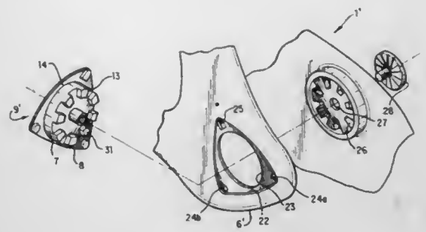
**ELASTOMERIC CONNECTING MEANS FOR FOOTWEAR**

**Erik O. Giese; Mark C. Joseph; Roger J. Brown, all of Aspen, and Michael D. Racosky, Boulder, all of Colo., assignors to Comfort Products, Ltd., Aspen, Colo.**

**Continuation-in-part of Ser. No. 270,853, Jul. 5, 1994, Pat. No. 5,611,155. This application Jul. 12, 1996, Ser. No. 678,900**
**Int. Cl.[6] A43B** *5/04;5/16*
**U.S. Cl. 36—118.2** **31 Claims**

1. The improvement in a boot having a first shoe shaped shell member with a heel, middle and front portion for receiving and supporting an individual's foot along at least the bottom portion of






the foot, a second member having a section overlapping the shell member with a first surface of said second member facing a first surface of said shell member, said second member extending upwardly from the shell member for covering a portion of the individual's leg; and attaching means for pivotally attaching the second member to the shell member for rotation about a pivot axis; the improvement wherein said attaching means includes:

a) an insert with a first surface facing said first surface of said shell member, said insert removably connected to said section of the second member overlapping the shell member and pivotally connected to the shell member for pivoting movement of said second member relative to said shell member in response to pivoting of the individual's leg relative to the individual's foot;

b) an elastomeric material disposed between said shell member and said insert, said elastomeric material having opposite sides, with a first side facing said first surface of the shell member and a second side facing said first surface of the insert;

c) a connecting means for connecting said first side of said elastomeric material to said shell member and said second side thereof to said insert for movement of said first and second sides of the elastomeric material relative to each other in a direction extending along said surfaces of said shell member and said second member as said second member is pivoted relative to said shell member.

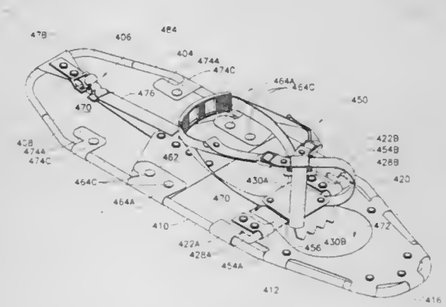
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**5,740,621**

**COMPACTIBLE SNOWSHOES AND BINDINGS AND METHOD OF ASSEMBLY**

**Harold R. Wing, Springville; N. Ryan Moss, Mapleton, and David Francis, Orem, all of Utah, assignors to Wing Enterprises, Inc., Springville, Utah**

**Filed Sep. 29, 1995, Ser. No. 536,692**
**Int. Cl.[6] A43B** *5/04;5/16*
**U.S. Cl. 36—122** **31 Claims**




1. A method of assembling a compactible snowshoe from a compact storage configuration to a usable configuration, the compactible snowshoe comprising at least a first frame member, a second frame member, a third frame member, a fourth frame member, and a deck, the method comprising the steps of:

interconnecting the first frame member and the second frame member;

interconnecting the third frame member and the second frame member;

interconnecting the fourth frame member and the third frame member such that when at least the first, second, third, and fourth frame members are interconnected a closed frame is formed;

coupling the deck to the closed frame such that the deck provides resistance to passage of snow through the closed frame; and

tensioning the deck within the closed frame using a sole unitary member, comprising a strap connected to the deck, which is gripped by a user and exerted force upon to tension the deck without the need to utilize additional tensioning devices so that the snowshoe assumes a usable configuration.

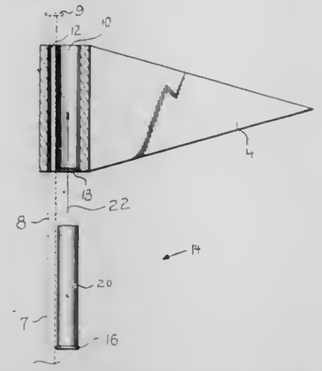
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**5,740,622**

**ANTENNA MOUNTED AUTOMOBILE AND TRUCK PENNANT**

**René J. Martin, 115 Prince Ave., Melbourne, Fla. 32901**

**Filed Aug. 5, 1996, Ser. No. 692,271**
**Int. Cl.[6] G09F** *21/04*
**U.S. Cl. 40—591** **8 Claims**




1. An antenna-mounted pennant comprising a flag attached to a body, and a pin, said body comprising a pin bore communicating with an antenna bore, said pin bore being sized to frictionally admit said pin, said body and said flag being of one-piece construction, said antenna bore being substantially circular in cross-section, said pin comprising a pin lip, and said pin bore comprising a pin bore groove sized to frictionally engage said pin lip, whereby the frictional fit between said pin and said pin bore may be enhanced.

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**5,740,623**

**TUBULAR IDENTIFICATION WRISTBAND**

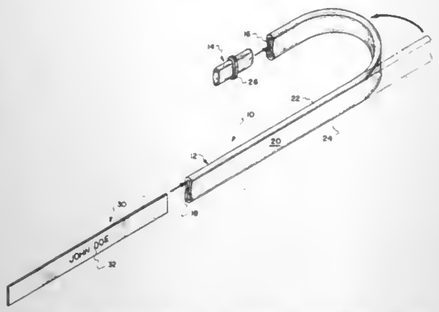
**Dodge Juhan, Ontario, and Dean D. Peterson, Sylmar, both of Calif., assignors to Precision Dynamics Corporation, San Fernando, Calif.**

**Filed Jan. 28, 1997, Ser. No. 787,757**
**Int. Cl.[6] G09F** *3/08*
**U.S. Cl. 40—633** **8 Claims**

1. In an identification wristband: an elongated tubular body formed from transparent synthetic plastic material and having first and second extremities, said tubular body having a substantially flat intermediate portion with top and bottom surfaces and semicircular edges, said flat intermediate portion being adapted to receive an identification tag which can be effectively read through the substantially flat portion of said body and each of said semicircular edges having a portion projecting above said top surface

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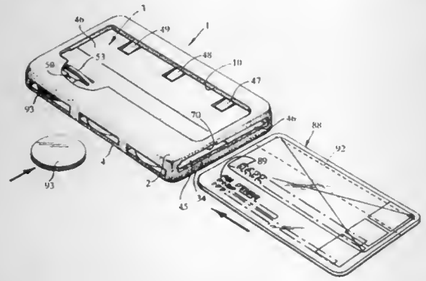




and a portion projection below said bottom surface of said flat intermediate portion; and a connector engagable with said first and second extremities for expanding said extremities into a substantially elliptical configuration and securing said first and second extremities against removal of said body.

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**5,740,624**
**IDENTIFICATION CARD HOLDER**
**Paul Reginald Baseley, 2 & 3 Park Barn Cottages, Ditcham Park, Near Petersfield, Hampshire GU31 5RL, England**
**Filed Mar. 6, 1995, Ser. No. 399,213**
**Int. Cl.[6] G09F** *3/20*
**U.S. Cl. 40—649** **13 Claims**



**1**. An identification card holder holding a removably inserted identification card bearing a magnetic strip on one face and embossed characters on the other face, the card holder comprising a base plate and front plate secured in spaced apart relationship to define a card receiving slot to receive the inserted card and with a mouth opening at the edge of the holder, the front plate having a face hole of a size less than that of the card, the base plate having a spring acting to urge the inserted card towards a card-contacting face of the front plate and situated so as not to interfere with the magnetic strip of the inserted card, the card-contacting face of the front plate having a channel in the area of the embossed characters, of a depth sufficient that the embossed characters on the inserted card do not contact the surface of the front plate.

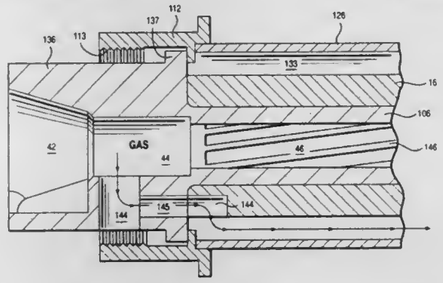
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**5,740,625**
**FIREARM AIMING SUPPORT**
**Melvin R. Jenkins, 818 Fountain St., Mineral Point, Wis. 53565**
**Filed Oct. 21, 1996, Ser. No. 734,540**
**Int. Cl.[6] F41C** *27/00*
**U.S. Cl. 42—94** **7 Claims**

**1**. A firearm aiming support comprising a cradle, a standard and a foot thrusting peg, the cradle comprising
two prongs and
a vertex joining them and disposing them separately upwards whereby part of the firearm may be permitted to rest therein, improving the firearm operator's aim and reducing fatigue; the standard comprising a rod and a tubular sleeve
the rod comprising in turn a first end and a second end,
the rod's first end comprising a spike, whereby the standard may be thrust downward into the ground disposing the aiming support vertically;
the rod's second end comprising an internally threaded receptor;
the tubular sleeve comprising a first end, a second end and an internally seated externally threaded post proximate the second end thereof, the tubular sleeve's first end comprising a cradle vertex attachment site at which site the cradle is attached to the tubular sleeve and the tubular sleeve's second end comprising an opening of inner diameter greater than the outer diameter of the rod, the threads of the externally threaded post being mated to those of the internally threaded receptor at the second end of the rod, wherein the rod is snugly fitted within the tubular sleeve and emplaced securely therein by twisting together the threads of the rod and those of the tubular sleeve; whereby dirt and moisture are prevented from entering the sleeve;
the foot thrusting peg being attached radially to the rod proximate the spike so as to configure it with a proximally attached end and a distal end;
whereby the operator's foot may be brought to bear downward against the foot thrusting peg in such manner as to force the spike into the ground.

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**5,740,626**
**MODIFIED FIREARMS FOR FIRING SIMULATED AMMUNITION**
**Robert C.E. Schuetz, and Brian D. Schuetz, both of Olympia, Wash., assignors to Olympic Arms, Inc., Olympia, Wash.**
**Filed Apr. 3, 1997, Ser. No. 832,497**
**Int. Cl.[6] F41C** *27/00*
**U.S. Cl. 42—106** **6 Claims**



**1**. A handheld firearm for firing simulated ammunition, said firearm comprising a barrel having a cartridge chamber formed at one end thereof, and a pressure safety system adapted for preventing the successful completion of a firing cycle of live ammunition, said safety system comprising a pressure relief port formed through the wall of said chamber and arranged to align with the wall of a live cartridge located in the chamber of said firearm, said port being of sufficient diameter to allow a portion of the wall of a cartridge fired in said chamber to be expelled through said port, and said port communicating with a discharge channel system arranged to divert and disperse gases from a fired cartridge therethrough.



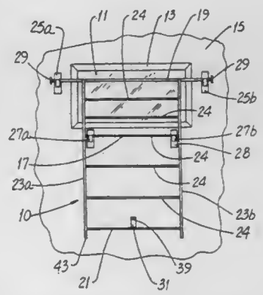
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**5,740,627**
**METHOD AND APPARATUS FOR ENHANCING GROWTH CHARACTERISTICS OF SEEDS USING ION-ELECTRON AVALANCHES**
**William C. Levengood, 4853 Wolf Lake Rd., Grass Lake, Mich. 49240, and John A. Burke, 20 Cyrus Pt. Rd., Bayville, N.Y. 11709**
**Filed Sep. 18, 1996, Ser. No. 715,618**
**Int. Cl.[6] A01C** *1/00;* **A01G** *7/04;* **A01B** *79/00*
**U.S. Cl. 47—1.3** **9 Claims**

**1**. A method for treating a seed to enhance growth characteristics of the seed which comprises:
(a) providing the seed between a pair of spread apart electrodes as an anode and a cathode having a gap between them with seed on or adjacent to the anode;
(b) applying a direct current (DC) voltage to the anode and the cathode using a power supply with an output voltage with an impressed alternating current AC ripple having a frequency up to 220 Hz on the output voltage so as to produce self-organized, or pulsed avalanches of electrons moving from the cathode towards and into the seed between the anode and cathode or on the anode for a period of time which enhances the growth characteristics of the seed; and
(c) storing the seed for a period of time before planting sufficient to provide the seed with the enhanced growth characteristics.

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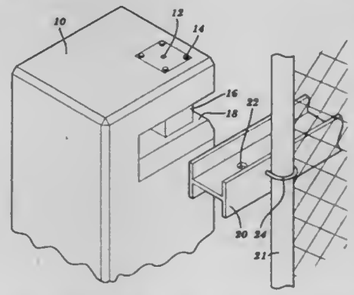
**5,740,628**
**REMOVABLE SECURITY APPARATUS FOR BUILDING OPENINGS**
**Gary L. Almond, 3404 Osborne Blvd., Racine, Wis. 53405**
**Filed Mar. 8, 1996, Ser. No. 611,598**
**Int. Cl.[6] E05B** *65/10*
**U.S. Cl. 49—141** **17 Claims**



**1**. An apparatus preventing ingress through an opening in a building, such apparatus serving as a support to exit the building through the opening, the apparatus including a grille structure removably secured with respect to the opening and having (a) an upper horizontal bar member, (b) at least one lower horizontal bar member, (c) a pair of laterally-disposed vertical members coupled to the horizontal members, and (d) a latch mechanism for limiting movement of the grille structure, the improvement wherein:
the grille structure is secured within the building;
the latch mechanism moves between a first position limiting upward movement of the grille structure with respect to the building and a second position permitting upward removal of the grille structure; and
the latch mechanism is remote from the opening and accessible only from inside the building;
whereby the latch mechanism may be manipulated only from the inside the building.

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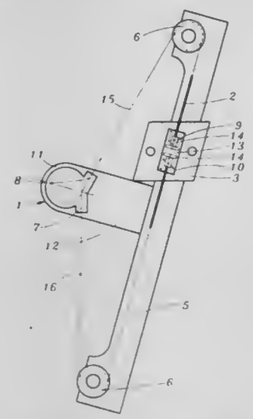
**5,740,629**
**FORTIFIED GATE SYSTEM AND LOCKING DEVICE**
**Kenn C. Fischer, Burnt Hills; Kevin E. Higgins, S. Glens Falls, both of N.Y., and Ronald J. Massa, Bedford, Mass., assignors to The Tymetal Corporation, Clifton Park, N.Y.**
**Filed Jul. 23, 1996, Ser. No. 686,119**
**Int. Cl.[6] E01F** *13/02*
**U.S. Cl. 49—9** **18 Claims**



**1**. A system for automatically fortifying a gate comprising:
a gate having a brace; and
a plurality of anchors including means, movably positioned within each said anchor, for locking said brace to said anchors when said gate is impacted.

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**5,740,630**
**CABLE-DRIVEN WINDOW LIFT**
**Thomas Medebach, Wetzlar-Dudenhofen, Germany, assignor to Kuster & Co. GmbH, Germany**
**PCT No. PCT/EP95/01196, § 371 Date Jan. 24, 1996, § 102(e) Date Jan. 24, 1996, PCT Pub. No. WO95/27116, PCT Pub. Date Oct. 12, 1995**
**PCT Filed Mar. 30, 1995, Ser. No. 553,538**
**Claims priority, application Germany, Mar. 30, 1994, 44 11 194.0**
**Int. Cl.[6] E05F** *11/48*
**U.S. Cl. 49—352** **10 Claims**



**1**. A cable window-lift in particular for motor vehicles and comprising a drive (1) for alternatingly winding and unwinding a

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cable (2) running in at least one loop and divided into a cable lifting portion (15) and a cable descending portion (16) as regards a movement of a pane, further comprising a pane lifter (3) displaceable up and down along a guide (5), a first spring element (9) being present in the cable lifting portion (15) and a second spring element (10) in the cable descending portion (16) to compensate cable slackness, wherein the first spring (9) in the cable lifting portion (15) which is compressed when the pane is being closed evinces a spring force larger than the force of displacement resulting from the pane weight and from the friction of the pane being displaced and also larger than the spring force of the second spring (10) mounted in the cable descending portion (16).

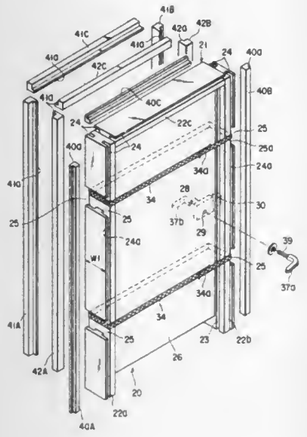
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**5,740,631**

**DOOR APPARATUS AND A METHOD FOR INSTALLING THE SAME IN A DOOR OPENING OF A BUILDING**

**Toshiaki Mori, Yokohama, Japan, assignor to Abe Kogyo Co., Ltd., Tokyo, Japan**

**Filed Sep. 6, 1996, Ser. No. 709,484**
**Int. Cl.[6] E06B *1/00***
**U.S. Cl. 49—380** **8 Claims**



1. A door apparatus attachable to an edge of a door opening, said door apparatus comprising:

a frame structure fixable to the edge of the door opening, said frame structure including first and second vertical frames extending parallel to each other, and an upper frame connecting respective upper ends of the first and second vertical frames, said first and second verical frames each having a transversely continuous groove in corresponding positions on respective outer surfaces thereof;

a door provided inside the frame structure, said door having a first side portion corresponding to the first vertical frame and a second side portion corresponding to the second vertical frame;

a hinge for swingably connecting the first side portion of the door to the first vertical frame;

a lock body having a latch bolt provided on the second side portion of the door;

a strike provided on the second vertical frame and having a latch retaining aperture for releasably receiving the latch bolt when the door is closed; and

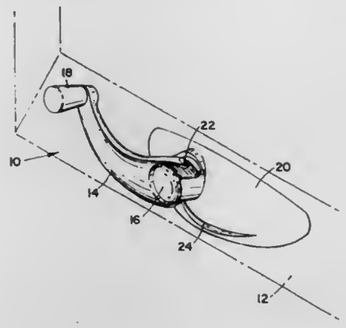
a band passed around and between the first and second vertical frames via the respective transversely continuous grooves thereof with the door closed so that the latch bolt is received in the latch retaining aperture, thereby binding the first and second vertical frames and the door together.

**5,740,632**

**MULTI-POSITION WINDOW OPERATOR HANDLE**

**Steven G. Peterson, Hudson, Wis.; Craig R. Orf, Oakdale, Minn., and Rodney R. Lake, Machesney Park, Ill., assignors to Andersen Corporation, Bayport, Minn.**

**Continuation-in-part of Ser. No. 443,473, May 18, 1995, abandoned. This application May 15, 1996, Ser. No. 648,339**
**Int. Cl.[6] E05B *1/00***
**U.S. Cl. 49—460** **5 Claims**



1. A window operator handle, said handle comprising:

(a) a housing having a generally planar bottom surface for mounting to a window frame having a generally planar mounting surface;

(b) an arm having a central longitudinal axis secured to said housing at a first end with a knob secured to a second end of said arm, said arm having a center point substantially equidistant from said first and second ends,

(c) a pivot means pivotally attaching said arm to said housing, said arm having at least two positions, a first position which extends said knob outwardly from said housing bottom plane, and a second position which extends said knob inwardly toward said housing bottom surface plane whereby said arm is pivoted about said housing and in a plane and pivots through an obtuse angle;

(d) means for locking the arm in one of the first and second positions; and

(e) said arm, is sufficiently curved such that when in the second position the longitudinal axis at said second end is further from said housing bottom surface plane than the longitudinal axis at said arm's center point whereby the knob extends inwardly and is adapted to still not extend into a mounting surface of a window frame.

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**5,740,633**

**SYSTEM FOR AFFIXING A GUTTER SYSTEM**

**Wendel James Champagne, 21823 W. Champagne Cir., Tomball, Tex. 77375**

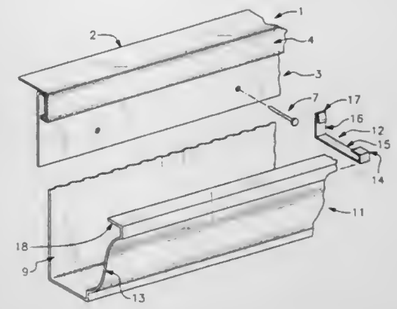
**Filed Nov. 13, 1995, Ser. No. 555,885**
**Int. Cl.[6] E04D *13/06***
**U.S. Cl. 52—11** **8 Claims**

1. An interlocking gutter retaining system for mounting a rain gutter under the eaves of a pitched roof, comprising:

A retainer member affixed to the fascia board of a building for separate mounting under the roofing, said retainer member comprising first, second and third portions, wherein said first and third portions are transverse to each other, and lie along the top and outer face, respectively, of the fascia board, and said second and third portions cooperating to form a downwardly opening channel for receiving and retaining a rear wall of the gutter; and

Engaging means associated with said retainer member to engagingly receive, retain and support the gutter against the fascia board directly under the roofing, said engaging means permitting the gutter to move freely within said channel in a lateral direction but resisting withdrawal of the gutter from said channel.





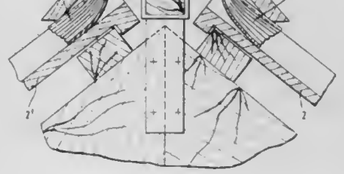
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**5,740,634**

**SEALING STRIP FOR A ROOF RIDGE OR ARRIS COVER**

**Kurt Schade, Wildeshausen, Germany, assignor to Ing. Kurt Schade GmbH & Co., Wildeshausen, Germany**

**Filed Oct. 4, 1996, Ser. No. 726,162**
**Claims priority, application Germany, Oct. 6, 1995, 195 37 266.2**
**Int. Cl.[6] B61D *17/14***
**U.S. Cl. 52—43** **17 Claims**



1. An elongated sealing strip made of a single piece of soft, easily deformable material selected from the group consisting of copper and aluminum for mounting on a roof surface underneath a roof cover cap, and for sealing a roof ridge or arris cover, comprising:

a center strip zone comprising a longitudinally extending middle section and two longitudinally extending side sections integrally formed therewith, each of said two side sections having plurality of holes and being permeable to air for ventilating the roof, and said middle section lacking holes;

two longitudinally extending lateral strip zones, each lateral strip zone being integrally formed with one of said two side sections of said center strip zone and having an underside for contacting the roof surfaces and defining the outer edges of the sealing strip;

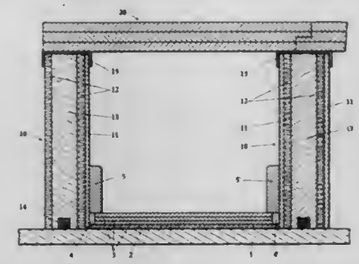
wherein the lateral strip zones are profiled in a pleated-like manner and wherein said pleating is arranged substantially perpendicular to the longitudinal axis of the sealing strip.

**5,740,635**

**ENCLOSURE FIRE-RESISTIVE FOR A PREDETERMINED TIME**

**Maria Desamparados Mateu Gil; Beatriz Mateu Gil, and Lorena Mateu Gil, all of Calle San Vicente, 22, Valencia, Spain**

**Filed Dec. 19, 1996, Ser. No. 771,218**
**Int. Cl.[6] E04B *2/02***
**U.S. Cl. 52—79.1** **10 Claims**



1. An enclosure which is fire resistive for a predetermined period of time comprising:

a floor affixed upon a forging;

walls extending vertically from said floor;

a ceiling connected to said walls, and

doors and windows formed in said walls, said floor and said walls and said ceiling and said doors and said windows being made of fire-resistant materials, said floor constituted by a glass wool felt layer of incombustible material, a platform being affixed onto said glass wool felt layer, said platform being composed of several wooden plates glued one to another, said wooden plates having an expansion joint attached thereon, a wooden skirt board attached to an upper side of said wooden plates and said expansion joint, said expansion joint being sandwiched between said walls and said wooden plates.

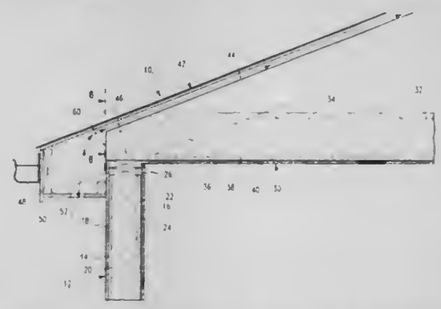
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**5,740,636**

**WEATHER BLOCK AND VENT**

**William L. Archard, P.O. Box 5, New Paltz, N.Y. 12651**

**Filed Apr. 19, 1993, Ser. No. 48,616**
**Int. Cl.[6] E04B *7/00***
**U.S. Cl. 52—94** **6 Claims**



1. In a building having a plate, adjacent beams each resting at their one ends on the plate, a ceiling covering on the underside of the beams, a thermal insulation layer between said beams and having a vapor barrier adjacent said ceiling covering, and a weather block and vent member extending between the bottom portions of the said beams at said plate to block atmospheric air from flowing towards the end of the vapor barrier, wherein the beams are joists and a corresponding set of rafters rest on said plate juxtaposed to the joists, and the weather block and vent member

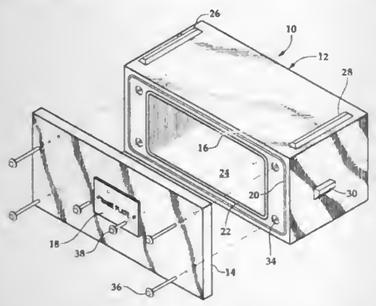
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extends upwards between the rafters to form a trough redirecting blocked air upwards oven the insulation layer, wherein the weather block and vent member trough is formed by a horizontal-in-crosssection portion having raised sides bent upwardly along side score lines and extending along the sides of the adjacent rafters and which raised sides have laterally outward directed portions which are secured to the upper surfaces of the rafters.

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**5,740,637**
**CREMATION NICHE**
**William L. Snow, 702 Fern St., Anna Maria, Fla. 34216**
**Filed Apr. 5, 1996, Ser. No. 628,461**
**Int. Cl.[6] E04H** *13/00*
**U.S. Cl. 52—136** **2 Claims**

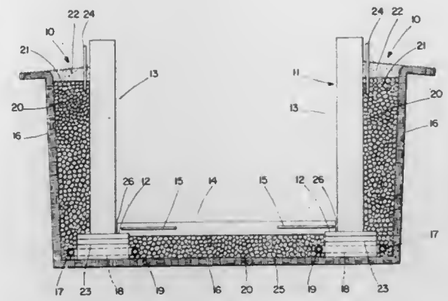


1. A cremation niche for storing cremation remains comprising:
a concrete masonry block as a single unit having an uninterrupted cross section which includes rectangular sides, top, bottom and back panels and an opening formed in a rectangular front surface thereof, said opening providing access into a hollow cavity substantially horizontally disposed within said concrete block;
a rigid rectangular decorative face block covering said opening and substantially mating with said front surface of said concrete block;
means connecting said face block against and substantially aligned with, said front surface after the cremation remains are placed into said cavity;
sealing means sealing said cavity against said front surface;
said concrete block having material consistency and overall outside dimensions substantially equal to those of a conventional concrete building block; and
a spacer tab extending outwardly from said top or bottom panel and one said side panel and sized to space each said cremation niche apart from next above and adjacent cremation niches, respectively, when a plurality of said cremation niches are arranged to form an upright wall.

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**5,740,638**
**COMBINATION DRAINAGE SYSTEM AND RADON GAS VENTING SYSTEM FOR A STRUCTURE FOUNDATION**
**Allen S. Shepherd, III, Plain City, Ohio, assignor to Shepherd Excavating, Inc., Dublin, Ohio**
**Filed Feb. 21, 1997, Ser. No. 804,711**
**Int. Cl.[6] E02D** *1/92*
**U.S. Cl. 52—169.5** **12 Claims**

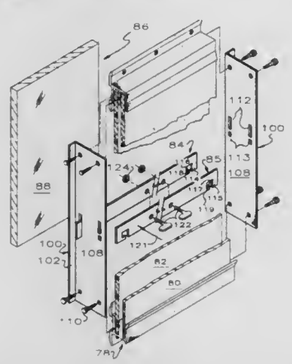
1. A combination drainage system and radon gas venting system comprising:
a structure foundation comprising foundation walls each having a base and an interior and exterior side, and connected by a concrete floor adjacent the base of said foundation walls;
a trench having a bottom lower than said concrete floor and adjacent the exterior of said foundation walls;
drain tile in said trench and under said concrete floor;



vents having intakes under said concrete floor and exhausting into said trench; and
solid rubber particle fill under said concrete floor, solid rubber particle fill up to a level in said trench and covering said drain tile and said vents connected to said trench; and
vents having intakes positioned below the level of said solid rubber particle fill in said trench and exhausting to the atmosphere.

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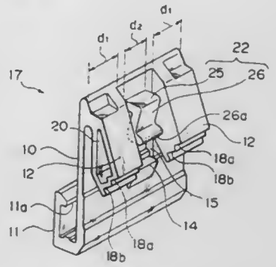
**5,740,639**
**DOUBLE PANEL STORM SHUTTER INSTALLATION WITH BRACE**
**James B. Covington, 3595 Lighthouse Dr., Palm Beach Gardens, Fla. 33410**
**Filed Oct. 4, 1996, Ser. No. 725,500**
**Int. Cl.[6] E06B** *9/02*
**U.S. Cl. 52—202** **19 Claims**



1. A storm shutter for protecting an opening in a building, comprising
first and second supports for attachment to the building on opposite sides of the opening, the first and second supports each comprising
at least one panel receiving channel, the at least one channel of the first support and the at least one channel of the second support defining a plane for receiving a first planar protective panel, and
means for securing the supports to the building;
first and second planar protective panels, at least one of the panels being for receipt in the at least one channel; and
means for clamping the first and second panels together comprising a bar, means for mounting the bar on the building and means for binding the panels to the bar.



**5,740,640**
**CLIP FOR DOOR MOLDING**
**Mitsuhiro Yasuda, Kanagawa-ken, Japan, assignor to Nifco Inc., Yokohama, Japan**
**Continuation of Ser. No. 449,812, May 24, 1995. This application Jan. 9, 1997, Ser. No. 780,892**
**Claims priority, application Japan, Sep. 6, 1994, 6-212482**
**Int. Cl.[6] E06B** *7/16*
**U.S. Cl. 52—204.597** **11 Claims**

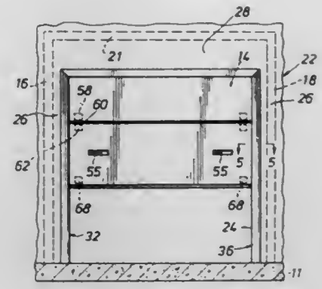


1. A clip for attaching a door molding to a periphery of a door panel, the clip comprising:
a generally planar body portion having first and second opposing sides and first and second opposing edges;
an inner engagement piece extending from said first edge of said planar body portion on said first side, said inner engagement piece and said planar body portion defining a groove portion;
a pair of spaced apart outer engagement pieces extending from said second edge of said planar body portion on said second side, each outer engagement piece comprising:
a first surface portion extending from said second edge;
a second surface portion extending from generally the same location as said first surface portion and at an angle relative to said first surface portion such that respective distal ends of said first and second surface portions are spaced apart from one another; and
a connecting surface portion extending between said respective distal ends of said first and second surface portions, whereby the outer engagement pieces simultaneously engage both the door molding and the door panel; and
an intermediate engagement piece located between said pair of outer engagement pieces and extending from said second edge on the same side as said pair of outer engagement pieces.

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**5,740,641**
**SELF STORAGE FACILITY HAVING INSULATED STORAGE ROOMS**
**Henry J. Oxnard, Spring, Tex., assignor to Adeline Investment Properties, L.L.P., Houston, Tex.**
**Filed Apr. 1, 1997, Ser. No. 831,732**
**Int. Cl.[6] E04B** *1/348*; **E06B** *7/08*
**U.S. Cl. 52—234** **10 Claims**

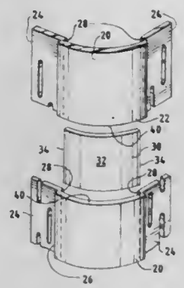
1. A self storage warehouse facility having a plurality of insulated self storage rooms, each of said insulated storage rooms comprising:
a floor;
an exterior front wall;
a pair of side walls and a rear end wall connecting said pair of side walls;
a rectangular exterior door opening in said exterior front wall to provide direct access to the area outside the warehouse;
an insulated foldable door mounted within said door opening for movement between open and closed positions relative to said door opening; said insulated door being of a width to permit access for a vehicle;
said insulated door having a plurality of connected partitions including upper, lower, and intermediate partitions pivotally connected to each other, each partition formed of an inner layer of insulating and having guide rollers extending laterally outwardly;



a pair of parallel tracks mounted along said side walls and receiving said guide rollers for guiding said door between open and closed positions;
a sealing strip mounted along the upper edge and parallel side edges of said door opening; said sealing strip engaging said insulated door in sealing relation in the closed position of said door;
said lower partition having an elastomeric bottom seal thereon for engaging and sealing against said floor in the closed position of said door;
a cool air duct in fluid communication with each of said insulated storage rooms;
a damper positioned in said cool air duct movable between open and closed positions to vary the amount of cool air supplied to an associated storage room; and
solenoid operated control means for said damper responsive to opening of said insulated door to close said damper and responsive to closing of said insulated door to open said damper.

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**5,740,642**
**DRYWALL CORNER-TRIMMING ASSEMBLY RESISTING BUTT-EDGE SEPARATION**
**Joseph M. Koenig, Jr., Lincolnwood; Leopold Budzik, and Mark Budzik, both of Niles, all of Ill., assignors to Trim-Tex, Inc., Lincolnwood, Ill.**
**Filed Mar. 1, 1996, Ser. No. 609,848**
**Int. Cl.[6] E04B** *2/72*
**U.S. Cl. 52—255** **8 Claims**



1. A drywall corner-trimming assembly comprising two corner-trimming members approximating each other at one end of each of the members and comprising a separate splice, each member having a central portion and two flanged portions with the central portion having a generally arcuate profile defining a concave surface and a convex surface and with each flanged portion extending from one of the lateral edges of the central portion at a step

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defining a lateral limit of the concave surface of the central portion, the splice having two expansive surfaces and two lateral edges, wherein the members and the splice are assembled so that the splice straddles said members, so that one said expansive surface of the splice is convex and the other expansive surface of the splice is concave, so that a portion of the convex surface of the splice faces the concave surface of the central portion of each of the members, and so that the splice is stressed into a generally arcuate profile between the steps, at the lateral edges of the splice, with each of the lateral edges of the splice pressed firmly against the step at one of the lateral edges of the central portion of each of said members, whereby the splice resists butt-edge separation of said members.

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**5,740,643**

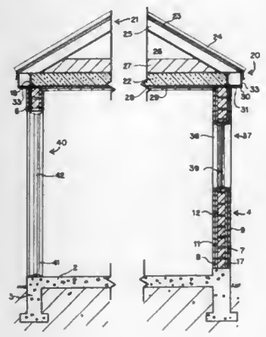
**FIREPROOF BUILDING**

**Henry Huntley, 1838 Leisure La., Meridian, Id. 83642**

**Filed Aug. 24, 1995, Ser. No. 519,411**

**Int. Cl.[6] E04B** *1/94*

**U.S. Cl. 52—265** **5 Claims**



1. A fireproof and hurricane proof building comprising:

a. a concrete floor, said floor having a downwardly extending concrete foundation integral with said floor;

b. an upwardly extending wall assembly having a top end and a bottom end, said bottom end being fixedly connected to said concrete floor, said wall assembly further comprising:

(1) a reinforced cinder block wall having an inside face and an outside face;

(2) foam faced with mesh, the foam and mesh fixedly connected to said outside face of said block wall:

(3) stucco fixedly attached to said mesh;

(4) a fireproof coating attached to said stucco:

(5) a first metal lath attached to said inside face of said block wall; and

(6) fire retardant plaster connected to said first metal lath:

c. a roof assembly attached to said top end of said wall assembly;

d. an interior wall comprising:

(1) a plurality of elongated steel studs, at least one of said plurality of studs fixedly connected to said inside face of said block wall, said plurality of studs being fixedly connected to and upwardly extending from said concrete floor, each of said studs further having a top stud end and a bottom stud end and a surface;

(2) a second metal lath fixedly attached to said surface of each of said studs; and

(3) fire retardant plaster fixedly attached to said second lath.

**5,740,644**

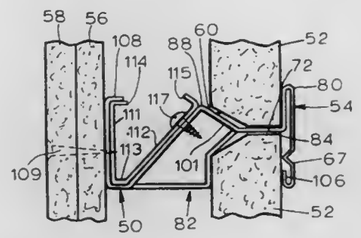
**WALL WITH HORIZONTAL METAL STUD AND REINFORCEMENT CHANNEL THEREFOR**

**Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Charlotte, N.C.**

**Continuation of Ser. No. 415,547, Apr. 3, 1995, abandoned, which is a continuation-in-part of Ser. No. 385,673, Feb. 8, 1995. This application Jan. 28, 1997, Ser. No. 790,682**

**Int. Cl.[6] E04B** *2/30*

**U.S. Cl. 52—281** **9 Claims**



1. A reinforced elongated metal stud comprising, in cross section, inner and outer flanges, each of said flanges having upper and lower edges and said flanges being substantially parallel and spaced apart; a web extending between and integrally formed with said flanges; said web including a diagonal portion connected to said lower edge of said outer flange and extending at an angle upwardly and toward said inner flange; said outer flange including a stud leg formed on said upper edge thereof and extending toward said inner flange; said outer flange, said diagonal portion and said stud leg forming a partially enclosed space; and a reinforcement channel positioned within said partially enclosed space, said channel comprising a vertical flange engaging said outer flange, a slanted flange engaging said diagonal portion, and a channel leg engaging said stud leg, said vertical flange, said slanted flange and said channel leg fitting snugly against said outer flange, said diagonal portion and said stud leg, respectively.

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**5,740,645**

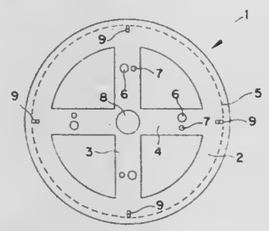
**J-BOLT FORM**

**David Michael Raby, 8202 Briargate, San Antonio, Tex. 78230-5006**

**Filed Jan. 8, 1997, Ser. No. 780,586**

**Int. Cl.[6] E02D** *27/00*

**U.S. Cl. 52—297** **3 Claims**



1. A support for attaching J-bolts to a concrete base for a light pole, said support comprising:

a base plate having an outer dimension and an inner dimension, and a top and a bottom surface,

at least two cross members extending from a center of said base plate to said inner dimension,

said cross members having a plurality of apertures therethrough,

said base plate having a central aperture extending therethrough,

said base plate having a recess in said bottom surface formed by a wall projecting downward from said base plate,



said base plate having a plurality of projections on said top surface.

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**5,740,646**

**GLASS BRICK WALL**

**Randolf Andrew Wirkus, and Michelle Ann Wirkus, both of 32 Norm Street, Kenmore, Queensland, 4069, Australia**

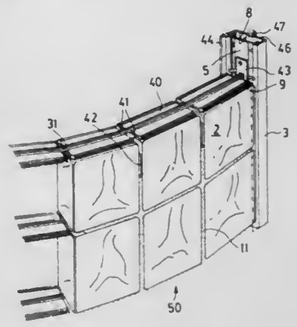
**PCT No. PCT/AU94/00472, § 371 Date Feb. 13, 1996, § 102(e) Date Feb. 13, 1996, PCT Pub. No. WO95/05510, PCT Pub. Date Feb. 23, 1995**

**PCT Filed Aug. 15, 1994, Ser. No. 591,561**

**Claims priority, application Australia, Aug. 13, 1993, PM 0556; Oct. 28, 1993, PM 2105; Nov. 17, 1993, PM 2484; Dec. 6, 1993, PM 2827; Jun. 21, 1994, PM 6385**

**Int. Cl.[6] E04B** *5/46;* **E04C** *1/42*

**U.S. Cl. 52—308** **28 Claims**



13. A glass brick wall having at least one separation strip and a vertical frame member with a plurality of vertically spaced horizontal slots, wherein each glass brick is made from edge welded together dish-like sections having a weld bead extending around the brick in a shallow recessed side wall thereof, each separation strip being self locating in adjacent recesses of adjacent horizontal runs of bricks, each separation strip having transversely spaced pairs of back-to-back channels for holding jointing paste and opposed relatively thick longitudinally extending marginal edge portions adjacent the channels and there being provided at the juncture between the channels and the marginal edge portions, recess register means adapted to project into the glass brick recess to automatically locate the separation strip, each pair of back-to-back channels sharing a relatively thin wall and the separation strip having a relatively thick central medial portion located over the weld bead, and at least one end of a separation strip projecting into a respective horizontal slot in said frame member.

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**5,740,647**

**BULIT-UP ROOF (BUR) OR MODIFIED ROOF ASSEMBLY SYSTEM**

**Thomas L. Kelly, 31 Sands St., Waterbury, Conn. 06710**

**Filed Jun. 1, 1995, Ser. No. 460,404**

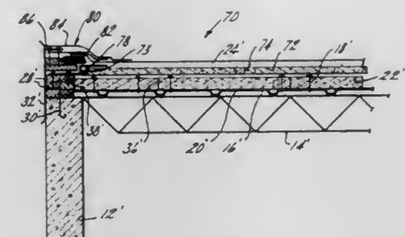
**Int. Cl.[6] E04B** *7/00*

**U.S. Cl. 52—408** **39 Claims**

1. A roof assembly comprising:

a) a roof substrate;

b) a layer of loose laid mass-weighted material resting on and unsecured to said roof substrate to allow relative movement between said material and said substrate; and



c) a roof waterproofing construction upwardly adjacent and at least partially affixed to said layer of mass-weighted material.

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**5,740,648**

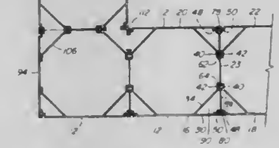
**MODULAR FORMWORK FOR CONCRETE**

**Francesco Piccone, 5076 Connaught Drive, Vancouver, Canada, V6M 3G1**

**Filed May 14, 1996, Ser. No. 648,210**

**Int. Cl.[6] E04B** *2/26;* **F04B** *2/32*

**U.S. Cl. 52—426** **9 Claims**



1. A modular formwork assembly for casting concrete to form vertical structures, comprising:

an elongated element having a surface extending from one longitudinal edge of the element to the opposite longitudinal edge of the element so as to define a generally concave cross section, said surface having a generally planar middle portion, and said element further comprising two extensions which extend laterally outward from said middle portion and which are co-planar with said middle portion, wherein the longitudinal edges and the edges of the extensions are provided with means for releasably interconnecting the element with a connecting member, said interconnecting means extending substantially along the length of the element;

an elongated connecting member comprising an elongated wall defined between a first and an opposite longitudinal edges of the member, a central portion defined between a first and an opposite inner longitudinal section lines of the member, two outer portions each of which is defined between a longitudinal edge and an inner longitudinal section line of the member, and wherein each of the longitudinal edges and inner longitudinal section lines of the member is provided with engaging means for engaging said interconnecting means, said engaging means adapted to cooperate in longitudinal sliding engagement with the interconnecting means of each of a pair of said elements when said elements are presented in edge to edge relationship for connection about opposing sides of the interconnecting means of the member;

whereby the connecting member is engaged simultaneously by each of a first pair of said elements presented in edge to edge

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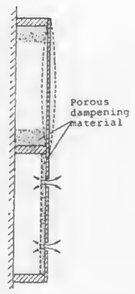
relationship about one outer portion of the member and each of a second pair of said elements presented in edge to edge relationship about the opposite outer portion of the member.

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**5,740,649**
**FALSE CEILING**

**Helmut Fuchs, Weil im Schönbuch, and Dietmar Eckoldt, Deufringen, both of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V., Munich, Germany**

**PCT No. PCT/EP94/01277, § 371 Date Oct. 19, 1995, § 102(e) Date Oct. 19, 1995, PCT Pub. No. WO94/24382, PCT Pub. Date Oct. 27, 1994**
**PCT Filed Apr. 20, 1994, Ser. No. 537,674**
**Claims priority, application Germany, Apr. 20, 1993, 43 12 885.8**
**Int. Cl.[6] E04B *2/00***
**U.S. Cl. 52—506.06** **11 Claims**




1. A false ceiling for rooms in buildings, which is designed to absorb soundwaves, comprising a perforated panel having sufficient construction so that sound waves in the building do not excite vibrations in the panel and having a multiplicity of holes having a diameter d of 0.2–3 mm and a hole to surface portion of less than 4%, and suspensions or subconstructions for attaching the perforated panel to the buildings, wherein air in said holes forming with air in hollow spaces situated thereabove a spring-mass system and wherein additional porous or fibrous damping material is not included.

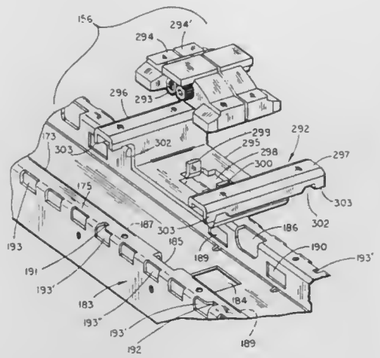
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**5,740,650**
**PARTITION SYSTEM**

**Charles A. Seiber, Palo Alto, Calif.; Benjamin G. Shaw, London, England; Christopher O. Lada, Palo Alto; Phillip M. Hobson, Los Altos, both of Calif.; Robert P. Poppe; David A. Shipman, both of Grand Rapids, Mich.; Robert J. Luchetti, Cambridge; Gregg R. Draudt, Watertown, both of Mass.; James B. Eldon, III, Barto, and David D. McClanahan, Harleysville, both of Pa., assignors to Steelcase Inc., Grand Rapids, Mich.**

**Continuation-in-part of Ser. No. 367,802, Dec. 30, 1994. This application Dec. 26, 1995, Ser. No. 578,089**
**Int. Cl.[6] E04B *2/78***
**U.S. Cl. 52—584.1** **25 Claims**

22. A connection system comprising:
top and bottom partition panels arranged in a stacked arrangement, the bottom partition panel including a top frame member and the top partition panel including a bottom frame member juxtaposed above the top frame member when in the stacked arrangement;
one of the top and bottom frame members including a recess; and
the other of the top and bottom frame members including a stacking connector, the stacking connector including opposing



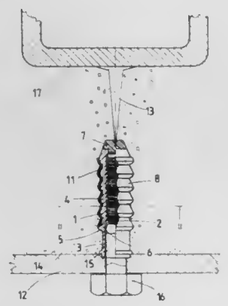

clamping members movable in forwardly and rearwardly directions and a shaft configured to move the clamping members between a collapsed assembly-permitting position wherein the top partition panel can be positioned on the bottom partition panel, and an expanded interlocked position wherein the clamping members engage the recess to secure the top partition panel to the bottom partition panel.

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**5,740,651**
**ANCHORING SLEEVE**

**Gérard Lucien Vanotti, Saint-Paul-de-Varax, France, assignor to Vape Rail International S.A., France**

**PCT No. PCT/IB95/00186, § 371 Date Nov. 13, 1996, § 102(e) Date Nov. 13, 1996, PCT Pub. No. WO95/25900, PCT Pub. Date Sep. 28, 1995**
**PCT Filed Mar. 17, 1995, Ser. No. 716,166**
**Claims priority, application France, Mar. 18, 1994, 94 03223; Spain, Nov. 22, 1994, 9402985**
**Int. Cl.[6] F16B *13/06;13/12***
**U.S. Cl. 52—698** **10 Claims**



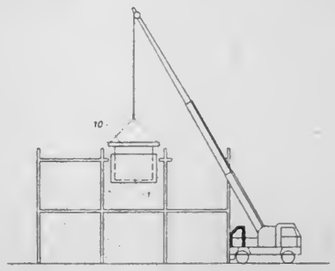

1. Anchoring sleeve intended to receive a screw in a concrete building element, the sleeve comprising a tubular body (**1**) having ends and being closed at one of said ends and made of synthetic material which on the inside has a screw thread (**2**) and, on the outside, has peripheral anchorage ahd load-spreading bosses (**4**) and two longitudinal ribs (**10**), said body being surrounded by a metal shell (**8**) consisting of two half-shells (**8***a*, **8***b*) fixed to the longitudinal ribs of the body made of synthetic material, characterized in that the metal shell (**8**) stretches only over part of the body (**1**) made of synthetic material so as to leave at least the closed end of this body free, and in that the said closed end is able to be destroyed.



**5,740,652**
**METHOD OF INSTALLING SEISMIS DAMPING WALL**

**Katsufumi Inoue, Fujieda; Mitsuo Miyazaki; Masami Nomori, both of Tokyo, and Fumiaki Arima, Oyama, all of Japan, assignors to Sumitomo Construction Co., Ltd., Tokyo, Japan**

**Filed Jun. 13, 1996, Ser. No. 664,151**
**Int. Cl.[6] E04B *1/98***
**U.S. Cl. 52—745.1** **6 Claims**




1. A method of installing a seismic wall filled with damping fluid in a building structure, said method comprising:
mounting the seismic wall on a structural beam to be used in the building structure prior to filling the seismic wall with the damping fluid,
thereafter, mounting the structural beam in the building structure, and
thereafter, filling the seismic wall with the damping fluid.

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**5,740,653**
**METHOD FOR GROUTING TILE**

**Leonid Dubizhansky, 8515 Chloe Ave. #208, San Diego, Calif. 92175, assignor to Leonid Dubizhansky, San Diego, Calif.**

**Filed Apr. 10, 1996, Ser. No. 631,619**
**Int. Cl.[6] E04F *15/022***
**U.S. Cl. 52—747.11** **20 Claims**

1. A method for forming grout joints in a tiled area having a plurality of tiles installed on a subsurface, each tile of said plurality of tiles having a top surface, a plurality of side surfaces, and a plurality of spaces with one space adjacent each side surface of said plurality of side surfaces, said method comprising:
applying a flexible protective coat on each of said plurality of tiles, said flexible protective coat having an edge extending beyond said top surface;
pouring a grouting material into said plurality of spaces and onto at least a portion of said edge of said flexible protective coat;
removing said flexible protective coat from said top surface of each said tile; and
shaping said grouting material within said plurality of spaces to form said grout joints.

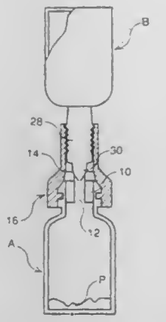
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**5,740,654**
**PACKAGING ASSEMBLY FOR FREEZE-DRIED PREPARATIONS**

**Charles Manni, Monaco, Monaco, and Jean-Pierre Augier, Nice, France, assignors to Semco, Monaco, Monaco**

**Filed Apr. 12, 1996, Ser. No. 632,525**
**Int. Cl.[6] B65B *3/04***
**U.S. Cl. 53—242** **6 Claims**

1. A stopper for insertion in a flask that holds a freeze-dried product comprising:
a top part sized to prevent the top part from being inserted in a neck of a flask that holds a freeze-dried material;
an engagement part that abuts the top part and which is sized to allow it to fit tightly inside the neck of the flask when the stopper is fully inserted in the flask;



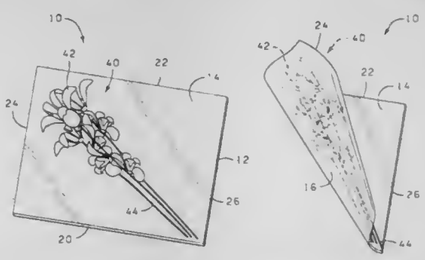

a middle part that abuts the engagement part mad which includes a bottom surface that forms an end of the stopper;
at least one stop positioned on the middle part, the stop being sized to remain outside of the flask when the middle part of the stopper is inserted in the flask up to the stop, but which will fit inside the flask when sufficient force is applied to the stopper;
a central passageway which extends through the stopper from the top part to the bottom surface to provide a passageway through which a liquid can enter and exit the flask;
at least one lateral recess formed by the middle part, the lateral recess comprising a passageway that extends along an outside edge of the middle part from the bottom surface up to the engagement part, the passageway providing a space through which a gas can escape from the flask when the middle part of the stopper is inserted in the flask but the engagement part is not; and
at least one horizontal aperture which connects at least one lateral recess with the central passageway so that a liquid can flow between the lateral recess and the central passageway.

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**5,740,655**
**METHOD OF WRAPPING A FLORAL GROUPING**

**Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., Oklahoma City, Okla.**

**Continuation-in-part of Ser. No. 439,024, May 11, 1995, Pat. No. 5,651,232, which is a continuation-in-part of Ser. No. 923,202, Oct. 13, 1992, Pat. No. 5,596,862. This application May 28, 1997, Ser. No. 864,395**
**Int. Cl.[6] B65B *11/00***
**U.S. Cl. 53—397** **27 Claims**




1. A method of wrapping a floral grouping comprising the steps of:
providing a floral grouping comprising a bloom portion;
providing a flexible bilayered sheet of material comprising a waxy layer and a support layer, the waxy layer constructed from a sheet of waxy material and superposed upon a first surface of the support layer and connected thereto, and wherein the bilayered sheet of material, when wrapped about

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the floral grouping, is less compressible about the floral grouping than a wrapper formed from the sheet of waxy material alone; and

placing the bilayered sheet of material about the floral grouping such that the waxy layer is positioned adjacent the bloom portion forming a wrapper which substantially encompasses the bloom portion, the wrapper having an upper end and a lower end.

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**5,740,656**

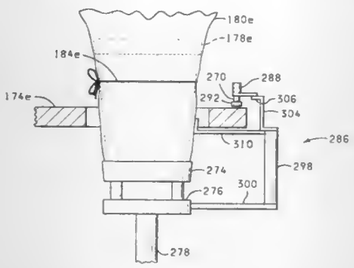
## SINGLE STATION COVERING AND FASTENING SYSTEM

**Donald E. Weder; Joseph G. Straeter, both of Highland, Ill., and Paul Fantz, Imperial, Mo., assignors to Southpac Trust International, Inc.**

**Continuation of Ser. No. 462,342, Jun. 5, 1995, Pat. No. 5,636,502, which is a continuation of Ser. No. 252,876, Jun. 2, 1994, Pat. No. 5,609,009, which is a continuation-in-part of Ser. No. 88,692, Jul. 7, 1993, Pat. No. 5,481,850, which is a continuation-in-part of Ser. No. 819,311, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned, said Ser. No. 252,876 is a continuation-in-part of Ser. No. 88,976, Jul. 8, 1993, Pat. No. 5,450,707, and Ser. No. 979,389, Nov. 19, 1992, abandoned, which is a continuation of Ser. No. 823,096, Feb. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned. This application Feb. 5, 1997, Ser. No. 796,099**

**Int. Cl.[6] B65B** *11/00;51/08*

**U.S. Cl. 53—399** **24 Claims**




1. A method for fastening a cover about a flower pot having an open upper end, a lower end and an outer peripheral surface such that the open upper end of the flower pot remains substantially uncovered, comprising:

providing a platform having an opening extending therethrough, the opening having a cover forming member disposed therein, the cover forming member having contacting portions and adapted to receive at least a portion of the flower pot;

providing a sheet of material;

placing the sheet of material in a cover forming position on the platform wherein a portion of the sheet of material is disposed over the opening in the platform and over the cover forming member;

providing the flower pot;

positioning the flower pot over the portion of the sheet of material disposed over the opening in the platform and the cover forming member;

moving the flower pot such that the lower end of the flower pot engages a portion of the sheet of material whereby, upon movement of the flower pot and the sheet of material through the opening in the platform and into the cover forming member, the contacting portions of the cover forming member press the sheet of material about the outer peripheral surface of the flower pot and thereby form the sheet of material into a cover extending about at least a portion of the outer peripheral surface of the flower pot will maintaining the open upper end of the flower pot substantially uncovered;

automatically applying a fastener about a portion of the cover for fastening the cover about the flower pot; and

removing the flower pot having the cover fastened about at least a portion of the outer peripheral surface thereof from the platform.

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**5,740,657**

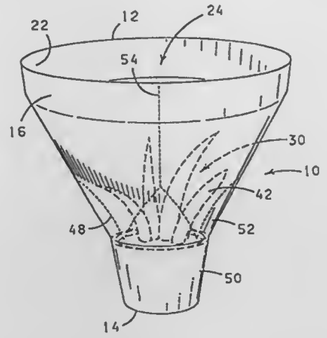
## METHOD FOR FORMING A DECORATIVE COVER ABOUT A FLOWER POT

**Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., Oklahoma City, Okla.**

**Continuation of Ser. No. 459,923, Jun. 2, 1995, Pat. No. 5,615,535, which is a continuation of Ser. No. 237,078, May 3, 1994, Pat. No. 5,625,979, which is a continuation-in-part of Ser. No. 220,852, Mar. 31, 1994, Pat. No. 5,572,851, and Ser. No. 940,930, Sep. 4, 1992, Pat. No. 5,361,482. This application Jan. 2, 1997, Ser. No. 778,401**

**Int. Cl.[6] A01G** *9/02;* **B65B** *25/02;* **B65D** *85/52*

**U.S. Cl. 53—412** **40 Claims**




1. A method of wrapping a potted plant, comprising:

providing a potted plant comprising a floral grouping disposed in a pot means, the pot means having a lower end, an upper rim and an outer peripheral surface;

providing a sleeve comprising:

a base having an upper end, a lower end, an inner peripheral surface and an outer peripheral surface, the base having a flattened state wherein the base is tapered from the upper end to the lower end in the flattened state of the base and is openable from the flattened state to an opened position wherein the inner surface of the base defines and encompasses an inner retaining space, an opening being formed through the upper end of the base in communication with the inner retaining space, the base sized and tapered to fit the outer peripheral surface of the pot means and having a portion in the lower end inwardly folded to form a gusset which is unfoldable for forming a closed bottom of the base in the opened position of the base, and

an upper portion connected to the upper end of the base along a non-linear line of perforations and having means in the upper portion for supporting the sleeve from wicket means;

opening the base into the opened position thereby exposing the inner retaining space of the base thereby providing a base tapered for fitting the pot means;

disposing the potted plant in the inner retaining space of the base of the sleeve with the lower end of the pot means positioned upon the closed bottom of the base and with the base covering at least a portion of the outer peripheral surface of the pot means to provide the decorative cover for the potted plant; and

separating the base of the sleeve from the upper portion by tearing along the line of perforations forming a non-linear edge along the upper end of the base.



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**5,740,658**

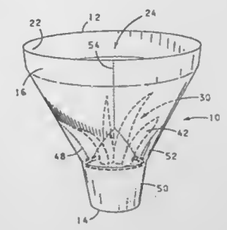
## METHOD FOR FORMING A DECORATIVE COVER ABOUT A FLOWER POT

**Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., Oklahoma City, Okla.**

**Continuation of Ser. No. 460,180, Jun. 2, 1995, Pat. No. 5,617,703, which is a continuation of Ser. No. 237,078, May 3, 1994, Pat. No. 5,625,979, which is a continuation-in-part of Ser. No. 220,852, Mar. 31, 1994, Pat. No. 5,572,851, and Ser. No. 940,930, Sep. 4, 1992, Pat. No. 5,361,482. This application Jan. 2, 1997, Ser. No. 775,516**

**Int. Cl.[6] A01G** *9/02;* **B65B** *25/02;* **B65D** *85/52*

**U.S. Cl. 53—413** **33 Claims**




1. A method of wrapping a potted plant, comprising:

providing a potted plant comprising a floral grouping disposed in a pot means, the pot means having a lower end, an upper rim and an outer peripheral surface;

providing a sleeve comprising:

a base having an upper end, a lower end, an inner peripheral surface and an outer peripheral surface, the base having a flattened state wherein the base is tapered from the upper end to the lower end in the flattened state of the base and is openable from the flattened state to an opened position wherein the inner surface of the base defines and encompasses an inner retaining space, an opening being formed through the upper end of the base in communication with the inner retaining space, the base sized and tapered to fit the outer peripheral surface of the pot means and having a closed bottom in the base and the base having a non-linear edge in the upper end thereof and wherein the sleeve is free of an upper portion extending upwardly from the non-linear edge of the upper end;

opening the base into the opened position thereby exposing the inner retaining space of the base thereby providing a base sized and tapered for fitting the pot means; and

disposing the potted plant in the inner retaining space of the base of the sleeve with the lower end of the pot means positioned upon the closed bottom of the base and with the base covering at least a portion of the outer peripheral surface of the pot means to provide the decorative cover for the potted plant.

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**5,740,659**

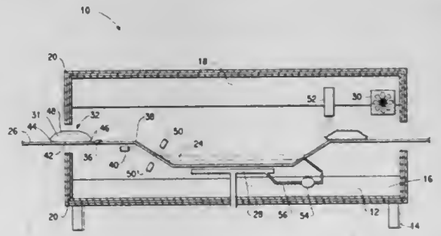
## SHRINK TUNNEL AND METHODS RELATING THERETO

**John Farrell Cox, Drexel Hill; Frederick Henry Fiesser, Furlong; Robert Vincent Jeral, Philadelphia, all of Pa.; Donald Earl Erlston, Jr., Riverside, and Richard Alan Hansen, Mt. Holly, both of N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Sep. 29, 1995, Ser. No. 537,188**

**Int. Cl.[6] B65B** *53/02*

**U.S. Cl. 53—442** **10 Claims**




8. A continuous, in-line process for heat shrinking a shrink film around an article having a front edge and a rear edge and a bottom surface comprising:

moving the article wrapped with shrink film toward an apex,

pivoting the article wrapped with shrink film over the apex,

heating only an underside portion of the bottom surface of the article, the bottom surface portion being a distance from the front edge of the article of from about one tenth to about nine tenths of a package length, the package length being defined as the distance between the front edge and the rear edge of the bottom surface of the article, said heating of the underside portion occurring as the article pivots over the apex, and

thereafter moving the article into and through a heated liquid bath.

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**5,740,660**

## METHOD AND APPARATUS FOR FORMING SOFT GELATIN CAPSULES CONTAINING PARTICULATE MATERIAL

**Dennis Rowe, Wootton Bassett, United Kingdom, assignor to R.P. Scherer Corporation, Troy, Mich.**

**PCT No. PCT/GB94/02774, § 371 Date May 20, 1996, § 102(e) Date May 20, 1996, PCT Pub. No. WO95/17153, PCT Pub. Date Jun. 29, 1995**

**PCT Filed Dec. 20, 1994, Ser. No. 454,124**

**Claims priority, application United Kingdom, Dec. 20, 1993, 9325965**

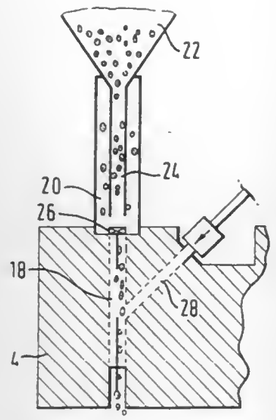
**Int. Cl.[6] B65B** *1/02;1/38;9/04;37/06*

**U.S. Cl. 53—454** **14 Claims**

1. Apparatus for producing soft gelatin capsules containing a fill material, comprising two cylindrical rollers mounted with their longitudinal axes substantially parallel and defining a nip therebetween, with at least one roller having a plurality of recesses on its outer surface; and means for feeding gelatin ribbon to each roller surface and thereby to the nip; a metering system disposed in a wedge mounted at the entrance to the nip, for delivering particulate material between gelatin ribbons at the nip, the wedge defining a conduit extending from the nip to a reservoir for the particulate material, and a passage coupled to an intermediate section of the conduit, the apparatus including means for selectively delivering pressurized air along the passage, and down the conduit towards the nip between the gelatin ribbons to force ribbon into the recesses; and means for rotating the rollers in synchronism with the metering system such that particulate material is supplied over a

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recess in said at least one roller, and the juxtaposed ribbon sections close over the particulate material to form a capsule.

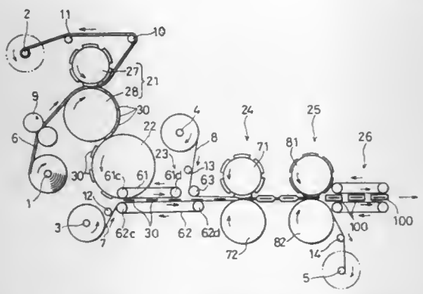
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**5,740,661**

## METHOD AND APPARATUS OF PRODUCING SHEET WRAPPING BODY

**Takayuki Yamaguchi, Niihama; Takanori Kume, Ichihara; Yasuhiro Kayano, and Tomio Higuchi, both of Niigata, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, and Sanjo Machine Works Ltd., Niigata, both of Japan**

**Filed May 22, 1996, Ser. No. 651,612**
**Claims priority, application Japan, May 23, 1995, 7-124109**
**Int. Cl.[6] B65B** *9/02*
**U.S. Cl. 53—553** **8 Claims**




1. A sheet wrapping body producing apparatus comprising:
a supply unit of a sheet material subject to wrapping;
a first cut unit;
a transportation unit;
a bottom coating material supply unit;
a top coating material supply unit;
a seal unit; and
a second cut unit,
wherein,
said supply unit of a sheet material subject to wrapping supplies a strip of a sheet material subject to wrapping to said first cut unit;
said first cut unit cuts out sheet tips subject to wrapping from said strip of the sheet material subject to wrapping using a first pair of rotating roller,
said transportation unit transports said sheet tips subject to wrapping made by said first cut unit onto a bottom coating material while holding each said sheet tip subject to wrapping not to cause misalignment,
said bottom coating material supply unit supplies a strip of said bottom coating material onto a transportation surface of said transportation unit, and transports said bottom coating material to a farther position by way of said seal unit and said second cut unit,
said top coating material supply unit supplies a strip of a top coating material onto said sheet tips subject to wrapping placed on said bottom coating material, and transports said top coating material to a farther position by way of said seal unit and said second cut unit,
said seal unit is provided in a stage following said transportation unit, and seals said top coating material and said bottom coating material to wrap up said sheet tips subject to wrapping individually using a second pair of rotating rollers, and
said second cut unit cuts said top coating material and said bottom coating material in a sealed portion made by said seal unit using a third pair of rotating rollers, and produces sheet wrapping bodies each respectively wrapping the sheet tip subject to wrapping;
wherein,
said transportation unit comprises an upper transportation unit and a lower unit, said upper transportation unit and said lower transportation unit opposing each other vertically to enable fastening of said sheet tips subject to wrapping, said upper and lower transportation units each comprises an upstream end portion and a downstream end portion with respect to a direction in which said sheet tips subject to wrapping are transported, said downstream end portion of said lower transportation unit extending farther in the direction in which said sheet tips subject to wrapping are transported compared with said downstream end portion of said upper transportation unit;
said bottom coating material supply unit supplies a strip of said bottom coating material onto a transportation surface of said lower transportation unit;
said top coating material supply unit includes a guide roller for guiding said top coating material onto said sheet tips subject to wrapping placed on said lower transportation unit, said roller being provided above said lower transportation unit at a position downstream in respect to said downstream end portion of said upper transportation unit, said guide roller, together with said lower transportation unit, transporting said sheet tips subject to wrapping while fastening said sheet tips subject to wrapping, said guide roller being provided at a position enabling fastening of a top end portion of each said sheet tip subject to wrapping with said lower transportation unit while a bottom end portion thereof is fastened by said lower transportation unit and said upper transportation unit.

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**5,740,662**

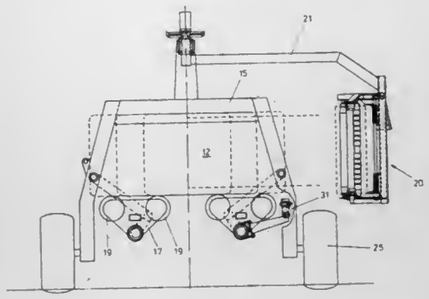
## BALE WRAPPER APPARATUS

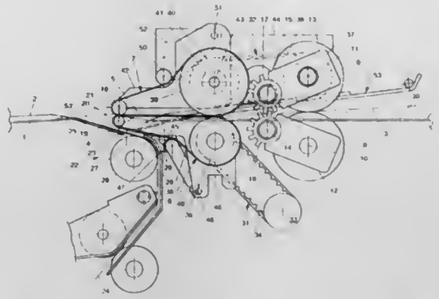
**Erling Royneberg; Jahn Haugstad; Frode Underhaug, and Trygve Tjermestad, all of Naerbo, Norway, assignors to Kverneland Underhaug A/s, Naerbo, Norway**

**PCT No. PCT/GB94/00176, § 371 Date Aug. 15, 1995, § 102(e) Date Aug. 15, 1995, PCT Pub. No. WO94/17653, PCT Pub. Date Aug. 18, 1994**
**Continuation of Ser. No. 507,345, Aug. 15, 1995, abandoned.**
**This PCT application Jan. 28, 1994, Ser. No. 713,723**
**Claims priority, applicatinn United Kingdom, Feb. 15, 1993, 9302996; Jun. 4, 1993, 9311563**
**Int. Cl.[6] B65B** *53/00;11/04*
**U.S. Cl. 53—556** **23 Claims**

22. A bale wrapper apparatus for applying stretchable plastics film windings around a bale of rectangular cross section in order to wrap the bale, in which the apparatus comprises:
a frame;
a towbar attached to and projecting forwardly of the frame to enable the apparatus to be towed behind a propelling vehicle;
an arch structure forming part of said frame and facing in the intended direction of travel, said structure being of sufficient size to allow a bale lying on the ground to pass through the arch when the apparatus is moved forwardly;
a bale lifting device mounted on the frame and operative to lift a bale lying on the ground to a bale-wrapping position;
means for rotating the bale about a substantially horizontal axis extending generally parallel to the direction of travel when the bale has been lifted to the bale wrapping position;
a rotatable arm adapted to carry a supply reel of stretchable plastics film and mounted on the frame to rotate about a substantially vertical axis and thereby cause the reel to carry out a circular orbit around the bale while the latter is rotated about the substantially horizontal axis and thereby apply overlapping windings of film around the outer surface of the bale;
in which the bale-lifting device comprises:
a pair of lifting assemblies mounted on the frame at laterally spaced apart positions to allow the rectangular cross section bale to be received therebetween with two opposed sides of the bale extending substantially vertically;
a pair of rollers rotatably mounted in each assembly and extending in a direction parallel to the direction of travel and defining a clear entry path for the bale to be received between the rollers of the two assemblies;
pivotable mountings supporting each assembly and allowing each assembly to occupy an engaging position in which the rollers of each assembly are located one above the other and able to engage the adjacent side of the bale, and when drive is applied to the rollers to cause the bale to be lifted from the ground under frictional contact with the sides of the bale and then take-up a bale-wrapping position, and said assemblies also being able to take-up a bale supporting and driving position in which the rollers of each assembly are located side by side and supporting the underside of the bale and being operative when drive is applied to all of the rollers to cause the bale to rotate about said substantially horizontal axis extending parallel to the direction of travel and thereby form said bale rotating means; and,
means for laterally separating the assemblies from the bale when wrapping has been completed, whereby the wrapped bale can fall under gravity onto the ground and then be discharged rearwardly relative to the apparatus when the latter is moved forwardly by the propelling vehicle.





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**5,740,663**

## INSERTING APPARATUS

**Hendrik Andries de Haan, Bergum, and Christiaan Antoon Munneke, Surhuisterveen, both of Netherlands, assignors to Hadewe B.V., Drachten, Netherlands**

**Filed Dec. 27, 1996, Ser. No. 775,026**
**Claims priority, application Netherlands, Dec. 29, 1995, 1002001**
**Int. Cl.[6] B65B** *43/26;43/42;39/00*
**U.S. Cl. 53—569** **11 Claims**

1. An inserting apparatus comprising:
an envelope holder for holding an envelope in or against a particular surface,
a flap holder for holding in an open position a flap of an envelope being held in the envelope holder, and
a document feed path, of which most downstream operative transport elements are formed by an extreme downstream conveyor roller on a first side of the document feed path proximal to the flap holder, which also constitutes the extreme downstream guide on the first side of the document feed path proximal to the flap holder, and an opposite, circulating conveying element, defining a nip together with said downstream conveyor roller, which constitutes the extreme downstream conveying element on a second side of the document feed path,
wherein said extreme downstream roller on said first side of the document feed path is designed as a downstream return pulley of a circulating conveyor belt.

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**5,740,664**

## SINGLE STATION COVERING AND FASTENING SYSTEM

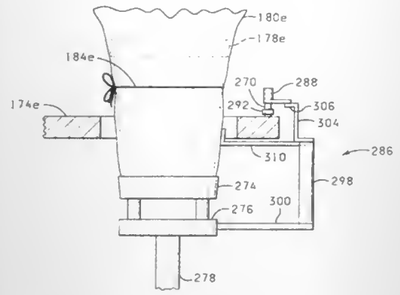
**Donald E. Weder; Joseph G. Stracter, both of Highland, Ill., and Paul Fantz, Imperial, Mo., assignors to Southpac Trust International, Inc.**

**Continuation of Ser. No. 462,342, Jun. 5, 1995, Pat. No. 5,636,502, which is a continuation of Ser. No. 252,876, Jun. 2, 1994, Pat. No. 5,609,009, which is a continuation-in-part of Ser. No. 88,692, Jul. 7, 1993, Pat. No. 5,481,850, which is a continuation-in-part of Ser. No. 819,311, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned, said Ser. No. 252,876 is a continuation-in-part of Ser. No. 88,976, Jul. 8, 1993, Pat. No. 5,450,707, and Ser. No. 979,389, Nov. 19, 1992, abandoned, which is a continuation of Ser. No. 832,096, Feb. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 765,416, Sep. 26, 1991, abandoned, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned.**
**This application Feb. 5, 1997, Ser. No. 795,536**
**Int. Cl.[6] B65B** *11/00;47/00*
**U.S. Cl. 53—580** **22 Claims**

1. An apparatus for forming and fastening a cover to an article having an open upper end, a lower end and an outer peripheral surface such that the open upper end of the article remains substantially uncovered, the apparatus comprising:
a platform having an opening extending therethrough, the platform adapted to support at least one sheet of material such that a portion of the sheet of material is positioned generally over the opening in the platform;
a cover forming member disposed in the opening in the platform, the cover forming member having contacting portions for contacting the sheet of material and forming the sheet of material into a cover extending about at least a portion of the outer Peripheral surface of the article such that the open upper end of the article remains substantially uncovered when the article and at least a portion of the sheet of material are moved

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through the opening in the platform and into contact with the cover forming member; and

means for automatically applying a fastener about a portion of the cover and for fastening the cover about the article such that the open upper end of the article remains substantially uncovered.

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**5,740,665**

**RIDING SADDLES**

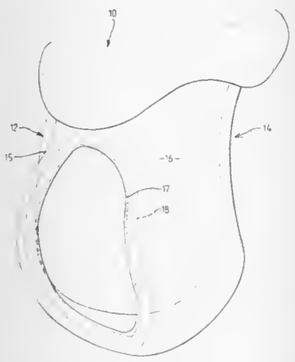
**Geoffrey Paul Belton, Albion House Caldmore Road, Walsall, England, WS1 3MR**

**Filed Feb. 23, 1996, Ser. No. 604,799**

**Claims priority, application United Kingdom, Sep. 5, 1995, 9518051**

**Int. Cl.[6] B68C** *1/02*

**U.S. Cl. 54—44.1** **14 Claims**




1. A riding saddle comprising a seat on which a rider can sit, a panel beneath the seat to rest on and over the back of a horse or other animal and a respective loose flap over the panel on each side of the seat, wherein the flaps each comprise a first, main, part and a plurality of differently contoured second, removable parts, each having a different outwardly facing surface configuration, wherein the first part is attached to or integral with the seat, the first and second parts having mutually engageable releasable attachment means whereby each of said second parts is releasably attachable at or adjacent a front edge of the first part.

**5,740,666**

**METHOD AND SYSTEM FOR CONTROLLING THE ROTATIONAL SPEED OF A ROTARY RING MEMBER**

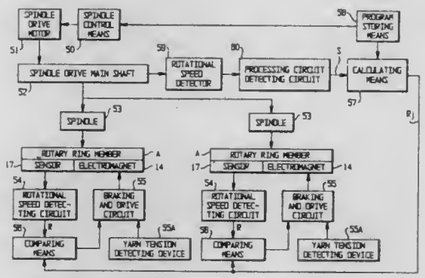
**Hiroshi Yamaguchi, 7-45, Ooyamada 6-chume, Kuwana-shi, Mie, 511, and Masashi Yamaguchi, 12-7, Shimizuoka 1-chome, Sumiyoshi-ku, Osaka-shi, Osaka, 558, both of Japan**

**Continuation-in-part of Ser. No. 237,362, May 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 22,426, Feb. 16, 1993, abandoned, which is a continuation of Ser. No. 671,798, Aug. 3, 1990, abandoned. This application Jan. 16, 1996, Ser. No. 587,241**

**Claims priority, application Japan, Aug. 3, 1989, 1-202129**

**Int. Cl.[6] D01H** *7/46;7/92*

**U.S. Cl. 57—264** **12 Claims**




1. A method for automatically controlling motion of a plurality of rotary ring devices in a textile machine during a period for producing a plurality of full packaged cops, said textile machine having a plurality of spindles and a mechanism for controlling a common rotational speed of said spindles according to a predetermined program by which said common rotational speed is forced to change during said period, said plurality of rotary ring devices being arranged along an alignment of spindles in cooperation with respective ones of said spindles, individual ones of said rotary ring devices having a rotary ring member capable of coaxially rotating with a corresponding spindle, a magnetic bearing rotatably supporting said rotary ring member, a traveller capable of running on a circular running trace formed by said rotary ring member, and means for electrically controlling braking action of said magnetic bearing so that a rotational speed of said rotary ring member is controlled, comprising

(a) initially setting a control program of a variable ratio between a standard rotational speed of rotary ring members of a group of rotary ring devices and said common rotational speed of said spindles, in a condition that the rotational speed of respective ones of said rotary ring members does not exceed a rotational speed of said traveller,

(b) continuously detecting said common rotational speed of said spindles and the rotational speed of each one of said rotary ring members of said group of rotary ring devices,

(c) computing a desired rotational speed for said respective ones of said rotary ring members by multiplying said variable ratio by said detected common rotational speed of said spindles, where said ratio is defined as an exact time when the rotational speed of the respective ones of said rotary ring members is detected,

(d) comparing said detected rotational speed of the respective ones of said rotary ring members with said desired rotational speed of said rotary ring members of said group of rotary ring devices,

(e) electrically adjusting braking action of said magnetic bearing of said rotary ring members of said group of rotary ring devices when said comparison indicates that the rotational speed of said rotary ring member of said rotary ring device is outside a predetermined acceptable range of control whereby said rotational speed of said rotary ring member is controlled to satisfy said predetermined acceptable range of control.



**5,740,667**

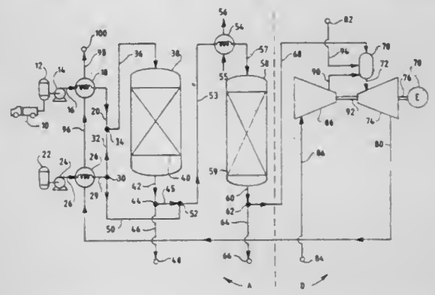
**PROCESS FOR ABATEMENT OF NITROGEN OXIDES IN EXHAUST FROM GAS TURBINE POWER GENERATION**

**Alakananda Bhattacharyya, Wheaton, and Arunabha Basu, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.**

**Continuation-in-part of Ser. No. 597,209, Feb. 6, 1996, Pat. No. 5,626,794, which is a continuation of Ser. No. 356,492, Dec. 15, 1994, Pat. No. 5,498,370. This application Aug. 22, 1996, Ser. No. 701,387**

**Int. Cl.[6] F02C** *7/26;* **F02B** *43/00*

**U.S. Cl. 60—39.02** **24 Claims**



1. A process for abatement of nitrogen oxides in exhaust from a gas turbine system having a compressor section which receives and compresses a gaseous source of dioxygen which is directed to a combustor section from which a combustion product stream is directed to a turbine section, which process comprises:

introducing, into the combustor, a supplementary gaseous stream comprising dihydrogen, carbon monoxide and/or carbon dioxide, and a stream of gaseous fuel, with the source of dioxygen to form a combustible gaseous mixture;

combusting the mixture to produce heat and the combustion product stream; and

driving a turbine with the combustion product stream to produce an exhaust stream and to generate mechanical power

wherein the stream of gaseous fuel and the supplementary gaseous stream are mixed at ratios in a range of from about 1:19 to about 19:1 by volume measured under conditions of 25° C. temperature and 1 atmosphere pressure.

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**5,740,668**

**HIGH EFFICIENCY GAS TURBINE**

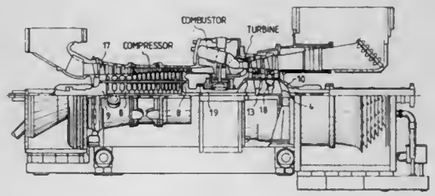
**Tetsuo Fujiwara, Hitachi; Masateru Suwa, Hitachinaka; Yutaka Fukui, and Hideki Tamaki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 19, 1995, Ser. No. 424,614**

**Claims priority, application Japan, Apr. 20, 1994, 6-081272**

**Int. Cl.[6] F02C** *3/00*

**U.S. Cl. 60—39.75** **21 Claims**




1. A power generation gas turbine equipped with a compressor; a combustor; turbine blades fixed to a turbine disc; and turbine nozzles provided in correspondence to said turbine blades, wherein first stage turbine blades are made of an alloy whose $10^5$-hour 14-kgf/mm$^2$ temperature capacity is 920° C. or over, second stage turbine blades are made of an alloy whose $10^5$-hour 14-kgf/mm$^2$ temperature capacity is 800° C. or over, first stage turbine nozzles are made of an alloy whose $10^5$-hour 6-kgf/mm$^2$ temperature capacity is 900° C. or over, second stage turbine nozzles are made of an alloy whose $10^5$-hour 6-kgf/mm$^2$ temperature capacity is 800° C. or over, said first stage turbine blades and said first stage turbine nozzles are made of a Ni-base single crystal cast alloy,

said second stage turbine blades are formed as Ni-base alloy casts, and wherein the Ni-base alloy used for said second stage turbine blades is made of a Ni-base alloy comprising Cr 12 to 16%, Mo 0.5 to 2%, W 2 to 5%, Al 2.5 to 5%, Ti 3 to 5%, Ta 1.5 to 3%, Co 8 to 10%, C 0.05 to 0.15%, and B 0.005 to 0.02% by weight.

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**5,740,669**

**EXHAUST GAS PURIFICATION DEVICE FOR AN ENGINE**

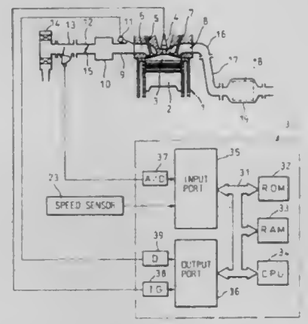
**Yukio Kinugasa; Kouhei Igarashi, both of Susono; Takaaki Itou, Mishima, and Toshifumi Takaoka, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan**

**Filed Nov. 16, 1995, Ser. No. 559,107**

**Claims priority, application Japan, Nov. 25, 1994, 6-291662; Oct. 11, 1995, 7-263019**

**Int. Cl.[6] F01N** *3/28*

**U.S. Cl. 60—285** **5 Claims**




1. An exhaust gas purification device for an internal combustion engine comprising:

a $NO_x$ absorbent disposed in an exhaust passage of an internal combustion engine, wherein the $NO_x$ absorbent absorbs $NO_x$ in exhaust gas from the engine when the air-fuel ratio of the exhaust gas flowing into the $NO_x$ absorbent is lean, and releases the absorbed $NO_x$ when the oxygen concentration in the exhaust gas becomes lower;

temperature detecting means for detecting a temperature of the $NO_x$ absorbent;

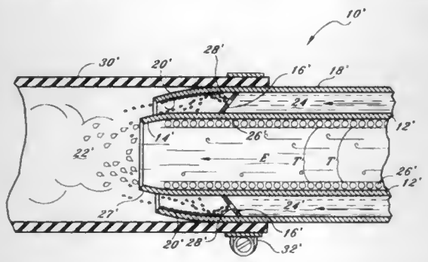
regenerating means for causing the air-fuel ratio of the exhaust gas flowing into the $NO_x$ absorbent to become one of a rich air-fuel ratio and a stoichiometric air-fuel ratio to cause the $NO_x$ accumulated in the $NO_x$ absorbent to be released from the $NO_x$ absorbent and to be reduced to nitrogen; and

regeneration control means for activating the regenerating means to cause the air-fuel ratio of the exhaust gas flowing into the $NO_x$ absorbent to become one of a rich air-fuel ratio and a stoichiometric air-fuel ratio only when the temperature of the $NO_x$ absorbent is lower than a predetermined temperature and an amount of $NO_x$ accumulated in the $NO_x$ absorbent is at least a predetermined amount.

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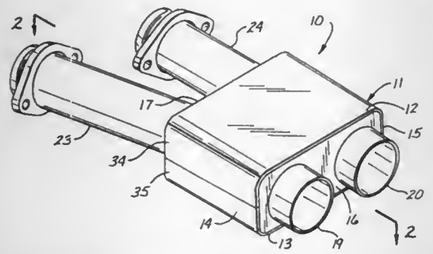
**5,740,670**
**WATER JACKETED EXHAUST PIPE FOR MARINE EXHAUST SYSTEMS**
**Woodrow Woods, 3640 Fiscal Ct., Riviera Beach, Fla. 33404**
**Continuation-in-part of Ser. No. 419,097, Apr. 10, 1995, abandoned. This application Dec. 29, 1995, Ser. No. 580,548**
**Int. Cl.[6] F01N** *3/04*
**U.S. Cl. 60—310** **14 Claims**



1. A water jacketed exhaust pipe for marine engines comprising:
an elongated inner liner, said liner having a tail end, said tail end defining a first inwardly tapered section;
an elongated outer shell, said shell surrounding said liner about an elongate axis of said pipe, said shell further having a tail end, said shell tail end defining a second inwardly tapered section;
said elongated inner liner extends axially beyond said tail end of said elongated outer shell;
a spacer disposed between said outer shell and said inner liner for separating said shell from said liner at to define a volume therebetween, said spacer further defining at least one passageway there through communicating said volume with a second volume outside said exhaust pipe.

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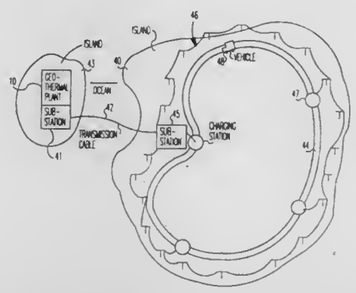
**5,740,671**
**BALANCE BOX EXHAUST ACCELERATOR**
**Mack L. Jones, M.A.C. Products, Inc. 43214 Black Deer Loop, Unit 113, Temecula, Calif. 92590-3473**
**Filed Apr. 1, 1997, Ser. No. 831,021**
**Int. Cl.[6] F01N** *7/10*
**U.S. Cl. 60—323** **7 Claims**



1. An exhaust component, comprising:
a housing having an interior, the housing including opposite top and bottom walls, opposite left and right side walls, and opposite inlet and outlet end walls that enclose the interior;
means for conveying exhaust gases to the interior of the housing, including left and right inlet tubes on the inlet end wall;
means for conveying the exhaust gases from the interior, including at least one outlet tube on the outlet end wall;
means for defining an outlet opening intermediate the inlet and outlet end walls that is in fluid communication with the outlet tube, said means including a first panel that extends between the top and bottom walls of the housing in a position intermediate the inlet and outlet end walls, the first panel defining the outlet opening and the outlet tube extending from the outlet end wall to the outlet opening so that the outlet tube is in fluid communication with the outlet opening; and
means for directing exhaust gases in the interior toward the outlet opening, including second and third panels that extend between the top and bottom walls, the second panel extending from the left side wall to a left side of the outlet opening and the third panel extending from the right side wall to a right side of the outlet opening.

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**5,740,672**
**METHOD FOR USING GEOTHERMAL POWER PLANT**
**Lucien Y. Bronicki, Yavne, Israel, assignor to Ormat Turbines (1965) Ltd., Yavne, Israel**
**Continuation of Ser. No. 551, Jan. 4, 1993, abandoned, which is a continuation of Ser. No. 656,879, Feb. 19, 1991, abandoned. This application Dec. 18, 1996, Ser. No. 768,272**
**Int. Cl.[6] F03G** *7/00*
**U.S. Cl. 60—641.2** **3 Claims**



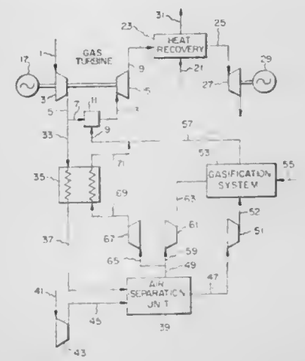
1. A system for an island having a source of geothermal fluid, said island being isolated from any external source of electrical power, and having a primary electrical grid defining a primary electrical load during the day which exceeds the electrical load defined by this grid during the night, said system comprising:
a) a ringroad around said island;
b) a plurality of recharging stations spaced around the ringroad for recharging the batteries of electric vehicles and establishing a secondary electrical grid defining a secondary electrical load different from said primary electrical load;
c) and electrical distribution system for supplying power to said primary grid during the day, and to said secondary grid during the night, said distribution system including a geothermal power plant for generating power at a substantially constant rate day and night, said power plant including;
(1) a separator for separating said geothermal fluid into geothermal steam containing non-condensable gases, and into geothermal liquid;
(2) at least one integrated power plant unit module having a steam turbine responsive to said steam and producing heat depleted steam, a steam condenser associated with said steam turbine operating at a pressure no less than atmospheric pressure for vaporizing organic fluid supplied to said steam condenser and for condensing said heat depleted steam to produce steam condensate, an organic fluid turbine operating on organic fluid vaporized by said steam condenser, a single electric generator driven by said steam turbine and said organic Rankine cycle turbine for producing electric power, and a preheated for perheating said organic fluid before it is vaporized;



(3) means for applying said geothermal liquid to said preheated for preheating said organic fluid; and
(4) means for applying cooled geothermal liquid, steam condensate, and non-condensable gases to a re-injection well.

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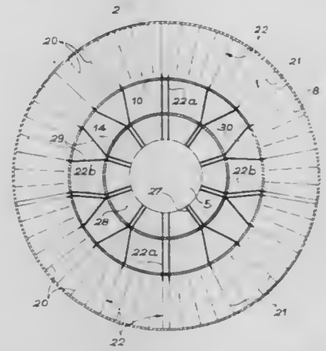
**5,740,673**
**OPERATION OF INTEGRATED GASIFICATION COMBINED CYCLE POWER GENERATION SYSTEMS AT PART LOAD**
**Arthur Ramsden Smith, Telford, and Donald Winston Woodward, New Tripoli, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**
**Filed Nov. 7, 1995, Ser. No. 553,187**
**Int. Cl.[6] F02C** *3/28*
**U.S. Cl. 60—39.02** **14 Claims**



1. A method of operating an integrated gas turbine/air separation system at part load which comprises compressing a first stream of air in a gas turbine air compressor, combusting at least a portion of the resulting compressed air with a fuel in a gas turbine combustor to form hot combustion products, expanding the hot combustion products in a gas turbine expander which drives the compressor, separating air into nitrogen-rich and oxygen-rich products in a cryogenic air separation unit wherein feed air to the air separation unit is provided at least in part by compressing a second stream of air in a main air compressor, wherein the integrated gas turbine/air separation system is operated at part load such that
(a) when the gas turbine air compressor supplies compressed air at a given operating pressure which is greater than a minimum air separation unit feed pressure, the air separation unit is operated at a feed pressure essentially equal to the given operating pressure and the feed air is provided to the air separation unit in part by the main air compressor and in part by an additional portion of compressed air from the gas turbine air compressor; and
(b) when the gas turbine air compressor supplies compressed air at a given operating pressure which is essentially equal to or less than the minimum air separation unit feed pressure, the air separation unit is operated at a feed pressure essentially equal to the minimum air separation unit feed pressure and the feed air to the air separation unit is provided by the main air compressor without additional compressed air from the gas turbine air compressor.

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**5,740,674**
**ARRANGEMENT OF GAS TURBINE ENGINE COMPRISING AERODYNAMIC VANES AND STRUTS LOCATED IN THE SAME PLANE AND AN INTERMEDIATE CASING**
**Bruno Beutin, Corbeil Essonnes; Jean-Louis Charbonnel, Boissise Le Roi; André Collot, Mennecy; Claude Dejaune, Boissise la Bertrand; Alain Espenel, Vert Saint Denis; Philippe Fessou, Melun; Jean-Claude Gregoire, Echarcon; Daniel Martin, Bombon; Hervé Paitre, Combs la Ville; Jean-Francois Ranvier, Ponthierry, and Monique Thore, Crosne, all of France, assignors to Societe Nationale d'Etude Et de Construction de Moteurs d'Aviation "Sherma", Paris, France**
**Filed Aug. 15, 1996, Ser. No. 698,064**
**Claims priority, application France, Aug. 30, 1995, 95 10199**
**Int. Cl.[6] F02C** *7/00*
**U.S. Cl. 60—226.1** **21 Claims**



1. Arrangement of a gas turbine engine comprising:
a first, a second, a third and a fourth circular casing of decreasing and concentric diameters, the first casing and second casing forming the boundary of a bypass engine air channel and the third casing and fourth casing forming a primary air channel, the bypass engine air channel being occupied by fixed gas guide vanes outer parts of fixed support vanes extending from the first to the fourth casing, the outer parts being prolonged by support arms between the third and fourth casings and by intermediate sleeves between the second and third casings, the guide and support vanes alternate by groups on a single circumference and the intermediate sleeves are oblique and branched from the support arms to the outer parts of the support vanes.

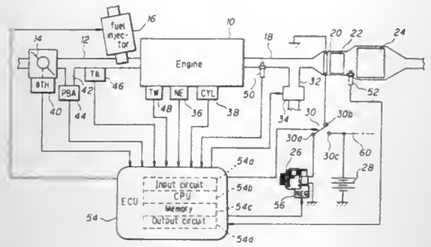
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**5,740,675**
**EXHAUST SYSTEM AMBIENT TEMPERATURE DETECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE**
**Yuichi Shimasaki; Hiroshi Ohno; Tetsu Teshirogi; Hiroaki Kato; Akihisa Saito; Takashi Komatsuda; Hideo Furumoto; Takuya Aoki, all of Wako, and Takayoshi Nakayama, Hagamachi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**
**Filed Jun. 14, 1996, Ser. No. 663,782**
**Claims priority, application Japan, Jun. 16, 1995, 7-174257**
**Int. Cl.[6] F02D** *41/14;* **F01N** *3/20;3/28*
**U.S. Cl. 60—274** **21 Claims**

1. A system for detecting ambient temperature of an exhaust system of an internal combustion engine, comprising:
an oxygen sensor installed at the exhaust system for detecting oxygen content in exhaust gases generated by the engine, said oxygen sensor having a detection element for detecting the oxygen content in the exhaust gases and a heater for heating the detection element when supplied with current;

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an electric circuit for supplying current from a power source to the heater;

electric resistance detecting means for detecting electric resistance of the heater when the heater is supplied with current;

characteristic establishing means for establishing characteristics of the ambient temperature of the exhaust system with respect to the electric resistance of the heater; and

exhaust system ambient temperature detecting means for detecting the ambient temperature of the exhaust system based on the detected electric resistance of the heater in accordance with the established characteristics.

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**5,740,676**

**DIAGNOSTIC APPARATUS FOR EXHAUST GAS CLARIFICATION APPARATUS FOR INTERNAL COMBUSTION ENGINE**

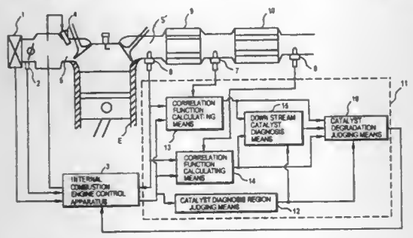
**Rogelio B. Agustin, Hitachinaka; Akihito Numata, Urizura-machi; Eisaku Fukuchi, Hitachi; Yutaka Takaku, and Toshio Ishii, both of Mito, all of Japan, assignors to Hitachi, Ltd., and Hitachi Car Engineering Co., Ltd., both of Japan**

**Filed Feb. 20, 1996, Ser. No. 603,345**

**Claims priority, application Japan, Feb. 17, 1995, 7-029737**

**Int. Cl.[6] F01N** *3/28*

**U.S. Cl. 60—276** **8 Claims**




1. In an internal combustion engine having means for detecting operation status thereof and an air/fuel ratio control means for regulating amount of fuel injection in response to the detected operation status so as to keep air/fuel ratio in the exhaust gas thereof at a predetermined value, a diagnosis device for an exhaust gas clarification arrangement including a first exhaust gas catalyst unit disposed at an upstream side and a second exhaust gas catalyst unit disposed at a downstream side in an exhaust gas passage in the internal combustion engine, comprising:

a first air/fuel ratio sensor located at an upstream side of the first unit in the exhaust gas passage; a second air/fuel ratio sensor located between the first and second units in the exhaust gas passage; a third air/fuel ratio sensor located at a downstream side of the second unit in the exhaust gas passage; a first diagnostic means for performing diagnosis of the first unit based on output signals from said first and second air/fuel ratio sensors; and a second diagnostic means for performing diagnosis of a combined unit of the first and second units based on output signals from said first and third air/fuel ratio sensors, wherein said first diagnostic means is configured to perform the diagnosis of the first unit under a first operation region of the internal combustion engine, and said second diagnostic means is configured to perform the diagnosis of the combined unit under a second operation region of the internal combustion engine of which load is larger than that of the first operation region.

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**5,740,677**

**METHOD AND PLANT FOR USE IN STAND-ALONE PLANTS, PREFERABLY A WIND/DIESEL PLANT**

**Søren Qvist Vestesen, Stenrosevej 26, Beder, DK-8330, Denmark**

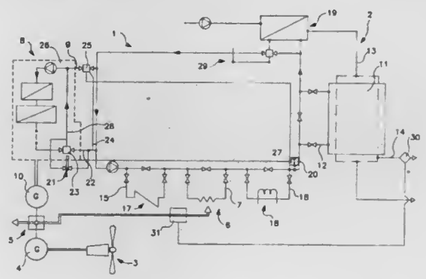
**PCT No. PCT/DK95/00066, § 371 Date Aug. 19, 1996, § 102(e) Date Aug. 19, 1996, PCT Pub. No. WO95/22692, PCT Pub. Date Aug. 24, 1995**

**PCT Filed Feb. 16, 1995, Ser. No. 700,439**

**Claims priority, application Denmark, Feb. 17, 1994, 0190/94**

**Int. Cl.[6] F01B** *21/04*

**U.S. Cl. 60—698** **12 Claims**



1. A method for operating a plant that includes at least an internal-combustion engine (**8**), a wind turbine (**3**), at least one heat exchange unit (**11**) as a distillation unit, and a first closed fluid circuit (**1**) containing heating and cooling devices, wherein fluid of the first closed fluid circuit (**1**) is led through an electric heating unit (**6**) which is supplied with energy from the wind turbine (**3**) and from the internal-combustion engine (**8**), and through a cooling system (**9**) of the internal-combustion engine (**8**) and the at least one heat exchange unit (**11**) with a second open fluid circuit (**2**) in which a thermal energy transfer is established with a heat-absorbing medium, and wherein fluid from the first closed circuit is led to the cooling system of the combustion engine (**8**) and regulated depending on the temperature of the fluid in an outlet of the cooling system (**9**) of the internal-combustion engine (**8**), and wherein the operation of the engine (**8**) is regulated depending on the output of the wind turbine (**3**).

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**5,740,678**

**IMPINGEMENT JET FREEZER AND METHOD**

**Ron C. Lee, Bloomsbury, and Michael K. Sahm, Annendale, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.**

**Filed May 24, 1995, Ser. No. 449,456**

**Int. Cl.[6] F25D** *13/06*

**U.S. Cl. 62—63** **19 Claims**

1. An impingement freezer comprising:

a freezing chamber having an inlet for receiving articles to be refrigerated and an outlet for discharging said articles after having been refrigerated;

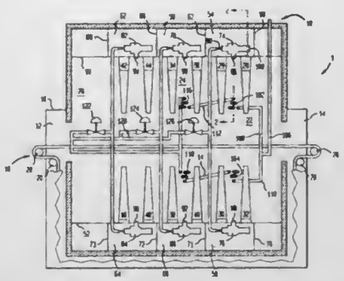
means for conveying articles from said inlet to said outlet;

at least two zones including an inlet zone located adjacent said inlet and an outlet zone located adjacent said outlet;

each of said at least two zones having,

impingement nozzle means for directing at least one refrigerant jet against said articles to be refrigerated, and





circulation means connected to said impingement nozzle means for drawing said refrigerant from said freezing chamber after having exchanged heat with said articles into a mixture with incoming refrigerant and for discharging said mixture into said impingement nozzle means to form said at least one refrigerant jet;

the circulation means driven by said at least partially vaporized incoming refrigerant;

control means for independently controlling flow rates of said incoming refrigerant to said circulation means of said at least two zones;

vaporizer means positioned within said freezing chamber to exchange heat between said incoming refrigerant and said refrigerant drawn by said circulation means of at least one of said at least two zones for at least partially vaporizing said incoming refrigerant; and distribution means connected to said heat exchange means for distributing said incoming refrigerant from said vaporization means to said control means.

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**5,740,679**

**BINARY REFRIGERATING APPARATUS**

**Akitoshi Ueno, and Yuji Fujimoto, both of Osaka, Japan, assignors to Daikin Industries, Ltd., Japan**

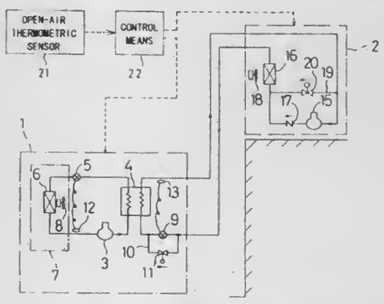
**PCT No. PCT/JP96/00055, § 371 Date Nov. 4, 1996, § 102(e) Date Nov. 4, 1996, PCT Pub. No. WO96/21830, PCT Pub. Date Jul. 18, 1996**

**PCT Filed Jan. 12, 1996, Ser. No. 704,514**

**Claims priority, application Japan, Jan. 13, 1995, 7-003890**

**Int. Cl.[6] F25B** *7/00*

**U.S. Cl. 62—175** **3 Claims**




1. A binary refrigerating apparatus having:

a lower temperature side unit in which a lower temperature side compressor, a condensation part of a cascade condenser, expansion means and an evaporator are sequentially connected thereby forming a lower temperature refrigeration cycle; and

a higher temperature side unit which has a higher temperature side compressor and a condenser for condensing refrigerant by using the air and which is connected to an evaporation part of the cascade condenser through expansion means so that the higher temperature side compressor and the condenser form a higher temperature refrigeration cycle,

the improvement comprising:

said higher temperature side unit being disposed at a position higher than a position where said lower temperature side unit is disposed,

an open-air thermometric sensor for sensing an open-air temperature; and

natural circulation means for naturally circulating refrigerant in the higher temperature refrigeration cycle when an open-air temperature sensed by the open-air thermometric sensor is below a specific temperature.

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**5,740,680**

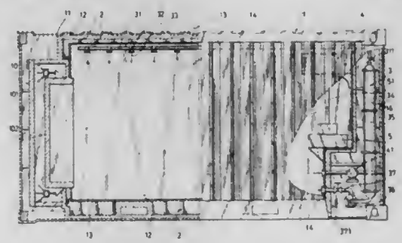
**DEODORIZING REINFORCED CONTAINER FOR LOW PRESSURE, LOW TEMPERTURE AND HUMIDIFIED STORAGE**

**Fong-Chuan Lee, Room 332, Fishing Industrial Building, No. 3, Yu-Kang East 2nd Road, Chien-Chen District, Kaohsiung (806), Taiwan**

**Filed Aug. 19, 1996, Ser. No. 697,081**

**Int. Cl.[6] F25B** *19/00*

**U.S. Cl. 62—268** **4 Claims**



1. A deodorizing reinforced container for low pressure, low temperature and humidified storage comprising:

a housing including an outer shell lined with a thermally insulative lining on an inside surface of said outer shell, an inner shell separating from the outer shell and circumferentially confining a storing chamber within said inner shell for storing preservation materials in said storing chamber, a cooling hypobaric device and a humidifier installed in said storing chamber for producing low pressure, low temperature and increasing humidity in said storing chamber for freshening the preservation materials therein;

a plurality of reinforcing ribs longitudinally and latitudinally formed in said housing, each said reinforcing rib retained in between said inner shell and said outer shell lined with said thermally insulative lining; and

a deodorizing means provided in said housing for deodorizing and absorbing excess unexpected odors and gases as laden in the air in said storing chamber of said housing.

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**5,740,681**

**METHOD AND APPARATUS FOR CONTROLLING THE TEMPERATURE OF AIR DELIVERED TO THE CABIN OF A MOTOR VEHICLE**

**Stefan Karl, Paris, France, assignor to Valeo Climatisation, La Verriere, France**

**Filed Dec. 19, 1996, Ser. No. 770,081**

**Claims priority, application France, Dec. 21, 1995, 95.15288**

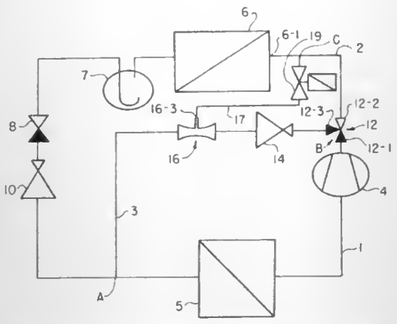
**Int. Cl.[6] F25B** *13/00*

**U.S. Cl. 62—324.6** **12 Claims**

1. A method of regulating the temperature of an air stream to be delivered into the cabin of a vehicle, by heat exchange with an evaporator in which a refrigerant fluid flows, with said fluid also

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passing into a compressor and into an expansion device, the said method having a cooling mode for the air stream and a heating mode for the air stream, the method comprising, in the said cooling mode, causing the said fluid to flow successively through the evaporator, the compressor, a condenser in which it gives up heat to another medium, and an expansion device, the method further comprising, in the said heating mode, passing the fluid from the compressor to the evaporator without passing it through any condenser, the method further including, in the said heating mode, and when the mass flow of the body of fluid flowing through the evaporator is insufficient to produce a predetermined amount of heat energy, the step of causing the said body of fluid to produce an aspiration effect, thereby drawing from the condenser an incident mass flow joining the said body of fluid, whereby to augment the latter.

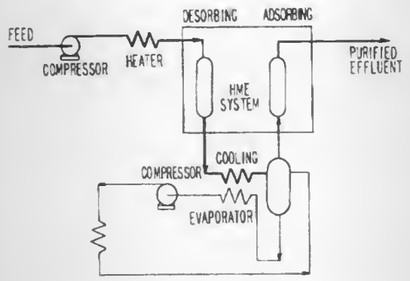
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**5,740,682**

**METHOD FOR THE RECOVERY OF ORGANIC VAPORS**

**Ram Lavie, 33 Italia Street, Haifa 34987, Israel, assignor to Ram Lavie, Haifa, and Technion Research and Development Foundation Ltd., Technion, both of Israel**

**Filed Jan. 23, 1995, Ser. No. 376,933**
**Claims priority, application Israel, Feb. 13, 1994, 108626**
**Int. Cl.[6] F25J** *3/00*
**U.S. Cl. 62—617** **8 Claims**



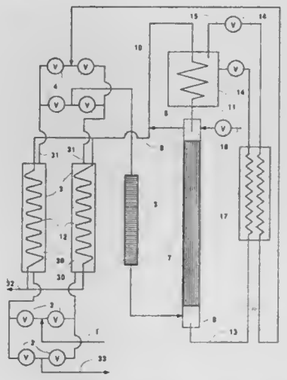

1. A method for the recovery of fugitive volatile organic vapors which comprises the steps of:
(a) compressing said vapors to a pressure of at least 200 kpa;
(b) feeding the hot compressed vapors to the desorption step of a Heat-Mass-Exchange (HME) system;
(c) cooling the effluent resulting from the desorption step to ambient temperature and separating out the condensed liquid obtained; and
(d) feeding the residual cold vapor phase, after the separation of the condensed liquid, to the adsorption step of said HME system to recover the fugitive organic vapors,
wherein the cold expanded volatile organic compound exchanges heat with the cooled effluent from the desorption step of the MEH system.

**5,740,683**

**CRYOGENIC RECTIFICATION REGENERATOR SYSTEM**

**John Fredric Billingham, Getzville, and Thomas John Bergman, Jr., Clarence Center, both of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.**

**Filed Mar. 27, 1997, Ser. No. 826,135**
**Int. Cl.[6] F25J** *1/00*
**U.S. Cl. 62—644** **8 Claims**



1. A method for producing nitrogen by the cryogenic rectification of feed air using a regenerator having a shell side and a coil side, said method comprising:
(A) cooling feed air by passing the feed air through the shell side of a regenerator during a cooling period, and introducing the cooled feed air into a column;
(B) passing exogenous cryogenic liquid into the column and separating the feed air by cryogenic rectification within the column into nitrogen vapor and oxygen-enriched liquid;
(C) condensing a first portion of the nitrogen vapor by indirect heat exchange with oxygen-enriched liquid to produce oxygen-enriched vapor;
(D) warming a second portion of the nitrogen vapor by indirect heat exchange with said cooling feed air by passing said second portion of the nitrogen vapor through the coil side of the regenerator;
(E) recovering the warmed second portion of the nitrogen vapor as product nitrogen; and
(F) passing oxygen-enriched vapor through the shell side of the regenerator during a non-cooling period.

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**5,740,684**

**SECURITY SYSTEM FOR USE ON THE BEACH**

**Thomas M. Sherlock, 27260 Sherlock Rd., Los Altos Hills, Calif. 94022, and Eric W. Kramer, 730 College Ave., Palo Alto, Calif. 94306**

**Continuation-in-part of Ser. No. 257,504, Jun. 8, 1994, Pat. No. 5,501,086. This application Jun. 7, 1995, Ser. No. 480,576**
**Int. Cl.[6] E05B** *73/00*
**U.S. Cl. 70—58** **2 Claims**

1. A security system for locking items on a loosely packed ground surface like a beach, comprising:
a first auger having upper and lower ends, the first auger having a spiral blade at the lower end;
a second auger having upper and lower ends, the second auger having a spiral blade at the lower end; and
a locking mechanism, the locking mechanism coupling the upper ends of the first and second augers;
wherein when the first and second augers are placed in the ground surface, the locking mechanism restricts rotation of the first and second augers making it difficult to remove the first and second augers from the ground surface;





wherein at least one auger includes: a first bar; a second bar coupled to the first bar at a joint; and a spiral blade on an end of the second bar opposite the joint; wherein the auger is folded at the joint for compact storage and the joint is formed by a loop on one end of the first bar linked with a loop on one end of the second bar;
wherein at least one loop of the joint is formed at an oblique angle to the bar on which it is formed so that the auger is foldable flat.

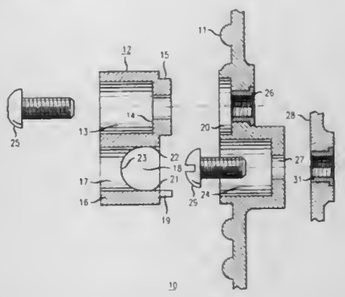
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**5,740,685**

**SECURITY MECHANISM FOR A NETWORK INTERFACE UNIT**

**Bassel Hage Daoud, Parsippany, N.J., assignor to Lucent Technologies, Inc., Murray Hill, N.J.**

**Filed Aug. 13, 1996, Ser. No. 700,602**
**Int. Cl.[6] B65D** *55/14*
**U.S. Cl. 70—164** **9 Claims**



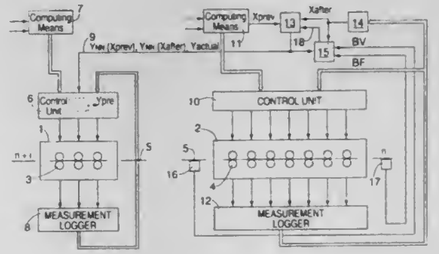
1. A security apparatus comprising:
a first fastener;
a second fastener;
a cover for an electronics enclosure, the cover including a first aperture for receiving the first fastener and a second aperture for receiving the second fastener; and
a bracket mounted on the cover, said bracket including a first portion defining a third aperture aligned with the first aperture and a second portion defining a fourth aperture aligned with the second aperture, the second portion also defining a cavity which accommodates a shackle of a padlock placed over the second fastener, at least the fourth aperture being structurally defined so that the second fastener can be accessed when the first fastener is at least partially removed, independent of whether the shackle is removed from the cavity.

**5,740,686**

**METHOD AND APPARATUS FOR ROLLING A METAL STRIP**

**Thomas Martinetz, München; Thomas Poppe, Munich; Guenter Soergel, Nuremberg, and Otto Gramckow, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Jun. 28, 1995, Ser. No. 496,271**
**Claims priority, application European Pat. Off., Jul. 7, 1994, 94110599**
**Int. Cl.[6] B21B** *37/00*
**U.S. Cl. 72—8.4** **18 Claims**




14. An apparatus for rolling a metal strip in a roughing line and a finishing line, wherein a rolling process in the roughing line is adjusted as a function of a predicted value for a change in width of the metal strip in the finishing line such that the metal strip has a predetermined finished strip width when leaving the finishing line, the apparatus comprising:
a control unit calculating first influencing parameters before a last edging pass in the roughing line to preset the finishing line, the change in width being dependent on the first influencing parameters;
a neural network having variable network parameters and receiving the influencing parameters, the neural network generating a calculated value for the change in width as a function of the predicted value; and
a measurement logger for measuring and calculating second influencing parameters after the metal strip passes through the finishing line as a function of other measured process parameters,
wherein, after the strip metal passes through the finishing line, the second influencing parameters are provided to the neural network,
wherein the neural network reduces a deviation between a resulting network response and a measured change in width of the metal strip by adapting the variable network parameters of the neural network, and
wherein, when at least one strip is positioned between a first metal strip (n+i, where i≧1) upstream from at least the last edging pass in the roughing line and a second metal strip (n) leaving the finishing line, the predicted value for the change in width of the first metal strip in the finishing line is calculated from a calculated value ($y_{NN}(x_{prev}(n+i))$) generated by the neural network, the resulting network response ($y_{NN}(x_{after}(n))$) being generated for the first metal strip leaving the finishing line based on the second influencing parameters that are one of calculated and measured, and wherein the measured change in width $y_{actual}(n)$ is calculated according to the equation:

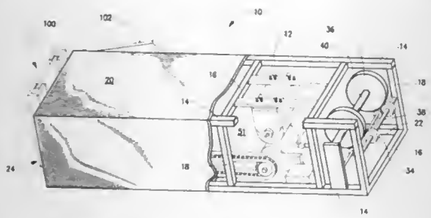
$$y_{prev}(n+1)=k_1 \cdot y_{actual}(n)+k_2 \cdot y_{NN}(x_{prev}(n+1))+(1-k_1-k_2) \cdot y_{NN}(x_{after}(n)),$$

where $0 \leqq k_1$ and $k_2 \leqq$.

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**5,740,687**
**FORMING APPARATUS FOR STRIP MATERIALS**
**Bruce E. Meyer, Lakewood; David H. Cunningham, Fort Lupton, and Ronald W. Shell, Firestone, all of Colo., assignors to New Tech Machinery Corporation, Denver, Colo.**
**Filed Apr. 21, 1995, Ser. No. 426,041**
**Int. Cl.[6] B21D** *5/08;28/00*
**U.S. Cl. 72—131** **21 Claims**



**1**. A forming apparatus adapted to receive an elongated sheet of formable material and operative to form a selected profile thereon, comprising:

(a) a frame having an entrance at a first end and an exit at a second end;

(b) a sheet drive supported by said frame and operative to advance the elongated sheet therethrough, said sheet drive consisting of three pairs of co-acting rollers, each of said pairs being longitudinally spaced from an adjacent one of said pairs in a downstream direction from said entrance to said exit, each of said pairs of co-acting rollers including a driven roller and a free-wheeling roller rotatably journaled with respect to said frame on transverse axes, each said driven roller and free-wheeling roller having a circumferential layer of polyurethane;

(c) a drive assembly interconnected to each said driven roller and operative to rotatably drive each said driven roller whereby each of said pairs of co-acting rollers is operative to engage a portion of said elongated sheet and advance said sheet in a downstream direction through said frame to discharge said sheet at the exit;

(d) a plurality of forming rollers disposed in said frame downstream of said entrance, said forming rollers positioned to engage portions of said sheet and operative to form said sheet into a formed sheet having the selected profile; and

(e) a shear assembly disposed proximate to said exit and operative to receive said formed sheet and selectively actuable to cut said formed sheet into sections of selected length.

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**5,740,688**
**PRESSURE-ASSISTED FORMATION OF SHAPED ARTICLES**
**Navtej S. Saluja, Arlington, Mass., and Alfredo Riviere V., Caracas, Venezuela, assignors to Sural Tech, Montreal**
**Filed Oct. 5, 1995, Ser. No. 539,371**
**Int. Cl.[6] B21C** *23/00*
**U.S. Cl. 72—262** **20 Claims**

**18**. A method for production of shaped articles, comprising:

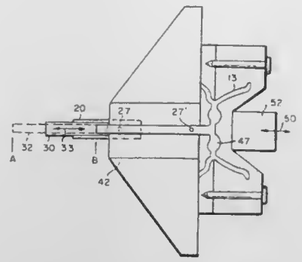
introducing a feed material into a frictions/extrusion source;

receiving extruded feed material from the extrusion source in a metering chamber, the metering chamber in flow communication with the frictional extrusion source;

applying an additional pressure to the extruded materials within the metering chamber;

directing extruded feed material from the metering chamber under pressure into a die chamber contactable in flow communication with an outlet conduit of the metering chamber

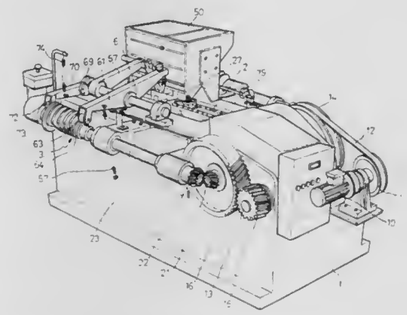
monitoring extrusion of extruded feed material from the metering chamber; and



selectively controlling sealing means disposed in the outlet conduit, the sealing means responsive to monitoring flow of extruded material therethrough.

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**5,740,689**
**WHEEL SPOKE EXTRUSION STRETCHER**
**Yen-Shun Chu, 40 San-Min Rd., Lin 10, Pei-Lung Li, Hou-Lung Chen, Miao-Li Hsien, Taiwan**
**Filed May 29, 1997, Ser. No. 864,908**
**Int. Cl.[6] B32F** *39/00*
**U.S. Cl. 72—294** **1 Claim**



**1**. A wheel spoke extrusion stretcher comprising:

a machine base;

a motor mounted on said machine base at one end and having a reduction gear coupled thereto;

a belt transmission unit turned by said reduction gear, said belt transmission unit comprising a small belt pulley coupled to said reduction gear, a big belt pulley, and a transmission belt mounted on said small belt pulley and said big belt pulley;

a main shaft mounted on said machine base and turned by said belt transmission unit, having two small helical gears fixedly mounted thereon at two opposite ends;

two driven shafts mounted on said machine base in parallel to said main shaft and turned by said main shaft, each driven shaft being fixedly mounted with a big bevel gear at an outer end, an eccentric block at an inner end, and a big helical gear adjacent to said big bevel gear, the big helical gears of said driven shaft being meshed with the small helical gears of said main shaft respectively;

a crank mechanism, said crank mechanism comprising a connecting rod connected between the eccentric blocks of said driven shafts and disposed in parallel to said main shaft, a main sliding block reciprocated on a rack on said machine base and having a front side terminating in a U-frame and a rear side coupled to said connecting rod, and a link coupled between said connecting rod and the rear side of said main sliding block, said U-frame having two longitudinal rows of screw holes at a top side thereof;



two transmission shafts mounted on said machine base at two opposite sides and turned by the big bevel gears of said driven shafts respectively, said transmission shafts having a respective small bevel gear fixedly disposed at one end and respectively meshed with the big bevel gears of said driven shafts;

two sets of cam wheels of different sizes respectively mounted on said transmission shafts remote from said small bevel gears, and turned with said transmission shafts;

two sets of transverse sliding blocks transversely moved on said machine base between said transmission shafts;

two chuck units respectively mounted on said transverse sliding blocks at an inner side, each unit comprising a plurality of chucks, each chuck having a groove for holding a workpiece and two spring-supported steel balls in a respective hole in the groove for ejecting a workpiece;

two sets of rollers respectively mounted on said transverse sliding blocks at an outer side and respectively disposed in contact with said sets of cam wheels;

an eye block die mounted in the U-frame of said main sliding block and having a conical front end and a center hole disposed perpendicular to said main shaft;

a tool block fastened to said main sliding block and controlled to cut a workpiece to the desired length, said tool block comprising a block base fastened to the screw holes of the U-frame of said main sliding block by screws and having a vertical through hole and a horizontal hole in alignment with said eye block die and in communication with said vertical through hole for receiving a workpiece, a tool bar inserted into said vertical through hole and having a head disposed outside said block base, a cutting tool fixedly fastened to said tool bar at a bottom side, and a compression spring mounted around said tool bar and stopped above said block base to support the head of said tool bar above said block base;

a feed trough fixedly mounted on said machine base above said chuck units and adapted for receiving and feeding workpieces, said feed trough having a bevel bottom side, a transverse feed slot horizontally disposed at the lowest side edge of its bevel bottom side through which workpieces are guided out one by one, and bumper devices disposed adjacent to said transverse feed slot and adapted to limit the output of workpieces from said transverse feed slot;

a feed plate disposed below said feed trough, and adapted to carry workpieces one after another from said feed trough to a processing position for processing;

an axle longitudinally mounted on said machine base between said cam wheel sets;

a swing link adapted for gripping workpiece, said swing link having a fixed end pivoted to said axle and a free end mounted with a round rod and two jaw chucks on said round rod, each of said jaw chucks comprising a front jaw plate and the rear jaw plate, said front jaw plate comprising a fixed jaw tip, a movable jaw tip moved relative to said fixed jaw tip, and a spring connected between said movable jaw tip and said front jaw plate, the fixed end of said swing link being fixedly mounted with a gear meshed with a gear block at one end of a linking rod, said linking rod being suspended from an upright stand above said machine base by a return spring and having an opposite end mounted with a roller disposed in contact with one cam wheel of one of said cam wheel sets, said linking rod being forced by the corresponding cam wheel to turn said swing link up and down alternatively, causing said jaw chucks to pick up a workpiece from said feed plate, permitting caught a workpiece to be seized by said chuck units;

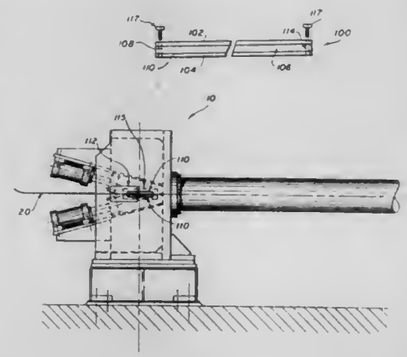
a swing arm turned about said axle, having one end mounted with a roller disposed in contact with one cam wheel of one of said cam wheel sets, and an opposite end mounted with a hammer bit, said swing arm being turned by the corresponding cam wheel to force said hammer bit downwards, causing it to hit said tool block in cutting a workpiece;

a feeding mechanism controlled to move said feed plate, permitting a loaded workpiece to be picked up from said feed plate by said jaw chucks, said feeding mechanism comprising a cam wheel mounted on one transmission shaft, a rocker having a first end pivoted to said machine base and a second end connected to said machine base by a spring and a projecting rod disposed in the middle and mounted with a roller in contact with the cam wheel of said feeding mechanism, an elongated sliding block connected to the second end of said rocker by an extension rod and moved in a sliding way on said machine base below said feed trough, said elongated sliding block having a bevel guide face stopped at a guide rod at one side of said feed plate, said guide rod being forced to push out said feed plate when said elongated sliding block is moved forwards by said rocker, permitting a loaded workpiece to be picked up by said jaw chucks; and

a stop block fastened to said machine base at one end near one side of the chuck units by an adjustment screw, and adapted for stopping a workpiece in the processing position.

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**5,740,690**
**METHOD FOR STRETCHER LEVELING METAL WITH A GRIPPING ELEMENT**
**Bertram A. Holloway, 150 Karen Dr., Washington, Pa. 15301**
**Continuation of Ser. No. 893,671, Jun. 5, 1992, Pat. No. 5,491,999, which is a continuation-in-part of Ser. No. 782,416, Oct. 25, 1991, Pat. No. 5,181,411, which is a continuation of Ser. No. 575,167, Aug. 29, 1990, Pat. No. 5,077,887, which is a division of Ser. No. 376,387, Jul. 6, 1989, Pat. No. 4,982,593, which is a continuation-in-part of Ser. No. 819,028, Jan. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 485,275, Apr. 15, 1983, abandoned. This application Feb. 13, 1996, Ser. No. 600,829**
**Int. Cl.[6] B21D** *25/04*
**U.S. Cl. 72—302** **3 Claims**



**1**. A method for stretcher leveling metal with a gripping element comprising the steps of:

providing a rectangular support plate having a first support surface;

pouring polyurethane material onto the first support surface;

allowing the polyurethane material to solidify on the first support surface such that it chemically bonds thereto, thereby forming a first polyurethane gripping pad on the support plate so that the polyurethane gripping pad acts to grip the metal being stretcher leveled within the stretcher leveler apparatus;

inserting the polyurethane gripping rod into a stretcher leveler apparatus;

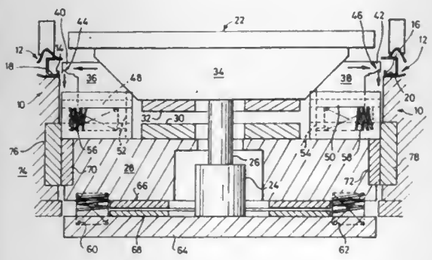
activating the stretcher leveler apparatus so the metal being stretched is gripped by the polyurethane gripping rod; and

stretcher leveling the metal so the metal is flattened and elongated.

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**5,740,691**
**HEMMING MACHINE**
**Josef Kovarovic, Hinckley; John Ralph Kowalewsky, Solihull, both of United Kingdom, and Gerrit Wesley Sloat, Grand Blan, Mich., assignors to Western Atlas U.K. Limited, United Kingdom**
**PCT No. PCT/GB95/00289, § 371 Date Jul. 29, 1996, § 102(e) Date Jul. 29, 1996, PCT Pub. No. WO95/21711, PCT Pub. Date Aug. 17, 1995**
**PCT Filed Feb. 13, 1995, Ser. No. 687,503**
**Claims priority, application United Kingdom, Feb. 14, 1994, 9402759; Feb. 18, 1994, 9403129**
**Int. Cl.[6] B21D** *39/02*
**U.S. Cl. 72—306** **21 Claims**

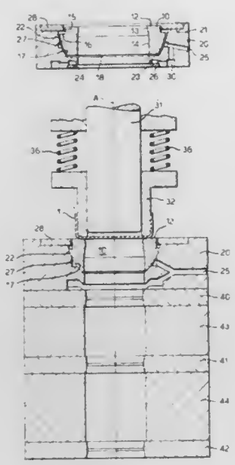


1. A press for prehemming and final hemming the internal upturned lip (**14**, **16**) of an aperture in a sheet metal component (**12**) comprising an anvil (**10**) on which the sheet metal component is held down so that the upturned lip to be hemmed is substantially in alignment with an edge of an opening in the anvil, a composite hemming tool (**40**, **42**) carried by a tool carrier (**36**, **38**) and adapted to perform prehemming and final hemming steps, a single drive means (**22**, **24**) which protrudes up from the press through the opening in the anvil so that a lower inclined leading edge (**44**, **46**) of the tool substantially registers with the upturned lip to be hemmed, said single drive means being so operable as to firstly force the tool outwards and into engagement with the lip (**14**, **16**) so as to bend the lip over until it is bent through substantially 90° from its upturned position, and thereafter to move the tool in a generally downward direction so as to compress the resulting downturned lip, and the tool (**40**, **42**) being mounted in a slideway (**48**, **50**) positioned so as to cause sliding movement of the tool outwards in a direction generally orthogonal to the upturned lip (**14**, **16**).

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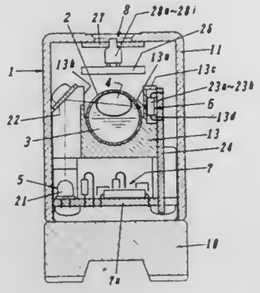
**5,740,692**
**CONTAINERS**
**Paul Robert Dunwoody, Wantage, United Kingdom, assignor to Carnaudmetalbox (Holdings) USA, Inc., Wilmington, Del.**
**Filed May 2, 1996, Ser. No. 643,248**
**Claims priority, application United Kingdom, May 26, 1995, 9510572**
**Int. Cl.[6] B21D** *22/00;22/21;* **B21B** *25/00*
**U.S. Cl. 72—347** **11 Claims**

1. Apparatus for forming a container body from a sheet metal component, said apparatus comprising a punch, an annular die axially aligned with the punch, and an annular blankholder surrounding the punch so arranged that relative motion as between the blankholder and an end face of the die restrains a periphery of the sheet metal component as the punch enters the annular die, characterised in that, the annular die has a spherical bearing surface portion centred on an effecting tilting movement relative to the longitudinal punch axis, and a die holder having an annular surface of arcuate cross-section cooperative with the spherical bearing surface portion of the annular die to impose a restraining force on sheet metal between the die end face and the blankholder.



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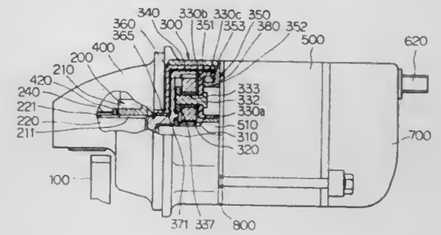
**5,740,693**
**PHOTOELECTRIC LEVELNESS DETECTOR**
**Yuzuru Tanaka, Daito, Japan, assignor to Daishowa Seiki Co., Ltd., Osaka, Japan**
**Filed Jun. 13, 1995, Ser. No. 490,028**
**Claims priority, application Japan, Jun. 13, 1994, 6-130513; Apr. 14, 1995, 7-89638**
**Int. Cl.[6] G01F** *23/00*
**U.S. Cl. 73—293** **17 Claims**



1. A levelness detector which comprises an elongated level tube having a longitudinal axis and containing a bubble in a liquid, a detector body for supporting said level tube therein, an electric projector for providing directly emitted light, means for directing said emitted light for passing across said level tube, a photoelectric sensor adapted to sense said emitted light and having a plurality of separate photoelectric receptor elements, said sensor and its receptor elements being arranged to receive the light arriving from across said level tube, said projector and said sensor being secured at predetermined positions relative to said level tube in said detector body, a discriminator circuit for identifying selected receptor elements to determine the location of light arriving across said level tube without interference by the bubble therein and thus to detect the levelness of said detector body, and at least one level indicator for providing a readout of said levelness.



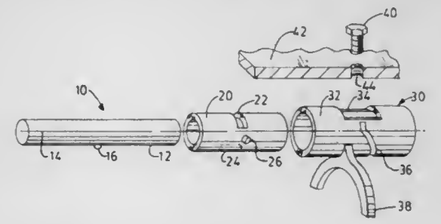
**5,740,694**
**STARTER WITH PLANETARY REDUCTION GEAR MECHANISM**
**Yasuhiro Nagao, Okazaki, and Mitsuhiro Murata, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**
**Filed May 29, 1996, Ser. No. 654,686**
**Claims priority, application Japan, Jun. 1, 1995, 7-135365**
**Int. Cl.[6] F02N** *11/02*
**U.S. Cl. 74—7 E** **11 Claims**



1. A starter comprising:
a pinion engageable with a ring gear of an engine;
a motor having an armature and an output shaft for transmitting a rotation thereof to the pinion;
a stationary member;
a planetary reduction gear mechanism including a sun gear provided on the output shaft of the motor, a planetary gear engaging the sun gear, a planet carrier supporting the planetary gear rotatably thereon and rotatable relative to the sun gear, and an internal gear surrounding and engaging the planetary gear to rotate the pinion; and
a one-way clutch including a plurality of rollers accommodated in each of a plurality of roller-accommodating grooves formed on a peripheral face of the planet carrier and contacting a peripheral face of the stationary member, and urging means held by the planet carrier to urge the rollers toward the peripheral face of the stationary member,
wherein the peripheral face of the planet carrier is placed radially outside the peripheral face of the stationary member, and the rollers are adapted to shift, by a centrifugal force of rotation of the planet carrier, to a clutch-disconnection side against the urging force of the urging means in an overrunning time.

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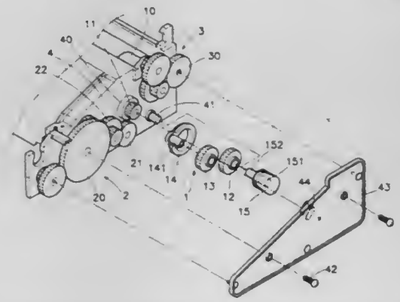
**5,740,695**
**SHIFT DEVICE FOR A MANUAL TRANSMISSION**
**David Allen Janson, Plymouth, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.**
**Filed Jan. 29, 1996, Ser. No. 593,067**
**Int. Cl.[6] F16H** *59/02*
**U.S. Cl. 74—337.5** **31 Claims**



1. A transmission shift rail, comprising:
a control rail;
a shift fork;
means for preventing translation of the shift fork when the control rail is translated; and
means for translating the shift fork when the control rail rotates.

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**5,740,696**
**TRANSMISSION UNIT FOR OFFICE MACHINE**
**Jaw-kuen Jean, Taipei Hsien; Chuan-Sheng Li, Taipei, and Bor-Harn Lin, Taipei Hsien, all of Taiwan, assignors to Sampo Corporation, Taipei, Taiwan**
**Filed Aug. 13, 1996, Ser. No. 695,959**
**Int. Cl.[6] F16H** *3/34*
**U.S. Cl. 74—354** **1 Claim**



1. A transmission unit mounted on the machine base of an office automation machine and covered with a cover and controlled to turn a first roller and a second roller of the machine, comprising a gear transmission mechanism, a first roller transmission mechanism driven and a second roller transmission mechanism respectively driven by said gear transmission mechanism to turn said first roller and said second roller, wherein said gear transmission mechanism comprises a motor, a rounded seat raised from one side of the machine base, a drive gear mounted on said rounded seat and coupled to said motor, an annular gear holder revolvably mounted around said rounded seat and having an upright gear shaft, an upright axle raised from the machine base adjacent to said rounded seat, a crank having a pivot hole at one end coupled to said upright axle and a gear shaft at an opposite end, a first planet gear revolvably mounted around the gear shaft of said crank and driven by said drive gear to turn said first roller transmission mechanism, a second planet gear revolvably mounted around the gear shaft of said annular gear holder and driven by said drive gear to turn said second roller transmission mechanism; said cover has an arched slot, which receives the gear shaft of said annular gear holder to guide the movement of said second planet gear along the teeth of said drive gear within a fixed angle.

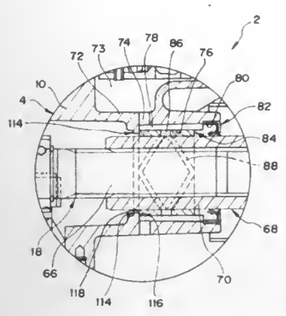
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**5,740,697**
**LUBRICATION STRUCTURE FOR A TRANSFER MECHANISM**
**Tetsuo Yamase, Shizuoka-ken, Japan, assignor to Suzuki Motor Corporation, Shizuoka-ken, Japan**
**Filed Sep. 20, 1996, Ser. No. 717,512**
**Claims priority, application Japan, Mar. 29, 1996, 8-104224**
**Int. Cl.[6] F16H** *37/06;57/04*
**U.S. Cl. 74—467** **4 Claims**

1. A lubrication structure for a transfer mechanism which distributes a driving force received from a transmission gear to two output shafts for outputting the driving force therefrom, comprising: a slide tube section for a yoke provided on a propeller shaft, said slide tube section being axially movably and nonrotatably coupled to a shaft section of said output shaft; a lubricating oil hole formed in an extended section of a transfer mechanism case covering said slide shaft section; a lubricating oil groove provided in an internal surface of said extended section and communicating with said lubricating oil hole, said lubricating oil groove being oriented in an axial direction of said extended section; a seal

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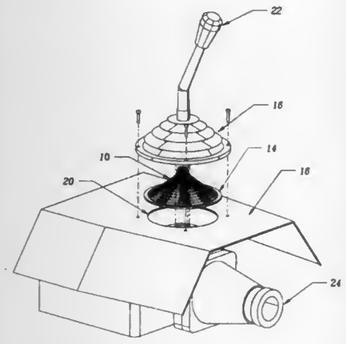
mechanism sealing between said slide tube section and an internal surface of said extended section at an outer end thereof; and a bushing provided between said extended section and said slide tube section so that the bushing covers said lubricating oil groove; and a first edge of said lubricating oil groove positioned adjacent an inner end of said extended section being closed and a second edge of said lubricating oil groove provided at an outer end of said extended section being open.

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**5,740,698**
**FLAME ATTENUATOR FOR POKE-THROUGH CONSTRUCTIONS**

**Donald J. Myronuk, 1369 Bryan Ave., San Jose, Calif. 95118-1812, and Jon F. Hoffman, 2445 Oro Dam Blvd., Ste 7, Oroville, Calif. 95966**

**Filed Oct. 7, 1996, Ser. No. 727,162**
**Int. Cl.[6] B61F *15/22*; F16H *59/04*; B27N *9/00***
**U.S. Cl. 74—473 R** **6 Claims**

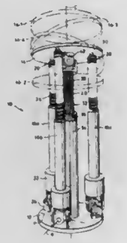


1. A flame attenuator comprising:
a plurality of overlapping metal mesh segments, said segments are configured so as to form an inverted funnel-shaped structure, said funnel-shaped structure includes a substantially circular opening at a top end thereof;
each of said segments overlaps two adjacent segments, and said segments form an opening at a top end thereof to receive a gear shift lever; and wherein
said attenuator is adapted to be placed inside a rubber dust boot of said gear shift lever.

**5,740,699**
**WRIST JOINT WHICH IS LONGITUDINALLY EXTENDIBLE**

**William John Ballantyne, Aurora; Bruce Clarke Walker, Bolton, and Al-Amyn Samji, Thornhill, all of Canada, assignors to Spar Aerospace Limited, Brampton, Canada**

**Filed Apr. 6, 1995, Ser. No. 417,699**
**Int. Cl.[6] G05G *11/00***
**U.S. Cl. 74—490.06** **19 Claims**



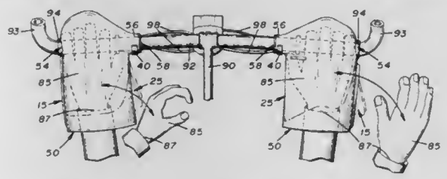
1. An extendible wrist mechanism comprising:
a base;
an end member;
at least three linear actuators disposed about an axis directed from said base to said end member, each actuator being mounted at one end to said base by a joint permitting a second end of said actuator to pivot radially toward and away from said axis and to pivot tangentially with respect to a circle centered about said axis and being mounted at said second end to said end member by a joint permitting pitch, yaw, and roll;
an extendible member extending from said base and mounted to said end member by a joint permitting pitch and yaw, but not rotation, of said end member about said axis, said extendible member to constraining said end member from movement in a direction transverse to said axis; and
each said linear actuator end member joint and said extendible member end member joint lying in a common plane.

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**5,740,700**
**HANDLEBAR HAND COVER**

**Steven A. Redmond, 17825 38th Pl. W., Lynnwood, Wash. 98037**

**Filed May 17, 1996, Ser. No. 648,993**
**Int. Cl.[6] B62K *21/12***
**U.S. Cl. 74—551.8** **8 Claims**



1. A handlebar cover for a handlebar having a hand grip and a bar extension, said cover comprising;
a. an outer shell capable of surrounding a hand grip on a handlebar, said outer shell having a medial side opening, a lateral side opening and a bar extension opening formed therein, said medial side opening and said lateral side opening being disposed on opposite sides of said outer shell so that said outer shell may be disposed around a hand grip of a handlebar, said bar extension opening being disposed on said outer shell to allow a bar extension attached to said handlebar to extend through said outer shell, said outer shell having a wrist opening formed therein to allow an user to extend his hand into said outer shell and grab the hand grip;



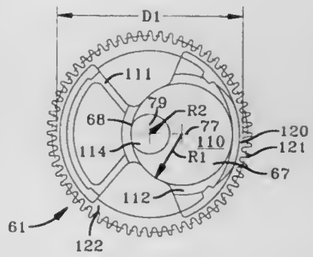
b. a first attachment means disposed along said medial side opening capable of selectively closing said medial side opening and allowing said medial side opening to open when the user's hand located inside said hand cover is forcibly extended through said medial side opening;
c. a second attachment means disposed along said lateral side opening capable of selectively closing said lateral side opening and allowing said lateral side opening to open when the user's hand located inside said hand cover is forcibly extended therethrough, said lateral side opening; and,
d. an inner lining attached inside said outer shell to provide additional warmth.

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**5,740,701**
**WASHING MACHINE TRANSMISSION DRIVE CONNECTION**

**Hans Hauser, Strongsville, Ohio, assignor to MTD Products Inc., Cleveland, Ohio**

**Continuation-in-part of Ser. No. 237,014, Apr. 29, 1994, Pat. No. 5,509,284. This application Mar. 29, 1995, Ser. No. 412,593**
**Int. Cl.[6] D06F *23/04*; F16H *21/18*; *19/04***
**U.S. Cl. 74—570** **38 Claims**



1. An eccentric gear having a center for use with a washing machine transmission, said eccentric gear comprising;
an extended bearing piece having a circumferential edge, said eccentric gear being rotatively supported to the washing machine transmission by an associated shaft having a radius, said circumferential edge of said bearing piece being displaced from said center of said eccentric gear by a distance substantially equal to the radius of the associated shaft.

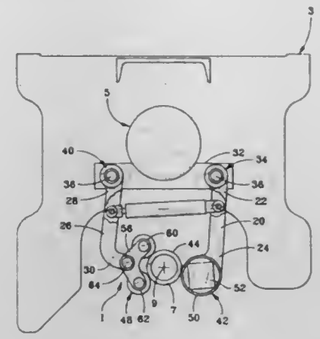
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**5,740,702**
**DEVICE FOR SPINNING DRILL PIPE IN A DRILL RIG**

**Donald W. Smith, Garland, Tex., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.**

**Filed Jul. 29, 1996, Ser. No. 681,591**
**Int. Cl.[6] B25B *13/50***
**U.S. Cl. 81—57.33** **4 Claims**

1. A pipe spinning device for spinning a drill pipe that is positioned on a drilling rig in a vertical plane comprising:
(a) a first elongated gripping arm having a first pivot end and a first pipe gripping end;
(b) a second elongated gripping arm having a second pivot end and a second pipe gripping end;
(c) first mounting means mounting said first pivot end on a support member, for pivoting said first gripping arm in a first plane substantially perpendicular to the drill pipe vertical plane;
(d) second mounting means mounting said second pivot end on a support member, for pivoting said second gripping arm in a second plane substantially parallel to said first plane;
(e) said first and second gripping arms being positioned with respect to each other to pivot alternatively toward and away from each other between a pipe gripping position and a gripping arm storage position, to cause said first and second gripping ends to alternatively move toward and away from each other;
(f) pipe spinning means on said first gripping end of said first gripping arm for frictionally contacting an outer surface of a pipe to rotatably spin the pipe about a rotation axis extending in the drill pipe vertical plane;
(g) pipe idler support means on said second gripping end of said second gripping arm for frictionally contacting an outer surface of a pipe to rotatably support the pipe as it spins about the rotation axis; and
(h) means for alternately moving said first and second gripping arms between said pipe gripping position and said gripping arm storage position, including gripping arm control means comprising:
a. first control means for locking in place against said pipe said pipe spinning means and said pipe idler means, while simultaneously causing said pipe spinning means to develop torque;
b. second control means for controlling pipe gripping pressure applied to said pipe by said pipe spinning means and said pipe idler means, to reduce damage done to said outer surface of said pipe; and
c. third control means for locking in said gripping arm storage position said first and second gripping arms.

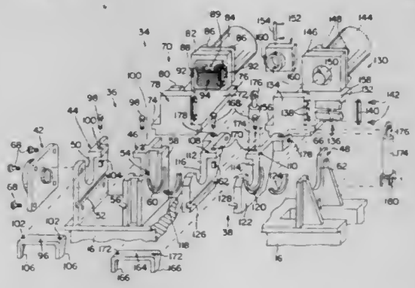


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**5,740,703**
**POWER WRENCH APPARATUS HAVING A POSITIVE SLIDING CLAMP**

**Robert G. Perry, 5335 E. Terrace Ave., Indianapolis, Ind. 46203**

**Filed Dec. 27, 1995, Ser. No. 579,119**
**Int. Cl.[6] B25B *13/50***
**U.S. Cl. 81—57.34** **25 Claims**



1. A tong apparatus for gripping a pipe, the apparatus comprising:
a support having a track, a first positive stop, and a second positive stop; and

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a jaw assembly having a base slidably coupled to the track of the support, the jaw assembly including a cylinder having a movable piston, the cylinder being rigidly coupled to the base, the jaw assembly also including a clamp for gripping the pipe, the clamp having a first jaw coupled to the movable piston and a second jaw coupled to the base, the first jaw having at least one stop located between the first and second positive stops of the support so that when the piston is extended from the cylinder the first jaw initially moves toward the second jaw until the first jaw engages the first positive stop, further extension of the piston causing the base, the cylinder, and the second jaw to move relative to the support toward the first jaw until the second jaw engages the pipe to grip the pipe and prevent rotation of the pipe relative to the jaw assembly and wherein retraction of the piston initially causes the first jaw to move away from the pipe prior to movement of the second jaw.

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**5,740,704**

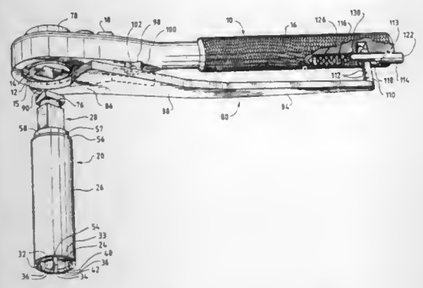
## SOCKET WRENCH

**Jerry A. Payne, Rte. 1, Box 42AA, Ravenswood, W. Va. 26164**

**Continuation-in-part of Ser. No. 334,872, Nov. 4, 1994, abandoned, which is a continuation-in-part of Ser. No. 225,691, Apr. 11, 1994, abandoned, which is a continuation-in-part of Ser. No. 199,110, Feb. 22, 1994, abandoned. This application Aug. 21, 1996, Ser. No. 696,889**

**Int. Cl.[6] B25B** *13/46;13/28;7/14*

**U.S. Cl. 81—60** **55 Claims**



1. A device for applying a torque to a fastener, the device comprising:

(a) a socket assembly having:

(i) a contractible and expandable socket;

(ii) a collet disposed substantially about the socket for effecting engagement of the socket with the fastener, the collet defining an aperture; and

(iii) a stud interconnecting the socket and the collet, the stud being received by the aperture, the stud having a recess; and

(b) a rotatable knob defining a bore for receiving the stud, the knob being rotatable to alternately engage and disengage the stud.

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**5,740,705**

## AUTOMATIC SCREWDRIVER JAWS FOR FACE FRAME HOLES

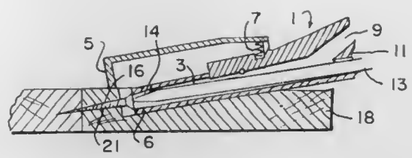
**Brian Graham, Boynton Beach, Fla., assignor to Nasco Industries Inc., Fort Lauderdale, Fla.**

**Filed Aug. 20, 1996, Ser. No. 700,147**

**Int. Cl.[6] B25B** *23/04;23/08*

**U.S. Cl. 81—430** **6 Claims**

1. Jaw apparatus adapted to be fitted to a driver head of an automatic screw feeding machine for holding a threaded fastener prior to and during insertion of the fastener in a face frame hole in



a support surface by a fastener driver of the automatic screw feeding machine, the jaw apparatus comprising:

an elongate tubular mandrel having first and second ends and an axial channel therethrough;

the mandrel attached at the first end to the driver head and the channel being in communication with a first passage through which a fastener is pneumatically passed, and in communication with a second passage through which the fastener driver passes;

cover means for covering the second end of the mandrel in a first mode of operation, the cover means including a flat plate disposed transverse to the axial channel, covering the second end, and having a dimension great enough to extend completely across the hole, in the first mode of operation;

connecting means for movably connecting the plate to the mandrel such that the plate will move progressively from the first mode of operation in which the fastener is held within a compartment formed by the mandrel channel and the plate to a second mode of operation in which the plate is forced away from covering the mandrel to release the fastener by the support surface across the hole as the mandrel is inserted in the hole; and

spring bias means for urging the cover means to the first mode of operation.

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**5,740,706**

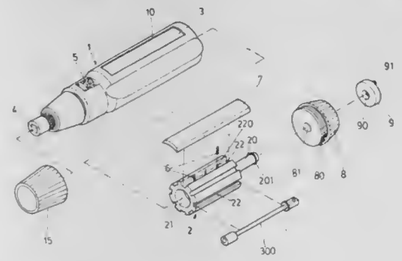
## TOOL HANDLE WITH CONCEALED STORAGE MEANS

**Sen Piao Tseng, P. O. Box 82-144, Taipei, Taiwan**

**Filed Oct. 2, 1996, Ser. No. 725,305**

**Int. Cl.[6] B25G** *1/08*

**U.S. Cl. 81—490** **1 Claim**



1. A tool handle comprising:

a handle body a backwardly opened receiving chamber on the inside, an axial shaft inside said receiving chamber, and a longitudinal opening through the periphery in communication with said receiving chamber, said longitudinal opening having a width gradually increased from a top side remote from said receiving chamber toward a bottom side facing said receiving chamber;

a rotary storage wheel mounted in said receiving chamber and turned on the axial shaft of said handle body, said rotary storage wheel comprising an axial wheel shaft raised from one side and extending out of said handle body, an axial coupling hole disposed at an opposite side and coupled to the axial shaft of said handle body, a plurality of longitudinal grooves spaced around the periphery, said longitudinal grooves including a longitudinal locating groove, and a plurality of longitudinal storage grooves adapted for storing tool bits and accessories, said longitudinal locating groove comprising a longitudinal row of upright stub rods and a plurality of springs respectively mounted on said upright stub rods, and an elongated cover plate supported on said springs above said longitudinal locating groove, said elongated cover plate having a substantially arched cross section fitting the longitudinal opening of said handle body, and a longitudinal row of downward stub rods respectively connected to said springs;

a cap fastened to said handle body through a screw joint to close the receiving chamber of said handle body, having a recessed back chamber, and an axial center through hole which receives the axial wheel shaft of said rotary storage wheel;

a rotary knob fastened to the axial wheel shaft of said rotary storage wheel and received in the recessed back chamber of said cap, and driven by hand to turn said rotary storage wheel, permitting said cover plate to be moved inside the receiving chamber of said handle body, and one longitudinal storage groove of said rotary storage wheel to be moved into alignment with the longitudinal opening of said handle body for loading or unloading tool bits and accessories.



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**5,740,707**

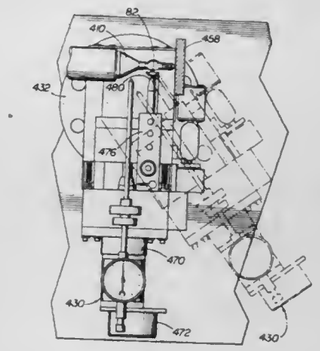
## MULTIFOCAL CONTACT LENS AND METHOD AND APPARATUS FOR MAKING THE SAME

**Jan B. Svochak, Watauga, and Colin Howard Wess, Euless, both of Tex., assignors to Tru-Form Optics, Inc., Euless, Tex.**

**Division of Ser. No. 538,099, Oct. 2, 1995. This application Oct. 21, 1996, Ser. No. 734,716**

**Int. Cl.[6] B23B** *3/00*

**U.S. Cl. 82—1.11** **4 Claims**



1. A method of making a contact lens, having a single optical axis and an anterior side, from a lens blank, comprising the steps of:

a. mounting the lens blank on a mandrel having an axis of rotation so that the single optical axis of the lens blank is perpendicular to the axis of rotation of the mandrel;

b. rotating the mandrel about the axis of rotation;

c. cutting a first vision surface, having a first radius of curvature, laterally along a first portion of the anterior side as the mandrel and lens blank rotate, so that the first vision surface has a first center of curvature disposed along the single optical axis;

d. cutting a second vision surface, having a second radius of curvature, laterally along a second portion of the anterior side as the mandrel and lens blank rotate, so that the second vision surface has a second center of curvature disposed along the single optical axis; and

e. cutting a transition surface, having a plurality of radii of curvature, laterally along a third portion of the anterior side, so that the third vision surface has a plurality of centers of curvature each disposed along the single optical axis between the first and second centers of curvature as the mandrel and lens blank rotate.

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**5,740,708**

## SUCTION MICROTOME, PARTICULARLY FOR HISTOLOGICAL WORK AND THE LIKE

**Hervé Tabone, Limonest, France, assignor to Microm Laborgeräte GmbH, Walldorf, Germany**

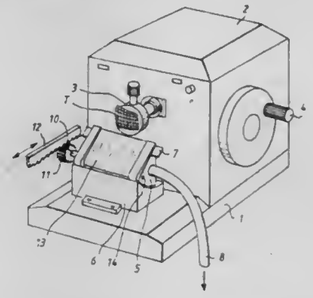
**PCT No. PCT/FR94/00648, § 371 Date Jan. 29, 1996, § 102(e) Date Jan. 29, 1996, PCT Pub. No. WO94/28390, PCT Pub. Date Dec. 8, 1994**

**PCT Filed Jun. 2, 1994, Ser. No. 557,077**

**Claims priority, application France, Jun. 2, 1993, 93 06801**

**Int. Cl.[6] B26D** *7/18*

**U.S. Cl. 83—100** **9 Claims**



1. A microtome for cutting sections from a piece of tissue, comprising:

a tissue carrier support for receiving said piece of tissue from which said sections are to be cut,

a knife carrier for interchangeably mounting a sectioning blade,

said knife carrier having a body and said body having an upper face at which said sectioning blade is mounted,

a mechanism suitable for providing an alternating movement between said tissue carrier support and said knife carrier combined with micrometric advancing movement between said tissue carrier support and said knife carrier perpendicular to said alternating movement,

a suction cavity formed in said upper face of said knife carrier,

said suction cavity being connected to a source of vacuum or reduced pressure, and

a cover pivotably mounted at said body of said knife carrier,

which cover can be pivoted to lie on said upper face of said body of said knife carrier,

said cover being profiled to cover said suction cavity and having a length also to partially cover said sectioning blade when covering said suction cavity,

said cover having a u-shaped cross-section, opened downwards,

whereby a narrow free space in form of a channel extending parallel to said upper face of said body of said knife carrier is provided between said upper face of said body of said knife carrier and said cover when said cover is pivoted to lie on said upper face of said body of said knife carrier, and whereby, when operating said source of vaccuum or reduced pressure, a flow of suctioning air exerted on said sections is provided through said narrow free space.

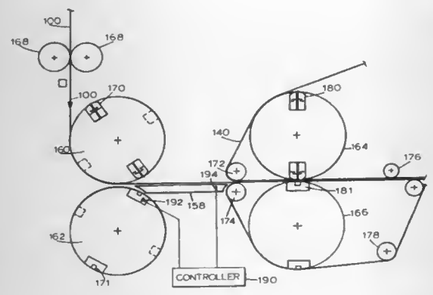
VOL 1209 ISS 3 APR 21 1998 UMI



## 5,740,709
## TWO STAGE CONTINUOUS WEB CUTTING SYSTEM AND METHOD

William A. Boston, and Frank A. Balow, both of Western Springs, Ill., assignors to Goss Graphic Systems, Inc., Westmont, Ill.

Continuation of Ser. No. 220,122, Mar. 30, 1994, abandoned. This application Aug. 21, 1996, Ser. No. 701,182
Int. Cl.[6] B26D *1/62*
U.S. Cl. 83—308 7 Claims




1. A web-cutting system for providing a product from a continuous web, comprising:

a web guiding arrangement having a partial-cut section and a finishing-cut section;

a primary cutting structure located adjacent the partial cut section, for providing a partially-cut segment in the continuous web along a cut line perpendicular to the web length, the partially-cut segment having a portion thereof cutout and a remaining portion thereof uncut;

a transport arrangement for moving the web in a direction parallel to the web length;

a secondary cutting structure spaced downstream from the primary cutting structure adjacent the finishing-cut section, including at least one cutting mechanism constructed and arranged for cutting the remaining uncut portion of the partially-cut segment along the cut line to provide the product;

means for sensing the cut line defined by the cutout portion of the web as provided by the primary cutting structure; and

means responsive to the sensing means for ensuring that the location of the secondary cutting structure in relation to the primary cutting structure will position the cutting mechanism of the secondary cutting structure to cut the remaining uncut portion of the partially-cut segment exactly on the cut line to provide the product.

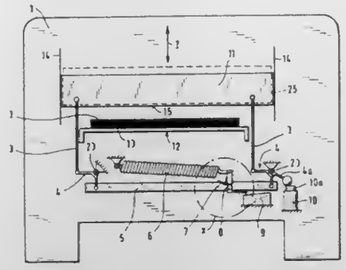
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## 5,740,710
## DEVICE FOR CUTTING SHEETS OF MATERIAL

Helmut Gross, Hofheim, and Adolf Rasch, Wiesbaden-Breckenheim, both of Germany, assignors to Adolf Mohr Maschinenfabrik GmbH & Co. KG, Hofheim am Taunus, Germany

Filed Jan. 25, 1996, Ser. No. 591,142
Claims priority, application Germany, Jan. 26, 1995, 195 02 291
Int. Cl.[6] B26D *7/02;7/22*
U.S. Cl. 83—375 11 Claims

11. An arrangement for cutting sheets of material, comprising: support means for holding the material; a blade spaced from said support means for cutting the material while held in said support means; a holdfast adjacent said blade and lowerable onto the material for securing the material to be cut in said support means; means connected to said holdfast for lowering said holdfast; spring means connected to said holdfast for raising said holdfast off the material; and interceptor means on said holdfast for braking said holdfast when said spring means raising said holdfast breaks; said interceptor means having means for engaging a detente to prevent dropping of said holdfast when said spring means is broken; a power train leading to said holdfast; a stationary stop extending into a path of said holdfast when said spring means is broken, said interceptor means comprising a detente component in said power train; two additional stops, said detente component pivoting in said power train between said two additional stops, said spring means being a first spring; a stationary component and a second spring weaker than said first spring, said first spring engaging said stationary component and said detente component and said second spring exerting a force on said detente component in opposition to a force exerted by said first spring; a frame for accommodating said holdfast; said power train comprising substantially rods having each one end engaging said holdfast; angled levers pivoting on said frame and engaging another end of said rods; a rod system connecting said levers; means operating in conjunction with one of said levers to engage said spring means with said frame and said detente component, said detente component being mounted in said rod system; said detente component having a vertex on said rod system, said detente component being angled and pivoting at said vertex on said rod system; said detente component having a first arm engaging said spring means; said detente component having a second arm with a free end operating in conjunction with said stationary stop; said stationary stop having a sliding detente for allowing engagement of said detente component with an interception position of said holdfast; said two stops comprising a bolt mounted in said rod system extending remote from an axis of said detente component and extending in a pivoting direction of said detente component; said means for lowering said holdfast comprising a hydraulic cylinder pivoting said holdfast.

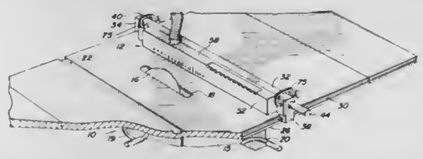


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## 5,740,711
## WORK PIECE GUIDE FOR SAW

Rudy R. Ramirez, 3756 E. 22nd St., Tucson, Ariz. 85713

Continuation-in-part of Ser. No. 33,857, Jan. 23, 1995. This application Dec. 26, 1995, Ser. No. 579,862
Int. Cl.[6] B26D *7/06*
U.S. Cl. 83—438 6 Claims



1. A work piece guide for attachment to a power saw workbench having a generally planar work surface with a cutting blade extending therethrough and of a type comprising: a rip fence adjustably positionable on said work surface in parallel relationship with respect to said blade, wherein the work piece guide includes:



(a) a generally elongated body having a generally rectangular cross section with first and second generally parallel opposite sides and first and second opposite edges;

(b) said body defining first and second spaced-apart vacuum chambers therein;

(c) said body defining a first plurality of aligned orifices located adjacent said first edge and one of said sides of said body and communicating with said first chamber;

(d) said body defining a second plurality of aligned orifices located adjacent said second edge and the other of said sides, said second plurality of orifices being of a smaller size than said first plurality of orifices and communicating with said second chamber;

(e) mounting means for detachably securing said body and said work surface rip fence in a first position with the first plurality of orifices disposed facing the saw blade and being generally perpendicular to the table surface and said body being positionable in a second position with said second plurality of orifices disposed facing the saw blade; and

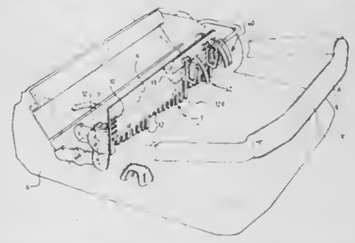
(f) first and second ports communicating respectively with said first and second chamber for selective connection to a vacuum source whereby a retention force will be imparted holding the work piece in place against one of said sides of said body.

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## 5,740,712
## PUNCHING DEVICES

Stephen Christopher Watkins, Redditch, and Geoffrey Felton, Stourport-on-Severn, both of United Kingdom, assignors to Acco-Rexel Group Services plc., United Kingdom

Continuation of Ser. No. 341,575, Nov. 22, 1994, abandoned. This application Apr. 14, 1997, Ser. No. 840,262
Claims priority, application United Kingdom, May 27, 1992, 9211191
Int. Cl.[6] B26F *1/04;1/14*
U.S. Cl. 83—549 10 Claims



1. A device for punching holes in sheet material, comprising:

a) a housing including a support for supporting the sheet material to be punched, said support having a plurality of apertures;

b) a punch mechanism including a punch body mounted in the housing for movement along a longitudinal direction, said punch body including a plate and a plurality of elongated integral punch members of one-piece with the plate, each integral punch member extending lengthwise from the plate along the longitudinal direction away from the plate for joint constant movement with the body, said punch mechanism further including an elongated auxiliary punch member extending lengthwise along the longitudinal direction and being mounted in an unlocked condition on the body for movement relative to the body along the longitudinal direction; each of said integral punch members and said auxiliary punch member being aligned along the longitudinal direction with a respective one of said apertures;

c) means for selectively locking the body in a force-transmitting relationship with the auxiliary punch member in a locked condition; and

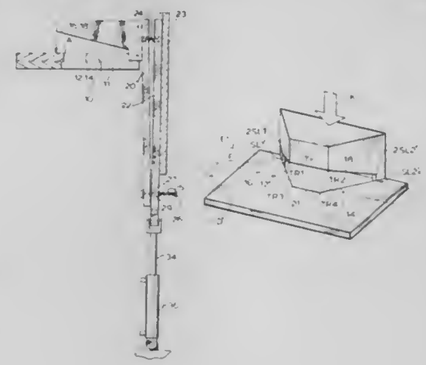
d) means for moving the punch mechanism between a retracted position in which the integral punch members and the auxiliary punch member in the unlocked condition are spaced from the apertures, and an advanced position in which the integral punch members and the auxiliary punch member in the locked condition extend through the apertures to form holes in the sheet material.

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## 5,740,713
## NOTCH CUTTER

Lothar Korb, 22 Burningham Cr., Ajax, Ontario, Canada, L1S 6A2

Continuation-in-part of Ser. No. 172,173, Dec. 23, 1993, Pat. No. 5,463,920. This application Sep. 12, 1995, Ser. No. 526,552
Int. Cl.[6] B26D *1/09;3/14*
U.S. Cl. 83—582 11 Claims



7. Fabric cutter comprising:

a pair of inwardly facing shear edges defining a first median plane and continuously converging in a first direction to define a first entrance and a first apex,

a pair of outwardly facing shear edges defining a second median plane and converging to a second apex, a projection of said outwardly facing shear edges in said first median plane converging at a substantially slightly lesser angle than said inwardly facing shear edges,

said second median plane sloping away from said first median plane in said first direction,

means for moving at least one of said pairs of shear edges relative to the other in a cutting direction, wherein said cutting direction is generally transverse to said first median plane, thereby bringing each of said outwardly facing shear edges and a respective one of said inwardly facing shear edges into contact with one another at a respective contact point and continuing the movement of said one pair of shear edges relative to the other in said cutting direction, and

means for supporting one of said pairs of shear edges for movement in a direction generally parallel to said first direction,

whereby said contact points continuously progress toward said apices during said movement in said cutting direction until said first and second apices contact each other.

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## 5,740,714
## ROTARY BLADE CLAMPING ASSEMBLY

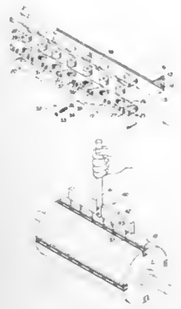
Mark S. Martin, 13760 Walton-Verona Rd., Verona, Ky. 41092

Continuation of Ser. No. 328,446, Oct. 25, 1994, abandoned. This application Nov. 25, 1996, Ser. No. 755,651
Int. Cl.[6] B26D *1/62*
U.S. Cl. 83—698.31 21 Claims

1. A blade clamping assembly to releasably retain an elongated flat blade in a transverse peripheral groove having a bottom wall

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and two sidewalls of a rotary cylinder in a manner whereby the blade is capable of being changed quickly, said blade clamping assembly comprising:

(a) an elongated retainer bar dimensioned to fit within the groove on the rotary cylinder and having an inside face and an outside face, said retainer bar having a substantially rectangular shape when viewed in a cross section taken normal to the direction of elongation of said retainer bar, said outside face receiving said flat blade therealong and being proximate one of the sidewalls of the transverse peripheral groove when said blade clamping assembly is placed in the groove to press the blade on the sidewall, said inside face being parallel to said outside face and to the elongated flat blade received along the outside face, said retainer bar having (i) at least one positioning cavity in the inside face and (ii) height adjusting means for adjusting the position of the retainer bar and blade in the groove;

(b) an elongated backing plate for the retainer bar and having an inside face and an outside face, said inside face of said backing plate lying parallel to said inside and outside faces of said retainer bar and facing said inside face of said retainer bar, said outside face of said backing plate being proximate the other of the sidewalls of the transverse peripheral groove when said blade clamping assembly is placed in the groove, said backing plate having at least one positioning cavity in the inside face thereof, each of which is in alignment with the respective positioning cavity in the retainer bar; and

(c) a compressive spacer disposed in both the positioning cavity of the retainer bar and the corresponding positioning cavity of the backing plate for each aligned positioning cavity to provide a space between said inside faces of said retainer bar and said backing plate and to exert a separating force on said inside faces of said retainer bar and said backing plate that is applied solely orthogonally to said inside faces to laterally force apart the elongated retainer bar and the elongated backing plate so as to define the space therebetween and, when the blade clamping assembly is positioned in the transverse peripheral groove of the rotary cylinder, to create a secure friction-fit of the blade against a sidewall of the transverse peripheral groove, and further each said compressive spacer is made of a resilient material for compressing together sufficiently to allow a removal of the blade from the groove and an insertion of another blade into the groove.

**5,740,715**

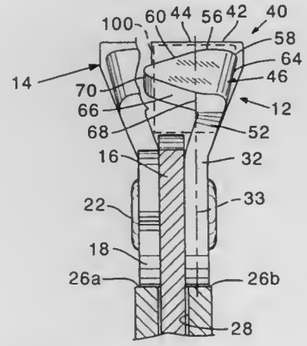
## CUTTER WITH BENT OVER DEPTH GAUGE

**James O. Burrows, Milwaukie; Randall D. Jensen, Oregon City, and Kent L. Huntington, Molalla, all of Oreg., assignors to Blount, Inc., Montgomery, Ala.**

**Continuation-in-part of Ser. No. 338,344, Nov. 14, 1994, Pat. No. 5,666,871. This application Apr. 28, 1997, Ser. No. 848,546**

**Int. Cl.[6] B27B** *33/14*

**U.S. Cl. 83—834** **36 Claims**




1. A cutter for an endless cutter device movable along a path for cutting a kerf in a workpiece, said cutter in an upright position comprising

a body portion disposed in a substantially upright plane and having forward and rearward regions,

a cutter portion on the rearward region of the body portion having a forwardly facing cutting edge extending transversely of said plane having a selected width as measured normal to the plane of the body portion and disposed at a selected elevation above the body portion, and

a depth gauge portion on the forward region of the body portion, said depth gauge portion comprising a plate portion bent over at substantially a right angle relative to the plane of the body portion and having an upper surface inclined substantially continuously downwardly from a rearwardly facing rear edge of the plate portion which is disposed at an elevation adjacent but below the elevation of the cutting edge to a forwardly facing front edge of the plate portion which is disposed at a lower elevation, said depth gauge portion having a maximum width region which has a width as measured normal to the plane of the body portion which is at least as great as the width of the cutting edge.

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**5,740,716**

## SYSTEM AND METHOD FOR SOUND SYNTHESIS USING A LENGTH-MODULATED DIGITAL DELAY LINE

**Timothy S. Stilson, Mountain View, Calif., assignor to The Board of Trustees of the Leland Stanford Juior University, Stanford, Calif.**

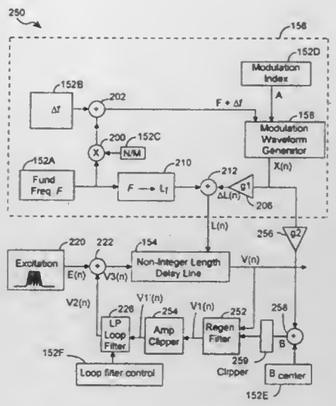
**Filed May 1, 1997, Ser. No. 847,005**

**Int. Cl.[6] G10H** *1/12;5/00*

**U.S. Cl. 84—661** **10 Claims**

1. An audio signal generation system, comprising:






a variable length, sampled data delay line having a multiplicity of integer positions from which data can be read; said delay line having a defined nominal length and an associated fundamental frequency;

an interpolation filter for reading data from the delay line at any specified non-integer position, the data read from the delay line by the interpolation filter representing an audio signal generated by the system;

an excitation source for inserting excitation data into said delay line;

a length modulation network for modulating the position at which data is read from the delay line by said interpolation filter, said length modulation network modulating said position at a frequency that is a function of said fundamental frequency; and

a loop filter coupled to the interpolation filter for filtering said data read from the delay line by said interpolation filter and for writing the filtered data into said delay line.

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**5,740,717**

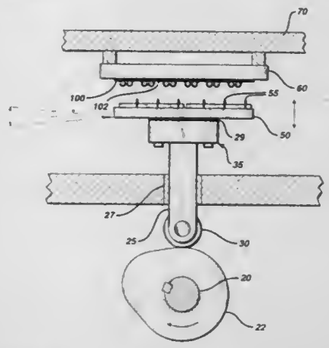
## BLISTER PACKAGE SCORING MACHINE

**Harry Sowden, Southampton, and Kenneth E. Fuller, Lansdale, both of Pa., assignors to McNeil-PPC, Inc., Skillman, N.J.**

**Filed Dec. 19, 1996, Ser. No. 770,022**

**Int. Cl.[6] B26F** *1/40*

**U.S. Cl. 83—879** **9 Claims**




1. In combination:

a. a machine for cutting having a work space with a cutting mechanism, comprising a plate wherein a material is held on said plate and the plate comes into contact with a cutting means comprising at least one knife blade, and wherein the cutting means is maintained at a certain predetermined distance away from the plate of the work space, the work space held by a spring means executing a spring force on the cutting means thereby isolated from motion of the remainder of said machine; and

b. a blister package comprising the material held on said plate, said blister package useful for containing sealed products therein; and

wherein the cutting means cuts said blister packages to a predetermined tolerance.

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**5,740,718**

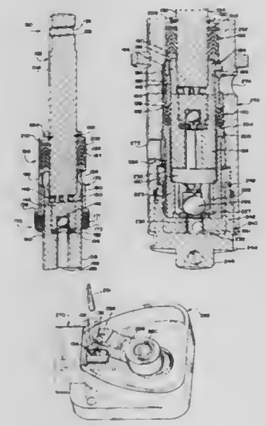
## MODULAR PISTON ROD ASSEMBLY WITH INTEGRATED HIGH-WEAR COMPONENTS

**Christopher Rathweg, Lafayette, Colo., assignor to Binks Manufacturing Company, Franklin Park, Ill.**

**Filed Oct. 17, 1996, Ser. No. 734,466**

**Int. Cl.[6] F16J** *15/18*

**U.S. Cl. 92—168** **30 Claims**



1. An assembly for fluidly sealing a piston member in a pump comprising:

a piston member having an outer surface;

a first compressible sealing material having an inner surface and disposed adjacent said piston member, said inner surface of said first sealing material sealingly contacting the outer surface of said piston member;

a second compressible sealing material having an inner surface and disposed adjacent said piston member, said inner surface of said second sealing material sealingly contacting the outer surface of said piston member; and,

a sleeve for mounting said first and second sealing materials in a spatial axial relation to each other, said sleeve having an end and a wall, said sleeve disposed adjacent the outer surface of said piston member and adapted for transferring through said wall a volume of fluid within said pump, wherein axial displacement of said sleeve at said end compresses both said first and second sealing materials.

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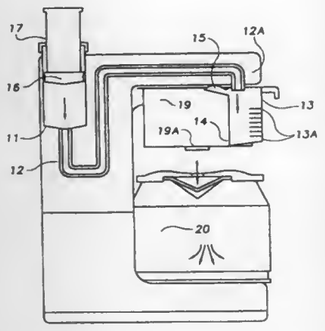


5,740,719

## COFFEE MACHINE FOR USE WITH SHELF-STABLE LIQUID COFFEE CONCENTRATE

Gary Triola, 71097 Hwy. 41, Pearl River, La. 70452, and Paul Gremillion, 210 Elmwood St., Slidell, La. 70460

Continuation-in-part of Ser. No. 617,059, Nov. 12, 1996, abandoned. This application Nov. 25, 1996, Ser. No. 753,424
Int. Cl.[6] A23F *3/00*
U.S. Cl. 99—302 R 7 Claims



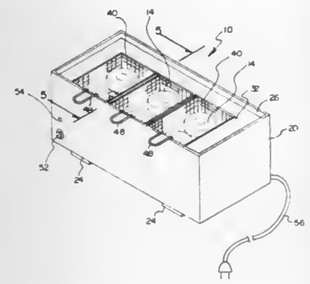

1. A coffee machine capable of brewing coffee in the home or office using shelf-stable liquid coffee concentrate comprising:
a shelf-stable liquid coffee concentrate storage reservoir;
a brewing chamber having an external surface;
means for manually delivering a selectively, variable quantity of liquid coffee concentrate from said storage reservoir to said brewing chamber; means for delivering a predetermined amount of water, to produce a desired quantity of coffee.

5,740,720

## MULTIPLE-DOUGHNUT FRYER SYSTEM

David L. Marsh, 336 W. Lawson Rd. #4, Dallas, Tex. 75253

Filed Jun. 5, 1997, Ser. No. 870,060
Int. Cl.[6] A47J *27/00;37/00;37/12*
U.S. Cl. 99—330 6 Claims



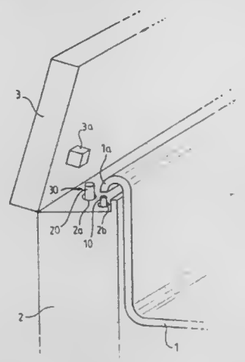

1. A Multiple-Doughnut Fryer System comprising:
a housing having a top opening;
a fry tank having an upper flange secured within said housing for containing cooking oil for frying a plurality of doughnuts;
three wire mesh baskets formed for removably projecting within said fry tank adjacent to one another, wherein each said wire mesh basket is formed for removably receiving at least two of said doughnuts;
an elongated heating element having a U-shaped cross-sectional area, wherein said elongated heating element is adjacent said fry tank for heating said cooking oil for frying said plurality of doughnuts; and
a pair of elongated insulated support members each having a bottom edge and a top edge, wherein said bottom edge is secured to a floor of said housing and wherein said top edge engages a bottom surface of said fry tank and an upper portion of said insulated support members engages said elongated heating element thereby supporting said elongated heating element and said fry tank.

5,740,721

## ELECTRICAL SAFETY DEVICE FOR FOOD HEATING APPLIANCE

Jean-Claude Bizard, Fontaine-les-Dijon; Bernard Beugnot, Is-sur-Tille, and Jean-Marie Thevenin, Bourberain, all of France, assignors to SEB S.A., Ecully, France

PCT No. PCT/FR95/01103, § 371 Date May 15, 1997, § 102(e) Date May 15, 1997, PCT Pub. No. WO96/05761, PCT Pub. Date Feb. 29, 1996
PCT Filed Aug. 22, 1995, Ser. No. 793,773
Claims priority, application France, Aug. 22, 1994, 94 10588
Int. Cl.[6] A47J *37/00;37/12*
U.S. Cl. 99—337 12 Claims




1. Cooking appliance comprising a casing (2) in which are integrated a cooking receptacle (1) intended for the cooking of foodstuffs, heating means in thermal communication with the cooking receptacle (1), detecting means (30) arranged on the one hand to detect if the cooking receptacle (1) is substantially empty and in this case to open the electric supply circuit of the heating means, and on the other hand to detect if the cooking receptacle (1) is filled in a manner to achieve a preestablished minimum weight, in order in this case to close the electric supply circuit of the heating means, characterized in the cooking receptacle (1) is removable and in that the detecting means (30) comprise a first activating element (10; 43) activated by the cooking receptacle (1) when this latter is in place in the casing (2), and a second activating element (20; 42) activated by the cover (3) of the appliance when the cover (3) is closed on the cooking receptacle (1), said second activating element (20; 42) being capable of acting in a manner to inhibit the action of the first activating element (10; 43) when the cooking receptacle (1) is not in place in the casing (2) or when the cooking receptacle (1) has not achieved the predetermined minimum weight.

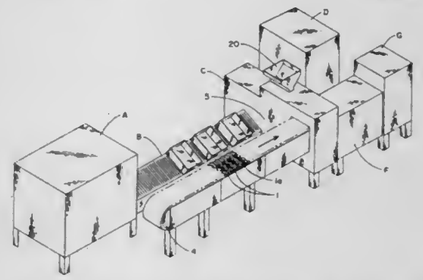


5,740,722

## MACHINE FOR THE AUTOMATIC PRODUCTION OF MEAT AND/OR VEGETABLE KEBABS

Michel Emsens, Z.A. du Parc, 42490 Fraisses, France

PCT No. PCT/FR95/01218, § 371 Date Apr. 15, 1997, § 102(e) Date Apr. 15, 1997, PCT Pub. No. WO96/11579, PCT Pub. Date Apr. 25, 1996
PCT Filed Sep. 22, 1995, Ser. No. 817,294
Claims priority, application France, Oct. 17, 1994, 94 12774
Int. Cl.[6] A22C *17/00;17/02;* A47J *37/04*
U.S. Cl. 99—419 10 Claims




1. A machine for automatically producing a kebab, said kebab being a plurality of ingredients having a specified shape with a spit skewered therethrough, comprising:
support means (1) for containing said plurality of ingredients;
said support means including at least one recess, each recess having a shape substantially congruent to said specified shape of said plurality of ingredients and each recess having a first end and a second end;
said support means including first (1*b*) and second (1*c*) open-ended clearances, each said open ended clearance (1*b*) (1*c*) fitting a tube (5);
said first end of said recess communicating with said first (1*b*) open-ended clearance; said second end of said recess communicating with said second (1c) open-ended clearance; and skewering means for skewering said spit through said plurality of ingredients contained in said support means, said skewering means including
said tube (5);
inserting means (6) (7) for inserting said spit (P) into said tube (5) thereby forming a spit/tube assembly;
said inserting means including pushing means for pushing said spit such that said spit protrudes beyond said tube (5) in said spit/tube assembly;
translating means (15) for translating said spit/tube assembly from a first position adjacent said support means to a second position inside said recess such that said plurality of ingredients is skewered by said spit/tube assembly; and
withdrawing means for withdrawing said tube from said spit/tube assembly whereby said spit remains skewered through said plurality of ingredients.

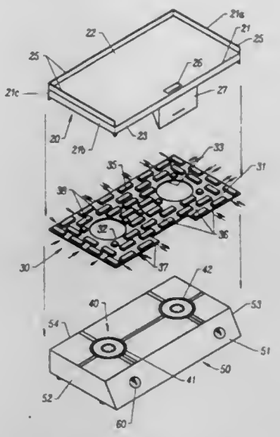
5,740,723

## PORTABLE OUTDOOR HIGH TEMPERATURE GRIDDLE

Michael D. Lin, 540 Chestnut Ave., San Bruno, Calif. 94066

Continuation-in-part of Ser. No. 673,331, Jun. 28, 1996, abandoned, which is a continuation-in-part of Ser. No. 559,741, Nov. 15, 1995, abandoned. This application Mar. 19, 1997, Ser. No. 820,532
Int. Cl.[6] F24C *3/00;* A47J *37/10*
U.S. Cl. 99—422 7 Claims

1. A portable, outdoor, high temperature griddle, comprising:
a thick, solid metallic plate means having upper and lower surfaces, said upper surface forming a cooking surface, said plate means having sufficient thickness to withstand continuous, direct and intense heat applied to its lower surface without deforming,



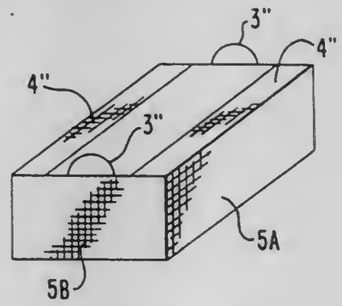

heating means for applying a direct, intense flame to said lower surface of said solid metallic plate means,
portable, wind-deflecting support means for carrying said solid metallic plate means, said portable, wind-deflecting support means having an upper surface formed with an array of wind-guiding passageways which channel any cross-wind along a tortuous pathway to prevent said cross-wind from blowing out or adversely affecting the flame under said metallic plate means, and,
heating control means for regulating the application of heat to said lower surface of said solid metallic plate means.

5,740,724

## DEVICE FOR COOKING OR GRILLING SMALL PIECES OF FOOD AND METHOD OF USE

Marvin Fabrikant, and Patricia Fabrikant, both of 5149 Tilden St., N.W., Washington, D.C. 20016

Continuation-in-part of Ser. No. 625,255, Apr. 1, 1996, which is a continuation-in-part of Ser. No. 571,772, Dec. 13, 1995, Pat. No. 5,560,286, which is a continuation-in-part of Ser. No. 442,931, May 17, 1995, Pat. No. 5,520,098. This application Apr. 5, 1996, Ser. No. 628,253
Int. Cl.[6] A47J *43/18*
U.S. Cl. 99—426 27 Claims




1. A device for cooking or grilling small pieces of food comprising a basket including a perforated metal made of a material suitable for cooking or grilling small pieces of food having openings throughout the perforated metal, said basket having a base and four adjoining side walls, wherein two opposite side walls each have an inwardly facing top edge to retain small pieces of food when the device is shaken or moved to turn the small pieces of food over.

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5,740,725

## WASTE PLASTICS COMPACTING APPARATUS

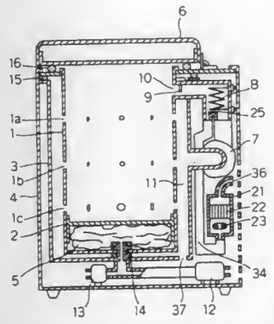
Takeshi Tomizawa; Kunihiro Ukai, both of Ikoma; Tatsuo Fujita, Osaka, and Jiro Suzuki, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 27, 1996, Ser. No. 622,808

Claims priority, application Japan, Mar. 27, 1995, 7-067755; Jul. 5, 1995, 7-169607; Jul. 11, 1995, 7-175117; Oct. 16, 1995, 7-267449

Int. Cl.[6] B30B *15/34*

U.S. Cl. 100—92 22 Claims



1. A waste plastics compacting apparatus using hot air to soften the waste plastics comprising:

a hot air generating part for generating hot air, said hot air generating part comprising a heater for heating air and a blower for blowing the hot air,

accomodating container for accommodating waste plastics and for receiving the hot air,

a bottom plate sliding up and down inside of said accommodating container for varying an inner volume of said accommodating container,

an inflatable flexible container provided beneath said bottom plate,

an air pump connected to said inflatable flexible container for inflating or deflating said inflatable flexible container to raise said bottom plate responsive to inflating and to lower said bottom plate responsive to deflating,

an outer container provided outside of, and surrounding, said accommodating container,

a lid connected to said accommodating container for allowing for the loading and unloading of the waste plastics into said accommodating container, and

a hot air circulation passage for permitting the hot air to flow through the waste plastics compacting apparatus, wherein

a first opening is provided in an upper part of the accommodating container,

a second opening is provided at substantially the same height of said first opening or beneath it, and

said hot air circulation passage is disposed such that the hot air circulates by flowing in from the first opening in the upper part of the accommodating container toward a lower part in the accommodating container, and returning to the blower after once flowing out from the second opening into a hot air return route formed between said accommodating container and said outer container.

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5,740,726

## WASTE MATERIAL PRESS WITH DISTANCE LEDGES AND RETAINING CLAWS

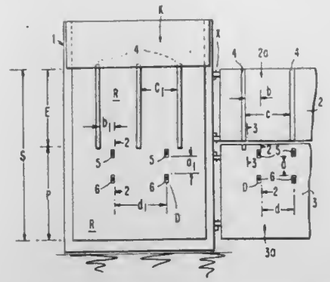
Hermann Schwelling, Hartmannweg 5, 88682 Salem, Germany

Filed Dec. 21, 1995, Ser. No. 576,805

Int. Cl.[6] B30B *15/00;9/30*

U.S. Cl. 100—220 6 Claims

1. A waste material press comprising a rear wall, side walls and first and second front doors, the rear wall, the side walls and the



front doors forming an essentially rectangular filling shaft and an essentially rectangular pressing shaft below the filling shaft, the first front door being part of the filling shaft and the second front door being part of the pressing shaft, and a pressure ram vertically movable in the filling and pressing shafts, stationary distance ledges mounted at least one of at the rear wall and the first front door, the rear wall and the second front having openings, retaining claws extending into the pressing shaft being pivotally mounted in the openings for holding down any waste material compressed in the pressing shaft or a finished bale which has not been tied.

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5,740,727

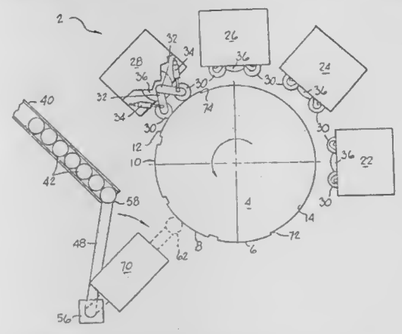
## CAN DECORATING APPARATUS

Frank L. Shriver, Lakewood, Colo., assignor to Coors Brewing Company, Golden, Colo.

Filed Jun. 12, 1996, Ser. No. 662,789

Int. Cl.[6] B41F *17/08*

U.S. Cl. 101—40 7 Claims



1. Apparatus for printing a desired multicolor pattern on a cylindrical outer surface of a can body comprising:

a rotatable printing wheel having a generally cylindrical outer surface;

rotating means for continuously rotating said rotatable printing wheel at a constant predetermined velocity;

a plurality of circumferential spaced apart arcuately shaped plates mounted on and projecting radially outwardly from said generally cylindrical outer surface;

each of said plates having differing arcuately shaped printing images formed thereon and projecting radially outwardly therefrom;

a plurality of circumferentially spaced apart ink fountains mounted at locations spaced from said arcuately shaped printing images in a radial direction;

each of said plurality of circumferentially spaced apart ink fountains having a different color of ink contained therein and having at least one movable ink applying roll mounted therein;

moving means for moving said at least one movable ink applying roll between a first location to contact said printing images and a second location not to contact said printing images;



each of said plurality of circumferentially spaced apart ink fountains applying a coating of ink of a desired color to said arcuately shaped printing images on only one of said arcuately shaped plates;

a stationary track for holding a plurality of can bodies;

a single pivotally mounted transfer arm;

a rotatable mandrel mounted on said transfer arm and having one exposed end;

pusher apparatus for pushing one of a plurality of can bodies on said stationary track over said one exposed end and onto said rotatable mandrel for rotation therewith;

pivot means for pivoting said transfer arm to a printing location where a can body on said rotatable mandrel may be tangentially contacted by said arcuately shaped printing images in succession to decorate a can body;

drying means located diametrically opposite to said tangential contact between a can body and said arcuately shaped printing images to cure ink deposited on a portion of a can body before said portion is in position to again be in tangential contact with another one of said arcuately shaped printing images;

a conveyor for receiving decorated can bodies and conveying them to further processing stations;

said pivot means pivoting said transfer arm from said printing location to a location adjacent to said conveyor; and

force applying means to move a decorated can body off of said rotatable mandrel and onto said conveyor.

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5,740,728

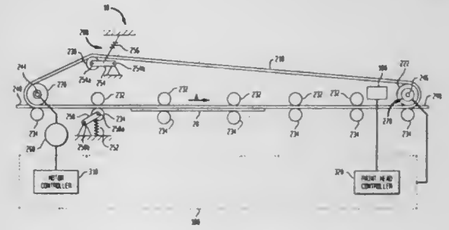
## MAILING MACHINE

Christopher DeBarber, Woodbury, and Gerald C. Freeman, Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 23, 1996, Ser. No. 717,788

Int. Cl.[6] B41L *47/46*

U.S. Cl. 101—93 17 Claims



1. A mailing machine comprising:

a print head module having individual print elements which are selectively energizable for printing on an envelope;

a transport means for feeding the envelope past the print head, the transport means including:

a pulley shaft rotatively mounted to a frame;

a pulley in proximate location to the print head module fixably mounted to the pulley shaft;

an endless belt extending around and in driving engagement with the pulley, the endless belt engaging the envelope and feeding the envelope past the print head module;

drive means for causing the endless belt to rotate; and

encoder means operatively coupled to the pulley shaft for providing signals indicative of the position of the pulley;

and control means in operative communication with the print head module, the encoder means and the drive means for synchronizing the feeding of the envelope with energizing of the elements of the print head module in response to the encoder signals.

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5,740,729

## PRINTING APPARATUS AND METHOD FOR INSPECTING PRINTED MATERIALS

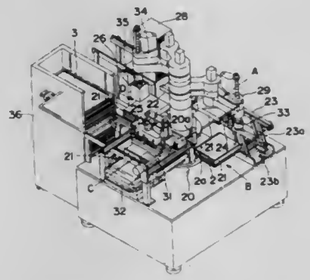
Osamu Hikita; Syoji Sato, both of Neyagawa; Toshinori Mimura, Moriguchi; Kazue Okanoue, Kadoma, and Youichi Nakamura, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Continuation of Ser. No. 247,235, May 23, 1994, abandoned. This application Sep. 29, 1995, Ser. No. 536,262

Claims priority, application Japan, May 21, 1993, 5-118892

Int. Cl.[6] B41M *1/12;1/34;* B41F *15/18*

U.S. Cl. 101—126 13 Claims



1. A printing apparatus for use in printing material in a predetermined pattern on boards, said printing apparatus comprising:

a plurality of board-securing tables to which the boards are to be respectively secured;

a rotary body supporting said board-securing tables at a plurality of angularly spaced apart positions;

a board supporting device for intermittently rotating said rotary body together with said board-securing tables so as to stop said board-securing tables at a plurality of stopping positions including a fixing position, a recognizing position, a printing position, and an inspecting position;

a board feed device for feeding the boards to said board-securing tables at said fixing position;

a board discharge device for discharging the boards from said board-securing tables at said fixing position;

a recognizing device for recognizing fixed positions of the boards relative to said board-securing tables at said recognizing position;

a printing device for printing the printing material on the boards at said printing position;

an inspecting device for inspecting, at said inspecting position, each of the boards to determine, for each of the boards, an actual total area thereof covered by the printing material printed thereon; and

a controlling part for receiving area inspection data from said inspecting device representing the total area covered by the printing material printed on each of the boards, and for feedback-controlling said printing device on the basis of said area inspection data so as to provide a feedback control of said printing device which is independent of an average film thickness of the printing material printed on each of the boards.

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5,740,730

## APPARATUS FOR DEPOSITING SOLDER AND ADHESIVE MATERIALS ONTO A PRINTED CIRCUIT BOARD

Curtis C. Thompson, Sr., Meridian, Id., assignor to Micron Electronics, Inc., Nampa, Id.

Filed Sep. 3, 1996, Ser. No. 706,448

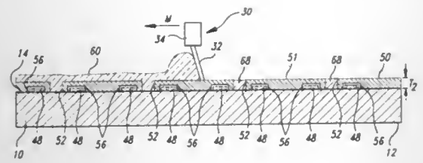
Int. Cl.[6] B05C *17/06;* B41L *13/12*

U.S. Cl. 101—127 20 Claims

1. A solder paste and adhesive dispenser that deposits solder paste pads and adhesive pads onto a printed circuit board for

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surface mounting electrical components to the printed circuit board, comprising:

a first stencil having a first thickness of a desired solder pad thickness and a plurality of first openings through which a solder paste is deposited onto the printed circuit board to form a plurality of first pads of solder paste on the printed circuit board in a first pattern; and

a second stencil having a second thickness of a desired adhesive thickness, a plurality of second openings, and at least one recess in a bottom face of the second stencil configured to receive the plurality of first pads when the second stencil is positioned on the board, wherein the second openings are arranged in a second pattern with respect to the first openings so that an adhesive material deposited onto the printed circuit board through the second opening forms a plurality of second pads of adhesive on the board in the second pattern.

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**5,740,731**

**IMAGE WRITING DEVICE FOR A STENCIL PRINTER**

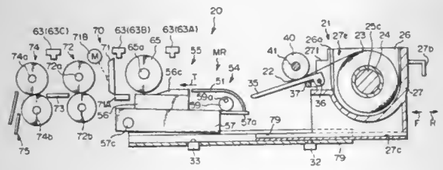
**Hideyuki Kagawa, Sendai, Japan, assignor to Tohoku Ricoh Co., Ltd., Miyagi-ken, Japan**

**Filed Sep. 12, 1996, Ser. No. 713,971**

**Claims priority, application Japan, Dec. 22, 1995, 7-335131; Jul. 29, 1996, 8-199179**

**Int. Cl.[6] B41L *13/04***

**U.S. Cl. 101—128.4** **36 Claims**



1. A device for writing an image in a stencil, comprising:

a body;

stencil storing means for storing the stencil in a form of a roll such that the stencil can be paid out from the roll;

master making means for perforating the stencil paid out from the roll to thereby make a master;

cutting means for cutting off the master from the stencil;

a stencil holding unit movable between an operative position defined in said body, and an inoperative position remote from said operative position and allowing the roll to be loaded and unloaded from said stencil storing means;

guiding means for guiding said stencil holding unit between said operative position and said inoperative position;

stencil guiding means included in said stencil holding unit, and for laying a leading edge of the stencil paid out from the roll thereon;

stencil conveying means included in said stencil holding unit, and for conveying the stencil in contact with said stencil guiding means via the leading edge of the stencil; and

stencil drive means for driving said stencil conveying means.

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**5,740,732**

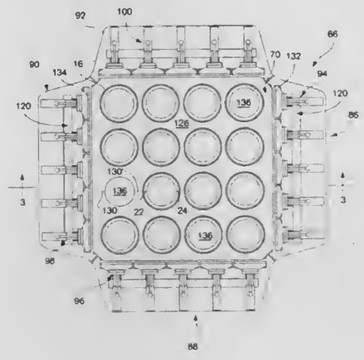
**APPARATUS FOR SIMULTANEOUSLY MANUFACTURING MULTIPLE ANNULAR SHAPED SCREEN FRAMES**

**William M. Karlyn, Lynnfield, and David A. Scher, Groveland, both of Mass., assignors to AutoRoll Machine Company, LLC, Middleton, Mass.**

**Division of Ser. No. 512,770, Aug. 9, 1995, abandoned. This application Dec. 17, 1996, Ser. No. 768,212**

**Int. Cl.[6] B41F *15/36***

**U.S. Cl. 101—128.4** **20 Claims**



1. Apparatus for use in the simultaneous manufacture of a plurality of silk-screens for use in a silk-screen printing process, each of said plurality of silk-screens comprising an annular-shaped screen frame, top and bottom planar surfaces being provided on each said annular-shaped screen frame and a circular-shaped screen being adhered to the top surface of each said annular-shaped screen frame, said apparatus comprising:

(a) means for stretching a woven fabric defined by a top surface and a bottom surface and comprising warp and weft threads each terminating in ends, said stretching means comprising opposed stretching members for engaging the ends of the warp and weft threads to be stretched and for providing the woven fabric in a horizontal plane;

(b) a plurality of annular-shaped screen frames, a top surface and a bottom surface being provided on each of said plurality of annular-shaped screen frames, and indexing means being provided on the top surface of each of said plurality of annular-shaped screen frames;

(c) a horizontally disposed support member defined by parallel, linear side edges and parallel linear end edges intersecting perpendicularly therewith, a top planar surface being provided on said support member for supporting said plurality of annular-shaped screen frames, indexing means being provided on the top surface of said support member for association with the indexing means provided on each of said plurality of annular-shaped screen frames whereby to align said plurality of screen frames in at least one row or column of annular-shaped screen frames; and

(d) means provided in combination with said horizontally disposed support member for raising the support member vertically upwardly and downwardly toward and away from the bottom surface of said woven fabric.



**5,740,733**

**METHOD FOR PRODUCING A HALF-TONE STENCIL INCLUDING REFERENCE STRUCTURES FOR ASSESSING ACCURACY OF PRINTING WITH THE STENCIL**

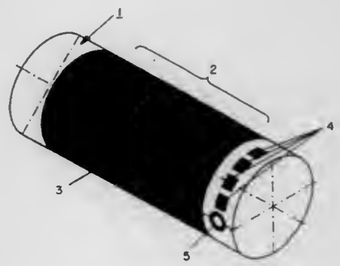
**Heinz Mungenast, Kufstein, Austria, assignor to Schablonentechnik Kufstein Aktiengesellschaft, Kufstein, Austria**

**Filed Apr. 7, 1997, Ser. No. 833,531**

**Claims priority, application European Pat. Off., Apr. 19, 1996, 96106203**

**Int. Cl.[6] B41C *1/14***

**U.S. Cl. 101—128.4** **16 Claims**



1. A process for producing a half-tone stencil comprising:

providing a basic stencil element having a predetermined stencil pattern area for receiving a stencil pattern hole structure thereon to form a stencil pattern; and

forming a plurality of reference hole structures having different degrees of permeability outside the pattern area on the basic stencil element.

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**5,740,734**

**DRUM AND STENCIL FOR A STENCIL PRINTER**

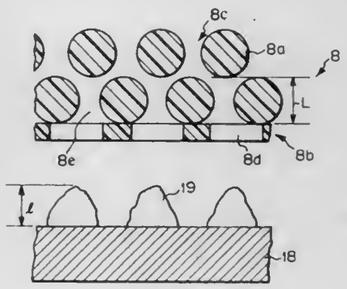
**Tomiya Mori, Kakuda, and Kazuto Yaegashi, Iwanuma, both of Japan, assignors to Tohoku Ricoh Co., Ltd., Miyagi-ken, Japan**

**Filed Feb. 8, 1996, Ser. No. 598,432**

**Claims priority, application Japan, Feb. 10, 1995, 7-022916; Jun. 30, 1995, 7-166178**

**Int. Cl.[6] B41C *1/14***

**U.S. Cl. 101—128.21** **10 Claims**



1. A stencil comprising a thermoplastic resin film and a porous substrate adhered to each other, said porous substrate including a surface having an average roughness of 5 μmRz to 45 μm Rz on a side of said substrate adhered to said thermoplastic resin film.

**5,740,735**

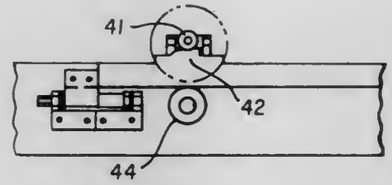
**APPARATUS FOR SECURING A SURFACE**

**Jean Xydias, Pittsford, and John Philip Roesser, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 2, 1996, Ser. No. 595,682**

**Int. Cl.[6] B41F *9/10***

**U.S. Cl. 101—169** **9 Claims**



1. An apparatus for precisely locating and securing a first, stationary surface in proximate rotating contact with a second, moving surface, comprising:

a frame for supporting the first surface;

means associated with said frame for compressively holding at least a portion of said first surface so as to expose a lateral edge portion thereof, said means exerting a constant uniform force substantially lengthwise along an outward face of said at least portion;

said means for holding comprising at least one clamp member pivotably connected to said frame for adjustably holding said first surface stationary against said frame and aligned continuously with said second surface, said clamp member being adapted to alternately receive and release said first surface; and,

a cam member having successively elevated first, second and third plateaus arranged thereon and a cooperating cam follower mounted for movement among said first, second and third plateaus thereby adjustably urging the clamp member to selectively receive and release the first surface.

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**5,740,736**

**PRINTING PRESS**

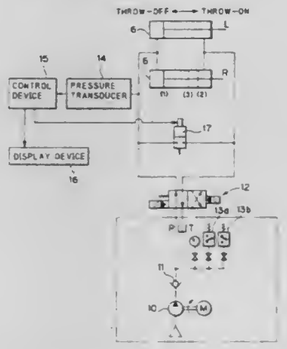
**Hideaki Toyoda, Chiba, Japan, assignor to Komori Corporation, Tokyo, Japan**

**Filed Dec. 12, 1996, Ser. No. 764,259**

**Claims priority, application Japan, Jan. 12, 1996, 8-003644**

**Int. Cl.[6] B41F *7/02***

**U.S. Cl. 101—218** **6 Claims**



1. A printing press comprising one cylinder having a notched portion and an effective impression area; another cylinder having a

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notched portion and an effective impression area; an eccentric bearing for supporting said other cylinder; a lever locked on one end side to said eccentric bearing; a fluid pressure cylinder for acting on the other end side of said lever to turn said eccentric bearing; adjusting means for adjusting the pressure of contact between said one cylinder and said other cylinder; fluid pressure detecting means for detecting a fluid pressure which acts on said fluid pressure cylinder when said other cylinder is pressed against said one cylinder; and display means for displaying a printing pressure between said one cylinder and said other cylinder that has been calculated from a detection signal produced by said fluid pressure detecting means when said notched portions of said two cylinders face each other, and a detection signal produced by said fluid pressure detecting means when said effective impression areas of said two cylinders face each other.

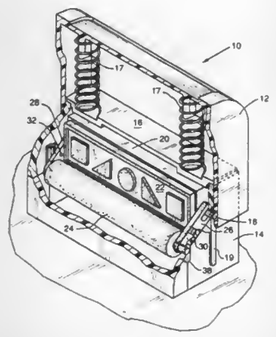
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**5,740,737**

## HANDSTAMPING APPARATUS

**Donald J. Polak, Nashville; Robert E. Ponter, Cookeville, both of Tenn., and Thomas J. Bush, Canton Center, Conn., assignors to Identity Group, Inc., Cookeville, Tenn.**

**Filed Dec. 5, 1996, Ser. No. 760,969**
**Int. Cl.[6] B41K** *1/42*
**U.S. Cl. 101—334** **3 Claims**



**1**. A handstamping apparatus comprising a first housing member and a second housing member cooperatively associated therewith, said first and said second housing members being movable relative to each other from a first position to a second position, said first position being a ready position and said second position being a print position; a biasing element coupled to said first and said second housing members for biasing said members to said first position; a die support operatively coupled to said first housing member for movement therewith relative to said second housing member, said die support comprising a printing die disposed thereon, said printing die and said die support being disposed within said second housing member and movable relative to said housings from a ready position to a print position, said printing die being in said print position when said housings are disposed in said second position; an ink roller operatively coupled to said second housing member, said ink roller being disposed within said second housing member and spaced from and out of contact with said printing die when said housing members are in said first position; and at least one connector drivingly connecting said die support and said ink roller for moving said ink roller and said printing die relative to each other in response to relative movement of said housings, whereby said ink roller inks said printing die as said housing members move from said first to said second position and said printing die moves to its printing position, and further comprising means on said second housing member engageable with said die support to move said die support to said print position as said housings move from said first position to said second position, wherein said die support is pivotable relative to said housing members about a first axis disposed transversely with respect to the direction of relative movement of said housing members, and said ink roller is rotatable about a second axis spaced from and parallel to said first axis and wherein said first axis comprises a first shaft supporting said die support and having respective ends thereof coupled to said first housing member, and said second axis is provided by a second shaft supporting said ink roller; said at least one connector comprising a rocker arm coupled to said second housing member, said rocker arm having first ends movably engaged with said first shaft and second ends thereof moveably engaged with said second shaft, whereby relative movement of said housing members causes movement of said ink roller to ink said printing die.

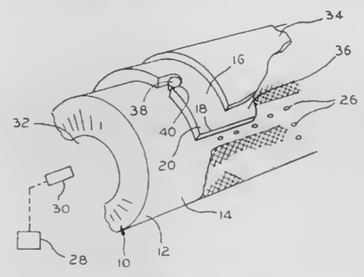
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**5,740,738**

## GAPLESS BLANKET CYLINDER

**Thaddeus A. Niemiro, Lisle, Ill., assignor to Goss Graphic Systems, Inc., Westmont, Ill.**

**Filed Aug. 14, 1996, Ser. No. 702,395**
**Int. Cl.[6] B41F** *13/193;27/00*
**U.S. Cl. 101—376** **10 Claims**



**7**. A gapless blanket cylinder, comprising:
an inner mandrel having an outer surface;
a split shell having a longitudinal slit defining opposed ends of the shell, the opposed ends of the split shell being disposed on the outer surface of the mandrel, the split shell being dimensioned such that the opposed ends define a gap absent an external force;
means associated with the mandrel for retaining the split shell on the mandrel; and
a compressible blanket formed on an outer surface of the split shell, said compressible blanket having an inner diameter slightly less than a diameter of the outer surface of the split shell so as to provide an external force to the split shell, the compressible blanket maintaining the closure of the gap between the opposed ends of the shell;
whereby a gapless blanket cylinder is provided.

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**5,740,739**

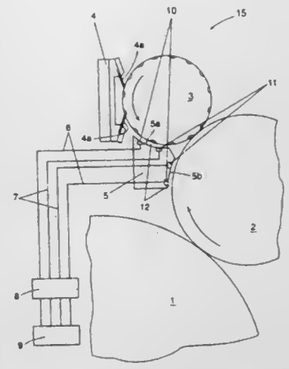
## METHOD AND DEVICE FOR WASHING A FORM CYLINDER AND AN ASSOCIATED APPLICATOR ROLLER IN A PRINTING MACHINE

**Manfred Herold, Hainburg; Georg Hartung, Seligenstadt, and Ulrich Jung, Limburg, all of Germany, assignors to MAN Roland Druckmaschinen AG, Germany**

**Filed Jul. 19, 1996, Ser. No. 684,154**
**Claims priority, application Germany, Jul. 20, 1995, 195 26 574.2**
**Int. Cl.[6] B41F** *35/02*
**U.S. Cl. 101—425** **18 Claims**

**1**. A printing unit of a printing machine comprising a rotatable form cylinder, a rotatable applicator roller in adjacent parallel relation to said form cylinder, a liquid medium feed device for feeding a liquid medium to said applicator roller, a washing device mounted for movement parallel to axes of said form cylinder and





applicator roller, said washing device having a cleaning fluid feed, a cleaning fluid discharge and a first curved surface in closely spaced adjacent relation to said form cylinder and a second curved surface in closely spaced adjacent relation to said applicator roller, said washing device having a spray device and a suction extractor device disposed at each said curved surface, said spray devices each being connected to the respective cleaning fluid feed and said suction extractor devices each being connected to the respective cleaning fluid discharge, said spray devices being operable for discharging cleaning fluid received from the respective cleaning fluid feed onto the adjacent form cylinder and applicator roller, said suction extractor devices being operable for removing cleaning fluid from the respective adjacent form cylinder and applicator roller and directing it to the respective cleaning fluid discharge, and a control for individually operating the spray devices and suction extractor devices of each curved surface.

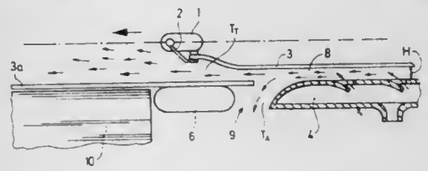
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**5,740,740**

## METHOD AND DEVICE FOR BRAKING SHEETS IN A DELIVERY OF A SHEET-FED ROTARY PRINTING PRESS

**Günter Stephan, Wiesloch-Baiertal, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany**

**Filed Jul. 29, 1996, Ser. No. 681,819**
**Claims priority, application Germany, Jul. 27, 1995, 195 27 440.7; Jul. 2, 1996, 196 26 369.7**
**Int. Cl.[6] B41F** *13/64*
**U.S. Cl. 101—483** **8 Claims**



**1**. Method for braking sheets in a delivery of a sheet-fed rotary printing press, which comprises:
providing a gripper for transporting sheets, a sheet brake receiving the sheets released from the gripper for braking the sheets, and a flotation-guide having an air-blast jet for transporting the sheets from the gripper to the sheet brake in an overlapping shingled arrangement of the sheets on the sheet brake;
providing a sheet pile delivery receiving the shingled sheets from the sheet brake; and
forming with the air-blast jet a carrying-air flow for producing a flotation-guide plane in a sheet transport direction and for simultaneously separating the sheets from an instant at which the sheets are being placed in the overlapping shingled arrangement, the carrying-air flow formed beneath an oncoming sheet continuing beneath the overlapping shingled arrangement of the sheets, and forming, with the sheets, an elongation of the flotation guide-plane towards the delivery.

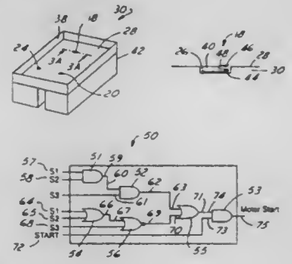
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**5,740,741**

## METHOD AND APPARATUS FOR CONVEYING AN ARTICLE ON A VEHICLE

**Ban Jaw Lee, Hsib-chu; Chen Chin Chen, Miao-Li Hsien; Jiunn Shyong Shu; Mi Kan Chang, both of Hsin-Chu, and Wu Jan Chena, Hsin-Chu Hsien, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Co., Ltd., Hsin-Chu, Taiwan**

**Filed Jan. 10, 1997, Ser. No. 781,717**
**Int. Cl.[6] B60K** *28/00*
**U.S. Cl. 104—288** **23 Claims**



**18**. A conveyor system for conveying an article on a vehicle comprising:
a vehicle having a laterally extended top surface for carrying an article and a drive system,
said laterally extended top surface having at least two sensors mounted therein for sensing the presence of the article,
said at least two sensors are positioned substantially apart and yet capable of being covered by the article,
a track for engaging the drive system of said vehicle, and
a controller for receiving signals transmitted from said at least two sensors and outputting a signal to said drive system to drive said vehicle when said at least two sensors are both covered by said article, when said at least two sensors are both uncovered by said article, and to stop said vehicle when one of said at least two sensors is covered and one of said at least two sensors is uncovered by said article.

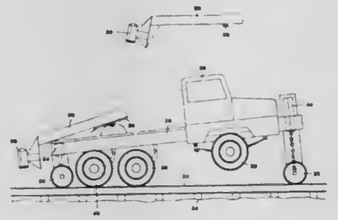
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**5,740,742**

## ROAD/RAIL TRUCK TRACTOR

**David E. Bush, Rte. 1 Box 77, Gary, Tex. 75643**

**Filed Feb. 21, 1997, Ser. No. 803,005**
**Int. Cl.[6] B61C** *11/00*
**U.S. Cl. 105—72.2** **8 Claims**



**1**. A truck tractor vehicle for operation on roadways and railways and for attaching to a railcar, comprising:

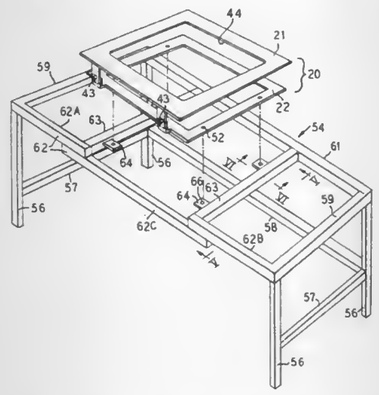
VOL 1209 ISS 3 AP 21 1998 UMI



(a) a vehicle frame including a hitch coupler capable of towing highway trailers;
(b) front and rear drive axles mounted to said vehicle frame for driving the vehicle on roadways and railways;
(c) front and rear pairs of retractable rail guide wheels mounted on opposite ends of said vehicle frame to locate the vehicle on a railway when said retractable rail guide wheels are extended for rail use; and
(d) a railcar hitch beam structure having one end mounted on said hitch coupler and the opposite end of said railcar hitch beam structure for engaging the railcar for towing the railcar.

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**5,740,743**
**PREPARATION OF MONITOR VIEWING APERTURES IN A WORK STATION**
**Edward C. Schairbaum, Ft. Worth, Tex., assignor to Nova Solutions, Inc., Effingham, Ill.**
**Filed May 31, 1995, Ser. No. 454,644**
**Int. Cl.[6] A47B** *85/00*
**U.S. Cl. 108—25** **13 Claims**

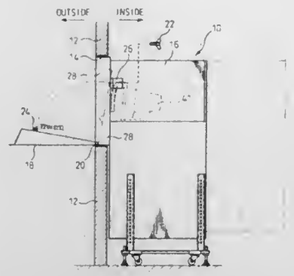


1. A deck structure for a work station comprising in combination a deck member which has defined therein a viewing aperture whose perimeter is defined by edge wall portions, said edge wall portions being associated in face-to-face engagement with outside surface portions of a liner sleeve, said liner sleeve being generally transversely flattened and having inside surface portions that are generally opposed to said outside surface portions, and that are generally configured to engage rim portions of a panel member that is positionable in and across said aperture, the interrelationship between said deck member, said aperture edge wall portions, and said liner sleeve being such that, when said panel member is so positioned in said aperture, said panel member is supported in said aperture.

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**5,740,744**
**THROUGH-WALL TYPE AUTOMATIC CUSTOMER SERVICE APPARATUS**
**Kenichi Nashirozawa; Michinori Kawano; Kazushi Watari; Shuetsu Oikawa; Hiroyuki Moto, and Setsuko Yamamoto, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**
**Filed Jul. 26, 1995, Ser. No. 506,771**
**Claims priority, application Japan, Nov. 29, 1994, 6-294284; Nov. 29, 1994, 6-294285; Nov. 29, 1994, 6-294286; Nov. 29, 1994, 6-294287**
**Int. Cl.[6] G07H** *9/00*
**U.S. Cl. 109—24.001** **28 Claims**

1. A through-wall type automatic customer service apparatus for positioning in a building structure defined at least in part by a



substantially upright wall which separates an interior of the building structure from an exterior of the building structure, the wall having corresponding inside and outside surfaces and an aperture extending therethrough, comprising:
a body having front and rear surfaces defining an interior of the body in which mechanical and electrical components are disposed and comprising a front frame portion protruding outwardly from the front surface, surrounding and defining an opening therethrough providing access to the interior of the body, and a facade mounted to the front frame portion for selective pivotal movement about a substantially horizontal axis between a closed position, substantially upright and covering the opening, and an open position, protruding outwardly from the front surface of the body and through the opening;
said body being adapted for positioning the front surface thereof contiguous the inside surface of the wall so that the facade is exposed to the exterior of the building structure through the aperture in the wall thereby to render the apparatus accessible for operation by users from the exterior of the building structure, said facade, in the open position thereof, protruding outwardly from the front surface of the body and through the aperture, exposing the interior of the body and providing access, from the exterior of the building structure, to at least selected mechanical and electrical components disposed in the interior of the body, and, in the closed position thereof, at least a portion of the facade being disposed within the aperture of the wall and blocking access to the interior of the body from the exterior of the building structure; and
a lock selectively locking the facade, in the upright position thereof, to the body.

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**5,740,745**
**PROCESS FOR INCREASING THE EFFECTIVENESS OF SLAG CONTROL CHEMICALS FOR BLACK LIQUOR RECOVERY AND OTHER COMBUSTION UNITS**
**Christopher R. Smyrniotis, Syracuse, N.Y.; William F. Michels, Aurora, Ill.; M. Damian Marshall, Chicago, Ill.; William H. Sun, Naperville, Ill.; Daniel V. Diep, and Cari M. Chenanda, both of Aurora, Ill., assignors to Nalco Fuel Tech, Naperville, Ill.**
**Filed Sep. 20, 1996, Ser. No. 710,630**
**Int. Cl.[6] F23B** *7/00*
**U.S. Cl. 110—343** **10 Claims**

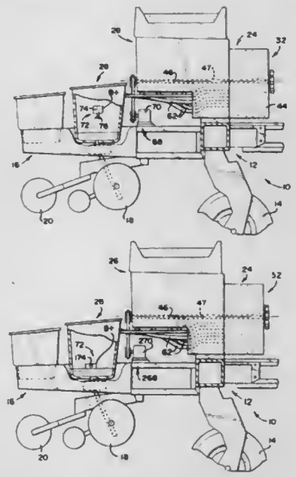
6. A process for cleaning a combuster of of slag buildup, comprising:
determining slagging locations within a furnace where slagging will occur in the absence of treatment;
determining the temperature and gas flow conditions within the combuster;
locating introduction points on the furnace wall where introduction of chemicals could be accomplished;
based on the temperature and gas flow conditions existing between the introduction points and the slagging locations, determining the droplet size, amount of treatment chemical, amount of carrier for the chemical, and droplet momentum necessary to direct the chemical in active form to the slagging locations; and,



based on the determinations of the previous steps, introducing chemical.

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**5,740,746**
**SEED MATERIAL DISPENSING SYSTEM FOR AN AGRICULTURAL PLANTER**
**Donald Lawrence Ledermann, Darien, and John F. Stufflebeam, Romeoville, both of Ill., assignors to Case Corporation, Racine, Wis.**
**Filed Aug. 11, 1995, Ser. No. 514,421**
**Int. Cl.[6] A01C** *1/00;7/00*
**U.S. Cl. 111—174** **20 Claims**

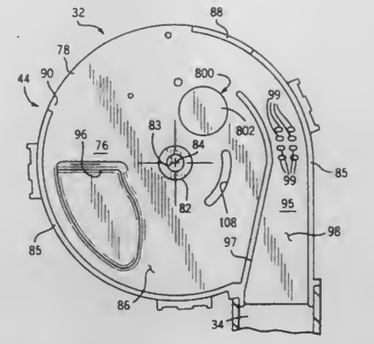


1. A seed material dispensing system for a planter having a mobile frame with a plurality of row units mounted on the frame, said dispensing system comprising:
a main seed material storage unit adapted to be supported on said frame for holding a mass of seed material;
an auxiliary seed material storage unit adapted to be mounted on each of said row units for holding a mass quantity of seed material substantially less than the mass quantity of seed material adapted to be held within said main seed material storage unit;
a seed metering unit adapted to be arranged in seed material receiving relation with each auxiliary seed material storage unit to control the discharge of seed material therefrom;
a delivery system extending between said main seed material storage unit and each auxiliary seed material storage unit to intermittently deliver seed material to each auxiliary seed material storage unit from said main seed material storage unit at a predetermined and controlled rate; and
a sensing apparatus to control operation of said delivery system as a function of the of seed material held in at least one of said auxiliary seed material storage units.

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**5,740,747**
**VACUUM SEED METERING ASSEMBLY**
**John F. Stufflebeam, Romeoville; Thomas A. Olson, Bolingbrook, and Lisle J. Dunham, Downers Grove, all of Ill., assignors to Case Corporation, Racine, Wis.**
**Filed Aug. 20, 1996, Ser. No. 700,214**
**Int. Cl.[6] A01C** *7/04*
**U.S. Cl. 111—185** **20 Claims**

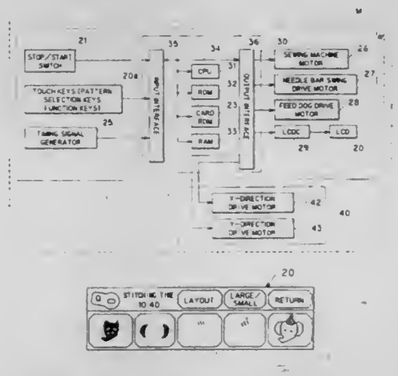
1. A seed metering mechanism comprising a rotary distribution disk provided with a circular row of openings toward a periphery



thereof for carrying seeds under the influence of pressure differentials, a housing having its interior divided by said disk into two enclosures, wherein one enclosure serves as a seed reservoir and the other, lying around a portion of the circular row of openings in said disk, defining a vacuum chamber, and an apparatus for imparting vibrations to said housing to promote separation of seeds carried in the disk openings from said disk for deposit to the ground.

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**5,740,748**
**EMBROIDERY STITCHING DEVICE CAPABLE OF SIMULTANEOUSLY PERFORMING STITCHING A COMPUTATION OF STITCHING TIME**
**Nami Morita, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**
**Filed Oct. 21, 1996, Ser. No. 734,547**
**Claims priority, application Japan, Oct. 20, 1995, 7-297685**
**Int. Cl.[6] D05C** *5/04;* **C05B** *21/00*
**U.S. Cl. 112—102.5** **17 Claims**



1. An embroidery stitching device comprising:
a display unit;
data storage means for storing a plurality of pieces of pattern data, each of said plurality of pieces of pattern data containing a plurality of pieces of embroidery data regarding a plurality of embroidery patterns, each of said plurality of embroidery patterns being stitched by at least one color thread;
embroidery stitching means for stitching an embroidery pattern in a workpiece cloth, said embroidery stitching means including a stitching mechanism provided with a needle, and a workpiece cloth moving mechanism for moving the workpiece cloth relative to said stitching mechanism;
stitching control means for controlling said embroidery stitching means so that the embroidery pattern is stitched in the work-

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piece cloth based on corresponding embroidery data stored in said data storage means;

pattern display control means for displaying a predetermined number of embroidery patterns in said display unit based on a selected one of said plurality of pieces of pattern data;

pattern selection means for selecting a desired embroidery pattern from said predetermined number of embroidery patterns displayed in said display unit;

stitching start instruction means for instructing said stitching control means to start stitching when the desired embroidery pattern is selected with said pattern selection means;

time computing means for computing a stitching period of time needed for stitching the desired embroidery pattern based on embroidery data corresponding to the desired embroidery pattern, the stitching period of time being computed in parallel relation with stitching of the desired embroidery pattern, said time computing means outputting time data representative of a computed stitching period of time; and

time display control means for displaying the computed stitching period of time in said display unit based on the time data output from said time computing means.

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**5,740,749**

## SEWING MACHINE

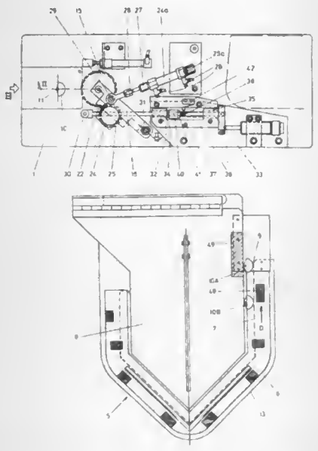
**Jason Prout, Leeds, England, assignor to AMF Reece, Inc., Richmond, Va.**

**Filed Jul. 5, 1996, Ser. No. 672,224**

**Claims priority, application United Kingdom, Jul. 8, 1995, 9515977**

**Int. Cl.[6] D05B *21/00***

**U.S. Cl. 112—470.07** **6 Claims**



1. A sewing machine including a template capable of holding together two or more layers of fabric that are to be stitched together, and comprising:

a groove provided in the template and shaped according to a required stitching profile;

a base plate of the sewing machine having a guide member projecting upwardly therefrom and engageable with said groove, said groove being open-ended at its start location;

a needle-receiving hole formed in the guide member;

a needle mounted on the sewing machine and operative to pass through said hole in the guide member to effect a stitching action;

a drive wheel having a periphery for engaging a drive edge of the template;

means for rotating the drive wheel to effect movement of the template relative to the guide member to drive the template so that the groove moves along the guide member;

a probe lying to a feed side of the drive wheel;

means biassing the probe generally towards the guide member;

first sensor means operable by movement of the probe against the biassing means in response to correct initial positioning of the template with the open end of the groove engaged over the guide member;

means responsive to the first sensor means to control the drive means so as to move the template into a start position;

second sensor means mounted on a head of the sewing machine and responsive to indicator means on the template to produce a signal sequence; and

control means responsive to the signal sequence to control commencement of stitching and drive of the template from the start position around the desired stitching profile.

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**5,740,750**

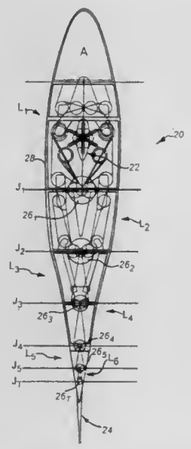
## METHOD AND APPARATUS FOR REDUCING DRAG ON A MOVING BODY

**Michael Triantafyllou, Belmont, and David S. Barrett, Needham, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed May 28, 1996, Ser. No. 652,673**

**Int. Cl.[6] B63B *1/34***

**U.S. Cl. 114—67 R** **24 Claims**



1. In a body having a length L being moved in a direction D through a selected fluid medium at a speed U sufficient to normally cause turbulence, a method for reducing drag on the body comprising the steps of:

dividing at least the portion of the body in the medium into at least three sections having junctions therebetween, at least selected sections being flexible in a direction perpendicular to the direction D; and

flexing the sections to produce a wave-like motion thereof having a frequency f, a wavelength $\lambda$ of between 0.5 L and 2.0 L, a reduced frequency value $\Omega$ between 0.1 and 0.5, and a time delay between successive junctions reaching peaks for their flex motion which is directly proportional to the distance x, in the direction D of the junction from a reference point and inversely proportional to the phase speed $c_p$ of the wave.



**5,740,751**

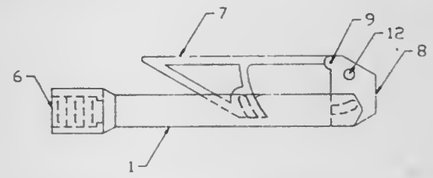
## MOORING LINE HOOK

**H. James Peever, and William McLean, both of Bay F, 7058 Farrell Road S.E., Calgary, Alberta, Canada, T2H 0T2**

**Filed Dec. 2, 1996, Ser. No. 759,257**

**Int. Cl.[6] B63B *9/00***

**U.S. Cl. 114—221 R** **6 Claims**



1. A device for passing a line through a closed ring attachment for securing the line thereto, comprising a rigid body member having first and second cavities therein, each cavity having permanent guides disposed therein, a line carrier including two relatively biased hingedly interconnected arm portions, each arm portion including at least one guide slot for mating with the permanent guides in one of the first or second cavities, said rigid body further including a third cavity for receiving external threads of an extension pole.

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**5,740,752**

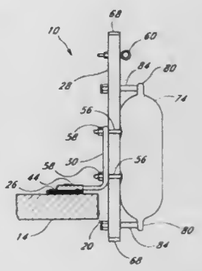
## APPARATUS FOR DOCKING BOATS TO EACH OTHER

**Howard M. Allenbaugh, 19525 Woodlands La., Huntington Beach, Calif. 92648**

**Filed Jun. 25, 1996, Ser. No. 673,663**

**Int. Cl.[6] B63B *21/00***

**U.S. Cl. 114—230** **18 Claims**



1. A docking apparatus for docking a smaller vessel to a substantially horizontal platform of a larger vessel, comprising:

(a) a mounting bracket attached to an outer edge of the platform of the larger vessel;

(b) a substantially vertical bumper attached to the mounting bracket such that the bumper extends vertically above and below the platform;

(c) an adjustment bracket connected between the bumper and the mounting bracket to permit vertical and horizontal adjustment of the bumper with respect to the platform, wherein the adjustment bracket is adapted to be connected to the mounting bracket at different horizontal positions relative to the platform; and

(d) a line connecting the smaller vessel to the bumper to thereby dock the smaller vessel to the platform of the larger vessel.

**5,740,753**

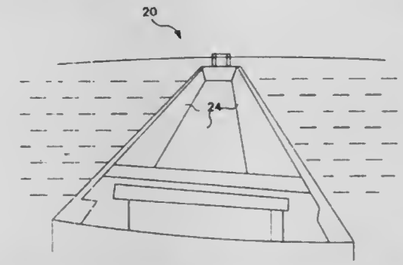
## METHOD OF FABRICATING BUOYANT PRESTRESSED CONCRETE BUILDING MODULES, RESULTING MODULES, AND ASSEMBLY THEREOF

**Peter M. Theophanis, 319 Old Jupiter Rd., Jupiter, Fla. 33477**

**Filed Oct. 24, 1995, Ser. No. 547,148**

**Int. Cl.[6] B63B *35/44***

**U.S. Cl. 114—267** **12 Claims**



1. A method of fabricating a buoyant building module, comprising the steps of:

providing a bed having a desired module shape and size, and having bed interior surfaces;

extending pre-stressing strands through said bed;

applying tensile loading to said pre-stressing strands with tensile loading application means;

seating a buoyant billet within said bed, between said prestressing strands;

extending pre-stressing strands through said bed above said bouyant billet;

applying tensile loading to said pre-stressing strands with tensile loading application means;

pouring cement mix into said bed around and over said buoyant billet;

permitting said cement mix to cure; and

removing said module from said bed.

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**5,740,754**

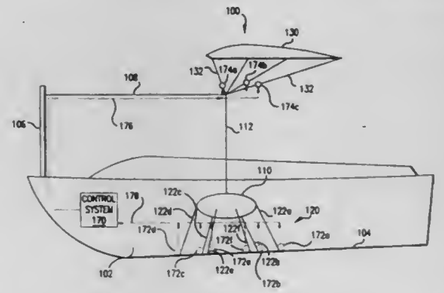
## AIR LIFTED MOTION ISOLATION SYSTEM AND METHOD THEREFOR

**William B. Harvey, Olney, and Leonard S. Haynes, Rockville, both of Md., assignors to Intelligent Automation, Inc., Rockville, Md.**

**Filed Mar. 28, 1997, Ser. No. 827,595**

**Int. Cl.[6] B63B *1/16***

**U.S. Cl. 114—273** **20 Claims**



1. A motion isolation system with air lifted stabilization for use in a waterborne craft, comprising:

platform means for supporting an object to be isolated from motion of the waterborne craft;

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means for pivotally coupling said platform means to the waterborne craft; and,

a lift producing body disposed in air above the waterborne craft and coupled to said platform means by a first tether for applying a substantially vertically directed force thereto.

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**5,740,755**

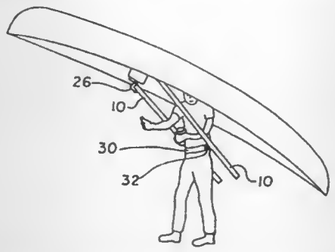
**INVERTED CANOE AND BOAT; POSITIONING LEGS AND LIFTING DEVICE**

**John B. Nichols, Jr., 835 Memorial Dr., Winthrop, Me. 04364**

**Continuation of Ser. No. 374,061, Jan. 18, 1995, Pat. No. 5,577,457. This application Nov. 14, 1996, Ser. No. 746,659**

**Int. Cl.[6] B63B** *35/71*

**U.S. Cl. 114—343** **8 Claims**




1. A watercraft positioning device comprising:

a) at least two support legs for supporting one end of an inverted watercraft above the ground, the support legs being of sufficient length to allow a person to lift a watercraft from a crouched position near the center of balance of the watercraft;

b) a joining means adapted for pivotal attachment of the support legs to an interior wall of opposing gunwales of a watercraft to be positioned, the joining means adapted to be mounted on the interior walls of the watercraft to be positioned and being positioned within the reach of an individual when carrying the watercraft in a portaging position; and

c) at least one strut of predetermined length, opposing ends of the strut adapted for engaging the joining means on opposing gunwales to thereby result in the frictional engagement of the joining means with the interior walls of the watercraft to be positioned.

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**5,740,756**

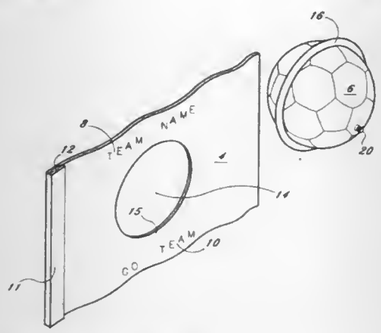
**INFLATABLE FLAG AND BANNER**

**John R. Ord, 10110 Vestal Ct., Coral Springs, Fla. 33071**

**Filed Nov. 5, 1996, Ser. No. 743,319**

**Int. Cl.[6] G09F** *17/00*

**U.S. Cl. 116—173** **4 Claims**




1. An inflatable flag comprising:

an essentially planar flexible member having a perimeter and an essentially air tight inflatable portion of a preselected size, shape, and appearance, located at least partially within said perimeter;

said essentially planar flexible member includes an aperture sized and shaped to receive said essentially air tight inflatable portion;

said essentially air tight inflatable portion includes an attachment perimeter area comprised of excess material for attachment adjacent said aperture, and means attaching said perimeter area to said essentially planar flexible member adjacent said aperture, wherein opposing sides of said essentially air tight inflatable portion extends outward from said essentially planar flexible member when said essentially air tight inflatable portion is fully inflated.

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**5,740,757**

**METHOD AND APPARATUS FOR FEEDING ANIMALS IN A HERD**

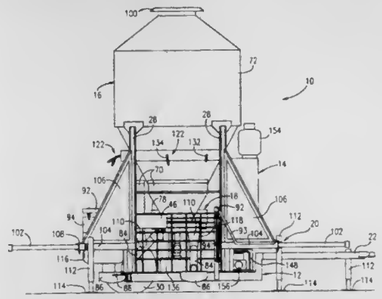
**William T. Smeester, Iron Mountain, Mich., assignor to Jitco Industries, Inc., Iron Mountain, Mich.**

**PCT No. PCT/US96/00761, § 371 Date Nov. 5, 1996, § 102(e) Date Nov. 5, 1996, PCT Pub. No. WO96/22018, PCT Pub. Date Jul. 25, 1996**

**PCT Filed Jan. 17, 1996, Ser. No. 704,695**

**Int. Cl.[6] A01K** *5/02;13/00*

**U.S. Cl. 119—51.02** **43 Claims**



1. An animal feeding apparatus for free access feeding by animals in a herd, said apparatus comprising:

a storage unit for holding a quantity of feed;

a multiplicity of feed dispensers circumferentially arrayed about said storage unit, each of said feed dispensers being in independent operative communication with said storage unit for selectively and independently delivering a portion of said feed to a respective stationary feeding site accessible to each of said animal in the herd;

a respective animal identifying element adapted for attachment to each animal to be fed in the herd;

a multiplicity of antennae, and mounting means positioning each of said antennae proximate to a respective one of said feeding sites for receiving respective animal identifying signals from the identifying elements worn by the animal to be fed when in proximity to one of said antennae;

a controller for identifying animals to be fed and for independently and selectively actuating each of said feed dispensers to deliver a portion of said feed specific to the identified animal; and

a panel carrying one of said antennae located proximate to each of said feeding sites, each of said panels being configured in vertically oriented for obstructing the view of the animal at one feeding station of other animals in the herd.



**5,740,758**

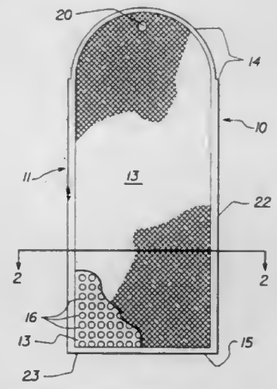
**DISPOSABLE BIRD FEEDER**

**Robert E. Damm, 4680 Woodhaven Dr., Galena, Ohio 43021-9607**

**Filed Feb. 24, 1997, Ser. No. 806,015**

**Int. Cl.[6] A01K** *1/10;5/00;39/00*

**U.S. Cl. 119—57.8** **11 Claims**




1. A disposable bird feeder comprised of:

a) a container of generally vertically elongated contour fabricated of porous sheet material defining a sidewall having sealed upper and lower extremities and interior and outer surfaces, the pores of said sheet material being of uniform size and shape having a diameter between 0.055 and 0.065 inch,

b) supporting means associated with said upper extremity, and

c) particulate bird feed material of substantially uniform particle size and elongated shape, the size of said particles, measured in at least one dimension being between 5% and 20% smaller than the diameter of said pores, said bird feed substantially filling said container.

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**5,740,759**

**BIRD FEEDER**

**Michael W. Cummings, 854 W. 600 North, Salt Lake City, Utah 84116**

**Filed Dec. 16, 1996, Ser. No. 767,024**

**Int. Cl.[6] A01K** *7/00*

**U.S. Cl. 119—72** **8 Claims**



1. A bird feeder comprising:

a. a feeding tube having a first end opposite a second end;

b. the tube having an interior;

c. the tube having a circumferentially disposed first depression positioned proximate the second end of the tube, a circumferentially disposed second depression positioned proximate the first end of the tube, and a sphere positioned inside the tube between the first depression and the second depression;

d. a first disc mounted to the first end and having a first aperture there-through, the first aperture being aligned with the interior of the tube;

e. a cap having a planar surface and having a second aperture through the planar surface, the second aperture sized to permit the tube to be inserted there-through;

f. a container having a base, and structure forming an opening opposite the base, the container configured to removably receive the cap over the opening;

g. the first disc configured to cover the opening and to fit within the cap in parallel relationship to the planar surface;

h. a solid second disc, the first disc and the second disc having substantially equal diameters;

i. whereby when the container is suspended such that the opening is below the base, and the tube is inserted through the second aperture, and the first disc is fit within the cap between the planar surface and the opening, and the cap is secured to the opening, bird food within the container will flow into the tube, and when the second disc is placed within the cap between the first disc and the planar surface, and the cap is secured to the opening, and the first disc is positioned within the cap such that the tube extends into the container, the second aperture is sealed by the second disc to essentially seal the container.

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**5,740,760**

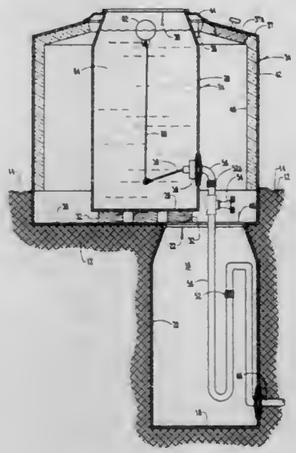
**FREEZE RESISTANT LIVESTOCK WATERER**

**Richard L. Winebrenner, 2651 265th St., Peru, Iowa 50222**

**Filed May 14, 1996, Ser. No. 648,205**

**Int. Cl.[6] A01K** *7/04*

**U.S. Cl. 119—73** **5 Claims**



1. An operationally freezeless livestock waterer, comprising,

a first compartment having a bottom portion, and open top portion, and sidewalls for location in the ground,

a pressurized water line in the ground and entering said first compartment at its lower portion and extending upwardly through said upper portion and terminating in an upper end,

a second compartment having a bottom, sidewalls, and an open top,

means for supporting said second compartment above said first compartment with the bottom thereof in spaced relation to the top portion of said first compartment,

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a third compartment having an open top, sidewalls and bottom extending over said first compartment so that the bottom of said third compartment extends over the open top portion of said first compartment, and so that the sidewalls thereof are spaced from the sidewalls of said second compartment,

said third compartment having an opening in the top thereof and surrounding the open top of said second compartment,

said opening in the top of said third compartment being substantially at the same vertical height as that of the open top of said second compartment,

the sidewalls of said third compartment being insulated, with the bottom of said sidewalls locatable below an upper level of the ground,

and a float activated valve connecting the upper end of said pressurized water line and the interior of said second compartment to substantially fill said second compartment with water while the latent heat from the ground will be transmitted to the air in said first compartment, and thence to the air around said second compartment, and thence through the sidewalls of said second compartment into the water within said second compartment to prevent said valve from freezing.

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**5,740,761**

## ANIMAL LITTER COMPOSITION AND METHOD OF MAKING SAME

**Bosco H. Lee, and Yvonne Huiyi Lee, both of 574 Williams St., Oakland, Calif. 94612**

**Continuation-in-part of Ser. No. 502,396, Jul. 14, 1995, abandoned. This application Jan. 27, 1997, Ser. No. 787,348**

**Int. Cl.[6] A01K** *29/00*

**U.S. Cl. 119—173** **20 Claims**

1. An animal litter composition consisting essentially of fibrous agricultural products which are pyrolyzed, said composition containing activated charcoal by greater than 50% and up to 90 weight %.

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**5,740,762**

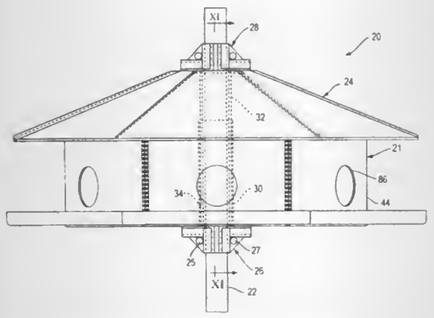
## MODULAR SHELTER ASSEMBLY FOR BIRDS

**Phillip D. Bennett, Mansfield, Mo., assignor to Stamina Products, Inc., Springfield, Mo.**

**Filed Mar. 14, 1997, Ser. No. 818,975**

**Int. Cl.[6] A01K** *31/00;39/00*

**U.S. Cl. 119—428** **6 Claims**



1. A modular bird shelter assembly comprising:

an elongated support member constructed and arranged to extend vertically at a mounting site;

a shelter;

a shelter supporting structure constructed and arranged to be attachable to said elongated support member at a position thereon which constitutes an end portion thereof when at the mounting site;

said shelter including a plurality of compartment modules having respective inner and outer ends, said plurality of compartment modules being constructed and arranged to be supported by said shelter supporting structure in side by side fashion around a periphery of said elongated support member with the outer ends of said compartment modules facing radially outwardly from said elongated support member so as to form one or more tiers of compartments suitable to accommodate a plurality of birds;

a compartment module mounting structure constructed and arranged to fixedly secure said plurality of compartment modules in supported relation on said shelter supporting structure around the periphery of said elongated support member, said compartment module mounting structure comprising:

a spacer element associated with each tier of said one or more tiers of compartments, said spacer element being constructed and arranged to fit around said elongated support member so as to define a peripheral space between an inner surface of said spacer element and an outer surface of said elongated support member; and

a support hook extending radially inwardly from an upper portion of said inner end of each compartment module, each of said support hooks being constructed and arranged to be disposed downwardly within said peripheral space to couple each compartment module between said spacer element and said elongated support member so that said outer end of each compartment module extends radially outwardly from said elongated support member;

a roof structure defining an opening through a center portion thereof through which said elongated support member extends, said roof structure being constructed and arranged to cover the top-most tier of said one or more tiers of compartments and to retain said one or more tiers of compartments in a fixed position on said elongated support member; and

a roof structure retaining element constructed and arranged to be attachable to said elongated support member above said roof structure and constructed and arranged to retain said roof structure in a position to cover said one or more tiers and to retain said roof structure and said one or more tiers in a fixed position with respect to said elongated support member between said shelter supporting structure and said roof structure retaining element when said roof structure retaining element is attached to said elongated support member.

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**5,740,763**

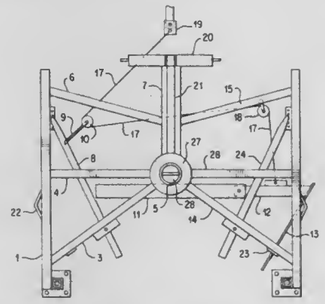
## CHICKEN COOP LITTER REMOVAL APPARATUS

**Tracy Hollingsworth, Rte. 2 Box 760, Oneonta, Ala. 35121**

**Filed Jan. 16, 1996, Ser. No. 585,711**

**Int. Cl.[6] A01K** *31/04*

**U.S. Cl. 119—442** **7 Claims**



1. A chicken coop litter removal apparatus comprising:

a frame adapted to have a left side member connected to a central hub by a left rear support and a left center support, a right side member connected to the central hub by a right rear support and right central support with the central hub adapted to have a hole in it;

a trailer hitch connected to the central hub by a bottom hitch support and a top hitch support and connected to the left side member by a left forward support and connected to the right side member by a right forward support;

a right wheel attached to the right side member;

a left wheel attached to the left side member;

a left side bar attached to left side member;

a right side bar attached to right side member:

a left rod adjustably attached to the left side member and adjustably attached to the left rear support;

a primary blade arm mounted under central hub;

a means of mounting the primary blade arm under the central hub of the frame so as to allow the primary blade arm to rotate relative to the central hub about an axis centered on the hole in the central hub;

a right secondary blade arm removably attached to the primary blade arm;

a right blade attached to the right secondary blade arm under the location where the right side bar is attached to the frame and attached so as to operate in its fully extended position when the primary blade arm is generally perpendicular to the right side member;

a backstop attached to the right blade adapted to be in contact with the right rear support when the blade is in its fully extended location;

a spring removably attached to the left rod;

a first pulley attached to the spring;

a second pulley removably attached to the right forward support;

a cable removably attached to a tractor that is run through the first pulley and the second pulley and is removably attached to the right secondary blade arm.



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**5,740,765**

## ROTARY PISTON INTERNAL COMBUSTION ENGINE

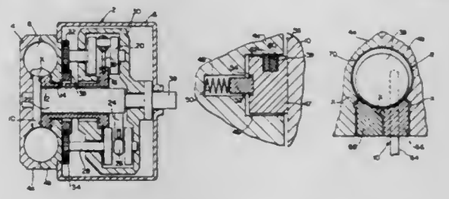
**Wilfried Ball, Dingolfing, and Peter Rönnberg, Seeshaupt, both of Germany, assignors to Peter Pelz, Geretsried, Germany**

**Filed Jul. 24, 1996, Ser. No. 685,514**

**Claims priority, application Germany, Jul. 27, 1995, 195 27 396.6**

**Int. Cl.[6] F02B** *53/00*

**U.S. Cl. 123—18 R** **9 Claims**



1. In a rotary piston internal combustion engine comprising:

a housing containing a cylinder chamber in the form of a circular ring;

an even number of pistons rotatable in the cylinder chamber, the pistons being of a circular cross-section adapted to the cylinder chamber;

first and second piston carriers which are mounted rotatably about the axis of the ring configuration of the cylinder chamber and to each of which are fixed half the number of said pistons, the peripheral surfaces of the piston carriers being such that they supplement the internal surface of the cylinder chamber to constitute a circular cross-section which corresponds to the pistons;

piston rings on the pistons sealing in relation to the cylinder chamber; and

at least one respective sealing ring accommodated between the piston carriers and between each piston carrier and an oppositely disposed wall of the housing in an annular groove in the housing and a piston carrier respectively;

the improvement that the sealing ring accommodated in the respective annular groove in the housing and one of the piston carriers bears against a co-operating surface of the respective co-operating piston carrier, acted upon by a force acting out of the annular groove.

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**5,740,764**

## TANGLE-RESISTANT LEASH

**Chris J. Jacobsen, 4020 County Rd. M, Middleton, Wis. 53562**

**Continuation-in-part of Ser. No. 282,039, Jul. 28, 1994, Pat. No. 5,485,811. This application Jan. 22, 1996, Ser. No. 589,825**

**Int. Cl.[6] A01K** *27/00*

**U.S. Cl. 119—798** **22 Claims**



1. A leash comprising an elongated elastomeric lead including at least one macroscopic concave depression therein, wherein the macroscopic concave depression includes embossed indicia therein.

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**5,740,766**

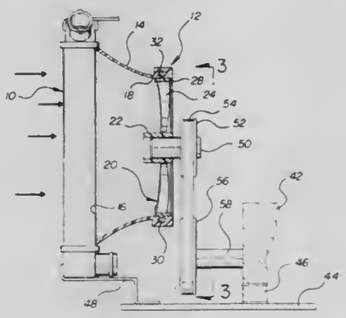
## AUTOMOTIVE FAN AND SHROUD ASSEMBLY

**George Moser, Wixom, Mich., assignor to Behr America, Inc., Charleston, S.C.**

**Filed Mar. 25, 1997, Ser. No. 826,350**

**Int. Cl.[6] F01P** *7/10*

**U.S. Cl. 123—41.49** **10 Claims**



1. An assembly (**12**) for moving air through a heat exchanger (**10**) comprising:

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a shroud (**14**) presenting a front opening (**16**) for mating with a heat exchanger (**10**) and presenting a rear opening (**18**),

a fan (**20**) disposed in said rear opening (**18**) comprising a hub (**22**) having an axis (A) and blades (**24**) extending radially from said hub (**22**) to distal ends for moving air through said shroud (**14**), and

a bearing mechanism (**28**, **30**) interconnecting said distal ends of said blades (**24**) and said shroud (**14**) for rotatably supporting said fan (**20**) solely by said shroud (**14**) and including a ring (**28**) surrounding and interconnecting said distal ends of said fan blades (**24**) and a guideway (**30**) in said shroud (**14**) supporting and retaining said ring (**28**) for rotation relative to said shroud (**14**), and wherein said ring (**28**) defines a head (**32**) as viewed in cross section and said guideway (**30**) embraces said head (**32**).

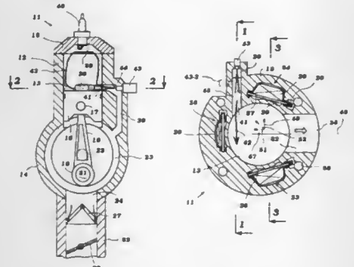
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**5,740,767**

## SCAVENGE CONTROL FOR ENGINE

**Junichi Kaku, and Kimitake Otome, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwat, Japan**

**Filed Mar. 20, 1997, Ser. No. 821,092**
**Int. Cl.[6] F02B** *33/04*
**U.S. Cl. 123—65 W** **17 Claims**



**1**. A two-cycle internal combustion engine having a cylinder block defining a cylinder bore, a piston reciprocating in said cylinder bore, an exhaust port formed in one side of said cylinder bore and opened and closed by the reciprocation of said piston, scavenge passage means formed in said cylinder bore and configured so as to create a scavenging air flow that moves axially along said cylinder bore toward said cylinder head, across said cylinder bore, and down said cylinder bore toward said exhaust port, and control means for controlling the volume and changing the direction of the scavenging air flow into said combustion chamber.

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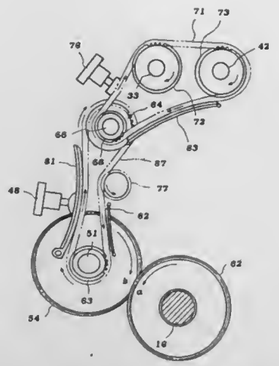
**5,740,768**

## ENGINE CAM SHAFT DRIVE ARRANGEMENT

**Kenichi Sakurai; Tatsuo Niiyama, and Masahiro Uchida, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kubushiki Kaisha, Iwata, Japan**

**Filed Jul. 19, 1996, Ser. No. 684,244**
**Claims priority, application Japan, Jul. 31, 1995, 7-195343**
**Int. Cl.[6] F02B** *1/00;* **F01L** *1/02*
**U.S. Cl. 123—90.27** **13 Claims**

**1**. An internal combustion engine comprised of a cylinder block, a cylinder head closing one end of said cylinder block, at least one overhead cam shaft journaled for rotation about a first axis in said cylinder head for operating valves therein, a crankcase closing the other end of said cylinder block and containing a crankshaft rotatably journaled about a second axis parallel to said first axis, an intermediate shaft journaled for rotation about a third axis parallel to said first and said second axes and disposed on one side of said cylinder block, a drive arrangement for driving said intermediate shaft from said crankshaft, a cam driving shaft journaled for



rotation at said one side of said cylinder block about a fourth axis parallel to said first, second, and third axes and spaced from said third axis and in proximity to said cylinder head, a first flexible transmitter for driving said cam driving shaft from said intermediate shaft, a second flexible transmitter for driving said cam shaft from said cam driving shaft, and at least one flexible transmitter tensioner engaged with one of said flexible transmitters on the side thereof spaced from said cylinder block.

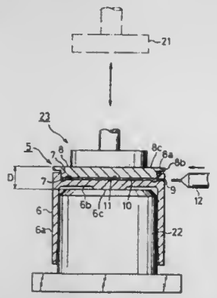
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**5,740,769**

## METHOD OF ADJUSTING A VALVE CLEARANCE

**Akiyoshi Mori, Yokohama, Japan, assignor to Fuji Oozx Inc., Japan**

**Division of Ser. No. 779,568, Jan. 9, 1997, Pat. No. 5,704,318, which is a division of Ser. No. 597,885, Feb. 7, 1996, Pat. No. 5,640,934. This application Jun. 3, 1997, Ser. No. 868,451**
**Claims priority, application Japan, Feb. 20, 1995, 7-30700**
**Int. Cl.[6] F01L** *1/20*
**U.S. Cl. 123—90.52** **7 Claims**



**1**. A method of adjusting valve clearance in a valve operating mechanism, the method comprising the steps of:

connecting a first member having a valve contacting surface which contacts an end of a valve, with a second member which has a cam contacting surface which contacts a cam for operating the valve, to provide a volume-variable filler enclosing portion between the first and second members to form an intermediate of a valve lifter;

putting the intermediate between a pair of holding parts of a jig, a distance between the pair of the holding parts being defined to a suitable one predetermined depending on a size in the valve operating mechanism in which the valve lifter is to be mounted;

introducing a filler into said filler enclosing portion to move the first and second members until the valve contacting surface and the cam contacting surface contacts the holding parts respectively to finish the valve lifter; and



attaching the valve lifter between the cam and the end of the valve in the valve-operating mechanism.

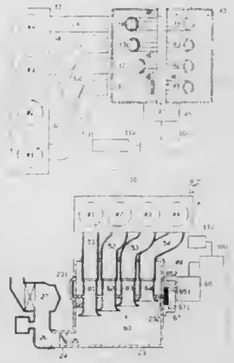
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**5,740,770**

## VARIABLE INTAKE AIR APPARATUS

**Kenjiro Morota, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan**

**Filed Feb. 13, 1997, Ser. No. 799,267**
**Claims priority, application Japan, Feb. 16, 1996, 8-029518**
**Int. Cl.[6] F02M** *35/10*
**U.S. Cl. 123—184.55** **14 Claims**



**1**. A variable intake apparatus in combination with an internal combustion engine, the combination comprising:

at least a first and a second combustion chamber located in the engine;

sensor means for sensing the state of a running condition of the engine;

at least a first and a second intake passage for conducting air to the combustion chambers, respectively, wherein the volumetric efficiency of each of the combustion chambers for a given state of the running condition is related to the length of the associated intake passage, each intake passage including a fixed portion and a variable portion;

length changing means associated with each variable portion for changing the effective lengths of the intake passages in accordance with a change in the state of the running condition in order to improve the volumetric efficiency of the engine, wherein the length changing means adds a predetermined distance to or subtracts a predetermined distance from the effective length of each intake passage in accordance with the state of the running condition of the engine by changing the variable portion of the intake passage, and wherein the predetermined distance added to or subtracted from the effective length of the first intake passage is equal to the predetermined distance added to or subtracted from the effective length of the second intake passage so that the effective length of the first intake passage always substantially matches the effective length of the second intake passage, and

wherein the lengths of the fixed portions of the two intake passages are significantly different from one another.

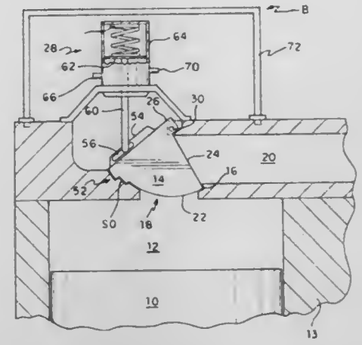
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**5,740,771**

## COMPUTER CONTROLLED INTAKE AND EXHAUST VALVE

**Duane J. Sebastian, P.O. Box 97, Krum, Tex. 76249**

**Filed May 9, 1997, Ser. No. 853,249**
**Int. Cl.[6] F01L** *9/02;9/04;1/44*
**U.S. Cl. 123—188.4** **10 Claims**



**1**. A computer controlled intake and exhaust valve for a piston driven internal combustion engine for propelling a vehicle, the engine having a torque curve and a horsepower curve to graphically represent the performance of the engine, the computer controlled intake and exhaust valve comprising:

a) a cylinder block with a piston cylinder having a top and a bottom and a reciprocable piston disposed in the cylinder, the piston positioned in its extreme positions in a top dead center position at the top of the cylinder and in a bottom dead center position at the bottom of the cylinder;

b) an intake passage with an intake port to the cylinder for taking in a mixture of air and a fuel prior to combustion, and an exhaust passage with an exhaust port to the cylinder for emitting exhaust fumes subsequent to combustion, the intake passage and the exhaust passage having a polygonal cross-section, the intake port and the exhaust port being polygonally shaped and being at the top of the cylinder;

c) an intake valve having a passage face being planar, a port face being curvilinear across one axis and linear across another axis, the curvilinear axis of the port face forming a right angle with the passage face, and an actuator face being substantially planar and having a junction with the passage face and a junction with the port face, the junction with the passage face forming a right angle and being pivotably attached to the intake passage opposite the intake port, the junction with the port face having a bevel;

d) an intake valve seat being defined by the intake passage at the intake port and conforming to the contours of the junction between the passage face of the intake valve and the port face of the intake valve, a closed position being defined when the intake valve is seated flush with the intake valve seat;

e) an exhaust valve having a passage face being planar, a port face being curvilinear across one axis and linear across another axis, the curvilinear axis of the port face forming a right angle with the passage face, and an actuator face being substantially planar and having a junction with the passage face and a junction with the port face, the junction with the passage face forming a right angle and being pivotably attached to the exhaust passage opposite the exhaust port, the junction with the port face having a bevel;

f) an exhaust valve seat being defined by the exhaust passage at the exhaust port and conforming to the contours of the junction between the passage face of the exhaust valve and the port face of the exhaust valve, a closed position being defined when the exhaust valve is seated flush with the exhaust valve seat;

g) an intake valve stem being pivotally attached to the actuator face of the intake valve;

h) an exhaust valve stem being pivotally attached to the actuator face of the exhaust valve;

i) a biasing means for biasing the intake valve to close against the intake valve seat, and a biasing means for biasing the exhaust valve to close against the exhaust valve seat;

j) an intake valve actuator having an inlet port, an outlet port for outflow of hydraulic fluid when the spring means is closing the intake valve, and an electronic actuator coupled to a hydraulic valve means having a displaceable hydraulic piston in engagement with the spring means and in engagement with

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the intake valve stem for displacement of the intake valve on electronic activation of the electronic actuator, thus defining an open position, wherein the electronic actuator comprises a means for supplying pressurized hydraulic fluid to the inlet port upon actuation by an electronic signal;

k) an exhaust valve actuator having an inlet port, an outlet port for outflow of hydraulic fluid when the spring means is closing the exhaust valve, and an electronic actuator coupled to a hydraulic valve means having a displaceable hydraulic piston in engagement with the spring means and in engagement with the exhaust valve stem for displacement of the exhaust valve on electronic activation of the electronic actuator, thus defining an open position, wherein the electronic actuator comprises a means for supplying pressurized hydraulic fluid to the inlet port upon actuation by an electronic signal;

l) an electronic control means for selective activation of the exhaust valve actuator and the intake valve actuator in accordance with a program; and,

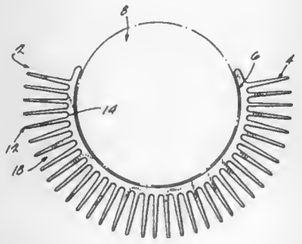
m) a sealing means for maintaining an air-tight seal at the intake passage, the exhaust passage, and the cylinder.

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**5,740,772**
**OIL FILTER COOLER**

**James S. Bluma, Colgate, Wis., assignor to Midwest Instrument Co., Inc., Hartland, Wis.**

**Filed Oct. 18, 1996, Ser. No. 733,094**
**Int. Cl.[6] F01M *5/00***
**U.S. Cl. 123—196 AB** **14 Claims**




1. An oil filter cooler comprising:

a circular, slightly flexible base ring, having a diameter which is adapted to fit in close conformity around at least part of the circumference of an oil filter and has a circumferential length exceeding 180° and wherein said base ring is dimensioned to snap fit onto and to remain in place on, but is removable from said oil filter;

at least one protrusion extending outwardly from said base ring, and,

wherein said base ring and said protrusion(s) is at least partially comprised of a heat conductive metal.

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**5,740,773**
**V-TYPE ENGINE**

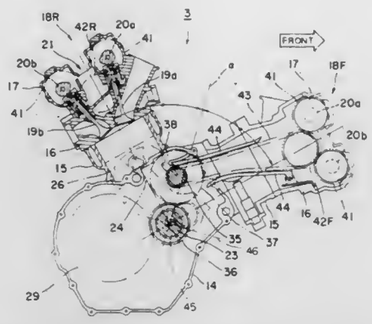
**Hidetoshi Ohshige, Hamamatsu, Japan, assignor to Suzuki Kabushiki Kaisha, Japan**

**Filed Sep. 26, 1996, Ser. No. 721,350**
**Claims priority, application Japan, Mar. 26, 1996, 8-069770**
**Int. Cl.[6] F01L *1/00*; F02B *77/00***
**U.S. Cl. 123—198 DA** **8 Claims**

1. A V-type engine comprising:

a crankshaft which is rotatable about an axis;

a crankcase in which said crankshaft is rotatably supported, said crankcase being formed in two halves which are connected along a plane which normally intersects the axis of rotation of said crankshaft;




a plurality of cylinders which are arranged in a V-shaped cylinder assembly so that the axes of the cylinders are parallel to the plane along which the two halves of the crankcase are connected; and

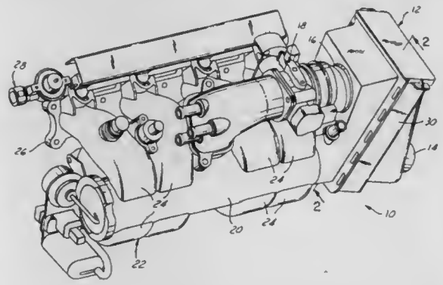
first and second bearings which are each respectively formed in upper and lower halves and which are press fitted into first and second supporting portions of said crankcase, the upper and lower halves of said first and second bearings being arranged to face each other along a plane which is essentially normal to a line which divides an angle between the V-shaped cylinder assembly in half.

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**5,740,774**
**ENGINE INDUCTION AIR SYSTEM HAVING IMPROVED AIR FILTER ACCESSIBILITY**

**Gary Kennedy, Clarkston, Mich., assignor to Siemens Electric Limited, Tilbury, Canada**

**Filed Dec. 18, 1996, Ser. No. 768,522**
**Int. Cl.[6] F02M *35/04***
**U.S. Cl. 123—198 E** **19 Claims**




1. An internal combustion engine induction air system comprising an induction air passage, bounded circumferentially by a side wall, and a filter, comprising a removable particulate filter medium, disposed in the induction air passage in circumferentially perimetrically sealed relation with the passage side wall to thereby constrain induction air flow to pass through the filter medium, the system comprising:

an opening in the passage side wall providing for a drawer to be slid into and out of the induction air passage; a drawer that slides through the passage opening in opposite directions into and out of the passage; the drawer comprising a perimeter that bounds an open center of the drawer and that supports the filter in covering relation to the drawer's open center; a filter stop that, once the drawer has been slid into the passage sufficiently to have passed the filter through the passage side wall opening completely into the passage, abuts the filter to prevent further insertion of the filter into the passage in the direction of drawer sliding into the passage; a mechanism that is effective once the filter abuts the filter stop to convert continued sliding of the drawer into the passage into bodily movement of the filter in a direction transverse to the direction of drawer sliding, causing the filter to be bodily moved into perimetrically sealed relation with the side wall, and thereby constrain induction air flow to pass through the filter medium; and a closure for closing the passage side wall opening after the filter has been bodily moved into perimetrically sealed relation with the passage side wall.

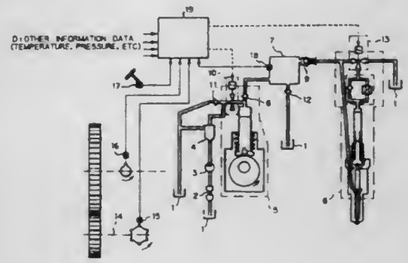


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**5,740,775**
**DIESEL ENGINE**

**Takashi Suzuki; Kiyohiro Shimokawa; Haruyuki Yokota; Yugo Kudo; Masatoshi Shimoda, and Toshiaki Kakegawa, all of Tokyo, Japan, assignors to Hino Motors, Ltd., Tokyo, Japan**

**Filed Sep. 26, 1996, Ser. No. 721,244**
**Claims priority, application Japan, Oct. 2, 1995, 7-278374; Mar. 1, 1996, 8-071108**
**Int. Cl.[6] F02M *45/02***
**U.S. Cl. 123—299** **6 Claims**




1. A diesel engine comprising:

a fuel injection device; and

a controller for controlling said fuel injection device in accordance with an operating condition of the engine, said controller providing a preliminary injection signal wherein a first predetermined amount of fuel is injected into a cylinder of the engine during a period from the initial part of an intake stroke to the middle part of a compression stroke, said controller further providing a main injection signal wherein a second predetermined amount of fuel is injected into a combustion chamber in the vicinity of top dead center of the compression stroke, whereby a maximum combustion temperature in said combustion chamber is decreased to suppress generation of NOx and to reduce emission of black smoke.

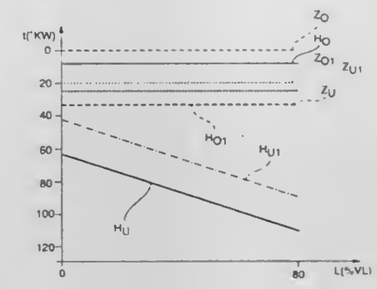
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**5,740,776**
**METHOD OF OPERATING AN INTERNAL COMBUSTION ENGINE**

**Christian Enderle, Baltmannsweiler; Stephan Krämer, Leutenbach; Stephan Pischinger, Waiblingen, and Klaus Rössler, Esslingen, all of Germany, assignors to Daimler-Benz AG, Stuttgart, Germany**

**Filed Jan. 17, 1997, Ser. No. 785,033**
**Claims priority, application Germany, Jan. 20, 1996, 196 02 065.4**
**Int. Cl.[6] F02B *3/04***
**U.S. Cl. 123—299** **5 Claims**

1. A method of operating an internal combustion engine with direct fuel injection into an engine combustion chamber, said method comprising the step of injecting into said combustion chamber during a compression stroke of a respective piston first, after completion of about 1/10 of the compression stroke of the engine piston over the full load range, a main fuel volume generating a main fuel cloud in said combustion chamber and subsequently an ignition fuel volume, which generates in said combustion chamber in the area around the spark plug an ignition fuel cloud providing an essentially stoichiometric fuel/air mixture and igniting said ignition fuel cloud which, upon combustion ignites the main fuel cloud.

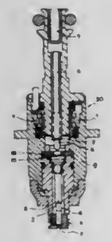



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**5,740,777**
**IN-CYLINDER INJECTION INTERNAL COMBUSTION ENGINE**

**Shigeo Yamamoto; Hiromitsu Ando; Osamu Hirako; Hiroshi Tanada; Kyoya Igarashi, and Hiroaki Miyamoto, all of Tokyo, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan**

**PCT No. PCT/JP96/01292, § 371 Date May 8, 1997, § 102(e) Date May 8, 1997, PCT Pub. No. WO96/36808, PCT Pub. Date Nov. 21, 1996**
**PCT Filed May 16, 1996, Ser. No. 765,927**
**Claims priority, application Japan, May 16, 1995, 7-117558; Sep. 11, 1995, 7-233131**
**Int. Cl.[6] F02B *5/00***
**U.S. Cl. 123—305** **10 Claims**



1. A 4-cycle in-cylinder injection internal combustion engine, comprising:

a combustion chamber formed between a top wall of a reciprocating piston fittedly inserted in a cylinder and a lower wall of a cylinder head;

a single fuel injection valve for injecting fuel directly into said combustion chamber; and

a spark plug facing on said combustion chamber, wherein

said fuel injection valve performs an injection of fuel into said combustion chamber in the form of a spray evenly spreading out in a conical shape from a spray nozzle as a vertex in a direction of an axis of said fuel injection valve, and wherein, when said engine is in an operation state in which fuel is required in a large quantity, performs said injection of fuel in an intake stroke of said engine and, when said engine is in an operation state in which fuel is required in a small quantity, performs said injection of fuel so that fuel is fed in a latter half of a compression stroke of said engine in which an internal cylinder pressure is higher than that in said intake stroke.

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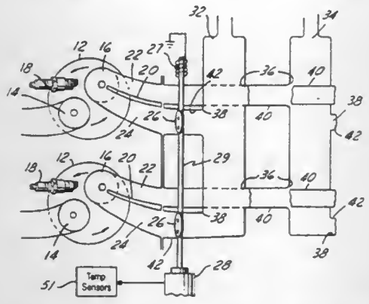


5,740,778

## VARIABLE GEOMETRY INTAKE SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

**William C. Corcoran, Dearborn Heights, Mich.; Darrell C. Drouillard, Windsor, Canada; Edwin J. Matysiewicz, Farmington Hills, Mich.; Randall Berry, Wallingford, Conn.; Vasant B. Patel, Taylor, and Stanley F. Zenas, Farmington Hills, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.**

**Filed Mar. 22, 1996, Ser. No. 620,144**
**Int. Cl.[6] F02B** *31/00*
**U.S. Cl. 123—306** **14 Claims**




1. An intake system for a multicylinder internal combustion engine, comprising:
- a manifold having a plurality of inlet runners for conducting charge air into the cylinders of an engine;
- at least one secondary throttle valve situated within at least one of said inlet runners;
- an electrically driven motor for positioning said secondary throttle valve; and
- a controller for operating said motor so as to open and close said secondary throttle valve, with said controller comprising:
  - a plurality of sensors for sensing a plurality of operating parameters of an engine; and
  - a processor for receiving the sensed values of said operating parameters and for determining an appropriate position for said secondary throttle valve and an appropriate value for the supply voltage for said motor, with the said voltage value being based upon at least the temperature of said motor.

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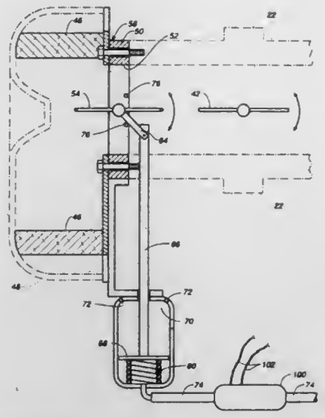
5,740,779

## APPARATUS FOR REDUCING EVAPORATIVE HYDROCARBON FUEL EMISSIONS FROM AN INTERNAL COMBUSTION ENGINE AND FOR IMPROVING THE PERFORMANCE THEREOF

**Mike Spencer-Smith, Napa, Calif., assignor to Northern California Diagnostic Laboratories, Inc., Napa, Calif.**

**Continuation-in-part of Ser. No. 780,849, Jan. 9, 1997, abandoned. This application Feb. 5, 1997, Ser. No. 790,207**
**Int. Cl.[6] F02M** *7/00*
**U.S. Cl. 123—394** **17 Claims**

1. In combination:
- an internal combustion engine having at least one hydrocarbon fuel combustion chamber and including air inlet defining means defining an air inlet for introducing air into the at least one hydrocarbon fuel combustion chamber and an ignition system;
- sensing means for sensing termination of operation of said internal combustion engine; and
- fluid flow modifying means operatively associated with the sensing means and with the internal combustion engine for reducing evaporative hydrocarbon fuel emissions from said internal combustion engine through said air inlet into the ambient atmosphere when said sensing means senses termination of operation of said internal combustion engine, said fluid flow modifying means including a valve member movable relative to said internal combustion engine between a closed position wherein said valve member substantially prevents fluid flow through said air inlet and an open position wherein fluid flow through said air inlet is generally unrestricted by said valve member, said internal combustion engine additionally including air intake means having a vacuum therein during operation of said internal combustion engine and said fluid flow modifying means additionally comprising valve member mover means for moving said valve member between said open and closed positions, said sensing means sensing whether or not a vacuum exists at the air intake means, and said valve member mover means responsive to said sensing means sensing a vacuum of determinable magnitude at said air intake means to move said valve member to said open position and responsive to said sensing means not sensing a vacuum of determinable magnitude at said air intake means to move said valve member to closed position, and solenoid valve means operatively associated with said ignition system and said valve member moving means for preventing said valve member moving means from moving said valve member from said open position to said closed position while said ignition system is energized.



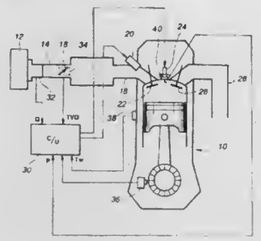
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5,740,780

## CONTROL SYSTEM FOR IMPROVED CYLINDER TORQUE BALANCE OF ENGINE

**Hirokazu Shimizu, and Kenichi Machida, both of Gunma, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan**

**Filed Feb. 5, 1997, Ser. No. 795,851**
**Claims priority, application Japan, Feb. 5, 1996, 8-019017**
**Int. Cl.[6] F02B** *5/14*
**U.S. Cl. 123—425** **12 Claims**



1. A control system for cylinder torque balance of an internal combustion engine including multiple cylinders, comprising:



means for determining individual cylinder torque having been developed by the cylinders of the engine;
means for calculating, out of the determined individual cylinder torque, a multiple cylinder average; and
means for controlling a control variable on which individual cylinder torque depends in such a manner as to decrease a deviation of the determined individual cylinder torque from the determined multiple cylinder average.

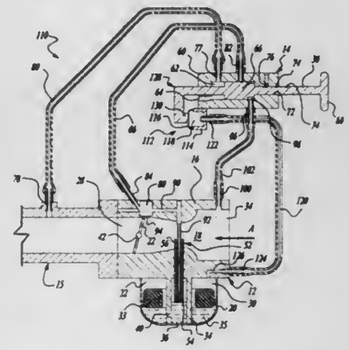
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5,740,781

## STARTING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

**William A. Scott; Gary L. Baumbarger, both of Decatur, and John G. Easter, Blue Mound, all of Ill., assignors to Tillotson, Ltd., Ireland**

**Filed May 9, 1996, Ser. No. 647,236**
**Int. Cl.[6] F02M** *1/16*
**U.S. Cl. 123—437** **24 Claims**



1. An apparatus for controlling the volume and ratio of an air/fuel mixture delivered from a carburetor to an intake manifold of an internal combustion engine, the carburetor of the type including a mixing passage interconnecting a source of air and the internal combustion engine, and a fuel cavity, the fuel cavity being in communication with the mixing passage, the apparatus comprising:
- a housing defining a chamber;
- a first port in selective communication with said chamber, said first port interconnected to the intake manifold;
- a second port in selective communication with said chamber, said second port interconnected to the fuel cavity; and
- an actuation member operative for selectively opening and closing said first and second ports;
- whereby the apparatus operates to control the volume and ratio of the air/fuel mixture delivered to the internal combustion engine by selectively establishing a negative pressure via said second port for drawing fuel from the fuel cavity to the mixing passage and selectively providing a source of positive, atmospheric air flow via said first port downstream from the carburetor.

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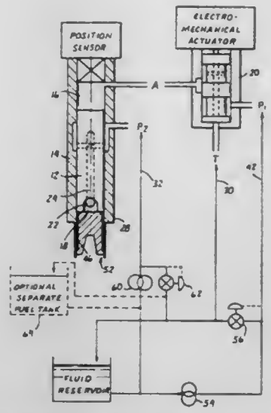
5,740,782

## POSITIVE-DISPLACEMENT-METERING, ELECTRO-HYDRAULIC FUEL INJECTION SYSTEM

**Alvin Lowi, Jr., 2146 Toscanini Dr., Rancho Palos Verde, Calif. 90275**

**Filed May 20, 1996, Ser. No. 650,611**
**Int. Cl.[6] F02M** *37/04;47/02;* **F16K** *15/14*
**U.S. Cl. 123—446** **26 Claims**

1. An electro-hydraulic fuel injector system comprising:




- a fuel injector housing comprising a first housing portion including a first chamber having a head space and a second housing portion including a second chamber having a floor;
- a piston closely fitted within said housing and adapted to freely oscillate between said head space and said floor and adapted to mate intimately against said floor;
- a first housing port in fluid communication with said head space;
- a fluid passageway within said piston, said fluid passageway in fluid communication with said second chamber;
- a second housing port in said second housing portion, said second housing port in fluid communication with said piston fluid passageway and said second chamber;
- a check valve within said piston fluid passageway, adapted to permit fluid to flow through said piston fluid passageway and into said second chamber and to prevent fluid from flowing from said second chamber back into said piston fluid passageway;
- a nozzle fitted within said second chamber and having an inner face forming said second chamber floor and adapted to open under fluid pressure to permit fluid to flow out of said second chamber;
- hydraulic means for oscillating said piston; and
- means for controlling the flow of fluid through said first housing port into said first chamber.

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5,740,783

## ENGINE DEMAND FUEL DELIVERY SYSTEM

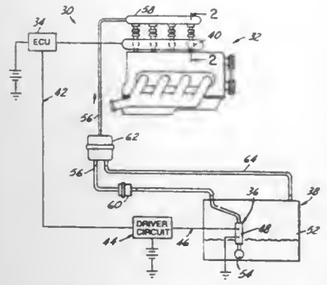
**William L. Learman, Caro; Ronald H. Roche, Cass City, and Matthew L. Werner, Caro, all of Mich., assignors to Walbro Corporation, Cass City, Mich.**

**Continuation of Ser. No. 367,106, Dec. 30, 1994, abandoned. This application Nov. 15, 1996, Ser. No. 749,448**
**Int. Cl.[6] F02M** *37/04*
**U.S. Cl. 123—497** **30 Claims**

1. A fuel delivery system for a spark ignited internal combustion engine having a fuel injector for dispensing fuel into a cylinder of the engine comprising:
- a fuel supply;
- an electric fuel pump in fluid flow communication with said fuel supply and responsive to application of electrical energy for delivery of fuel from said fuel supply to the injector of the internal combustion engine;
- a pressure regulator in communication with the fuel pump and the injector for supplying fuel to the injector at a substantially constant pressure;
- an engine spark ignition system for igniting fuel in the engine cylinder;
- an engine electronic control unit;
- a device driven by the engine and producing an electric current to power the engine spark ignition system, engine electronic

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control unit, fuel injector and the electric fuel pump system with the electric current produced by the device during engine startup and idle conditions having insufficient electric power to meet all of these electric power requirements if the electric pump were operated at a preselected maximum duty cycle to deliver a maximum quantity of fuel sufficient to meet the engine maximum fuel consumption demands;

a first sensor of the speed of rotation of the engine;

a second sensor of one of air intake throttle opening position and mass flow rate of intake air entering the engine; and

the engine electronic control unit being in communication with the first and second sensors and having first means determining the anticipated engine fuel demand for each injector before it delivers fuel to the engine and for supplying a first control signal to said fuel pump for varying and regulating the quantity of fuel said pump makes available to the fuel injector as a function of and proportional to the quantity of fuel the first means anticipates will be consumed by the engine between a preselected minimum quantity of fuel sufficient for operation of the engine under idle conditions and a preselected maximum quantity of fuel which prevents damage to the electric fuel pump by not exceeding its maximum duty cycle, second means producing a second control signal to control the amount of time each fuel injector stays open for supplying fuel to the engine, and for each fuel intake cycle of each cylinder of the engine the electronic control unit applies the first control signal to the fuel pump at least by the time it applies its associated second control signal to its associated fuel injector to deliver only slightly more fuel than is used by the fuel injector and minimize the electric power required to operate the electric fuel pump at startup, idle and low engine speeds.

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**5,740,784**

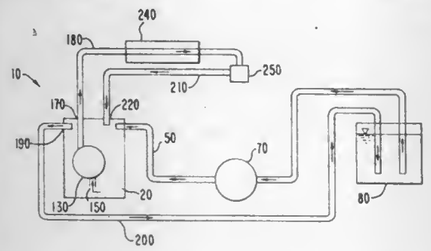
**FUEL CONTROL SYSTEM**

**Mark McKinney, Irmo, S.C., assignor to Pleasurecraft Marine Engine Co., Little Mountain, S.C.**

**Filed May 25, 1995, Ser. No. 450,698**

**Int. Cl.[6] F02M** *37/04*

**U.S. Cl. 123—509** **13 Claims**



1. A fuel control system for controlling fuel delivered to an engine, comprising:

a supply pump having a fuel flow rate;

a first fuel delivery conduit connecting the supply pump to a fuel tank; a canister, having a generally closed interior;

a second fuel delivery conduit connecting said supply pump and said canister for supplying fuel from said supply pump to the interior of the canister, a high-pressure pump including a fuel uptake means, located within said canister and connected to an outlet port in the canister, and having a fuel flow rate which is lower than the fuel flow rate of said supply pump so that during operation of the system fuel completely fills the canister,

wire means connecting the high-pressure pump to a power source; an unregulated fuel return line, connected respectively to the fuel tank and the canister, that delivers fuel which is in excess of the canister's fuel containing capacity back to the fuel tank;

a filter member mounted within said canister so as to filter the fuel drawn to the fuel uptake means in said high-pressure pump;

a third fuel delivery conduit connected to said outlet port in the canister, for delivering fuel pumped by said high-pressure pump to the engine;

an engine excess fuel return line connecting the engine and said canister; and

a pressure regulator operatively connected to said engine excess fuel return line which returns unburned fuel from the engine to the canister.

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**5,740,785**

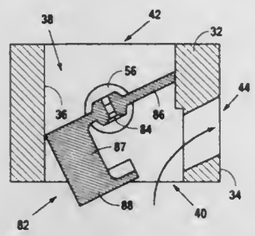
**TWO WAY-HIGH PRESSURE LOOP, EXHAUST GAS RECIRCULATION VALVE**

**Daniel W. Dickey, and Evan S Guy, both of Helotes, Tex., assignors to Southwest Research Institute, San Antonio, Tex.**

**Filed Jun. 9, 1997, Ser. No. 871,204**

**Int. Cl.[6] F02M** *25/07*

**U.S. Cl. 123—568** **11 Claims**



1. An exhaust gas recirculation valve interposed between an exhaust manifold and a turbocharger of an internal combustion engine, said valve comprising:

a housing having an exterior surface, an interior surface defining an 4 internally disposed chamber, an inlet port extending between said exterior surface and said internal chamber and adapted for fluid communication with said exhaust manifold of the engine, a first discharge port extending between said internal chamber and said exterior surface and adapted for fluid communication with a turbine inlet port of said turbocharger, a second discharge port extending between said interior chamber and said exterior surface and adapted for fluid communication with an intake port of said engine, a first bore extending between said internal chamber and the exterior surface of the housing and concentrically formed about a longitudinal axis extending through the internal chamber of said housing, a second bore coaxially aligned with said first bore and extending between said internal chamber of the housing and an opposed exterior surface of the housing;

a shaft rotatably mounted in said bore of the housing;

a throttle blade fixedly attached to said shaft and having a first portion shaped to block said first discharge port when said shaft it rotated to a first position, and a second portion spaced from said first portion and shaped to block said second discharge port when said shaft is rotated to a second position; and

a means for rotating said shaft between said first and second positions and to selective intermediate positions between said first and second positions.



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**5,740,786**

**INTERNAL COMBUSTION ENGINE WITH AN EXHAUST GAS RECIRCULATION SYSTEM**

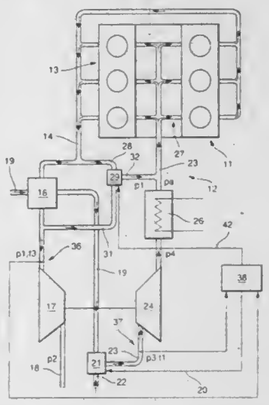
**Uwe Gärtner, Remshalden, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany**

**Filed Apr. 22, 1997, Ser. No. 844,823**

**Claims priority, application Germany, May 10, 1996, 196 18 868.7**

**Int. Cl.[6] F02M** *25/07*; **F02B** *33/44*

**U.S. Cl. 123—570** **7 Claims**



1. An internal combustion engine with an air supply duct and an exhaust gas duct and an exhaust gas recirculation system including an exhaust gas turbocharger having a turbine arranged in said exhaust gas duct so as to be driven by the exhaust gas discharged from said engine through said exhaust gas duct, and a compressor operated by said turbine and being in communication with said air supply duct for supplying charge air to said engine, an exhaust gas recirculation line extending between said exhaust gas duct upstream of said turbine and said air supply duct downstream of said compressor for recirculating exhaust gas from said exhaust gas duct to said air supply duct, a first heat exchanger arranged in said exhaust gas duct for reducing the temperature of the exhaust gas therein, a second heat exchanger arranged in said air supply duct for increasing the temperature of said charge air supplied to said engine and means for controlling the temperature of the exhaust gas entering said turbine and of the charge air entering said compressor to thereby provide for a pressure differential between the exhaust gas in said exhaust gas duct and the charge air in said air supply duct over a large engine operating range.

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**5,740,787**

**ELECTRIC CIRCUIT DEVICE HAVING AN EXCELLENT SEALING CONSTRUCTION**

**Koji Ando, Kariya, Japan, assignor to Denso Corporation, Kariya, Japan**

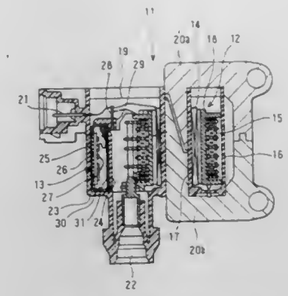
**Filed Dec. 24, 1996, Ser. No. 772,765**

**Claims priority, application Japan, Dec. 27, 1995, 7-340417**

**Int. Cl.[6] F02P** *11/00*

**U.S. Cl. 123—635** **27 Claims**

1. An electric circuit device comprising:



a container having an opening and a bottom opposite said opening;

a circuit element placed inside said container via said opening;

a gel medium filling said container sufficiently to seal said circuit element; and

a protective member contacting an entire surface of said gel medium proximate to said opening, said protective member sealing said entire surface of said gel medium against substantial contact with an overlying potting medium,

wherein said circuit element is disposed between a surface of said protective member and said bottom.

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**5,740,788**

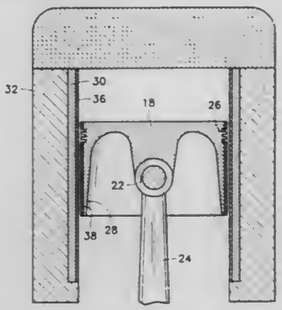
**FIBER REINFORCED CERAMIC MATRIX COMPOSITE PISTON AND CYLINDER/SLEEVE FOR AN INTERNAL COMBUSTION ENGINE**

**Steven Donald Atmur, Riverside, and Thomas Edward Strasser, Corona, both of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.**

**Filed Aug. 16, 1995, Ser. No. 515,927**

**Int. Cl.[6] F02B** *75/08*

**U.S. Cl. 123—668** **16 Claims**



1. A ceramic piston and cylinder/sleeve pair for an internal combustion engine having low coefficients of thermal expansion comprising:

a) a piston formed of a structural fiber reinforced ceramic matrix composite material;

b) a first erosion-resistant material disposed on the skirt portion of said piston, said first erosion-resistant material also possessing self-lubricating characteristics;

c) a cylinder/sleeve formed of said structural fiber reinforced ceramic matrix composite material; and,

d) a second erosion-resistant material disposed on a cylinder wall surface of said cylinder/sleeve, said second erosion-resistant material also possessing self-lubricating characteristics and being harder than said first erosion-resistant material.

6. A method of making a ceramic piston and cylinder/sleeve pair having low coefficients of thermal expansion for use in an internal combustion engine comprising the steps of:

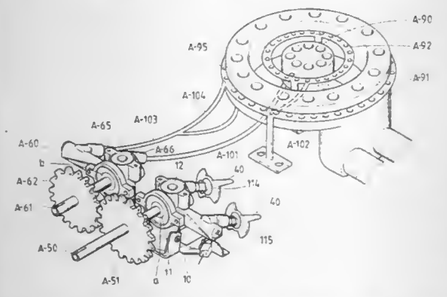
VOL 1209 ISS 3 APR 21 1998 UMI



a) forming a piston of a structural fiber reinforced ceramic matrix composite material;
b) applying a first erosion-resistant and self-lubricating material on a skirt portion of the piston;
c) forming a cylinder/sleeve of the same structural fiber reinforced ceramic matrix composite material; and,
d) applying a second erosion-resistant and self-lubricating material which is harder than said first erosion-resistant and self-lubricating material on a cylinder wall surface of the cylinder/sleeve.

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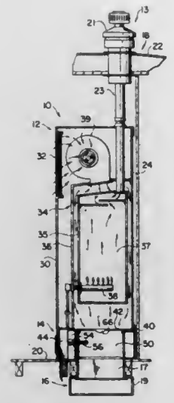
**5,740,789**
**MODIFICATION OF THE GAS STOVE BY INSTALLING OXYGEN BOOSTER**
**Che Yuan Chang, 2F, 4, San Kuang Lane, Taichung, Taiwan**
**Filed Aug. 21, 1995, Ser. No. 519,153**
**Int. Cl.[6] F24C** *3/00*
**U.S. Cl. 126—39 R** **2 Claims**




1. A gas stove including a burner, combined with an oxygen supplying device for complete combustion of gaseous fuel in the stove comprising:
a pair of first and second valves juxtaposedly secured to the front side of the stove for respectively supplying gaseous fuel and oxygen to the burner, each valve including a rotor plug therein, an elongate shaft axially connected on one end to the rotor and extended outward through a central hole of said valves, a gear perpendicularly connected to an appropriate middle periphery of each of said shafts and said respective gears meshed with each other and a knob connected to a free end of the shaft of said first valve;
said valves each having an inlet connected to a perimeter gas and oxygen supplies and two outlets connected to portions of the burner via a branched pipe;
such that when a user rotates the knob, said first and second valves work in concert to simultaneously supply the gaseous fuel and oxygen in proper rate to the burner.

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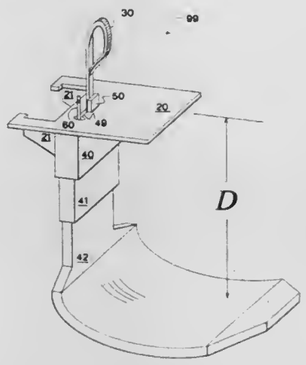
**5,740,790**
**COUNTER-FLOW HEATING AND AIR CONDITIONING METHOD FOR INSTALLING AIR CONDITIONER UNIT THEREIN**
**Steve S. Lipsky, Bethlehem, N.H., assignor to Global Engineering, Inc., Willimantic, Conn.**
**Filed Oct. 6, 1995, Ser. No. 540,263**
**Int. Cl.[6] F24F** *3/00*
**U.S. Cl. 126—113** **19 Claims**



1. In a heating and air conditioning system for a building having a floor and a heat distribution duct disposed below the floor, a feeder duct communicating with the heat distribution duct and extending upwardly through the floor, a counter-flow heating appliance disposed above the floor and including a housing having an air inlet in the upper portion thereof and base means defining an air outlet therethrough communicating with the interior of the housing and the feeder duct, a heat source contained within the housing, and means for directing air along a flow path from the air inlet downwardly past the heat source into and through the air outlet and the feeder duct and into the heat distribution duct, and air conditioning means for generally controlling the quantity of moisture in a portion of the flow path, the improvement wherein said air conditioning means comprises an air conditioning unit disposed below said heating appliance and externally of said housing between said housing and said floor and having a body defining a passageway therethrough communicating with said air outlet and said feeder duct, said passageway defining a portion of said air flow path between said air outlet and said feeder duct.

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**5,740,791**
**RETRACTING ORAL AIRWAY**
**Teodulo Aves, Woodlands, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.**
**Filed Apr. 26, 1996, Ser. No. 638,385**
**Int. Cl.[6] A61M** *16/00*
**U.S. Cl. 128—200.26** **8 Claims**

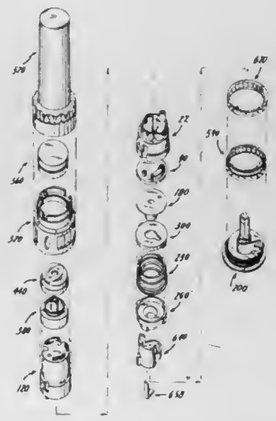



1. A retracting oral airway, comprising
a substantially planar dental flange;
an elongated intra-oral extension having a distal curved blade portion and a proximal portion, said proximal portion comprising extension retraction means and said extension retraction means comprising at least first and second slidingly adjustable segments, which are selectively adjustable by said extension retraction means said first segment being coupled to said dental flange;
displacement stop means to prevent disconnection of said slidingly adjustable segments; and
lock means to reversibly lock said slidingly adjustable segments to establish a maximum dimension between said dental flange and said distal curved blade portion.



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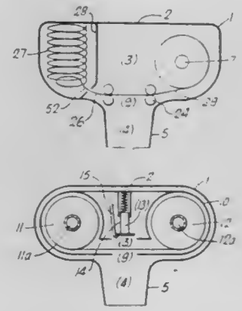
**5,740,792**
**INHALER FOR POWDERED MEDICATIONS WITH GEAR-TEETH COUNTER ASSEMBLY**
**Charles R. Ashley, Clinton; Charles M. Huck, Gladstone; Henry R. Sochon, Clifton, all of N.J., and Ken Wilkinson, Round Lake, Ill., assignors to Schering Corporation, Kenilworth, N.J.**
**Division of Ser. No. 446,804, Jun. 1, 1995, which is a continuation-in-part of Ser. No. 992,959, Dec. 18, 1992, abandoned. This application Jun. 1, 1995, Ser. No. 460,604**
**Int. Cl.[6] A61M** *15/00;16/00;* **B05D** *7/14;83/06*
**U.S. Cl. 128—203.15** **14 Claims**



1. A counter for a powdered medication inhaler which is actuated for dose delivery by a reciprocating partial relative rotation of its components, said counter comprising:
a continuous counter ring having counting indicia thereon and having gear teeth therearound;
an intermittent counter ring adjacent to said continuous counter ring, said intermittent counter ring having counting indicia thereon and having gear teeth therearound;
display means through which one of said counting indicia from said continuous counter ring and one of said counting indicia from said intermittent counter ring are displayed to indicate a count corresponding to a number of doses of powdered material that have been dispensed or remain to be dispensed;
actuating means including pawl means engaging with said gear teeth of said continuous counter ring, and said intermittent counter ring, for rotating said continuous counter ring one increment each time that a dose of the powdered material is dispensed to display another one of said counting indicia of said continuous counter ring through said display means, and for rotating said intermittent counter ring one increment every predetermined number of rotational increments of said continuous counter ring to display another one of said counting indicia of said intermittent counter ring through said display means; and
spring means for biasing said pawl means into engagement with said gear teeth of said continuous counter ring and said intermittent counter ring.

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**5,740,793**
**DRY POWDER INHALATION DEVICE WITH ELONGATE CARRIER FOR POWER**
**Peter D. Hodson; David K. Smith; David J. Velasquez; Anthony C.L. Wass, all of St. Paul, and Clyde D. Calhoun, Stillwater, all of Minn., assignors to Astra Aktiebolag, Sodertalje, Sweden**
**Continuation of Ser. No. 437,291, May 8, 1995, Pat. No. 5,619,984, which is a continuation of Ser. No. 103,411, Aug. 6, 1993, abandoned, which is a continuation of Ser. No. 933,882, Aug. 21, 1992, abandoned, which is a continuation of Ser. No. 516,328, Apr. 30, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 471,612**
**Claims priority, application United Kingdom, Apr. 28, 1989, 8909891**
**Int. Cl.[6] A61M** *15/00;16/00;* **B05D** *7/14;* **B65D** *83/06*
**U.S. Cl. 128—203.15** **16 Claims**

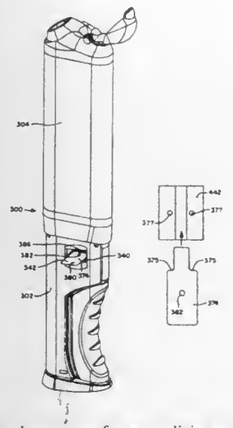


1. A method of delivering a powdered medicament to a patient during inhalation comprising the steps of:
a) providing a dry powder inhalation device comprising:
a housing defining a chamber, a patient port in communication with said chamber, and one or more air inlets in communication with said chamber so that when the patient inhales through the patient port an air flow is established from the air inlets to the patient port through the chamber;
an elongate carrier disposed within said housing, preloaded with a plurality of doses of medicament, said medicament being in the form of a plurality of finely divided powder particles, said finely divided powder particles being releasably retained directly on a surface of the carrier, without the presence of an adhesive between the carrier and powder particles by an attractive force between said carrier and said powder; and
an advancement mechanism for exposing an area of predetermined size of the elongate carrier within the chamber so that the powder particles in said area are exposed to said air flow during inhalation and can be released from said carrier and entrained into said airflow;
b) causing the patient to inhale through said patient port; and
c) simultaneously with step (b), applying a sufficient releasing force to said carrier to release said powder particles from said exposed portion of said carrier into said air flow.

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5,740,794
**APPARATUS AND METHODS FOR DISPERSING DRY POWDER MEDICAMENTS**
**Adrian E. Smith, Belmont; John D. Burr, Redwood City; Jeffrey W. Etter, Castro Valley; George S. Axford, Menlo Park, and Jack M. Anthony, Palo Alto, all of Calif., assignors to Inhale Therapeutic Systems, Palo Alto, Calif.**
**Continuation-in-part of Ser. No. 309,691, Sep. 21, 1994. This application Jun. 7, 1995, Ser. No. 487,184**
**Int. Cl.[6] A61M** *15/00;16/00;* **B05D** *7/14;* **B65D** *83/06*
**U.S. Cl. 128—203.15** **32 Claims**

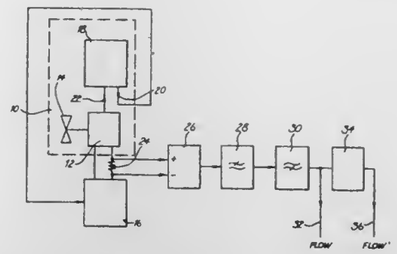


1. An improved apparatus for aerosolizing a powdered medicament, the apparatus being of the type having a housing and a source of pressurized gas for aerosolizing the powdered medicament, wherein the improvement comprises:
a pressurization cylinder;
a piston slidable within the cylinder;
a release valve in communication with the cylinder; and
a handle assembly having a handle operably attached to the piston and a valve closing mechanism operably attached to the handle, wherein movement of the handle in one direction moves the valve closing mechanism to engage and close the valve in a stable, closed position and movement of the handle in another direction axially translates the piston within the cylinder to produce the pressurized gas while the valve remains in the stable closed position to maintain the gas under pressure until released.

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5,740,795
**ESTIMATION OF FLOW AND DETECTION OF BREATHING IN CPAP TREATMENT**
**John William Ernest Brydon, Wollstonecraft, Australia, assignor to ResMed Limited, an Australian Company, North Ryde, Australia**
**Filed Dec. 2, 1994, Ser. No. 348,580**
**Claims priority, application Australia, Dec. 3, 1993, PM2793**
**Int. Cl.[6] A61M** *16/00*
**U.S. Cl. 128—204.21** **12 Claims**

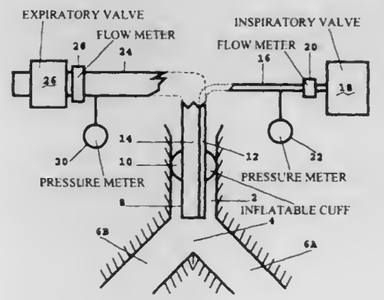
1. A method for detecting respiration during the administration of continuous positive airway pressure (CPAP) treatment by a CPAP system, said CPAP system including an electrical motor coupled to a turbine for supplying breathable gas to a mask via a gas delivery tube, said method comprising the steps of:
measuring motor voltage to derive a motor voltage signal;
measuring motor current to derive a motor current signal;
deriving an instantaneous motor power signal as a multiplication of said motor voltage signal and said motor current signal;
filtering said instantaneous motor power signal to remove non-respiratory components; and



sensing a change in said filtered true motor power signal as being indicative of a change in respiratory phase.

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5,740,796
**VENTILATOR SYSTEM AND METHOD FOR OPERATING SAME**
**Göran Skog, Bromma, Sweden, assignor to Siemens Elema AB, Solna, Sweden**
**Filed Nov. 6, 1996, Ser. No. 743,737**
**Claims priority, application Sweden, Dec. 1, 1995, 9504313**
**Int. Cl.[6] A61M** *16/00*
**U.S. Cl. 128—204.23** **12 Claims**



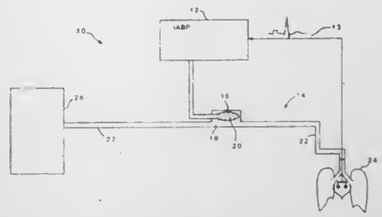

3. A ventilator system comprising:
an inspiratory line;
an expiratory line;
a connector device adapted for placement in the trachea of a patient, facing the carina, said connector device having a first gas line connected to said inspiratory line and a second gas line connected to said expiratory line;
means for permitting gas to flow in said inspiratory line and said first gas only in a direction toward said patient;
means for permitting gas to flow in said second gas line and in said expiratory gas line only in a direction away from said patient; and
an expiratory pressure meter disposed in said expiratory line for measuring pressure in the lungs of said patient by measuring pressure in said expiration line during inspiration.

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5,740,797
**CARDIAC SYNCHRONIZED VENTILATION**
**Eric W. Dickson, Worcester, Mass., assignor to University of Massachusetts, Boston, Mass.**
**Filed Feb. 23, 1996, Ser. No. 606,412**
**Int. Cl.[6] A61M** *16/00*
**U.S. Cl. 128—204.28** **21 Claims**

1. A cardiac synchronized ventilator for use with a patient, said ventilator comprising:
a balloon;

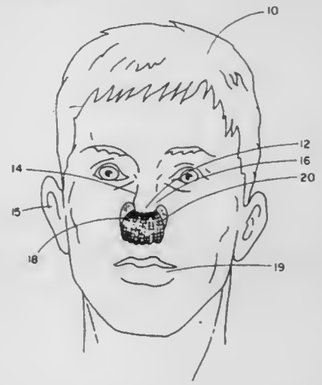




a balloon pump arranged to inflate and deflate said balloon, said inflation being in synchrony with cardiac function of the patient, and
a conversion unit comprising,
a chamber fillable with a ventilation medium and containing said balloon, and
one or more conduction lines for containing ventilation medium, said one or more conduction lines being arranged to carry ventilation medium from said chamber to the patient's lungs and arranged to carry ventilation medium from the patient's lungs;
whereby, said balloon is inflated during systole of the patient's heart, and said inflation pressurizes said conduction line to deliver ventilation medium to the patient's lungs.

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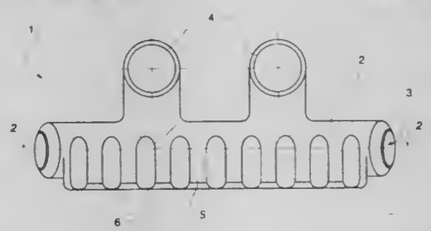
5,740,798
**DISPOSABLE NASAL BAND FILTER**
**Stella H. McKinney, 2126 Country Club Dr., Sugarland, Tex. 77478**
**PCT No. PCT/US95/04918, § 371 Date Oct. 22, 1996, § 102(e) Date Oct. 22, 1996, PCT Pub. No. WO95/28992, PCT Pub. Date Nov. 2, 1995**
**Continuation-in-part of Ser. No. 231,156, Apr. 22, 1994, abandoned. This PCT application Apr. 21, 1995, Ser. No. 737,105**
**Int. Cl.[6] A62B** *7/10*
**U.S. Cl. 128—206.18** **5 Claims**



1. A nasal band filter for wearing on a user's nose and surrounding a user's nostrils, comprising:
a filter element comprising a swatch of thermal undergarment material having an upper, a lower, a right and a left outer edge for surrounding a user's nostrils;
two sheer material pieces having an adhesive coating on one side, wherein each of said sheer material pieces is attached to an opposite end of said filter element;
at least one backing strip covering said sheer material pieces to protect the adhesive coating prior to application of the nasal band filter; and
an elastic strand stitched around the upper and the lower outer edges of said filter element such that said filter element includes a gathered portion around the upper, the lower, the right and the left outer edges and a bulging portion whereby said filter element will snuggle a user's nose and define a gap between said filter element and a user's nostrils.

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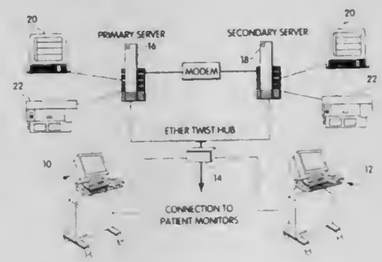
5,740,799
**DEVICE FOR THE SUPPLY OF OXYGEN AND/OR OTHER GASES TO A PATIENT**
**Lars Priess Nielsen, Hundested, Denmark, assignor to Maersk Medical A/S, Lynage, Denmark**
**PCT No. PCT/DK94/00482, § 371 Date Jun. 18, 1996, § 102(e) Date Jun. 18, 1996, PCT Pub. No. WO95/17220, PCT Pub. Date Jun. 29, 1995**
**PCT Filed Dec. 21, 1994, Ser. No. 669,466**
**Claims priority, application Denmark, Dec. 21, 1993, 1428/3**
**Int. Cl.[6] A61M** *15/08*
**U.S. Cl. 128—207.18** **9 Claims**



1. A device for the supply of oxygen and/or other gases to a patient and comprising a flow conduit which is, at its one end, provided with means for coupling to a supply source for oxygen and/or other gases and, at its other end, closed, and having between its two ends a patient connecting member comprising an upstream and a downstream tubular member each of which is designed for insertion into the nostrils of a patent, wherein, in the patient connecting member beyond the upstream one of the tubular members for insertion into the patient's nostrils, flow restriction means are provided for equalizing the outflow through the upstream and the downstream tubular member.

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5,740,800
**METHOD AND APPARATUS FOR CLINICAL PATHWAY ORDER SELECTION IN A MEDICAL INFORMATION SYSTEM**
**Maria F. Hendrickson, Chelmsford, and Michael M. Stern, Needham, both of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.**
**Filed Mar. 1, 1996, Ser. No. 609,185**
**Int. Cl.[6] A61B** *5/00*
**U.S. Cl. 128—630** **19 Claims**




1. A method for clinical pathway order selection in a computer-based medical information system including a medical database and a user terminal having a display screen, said method comprising the steps of:

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defining clinical pathways in the medical database, each of said clinical pathways being associated with a patient condition and including a sequence of time intervals and a plurality of clinical pathway order sets, each being associated with a selected one of said time intervals;

associating a selected one of said clinical pathways with a patient in accordance with the patient's condition;

in response to user selection of the patient's clinical pathway order sets, determining a next order set comprising a first unused order set in the patient's clinical pathway order sets; and

displaying on the display screen an identification of the next order set.

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**5,740,801**

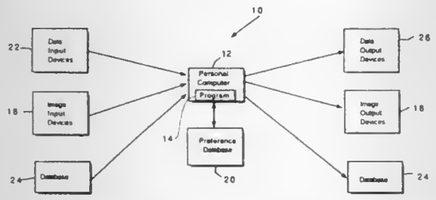
**MANAGING INFORMATION IN AN ENDOSCOPY SYSTEM**

**Philip J. Branson, 311 Courthouse Rd., Princeton, W. Va. 24740**

**Continuation-in-part of Ser. No. 40,633, Mar. 31, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 478,865**

**Int. Cl.[6] A61B** *5/103*

**U.S. Cl. 128—653.1** **55 Claims**




1. A system for acquiring images during a medical procedure and using the acquired images, comprising

at least one input device for obtaining said images,

at least one output device for using the images obtained by said input device to enable image data to be communicated to a medical practitioner,

a preference database for pre-storing, for each one of a plurality of users of said system, respective preference information that indicates one or more processing operations that said one of said plurality of users of said system prefers to be performed on said images obtained by said input device and that indicates a configuration of at least one of said input and output devices that said one of said plurality of users of said system prefers, and wherein said preference information further indicates, for each one of said users, a sequence of images that are to be obtained during said medical procedure, and wherein said system further comprises means for prompting said current user to obtain the images in said sequence, and

a processor for receiving an indication of an identity of one of said users, who is currently using said system, and, responsive to said indication of said identity of said one of said users who is currently using said system, for retrieving said preference information for said one of said users pre-stored in said preference database, for performing processing operations on said images obtained by said input device and applying said images to said at least one output device based on the preference information in said preference database that corresponds to said current user, and for establishing a configuration of at least one of said input and output devices based on the preference information in said preference database that corresponds to said current user.

**5,740,802**

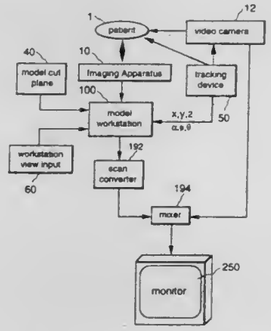
**COMPUTER GRAPHIC AND LIVE VIDEO SYSTEM FOR ENHANCING VISUALIZATION OF BODY STRUCTURES DURING SURGERY**

**Christopher Allen Nafis, Rexford; Timothy Patrick Kelliher, Nassau; William Edward Lorensen, Ballston Lake; Harvey Ellis Cline, Schenectady, all of N.Y.; David Egidio Altobelli, Wilmington; Ron Kikinis, Brookline, both of Mass.; Robert David Darrow, Scotia, and Charles Lucian Dumoulin, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Continuation of Ser. No. 342,690, Nov. 21, 1994, abandoned, which is a continuation of Ser. No. 49,913, Apr. 20, 1993, abandoned. This application Dec. 8, 1995, Ser. No. 569,560**

**Int. Cl.[6] A61B** *5/05*

**U.S. Cl. 128—653.1** **14 Claims**




1. A real-time surgery apparatus for augmenting a surgeon's view of a patient comprising:

a) a medical imaging system for obtaining three-dimensional (3D) imaging data of internal structures of said patient;

b) a video camera means for providing real-time video images of exposed surfaces of said patient from a camera viewpoint being a location (x,y,z) and orientation angle (α,φ,θ) with respect to the patient, and being substantially the same as a viewpoint of the patient as viewed by said surgeon;

c) a workstation for receiving the 3D imaging data creating a segmented model of internal structures of said patient and creating computer images from selected surfaces of the segmented model as viewed from the same location (x,y,z) and orientation (α,φ,θ) as the video camera means;

d) mixer means for creating a composite image being a desired mixture of the video image of exposed surfaces, and the computer image of the selected surfaces of the internal structures for most of the composite image, with a moveable window being a region of the composite image showing predominantly the video image, or the computer image; and

e) display means for displaying the composite image resulting in an image of semi-transparent exposed surfaces correctly registered with the internal structures, and a view of the patient as viewed by said surgeon to allow said surgeon to locate internal structures relative to visible external surfaces in surgery.

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**5,740,803**

**LOCATING THE CENTER OF THE ENTRANCE PUPIL OF AN EYE AFTER PUPIL DILATION**

**Gary P. Gray; Charline A. Gauthier, both of Orlando, Fla., and Ioannis G. Pallikaris, Crete, Greece, assignors to Autonomous Technologies Corporation, Orlando, Fla.**

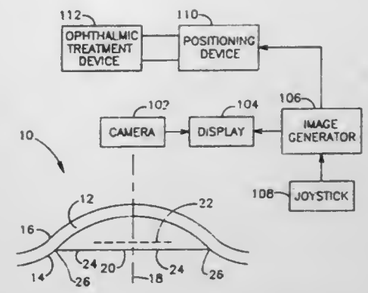
**Filed Mar. 7, 1997, Ser. No. 813,079**

**Int. Cl.[6] A61B** *3/107*

**U.S. Cl. 128—653.1** **13 Claims**

13. A system comprising:






a device for forming a first image of an eye with its pupil in an undilated state and for forming a second image of said eye when said undilated pupil is no longer available;

a display coupled to said device for displaying one of said first image and said second image;

an analyzer coupled to said display for locating a center of said undilated pupil in said first image and for locating a position of at least one anatomical landmark in relation to said center of said undilated pupil; and

a controller coupled to said analyzer and said display for subsequently aligning said eye based on said position of said at least one anatomical landmark such that said center of said undilated pupil in said eye is properly located.

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**5,740,804**

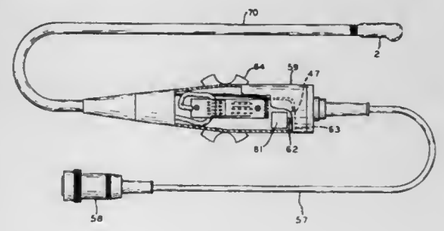
**MULTIPANORAMIC ULTRASONIC PROBE**

**Marino Cerofolini, Subbiano, Italy, assignor to Esaote, S.p.A, Casale Monferrato, Italy**

**Filed Oct. 18, 1996, Ser. No. 733,499**

**Int. Cl.[6] A61B** *8/00;* **G01B** *15/00*

**U.S. Cl. 128—660.1** **28 Claims**




1. An ultrasonic probe, comprising:

an ultrasonic transducer array having a gear;

control means for generating a first and a second open loop electrical control signal:

first rotating means having an output shaft with a bevel gear engaging said gear of said ultrasonic transducer array for rotating said ultrasonic transducer array about a first axis through a predetermined angle, said first rotating means coupled to said control means to rotate said transducer array in response to said first open loop electrical control signal; and

second rotating means connected to said ultrasonic transducer array for rotating said transducer array about a second axis through a predetermined angle, said second rotating means coupled to said control means to rotate said transducer array in response to said second open loop electrical control signal, said second axis perpendicular to said first axis.

**5,740,805**

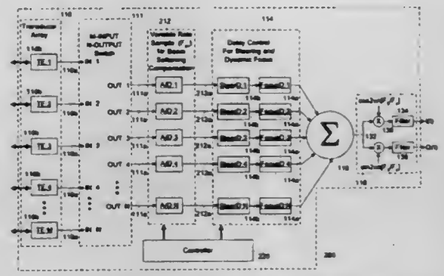
**ULTRASOUND BEAM SOFTENING COMPENSATION SYSTEM**

**Enrico Dolazza, Boston, and William Wong, Milton, both of Mass., assignors to Analogic Corporation, Peabody, Mass.**

**Filed Nov. 19, 1996, Ser. No. 752,719**

**Int. Cl.[6] A61B** *8/00*

**U.S. Cl. 128—660.06** **18 Claims**




1. A system for processing an ultrasound echo signal received in response to a transmitted ultrasound signal characterized as having an energy distribution with a predetermined center frequency, the ultrasound echo signal being characterized as having a centroid frequency that decreases from the center frequency of the transmitted ultrasound signal as a function of time, the system comprising:

(A) means for receiving the ultrasound echo signal including means for generating an electrical signal representative of the ultrasound echo signal;

(B) sampling means for generating samples of the electrical signal at a sampling frequency;

(C) demodulation means for demodulating the samples of the electrical signal, the demodulation means producing a demodulated signal having an energy distribution in the frequency spectrum substantially centered about a predetermined frequency; and

(D) control means for controlling the sampling means so that the sampling frequency decreases as a function of the centroid frequency so that said predetermined frequency remains substantially independent of changes in said centroid frequency.

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**5,740,806**

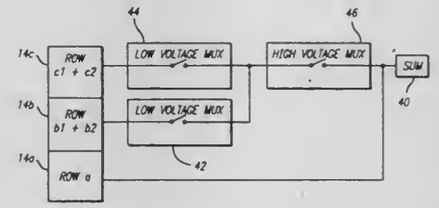
**DYNAMIC RECEIVE APERTURE TRANSDUCER FOR 1.5D IMAGING**

**Gregg Miller, Seattle, Wash., assignor to Siemens Medical Systems, Inc., Iselin, N.J.**

**Filed Mar. 29, 1996, Ser. No. 626,241**

**Int. Cl.[6] A61B** *86/00;* **G01N** *29/00*

**U.S. Cl. 128—661.01** **14 Claims**




1. An imaging system, comprising:

a transducer having a linear array of piezoelectric elements arranged in a plurality of distinct rows of said elements, said transducer being operable to provide acoustic pulses from elements of a first one of said rows in response to respective driving signals and to provide corresponding return signals in response thereto at elements of additional ones of said plurality of said rows and at said first one of said rows;

VOL 1209 ISS 3 AP 21 1998 UMI



a receiver adapted to receive a summed signal from said corresponding return signals of said elements;

a processor coupled to said receiver and said transducer to provide a 1.5D image from a plurality of said summed signals; and

switch means for coupling said transducer to said receiver, said switch means comprising a first switch element coupled to respective ones of said additional ones of said plurality of said rows, and a second switch element coupled between said first switch element and said receiver.

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**5,740,807**

**SUSPENDED ULTRA-SOUND INDUCED MICROBUBBLE CAVITATION IMAGING**

**Thomas R. Porter, Omaha, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.**

**Continuation of Ser. No. 439,619, May 12, 1995, Pat. No. 5,560,364. This application Sep. 26, 1996, Ser. No. 721,507**

**Int. Cl.[6] A61B** *8/00*

**U.S. Cl. 128—662.02** **19 Claims**

1. A method of ultrasonic myocardial, renal, or hepatic imaging which employs an echo contrast agent having microbubbles comprising:

introducing said echo contrast agent into an animal by intravenous injection;

suspending ultrasonic transmission for a time sufficient for said contrast agent to perfuse an organ of interest and thereafter;

resuming ultrasonic transmission.

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**5,740,808**

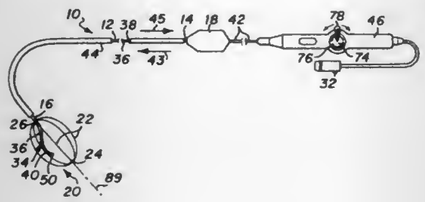
**SYSTEMS AND METHODS FOR GUILDING DIAGNOSTIC OR THERAPEUTIC DEVICES IN INTERIOR TISSUE REGIONS**

**Dorin Panescu; David McGee, both of Sunnyvale; James G. Whayne, Saratoga, and David K. Swanson, Mountain View, all of Calif., assignors to EP Technologies, Inc, Sunnyvale, Calif.**

**Filed Oct. 28, 1996, Ser. No. 739,508**

**Int. Cl.[6] A61B** *8/12*

**U.S. Cl. 128—662.06** **28 Claims**




1. A system comprising

a catheter tube having a distal region,

an imaging element on the distal region to visualize tissue,

a support structure on the distal region surrounding the imaging element,

a steering element coupled to the imaging element to move the imaging element relative to the support structure, and

a guidance element comprising a generating component to generate an electric field within the support structure, a sensing component to sense spatial variations in the electric field during movement of the imaging element, and a processing component to generate an output that locates the imaging element relative to the support structure based upon an analysis of the sensed spatial variations.

**5,740,809**

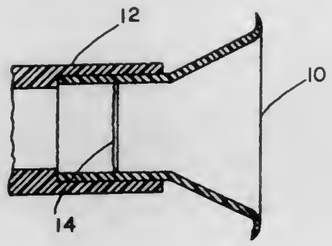
**NONINVASIVE INFRARED BLOOD FLOW DETECTOR**

**Francis I. Baratta, 138 Ridge St., Arlington, Mass. 02174-1737**

**Filed Oct. 26, 1994, Ser. No. 329,299**

**Int. Cl.[6] A61B** *6/00*

**U.S. Cl. 128—664** **10 Claims**




1. A system to detect diseased tissue within the eye comprising:

a first temperature sensor adapted to obtain the core temperature of a patient;

a second temperature sensor detecting infrared radiation supported within said first temperature sensor and adapted to obtain a series of spot temperatures at spots encompassing choroidal tissue of the eye of said patient;

a focusing means focusing said detected infrared radiation at said second temperature sensor;

a referenced oriented tracking means directing said second temperature sensor to avoid veins and arteries of said patient to provide said series of spot temperatures at spots encompassing said choroidal tissue of the eye of said patient;

computing means comprising a microprocessor calculating a set of signals proportional to the difference between said core temperature and each of said spot temperatures; and

output means providing an output map of the set signals.

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**5,740,810**

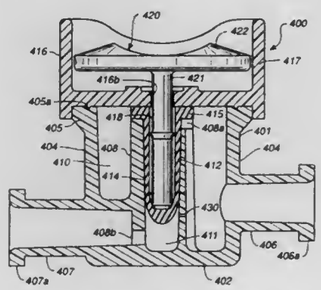
**ONE HAND PUSH BUTTON FAST FLUSH DEVICE**

**Robert H. Johnson, Fountain Green, and Gordon S. Reynolds, Bountiful, both of Utah, assignors to Abbott Laboratories, Abbott Park, Ill.**

**Continuation-in-part of Ser. No. 173,549, Dec. 23, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,224**

**Int. Cl.[6] A61B** *5/00*

**U.S. Cl. 128—673** **13 Claims**




1. A flush device for use in fluid flow systems employed for administering, a medicinal fluid to a patient, comprising:

(a) a housing having a tubular body including an inner cylinder and an outer annular wall and including an inlet and an outlet;

(b) an interior fluid entry chamber disposed between said inner cylinder and said outer annular wall, said interior fluid entry chamber being in fluid communication with the inlet for receiving the medical fluid, said outlet being adapted for coupling to a catheter through which the medical fluid flows to the patient;

(c) a capillary bore comprising part of a non-closable first fluid flow path from said inlet to said outlet that extends through said fluid entry chamber and said inner cylinder, said capillary bore being disposed in a wall of said inner cylinder and extending through said wall between the fluid entry chamber and an interior of said inner cylinder, connecting said fluid entry chamber in fluid communication with said outlet to provide a slow flow of medicinal fluid through the flush device along the first fluid flow path;

(d) a closable second fluid flow path extending through the interior of said inner cylinder from said inlet to said outlet and coupling said interior fluid entry chamber in fluid communication with said outlet, said second fluid flow path providing a substantially greater rate of flow of the medicinal fluid through the housing, said flush device further comprising a member disposed within the interior of said inner cylinder, said member comprising an elastically deformable material and having a portion positioned to press against the wall of said inner cylinder to close off said second flow path, said first and second fluid flow paths being substantially in parallel; and

(e) a plunger movably coupled to said housing and positioned to distend said member within said inner cylinder, thereby reducing a cross-sectional area of said member and causing said member to move away from the wall of said inner cylinder to open said second fluid path between the inlet and the outlet.



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**5,740,811**

**DEVICE AND METHOD FOR GENERATING A SYNTHESIZED ECG**

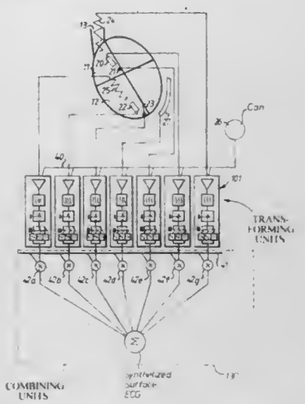
**Sven-Erik Hedberg, Kungsängen, and Jakub Hirschberg, Täby, both of Sweden, assignors to Pacesetter AB, Solna, Sweden**

**Filed Nov. 26, 1996, Ser. No. 756,374**

**Claims priority, application Sweden, Nov. 28, 1995, 9504258**

**Int. Cl.[6] A61N** *1/37*; **A61B** *5/0402*

**U.S. Cl. 128—697** **25 Claims**




1. A physiological signal processing device comprising:

a plurality of pairs of physiological sensors adapted for in vivo implantation in a subject, each pair of physiological sensors respectively generating an IEGM signal;

a plurality of first signal processing units, each first signal processing unit having an input for receiving at least one of said IEGM signals, and an output;

a second signal processing unit having a plurality of inputs respectively connected to said outputs of said first signal processing units, and having an output;

each of said first signal processing units comprising means for subjecting at least one of said IEGM signals, supplied at its input, to at least one transfer function for producing a pre-treated signal at its output; and

said second signal processing unit comprising means for combining at least two of said pre-treated signals for producing at least one synthesized ECG signal at said output of said second signal processing unit.

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**5,740,812**

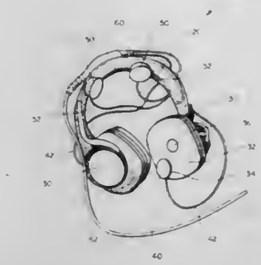
**APPARATUS FOR AND METHOD OF PROVIDING BRAINWAVE BIOFEEDBACK**

**Jonathan D. Cowan, Goshen, Ky., assignor to Mindwaves, Ltd., Goshen, Ky.**

**Filed Jan. 25, 1996, Ser. No. 590,405**

**Int. Cl.[6] A61B** *5/04*

**U.S. Cl. 128—732** **20 Claims**



1. A brainwave biofeedback apparatus to be worn by a user on the user's head, the apparatus comprising a scalp portion passing over a scalp of the user's head, said apparatus further comprising at least one scalp sensor unit, said at least one scalp sensor unit being detachably receivable by said scalp portion, said at least one scalp sensor unit having a scalp electrode cup and a compound sponge assembly, said scalp electrode cup including a scalp electrode having a scalp electrode lead extending therefrom, said compound sponge assembly including an absorbent sponge portion and a scalp contact and cleaning portion, said scalp contact and cleaning portion to engage said user's hair, said absorbent sponge portion being partway received by said scalp electrode cup, said scalp contact and cleaning portion being a layer external to said absorbent sponge portion and attached thereto.

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**5,740,813**

**METHOD OF CALCULATING WORK BURDEN INDEX AND APPARATUS FOR CARRYING OUT THE SAME METHOD AND WORK ROUTINE PLANNING METHOD UTILIZING THE SAME INDEX**

**Satoshi Ogata, Nagoya; Kiyoyuki Imayoshi, Toyota; Yoshinori Eri, Nagoya; Tatsuhisa Ishii, Aichi-ken; Tetsuro Konomi, and Kazunari Fukumoto, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan**

**Filed May 24, 1994, Ser. No. 248,489**

**Claims priority, application Japan, May 25, 1993, 5-122571; Mar. 3, 1994, 6-033541**

**Int. Cl.[6] A61B** *5/04*

**U.S. Cl. 128—733** **9 Claims**

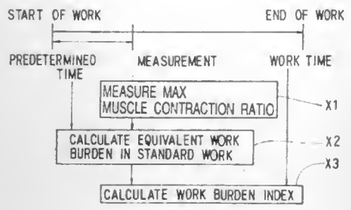
1. A method of calculating a work burden index comprising the steps of:

measuring the maximum muscle contraction ratio when a work has been continued for a predetermined time;

calculating, from said measured maximum muscle contraction ratio and said predetermined time, an equivalent work burden in a standard work wherein a work burden index calculated

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from the measured maximum muscle contraction ratio and the predetermined time is equal to a work burden index calculated from the equivalent work burden in the standard work and the predetermined time, and wherein a relation between the work burden index, work time, and work burden is known in said standard work; and

calculating, from said equivalent work burden and an actual work time, the work burden index when the work is continued for said actual work time.

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**5,740,814**

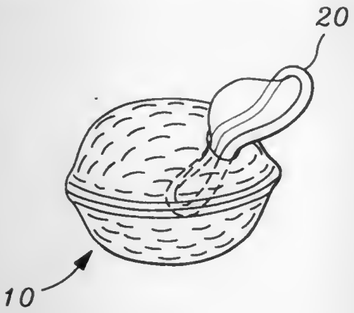
**CONDOM IN A NUT NOVELTY**

**Roger Comi, 15920 Meagher St., Fountain Valley, Calif. 92708**

**Filed Jun. 7, 1997, Ser. No. 872,482**

**Int. Cl.[6] A61F** *6/04*

**U.S. Cl. 128—844** **6 Claims**




1. A novelty, comprising:

a natural nut, the nut having a nutshell; and

a condom contained within the nutshell.

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**5,740,815**

**METHOD FOR SURGICALLY ACHIEVING MINIMUM ASTIGMATISM MEASURED REFRACTIVELY AND TOPOGRAPHICALLY**

**Noel A. Alpins, 7 Chesterville Road, Cheltenham, Victoria, 3192, Australia**

**Filed Jun. 7, 1995, Ser. No. 476,449**

**Int. Cl.[6] A61B** *19/00*

**U.S. Cl. 128—897** **40 Claims**

1. A method of evaluating astigmatism of an eye of a patient taking into account refractive and topographical measurements of the astigmatism comprising:

measuring magnitude and axis of astigmatism of an eye of a patient based on topography of the cornea of the eye of the patient,

measuring magnitude and axis of astigmatism of the eye of the patient based on refractive correction of said eye, and

determining surgical parameters based on the measurements of astigmatism both refractively and topographically suitable for surgically treating the eye,

said surgical parameters being determined by

a) summating the values of astigmatism measured topographically on the values of astigmatism measured refractively, on the one hand, and the values of astigmatism measured refractively on the values of astigmatism measured topographically, on the other hand, to obtain respective non-zero target astigmatism values for refraction and topography, and

b) establishing said surgical parameters based on both said target astigmatism values such that the sum of the target astigmatism values for refraction and topography is a minimum,

whereby astigmatism in the eye following surgery based on said parameters will be a minimum when measured topographically and refractively.

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**5,740,816**

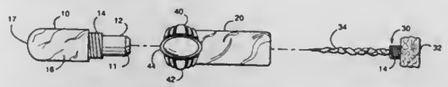
**SMOKING ACCESSORY**

**Raffi Ghazarian, 42 Helen St., Waltham, Mass. 02154, and VahéGhazarian, 4 Tory row, Woburn, Mass. 01801**

**Continuation-in-part of Ser. No. 60,520, Sep. 30, 1996. This application Jan. 10, 1997, Ser. No. 781,726**

**Int. Cl.[6] A24F** *13/24*

**U.S. Cl. 131—248** **14 Claims**




1. A smoking accessory comprising:

a tubular storage compartment having two opposing open ends wherein a first open end has a first portion of a first attachment means and a second open end has a first portion of a second attachment means;

a punch portion, wherein said punch portion further comprises a top portion having a cylindrical cutting element affixed to an end of said top portion, and a second, portion of a first attachment means disposed thereon for attaching said punch portion to said tubular storage compartment by engaging said first portion of said first attachment means with said second portion of said first attachment means; and

a puncturing awl; wherein said puncturing awl further comprises a base, a prong, and a second portion of a second attachment means disposed thereon for attaching said puncturing awl to said tubular storage compartment by engaging said first portion of said second attachment means with said second portion of said second attachment means.

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**5,740,817**

**PROCESSING OF SMOKING MATERIAL**

**William Cunningham, Backwell, United Kingdom, assignor to Imperial Tobacco Limited, Bristol, United Kingdom**

**PCT No. PCT/GB94/01359, § 371 Date Mar. 29, 1996, § 102(e) Date Mar. 29, 1996, PCT Pub. No. WO95/01108, PCT Pub. Date Jan. 12, 1995**

**PCT Filed Jun. 23, 1994, Ser. No. 564,235**

**Claims priority, application United Kingdom, Jun. 30, 1993, 9313431**

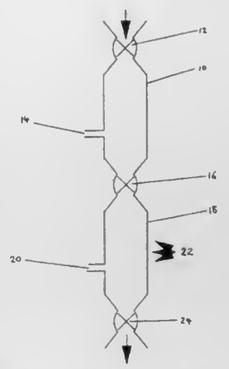
**Int. Cl.[6] A24B** *3/18*

**U.S. Cl. 131—291** **10 Claims**

1. A process for treating smoking material comprising the steps of (i) heating smoking material having a moisture content of from 5 to 75% by weight at a temperature of from 70° to 220° C. at about or above atmospheric pressure in the presence of air and (ii) reducing the pressure on the heated smoking material to a level of from 0.1 to 50 kPa at a rate such that the water contained within the smoking material evaporates causing the smoking material to expand, the smoking material being heated during pressure reduction to accelerate water evaporation.

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**5,740,818**

**Patent Not Issued For This Number**

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**5,740,819**

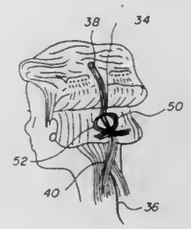
**PROCESS FOR SECURING SUPPLEMENTAL HAIR TO THE NATURAL HAIR OF AN INDIVIDUAL**

**Janice A. Hicks, P.O. Box 1861, Tucker, Ga. 30085-1861**

**Filed Nov. 6, 1996, Ser. No. 744,617**

**Int. Cl.[6] A41G** *3/00*

**U.S. Cl. 132—201** **12 Claims**




1. A process for securing supplemental hair to the natural hair of an individual comprising:

1) providing a weft of supplemental hair;

2) providing a length of thread;

3) binding said weft of supplemental hair around a binding portion of said weft located between three and six inches from a first end of said weft of supplemental hair by forming a series of stitches around said binding portion and then pulling said thread taut to create a bound weft in a manner to leave a top length and a bottom length of thread extending from said binding portion, said binding portion separating said bound weft into an upper weft portion and a lower weft portion;

4) defining a row of natural hair on a head of said individual to receive said supplemental hair;

5) defining first and second strands of hair from said row that are adjacent to each other;

6) separating said two strands to form a V-shaped notch at a scalp of said individual;

7) positioning said binding portion of said bound weft into said notch against the scalp of the individual in a manner such that said upper weft portion and said top length of thread are positioned above said row and said bottom weft portion and said bottom length of thread are positioned below said row;

8) braiding said bottom and top weft portions with said first and second strands to form a braid;

9) providing a curved needle having an eye formed at one needle end thereof;

9) inserting a first end of said top thread and a second end of said bottom length of thread through said eye of said curved needle;

10) sewing a plurality of blanket stitches around a base end of said braid and then pulling said thread taught;

11) sewing a plurality of blanket stitches up through a center of said braid;

12) sewing a plurality of blanket stitches around said first and second strands between said top of said braid and said scalp and then pulling said thread taut;

13) inserting said needle through said braid and exiting through a bottom of said braid; and then

14) severing any remaining thread extending past said bottom of said braid.

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**5,740,820**

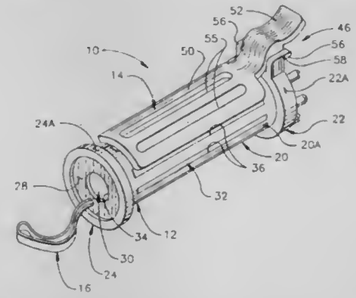
**HAIR ROLLERS WITH ENHANCED HAIR ROLLING AND SETTING FEATURES**

**Paule Stern, San Diego, Calif., assignor to Madison Star, LLC, San Diego, Calif.**

**Continuation-in-part of Ser. No. 536,936, Sep. 29, 1995. This application Sep. 16, 1996, Ser. No. 710,288**

**Int. Cl.[6] A45D** *2/16;2/28*

**U.S. Cl. 132—249** **68 Claims**




1. A hair roller, comprising:

(a) an elongated body having an annular cross-sectional shape around which hair can be wound between a pair of opposite ends of said body for styling a person's hair;

(b) a hair clip having a hair-engagable blade portion disposed longitudinally along and overlying an exterior side portion of said body and of curved cross-sectional shape conforming to said annular cross-sectional shape of said body;

(c) pivot means mounted at a first of said opposite ends of said body for mounting said hair clip to said body for undergoing pivotal movement relative to said body along an arcuate path between a closed position adjacent to said exterior side portion of said body and an opened position angularly displaced from said exterior side portion of said body such that a portion of the hair is retained between said blade portion of said hair clip and said exterior side portion of said body when said hair clip is at said closed position and is released from between said blade portion of said hair clip and said exterior side portion of said body when said hair clip is pivotally moved toward said opened position; and

(d) said hair clip having a lever portion extending from said pivot means beyond and away from said first of said opposite ends of said body for facilitating engagement by a finger of a user to cause pivotal movement of said lever portion through an arc wholly outside of said first end of said body and

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thereby pivotal movement of said hair clip from said closed position to said open position.

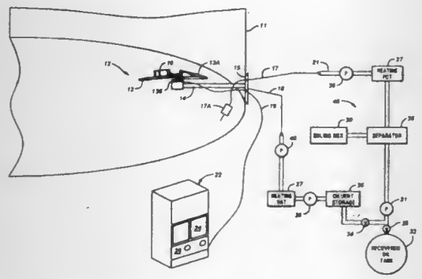
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**5,740,821**

**TANK CLEANING USING REMOTELY CONTROLLED MANWAY MOUNTED ROBOTIC SYSTEM**

**Kermit R. Arnold, Bacliff, Tex., assignor to Landry Service Co. Inc., Bacliff, Tex.**

**Filed Jul. 9, 1996, Ser. No. 677,389**
**Int. Cl.[6] B08B** *3/02*
**U.S. Cl. 134—113** **5 Claims**



1. A remotely controllable robotic cannon nozzle system sized and adapted for mounting in a manway port in a storage tank containing waste sludge or material to be removed, comprising:

a hollow mounting arm attachable to a manway or port cover on one end and having on its opposite end a pivotally mounted arm, said pivot being hydraulically powered and having on its end a second hydraulically powered pivot;

a cannon nozzle being attached to said second hydraulically powered pivot and having mounted therewith an axially aligned video camera, and an axially aligned light source;

means for supplying cleaning fluid to said nozzle under controllable pressure, the direction of said nozzle being remotely controllable by an operator, controlling the position of said first and second hydraulically powered pivots, in response to video images produced by said camera and said light source; and

an evacuation nozzle and hose means attached thereto, being remotely controllable by said operator for pumping a pumpable slurry of effluent from the tank to be cleaned.

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**5,740,822**

**PATIO SET**

**Barry Einck, Huntington Beach, Calif., assignor to Esign Design Inc., Huntington Beach, Calif.**

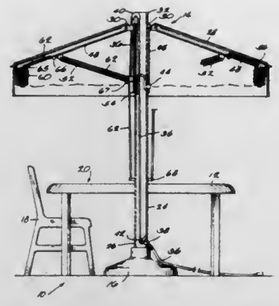
**Filed Jan. 15, 1997, Ser. No. 784,690**
**Int. Cl.[6] E04H** *15/02*
**U.S. Cl. 135—16** **18 Claims**

1. A patio set comprising:

a table having an upper surface and an opening in said upper surface; and

an umbrella positionable within said opening in said table, said umbrella comprising:

a shaft inserted into said opening in said table; and



a canopy having an opening through which said shaft extends, and having an upper end that is slidable relative to said shaft from a raised position to a lowered position.

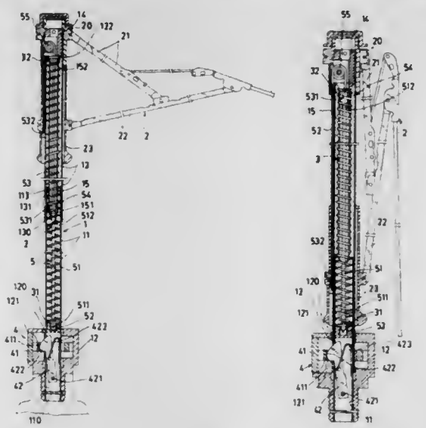
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**5,740,823**

**LIGHTENING SAFETY AUTOMATIC UMBRELLA**

**Chung-Kuang Lin, and Jung-Jen Chang, both of Taipei Hsien, Taiwan, assignors to Fu Tai Umbrella Works, Ltd., Taipei Hsien, Taiwan**

**Filed Apr. 14, 1997, Ser. No. 839,492**
**Int. Cl.[6] A45B** *25/14*
**U.S. Cl. 135—24** **1 Claim**



1. An automatic umbrella comprising:

a central shaft having a lower tube, an upper tube including a lower portion of said upper tube telescopically slidably engageable with the lower tube including an upper portion of said lower tube, a grip secured to the lower tube, an inner block secured to a top end portion of the upper shaft and an inner sleeve secured to and protruding downwardly from the inner block;

a rib assembly having at least a top rib pivotally secured to an upper notch fixed on a top end of the central shaft, and a stretcher rib pivotally secured between the top rib and a lower runner slidably held on the central shaft;

an opening spring resiliently retained in said upper tube and said lower tube, having an upper spring end of said opening spring retained on the inner block and disposed about an upper sleeve portion of the inner sleeve;

a control means built in said grip for controlling the opening of the umbrella, said control means including:

a push button slidably held in a button hole in the grip having an inward extension protruding inwardly from the push button;



and a catch pivotally secured in the grip having a hook portion protruding outwardly from the catch through the lower tube to be ingageable with a hook hole formed in a lower portion of the upper tube when folding the umbrella, and a catch spring retained between the hook portion and an inside wall of the lower portion of the lower tube for normally urging the hook portion outwardly ready for engaging the hook hole of the upper tube;

with the hook portion facing the inward extension of the push button, whereby upon depression of the push button and the inward extension, the hook portion will be inwardly depressed to disengage the hook hole of the upper tube for opening the umbrella when opened; and

a drag means normally retained between a lower portion of said lower tube and said lower runner, and operatively pulled as tensioned by the opening spring for extending the rib assembly when opening the umbrella, said drag means including:

a rod disposed within the opening spring;

a rope having an inner rope end secured to an upper rod portion of said rod by a coupling having a lowermost tapered coupling portion of the coupling engageable with a lower sleeve portion tapered downwardly from the inner sleeve when opening the umbrella;

with the rope wound about a roller rotatably mounted in a top portion of the central shaft to allow an outer rope end of the rope to be fixed in the lower runner, whereby upon opening of the umbrella, the rope and the rod will be stably extended as tensioned by the opening spring within the central shaft;

the improvement which comprises:

said opening spring having a lower spring end retained on a plug which is fixed in a lower portion of the central shaft;

and said rod of said drag means having a lower rod portion secured into said plug by a pin, whereby upon extending of the opening spring to open the umbrella, the upper tube will be extended above, without being separated from, said lower tube as being limited by said lower rod portion in said plug and in said lower tube.

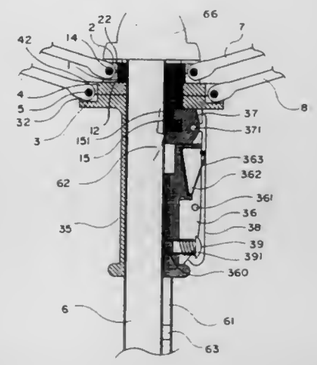
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**5,740,824**

**UMBRELLA WITH A STRETCH STRUCTURE FOR SELECTIVELY COLLECTING RAINWATER**

**Yoan Tang, 7F-5, No. 86, An-Ping Road, Chung-Ho, Taipei, Taiwan**

**Filed Dec. 4, 1996, Ser. No. 760,369**
**Int. Cl.[6] A45B** *25/06*
**U.S. Cl. 135—28** **1 Claim**



1. An umbrella with a stretch structure for selectively collecting rainwater, comprising an upper hub member, an upper hub cover disposed on said upper hub member, a lower hub member, a lower hub cover disposed on said lower hub member, a plurality of umbrella main ribs, a plurality of steel pins, a plurality of secondary ribs, a steel wire ring having an opening, a push-button switch having a control block pivotally connected to a top thereof, a stick having an axially extended channel, and an umbrella cover;

said upper and said lower hub members as well as said upper and said lower hub covers all having a central opening while said upper hub member and said upper hub cover further having an inward projection provided at one side of their respective central opening, and said upper and said lower hub members as well as said upper and said lower hub covers being up and down movably put around said stick with said inward projections engaging into said axial channel of said stick;

said upper hub member and said upper hub cover being correspondingly provided at a peripheral surface with a plurality of radially arranged vertical grooves and on a top and a bottom surface, respectively, with a plurality of shallow receiving recesses, each of said receiving recesses extending across a top of one of said vertical grooves to receive one of said steel pins therein while said steel pins respectively threading through a hole formed at an inner end of said umbrella main ribs to pivotally connect said main ribs to said vertical grooves of said upper hub member and said upper hub cover, and a retaining block having a facing-outward opening downward extending from a bottom surface of said upper hub member;

said lower hub member and said lower hub cover being correspondingly provided at a peripheral surface with a plurality of radially arranged vertical grooves and on a top and a bottom surface, respectively, with a shallow annular groove having a raised portion, said annular groove extending across a top of every said vertical grooves to receive said steel wire ring therein with said raised portions engaging with said opening of said steel wire ring, said steel wire ring threading through a hole formed at an inner end of said secondary ribs to pivotally connect said secondary ribs to said vertical grooves of said lower hub member and said lower hub cover, said vertical grooves on said lower hub member having a depth about one half of a depth of said lower hub member so that said secondary ribs are separately supported in said vertical grooves of said lower hub member without falling out of or declining from said lower hub member, said lower hub member and said lower hub cover both having a dent provided to one side of their central opening for fitly receiving said downward extended retaining block of said upper hub member; said lower hub member having a downward extended elongated tube portion to allow said lower hub member to be more easily moved toward or away from said upper hub member, said elongated tube portion being provided at one side with a vertically extended seat to receive said push-button switch therein by means of a supporting shaft threading through said seat and said push-button switch, said vertical seat having a V-shaped spring member disposed in a recess formed therein so that a leg of said spring member abuts against an inner side of said push-button switch to allow said switch to return to an outer home position after it is pushed inward; a control block being pivotally supported on a top of said switch and having a configuration and a position just allowing it to engaging with said downward extended retaining block of said upper hub member; a through hole being formed near a lower end of said vertical seat so that a push pin with a spring put therearound extends through said through hole to move in and out laterally;

said umbrella cover being fixed to and centered at a top end of said stick with an outer periphery thereof fixed to outer ends of said main ribs and a middle portion thereof connected to outer ends of said secondary ribs by sewing; and

said stick being formed near an upper portion with a springy retaining hook to press against a bottom of said retaining block of said upper hub member and thereby retain said upper hub member to an upper place on said stick when said retaining block is not engaged with said control block of said push-button switch, said stick further having an upper through hole formed below said springy retaining hook and a lower through hole formed at a lower portion of said stick slightly above a handle of said umbrella for said push pin to extend

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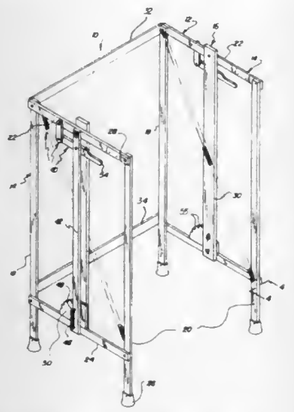


into and thereby locates said lower hub member at a higher or a lower position on said stick as required;

whereby when said upper and said lower hub member are pushed up until they reach the top end of said stick and said upper hub member is retained thereto by said springy retaining hook and said lower hub member is disengaged from said upper hub member and pulled down to be located at said upper through hole of said stick, said umbrella is stretched; when said lower hub member alone is pulled down to be located at said lower through hole on said stick, said umbrella is closed in a normal manner; and when said upper and said lower hub members are locked together by the engaged retaining block and control block and are pulled down together to located at said lower through hole on said stick, said umbrella is closed with said umbrella cover in a folded state for collecting rainwater attached to said umbrella cover.

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**5,740,825**
**ARTICULATED STAIR WALKER**
**P. J. Brunengo, 11940 S.E. Idleman Rd., Portland, Oreg. 97266**
**Filed Feb. 12, 1997, Ser. No. 799,501**
**Int. Cl.[6] A61H** *3/00*
**U.S. Cl. 135—67** **1 Claim**



1. A new and improved articulated stair walker for traversing staircases comprising, in combination:

a frame including first and second side sections and an intermediate section therebetween, each side section including a front leg, a rear leg, an upper tie bar and a lower tie bar, each leg being positioned vertically and including an upper extent and a lower extent, the lower extent of each leg including an elastomeric foot positioned thereupon, each upper tie bar being positioned horizontally and having two free ends pivotally coupled to the upper extent of each leg, each lower tie bar being positioned horizontally and having two free ends pivotally coupled to each leg above its lower extent;

an intermediate section including two vertical beams with upper and lower extents, the upper and lower extent of each vertical beam being pivotally coupled to the approximate centerpoint of the upper and lower tie bars;

a front section including an upper cross bar and a lower cross bar, the upper cross bar being positioned horizontally being rigidly affixed to the upper extent of the front legs, each lower cross bar being positioned horizontally and being rigidly affixed to the front legs at their lower extent;

a lift assembly comprising two lock pin rods, two lock pin lifts, four lock pin springs, lock pins and two quadrant cams, the lock pin rods being positioned vertically and having an upper extent and lower extent, the upper extent of each lock pin rod being slidably coupled to the approximate centerpoint of each upper tie bar, each lock pin rod including an aperture above its lower extent, each lock pin lift including an inboard piece and outboard piece, each outboard piece having a pivoting end and rounded gripping end, the outboard piece being pivotally coupled to a lock pin rod below its upper extent, each inboard piece having a first end pivotally coupled to the tie bar and a second end pivotally coupled to the pivoting end of the outboard piece;

two quadrant cams formed in a planar, generally arc shaped configuration with a rounded upper end and a lower end affixed to the lower tie bar, each upper end having a periphery including a plurality of equidistantly spaced slots, two cylindrical shaped lock pins each with two free ends, the cylindrical shaped lock pins including a pair of top pins each with a first end fixedly coupled to a top aperture formed in the lower extent of the corresponding lock pin rod and a second end slidably coupled within a vertical slot formed in the lower extent of the corresponding vertical beam of the intermediate section, the cylindrical shaped lock pins further including a pair of bottom pins each with a first end slidably coupled within a vertical slot formed in the lower extent of the corresponding lock pin rod and a second end fixedly coupled within a bottom aperture formed in the lower extent of the corresponding vertical beam of the intermediate section, the springs coupled between the associated first ends and associated second ends thereby urging the lock pin downward into a slot and further allowing removal of the pins upon the biasing of the corresponding lock pin rod upwardly via the lock pin lift; and

two leg springs each having an upper end and a lower end, the upper end of each spring being coupled to the upper extent of the front leg, the lower end of each spring being coupled to the lower extent of the rear leg, whereby in an operative orientation, the user places the front legs of the walker on a first step of a staircase and lifts the gripping ends of the lock pin lifts upwardly, with this action raising the locking pins that are movable and allowing the rear legs to be pivoted downwardly, the user then releasing the lifts, thereby locking each movable lock pin within a slot of the quadrant cam and securing the rear leg in the downward position.

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**5,740,826**
**COLLAPSIBLE STORAGE STRUCTURE**
**Michael Patrick Nevin, Cape Town, and John M. Malan, Johannesburg, both of South Africa, assignors to Cashel International Investments Limited, Roadtown, Virgin Islands (Br.)**
**Filed Oct. 6, 1995, Ser. No. 540,578**
**Int. Cl.[6] E04H** *15/06*
**U.S. Cl. 135—88.06** **18 Claims**

1. A collapsible storage structure for the storage of an object, the structure comprising:

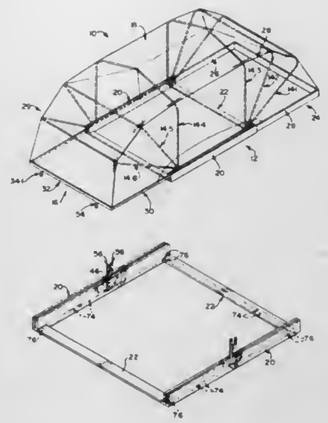
a base having front and rear ends and on or over which the object can be placed, the base comprising a pair of longitudinally extending, spaced, parallel rails;

a plurality of inverted, substantially U-shaped canopy supports spanning the base from one rail to the other and being mounted so as to be foldable with respect to the base;

a canopy carried on the canopy supports to be supported over the object, the arrangement being such that, when the canopy supports are in a collapsed configuration, the object can be positioned with respect to the base, whereafter the canopy supports can be displaced to an erected configuration in which the canopy covers the object;

a transport mechanism comprising a pair of carriages, one carriage being slidably arranged on each rail, the carriages carrying at least certain of the canopy supports and the carriages being displaceable between a first position in which the canopy supports are in their collapsed configuration, an intermediate position in which said at least certain of the canopy supports are held together in a substantially upright configuration, and a second position in which the canopy supports are in their erected configuration; and

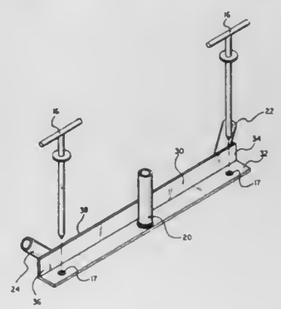




a locking arrangement associated with said at least certain of the canopy supports and at least one of the carriages for locking said at least certain of the canopy supports in their substantially upright configuration while the carriages traverse the rails between their first position and their second position.

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**5,740,827**
**TENT ANCHORING SYSTEM**
**Richard A Swarringim, 2124 S Main, Burlington, Iowa 52601**
**Filed Apr. 3, 1997, Ser. No. 832,901**
**Int. Cl.[6] E04H** *15/62*
**U.S. Cl. 135—118** **8 Claims**



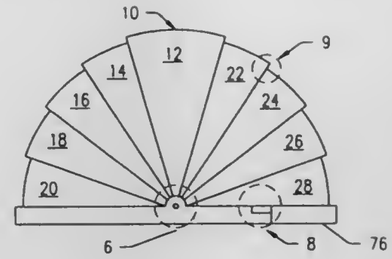
1. A Tent Anchoring System comprising: an elongated bar comprising a horizontal section and a vertical section, said horizontal section having at least two apertures therein for receiving tent stakes, a first post fixedly joined to said elongated bar and forming about a 90 degree angle with the horizontal section of said elongate bar, and a second and third post fixedly joined to said elongated bar at opposite end locations of said elongated bar.

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**5,740,828**
**COLLAPSIBLE SHELTERS**
**Evan J. Evans, 207 P.R. 2593, Alvord, Tex. 76225**
**Filed May 9, 1997, Ser. No. 853,247**
**Int. Cl.[6] E04H** *15/44*
**U.S. Cl. 135—132** **15 Claims**

1. A collapsible shelter comprising:

A. a roof section including,



a) a central portion terminating in first and second end portions, each said end portions being provided with an aperture proximate the distal end thereof, and

b) a left and a right edge, said left and said right edge, being provided with a downwardly extending lip portion;

B. a plurality of left and right sections having,

a) a central portion terminating in first and second end portions, each said end portions being provided with an aperture proximate the distal end thereof, and

b) a left and a right edge, said left edge being provided with a downwardly extending lip portion and said right edge being provided with an upwardly extending lip portion, and

c) said left edge of said left and right sections upwardly extending lip portions cooperating with said downwardly extending lip portions of said roof section;

C. each of the remaining left and right sections having,

a) a central portion terminating in first and second end portions, each said end portions being provided with an aperture proximate the distal end thereof,

b) a left and a right edge, said left edge, being provided with a downwardly extending lip portion and said right edge being provided with an upwardly extending lip portion, and

c) said left edge of said left and right section upwardly extending lip portion cooperating with said downwardly extending lip portion of a previous left and right section;

D. a base section having,

a) a central portion terminating in first and second end portions,

b) a left and a right edge, said left edge being provided with a base member portion having a first centrally disposed aperture and a second aperture disposed approximately three quarters the length of said base member portion on an extending portion, said right edge being provided with an upwardly extending lip portion, and

c) said right edge of said base section upwardly extending lip portion cooperating with said downwardly extending lip portion of a left section; and

E. a door section having,

a) a central portion terminating in first and second end portions, and

b) a left and a right edge, said right edge being provided with a door member portion that mates with said base member extending portion of said base member section and is provided with a centrally disposed aperture, said left edge being provided with an upwardly extending lip portion;

F. first mounting bolt means disposed within one said distal end aperture of all said sections slidably retaining them therein in a nesting manner;

G. second mounting bolt means disposed within the other of said distal end aperture of all said sections slidably retaining them therein in a nesting manner, and

H. retaining means for holding each said mounting bolt means within said distal end apertures;

wherein all said sections cooperating with each other to form said shelter when extended and collapse to essentially the width of said roof section.

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5,740,829

## METHOD OF SEALING AN OUTLET OPENING

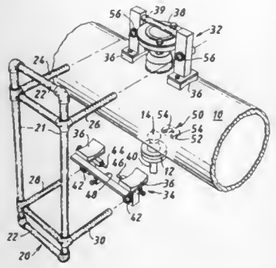
Michael Jacobs, Newcastle upon Tyne, and Leigh Martin Johnson, Bonsall, both of Great Britain, assignors to British Gas plc, London, England

Filed Jul. 25, 1995, Ser. No. 506,609

Claims priority, application United Kingdom, Jul. 26, 1994, 9415000

Int. Cl.[6] F16K *43/00*; F16L *55/10*

U.S. Cl. 131—15 8 Claims



1. A method of sealing an outlet opening to a branch line in a pipeline by applying a seal to the outlet opening from inside of the pipeline, said branch line being in fluid communication with said pipeline, the method comprising the steps of welding a joint-flange to the pipeline opposite to the branch line, using a jig to locate said joint-flange in relation to the pipeline so as to facilitate the welding of the joint-flange in the correct position, cutting an access opening through the wall of the pipeline opposite and in alignment with the outlet opening, inserting the seal into the pipeline through the access opening and applying the seal solely across the outlet opening interiorly of the pipeline so as to block communication between said branch line and said pipeline.

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5,740,830

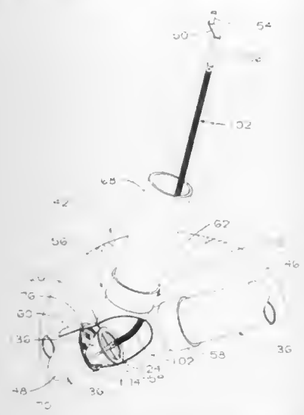
## TESTING OF PLUMBING INSTALLATIONS

John M. Mankins, 7320 Pinal Ave., Atascadero, Calif. 93422

Filed Dec. 30, 1996, Ser. No. 777,407

Int. Cl.[6] F16K *43/00*; G01M *3/04*; F16L *55/11*

U.S. Cl. 137—15 24 Claims



1. A method of testing a plumbing system in a building using a standard test plug, said system being adapted to be connected to a sewer line by a drain line, comprising the steps of:

installing the plumbing system in the building including providing a drain line between the plumbing system and the sewer line;

installing a standard test plug in the drain line thereby to prevent flow through the line past the plug;

testing the plumbing system by applying fluid pressure in the plumbing system on the opposite side of the plug from the sewer line and against the plug thereby to test the plumbing system for leaks; and

removing a portion of the plug disposed within a portion of the drain pipe, thereby creating an opening through the plug while the drain pipe remains connected to the sewer line, thereby allowing flow through the drain line and causing the removed portion of the plug to be flushed down the drain line to the sewer line.

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5,740,831

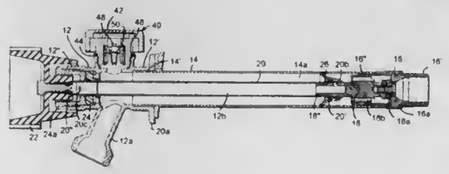
## FROSTPROOF HYDRANT SEAL

Patrick E. DeNardo, Goshen, and Mark A. Clark, Elkhart, both of Ind., assignors to Nibco Inc., Elkhart, Ind.

Filed Dec. 31, 1996, Ser. No. 777,845

Int. Cl.[6] E03C *1/10*

U.S. Cl. 137—218 14 Claims



1. A water sillcock comprising:

a hydrant body and a water tube forming a water flow passage, and a water outlet from said passage;

a main water valve for said passage;

a control handle;

an actuator stem extending from said control handle through said passage to said main water valve, and comprising a hollow vent tube forming a vent passage;

an inner vent hole from said water flow passage into said vent passage, and an outer vent hole from said vent passage to the ambient atmosphere;

a resilient, radially compressible and expandable back pressure seal valve separate from said main water valve, and located between said vent tube and said water tube to radially compress under forward water flow pressure for water flow through said water flow passage, and positioned and shaped to radially expand against said water tube to prevent backward water flow in said water flow passage; and

said seal valve being axially movable relative to said hollow vent tube a controlled amount between a vent hole-covering position to cover said inner vent hole during forward water flow pressure, and a vent hole-uncovering position to uncover said inner vent hole during back flow pressure and thereby vent said water flow passage of said back pressure to the ambient atmosphere.

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5,740,832

## ELEVATED COVER FOR BACKFLOW PREVENTION DEVICE

Herman W. Griffin, Mt. Juliet, and Edgar L. Cantrell, Lebanon, both of Tenn., assignors to Griffin & Cantrell Company, Inc., Mt. Juliet, Tenn.

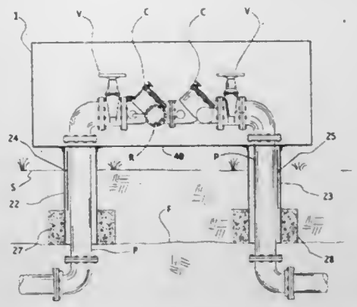
Filed Nov. 5, 1996, Ser. No. 743,939

Int. Cl.[6] F16K *49/00*

U.S. Cl. 137—341 27 Claims

1. Apparatus for protecting an above ground fluid conveying device in fluid communication with valves and piping upstream and downstream of the device, comprising:





a cover adapted to be disposed above ground level and configured to enclose the fluid conveying device, said cover having a top wall, side walls and a bottom wall, the top wall, side walls and bottom wall of said cover being insulated;

the bottom wall of said cover having an opening permitting fluid transfer out of said cover; and

the bottom wall having one or more holes adapted to allow the upstream and downstream piping to pass therethrough;

wherein the opening in the bottom wall of said cover is distinct from the one or more holes in the bottom wall of said cover.

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5,740,833

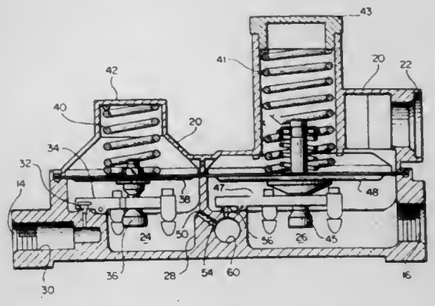
## GAS PRESSURE REGULATOR

Charles M. Olds, Anna; John D. Hostutler, Princeton; Mark E. Hood, Allen, and David W. Lambeth, McKinney, all of Tex., assignors to Fisher Controls International, Inc., Clayton, Mich.

Filed Mar. 31, 1995, Ser. No. 414,524

Int. Cl.[6] G05D *16/02*

U.S. Cl. 137—505.12 6 Claims



1. A two stage gas pressure regulator comprising:

a body housing having a gas inlet and a gas outlet;

a common interior wall dividing the body housing into two chambers in said housing with the gas inlet on one side thereof and the gas outlet on the other side thereof;

sealed diaphragm means including a first diaphragm sealing the common interior wall and defining a sealed first pressure reduction chamber at the gas inlet side, and a second diaphragm sealing the common interior wall and defining a sealed second pressure reduction chamber at the gas outlet side;

lever means including a first lever coupled to the first diaphragm for controlling the gas flow between said gas inlet and said sealed first pressure reduction chamber and a second lever for controlling the gas flow between the second pressure reduction chamber and said gas outlet;

respective non-aligned intersecting fluid passageways through said common interior wall fluidly coupling said sealed first pressure reduction chamber to said sealed second pressure reduction chamber and providing a gauge pressure tap on said body housing;

an outlet port at said common interior wall in said sealed first pressure reduction chamber;

an inlet orifice at said common interior wall in said sealed second pressure reduction chamber;

said respective intersecting fluid passageways including a first passageway fluidly communicating said outlet port to said inlet orifice; and

said second lever including a resilient disc controllably engaging said inlet orifice for controlling the gas flow between the second pressure reduction chamber and said gas outlet.

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5,740,834

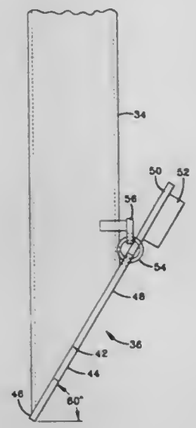
## REVERSE ANGLE INTEGRALLY COUNTER-WEIGHTED TRICKLE VALVE

Gregory S. Sherowski, Whippany, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Aug. 2, 1996, Ser. No. 691,735

Int. Cl.[6] F16K *15/00*

U.S. Cl. 137—527.6 16 Claims



1. A reverse angle, integrally counter-weighted trickle valve for the dipleg of a cyclone useful for separating particulate solids from gas comprising:

(i) a tubular body terminating at one end in a valve seat disposed at an angle of less than 90° from horizontal;

(ii) a flapper plate having an interior surface, an exterior surface, a valve seat engaging portion and a tongue extending upwards from said valve seat engaging portion with said interior surface of said valve seat engaging portion engaging said valve seat when said valve is in the closed position and said tongue being shorter than said valve seat engaging portion;

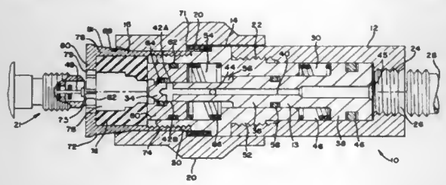
(iii) means for pivotally mounting said flapper plate whereby said plate engages said valve seat when said valve is in a closed position and swings down and away from said valve seat to an open position, and

(iv) counterweight means disposed adjacent said surface of said tongue for urging said plate against said valve seat in said closed position, wherein the mass centroid of said plate and counterweight means combination is above said hinge means.

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**5,740,835**
**VALVE CONNECTOR**
**Kevin Murphy, Schaumburg, Ill., assignor to Tuthill Corporation, Hinsdale, Ill.**
**Filed Apr. 21, 1997, Ser. No. 840,579**
**Int. Cl.[6] F16L** *29/00*
**U.S. Cl. 137—614.05** **12 Claims**

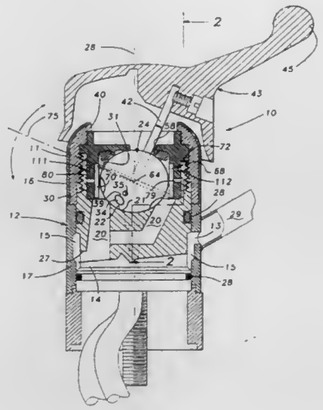


**1**. A connector adapted to engage a valve assembly for pressurization thereof and adapted to be connected to a pressure source, said connector including a housing member defining a housing inlet orifice adapted to communicate with a source of pressurized fluid; a first chamber defined within said housing member; a plunger slidably disposed in said first chamber, said plunger having a valve engaging end and another end; a fluid passage defined internal to said plunger, said fluid passage being in fluid communication with said housing inlet orifice; an insert member including a first end slidably disposed within said first chamber and overlying a portion of said plunger and a second end extending from said first chamber toward the valve assembly; a second chamber defined internal to said insert member; an entrance chamber including an opening at one end adapted to receive the valve assembly; seal means disposed within said entrance chamber adapted to surround the valve assembly; locking means adapted to decrease the volume of said entrance chamber so as to cause said seal means to grippingly engage and secure the valve assembly; first resilient biasing means adapted to engage said plunger so as to urge said plunger to a first position, out of engagement with the valve assembly; said connector operative, when the valve assembly is engaged within said entrance chamber and pressurized fluid is communicated to said housing inlet orifice, to overcome the force exerted by said first resilient biasing means and cause said plunger to move to a second position to engage the valve assembly for pressurization thereof.

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**5,740,836**
**BALL VALVE FAUCET**
**Tage Tang, Vejle, Denmark, assignor to Masco Corporation, Taylor, Mich.**
**PCT No. PCT/US95/13033, § 371 Date Apr. 4, 1997, § 102(e) Date Apr. 4, 1997, PCT Pub. No. WO96/12128, PCT Pub. Date Apr. 25, 1996**
**PCT Filed Oct. 5, 1995, Ser. No. 817,886**
**Claims priority, application Denmark, Oct. 5, 1994, 1153/94**
**Int. Cl.[6] F16K** *11/087*
**U.S. Cl. 137—625.41** **16 Claims**

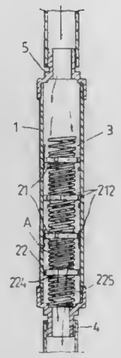
**11**. A ball valve cartridge for a mixer valve characterized by:
a ball valve element having at least one inlet and an outlet;
a cartridge housing member having a lower opening through which said movable ball valve element protrudes, said ball valve element being sealable in proximity to inlet ports of said mixer valve below said cartridge such that its at least one inlet is selectively alignable or misalignable with said inlet ports;
said cartridge housing member having an upper opening for allowing a control stem passing therethrough;
a sealing gasket being seated between said ball valve and said cartridge housing member for preventing fluid flow through said upper opening in said cartridge housing member;
said cartridge housing member having a first longitudinally extending slot therein extending between said upper opening and said lower opening; and



a pin transversely extending from said ball and slidably and pivotably received in said slot of said cartridge housing member.

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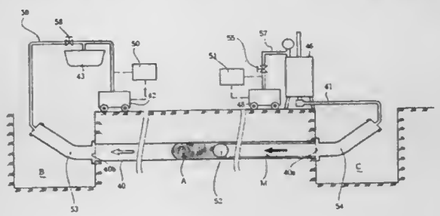
**5,740,837**
**MEANS FOR AUTOMATICALLY REGULATING WATER PRESSURE IN WATER PIPE**
**Swea Tong Chiang, No. 410, Chung Sun Road, She Koou Tsuen, Shern Gang Shiang, Taichung Hsien, Taiwan**
**Filed Nov. 5, 1996, Ser. No. 743,968**
**Int. Cl.[6] F15D** *1/02*
**U.S. Cl. 138—45** **3 Claims**



**1**. A device for automatically regulating water pressure in a water pipe, comprising a tube with a water inlet and a water outlet connected to the water pipe and a plurality of pressure-reduction members and springs alternatively disposed in the tube to bias the pressure-reduction members toward the water inlet; said pressure-reduction members each having an expanded middle portion which has an external diameter smaller than an inner diameter of said tube; at least one of said pressure-reduction members having a circumferential peripheral surface with a plurality of grooves, said pressure-reduction member closest to the water outlet having a plurality of through holes for water to flow through, whereby the pressure of water flowing through said tube from the water inlet to the water outlet is automatically regulated.



**5,740,838**
**METHODS OF LINING THE INTERNAL SURFACE OF A PIPE**
**Shinobu Satake, Tokyo; Tadao Yahata, Kanagawa-ken; Takashi Shigefuji, Tokyo; Shigeru Toyoda, Saitama-ken; Shuichi Yagi, and Masaaki Itagaki, both of Kanagawa-ken, all of Japan, assignors to Tokyo Gas Co., Ltd., Tokyo, Japan**
**Division of Ser. No. 548,300, Nov. 1, 1995, Pat. No. 5,609,186.**
**This application Jul. 19, 1996, Ser. No. 685,026**
**Claims priority, application Japan, Nov. 14, 1994, 6-279253; Mar. 29, 1995, 7-071946; Oct. 16, 1995, 7-267491**
**Int. Cl.[6] B05D** *7/22*
**U.S. Cl. 138—97** **2 Claims**

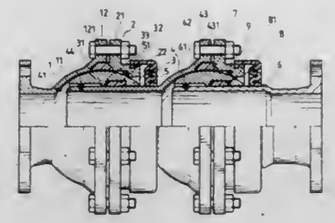


**1**. A method of lining the internal surface of a pipe, said method comprising the steps of:
injecting a necessary amount of resin into the pipe from an open end thereof;
inserting, behind the resin, a lining pig into the pipe;
providing a positive pressure as a pushing force, including the step of producing the positive pressure by an air blower provided with a first pressure detecting/controlling means:
applying the positive pressure behind the resin and lining pig in the pipe;
providing a negative pressure as a suction force, including the step of producing the negative pressure by a suction pump provided with a second pressure detecting/controlling means;
applying the negative pressure in front of the resin and lining pig in the pipe;
keeping the positive pressure and the negative pressure within predetermined ranges respectively so as to obtain a substantially stabilized pressure differential across the resin and lining pig and further comprises the steps of detecting the positive pressure in the pipe with the first pressure detecting/controlling means and controlling the air blower so that the positive pressure in the pipe is constantly maintained within a predetermined range, and detecting the negative pressure in the pipe with the second pressure detecting/controlling means and controlling the suction pump so that the negative pressure in the pipe is constantly maintained within a predetermined range; and
causing the resin and lining pig to move through the pipe along the entire length thereof by means of the substantially stabilized pressure differential, so as to form a resin lining layer on the internal surface of the pipe.

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**5,740,839**
**FLEXIBLE EXTENSION CONDUIT**
**Hsien-Jen Kuo, and Hsien-Wen Kuo, both of No. 93, Sec. 4, Chin-Hwa Rd., Tainan, Taiwan**
**Filed Mar. 25, 1997, Ser. No. 823,177**
**Int. Cl.[6] F16L** *27/00*
**U.S. Cl. 138—120** **8 Claims**

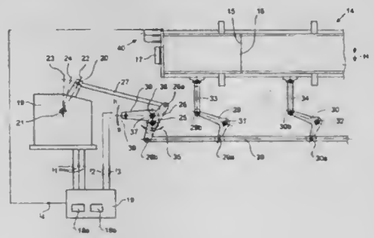
**1**. A flexible conduit assembly comprising:
(a) at least one joint base member having a base passage extending axially therethrough, said joint base member having coaxially disposed spherical housing and annular base flange sections, said spherical housing section having an inner wall portion defining a base socket chamber;



(b) at least one sliding pipe member having a pipe passage extending axially therethrough, said sliding pipe member having a tube section, an annular pipe flange section, and a spherical bearing section coaxially disposed therebetween, said tube section extending into said base socket chamber of said joint base member, said pipe passage being in open communication with said base passage of said joint base member, said spherical bearing section having an inner wall portion defining a pipe socket chamber;
(c) a flat pipe member having a tubular pipe section extending into said pipe socket chamber of said sliding pipe member;
(d) first coupling means for displaceably coupling said sliding pipe member to said joint base member; said first coupling means being adapted to enable both linear and pivotal displacement of said sliding pipe member relative to said joint base member; and,
(e) second coupling means for displaceably coupling said sliding pipe member to said flat pipe member; said second coupling means being adapted to enable both linear and pivotal displacement of said sliding pipe member relative to said flat pipe member.

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**5,740,840**
**CONTROL OF HEALD FRAME MOVEMENT FOR CHANGING SHUTTLE CLEARANCE THROUGH A WEAVING SHED**
**Jan Karl-Gustav Lindahl, Geer, S.C., assignor to Texo AB, Almhult, Sweden**
**Filed Jun. 10, 1996, Ser. No. 660,939**
**Claims priority, application Sweden, Jun. 12, 1995, 9502117-6**
**Int. Cl.[6] D03C** *13/00*
**U.S. Cl. 139—55.1** **11 Claims**



**1**. A weaving machine, comprising:
a plurality of individually adjustable heald frames for forming an upper shed and a lower shed by acting on warp threads, said heald frames being coordinately controllable by a control unit;
at least one shuttle for transporting weft threads through the upper shed and the lower shed;
at least one shuttle path, arranged under the warp threads forming the lower shed, for supporting said at least one shuttle; and

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said control unit for controlling movement of said heald frames to bring about different upwardly or downwardly directed forces on the warp threads depending upon a desired weaving design, said control unit adapting the forces applied to the warp threads of the lower shed to the shuttle path to provide said at least one shuttle with clearance through the upper shed and the lower shed that is substantially unaffected by the warp threads in spite of the force applied to the warp threads.

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**5,740,841**

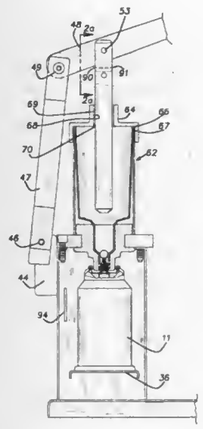
## CAN FILLING APPARATUS

**Donald J. Hirz, 835 Charles St., Willowick, Ohio 44095**

**Continuation-in-part of Ser. No. 265,330, Jun. 24, 1994, Pat. No. 5,535,790. This application Jul. 16, 1996, Ser. No. 680,601**

**Int. Cl.[6] B65B** *3/00*

**U.S. Cl. 141—20** **11 Claims**



1. Apparatus for injecting material to be sprayed into an aerosol can containing a liquified propellent gas under pressure, said can having a discharge valve at the top thereof, said apparatus comprising a base adapted to support an aerosol can to be filled in a vertical position, a cylinder member adapted to be supported on said base, said cylinder member having a vertical pumping bore and a reduced diameter outlet adapted to be coupled to the discharge valve of a can disposed on the apparatus, means for coupling the reduced diameter outlet to said valve, a piston operable in said pumping bore, means for reciprocating said piston within said pumping bore, and a reservoir disposed above said pumping bore and in communication with the upper end thereof for supplying material to be injected into said aerosol can to said pumping bore, a lower portion of the piston clearing the top of the pumping bore when the piston is at an upper limit of its travel whereby material will flow by gravity from the reservoir into said pumping bore, the base including a support for the cylinder member, the cylinder member support being arranged to receive and release the cylinder member with the reservoir by relative movement substantially exclusively in a horizontal direction and when so received automatically restrict the cylinder member axially in both vertical directions, and a can support on the base having a predetermined elevation relative to the cylinder support whereby, with the can coupled to the cylinder member, the can and cylinder member can be simultaneously received on their respective supports without interference.

**5,740,842**

## VENTING DEVICE FOR VEHICLE FUEL TANKS

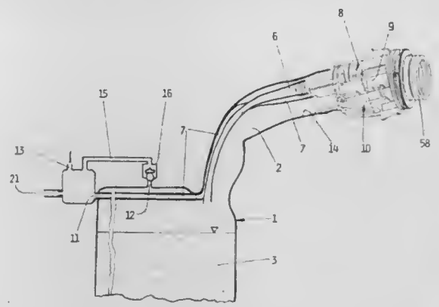
**Josef Maier, Hepberg; Dieter Simon, Treuchtlingen; Wolfgang Liebhart, Treuchtlingen; Thomas Theuer, Treuchtlingen; Klaus Müller, Oberscheinfeld; Rolf Walter, Stuttgart; Dieter Scheürenbrandt, Wolfschlungen; Manfred Weil, Schorndorf; Wolfgang Freiwald, Aichwald, and Gerhard Kiermaier, Stuttgart, all of Germany, assignors to Walter Alfmeier GmbH + Co. Präzisions-Baugruppenelemente, Treuchtlingen, and Mercedes Benz AG, Stuttgart, both of Germany**

**Filed Feb. 16, 1996, Ser. No. 602,245**

**Claims priority, application Germany, Feb. 17, 1995, 295 02 621.9**

**Int. Cl.[6] B65B** *31/00*

**U.S. Cl. 141—45** **18 Claims**



1. A fuel tank arrangement for a motor vehicle comprising:

a fuel tank adapted to receive fuel therein and having a gas space disposed above the fuel when fuel is received in the fuel tank; and

a venting device connected to the fuel tank and comprising:

an activated charcoal filter;

a venting conduit having an end thereof connected to the activated charcoal filter and another end in communication with the gas space for connecting the gas space to the activated charcoal filter thereby establishing gas communication therebetween, the venting conduit being disposed substantially inside the fuel tank, the end of the venting conduit connected to the activated charcoal filter emerging outside of the fuel tank; and

a stop valve disposed in the venting conduit and being adapted to open gas communication between the gas space and the activated charcoal filter during refueling.

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**5,740,843**

## CONTAINER FILLING DEVICE AND METHOD

**Ulrich Burkart, Schwaebisch Hall, Germany, assignor to Optima-Maschinenfabrik Dr. Buhler GmbH & Co., Germany**

**Filed Apr. 5, 1996, Ser. No. 628,796**

**Claims priority, application Germany, Apr. 7, 1995, 195 13 103.7**

**Int. Cl.[6] B65B** *43/52;43/56*

**U.S. Cl. 141—79** **10 Claims**

1. A device for filling containers comprising:

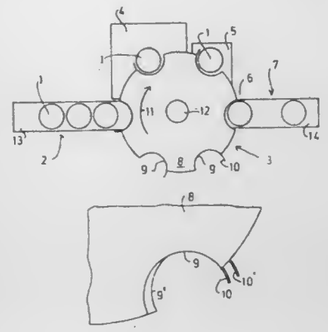
a supply mechanism, which successively supplies in a forward direction a number of containers to be filled;

a filling station, in which a single container is filled;

a delivery station, from which the filled containers can be removed;

a cyclically operating transfer mechanism, which receives the individual containers from the supply mechanism, moves the individual containers to the filling station, stops the individual containers at the filling station during filling, and after filling, moves individual containers to the delivery station;





the forward direction being a sequence of events from the supply mechanism to the filling station and then to the delivery station; and,

a drive for the transfer mechanism, having a servo-motor with a servo-motor control, the transfer mechanism being disengageable from the containers by a reverse rotation of the transfer mechanism.

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**5,740,844**

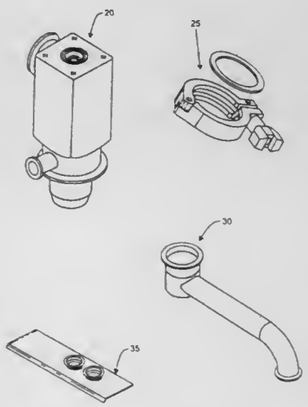
## FILL SYSTEM INCLUDING A FILL VALVE HOUSING WITH INTERCHANGEABLE SANITARY COVER AND CLEAN-IN-PLACE MANIFOLD

**Rodney W. Miller, Princeton, Minn., assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland**

**Filed Apr. 23, 1996, Ser. No. 636,580**

**Int. Cl.[6] B65B** *1/04*

**U.S. Cl. 141—90** **14 Claims**



1. A filling system comprising:

a valve housing having a flow channel, an inlet to the flow channel, and an outlet from the flow channel, the valve housing having a flange extending therefrom about at least a portion of the periphery of the valve housing;

a valve member disposed in the valve housing for controlling fluid flow from the outlet of the valve housing;

a clean-in-place manifold having an inlet and an outlet, the manifold further having a flange disposed about at least a portion of the periphery of the inlet of the manifold;

a sanitary cover having a shield portion and a securement portion, the securement portion comprising a collar extending from the shield portion and a flange disposed about at least a portion of the periphery of the collar;

a tri-clamp having a groove disposed therein for alternately securing the flange of the clean-in-place manifold to the flange of the valve housing and the flange of the sanitary cover to the flange of the valve housing.

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**5,740,845**

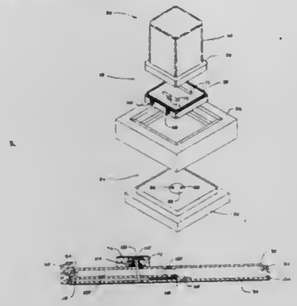
## SEALABLE, TRANSPORTABLE CONTAINER HAVING A BREATHER ASSEMBLY

**Anthony C. Bonora, 300 Felton Dr., Menlo Park, Calif. 94025; Frederick T. Rosenquist, 738 Canyon Rd., Redwood City, Calif. 94062; Sudhir Jain, P.O. Box 360156, Milpitas, Calif. 94538, and Mark R. Davis, 750 N. Shoreline Blvd., Apt. 158, Mountain View, Calif. 94043**

**Filed Jul. 7, 1995, Ser. No. 499,588**

**Int. Cl.[6] B65D** *85/30*

**U.S. Cl. 141—292** **34 Claims**



1. A sealable, transportable container capable of docking with a port, the port having a port sealing surface, the container comprising:

a box having a first sealing surface, a second sealing surface and an interior region, said first sealing surface capable of forming a first seal with said port sealing surface, said box adapted to store semiconductor wafers;

a box door having a third sealing surface adapted to form a second seal with said second sealing surface when said box door is moved to a sealing position with respect to said box;

a latch having a locked position and an unlocked position, said latch adapted to hold said box door in said sealing position with respect to said box when said latch is in said locked position; and

a breather assembly actuated by said latch so that said breather assembly allows gas to flow between said interior region and an environment external to said container when said latch is in said unlocked position.

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**5,740,846**

## HOSE ADAPTER FOR USE IN CONNECTING A PROCONDITIONED AIR HOSE TO AN AIRCRAFT

**L. Robert Larson, 312 Herricks Rd., Mineola, N.Y. 11501, and D. Jonathon Carmody, 78 Mineola Ave., Point Lookout, N.Y. 11569**

**Filed Oct. 11, 1996, Ser. No. 729,983**

**Int. Cl.[6] B65B** *1/04*

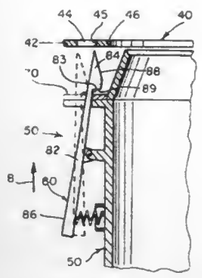
**U.S. Cl. 141—382** **11 Claims**

1. A hose adapter for use in connecting a preconditioned air hose to an aircraft having a ring connector with a plurality of slots formed therethrough by which a ground-based heating/air conditioning unit is connected to an internal ventilation system of the aircraft, said hose adapter comprising:

a generally hollow housing having a lower end defining an inlet and an upper end defining an outlet, said lower end being connectable to a preconditioned air hose, and said upper end being connectable to a ring connector of an aircraft; and

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a plurality of self-locking means for releasably connecting via a plurality of slots in the ring connector said upper end of said housing to the ring connector in a snap-fit manner, each of said self-locking means comprising a slot engaging arm having a hand-engageable lower end, said self-locking means being movable between a normally biased locking position, in which said self-locking means connects said hose adapter to the ring connector in a quick-connect, snap-fit manner, and a release position; in which said self-locking means disconnects from the ring connector in a quick disconnect manner, movement of said self-locking means from said locking position to said release position being effected via manual application of a generally radially directed force on said hand-engageable lower end.

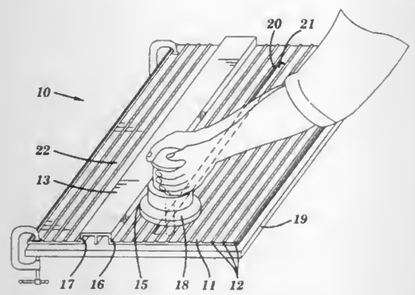
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**5,740,847**

**PORTABLE POWER TOOL CUTTING GUIDE**

**Eric E. Lakso, P.O. Box 1048 14 Commonwealth Sq., Oak Bluffs, Mass. 02557-1048, assignor to Eric E. Lakso, Oak Bluffs, Mass.**

**Filed Sep. 23, 1996, Ser. No. 717,761**
**Int. Cl.[6] B27C** *5/00;* **B23Q** *3/00*
**U.S. Cl. 144—144.52** **3 Claims**



1. A power tool cutting guide assembly, comprising:

(a) an elongated guide plate structure having a rectangular shape and a means associated with said guide plate structure for guiding a power tool along said guide bar plate in a straight path with the cutting edge of said power tool moving along a straight, predetermined cutting path alongside said guide plate structure

(b) said guide plate structure having a longitudinal dimension for alignment along said straight cutting path, said guide plate structure being made of a material which can be cut by said power tool to demarcate a reference edge

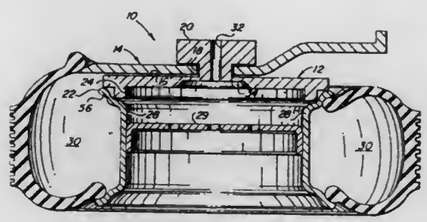
(c) said guide plate structure having an upwardly protruding portion extending the length of said guide plate structure with said protruding portion parallel with the parallel longer sides of said guide plate structure and against which said power tool is held as a guide while moving it along the straight, predetermined cutting path.

**5,740,848**

**TIRE CHANGER TOOL SET**

**Grant Goracy, 13563 Cantlay St., Van Nuys, Calif. 91405**

**Filed Nov. 16, 1995, Ser. No. 559,058**
**Int. Cl.[6] B60C** *25/04*
**U.S. Cl. 157—1.3** **5 Claims**



1. An improved tire changer tool set, said set comprising, in combination:

a) a tire rim engager, said rim engager comprising a generally horizontally extending disc having a peripheral depending portion adapted to engage the upper inside surface of a tire rim and seat said rim engager over said rim, said rim engager also including a generally central upstanding post having a tire lever-retaining upper portion, said rim engager disc defining a circular recess in the underside thereof, said depending portion comprising a ring releasably secured in said recess and depending therefrom; and,

b) a generally longitudinally extending lever having opposite ends and sides, one of said sides defining a notch between said opposite ends, said notch being adapted to engage said rim engager post for rotation of said lever around said post, one of said lever ends having a chamfered edge for prying a tire from its rim.

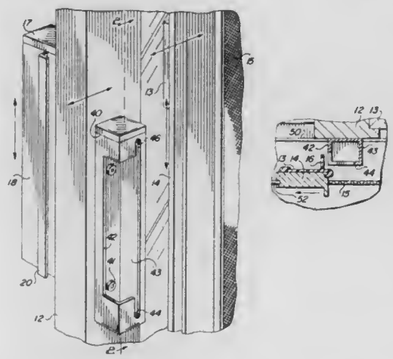
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**5,740,849**

**MULTIPLE MODE LATCH FOR SLIDING SCREEN DOOR SYSTEM**

**Fred Tashman, Scottsdale, Ariz., assignor to Tashco Industries, Inc., Gilbert, Ariz.**

**Filed Aug. 8, 1996, Ser. No. 689,375**
**Int. Cl.[6] A47H** *1/00*
**U.S. Cl. 160—102** **16 Claims**



1. The combination of a closure system and a sliding main door and sliding screen door in which said sliding main door and said sliding screen door are mounted to move in first and second opposite directions in adjacent, parallel, spaced, vertical planes, said combination including:

a sliding main door;



a sliding screen door adjacent said sliding main door in a parallel spaced plane to the plane of said sliding main door;

a first handle member mounted on the sliding main door and located in the space between said sliding main door and said adjacent sliding screen door when said doors are mounted for movement in said first and second opposite directions in spaced, parallel, vertical planes;

a second handle member mounted on said sliding screen door for movement on said sliding screen door in a direction perpendicular to the direction of movement of said sliding screen door in said first and second opposite directions to at least first and second different positions;

cooperating surfaces on said first and second handle members for engagement of said second handle member by said first handle member, with said second handle member in said first position thereof when said sliding main door is moved in said first direction, but not engaged when said sliding main door is moved in said second opposite direction; and

said sliding main door and said sliding screen door capable of fully independent movement with said second handle member in said second position.

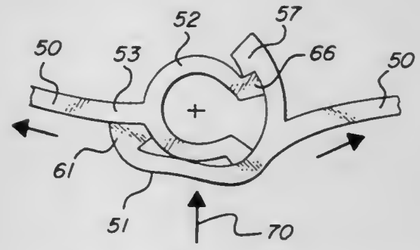
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**5,740,850**

**SEPARATION RESISTANT SLAT CONNECTIONS FOR FOLDING SHUTTERS**

**Robert E. Hoffman, 5618 Riviera Dr., Coral Gables, Fla. 33146**

**Continuation of Ser. No. 504,467, Jul. 20, 1995, Pat. No. 5,566,739. This application Aug. 6, 1996, Ser. No. 693,364**
**Int. Cl.[6] E05D** *15/26*
**U.S. Cl. 160—183** **3 Claims**



1. A separation resistant slat connection for accordion-type folding shutters having a number of vertically elongated, narrow, generally flat slats that are pivotly connected together along their adjacent vertical edges for extending the shutter across a building opening or folding the shutter for clearing the opening, comprising:

each slat having integral, tube-like, connector formations provided upon its opposite, elongated vertical edges for pivotly interconnecting with corresponding connector formations on the next adjacent slat;

one of said connector formations being an outer connector member and the other of such connector formations forming an inner connector member of a size to fit, generally co-axially, within the outer member of the next slat;

each connector member having an elongated slot, extending along its entire length, with the slot in the outer member forming an opening, in cross-section, that is about ½rd of the circumference of the tube-like shaped outer member and the slot in the inner member forming a opening, in the cross-sectional direction, that is about ¼th of the circumference of the inner-tube member;

the opposite longitudinal edges which define the slot in the outer member each having an integral, radially, inwardly extending bead formed thereon;

the opposite edges defining the slot in the inner member each having an integral, radially, outwardly extending bead;

with the slat edge portion upon which the inner member is provided being formed in the shape of an integral, narrow, elongated strip, extending the full length of the slat, and extending at an obtuse angle relative to the remainder of the slat and being integrally joined with its inner member along a plane which approximately bisects the inner member and its slot;

the outer member is joined to the opposite edge portion of each slat along a plane that is tangent to the outer member along a line which is slightly angularly offset from a diametrical plane which bisects the outer member and its slot;

the integral narrow strip extends through the slot of its respective outer member and is pivotly moveable between the opposite edges defining the slot in its respective outer member;

the adjacent slats may be pivoted about their respective interfitted outer and inner members for extending the shutter into its covering position, at which time the adjacent slats may be arranged at approximately a 90 degree angle relative to each other with one edge bead of the outer connector member engaging said strip and with the second edge bead of the same outer member being arranged closely adjacent to one edge bead of its respective inner member to form therewith a double thickness bead reinforcement extending along the adjacent vertical edges of their slats, and with the second edge bead of the inner member being arranged within and closely adjacent to the interior surface formed within the respective outer formation near a diametrical plane which approximately bisects the approximately 90 degree angle formed by the two adjacent connected slats;

whereby the interfitted inner and outer connector members and their adjacent beads provide a structure which resists penetration of the shutter and resists separation of adjacent slats by forces resulting from a forceful impact against the shutter such that one slat bends due to the force and the adjacent slat bent to partially absorb the force, and whereby the shutter is foldable to arrange the slats in close face-to-face relationship.

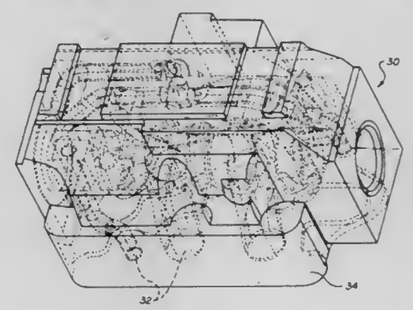
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**5,740,851**

**COMPONENT WITH CAST-IN FLUID PASSAGEWAYS**

**Ronald L. Haynes, Searcy, Ark., assignor to Trinova Corporation, Maumee, Ohio**

**Division of Ser. No. 492,368, Jun. 19, 1995, abandoned. This application Feb. 3, 1997, Ser. No. 792,369**
**Int. Cl.[6] B22D** *19/00*
**U.S. Cl. 164—98** **3 Claims**



1. A method for forming a mechanical body which includes pre-formed fluid-bearing passageways, said method comprising the steps of:

providing a laminate sheet having steel and copper layers;

rolling the sheet to create hollow, cylindrical tubing, wherein the copper layer is on the tubing exterior;

bending the tubing to produce at least one tube member having a desired configuration;

securing said at least one tube member in order to provide a tubing cluster which defines said pre-formed fluid-bearing passageways;

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casting iron around the tubing cluster in order to produce a solid block with the tubing cluster embedded therein, wherein the block and the tubing cluster form low-porosity fusion bond due to chemical migration of the copper into the iron matrix.

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**5,740,852**

## CONVEYOR BELT FOR USE IN A CONTINUOUS STRIP-CASTING DEVICE FOR THE CASTING OF METAL STRIPS

**Ewald Feuerstacke, Dorsten; Helmut Schlechtriem, Duisburg; Ulrich Urlau; Wolfgang Reichelt, both of Moers; Karl-Heinz Spitzer; Paul Freier, both of Clausthal-Zellerfeld; Frank Koch, and Joachim Koch, both of Osterode, all of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany**

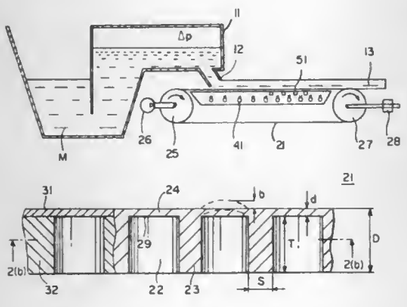
**PCT No. PCT/DE94/01545, § 371 Date Jul. 22, 1996, § 102(e) Date Jul. 22, 1996, PCT Pub. No. WO95/17988, PCT Pub. Date Jul. 6, 1995**

**PCT Filed Dec. 21, 1994, Ser. No. 666,464**

**Claims priority, application Germany, Dec. 27, 1993, 43 44 954.9**

**Int. Cl.[6] B22D** *11/06*

**U.S. Cl. 164—429** **9 Claims**



1. A conveyor belt of a continuous strip casting device for casting a strip of metal, the conveyor belt comprising an outer side on which the strip of metal can be supported and an inner side that faces away from the cast strip, a plurality of uniformly distributed blind holes being provided in the inner side of the belt, the blind bores being separated by webs having a minimum width so that a total surface area of the webs is 0.15 to 0.4 times a total surface area of the belt, the blind holes each having a bottom with a wall thickness which, upon heating of the web by the cast strip and simultaneous cooling of an inside surface of the blind holes permits a bulging of the bottom of the blind holes of less than 1 mm.

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**5,740,853**

## PROCESS AND APPARATUS FOR ONLINE-COILING QUENCH-SOLIDIFIED MAGNETIC STRIP

**Soshichi Tsuchihashi; Masayoshi Tatsukawa; Minoru Yamate, all of Futtsu; Hiroaki Sakamoto, Kawasaki, and Yuichi Sato, Futtsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Jan. 11, 1996, Ser. No. 584,513**

**Claims priority, application Japan, Jan. 11, 1995, 7-002873; Mar. 23, 1995, 7-064263**

**Int. Cl.[6] B22D** *11/06*

**U.S. Cl. 164—463** **4 Claims**

1. A process for online-coiling of a quench-solidified magnetic strip comprising:

providing a moving cooling substrate moving at a selected speed;

ejecting a liquid metal or a liquid metal alloy onto said moving cooling substrate thereby quench solidifying said ejected liquid metal or liquid metal alloy into a solidified metal strip, said solidified metal strip having a leading edge;

removing said solidified metal strip from said moving cooling substrate;

providing a rotating coiling roll adjacent said moving cooling substrate, said rotating coiling roll having a circumferential surface;

magnetizing said circumferential surface of said coiling roll;

rotating said coiling roll to cause said magnetized circumferential surface to move at a speed of not less than 90% and less than 100% of said moving cooling substrate moving speed;

capturing said leading edge of said solidified metal strip removed from said moving cooling substrate using magnetic attraction force provided by said magnetized circumferential surface of said rotating coiling roll when said magnetized circumferential surface is moving at said speed of not less than 90% and less than 100% of said moving cooling substrate moving speed, thereby commencing coiling of said solidified metal strip on said circumferential surface of said rotating coiling roll.

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**5,740,854**

## PRODUCTION METHODS OF METALLIC GLASSES BY A SUCTION CASTING METHOD

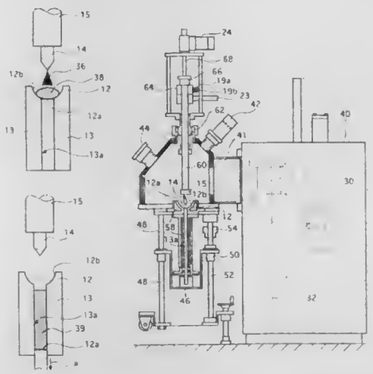
**Akihisa Inoue, Kawauchijutaku 11-806, Kawauchi mubanchi, Aoba-ku Sendai-shi, Miyagi; Tao Zhang, and Eiichi Makabe, both of Sendai, all of Japan, assignors to Akihisa Inoue, and Kabushiki Kaisha Makabe Giken, both of Miyagi, Japan**

**Continuation of Ser. No. 542,615, Oct. 13, 1995, abandoned. This application Jul. 14, 1997, Ser. No. 892,181**

**Claims priority, application Japan, Oct. 14, 1994, 6-249254**

**Int. Cl.[6] B22D** *27/04;27/15*

**U.S. Cl. 164—495** **2 Claims**



1. A method for producing a glassy metal by suction casting comprising the steps of:

filling a metal material in a mold cooled with water;

melting said metal material by using a high-energy heat source which is capable of melting said metal material;

and introducing the resulting molten metal instantaneously into a vertically extending water-cooled mold provided below said mold by using a pressure difference caused by lowering a vertically slidable piston within said vertically extending mold on which the metal melt rests to draw the metal melt into said vertically extended mold at a speed of at least 50 mm/sec and attain a high quenching rate to thereby enable the production of a glassy metal ingot of a large size.

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**5,740,855**

## DEVICE FOR SLOWING DOWN A MELT DURING CONTINUOUS CASTING OF BILLETS OF BLOOMS

**Jan Erik Eriksson, Västerås; Magnus Hallefält, Ängelholm; Sten Kollberg, and Anders Lehman, both of V ästerås, all of Sweden, assignors to ASEA Brown Boveri AB, Vasteras, Sweden**

**PCT No. PCT/SE95/01019, § 371 Date Mar. 17, 1997, § 102(e) Date Mar. 17, 1997, PCT Pub. No. WO96/09131, PCT Pub. Date Mar. 28, 1996**

**PCT Filed Sep. 11, 1995, Ser. No. 809,485**

**Claims priority, application Sweden, Sep. 20, 1994, 9403141**

**Int. Cl.[6] B22D** *27/02*

**U.S. Cl. 164—502** **5 Claims**



1. A device for slowing down the non-solidified portions of cast strands during continuous casting of billets or blooms in a plurality of moulds which are open in the direction of casting and which are each adapted to be supplied with a flow of melt, the device comprising:

a number of magnetic core parts adapted, together with the moulds, to form a closed magnetic circuit,

at least one magnetic-field generating member, adapted, together with the magnetic core parts, to generate and transfer a static magnetic field or a periodic low-frequency magnetic field to the inflowing melt in such a way that the movement of the melt is slowed down,

wherein between each pair of adjoining moulds, in a group of at least three separate moulds, one of said magnetic-field generating members is arranged, and wherein the magnetic core parts and the magnetic-field generating members are arranged to form, together with all the moulds in the group, a common closed magnetic circuit.

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**5,740,856**

## ROTARY REGENERATIVE HEAT EXCHANGER WITH MULTIPLE LAYER BASKETS

**Kent E. Ritter, Wellsville, N.Y., assignor to ABB Air Preheater Inc., Wellsville, N.Y.**

**Filed Apr. 28, 1997, Ser. No. 848,589**

**Int. Cl.[6] F28D** *19/00*

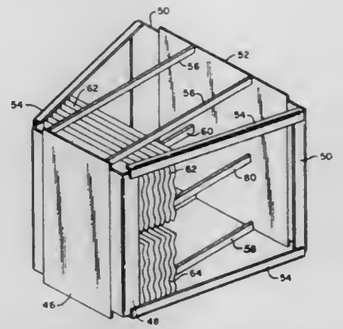
**U.S. Cl. 165—10** **2 Claims**

1. A heat transfer element basket assembly for a rotary regenerative heat exchanger comprising:

a. a basket framework including first and second end plates disposed at inner and outer ends of said basket and means attaching said first and second end plates in spaced relationship, said basket framework having top and bottom surfaces;

b. a first set of heat exchange plate support bars extending between said first and second end plates adjacent said bottom surface;





c. a second set of heat exchange plate support bars extending between said first and second end plates at a position intermediate said top and bottom surfaces;

d. a first set of heat exchange plates juxtaposed in a stacked array between said first and second end plates and supported on said first set of heat exchange plate support bars; and

e. a second set of heat exchange plates juxtaposed in a stacked array between said first and second end plates and supported on said second set of heat exchange plate support bars.

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**5,740,857**

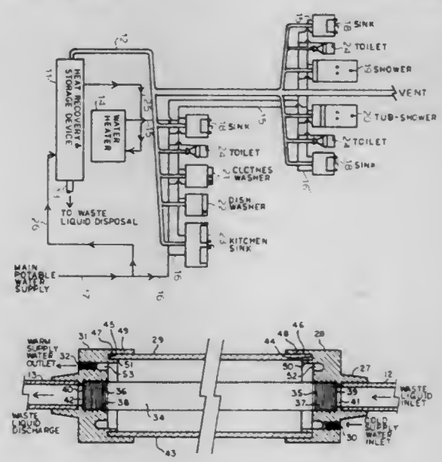
## HEAT RECOVERY AND STORAGE SYSTEM

**John G. Thompson, P.O. Box 1236, Orange, Va. 22960, and Wilfred L. Harris, Jr., 12129 Hidden Lakes, Culpeper, Va. 22701-3728**

**Filed Jan. 17, 1995, Ser. No. 373,029**

**Int. Cl.[6] F28D** *7/10;* **F24H** *1/12*

**U.S. Cl. 165—47** **21 Claims**




1. A heat recovery and storage system for transferring heat from intermittently outgoing waste liquid to incoming supply water for a hot-water-using system, the hot-water-using system being of the type having a downward-inclined but near horizontal outgoing waste liquid pipe consisting of an inlet pipe leading into a heat recovery and storage device and a discharge pipe leading from the heat recovery and storage device to a waste liquid disposal means, the improvement comprising:

a straight linear form waste liquid transmission pipe made of high-thermal-conductivity material, having a downward-inclined but near horizontal axis, a proximal planar end for coupling to the waste liquid inlet pipe and a distal planar end,

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both ends being planar normal to the axis of the waste liquid transmission pipe, and being congruent in cross section to the waste liquid inlet and discharge pipes;

a straight linear form supply water reservoir pipe made of low-thermal-conductivity plastic material, having a larger internal cross section than the external cross section of the waste liquid transmission pipe, disposed around and on the same axis as the waste liquid transmission pipe, and having two planar ends normal to the axis, and a wall, for forming the longitudinal outer casing of a supply water reservoir;

two liquid-tight endplates made of low-conductivity plastic material, one of said endplates being affixed to each end of the water supply reservoir pipe normal to its axis and to each respective end of the waste liquid transmission pipe and extending between the water supply reservoir pipe and the external surface of the waste liquid transmission pipe, to maintain and enclose in pressured-liquid-tight fashion the space between the waste liquid transmission and supply water reservoir pipes as a supply water reservoir;

a coupling means formed in liquid-tight fashion in the endplate at the proximal end of the device for coupling the proximal end of the waste liquid transmission pipe in line with the end of the waste liquid inlet pipe, said pipes having the same axis;

a further coupling means formed in liquid-tight fashion in the endplate at the distal end of the device for coupling the distal end of the waste liquid transmission pipe in line with the waste liquid discharge pipe, the pipes having the same axis;

a supply water injection means for injecting cold supply water into the supply water reservoir, the injection means being located in the lower portion of the reservoir pipe; and

a supply water tapping means for extracting warmed supply water from the supply water reservoir, the tapping means being located in the upper portion of the reservoir.

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**5,740,858**

**HEATING/COOLING SYSTEMS**

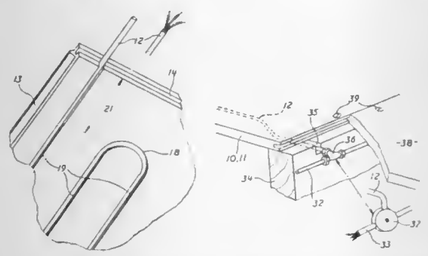
**Rex Anthony Ingram, The Old Vicarage, Shute, Axminster, Devon EX13 7PU, England**

**Division of Ser. No. 131,127, Oct. 4, 1993, Pat. No. 5,497,826. This application Feb. 26, 1996, Ser. No. 607,329**

**Claims priority, application United Kingdom, Oct. 5, 1992, 9220888**

**Int. Cl.[6] F24D** *3/14*

**U.S. Cl. 165—56** **3 Claims**



1. A method of installing a heating/cooling system which includes:

a) providing a plurality of solid panels each of which comprises a solid body having an upper surface and a lower surface some of the panels being in the form of heating/cooling modules each of which incorporates a heat exchange element of serpentine form disposed within a downwardly facing serpentine channel in the body of the panel so as to be spaced from the upper surface of the panel and located in thermal contact with the body of the panel, while others of said panels do not contain a heat exchange element,

b) the panels containing heat exchange elements being of the same size and external configuration ad those not containing heat exchange elements,

c) joining said panels together to form a structure, and

d) interlinking the heat exchange elements of said modules, and in which:

i) each serpentine channel is formed in the undersurface of the respective panel,

ii) the undersurface of each panel which incorporates a heating element is covered by a sheet of reflective metal foil, and

iii) the upper surface of each panel which incorporates a heating element is marked to indicate the location of the heating element.

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**5,740,859**

**PLATE HEAT EXCHANGER**

**Derek Ian Finch, Goldsboro, N.C., assignor to APV Corporation Limited, England**

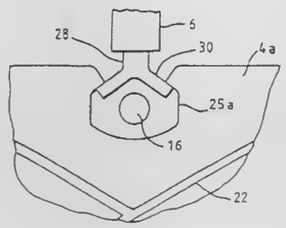
**PCT No. PCT/GB94/00095, § 371 Date Jul. 18, 1995, § 102(e) Date Jul. 18, 1995, PCT Pub. No. WO94/17354, PCT Pub. Date Aug. 4, 1994**

**PCT Filed Jan. 18, 1994, Ser. No. 491,924**

**Claims priority, application United Kingdom, Jan. 20, 1993, 9301021**

**Int. Cl.[6] F28F** *9/007*

**U.S. Cl. 165—67** **12 Claims**




1. A plate heat exchanger comprising a head, a follower, a stack of plates disposed between said head and said follower, and supported by a rail, tie bars for compressing said plates together between said head and said follower, wherein at least one tie bar extends through a cut-out formed within a plate area, and at least one of said plates has an outer periphery which bounds said cut-out, and wherein said at least one tie bar is located on the vertical center line of the heat exchanger.

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**5,740,860**

**SIDE POCKET MANDREL FOR A MEASURING INSTRUMENT**

**William B. Crawford, 107 Llansfair Dr., Lafayette, La. 70503; Douglas W. Crawford, Rte. 1. Box 41X, Cushing, Tex. 75760, and Mark S. Crawford, 5107 Graystone La., Houston, Tex. 77069**

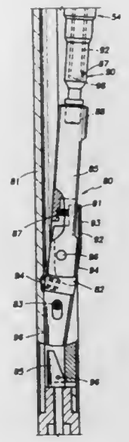
**Filed Apr. 8, 1996, Ser. No. 628,984**

**Int. Cl.[6] E21B** *47/00*

**U.S. Cl. 166—64** **10 Claims**

1. A side pocket mandrel adapted to be connected in a tubing string, comprising: a body having a main bore aligned with the bore of the tubing and an open-bottomed side pocket laterally offset from said main bore; a seal bore opening through a wall of said body at the upper end of said side pocket; and first electrical connector means mounted in said seal bore and being adapted to be connected to a cable extending upward along the tubing string to the surface, said side pocket being arranged to receive a measuring





instrument having second electrical connector means adapted to mate with said first connector means.

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**5,740,861**

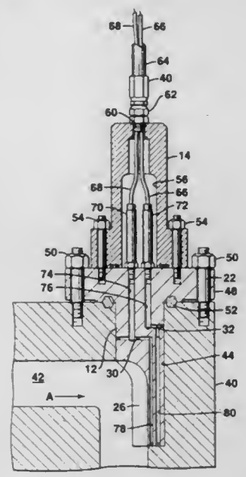
**REPLACEABLE CONSUMABLE EROSION DETECTOR**

**Michael R. Williams, Houston, Tex., assignor to FMC Corporation, Chicago, Ill.**

**Filed May 21, 1996, Ser. No. 646,820**

**Int. Cl.[6] E21B** *47/10;* **G01N** *15/06*

**U.S. Cl. 166—66** **18 Claims**



1. Detector means for the detection of abrasive material being carried by fluid passing through a wellhead comprising:

an erosion block having a passage therein and a bore intercepting said passage;

a probe for insertion into said bore of said erosion block, said probe having a contact zone, with a surface, exposed to said passage when said probe is inserted in said bore of said erosion block;

a first bore extension in said probe inboard of the surface of said contact zone;

a first bore in communication with said first bore extension;

a first pressure transducer for sensing pressure in said first bore and in the first bore extension connected thereto, said first pressure transducer providing an electrical output indicative of a change in pressure in said first bore; and

means for responding to said electrical output of said first pressure transducer;

wherein said passage in said erosion block includes a bend in the zone of the passage intersecting said bore of the erosion block and said surface of the contact zone is exposed to said passage in the zone of the bend in said passage.

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**5,740,862**

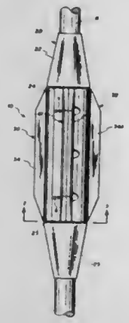
**ROD GUIDE ASSEMBLY**

**Donald E. Sable, 4301 Edmondson Ave., Dallas, Tex. 75205**

**Continuation of Ser. No. 373,108, Jan. 17, 1995, abandoned. This application Mar. 31, 1997, Ser. No. 828,623**

**Int. Cl.[6] E21B** *17/10*

**U.S. Cl. 166—241.2** **20 Claims**



1. A sucker rod guide assembly for the shank of a sucker rod positionable in a well tubing, said assembly including, a centralizer mount having a tubular body on and rigid with the shank of a sucker rod, said body having an elongate intermediate portion having a longitudinally extending bearing surface concentric with the longitudinal axis of the rod and end portions at opposite ends of said intermediate portion extending radially outwardly of said intermediate portion, said end portions having spaced facing stop shoulders; a tubular centralizer rotatably disposed on said body about said intermediate portion and said bearing surface portion and between said stop shoulders, said stop shoulders limiting longitudinal movement of said centralizer on said intermediate portion, said centralizer having a tubular body having end surfaces engageable with said stop shoulders of said mount, and tubing engageable means extending from said tubular body radially outwardly of said stop shoulders of said mount, said centralizer having an internal cylindrical surface of greater radius than the radius of said bearing surface whereby a chamber is provided between said bearing surface and the internal surfaces of said tubular body; and closure means at opposite ends of said chamber and engaged with said centralizer and said mount for preventing entry therepast of solid particles into said chamber.

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**5,740,863**

**SUBSEA WELLHEAD MECHANICAL EROSION DETECTOR**

**Charles R. Ortloff; Thomas James Dorsch, both of Los Gatos, Calif.; Lee A. Gillette; John Charles Vicic, both of Spring, Tex., and Michael R. Williams, Houston, Tex., assignors to FMC Corporation, Chicago, Ill.**

**Filed May 21, 1996, Ser. No. 646,822**

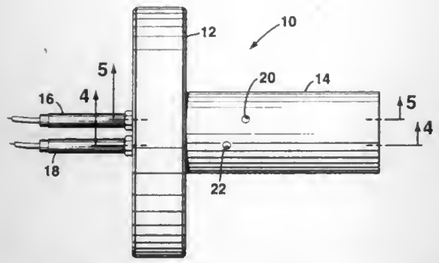
**Int. Cl.[6] G01N** *17/00*

**U.S. Cl. 166—368** **3 Claims**

1. An ablation detector for use in a fluid transmission conduit which is used to transmit fluid under pressure, the fluid being capable of ablating the conduit, the improvement comprising:

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a wall surface for contacting the fluid in the transmission conduit;

a first cavity means separated from the fluid in the transmission conduit by the wall surface, the first cavity means being pressurized by the pressure in the transmission conduit when the fluid ablates at least a portion of the wall surface to expose the first cavity means;

wherein the pressure in the first cavity means actuates a pressure responsive signal means at a point in time for signaling pressure in the first cavity means;

a second cavity means separated from the fluid in the transmission conduit by the wall surface, the second cavity means being separate from said first cavity means and being pressurized by the pressure in the transmission conduit when the fluid ablates at least a portion of the wall surface to expose the second cavity means.

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**5,740,864**

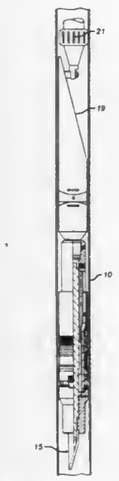
**ONE-TRIP PACKER SETTING AND WHIPSTOCK-ORIENTING METHOD AND APPARATUS**

**Bernard de Hoedt, Celle, Germany, and Jelle Wielenga, Ümiden, Netherlands, assignors to Baker Hughes Incorporated, Houtson, Tex.**

**Filed Jan. 29, 1996, Ser. No. 593,729**

**Int. Cl.[6] E21B** *7/08*

**U.S. Cl. 166—387** **16 Claims**




1. A method of placement of a whipstock in a wellbore, comprising:

mounting a setting tool to a packer having an orientation key for whipstock anchor thereon;

mounting instrumentation adjacent to said setting tool to indicate depth of the packer;

mounting instrumentation adjacent to said setting tool to determine the orientation of said whipstock anchor orientation key;

running said packer with said setting tool and said depth indicating and orientation sensing instrumentation into the wellbore to a predetermined depth; and

obtaining the predetermined depth of said packer and orientation of said whipstock anchor orientation key in one trip; and

setting said packer.

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**5,740,865**

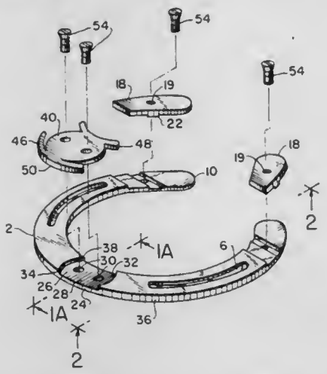
**HORSESHOE**

**Nathan Turk, 600 Vineyard Ave., Highland, N.Y. 12528**

**Filed Jun. 28, 1995, Ser. No. 496,009**

**Int. Cl.[6] A01L** *1/04;7/06*

**U.S. Cl. 168—4** **8 Claims**




1. A horseshoe adaptable to multiple modifications, said horseshoe comprising a horseshoe stock piece having a conventional top hoof surface, a bottom ground surface and inner and outer faces, fullering in said ground surface of said horseshoe stock piece, nail holes through said piece within the fullering, a toe section, said toe section of said horseshoe stock piece having a generally flat recess in said bottom ground surface thereof, said recess running from the outer face to the inner face of said stock piece, said recess being from about 40% to about 60% the thickness of said shoe in depth, side walls of said recess generally perpendicular to a generally flat base surface of said recess, at least one threaded recess in said base surface of said recess, said recess being dimensioned to receive a complementary piece, said complementary piece having side walls shaped to form a congruent fit with said side walls of said recess, at least one aperture in said complementary piece to receive a threaded fastener to secure said piece to said stock piece, said complementary piece having lateral wings, which bear against the inner and outer faces of said stock piece in said toe section, and extend laterally of said recess, and said complementary piece when secured to said stock piece completing a desired horseshoe structure.

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**5,740,866**

**HORSESHOE**

**Sten Bergström, Eskilstuna, and Ulrik Grennard, Västerås, both of Sweden, assignors to Cabato AB, Eskilstuna, Sweden**

**PCT No. PCT/SE95/00801, § 371 Date Dec. 30, 1996, § 102(e) Date Dec. 30, 1996, PCT Pub. No. WO96/01044, PCT Pub. Date Jan. 18, 1996**

**PCT Filed Jun. 28, 1995, Ser. No. 765,712**

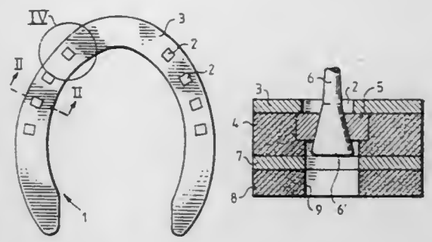
**Claims priority, application Sweden, Jul. 1, 1994, 9402330**

**Int. Cl.[6] A01L** *1/04*

**U.S. Cl. 168—12** **7 Claims**

1. A horseshoe having holes for horseshoe nails extending therethrough and including a resilient material in which are embedded






washers through which the nails are extendable when the horseshoe is fastened to a hoof of a horse, the horseshoe comprising:

a portion of the horseshoe being adapted to bear on the hoof being a plate of a relatively hard material against which the resilient material is attached;

the washers abut the plate and are horizontally movable relative thereto; and

the holes in the plate having a larger cross section than the nails, such that the nails are movable horizontally together with the washers during loading of the horseshoe.

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**5,740,867**

**DEVICE FOR PREVENTING THE RISK OF FIRE DUE TO BURNING OR GLOWING PARTICLES IN A PIPELINE**

**Lennart Carl Erik Jansson, Värmdö , Sweden, assignor to Firefly AB, Huddinge, Sweden**

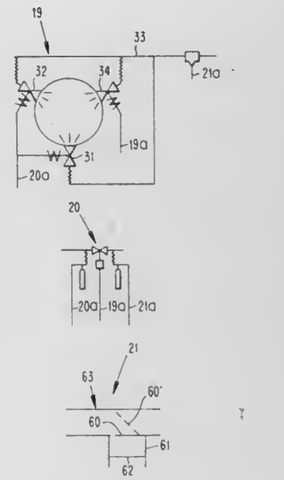
**PCT No. PCT/SE94/00907, § 371 Date Apr. 3, 1996, § 102(e) Date Apr. 3, 1996, PCT Pub. No. WO95/10329, PCT Pub. Date Apr. 20, 1995**

**PCT Filed Oct. 3, 1994, Ser. No. 624,473**

**Claims priority, application Sweden, Oct. 8, 1993, 9303305**

**Int. Cl.[6] A62C** *3/00*

**U.S. Cl. 169—60** **10 Claims**




1. A preventive safety system comprising:

means for transporting material between a first unit and a second unit,

an indicating zone for indicating a presence of hazardous particles,

an indicating and activating unit, and

an extinguishing zone having a device located therein,

the indicating zone including a hazardous particle sensor for coacting with the indicating and activating unit,

the device located in the extinguishing zone including extinguishing means for delivering an extinguishing agent and removing means for removing said hazardous particles from the system,

the indicating and activating unit including:

means for evaluating an intensity of hazardous particle temperature,

means for selectively activating one of the extinguishing means and the removing means in response to the evaluating means, and

means for selectively adjusting operation of the extinguishing means in response to the evaluating means.

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**5,740,868**

**PRESSURE CONTROL CIRCUIT FOR A COMBINATION OF A REVERSIBLE PLOUGH WITH A PLURALITY OF SOIL PREPARATION DEVICES COUPLED THEREWITH**

**Kjell-Egil Stangeland, Kleppe, Norway, assignor to Kverneland Klepp AS, Kverneland, Norway**

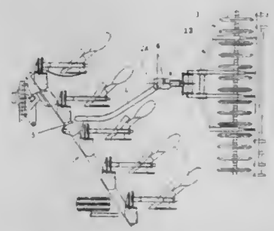
**PCT No. PCT/GB95/01270, § 371 Date Apr. 1, 1996, § 102(e) Date Apr. 1, 1996, PCT Pub. No. WO95/33364, PCT Pub. Date Dec. 14, 1995**

**PCT Filed Jun. 1, 1995, Ser. No. 592,322**

**Claims priority, application United Kingdom, Jun. 4, 1994, 9411213**

**Int. Cl.[6] A01B** *3/28*

**U.S. Cl. 172—219** **5 Claims**



1. A combination comprising a reversible plough coupled with a plurality of soil preparation devices for connection to a propelling vehicle, said vehicle defining a direction of travel relative to the ground and said vehicle having lifting arms, said reversible plough comprising:

a headstock by means of which the combination can be mounted on said lifting arms at the rear of said propelling vehicle;

a plough frame including a carrying beam mounted on said headstock;

a number of pairs of reversible plough bodies mounted on said carrying beam and rotatable through approximately 180° in order to reverse the plough bodies of each pair;

each of said soil preparation devices comprising:

a plurality of working elements and a swivel coupling, said swivel coupling defining a swivel axis, said swivel axis being substantially horizontal and extending generally parallel to said direction of travel, said device pivoting about said swivel axis during plough body reversal;

said soil preparation device being mounted on a movable part of said plough frame which allows said soil preparation device to be towed by said vehicle and also to be suspended from said frame during plough body reversal, in which

a common hydraulic pressure control circuit is provided to control the height of each soil preparation device relative to its swivel coupling, said circuit comprises an actuator cylinder associated with each soil preparation device, said actuator cylinder adjusting the height of said working elements of each device relative to said swivel mounting of said device, said cylinders being in fluid communication with each other whereby relative adjustment movement of one of said cylin-

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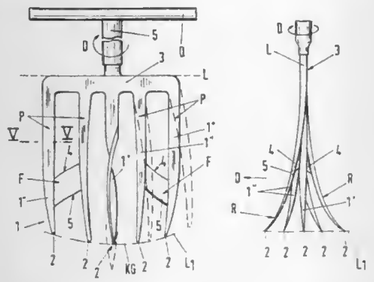
ders as a consequence of upward or downward movement of said respective soil preparation device to follow the contour of said ground causes automatic compensating adjustment of said other actuator cylinders.

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**5,740,869**
**CULTIVATING TOOL**

**Hartwig Sandholzer, Bessemer Strasse 8, D-60388 Frankfurt, Germany**

**Filed Mar. 31, 1995, Ser. No. 414,422**
**Claims priority, application Germany, Aug. 10, 1994, 9412819 U; Aug. 18, 1994, 9413329 U**
**Int. Cl.[6] A01B** *1/00*
**U.S. Cl. 172—378** **9 Claims**



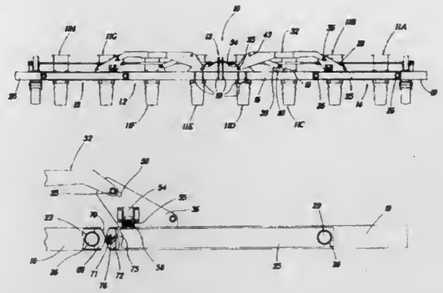
1. A cultivating tool comprising:
a rod having a first end, a second end and a longitudinal axis;
a handle on said first end of said rod; and
a tool head on said second end of said rod, said tool head configured as a fork spade having soil-breaking elements,
with said tool head including a shoulder piece extending substantially along a line that intersects with the longitudinal axis of said rod and further including a plurality of tines,
with said shoulder piece including a center on the line along which said shoulder piece extends, with at least two of said tines located on opposite sides of said center and deflected outwardly away from the line along which said shoulder piece extends in directions opposite to each other, and with a twisted central tine located at said center, wherein said tines adjacent said central tine are angularly offset relative to the line along which said shoulder piece extends.

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**5,740,870**
**AGRICULTURAL IMPLEMENT WITH STACKING WINGS**

**Steven D. Rodgers, North English; Alan F. Barry, Fairfax, and Harry C. Deckler, Williamsburg, all of Iowa, assignors to Kinze Manufacturing, Inc., Williamsburg, Iowa**

**Filed Jan. 6, 1997, Ser. No. 779,309**
**Int. Cl.[6] A01B** *51/04*
**U.S. Cl. 172—456** **15 Claims**



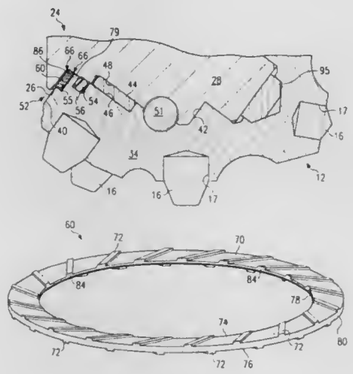
1. In an agricultural implement including a center section and first and second wing sections, and row units carried by said center section and said first and second wing sections, said implement adapted to convert between a use position in which said wing sections are laterally aligned with said center section, and a transport position in which said wing sections are stacked above said center section, the improvement wherein each wing section comprises:
a wing frame;
a guide link having inner and outer ends;
first pivot means pivotally connecting said guide link at a location adjacent said outer end thereof to said wing frame;
second pivot means adjacent the inner end of said guide link for connecting said guide link to said center section for rotation about an axis extending in the direction of travel of said implement; and
a bearing member mounted to one of said wing section frame and said center section and arranged to contact the adjacent end of the other of said wing section frame and said center section when said implement is arranged in the use position, thereby to resist a bending moment on said second pivot means generated by a draft force on said wing section.

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**5,740,871**
**FLOW DIVERTER RING FOR A ROTARY DRILL BIT AND METHOD**

**Mark E. Williams, Grand Prairie, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed May 1, 1996, Ser. No. 641,417**
**Int. Cl.[6] E21B** *10/22*
**U.S. Cl. 175—371** **22 Claims**



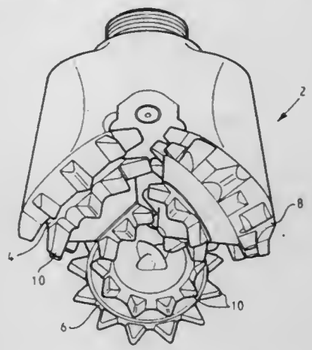
16. A diverter ring for a rotary cone drill bit, the diverter ring comprising:
a cylindrical disk for rotation about a spindle of said rotary cone drill bit; and
a plurality of ribs extending from the disk to divert abrasive fluid flow away from a sealing element of said drill bit.



**5,740,872**
**HARDFACING MATERIAL FOR ROLLING CUTTER DRILL BITS**

**Randolph Carl Smith, Houston, Tex., assignor to Camco International Inc., Houston, Tex.**

**Filed Jul. 1, 1996, Ser. No. 673,978**
**Int. Cl.[6] E21B** *10/52*; **B32B** *15/02*
**U.S. Cl. 175—374** **16 Claims**



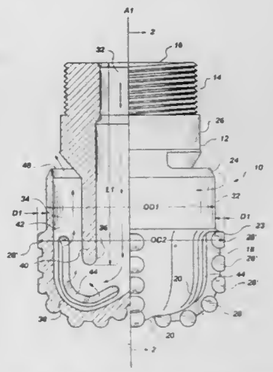
14. A rolling cutter earth boring bit with a rolling cutter cone having cutting teeth, a tooth on said cone having a hardfacing comprising primary sintered cemented refractory metal carbide particles and a matrix alloy; a carburized surface layer having an iron matrix alloy composition by weight of from 0.1% to 3% Chromium, 0.1& to 2.5% Nickel, 0.1% to 1.5% Molybdenum, 0.5% to 9% Manganese, 0.3% to 2% Silicon, 0.4% to 1.3% Carbon, unavoidable impurities and iron, wherein the volume percent of said cemented refractory metal carbide particles exhibiting at least 90% of their original hardness is at least 85%.

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**5,740,873**
**ROTARY BIT WITH GAGELESS WAIST**

**Gordon A. Tibbitts, Salt Lake City, Utah, assignor to Baker Hughes Incorporated, Houston, Tex.**

**Filed Oct. 27, 1995, Ser. No. 550,092**
**Int. Cl.[6] E21B** *10/26*
**U.S. Cl. 175—393** **25 Claims**



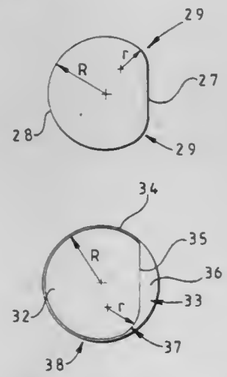
1. A rotary drill bit for drilling subterranean formations, comprising:
a bit body having a distal end including a face, a proximal end, a longitudinal axis and a waist delining a first outer diameter located longitudinally proximal of said face and extending toward said proximal end, said bit body defining no greater diameter than said waist proximally therefrom;
a connecting structure positioned at said proximal end of said bit body for connecting said bit body to a drill string;
an internal passage defined by said bit body for circulating drilling fluid from said drill string, into said bit body, adjacent said face and in communication therewith, and out of said drill bit at a location proximal of said waist; and
cutting structure fixedly mounted on said face at said distal end of said bit body for cutting a subterranean formation, said cutting structure positioned distally of said waist, extending radially outwardly past said waist, and defining a second outer diameter substantially greater than said first outer diameter, said radially extending cutting structure comprising a last contact area between said drill bit and a subterranean formation being drilled by said drill bit.

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**5,740,874**
**CUTTING ELEMENTS FOR ROTARY DRILL BITS**

**Terry R. Matthias, Longlevens, England, assignor to Camco Drilling Group Ltd. of Hycalog, Stonehouse, England**

**Filed Apr. 19, 1996, Ser. No. 635,110**
**Claims priority, application United Kingdom, May 2, 1995, 9508892**
**Int. Cl.[6] E21B** *10/46*
**U.S. Cl. 175—430** **51 Claims**



1. A preform cutting element for a rotary drag-type drill bit including a facing table of superhard material having a front face, a peripheral surface, and a rear surface bonded to a substrate of a material which is less hard than the superhard material, the peripheral surface of the cutting element including a single substantially straight cutting edge having at opposite ends thereof junctions with the remainder of said peripheral surface, at least one of said junctions being formed with a smoothly curved chamfer which provides a continuous transition between the end of the cutting edge and the adjacent portion of the remainder of the peripheral surface of the cutting element.

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**5,740,875**
**TRACKED VEHICLE DRIVE SYSTEM**

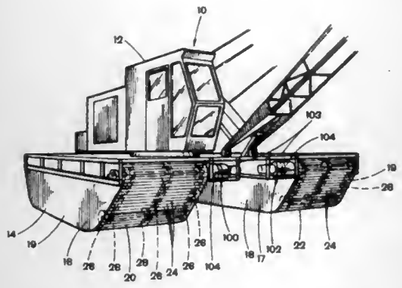
**John M. Wilson, Sr., and Dean R. Wilson, both of Marrero, La., assignors to Wilco Marsh Buggies & Draglines, Inc., La.**

**Filed Jan. 19, 1996, Ser. No. 588,875**
**Int. Cl.[6] B62D** *55/12*
**U.S. Cl. 180—9.62** **6 Claims**

1. An amphibious tracked vehicle comprising:
a. a pontoon surrounded by an endless track assembly;
b. a drive assembly for driving the endless track assembly about the pontoon, the drive assembly comprising:
1) a motor;

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2) a shaft assembly which is rotatable by the motor, the shaft assembly having an elongated inner shaft, an outer sleeve disposed along at least a portion of the inner shaft, and a sprocket, the shaft assembly being rotatable about its longitudinal axis as a unitary piece.

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**5,740,876**

**POWER PLANT SUPPORT DEVICE FOR A VEHICLE**

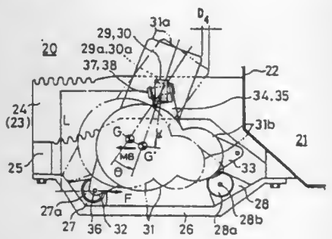
**Yoshifumi Shimose, and Yasuki Matsuura, both of Kanagawa Pref., Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 920,226, Jun. 9, 1992, abandoned. This application Dec. 15, 1993, Ser. No. 166,982**

**Claims priority, application Japan, Jun. 24, 1991, 3-151273**

**Int. Cl.[6] B60K** *5/12*

**U.S. Cl. 180—232** **13 Claims**



1. A power-plant support device for a vehicle, comprising:

first and second mounts supported to a framework of an engine compartment of the vehicle and connected to a power-plant,

said first mount being located below a center of mass of the power-plant and comprising release means for releasing a connection to a rearward portion of said power-plant upon application of an impact force which is larger than a predetermined impact force and is applied from a front of the vehicle toward the rear thereof,

said second mount rotatably supporting the power-plant being located forwardly of said first mount and forwardly of and at a lower height than a center of mass of the power-plant, said second mount being supported to said framework so as to cause the power-plant to be rotated so that an upper portion of the power-plant is moved forwardly and upwardly relative to the engine compartment and the rearward portion of the power-plant is moved upwardly upon the vehicle experiencing said impact force.

**5,740,877**

**DRIVING-TORQUE DISTRIBUTION CONTROL SYSTEM FOR FOUR-WHEEL DRIVE VEHICLES**

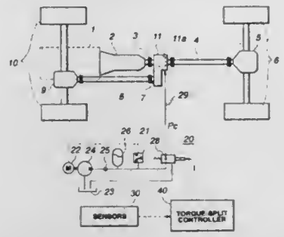
**Hiroki Sasaki, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan**

**Filed Dec. 21, 1995, Ser. No. 576,357**

**Claims priority, application Japan, Dec. 26, 1994, 6-323402**

**Int. Cl.[6] B60K** *17/35*

**U.S. Cl. 180—248** **5 Claims**




1. A driving-torque distribution control system for a four-wheel drive vehicle, comprising:

a transfer having a transfer clutch for variably adjusting a torque distribution between front and rear drive wheels;

sensor means for detecting an amount of shift of wheel-load from one of left and right wheels included in said secondary drive wheels to another;

weighting means responsive to said amount of shift of wheel-load for setting a weighting coefficient to a lower speed of rotational speeds of said left and right wheels included in said secondary drive wheels;

means for calculating a simple mean of rotational speeds of primary drive wheels, and for calculating a weighted mean of rotational speeds of said secondary drive wheels based on said weighting coefficient; and

means for controlling said transfer clutch in accordance with said torque distribution based on a difference between said simple mean and said weighted mean.

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**5,740,878**

**MINIATURIZED SINGLE-SEATER MOTOR-VEHICLE, IN PARTICULAR FOR SPORTS AND RECREATIVE USE**

**Oscar Sala, Lissone, Italy, assignor to Birel S.R.L., Lissone, Italy**

**Filed Nov. 27, 1995, Ser. No. 563,271**

**Claims priority, application European Pat. Off., Dec. 23, 1994, 94830587**

**Int. Cl.[6] B60K** *5/00*

**U.S. Cl. 180—291** **13 Claims**

1. A miniaturized single-seater motor-vehicle comprising:

a frame (**2**);

a rear axle (**3**) supporting driving wheels (**4**);

a motor (**19**) fastened to the frame (**2**);

a front axle (**5**) supporting front wheels (**6**);

a steering wheel (**20**) rotating about a rotation axis (**21**) for steering said front wheels;

a seat (**10**) engaged to the frame (**2**), wherein:

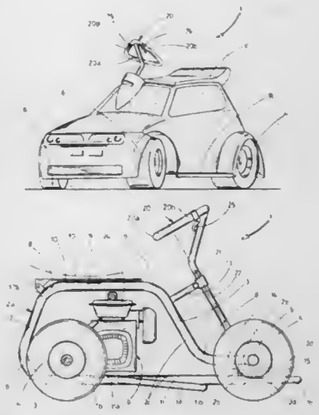
said frame (**2**) comprises two half-frames (**2***a*) substantially extending in planes disposed symmetrically in side by side relation with respect to a longitudinal vertical center plane (**7**), each half-frame (**2***a*) being provided with a plurality of sections (**9**, **11**, **12**, **13**, **14**) consecutively connected to each other to define a shaped profile substantially in the form of a closed loop an upper section (**9**) of which supports said seat (**10**);

said motor (**19**) is located under said seat in a hollow space defined between said shaped half-frames (**2***a*), within said closed loop profile;

said steering wheel (**20**) exhibits a rim including a forward portion (**20***b*) and a rear portion (**20***a*) relative to the running direction of the motor-vehicle, said forward potion (**20***b*) projecting more than said rear portion (**20***b*) with respect to said rotation axis (**21**);

a pair of footboards (**18**) being associated with said frame (**2**), each of them projecting laterally from one of said half-frames (**2***a*).





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**5,740,879**

**POWER STEERING APPARATUS**

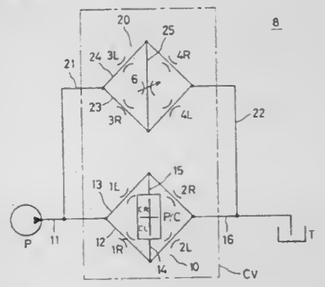
**Yasuyoshi Emori; Yukimitsu Minamibata; Ikuo Nomura, and Tetsuya Koike, all of Saitama-ken, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan**

**Filed Jun. 6, 1995, Ser. No. 465,769**

**Claims priority, application Japan, Jun. 27, 1994, 6-144618; Jul. 21, 1994, 6-169532**

**Int. Cl.[6] B62D** *5/06*

**U.S. Cl. 180—423** **6 Claims**




1. A power steering apparatus including a control valve which is opened or closed in response to a steering operation for selectively switching a path between a pump, a tank and left and right chambers of a power cylinder, the improvement wherein:

the control valve includes a first fluid pressure bridge circuit and a second fluid pressure bridge circuit that are connected in parallel between a supply path for a pressure fluid from the pump and a return path to the tank;

the first fluid pressure bridge circuit comprises a first set of variable throttles which are opened and closed in response to the steering operation and which are connected to the left and right chambers of the power cylinder for regulating fluid flow to and from the left and right chambers of the power cylinder in response to the steering operation; and

the second fluid pressure bridge circuit comprises a second set of variable throttles, separate from the first set of variable throttles, which are opened and closed in response to the steering operation, and a vehicle speed responsive variable throttle valve which is positioned between the variable throttles forming the second set of variable throttles and which is for controlling fluid flow through said second set of variable throttles and which is controlled to be opened or closed in accordance with a vehicle speed, whereby the power steering apparatus is responsive to vehicle speed.

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**5,740,880**

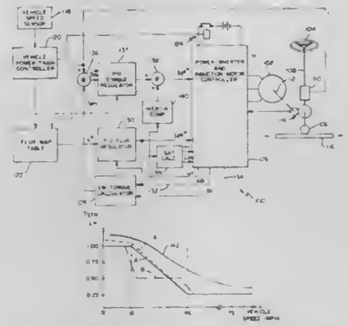
**SPEED TRACKING OF INDUCED ARMATURE FIELD IN ELECTRIC POWER ASSISTED STEERING**

**John Michael Miller, Saline, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.**

**Filed Dec. 7, 1995, Ser. No. 568,729**

**Int. Cl.[6] H02P** *7/00;5/40;* **B62D** *5/04*

**U.S. Cl. 180—446** **34 Claims**



1. A motor driven power assisted steering system for a motor vehicle comprising:

an electric motor with a controllable induced armature field;

a coupler mechanism for coupling an output shaft of said electric motor to steering gear of a motor vehicle;

a vehicle speed sensor coupled to said motor vehicle for detecting the operating speed of said motor vehicle and for generating representative speed signals; and

a motor controller responsive to said speed signals for controlling the induced armature field of said electric motor as a function of the operating speed of said motor vehicle, said motor controller operating along a flux versus vehicle velocity curve to reduce power consumed by said electric motor, said flux versus vehicle velocity curve having a maximum value for a range of low vehicle speeds, a minimum value for a range of high vehicle speeds and a smooth transition between said range of low vehicle speeds and said range of high vehicle speeds.

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**5,740,881**

**SAFETY DEVICE FOR DETECTING IMPROPER POSITIONING OF A LADDER**

**Michael Lensak, 124 Weinmanns Blvd., Wayne, N.J. 07470**

**Filed Sep. 6, 1996, Ser. No. 744,656**

**Int. Cl.[6] E06C** *5/34*

**U.S. Cl. 182—18** **3 Claims**

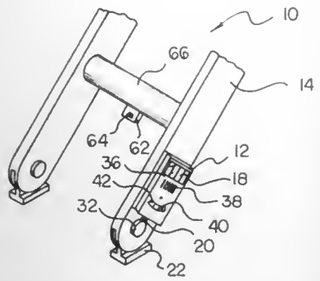
1. A safety device for detecting improper positioning of a ladder comprising:

an alarm connected to an energy source;

a lateral level indicator switch coupled to a rung of a ladder and connected between the alarm and energy source with a first orientation for precluding power transfer to the alarm when the ladder is orientated no more than a predetermined angle with respect to a vertical axis, the lateral level indicator switch having a second orientation for allowing power transfer to the alarm when the ladder is oriented at least a predetermined angle with respect to the vertical axis; and

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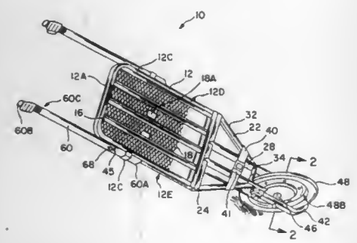





an actuator switch means with an associated switch coupled thereto and connected between the energy source and alarm and a spring having a biased orientation for closing the associated switch upon use of the ladder and an unbiased orientation for opening the associated switch after use of the ladder.

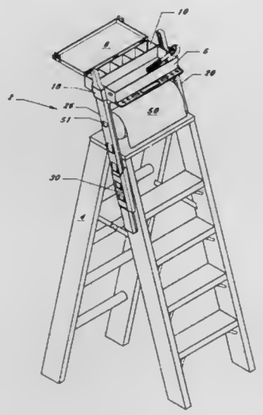
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**5,740,882**
**COMBINATION HUNTING STAND AND GAME CARRIER APPARATUS**
**Ricky L. Griffith, 4626 Hicks Hwy., Olivet, Mich. 49076, and Randy L. Griffith, 1576 Riley Center Rd., Riley Twp., Mich. 48041**
**Filed May 31, 1996, Ser. No. 658,941**
**Int. Cl.[6] A45F** *3/26;* **A01M** *31/02*
**U.S. Cl. 182—20** **24 Claims**




1. A combination hunting stand and game carrier apparatus which can be configured as one or the other, which comprises:
(a) a first frame means having opposed ends forming a support surface therebetween for supporting game when the apparatus is in the game carrier configuration;
(b) a second frame means having opposed ends with one end pivotably connected to one end of the first frame means;
(c) a third frame means having opposed ends with one end pivotably connected to the other end of the second frame means;
(d) a connecting means for holding the first, second and third frame means in one of the configurations;
(e) at least one wheel removably mounted on the third frame means enabling the apparatus to be moved when in the game carrier configuration, wherein the wheel is able to be removed from the third frame means and mounted on the third frame means to provide a seat means when the apparatus is in the hunting stand configuration;
(f) a handle means mounted on the first frame means for transporting the apparatus when configured as the game carrier; and
(g) a securing means provided on the second frame for mounting the apparatus on a support when in the hunting stand configuration.

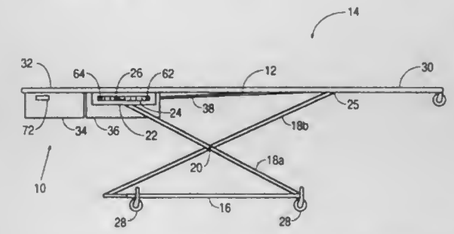
**5,740,883**
**TOOL ACCESSORY FOR LADDER**
**Robert D. Trank, 331 SE. 8th St., Pompano Beach, Fla. 33060**
**Filed Feb. 3, 1997, Ser. No. 790,220**
**Int. Cl.[6] E06C** *7/14*
**U.S. Cl. 182—129** **8 Claims**



1. A tool and accessory box for use on a ladder comprising:
a container body having a plurality of side walls and a floor, joined together, and a removable and openable lid, said lid movable between an open position to access an interior of said container body, and a closed position to form an essentially horizontal platform;
a pair of elongated support members, each of said pair of elongated support members including a plurality of evenly spaced downward facing wedged shaped protruding members, each of said plurality of evenly spaced wedged shaped protruding members manually movable to a nonprotruding position essentially flush with a surface of each of said elongated support members, each of said plurality of evenly spaced wedged shaped protruding members being biased in the protruding position;
a pair of mounting brackets, each of said pair of mounting brackets including means for attaching to a side of a ladder, said pair of mounting brackets being mountable on opposite sides of the ladder and external to the steps, each of said pair of mounting brackets further including an essentially vertical aperture sized to receive one of said elongated support members, each of said mounting bracket essentially vertical apertures including at least one fixed horizontal portion positioned to engage a lower edge of each of said wedge shaped protruding members to adjustably position each of said elongated support members in a plurality of fixed positions in relation to each of said mounting brackets;
each of said elongated support members being slidable in relation to each of said mounting brackets when each of said plurality of said wedged shaped protruding members are manually moved to said flush position when adjacent said at least one fixed horizontal portion of said essentially vertical aperture;
said container body including a pair of apertures sized and positioned to receive one each of said pair of elongated support members;
each of said pair of elongated support members having a prepositioned shoulder to support said container body when said elongated support members are received within said pair of apertures on said container body;
wherein said plurality of fixed positions of each of said elongated support members within each of said mounting bracket essentially vertical apertures provides a plurality of height positions for said container body relative to the ladder.



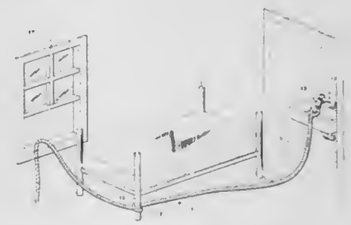
**5,740,884**
**POWER LIFTING UNIT AND METHOD FOR CONVERTING MOBILE PATIENT TRANSPORTER**
**Vito A. DiMucci, and Michael V. DiMucci, both of 14343 Old Wood Rd., Saratoga, Calif. 95070**
**Continuation-in-part of Ser. No. 103,851, Aug. 9, 1993, Pat. No. 5,495,914. This application Apr. 7, 1995, Ser. No. 418,394**
**Int. Cl.[6] A61G** *1/02*
**U.S. Cl. 182—141** **25 Claims**




1. A power lifting unit apparatus for adjusting the height of a gurney, the gurney having a platform with a top surface for holding a person and a bottom surface, an undercarriage containing wheels, and means connecting said platform to said undercarriage by using a scissors-like structure, said apparatus comprising:
an electric motor;
lead screw assembly including a lead screw capable of being driven by said motor;
a threaded assembly engaged with said lead screw and capable of being slidably mounted on said bottom surface such that when said lead screw is rotated in a first direction, the threaded assembly moves away from said motor and when said lead screw is rotated in a second direction the threaded assembly moves toward said motor; and
at least one tension arm capable of interconnecting said lead screw assembly and said scissors-like structure;
wherein said threaded assembly is capable of being connected to said scissors-like structure such that rotating said lead screw in said first direction creates a tensile force in said tension arm and moves said platform away from said undercarriage.

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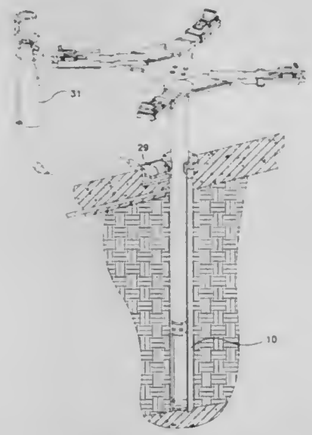
**5,740,885**
**FIREPROOF WATER-COOLED ESCAPE CABLE AND METHOD**
**William Paradise, 515 Wood Forest Ct., NE., Marietta, Ga. 30066**
**Filed Aug. 10, 1995, Ser. No. 513,402**
**Int. Cl.[6] A62B** *1/00*
**U.S. Cl. 182—190** **11 Claims**



1. A fireproof water-cooled cable, comprising:
an elongated hollow core having perforations;
a longitudinal seam along said core;
metal cable strands wrapped about said core, wherein a plurality of gaps are located between said metal strands;
a water spigot fitting affixed to said cable; and
said cable is capable of allowing water to pass through said core to cool said cable, and said cable is capable of forcing a portion of said water to travel transverse to said core through said perforations and through said gaps to the exterior surface of said cable.

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**5,740,886**
**METHOD OF RETROFIT OF IN-GROUND AUTOMOTIVE LIFT SYSTEM**
**Robert H. Fletcher, San Diego, Calif., assignor to Advantage Lift Systems, Inc., San Diego, Calif.**
**Filed Jul. 18, 1996, Ser. No. 683,305**
**Int. Cl.[6] B66F** *7/00*
**U.S. Cl. 187—205** **7 Claims**




1. A method of retrofit of a pre-existing in-ground automotive lift system, the method comprising the steps of:
(a) removal of a superstructure of the pre-existing system;
(b) excavation of any solid structure surrounding the lift casing of the pre-existing system;
(c) evacuation of hydraulic fluid of the pre-existing system;
(d) removal of guide means associated with a plunger of the pre-existing structure;
(e) removal of said plunger of the pre-existing system;
(f) within the casing of the pre-existing system, installation of a self contained or sealed high pressure, low volume hydraulic cylinder and associated hydraulic lines;
(g) installation of a power unit for said high pressure, low volume hydraulic cylinder;
(h) installation of a plunger associated with said high pressure low volume cylinder using said casing as an outer guide means for said plunger; and
(i) replacement of the superstructure of the pre-existing system.

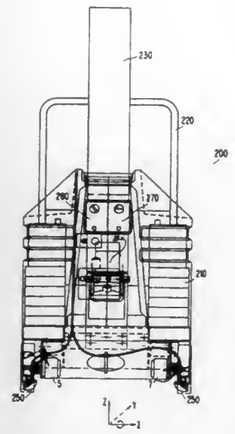
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**5,740,887**
**DRIVE SYSTEM FOR VERTICAL MAST PERSONNEL LIFT**
**Mark R. Unger, Hagerstown, Md., and Brian M. Boeckman, Chambersburg, Pa., assignors to JLG Industries, Inc., McConnellsburg, Pa.**
**Filed Jan. 18, 1996, Ser. No. 588,371**
**Int. Cl.[6] B66F** *9/06*
**U.S. Cl. 187—231** **24 Claims**

11. A drive control system for a personnel lift having a base portion and a movable portion, comprising:
first and second rear wheels fixedably mounted to a bottom surface of the base portion such that the first and second rear wheels rotate about a single axis, the single axis being substantially aligned with a widthwise axis of the base portion;

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first and second motors respectively connected to the first and second rear wheels and configured to provide rotational movement of the first and second rear wheels; and

first and second front wheels pivotably mounted to the bottom surface of the base portion and configured to rotate in any angular direction;

wherein the first and second motors are actuated to rotate the first and second rear wheels to cause steering of the personnel lift without steering either one of the first and second rear wheels, and wherein the first and second front wheels are free to rotate during the steering of the personnel lift and are not controlled by the drive control system.

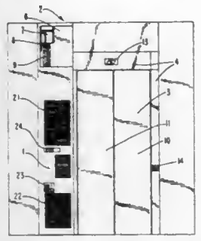
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**5,740,888**

**ARRANGEMENT IN AN OPENING IN THE WALL OF AN ELEVATOR SHAFT AND INSTRUMENT PANEL**

**Esko Aulanko, Kerava; Harri Hakala, and Jorma Mustalahti, both of Hyvinkää, all of Finland, assignors to Kone Corporation, Hyvinkaa, Finland**

**Continuation of Ser. No. 434,585, May 4, 1995, abandoned. This application Feb. 25, 1997, Ser. No. 806,152**
**Claims priority, application Finland, May 4, 1994, 942063**
**Int. Cl.[6] B66B** *7/12*
**U.S. Cl. 187—336** **13 Claims**



1. An arrangement in an opening for an automatic elevator landing door in a wall of an elevator shaft, the landing door being in an opening for the elevator and being positioned in a plane when in a closed position, the arrangement comprising an instrument panel for the elevator, the instrument panel containing elevator control equipment, an access opening with a window and a drive for controlling a hoisting motor of the elevator, the instrument panel being placed in the opening with the landing door of the elevator and being spaced from the plane in which the landing door is positioned when the landing door is in the closed position such that the elevator is on one side of the plane and the instrument panel is on an opposite side of the plane, the instrument panel being rigidly mounted in the arrangement so as to be fixed in position relative to the wall of the elevator shaft and the instrument panel and window preventing ready access to the elevator shaft.

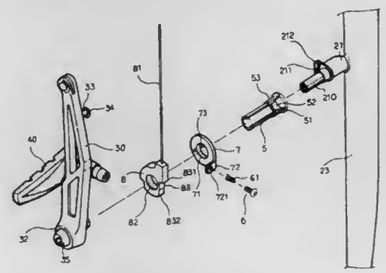
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**5,740,889**

**BRAKE MECHANISM HAVING A MICRO-ADJUSTABLE DEVICE**

**Shih Fan Tsai, P.O. Box 63-99, Taichung, Taiwan**

**Filed Dec. 16, 1996, Ser. No. 767,420**
**Int. Cl.[6] B62L** *3/00*
**U.S. Cl. 188—24.19** **1 Claim**



1. The brake mechanism for a bicycle, the bicycle including at least one fork tube, said brake mechanism comprising:

a rod secured to the fork tube of the bicycle, said rod including a panel having at least one hole,

a barrel engaged on said rod,

a disc engaged on said barrel and including a projection for engaging with said at least one hole of said panel, said disc including a flap folded relative to said disc,

a ring rotatably engaged on said barrel and including a surface,

a brake arm rotatably secured to said barrel and including a protrusion,

a spring rod including a first end secured to said ring and including a second end engaged with said protrusion of said brake arm for applying a spring force against said brake arm, and

a screw threadedly engaged with said flap for engaging with said surface of said ring and for allowing said screw to rotate said ring relative to said rod and for allowing said screw to adjust the spring force of said spring rod against said brake arm without disengaging said brake arm.

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**5,740,890**

**VIBRATION DAMPER OR SHOCK ABSORBER WITH ADJUSTABLE DAMPING FORCE ARRANGEMENT HAVING AN INTERMEDIATE TUBE**

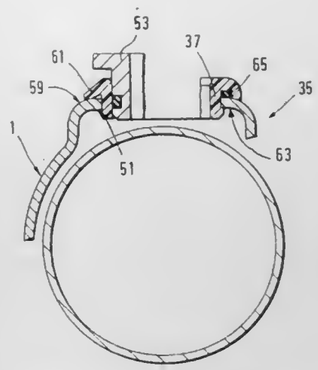
**Andreas Förster, Schweinfurt, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany**

**Filed Jul. 10, 1995, Ser. No. 500,175**
**Claims priority, application Germany, Jul. 12, 1994, 44 24 433.9**
**Int. Cl.[6] F16F** *9/32*
**U.S. Cl. 188—322.2** **20 Claims**

1. A vibration damper with adjustable damping force, having an intermediate tube;

said intermediate tube comprising a tube socket which as an overlap with a valve seat body and forms a hydraulic connection to a controllable valve, wherein an intermediate ring is located inside the tube socket, said intermediate ring being supported at least on one opening side of the tube socket by means of a support and has a greater axial length than the tube socket, and said intermediate ring comprising a region forming a snap fastening to permit said intermediate ring to snap into place with a portion of said tube socket upon said region, forming said snap fastening, passing over said portion of said tube socket.





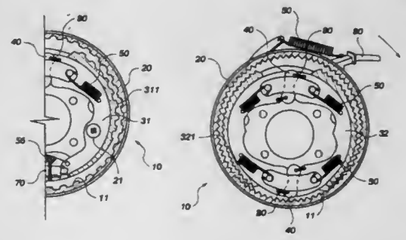
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**5,740,891**

**CENTER BRAKE FOR AUTOMOBILES**

**Jae-hyou Song, 421-12 Mangu-3-dong, Junglang-gu, Seoul, Rep. of Korea**

**PCT No. PCT/KR95/00052, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO95/31650, PCT Pub. Date Nov. 23, 1995**
**PCT Filed May 9, 1995, Ser. No. 732,509**
**Claims priority, application Rep. of Korea, May 12, 1994, 94-10482**
**Int. Cl.[6] F16D** *69/00*
**U.S. Cl. 188—326** **9 Claims**



1. A center brake for automobiles comprising:

a brake drum fixed to a drive shaft of the automobile, the brake drum being adapted for braking the drive shaft using frictional force generated by a pair of brake shoes when the brake is engaged,

a housing which said brake drum may be installed to, the combination of housing and brake drum creating an enclosure in which brake parts may be located,

a pair of brake shoes installed on said housing by use of anchor pins, each of said brake shoes having a first end and a second end, said brake shoes being capable of pivoting with respect to said housing about said anchor pins when said brake shoes are forced against the inner surface of said brake drum by an actuating force when the brake is engaged,

a cam located on said housing, said cam being capable of exerting an actuating force on said brake shoes when the brake is engaged, the cam thereby biasing said brake shoes outward so that they pivot about their anchor pins and contact the inner surface of said brake drum,

an operating lever attached to said cam and being capable of effecting actuation of said cam,

a plurality of return springs for elastically returning said operating lever and said brake shoes to their original positions when said brake is disengaged,

an adjuster disposed between said second ends of said brake shoes, said adjuster being adapted for controlling a gap between said brake shoes,

a compression coil spring extending between said second ends of said brake shoes proximate to said adjuster and adapted to prevent separation of said adjuster from said brake shoes, and

a plurality of braking teeth integrally formed on the inner surface of said drum and on the outer surfaces of said shoes, the braking teeth of said shoes engaging with the braking teeth of said drum when the brake is engaged;

wherein actuation of said brake shoes by said cam causes said brake shoes to come into contact with and firmly engage said brake drum with the interior surface of said brake drum when the brake is engaged.

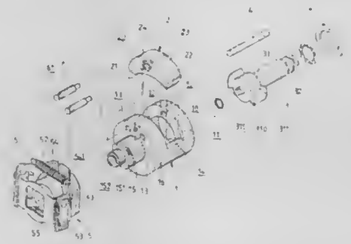
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**5,740,892**

**POWER WRENCH TORQUE TRANSMISSION MECHANISM**

**Chen Shu-Hsia Huang, 8F, No. 472, Sec. 3, Ming-Chih Road, Tai-Shan Hsiang, Taipei Hsien, Taiwan**

**Filed Aug. 26, 1996, Ser. No. 703,103**
**Int. Cl.[6] B25B** *15/00*
**U.S. Cl. 192—43.1** **7 Claims**



1. A torque transmission mechanism comprising a cylindrical main body having a central bore surrounded by a cylindrical side wall with a closed end adapted to connect to a motor and an open end to receive and rotatably support a toothed end of an output shaft within the central bore, the main body comprising a radial notch in communication with the central bore to receive and rotatably support therein a coupling member, the coupling member comprising two wings opposite to each other and alternately movable into the central bore to selectively engage and drive the toothed end of the output shaft, the coupling member further comprising an inclined side surface, a centrifugal clutch mounted to the main body and having at least one control pin coupled thereto to be movable by the centrifugal clutch between a first position where the at least one control pin engages the inclined side surface of the coupling member to prevent the wings of the coupling member from moving into the central bore and engaging the toothed end of the output shaft and a second position where the at least one control pin disengages from the coupling member to allow the wings to move into the central bore to engage the toothed end of the output shaft, wherein the at least one control pin comprises a circumferential groove located at one end thereof and the centrifugal clutch comprises an open slot having a width sufficient to loosely receive the circumferential groove of the at

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least one pin therein to have a second opposite end of the at least one control pin pointing toward the inclined side surface of the coupling member.

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**5,740,893**

## ONE-WAY CLUTCH AND METHOD OF MAKING BEARING RING

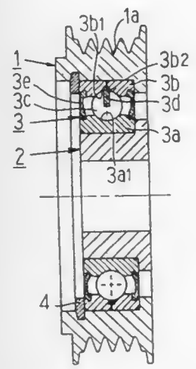
**Ken Yamamoto, Iwata, Japan, assignor to NTN Corporation, Osaka, Japan**

**Filed Jun. 3, 1996, Ser. No. 657,165**

**Claims priority, application Japan, Jul. 14, 1995, 7-178542; Jul. 26, 1995, 7-190595; Aug. 25, 1995, 7-217411; Aug. 29, 1995, 7-220084; Aug. 31, 1995, 7-223215**

**Int. Cl.[6] F16D** *41/064*

**U.S. Cl. 192—45** **11 Claims**




**1**. A one-way clutch comprising:

an inner member having a raceway surface formed on an outer peripheral surface thereof;

an outer member having a raceway surface formed on an inner peripheral surface thereof;

a plurality of balls interposed between said raceway surfaces;

a retainer in the form of a one-split ring fitted in said raceway surface of one of said members in a state of concomitant rotation with the one member, said retainer having cam surfaces cooperating with said raceway surface of the other member to define wedge clearances in one rotative direction;

wherein in one rotative direction, because said balls are engaged with said wedge clearances, said members are locked together, and in another rotative direction, because said balls are disengaged from said wedge clearances, said members are relatively rotated to each other while supporting a load through contacts of said balls with said raceway surfaces, and

wherein said engagements and disengagements of said balls with said wedge clearances are changed through said concomitant rotation of said retainer with the one member.

**11**. A method of producing a bearing ring serving as a member in a one-way clutch, comprising the steps of:

producing a bearing ring blank with a single spherical surface having a radius of curvature greater by a predetermined amount than a radius of a ball serving as a rolling element, wherein said bearing ring blank has a width greater by a predetermined amount than the width of a complete bearing ring; bisecting said bearing ring blank along a widthwise centerline thereof; and cutting a split surface of each divisional part by an amount corresponding to said predetermined amount.

**5,740,894**

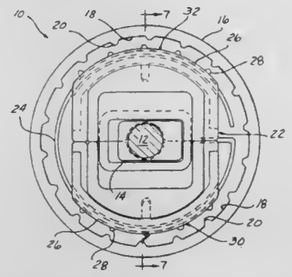
## ACCELERATION REACTION CLUTCH WITH OVERRIDE CAPABILITY

**Harry C. Buchanan, Jr., Spring Valley, Ohio, and James P. Penrod, Fort Thomas, Ky., assignors to ITT Automotive Electrical Systems, Inc., Auburn Hills, Mich.**

**Continuation of Ser. No. 501,557, Jul. 12, 1995, Pat. No. 5,582,279. This application Jul. 24, 1996, Ser. No. 685,427**

**Int. Cl.[6] F16D** *43/20*

**U.S. Cl. 192—54.5** **21 Claims**




**21**. An apparatus for moving a sliding door of a vehicle with respect to a door frame defining a door opening, said door slidably mounted on said frame for movement between an open position wherein said door is withdrawn to one side of said opening and a fully closed position wherein said door is received in sealed engagement with said frame around the periphery of said door opening, said apparatus for moving said door between a closed position immediately adjacent said fully closed position and said open position, said apparatus comprising:

a push/pull member for selectively pushing longitudinal movement in one direction and selectively pulling longitudinal movement in an opposite direction along a fixed path and having a first longitudinal end and a second longitudinal end, and means adjacent said first end for securing said push/pull member to said vehicle door;

driving means for drivingly engaging said push/pull member intermediate said first and second ends;

motor means for powering said driving means;

clutch means for selectively transmitting torque and rotary motion from a spindle having an axis of rotation to a drum, said clutch means disposed radially between said spindle and said drum for moving radially with respect to said axis of rotation between an engaged position and a disengaged position with respect to said drum, said clutch means responsive to acceleration for moving into said engaged position and responsive to rotational speed for moving into said disengaged position; and

biasing means for normally maintaining said clutch means in said disengaged position when said spindle is at rest.

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**5,740,895**

## INTEGRATED WHEEL END SYSTEM

**Jon A. Bigley, Canton, Mich., assignor to Warn Industries, Milwaukie, Oreg.**

**Filed May 22, 1996, Ser. No. 651,384**

**Int. Cl.[6] B60K** *17/26;23/06*

**U.S. Cl. 192—69.41** **23 Claims**

**1**. An integrated wheel end system for a vehicle including a clutch adapted to provide driving engagement/disengagement of a wheel to convert between driven and non-driven modes of wheel movement, said system comprising,

a support coupled to the frame of the vehicle,

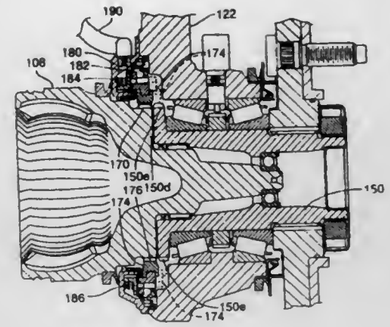
an elongate cylindrical spindle mounted on said support for relatively free rotation about the central axis of the spindle, said spindle having an outer end portion spaced outwardly from the support adapted to have a wheel mounted thereon, an inner portion disposed inwardly toward the center of the vehicle from the outer end portion, a flange extending radially outwardly from said inner portion, and engaging elements formed on said flange adjacent the periphery thereof,

a drive element adapted to be rotated under power adjacent the flange of the spindle and having engaging elements arrayed thereabout, and

a clutch member mounted adjacent the engaging elements of the spindle flange and the drive element shiftable substantially parallel to the central axis of the spindle between a first position engaging the engaging elements of both said spindle and drive element to produce a driving connection therebetween whereby the spindle is driven by powered rotation of the drive element and a second position in which no driving connection is produced permitting the spindle to rotate freely of the drive element,

wherein the engaging elements on the spindle and drive element comprise outwardly directed teeth disposed at the outer peripheral edges of the spindle and drive member, and said clutch member comprises a ring gear having radially inwardly directed teeth which engage the teeth on the spindle and drive element when in the first position and are out of engagement with the teeth on at least one of the spindle and drive element in the second position.






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**5,740,896**

**Patent Not Issued For This Number**

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**5,740,897**

## DEVICE FOR THE REMOVAL OF A PAPER CURRENCY STACKER ASSOCIATED WITH A PAPER CURRENCY VALIDATOR DEVICE OF AN AUTOMATIC ENTERTAINMENT APPARATUS

**Michael Gauselmann, Espelkamp, Germany, assignor to Atronic Casino Technology Distribution GmbH, Espelkamp, Germany**

**Filed Sep. 21, 1995, Ser. No. 531,501**

**Claims priority, application Germany, Sep. 23, 1994, 44 34 126.1**

**Int. Cl.[6] G07F** *7/04*

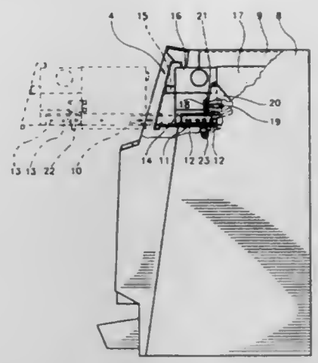
**U.S. Cl. 194—206** **35 Claims**

**15**. A paper currency accepting machine comprising

a support structure formed by a side wall and a top cover attached to the side wall;

a pair of rail sliders extending substantially horizontally from a front of the paper currency accepting machine to a rear of the paper currency accepting machine and attached to the support structure;

a drawer framework engaged with and running on the rail sliders for allowing withdrawal of the drawer framework from the paper currency accepting machine;




a front cover panel section attached to the drawer framework for furnishing a substantially closed front side of the paper currency accepting machine when the drawer framework is in a recessed position;

a paper currency insertion slot furnished in the front cover panel section;

a paper currency validator mounted to the drawer framework and disposed neighboring to the paper currency insertion slot for receiving paper currency inserted into the paper currency insertion slot;

a paper currency stacker disposed on the drawer framework and neighboring to the paper currency validator for receiving paper currency validated by the paper currency validator and for stacking such paper currency;

a second pair of rail sliders extending substantially horizontally and attached to the drawer framework and engaged with the rail sliders attached to the structure by means of a ball bearing slide.

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**5,740,898**

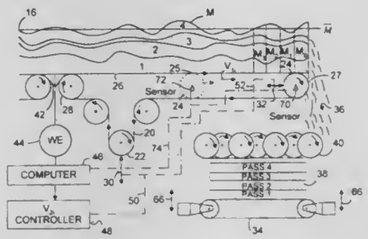
## METHOD AND APPARATUS FOR LAYING UP STRANDS

**Martin Thomas Pearson, Burnaby, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada**

**Filed Oct. 24, 1996, Ser. No. 739,079**

**Int. Cl.[6] B65G** *47/26*

**U.S. Cl. 198—382** **12 Claims**




**1**. A system for producing a lay-up of strands comprising a plurality of lay-up heads, a receiving conveyor for receiving a layer of strands formed by each of said lay-up heads to produce a layered lay-up, a distributing conveyor having a variable length upper reach terminating at a free end, means to move said free end from an extended position to a retracted position and to discharge lengths of said layered lay-up off said free end and to deposit said selected lengths over selected distances and means for collecting said strands discharging from said free end of said distributing conveyor.

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**5,740,899**

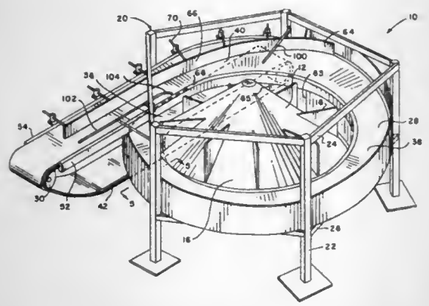
## POSITIVE SPACING CONVEYOR APPARATUS

**Roger Dale Pugh, 4831 Antler Dr., Greenwood, Ark. 72936, and Herman H. Tolbert, Rte. 1, Box 26, Bokoshe, Okla. 74830**

**Continuation-in-part of Ser. No. 371,875, Jan. 12, 1995, Pat. No. 5,474,493. This application Dec. 11, 1995, Ser. No. 571,626**

**Int. Cl.[6] B65G** *47/24*

**U.S. Cl. 198—392** **38 Claims**



1. An apparatus for placing items in a single file comprising:

a rotatable member having an outer periphery;

a conveyor having a removal section of a predetermined width and being disposed about the outer periphery of said rotatable member for receiving items from said rotatable member; and

guide means extending gradually across the removal section to reduce the effective width of the removal section for guiding the items in a single file.

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**5,740,900**

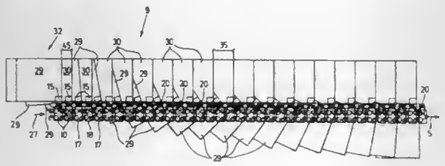
## APPARATUS FOR SPLITTING A PRODUCT STREAM

**Kevin Lauren Cote, Durham, and Richard Daniel Curley, Dover, both of N.H., assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Harris, Inc., Dover, N.H.**

**Filed Jul. 20, 1995, Ser. No. 504,868**

**Int. Cl.[6] B65G** *47/26*

**U.S. Cl. 198—436** **19 Claims**



9. An apparatus for splitting a product stream comprising:

a conveying belt including at least a plurality of first grippers and a plurality of second grippers, each of the first and second grippers gripping a respective product and conveying the products as a first product stream in a conveying direction;

one or more of the second grippers having a gripper head rotatably mounted thereon; and

a support, the gripper head rotationally mounted on the support, the gripper head rotating its respective product so as to form a separate second product stream in the conveying direction.

**5,740,901**

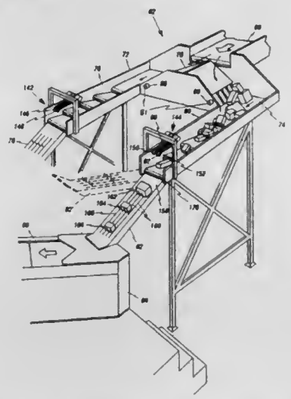
## APPARATUS AND METHOD FOR HANDLING FLOW OF PACKAGES

**S. James Lazzarotti, Broomall, and Eugene T. Mullin, Phoenixville, both of Pa., assignors to Lockheed Martin Corporation, Bethesda, Md.**

**Division of Ser. No. 176,063, Jan. 3, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 469,494**

**Int. Cl.[6] B65G** *43/00*

**U.S. Cl. 198—444** **9 Claims**



1. Apparatus for singulating a flow of items, comprising a plurality of conveyor belts arranged in series, flow sensing means associated with each of said plurality of conveyor belts for sensing flow either entering or leaving each of said belts, control means responsive to said plurality of flow sensing means for controlling the advancement of each of said conveyor belts to create separations between items; each said belt being upwardly tilted in its direction of flow with the flow output end of one belt being higher than the flow input end of any next belt in said series such that the belts are spaced apart from each other by a spacing and a plane passes through the output end of the upstream belt and the input end of the downstream belt and each said sensing means being disposed for item detection within the spacing separating each of said conveyor belts and through said plane; and at least one of said sensing means including a sensor disposed for sensing across the path of item flow of a given conveyor for the presence of nonsingular item patterns; and means associated with said sensor for selectively restraining a plurality of laterally adjacent items disposed on said given conveyor from advancement and for causing the release of one of said laterally adjacent items into a single stream of articles to be delivered.

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**5,740,902**

## METHOD AND UNIT FOR EQUALLY SPACING PRODUCTS, IN PARTICULAR FOOD PRODUCTS

**Mario Spatafora, Bologna, Italy, assignor to Azionaria Costruzioni Macchine Automatiche A.C.M.A., S.p.A., Bologna, Italy**

**Filed Nov. 8, 1995, Ser. No. 555,329**

**Claims priority, application Italy, Nov. 11, 1994, BO94A0495**

**Int. Cl.[6] B65G** *47/26*

**U.S. Cl. 198—459.2** **23 Claims**

1. A method of equally spacing products (**2**), the method comprising:

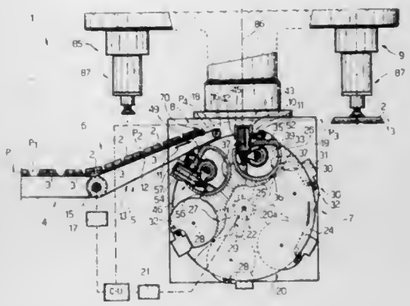
a feed stage wherein said products (**2**) are fed at a constant rate along at least part of an initial portion (**P1**, **P2**) of a product supply path (**P**);

a gripping stage wherein each one of said products (**2**), when fed along said initial portion (**P1**, **P2**) of said path (**P**), is gripped by a head (**45**) of a respective accelerating member (**30**) and fed to an unloading station (**10**) where said one of said products is transferred to an end portion (**P3**) of said path (**P**), each said accelerating member (**30**) being fed through said unloading station (**10**) with a predetermined constant spacing and at said constant rate; and

a final stage wherein said products (**2**) are fed with said spacing and at said constant rate along said end portion (**P3**) of said path (**P**);

wherein said gripping stage comprises a substage wherein said head (**45**) is imparted a movement in a direction perpendicular to said initial portion (**P1**, **P2**) of said path (**P**) and through said initial portion (**P1**, **P2**) of said path (**P**) to engage and lift respective said products (**2**) off said initial portion (**P1**, **P2**) of said path (**P**) at a pickup point (**88**), said head being moved through said pickup point (**88**) at an advancement speed greater than a traveling speed of said respective products (**2**) at said pickup point (**88**).





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**5,740,903**

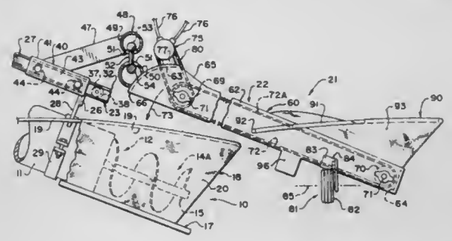
## FEED DEVICE FOR A MATERIAL TRANSPORTATION TUBE

**Richard J. Epp, and Dwayne S. Epp, both of Box 64, Fiske, Saskatchewan, Canada, S0L 1C0**

**Filed Jan. 16, 1996, Ser. No. 585,590**

**Int. Cl.[6] B65G** *17/28*

**U.S. Cl. 198—594** **19 Claims**



1. A material handling apparatus for transporting a particulate material comprising:

a main transport device having an elongate transportation tube, means for supporting the tube with a lower feed end and an upper discharge end and a transportation means in the tube for moving the material from the lower end to the upper end;

the tube having an open top hopper at the lower feed end thereof;

a feed transport device for moving the material from an initial feed point to the hopper at the lower feed end of the main transport device for transport therein;

the feed transport device comprising an elongate transport body arranged for carrying the material along the transportation body and for supporting the material away from a ground surface as the material is carried from a feed end to a discharge end;

and mounting means for mounting the feed transport device on the transportation tube such that the feed transport device is movable to different positions relative to the lower feed end of the tube;

the mounting means comprising a support head, connecting means pivotally connecting the support head to the transport body of the feed transport device at the discharge end thereof, a guide track extending along a top surface of the tube at the lower end thereof longitudinally of the tube, and means for moving the support head along the guide track from an operating position to a raised position in which the feed transport device is pulled into a transport position on the top surface of the tube;

the support head and the guide track being arranged such that in the operating position the discharge end of the feed transport device is located above the hopper for discharging the material carried thereby downwardly into the hopper.

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**5,740,904**

## SWITCH ASSEMBLY WITH INTERNAL ELECTRONIC COMPONENTS

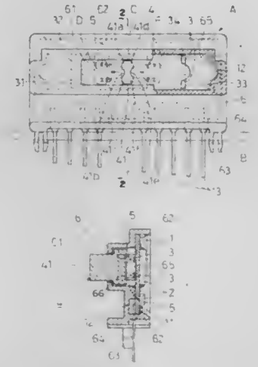
**Kenichi Ishizuka, and Osamu Furukawa, both of Tokyo, Japan, assignors to Niles Parts Co., Ltd., Tokyo, Japan**

**Filed Sep. 4, 1996, Ser. No. 711,945**

**Claims priority, application Japan, Dec. 28, 1995, 7-353045**

**Int. Cl.[6] H01H** *1/64*

**U.S. Cl. 200—293** **17 Claims**



1. A switch assembly of a power window switch, the switch assembly having internal electronic components, comprising:

a base plate (**1**);

electronic components (**2**) mounted to one side (**11**) of the base plate (**1**);

switch electrodes (**3**) formed in the other side (**12**) of the base plate (**1**); and

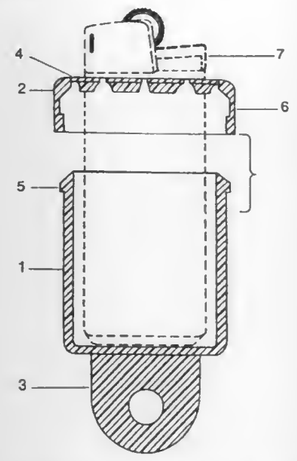
a switch case (**6**) including a switch operating mechanism (**4**) and a movable contact (**5**), means for resiliently fitting the base plate to said switch case to seal the switch electrodes (**3**), said means for resiliently fitting comprising a plurality of pawls on said switch case;

said switch operating mechanism (**4**) including a lever (**41**), said lever (**41**) extending out of the switch case (**6**) and including a plurality of combined projections and recesses (**41***a* to **41***f*) arranged in a direction transverse to the direction in which the switch operating mechanism (**4**) is moved.

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**5,740,905**
**KEY RING ATTACHABLE LIGHTER HOLDING SHELL WITH FLEXIBLE HOLDING FLAPS**
**Kevin Lee Kilfoy, 122 E. 17th St., Davenport, Iowa 52803**
**Filed Jun. 6, 1996, Ser. No. 659,507**
**Int. Cl.[6] A24F** *19/00*
**U.S. Cl. 206—87** **2 Claims**

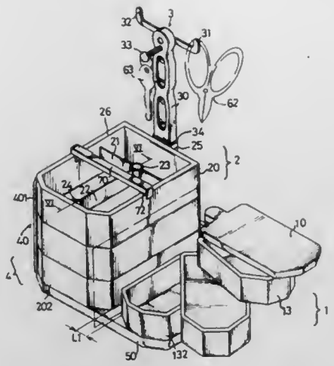



1. A key holder-attachable open-ended shell for holding lighters comprising in combination:
a generally elongated hollow shell body having an open top at a first end of said shell body and a lighter cavity shaped to receive a lighter,
said lighter cavity being bounded by side wall portions and by a closed bottom at a second end of said shell body, and
a section that is a part of said shell body with a hole through it that permits said shell to be attached to a key holder,
an open-ended cap adapted to receive and fit into the top of said hollow shell body,
said open-ended cap having individual flexible plastic flap means for pressing against the side walls of a lighter to secure said lighter in said holding shell,
said flexible plastic flap means surrounding the circumference of the top of said open-ended cap and extending inwardly toward the center of said open-ended cap with linear gaps between said flexible plastic flap means extending slightly inwardly from where said flap means are attached to the inside circumference of said side walls of said open-ended cap to form the outside circumference of an opening in the center of the top of said open-ended cap, in the shape of the circumference of the lighter to be held thereby, but slightly smaller than the circumference of the lighter to be held thereby,
said opening being generally adapted to receive said lighter.

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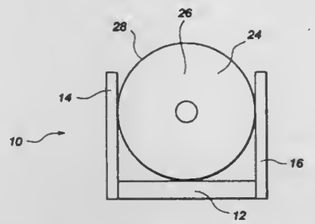
**5,740,906**
**CONTAINER COMBINATION FOR STATIONERY GOODS**
**Yung-feng Lai, 1st Fl., No. 4, Lane 328, Sec. 2, Chungshan Rd., Chungho City, Taipei Hsien, Taiwan**
**Filed Aug. 8, 1996, Ser. No. 693,519**
**Int. Cl.[6] A45C** *11/34*
**U.S. Cl. 206—214** **17 Claims**

1. A container combination for stationery goods, comprising:
a base plate having receiving means on a bottom thereof;
a central container assembly provided on the base plate and including a first assembling frame abutting the base plate and at least one second assembling frame stacked up on the first assembling frame, each of the first and second assembling frames having top and bottom openings therein and having at least one joint means therein, at least one of these assembling frames having attachment means on a rear side wall thereof;
a lateral container assembly provided on the base plate adjacent to one side of the central container assembly and including a first container abutting the base plate and at least one second container stacked on the first container, each of the first and second containers having an open top and having pivoting means on a rear side wall thereof for pivoting with other containers around an axis perpendicular to the base plate;
a bookend assembly provided on the base plate adjacent to another side of the central container assembly and including an L-shaped movable plate having a vertical portion and a horizontal portion received in the receiving means of the base plate, and spring means disposed between the horizontal portion and the base plate for biasing the vertical portion of the movable plate toward an edge of the base plate; and
a post assembly for hanging articles thereon including a main bar having a lower portion attachable to the central container assembly by the attachment means, and at least one hook on an upper portion of the main bar.




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**5,740,907**
**DISK HOLDER**
**Robyn S. McCloy, 565 E. 6400 South, Murray, Utah 84107**
**Filed Apr. 28, 1997, Ser. No. 847,701**
**Int. Cl.[6] B65D** *85/57*
**U.S. Cl. 206—307** **10 Claims**

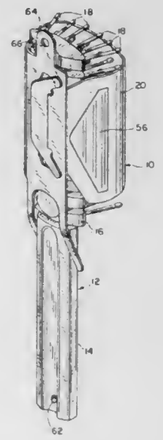



1. An apparatus for holding an information disk comprising an information-storing surface area and a non-information-storing edge, the apparatus comprising:
a base member;
a first wall disposed on the base member, the first wall having a plurality of substantially linear, substantially parallel grooves disposed therein, the grooves dimensioned for receiving the edge of the disk without contacting the information-storing surface area;
a second wall disposed on the base member such that the second wall is substantially parallel to the first wall, the second wall comprising a plurality of substantially parallel flexible fingers each having a longitudinal axis and having disposed therein at least one groove substantially parallel to the longitudinal axis thereof and to the grooves in the first wall and dimensioned for receiving the edge of the disk without contacting the information-storing surface area:
wherein the second wall is spaced apart from the first wall by a distance sufficient to receive a disk therebetween and for a finger of the second wall to bias the disk against the first wall and thereby hold the disk.



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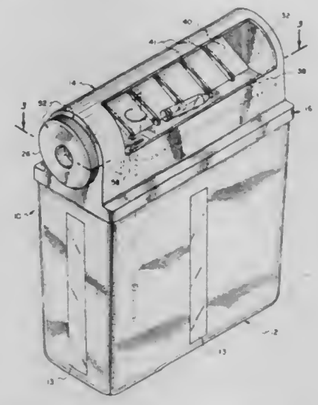
**5,740,908**
**DEVICE FOR DISPLAYING AND PROTECTING A HAIRBRUSH**
**Paul A. Anzalone, Huntington, N.Y., assignor to Goody Products, Inc., N.J.**
**Filed Mar. 28, 1996, Ser. No. 623,247**
**Int. Cl.[6] B65D** *65/12*
**U.S. Cl. 206—362.3** **18 Claims**




1. A device for displaying a hairbrush for sale and preventing use of the hairbrush prior to sale, the hairbrush including a handle and a head having a plurality of bristles projecting from the head, the device comprising:
a strip of flexible sheet material having a predetermined length, first and second opposing sides extending along the length of the strip, and first and second opposing ends extending between said first and second sides, the first end secured to the second end to form a tube, the tube adapted to encircle the head of the hairbrush and at least a portion of the tube configured to be substantially perpendicular to the bristles; and
a tab extending from the first side of the strip, the tab having an attached end coupled to the first side, a free end disposed opposite the attached end, and a hole formed therein, the hole configured to receive the handle of the hairbrush,
wherein the free end of the tab extends away from the strip and remains detached from the strip when the tab is secured to the handle.

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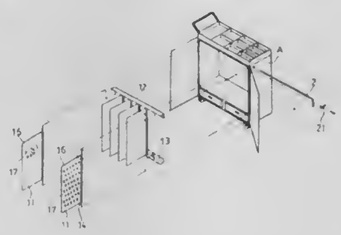
**5,740,909**
**LOCKABLE AND LEAK-PROOF SHARPS DISPOSAL CONTAINER**
**Raymond Nazare; Donna M. Nazare, both of Woodland Hills, and William L. Gottsegen, Encino, all of Calif., assignors to Gene W. Arant, Ventura, Calif., a part interest**
**Continuation-in-part of Ser. No. 535,971, Sep. 29, 1995, Pat. No. 5,603,404. This application Feb. 10, 1997, Ser. No. 795,507**
**Int. Cl.[6] B65F** *1/16*
**U.S. Cl. 206—366** **18 Claims**



1. In a sharps disposal container, the combination of a receptacle and cover wherein the receptacle is of generally box-like configuration having an open top; the cover is of a horizontally extending, generally semi-cylindrical configuration, and has a horizontal base for attachment to the top of the receptacle; the base of the cover and the upper perimeter of the receptacle are provided with interlocking edges so that once assembled they are permanently locked together; the receptacle has side walls with viewing windows made of a puncture resistant material; the cover has a side wall with an elongated opening formed therein; one end wall of the cover has a dial recess formed therein; and the other end wall of the cover has a pivot pin recess formed therein for rotatably supporting one end of a rotatable tray that may be positioned within the cover and accessible through the elongated opening.

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**5,740,910**
**TOOL BOX**
**Gaw-Gwo Ueng, P.O. Box 82-144, Taipei, Taiwan**
**Filed Aug. 26, 1996, Ser. No. 709,654**
**Int. Cl.[6] A47B** *81/00*; **B65D** *85/00*
**U.S. Cl. 206—373** **4 Claims**




1. A tool box comprising:
a rectangular container having a rear wall and two side walls;
an upper elongated angular member fixedly mounted on an upper portion of said rear wall;

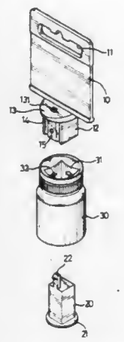
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a lower elongated angular member fixedly mounted on a lower portion of said rear wall;
a plurality of vertically disposed rectangular panels having a vertical edge pivotally fitted between said upper and lower elongated angular members and formed with a plurality of recesses each on an upper edge close to an upper outer corner thereof and a plurality of holes thereon;
a positioning rod extending through said two side walls and engaged with said recesses; and
a plurality of hooks detachably fitted in said holes respectively.

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**5,740,911**
**DISPLAY PACK HAVING A SECURITY DEVICE**
**Ta-Ching Chou, No. 22, West 4th Alley, 20 Lin, Hsi Ping Li, Hua Hsia Lane, Hsi Tun Dist., Taichung, Taichung, Talwan**
**Filed Apr. 10, 1997, Ser. No. 838,781**
**Int. Cl.[6] B65D** *73/00*
**U.S. Cl. 206—378** **3 Claims**

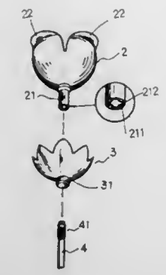


1. A display pack having a security device, comprising:
a hanging portion having a first hole defined therethrough and a disk extending laterally from a lower edge of said hanging portion, said disk having a second hole defined therethrough, at least two opposite side walls extending from said disk and in a direction opposite said hanging portion, each of said side walls having at least one protrusion extending therefrom, and
a securing member having an upper end and a lower end from which a flange extends radially, said upper end of said securing member having a hook member extending therefrom so that said securing member extends through a product attached to said side walls and said hook member is engaged with said second hole to position said product relative to said side walls.

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**5,740,912**
**CONTAINER FOR HOLDING FOOD, CANDIES AND THE LIKE**
**Chin-Sheng Chen, 171, Sue Koo Road, Sung Kang Hsiang, Changhua Hsien, Taiwan**
**Filed Mar. 25, 1997, Ser. No. 824,193**
**Claims priority, application Taiwan, Oct. 14, 1996, 85215698**
**Int. Cl.[6] B65D** *85/00*
**U.S. Cl. 206—457** **5 Claims**

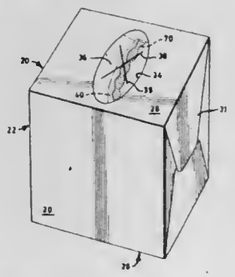
1. A food container comprising:
a main body having a capacity for holding a predetermined amount of food, said main body futher having a hollow connection rod which is fastened at one end thereof with an underside of a botttom of said main body;
a receptacle having a through hole of a size permitting said connection rod of said main body to pass therethrough when main body is received in said receptacle; and



a stem provided at one end thereof with means for fastening said stem with said connection rod of said main body via said through hole of said receptacle such that said main body and said receptacle are joined together securely.

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**5,740,913**
**POP-UP TISSUE DISPENSER**
**Timothy Maurice McFarland, Neenah, Wis., assignor to Kimberly-Clark Worldwide, Inc., Neenah, Wis.**
**Filed Aug. 12, 1996, Ser. No. 695,485**
**Int. Cl.[6] B65D** *73/00*
**U.S. Cl. 206—494** **12 Claims**



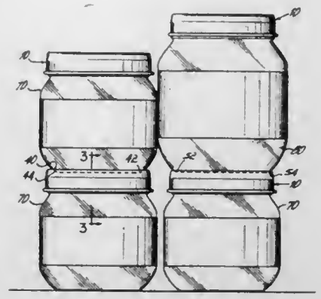
1. A pop-up tissue dispenser, comprising:
a carton comprising a plurality of walls defining therein a carton opening; and
a clip of tissues disposed within the carton, the clip comprising a visually distinctive tissue and a plurality of other tissues, each of the visually distinctive and other tissues being substantially identical except that the visually distinctive tissue comprises a visual indicator, the visually distinctive tissue being oriented within the carton such that the visual indicator is visible through the carton opening prior to removal of any tissues from the carton.

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**5,740,914**
**CLOSURE FOR STACKING CONTAINERS OF DIFFERENT SIZES**
**James M. Herzog, Lancaster, Ohio, assignor to Anchor Hocking Packaging Co., Cincinnati, Ohio**
**Filed Jul. 22, 1996, Ser. No. 681,156**
**Int. Cl.[6] B65D** *21/036*
**U.S. Cl. 206—501** **5 Claims**

1. A closure and at least two containers of different internal capacities,
each container having a finish for receiving the closure and a stacking bead for stacking that container on the closure, the finishes of the containers being of the same size, said containers comprising a first container of a first internal capacity and a stacking bead of a first diameter, and a second container of

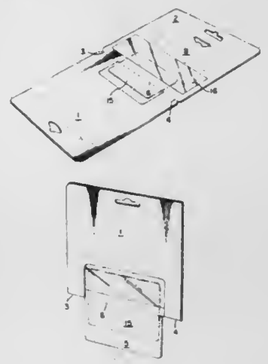




a different internal capacity and a stacking bead of a second diameter smaller than that of said first container,
said closure being configured for use with each said container and comprising a top panel and a skirt depending from said top panel, said skirt adapted to surround and grip the finish of each container alternatively, said top panel having an outer stacking area contoured to nestingly receive the stacking bead of said first container if placed on said closure, said top panel having an inner stacking area inwardly of said outer stacking area, said inner area being contoured to nestingly receive the stacking bead of said second container if placed on said closure,
said closure having a sealing gasket on an under-surface thereof, said outer stacking area being above said sealing gasket, and said inner stacking area being positioned to lie above the mouth opening of a container to which said closure has been applied.

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**5,740,915**
**PACKAGE FOR A PLANAR ELEMENT**
**David E. Williams, Fayetteville, Ga., assignor to Creative South, Inc., Fayetteville, Ga.**
**Filed Feb. 10, 1997, Ser. No. 797,171**
**Int. Cl.[6] A45C** *11/18*
**U.S. Cl. 206—555** **7 Claims**



1. A package for a planar element comprising a front panel, a rear panel foldably joined along at least one fold line to said front panel and being disposed in flat face contacting relation therewith, said planar element being disposed intermediate said panels with a portion thereof extending beyond the associated peripheries of said panels, and an auxiliary flap foldably joined to said rear panel and disposed in flat face contacting relation with said portion of said planar element.

**5,740,916**

**Patent Not Issued For This Number**

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**5,740,917**
**BOUNDARY LAYER CONDENSATE DRAIN POT**
**Douglas B. Jung, 3209 Franz Valley Rd., Santa Rosa, Calif. 95404**
**Filed Jan. 2, 1996, Ser. No. 581,900**
**Int. Cl.[6] B03D** *5/66*
**U.S. Cl. 209—156** **6 Claims**




1. A guide structure in a circular pipe that capable of reducing a distance requires to develop a flow regime from annular to stratified comprising:
a plurality of guide bars of various sizes and configurations being attached circumferentially to an internal circumference of said pipe, each of said guides having an upper end and a lower end, said guides being attached in a slanted orientation with said lower ends pointing downwardly and downstream of said flow; said upper ends of said guides being spaced from one another at a top of said pipe; said lower ends of said guides being spaced from one another at a bottom of said pipe to facilitate separating and draining of condensate fluid and solid from said stratified region, said guides being located in the range of about 0 to 100 plus pipe diameters from a pipe obstruction and in the range of 0 to about 5 pipe diameters upstream from a drip-pot, wherein said guides direct the condensates on a wall of said pipe downwardly.

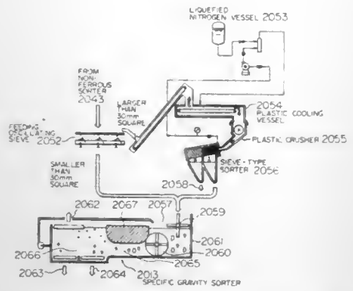
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**5,740,918**
**APPARATUS AND METHOD FOR DENSITY SEPARATION OF PLASTICS**
**Masakatsu Hayashi, Ushiku; Yoshiyuki Takamura, Kudamatsu; Tsutomu Hasegawa, Niiza; Hideharu Mori, and Tatsuji Katoh, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Division of Ser. No. 453,062, May 26, 1995, Pat. No. 5,611,493, which is a continuation of Ser. No. 85,092, Jul. 2, 1993, Pat. No. 5,431,347, which is a continuation-in-part of Ser. No. 56,937, May 5, 1993, Pat. No. 5,301,881, which is a continuation of Ser. No. 984,492, Dec. 2, 1992, abandoned.**
**This application Sep. 27, 1995, Ser. No. 534,710**
**Claims priority, application Japan, Dec. 2, 1991, 3-317643; Jan. 29, 1993, 5-013385**
**Int. Cl.[6] B03B** *5/60*
**U.S. Cl. 209—173** **7 Claims**

1. An apparatus for sorting plastic pieces by specific gravity sorting, said plastic pieces having sizes suited to the specific gravity sorting and comprising those of at least first, second and third kinds, said first kind of plastic pieces having a specific gravity smaller than that of water, said second kind of plastic pieces having a specific gravity greater than that of water, said third kind of plastic pieces having a specific gravity greater than that of water

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but smaller than the specific gravity of said second kind of plastic pieces, said apparatus including:

a vessel containing an amount of water and having an inlet for plastic pieces to be sorted;

means for introducing plastic pieces to be sorted into said vessel through said inlet;

air-bubble removing means positioned within the water contained in said vessel for removing air bubbles from the plastic pieces introduced into said vessel; and

means for moving said plastic pieces with said water in said vessel to allow said second kind of plastic pieces to sink in said water at a first stage portion of said vessel and allow said third kind of plastic pieces to sink in said water at a second stage portion of said vessel downstream of said first stage portion, said first kind of said plastic pieces floating on the surface of said water and being moved by the movement of said water to a third stage portion of said vessel downstream of said second stage portion.

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**5,740,919**

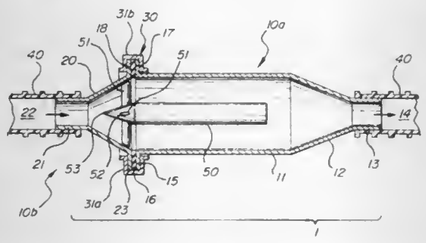
**MAGNETIC SEPARATOR**

**Michael W. Stowe, 3923-C Pine Hurst Shore Dr., Boyne City, Mich. 49712**

**Continuation of Ser. No. 373,768, Jan. 17, 1995, abandoned. This application Mar. 5, 1997, Ser. No. 812,242**

**Int. Cl.[6] B03C** *1/00*

**U.S. Cl. 209—223.1** **36 Claims**




1. In a magnetic separator assembly comprising a conduit designed to trap extraneous magnetizable material traveling in a path directed through said conduit, said conduit including at opposite ends thereof an inlet and an outlet and an intermediate section between said inlet and said outlet and having a magnet disposed therein, the improvement comprising:

said conduit having at least first and second portions comprising axially mating halves, said first half including said conduit inlet and said second half including said conduit outlet; and

said magnet having at least one support member including a distal end at which said support member is connected to one of either of said halves of said conduit, such that said magnet is accessible by axially separating said at least first and second halves along said intermediate section, and wherein further said at least one support member extends from said magnet such that a majority of said magnet depends freely within said conduit proximate one of either of said inlet or said outlet.

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**5,740,920**

**JIGGING SCREEN DEVICE WITH PNEUMATIC VALVE CONTROL**

**Helmut Timmermann, Bochum, Germany, assignor to Ruhrkohle Aktiengesellschaft, Essen, Germany**

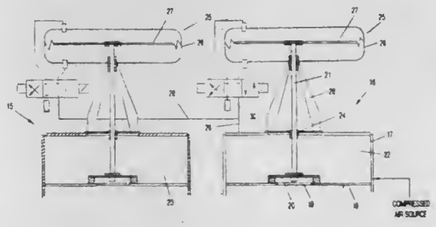
**PCT No. PCT/DE93/01259, § 371 Date Jul. 28, 1995, § 102(e) Date Jul. 28, 1995, PCT Pub. No. WO94/16819, PCT Pub. Date Aug. 4, 1994**

**PCT Filed Dec. 29, 1993, Ser. No. 501,097**

**Claims priority, application Germany, Jan. 30, 1993, 43 02 672.9**

**Int. Cl.[6] B03B** *5/52*

**U.S. Cl. 209—455** **12 Claims**




1. A pneumatic jigging screen device comprising:

an air chamber;

a compressed air source for generating pulsation in said air chamber;

an air outlet;

an air inlet valve in the form of a disk valve connected between said compressed air source and said air chamber, said air inlet valve including a valve rod;

an air outlet valve in the form of a disk valve connected between said air chamber and said air outlet, said air outlet valve including a valve rod;

a first pneumatic valve drive coupled to said valve rod of said air inlet valve;

a second pneumatic valve drive coupled to said valve rod of said air outlet valve;

a connecting line connecting said compressed air source to said first and second valve drives;

a first electromagnetic control valve positioned between said first pneumatic valve drive and said compressed air source in said connecting line; and

a second electromagnetic control valve positioned between said second pneumatic valve drive and said compressed air source in said connecting line.

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**5,740,921**

**METHOD AND APPARATUS FOR SORTING SHEETS IN A PREDETERMINED SEQUENTIAL ORDER**

**Taichiro Yamashita, Tsuchiura; Kazushi Yoshida, Ibaraki-ken; Yasunori Hamada, Tsuchiura; Junichi Tamamoto, Ibaraki-ken, and Toshihiko Tajiri, Owariasahi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Dec. 21, 1995, Ser. No. 576,688**

**Claims priority, application Japan, Dec. 22, 1994, 6-319766**

**Int. Cl.[6] B07C** *5/00*

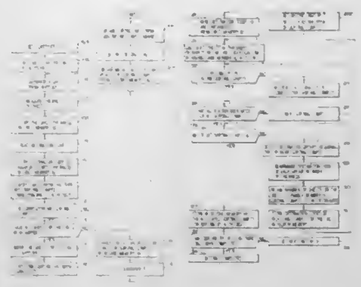
**U.S. Cl. 209—584** **18 Claims**

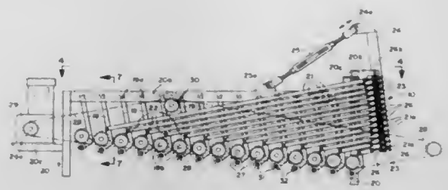
1. A method for sorting sheets comprising the steps of:

performing an initial sorting operation which includes the following sorting steps of:

separating a sheet from a plurality of sheets fed from feed means holding said sheets in upright position;







reading a destination code of a plurality of destination codes from said sheet;

storing said destination code in a first memory unit;

storing, in a second memory unit, a sorting setting showing a correspondence between said plurality of destination codes and a plurality of sorting compartments in accumulating means;

classifying said sheet by referencing the sorting setting in said second memory unit to identify one of said plurality of sorting compartments corresponding to said destination code stored in said first memory unit; and

throwing said sheet into one of said plurality of sorting compartments of said accumulating means;

performing all the above series of said sorting steps to sequentially sort and accumulate remaining ones of said plurality of sheets into said plurality of sorting compartments of said accumulating means, located above and adjacent to said feed means, according to said sorting setting, said plurality of sorting compartments now holding a plurality sorted and accumulated sheets;

moving the plurality of sorted and accumulated sheets from said accumulating means to said feed means; and

subsequently, rearranging said plurality of sorted and accumulated sheets in a specified order by performing another sorting operation, which includes the following sorting steps:

storing, in a third memory unit, a number of sheets to be sorted and thrown into each of said sorting compartments by;

obtaining the number of said sheets to be sorted and thrown into each of said sorting compartments in said another sorting operation from said destination codes stored in said first memory unit during the initial sorting operation, and storing the obtained number of said sheets in said third memory unit;

arranging said sorting setting so as to allocate a plurality of consecutive sorting compartments to accommodate said number of sheets as applicable sorting compartments when said number of sheets exceeds a specified value in any of the sorting compartments, and storing said arranged sorting setting in said second memory unit; and

performing said initial sorting operation for at least another time according to said arranged sorting setting.

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**5,740,922**

**SIZING SCREEN WITH INDIVIDUAL ROW SPACING ADJUSTABILITY**

**Stephen G. Williams, Blackfoot, Id., assignor to Milestone Blackfoot, Inc., Blackfoot, Id.**

**Filed Dec. 29, 1995, Ser. No. 580,628**

**Int. Cl.[6] B07B** *13/05*

**U.S. Cl. 209—668** **4 Claims**

1. Sizing screen apparatus for agricultural produce, comprising an elongate sizing screen having a sizing deck extending longitudinally from a loading end thereof to a final discharge end thereof; a supporting frame within which said screen is mounted; said screen comprising a longitudinal series of transverse rows of sizing members that are mounted side-by-side in the respective rows on shaft means for rotation; longitudinally movable members pivotally mounted in said frame and rotatably receiving said shaft means, respectively, for supporting the respective rows of sizing members, said rows being spaced apart from one another longitudinally of said sizing screen to define respective transverse series of sizing openings for passing therethrough various sized items from a mass of agricultural produce that is loaded on the screen deck at the loading end thereof and that travels on and along said deck toward the discharge end thereof; and mechanism for adjusting the extent of the respective spacings longitudinally of said deck between mutually adjoining, individual rows relative to one another, said mechanism comprising longitudinally movable structure mounted on and adjacent to one end of said frame, a series of individual, elongate, connecting members extending side-by-side longitudinally of said screen and connected at one set of their corresponding ends, respectively, to said longitudinally movable structure and at the opposite set of their corresponding ends to said longitudinally movable members, and means for moving said longitudinally movable structure back or forth longitudinally of said screen for simultaneously adjusting the spacings between rows of said sizing members; and means for selectively shortening or lengthening the effective lengths of the individual, elongate, connecting members, respectively, to individually adjust the extent of spacings between mutually adjoining rows of said sizing members, said means comprising coactive, length-adjustable means interconnecting said one set of ends, respectively, with said longitudinally movable structure.

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**5,740,923**

**STORING AND SORTING RECEPTACLE APPARATUS AND METHOD**

**Karen P. Mayhew, Rte. 1, Box 77B, Stony Point, N.C. 28678**

**Continuation-in-part of Ser. No. 47,009, Nov. 24, 1995, Pat. No. Des. 379,015. This application Sep. 20, 1996, Ser. No. 710,785**

**Int. Cl.[6] B42F** *17/00*

**U.S. Cl. 211—10** **14 Claims**

1. Apparatus for sorting and storing articles, comprising:

a base assembly,

an integral upstanding storage panel assembly,

said base assembly providing support for said upstanding storage panel assembly,

said upstanding storage panel assembly having a front face, a rear face, and at least one opening extending orthogonally therethrough between said front face and said rear face, and

at least one support extending rearwardly from said rear face proximal to said at least one opening for supporting a first removable storage means communicating with said at least one opening,

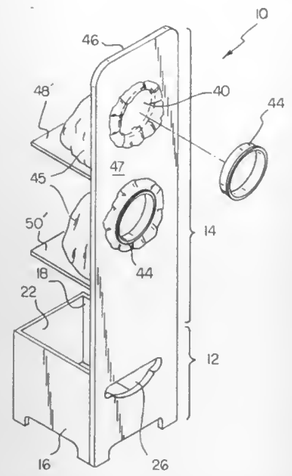
wherein said base assembly comprises a receptacle defining a second storage means,

said upstanding panel assembly having at least another normally open passage extending orthogonally therethrough between said front face and said rear face, and

wherein said another passage communicates with said receptacle defining said second storage means such that articles passed

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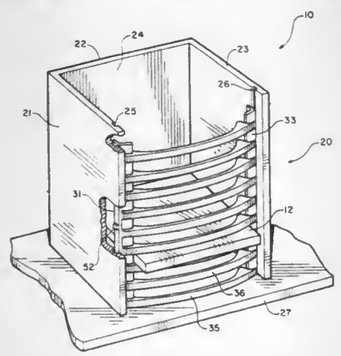





through said passage and stored in said receptacle provide enhanced stabilizing support for said upstanding panel assembly.

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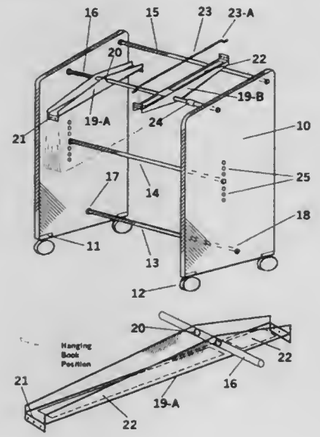
**5,740,924**
**ORGANIZER RACK COMPONENT AND METHOD OF USING SAME**
**Thomas A. Hunt, Encinitas, Calif., assignor to Spectrum Concepts, Inc., Encinitas, Calif.**
**Filed Sep. 10, 1996, Ser. No. 711,039**
**Int. Cl.[6] A47F** *7/00*
**U.S. Cl. 211—40** **24 Claims**




1. An organizer rack component for use with furniture wall means supporting a plurality of boxlike articles, comprising:
a pair of parallel spaced apart elongated rails;
a series of substantially parallel, spaced apart ribs having opposite ends connected integrally to said rails for defining a series of elongated access openings to receive the articles therein, wherein said ribs are spaced apart by a given distance sufficiently larger than a corresponding dimension of the articles to enable said ribs to retain the articles therebetween;
mounting means for helping secure the organizer rack component to the furniture means;
wherein one of said ribs is connected to said rails at about end portions thereof at about said given distance from terminal ends thereof, and another one of said ribs is connected to said rails at opposite end portions thereof to define a continuous portion thereat to facilitate the combining of like organizer rack components to appear to be a single continuous unit in an aesthetically appealing manner.

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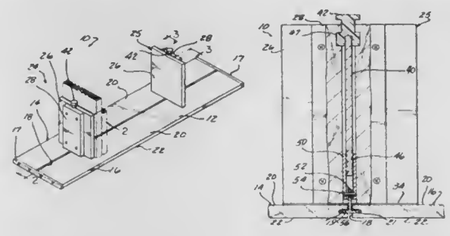
**5,740,925**
**PHONE BOOK CART**
**Frederick H. Crismon, Sr., and Robert W. Crismon, both of 424 N. Muleshoe Rd., Apache Junction, Ariz. 85219**
**Filed Oct. 5, 1995, Ser. No. 538,915**
**Int. Cl.[6] A47F** *7/00*
**U.S. Cl. 211—43** **1 Claim**




1. A book holding bracket for rotatable mounting of a reference book, said book holding bracket comprising:
an elongated channel shaped member having two parallel sides and an interconnecting web, means in said two sides for rotatable mounting of said bracket to a support structure, book attachment means located at opposite ends of said channel shaped member for attaching a reference book to said bracket, and at least one opening in said interconnecting web, whereby information on the spine of a book attached to said bracket, may be viewed through said opening.

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**5,740,926**
**BOOKSHELF WITH ADJUSTABLE LOCKING BOOKENDS**
**Bernard J. Mulloy, 2092 128th Ave., Hopkins, Mich. 49328**
**Filed Dec. 20, 1996, Ser. No. 770,665**
**Int. Cl.[6] A47B** *65/00*
**U.S. Cl. 211—43** **10 Claims**



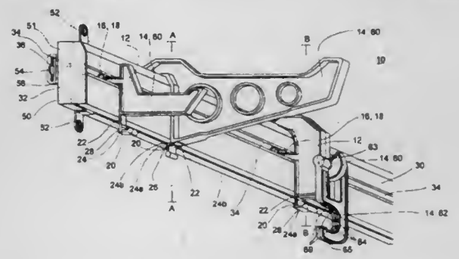
1. A bookshelf comprising:
a shelf having top and bottom surfaces and opposed longitudinally spaced first and second ends;



a longitudinal slot formed in and extending longitudinally between the first and second ends of the shelf;
an article support member movably disposed on the top surface of the shelf; and
a lock member carried in the article support member and having an end releasably engagable with the longitudinal slot in the shelf, a rotatable member carried in the article support member and having an actuator extending externally of the article support member, and means for extensibly connecting the lock member to the rotatable member for extensible movement of the end of the lock member relative to the shelf upon rotation of the rotatable member for releasably locking the article support member in a selectively adjustable position along the length of the shelf.

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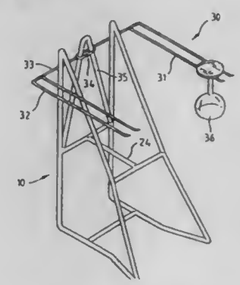
**5,740,927**
**TOOL RACK**
**Zvi Yemini, Tel Aviv, Israel, assignor to Zag Ltd., Rosh Haayin, Israel**
**Filed Jan. 9, 1997, Ser. No. 781,016**
**Int. Cl.[6] A47F** *7/00*
**U.S. Cl. 211—70.6** **12 Claims**



1. A tool rack for hanging tools, comprising:
(a) at least one hanging implement for hanging a tool, each of said at least one hanging implements including:
(i) a hanging device for engaging said tool;
(ii) a first securing device having a first profile, said first securing device being connected to said hanging device; and
(iii) a locking device, said locking device including an integral hinge connected to said hanging device and a first member of a locking implement connected to said hinge, said first member of said locking implement having a second profile; and
(b) an elongated body including a first end, said elongated body being formed with:
(i) a first extended securing groove, said first extended securing groove extending along said elongated body starting at said first end, said first extended securing groove having a third profile, said third profile being shaped and dimensioned to slideably accommodate said first profile of said first securing device of said hanging implement, such that said first securing device is inserted into said first extended securing groove via said first end; and
(ii) a second member of said locking implement, said second member of said locking implement having a fourth profile shaped and dimensioned to tightly accommodate said second profile of said first member of said locking implement, such that by bending said first member of said locking implement via said integral hinge said first and second members of said locking implement become locked to one another and, as a result, each of said at least one hanging implements becomes locked to a specific position along said elongated body;
wherein at least one of said hanging implements further includes a second securing device having a fifth profile, said second securing device is connected to said hanging device, and further wherein said elongated body further includes a second extended securing groove, said second extended securing groove extending along said elongated body starting at said first end, said second extended securing groove has a sixth profile, said sixth profile is shaped and dimensioned to slideably accommodate said fifth profile of said second securing device of said hanging implement, such that said second securing device is inserted into said second extended securing groove via said first end.

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**5,740,928**
**CASK STAND**
**Ian Frank Dale, and Margaret May Dale, both of 10 Sistertree Creek Road, Kin Kin, Queensland 4571, Australia**
**PCT No. PCT/AU94/00776, § 371 Date Jun. 13, 1996, § 102(e) Date Jun. 13, 1996, PCT Pub. No. WO95/17841, PCT Pub. Date Jul. 6, 1995**
**PCT Filed Dec. 16, 1994, Ser. No. 663,064**
**Claims priority, application Australia, Dec. 24, 1993, PM3181**
**Int. Cl.[6] A47G** *29/00*
**U.S. Cl. 211—71.01** **6 Claims**




1. A rigid, non-collapsible stand for a rectangular block-shaped cask having an outlet tap in a lower region, said stand comprising a platform for retaining the cask above a support surface by a sufficient amount to enable a receptacle to be placed under the outlet tap, and associated side walls to prevent lateral movement of the cask during manipulation of the outlet tap; wherein each side wall comprises a contiguous open-framed substantially identical vertically extending structure which is joined to the other side wall at an intermediate region by the platform, wherein a rear wall extends in the space between the vertically extending structures, above the intermediate region, which rear wall defines a surface against which a rear wall of the cask can be urged to restrain the cask from rearward movement; said stand including an extension for holding stemmed drinking glasses, said extension comprising two identical portions located on each side of the stand which are interconnected by an integral member fitted to the rear wall of the stand, said portions consisting of a pair of spaced arms which are projected horizontally and between which the stem of a drinking glass can be inserted and retained in an inverted position.

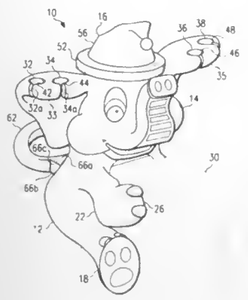
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**5,740,929**
**TOILETRY ARTICLE STORAGE SYSTEM**
**Gail B. Frankel, 5710 Glen Heather Dr., Dallas, Tex. 75252**
**Filed Sep. 24, 1996, Ser. No. 721,086**
**Int. Cl.[6] A47G** *29/00*
**U.S. Cl. 211—71.01** **33 Claims**

1. A toiletry article storage system, comprising:
a main body portion having a side surface and first and second members;
each of said first and second members outwardly projecting from said side surface of said main body portion and having a side surface;
said side surface of said first member spaced apart from said side surface of said second member to define an opening sized

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to receive a first toiletry article supportable by a surface on which said toiletry article storage system rests such that movement of said first toiletry article, when placed in said opening, is restrained by said side surface of said first member and said side surface of said second member;

an upper body portion attached to said main body portion, said upper body portion having a central portion and a peripheral edge portion which circumferentially surrounds said central portion, said peripheral edge portion having a generally flat top side surface;

wherein a liquid receptacle may be supported by said toiletry article storage system by placing a lip portion of said liquid receptacle on said generally flat top side surface of said peripheral edge portion of said upper body portion.

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**5,740,930**

**CONNECTING MECHANISM FOR CONNECTING A MOBILE UNIT TO A BASIC UNIT**

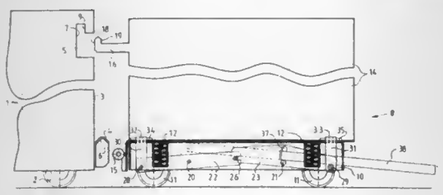
**Hendrik Smit, Grubbenvorst, Netherlands, assignor to Océ-Nederland B.V., Netherlands**

**Filed Jun. 26, 1996, Ser. No. 670,427**

**Claims priority, application Netherlands, Jun. 26, 1995, 1000660**

**Int. Cl.[6] B60D** *7/00*

**U.S. Cl. 213—75 R** **25 Claims**



1. A mobile unit including a functional part which is connectable to a basic unit provided with a first connecting element, the mobile unit comprising:

a bottom part including means for enabling movement over a support surface to thereby enable movement of the mobile unit along a first direction toward and away from the basic unit;

a functional part carried by the bottom part for movement therewith toward and away from the basic unit;

a second connecting element provided on the functional part, the second connecting part being cooperable with the first connecting element to effect a connection between the functional part and the basic unit; and

means for enabling movement of the functional part relative to the bottom part between a first position in which the second connecting element is aligned with and spaced below the first connecting element and a second position in which the second connecting element contacts the first connecting element to thereby connect the functional part of the mobile unit to the basic unit.

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**5,740,931**

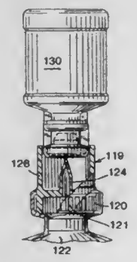
**TORQUE-RESISTANT CLOSURE WITH A SPIKE CONNECTOR INSERT FOR A HERMETICALLY SEALED CONTAINER**

**Gerhard H. Weiler, South Barrington, Ill., assignor to Automatic Liquid Packaging, Inc., Woodstock, Ill.**

**Division of Ser. No. 253,111, Jun. 2, 1994, Pat. No. 5,649,637. This application Jul. 30, 1996, Ser. No. 688,366**

**Int. Cl.[6] B65D** *1/02*

**U.S. Cl. 215—50** **5 Claims**



1. A hermetically sealed container of a thermoplastic material comprising:

(a) a body portion having an upper end terminating in a neck portion unitary therewith:

(b) a throat portion unitary with said neck portion:

(c) a preformed closure insert immobilized within said throat portion; said closure insert having a rough perimeter surface defined by axially aligned ribs uniformly spaced from one another and an axially extending passageway defined therethrough; and

(d) a removable overcap unitary with said throat portion and delineated by a peripheral frangible web circumscribing the closure insert above the rough perimeter surface, wherein the thermoplastic material in the throat portion of the container is in intimate contact with said rough perimeter surface and wherein spaces between said ribs are filled by the thermoplastic material;

said closure insert being a transfer spike surrounded by a guide skirt.

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**5,740,932**

**SECURITY CLOSURE FOR BOTTLES AND THE LIKE**

**Piero Battegazzore, Alessandria, Italy, assignor to Guala Patents B.V., Amsterdam, Netherlands**

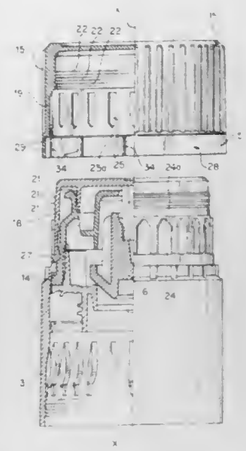
**Filed Nov. 2, 1995, Ser. No. 552,297**

**Int. Cl.[6] B65D** *41/34*

**U.S. Cl. 215—252** **9 Claims**

1. A security closure for bottles and other containers, comprising a pourer body, a cylindrical sleeve having an internal rim for retaining the pourer body, a cap, a threaded coupling between the cap and the pourer body for the unscrewing and screwing of the cap, and a security band comprising a ring which is fixed to the cap by means of a weakened line, external teeth being formed on the cylindrical sleeve and opposing internal teeth being formed on the ring for engaging the external teeth when the cap is first unscrewed, wherein the ring is divided into at least two portions





and the external teeth are formed in a recess in the cylindrical sleeve defined by a sloping shoulder.

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**5,740,933**

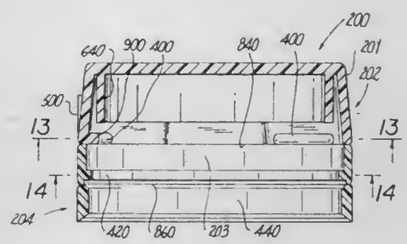
**CHILD PROOF CONTAINER CAP DESIGNED FOR MANIPULATION BY ARTHRITIC FINGERS**

**Vincent N. Conti, West Hempstead, N.Y., and Don Yeager, Forest City, N.C., assignors to American Safety Closure Corp., West Hempstead, N.Y.**

**Continuation-in-part of Ser. No. 169,066, Dec. 20, 1993, Pat. No. 5,423,441. This application Aug. 15, 1994, Ser. No. 291,521**

**Int. Cl.[6] B65D** *50/02;41/48*

**U.S. Cl. 215—256** **1 Claim**



1. The combination of a container and cap, said container having a body and a neck of said body comprising an opening into said body, said cap being for reversibly sealing said opening and comprising a closure seal, a depending skirt, an annular tear strip secured to said depending skirt by a first band of reduced thickness, an annular tamper evident ring secured to said tear strip by a second band of reduced thickness, first, second and third annular raised anchor ridges extending parallel to and spaced from one another and radially inwardly successively from inner surfaces of said depending skirt, said tear strip and said ring, said neck and cap comprising a child proof lock, said closure system providing indication to a user of a first time breach of said closure seal, and comprising:

on an outer surface of said neck, in order from said opening, a first annular raised retainer ridge, a second annular raised retainer ridge generally parallel to and spaced from said first retainer ridge, and a third annular raised retainer ridge generally parallel to and spaced from said second retainer ridge, said first, second and third anchor ridges being for bearing respectively against the first, second and third retainer ridges on their distal sides with respect to said opening, when said cap is fully seated on said neck over said opening,

said tear strip extending between said first and second bands, wherein removal of said tear strip frees said skirt from the remainder of said cap distal from said first band of reduced thickness so that said skirt is independent from said container when removed from said neck,

means for pulling said tear strip from said skirt,

said first annular raised anchor ridge being discontinuous, said inner surface and of said skirt having a single narrow latch finger in the plane of said first anchor ridge, extending generally normally from said inner surface of said skirt,

a narrow portion of said first retainer ridge being of reduced height forming thereby a latch finger bypass opening through which said latch finger can pass for initiating removal of said cap from said neck,

no other portion of said discontinuous first anchor ridge being narrower than said bypass opening,

finger grip means for urging said cap away from said opening, and generally under said tear strip within the inclusive region from said second retainer ridge to said third retainer ridge, means for tactile indication by a finger of an operator, of the rotational location of said bypass opening by rotation of said cap while said finger is simultaneously in contact with said finger grip means, and

said first, second and third retainer ridges being approximately equal in their outer diameters,

said annular skirt having an axial length and a width normal to said axial length, the ratio of said width to said skirt axial length being substantially 3 to 1,

a plurality of surfaces angled relative to one another about the outer side of said axial length of said annular of said annular skirt so that gripping ridges are formed between said plurality of angled surfaces,

said ratio along with said plurality of angled surfaces constituting means for grasping by an enfeebled hand.

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**5,740,934**

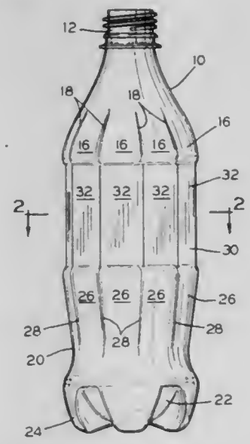
**CONTAINER WITH VERTICAL STIFFENING IN CENTRAL PANEL**

**Thomas E. Brady, Sylvania, Ohio, assignor to Plastic Technologies, Inc., Holland, Ohio**

**Continuation of Ser. No. 529,744, Sep. 18, 1995. This application Mar. 10, 1997, Ser. No. 814,795**

**Int. Cl.[6] B65D** *1/44*

**U.S. Cl. 215—381** **8 Claims**



1. A plastic container having an upper section including a neck portion, a closed base section, and a central section interconnecting

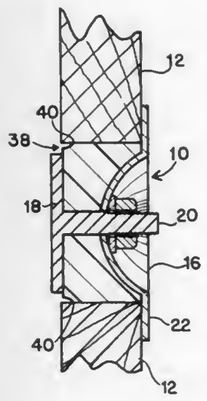
VOL 1209 ISS 3 AP 21 1998 UMI



the upper section and the base section, the central section comprising a plurality of juxtaposed reinforcing flat panels, each one of said flat panels being connected to its adjacent said panels to form a polygonal cross sectional shape, said panels being formed of a plastic material having outwardly deformable elastic characteristics, said panels together tending to substantially deform outwardly to a substantially circular cylindrical shape when the container is pressurized, and said upper and base sections tending to remain substantially undeformed and tending to substantially retain their configurations when the container is pressurized.

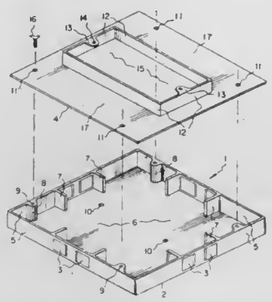
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**5,740,935**
**BUNG HOLE PLUG**
**Laurent A. Desfarges, Durbanville, South Africa, assignor to Idaho Bung Co., Inc., Boise, Id.**
**Continuation of Ser. No. 369,528, Jan. 5, 1995, abandoned. This application Apr. 9, 1996, Ser. No. 629,767**
**Int. Cl.[6] B65D** *39/12*
**U.S. Cl. 217—110** **3 Claims**




1. A bung hole plug, for use with a barrel having a cylindrical bung hole formed in a side thereof, which comprises:
a resilient, tapered, cylindrical plug, having a smaller end and a larger end, said larger end having a concave face portion, configured for insertion of the smaller end into the bung hole of the barrel, said cylindrical plug further having a hole formed therethrough coincident to its longitudinal axis for receiving a threaded post;
a back plate for positioning against the smaller end of the cylindrical plug;
a threaded post attached to said back plate and sized for extension through said axial hole in said cylindrical plug;
a face plate having a hole therethrough for receiving the extending end of said threaded post, said face plate having a convex central portion for interfitting engagement with the concave face portion of the cylindrical plug, said face plate further having a circumvolving lip having a planar surface for engagement with the surface of the barrel side when the resilient tapered cylindrical plug is inserted into the bung hole; and
a threaded traveler nut for threaded engagement with the end of the threaded post extending through the convex portion of the face plate for drawing said face plate towards said back plate and squashing the sides of the tapered cylindrical plug against the sides of the bung hole.

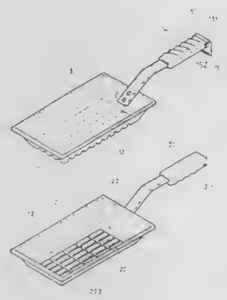
**5,740,936**
**ELECTRIC OUTLET BOX ASSEMBLY**
**William L. Nash, 4069 NE. 8th Ave., Oakland Park, Fla. 33334**
**Filed Nov. 20, 1996, Ser. No. 754,027**
**Int. Cl.[6] H02G** *3/08*
**U.S. Cl. 220—3.3** **8 Claims**



1. An electrical outlet box assembly to be installed on a masonry structure between furring strips for mounting thereon a wall finishing board, the assembly comprising:
a main housing member being formed of a generally flat back plate and side walls extending orthogonally away from said back plate;
a cover top mounted to said main housing member, said cover top being formed of a wall finishing support top, for receiving a wall finishing board, and riser walls extending orthogonally away from said wall finishing support top;
said riser walls having an electrical device cavity formed therein for receiving an electrical device; and
said side wall having a given first height and said wall finishing support top having a thickness, together corresponding to a thickness of a furring strip, said thickness of said furring strip being less than 1½ inches, and said riser wall having a given second height corresponding to a width of the wall finishing board for facilitating installation of the wall finishing board when said main housing member is placed between furring strips on a masonry wall.

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**5,740,937**
**COMBINATION PAN**
**Frank Sheu, P.O. Box 82-144, Taipei, Taiwan**
**Filed Apr. 21, 1997, Ser. No. 844,651**
**Int. Cl.[6] B65D** *25/00*
**U.S. Cl. 220—23.83** **3 Claims**

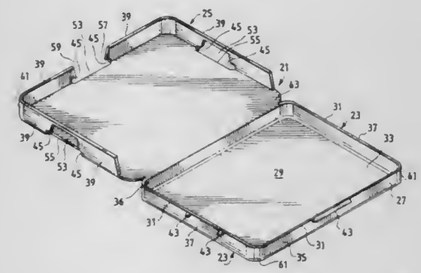


1. A combination pan comprising:
a steamer pan, having a bottom wall, longitudinal grooves and transverse grooves intersecting at a bottom side of its bottom wall, a plurality of through holes through its bottom side and respectively aligned in said longitudinal grooves and said transverse grooves;
a frying pan fitting over the outside wall of said steamer pan, said frying pan comprising a bottom wall having a top side and a bottom side, a plurality of longitudinally and transversely aligned flat blocks raised from the top side of its bottom wall and separated from one another by longitudinal and transverse grooves, and a plurality of annular ribs concentrically raised from the bottom side of its bottom wall in the middle.



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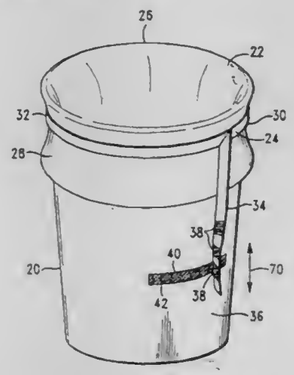
**5,740,938**
**SAFETY CONTAINER**
**Richard W. Hofmann, Chicago, and Alex J. Kutaj, Vernon Hills, both of Ill., assignors to Magenta Corporation, Chicago, Ill.**
**Continuation-in-part of Ser. No. 404,034, Mar. 14, 1995, abandoned. This application Jan. 31, 1996, Ser. No. 594,125**
**Int. Cl.[6] B65D** *45/22;83/04*
**U.S. Cl. 220—324** **7 Claims**



1. A blister-pack box for small articles comprising:
a receptacle having a bottom wall, a receptacle wall extending from the bottom wall;
a cover operatively associated with the receptacle;
a blister-pack containing a plurality of spaced closed blister-pack compartments, each of said closed blister-pack compartments containing a small article, said blister-pack having a blister-pack bottom surface through which the small article is normally dispensed, said blister-pack bottom surface being positioned in said receptacle on said receptacle bottom wall;
a plurality of article dispensing holes formed in said receptacle bottom wall, said dispensing holes are sized to conform to the size and spacing of the blister-pack compartments whereby when a portion of a blister-pack bottom surface for one of the blister-pack compartments is perforated through a corresponding article dispensing hole, said small article in the one blister-pack compartment can be dispensed through the corresponding article dispensing hole by finger or thumb pressure on a top of the one blister-pack compartment;
said receptacle having at least three releasable locks to open and close said receptacle, said releasable locks being constructed to only open the receptacle when all the releasable locks are simultaneously opened, said releasable locks being spaced apart from each other to require two hands to simultaneously open the locks;
each of said locks having means on said cover and said receptacle wall to releasably lock said cover to said receptacle wall;
each lock having a cover opening, each cover opening being sized such that receptacle wall lock portions of the receptacle wall are finger-accessible through the cover side openings when the box is closed;
each of said receptacle wall lock portions are inward of their corresponding cover openings when the box is closed, and said receptacle wall lock portions are only finger accessible through their corresponding cover openings and wherein inward finger pressure exerted on all of the receptacle wall lock portions simultaneously moves the receptacle wall inward and allows the box to be opened;
said cover includes depending wall portions which are adjacent to the receptacle wall when the container is closed, and wherein the corresponding cover openings are located in the depending wall portions; and wherein
lock catches for each of the locks comprise notches extending through the surface of the cover, the notches having ledges which abut nubs on the receptacle wall to secure the cover to the receptacle wall;
said cover has a top edge and the notches are located at the top edge and wherein corresponding cover openings are in communication with the notches, whereby fingers of a hand positioned above the cover can apply inward pressure in at least one receptacle wall lock portion while also grasping the top edge of the cover;
one of said corresponding cover openings in one of the depending wall portions extends the height of the depending wall portion to form a finger channel with a mouth opening toward the bottom wall of the box, so that when a hand is holding the receptacle from below the bottom wall a finger placed in the finger channel need not be moved when the cover is separated from the receptacle; and wherein
the cover will only be released from the receptacle wall when inward pressure is exerted simultaneously through all of the cover openings.

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**5,740,939**
**LINER RETAINER**
**J. Scott Muldner, 18481 Wildflower Dr., Penn Valley, Calif. 95946, and Dean Brennan, 21887 Wilson Ct., Cupertino, Calif. 95014**
**Division of Ser. No. 310,138, Sep. 21, 1994, Pat. No. 5,518,136. This application May 20, 1996, Ser. No. 650,287**
**Int. Cl.[6] B65F** *1/06*
**U.S. Cl. 220—404** **8 Claims**

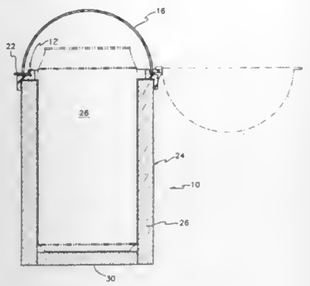


1. A liner retainer being attachable to a container having a mouth and a replaceable liner, the liner retainer comprising:
a retainer member having an elastic portion defining a loop
a connector member being attachable to an exterior surface of the container,
wherein the retainer member is positionable around the container and the liner, the liner having its mouth folded over the mouth of the container and the connector member being attachable to the container for holding the liner in place in the container,
an anchor member depending from the connector member and being connectable to the container,
and wherein the anchor member includes at least one hook and loop fastener, each hook and loop fastener of the anchor member being attachable with the container.

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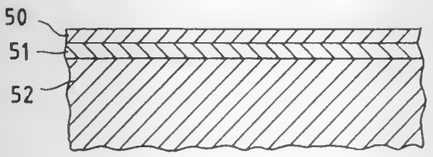
**5,740,940**
**HINGED COVER FOR AN INSULATED BEVERAGE CONTAINER**
**Dave Weiss, 12230 87th St. North, Stillwater, Minn. 55082**
**Filed Jun. 11, 1996, Ser. No. 661,698**
**Int. Cl.[6] B65D** *90/04*
**U.S. Cl. 220—412** **4 Claims**




1. An insulated beverage holder comprising:
an external, cylindrical shell portion, said cylindrical shell portion constituted of a foam material sized for receiving a cylindrical beverage container, and having incorporated on it a two-piece cover device comprising
an annular collar supported on said cylindrical shell portion;
a cover;
hinge means for pivotally connecting said cover to said annular cover, said hinge means comprising two upwardly extending ears and a rod connecting said two upwardly extending ears, wherein said cover may be pivoted on said hinge means to an open position exposing the beverage container, and to a closed position covering the beverage container;
first locking means to retain said cover in said closed position, comprising a horizontal lift tab extending outwardly from said cover, said annular collar forming a recess below said horizontal lift tab to receive said horizontal lift tab, and collar comprising a projection extending horizontally above said annular collar over said recess, wherein said horizontal lift tab slides over said projection to form a locking engagement with said recess, thus enabling said cover to be retained in said closed position; and
second locking means to retain said cover in said open position.

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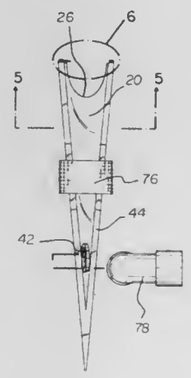
**5,740,941**
**SHEET MATERIAL WITH COATING**
**Jerome Lemelson, 868 Tyner Way, Incline Village, Nev. 89451**
**Division of Ser. No. 108,103, Aug. 16, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 471,389**
**Int. Cl.[6] B65D** *25/54*
**U.S. Cl. 220—454** **17 Claims**




1. An article of manufacture comprising:
a base substrate defined at least in part by a sheet of material having a generally planar surface;
said substrate further including an outer surface;
a visible marking placed on a predetermined portion of said outer surface;
a coating of transparent synthetic diamond material bonded to said predetermined portion of said outer surface and over said visible marking; and
said coating of transparent synthetic diamond material sealingly covers said visible marking.

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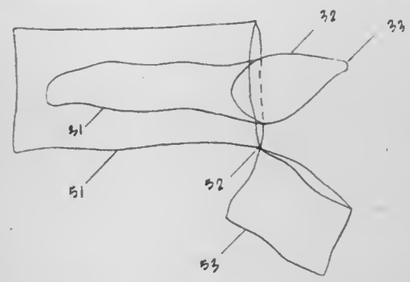
**5,740,942**
**COLLAPSIBLE CONTAINER**
**Jess J. Araujo, Jr., 2530 Greenbrier, Santa Ana, Calif. 92706**
**Filed Nov. 1, 1996, Ser. No. 743,010**
**Int. Cl.[6] A65D** *6/16*
**U.S. Cl. 220—666** **4 Claims**




1. A new and improved collapsible container, the container comprising in combination,
a flexible liner constructed from a synthetic material, the liner comprising a first, second and third rectangular wall, each of the walls having a pair of major edges and an upper minor edge and a lower minor edge, all the of rectangular walls being joined to one another along the major edges, the liner further comprising an upper triangular wall and a lower triangular wall, the upper triangular wall being joined to the upper minor edges of the rectangular walls, the lower triangular wall being joined to the lower minor edges of the rectangular walls, a threaded aperture formed through the upper triangular wall;
a first metallic rectangular wall having a first major edge, a second major edge, an upper minor edge, lower minor edge, an interior surface, and an exterior surface, a handle formed upon the upper minor edge, the interior surface secured to the first rectangular wall of the flexible liner;
a second metallic rectangular wall having a first major edge, a second major edge, an upper minor edge, a lower minor edge, an interior surface, and an exterior surface, a handle formed upon the upper minor edge, the interior surface secured to the second rectangular wall of the flexible liner, the first major edge of the first metallic rectangular wall and the first major edge of the second metallic rectangular wall being joined to one another and defining a primary hinge, due to the material characteristics of the metallic rectangular walls the primary hinge functioning to urge the first and second rectangular walls towards one another;
a carry strap having a first end and a second end and an intermediate extent therebetween, the first end secured to the handle of the first metallic rectangular wall, the second end secured to the handle of the second metallic rectangular wall; and
a pouring spout having a first extent and a second extent, with the second extent being positioned ninety degrees relative to the first extent, the first extent having a threaded end which is adapted to be removably secured within the threaded aperture of the upper triangular wall.



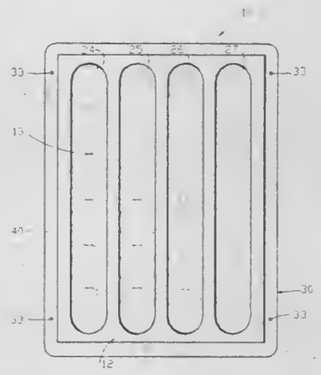
**5,740,943**
**STERILE BIASED COT AND EXAMINATION GLOVE DISPENSERS**
**Jack W. Shields, 1950 Las Tunas Rd., Santa Barbara, Calif. 93103, and W. Mark Shields, 1735 Clearview Rd., Santa Barbara, Calif. 93101**
**Filed Mar. 5, 1997, Ser. No. 812,963**
**Int. Cl.[6] B65H** *1/00*
**U.S. Cl. 221—33** **4 Claims**




2. Sterile dispensers for sterile finger cots, said sterile dispensers comprising sealed sterile envelopes whose manual opening across both sides of one end exposes only proximal apices of biased bases of said sterile finger cots for grasping by fingers of the hand opposite to the hand having said chosen finger, such that distal parts for covering the phalanges of said chosen finger are not touched by any finger or any external part of said sealed sterile envelopes during withdrawal of said sterile finger cots from said sterile dispensers.

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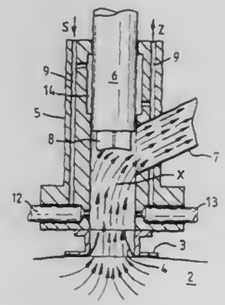
**5,740,944**
**SOCK STORAGE AND DISPENSER**
**Arthur D. Crawford, 12 Rockford Pl., Rome, Ga. 30165-1728**
**Filed Apr. 1, 1996, Ser. No. 625,817**
**Int. Cl.[6] B65G** *59/00*
**U.S. Cl. 221—134** **5 Claims**




1. An apparatus for storing and dispensing pairs of rolled socks, comprising a structure having a base and a front wall, the structure defining at least one elongated channel which terminates at the base; the front wall defining an elongated slot of fixed dimensions through which any pair of rolled socks stored in the channel can be viewed; the channel, in transverse cross-section, being sized to accommodate only a single pair of rolled socks; the slot being substantially narrower in transverse width than the channel, the slot being both sufficiently narrow to retain pairs of socks within the channel and sufficiently wide to allow immediate access to any individual pair of socks stored within the channel regardless of whether any other pair of socks stored therewithin separates said pair from the base, so that said individual pair of socks, when slightly compressed, can be readily removed from the channel.

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**5,740,945**
**METHOD AND APPARATUS FOR STERILE DISPENSING OF PRODUCT**
**Malcolm Shipway, Bristol, United Kingdom, assignor to David S. Smith Packaging Limited, United Kingdom**
**PCT No. PCT/GB94/00398, § 371 Date Feb. 1, 1996, § 102(e) Date Feb. 1, 1996, PCT Pub. No. WO94/20406, PCT Pub. Date Sep. 15, 1994**
**PCT Filed Mar. 1, 1994, Ser. No. 513,936**
**Claims priority, application United Kingdom, Mar. 1, 1993, 9304052**
**Int. Cl.[6] G01F** *11/00*
**U.S. Cl. 222—1** **8 Claims**




1. A method for sterile dispensing of product from an aseptic source thereof, comprising the steps of providing a valve device having a reciprocable valve member and being adapted for mounting on an outlet of the source, mounting the valve device at the outlet, providing sterilizing medium, and sterilizing the outlet and valve member with the medium prior to dispensing product including the step of providing a sterilizing chamber between the valve member and valve device and continuously sterilizing part of the valve member in the chamber whilst product delivery occurs to create an aseptic barrier between the product and the environment.

8. Apparatus for sterile dispensing of product from an aseptic source thereof, comprising a valve and a source of sterilizing medium, the arrangement being that the valve, a mounting thereof by which it is adapted to cooperate with the source, and an outlet from the source, are sterilized by the sterilizing medium when the valve and source are mounted one with the other wherein the apparatus includes a sterilizing chamber in the valve disposed to allow continuous sterilization of a part of a valve member whilst product delivery takes place.

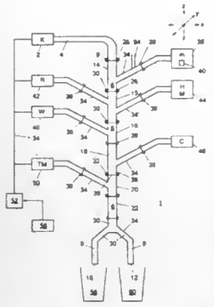
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**5,740,946**
**MODULAR COMPOSED MACHINE FOR DISPENSING HOT BEVERAGES SUITABLE FOR CONSUMPTION**
**Siwart Gerhardus Swier, Baarn, and Petrus Josephus Carolus Piscaer, Rotterdam, both of Netherlands, assignors to Sara Lee/DE N.V., Utrecht, Netherlands**
**Filed Feb. 13, 1996, Ser. No. 596,869**
**Claims priority, application Netherlands, Feb. 13, 1995, 9500291**
**Int. Cl.[6] B67D** *5/56*
**U.S. Cl. 222—129.1** **17 Claims**

1. A machine for dispensing hot beverages suitable for consumption, comprising at least one beverage-dispensing device for dispensing a hot base beverage such as coffee, tea and chocolate, and at least one additive-dispensing device for dispensing an additive to be optionally added to the hot base beverage, such as for instance milk, cream and alcoholic beverages, the machine further

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comprising a main discharge channel having an inlet and at least one outlet for dispensing the hot beverage into at least one container, the inlet being connected to the beverage-dispensing device and the main discharge channel forming an outflow path for the base beverage from the beverage-dispensing device to the outlet, characterized in that the main discharge channel is composed of a number of series-connected modules which each comprise a subchannel having a main inlet and a main outlet, the main outlet of the first module of a first and a second series-connected module being connected to the main inlet of the second module in a liquid-tight manner, and the subchannels of the series-connected modules forming the main discharge channel, whilst further at least one module is designed as an additive module provided with a side channel which opens into the subchannel of the additive module and has an ancillary inlet connected to an additive-dispensing device.

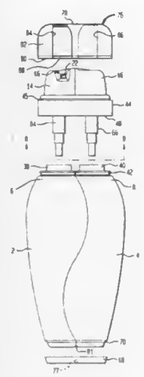
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**5,740,947**

**DUAL COMPARTMENT PUMP DISPENSER**

**Raymond Michael Flaig; James Lynn Turbett, both of Stamford, and Peter Bertolini, Shelton, all of Conn., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.**

**Filed May 13, 1996, Ser. No. 645,395**
**Int. Cl.[6] B67D** *5/52*
**U.S. Cl. 222—135** **23 Claims**



1. A dual compartment pump dispenser comprising:
(i) a first container having a top and a bottom end, the top end having an opening and the bottom end being closed;
(ii) a second container having a top and a bottom end, the top end having an opening and the bottom end being closed; and
(iii) a pair of pump means each with a dispensing nozzle having an opening for emptying product from the respective containers positioned on the top end of each container, the dispensing nozzle openings being oriented at an angle from 60° to 180° apart from one another, the first and second containers having respective complementary shaped first and second curvilinear surfaces fitted together extending from the respective top to bottom ends, and the first curvilinear surface including a trough-shaped elongated recess and an adjacent elongated ridge each bisected by a common plane.

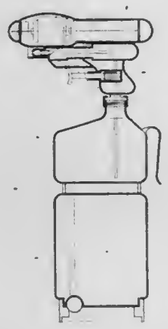
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**5,740,948**

**MULTI-FUNCTIONAL COMPOUND INTEGRATED BOTTLE**

**Wei-Yieh Chu, 2347 Westbrook Ct., Claremont, Calif. 91711, and Chih-Kwei Nii, 1143 Calle Ortega, San Dimas, Calif. 91773**

**Filed Feb. 3, 1997, Ser. No. 792,372**
**Int. Cl.[6] B67D** *5/06*
**U.S. Cl. 222—175** **20 Claims**



1. A multi-functional compound integrated bottle, comprising an integrated bottle body, a spray device, and a driver, in which,
said integrated bottle body comprises a first bottle body and a second bottle body connected on top of said first bottle body, an opening being formed at a bottom portion of said first bottle body, in which said opening is sealed by a lid cover, said second bottle body further comprising a small opening with a protrusion thread disposed at a top portion of said second bottle body;
said spray device comprising a receiving threaded head at a bottom portion thereof for connecting to said protrusion thread of said small opening of said second bottle body, a dip tube extended into said second bottle body for sucking purpose, a spray pipe installed thereon for prodding a path for spreading out water stored in said second bottle body through said dip tube, a trigger mounted thereon for releasing water out through said spray pipe, a spray nozzle connected on a head end of said spray pipe for spraying out water therethrough, and a connecting groove indentedly provided at a top portion of said spray device for connecting with said driver;
said driver comprising a click-on plug integrally extended downwardly and rearwardly from a bottom side of said driver for inserting into said connecting groove of said spray device so as to combine said driver and said spray device into a one body structure, a driving device which is centrally installed inside said driver comprising an output axle extended out of a front end of said driver, an eccentric wheel disposed on said output axle, a motor connected with said output axle for driving it to rotate, a battery connected with said motor for providing power source, and a fan head connected to a front end of said outlet axle.



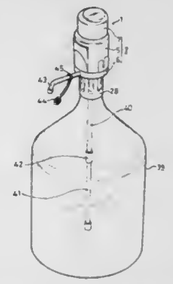
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**5,740,949**

**AIR PUMP FOR NATURAL MINERAL WATER BARREL**

**Kyoung-Seo Park, Lucky Apt. 1-602, 1257, Kuro6-dong, Kuro-ku, Seoul, Rep. of Korea**

**Filed May 20, 1996, Ser. No. 650,572**
**Int. Cl.[6] B65D** *37/00*
**U.S. Cl. 222—209** **17 Claims**



1. An air pump for a natural mineral water barrel comprising:
a cover member comprising an upper cover including a through-hole whose radius center is eccentrically positioned from a radius center of a cylindrical body, an annular flange being extended downward on the inner periphery of said through-hole, a guide piece being formed lengthwise from said upper cover on one side of the inner periphery thereof, and fixed protrusions being formed at a predetermined interval along the circumference of said upper cover in the lower portion thereof, a lower cover including fixed holes formed in the outer periphery of the upper portion thereof so as to correspond to the fixed protrusion, a circular boss projected downward from the lower center of the lower cover by a predetermined distance, an air injecting pipe having threaded portions with a predetermined length, respectively, in the upper and lower of the outer periphery thereof and projected from the lower center of the circular boss, and a drain pipe formed within the air injecting pipe at a predetermined interval from the inner periphery of the air injecting pipe and passed through and extended from a side wall of the outer periphery of the lower cover, a head having a circular shaped flange formed in the lower outer periphery thereof and formed eccentrically from the center thereof, said head being inside of an upper cover so as to be inserted into or projected from the inside of the upper cover;
a bellows including an upper boss disposed to the upper center portion thereof which is provided with a pressure spring and a lower boss disposed to the lower center portion thereof, the upper and lower bosses corresponding to a mounting groove of an operation plate having a suction valve and a mounting groove formed in the center portion of the lower cover, respectively; and
a sealing means including a packing tube inserted through the outer periphery of the air injecting pipe, said air injecting pipe being joined with a seperation preventing cap at a lower portion thereof, and a pressing means for pressing the packing tube so as to be expanded radially, whereby the packing tube makes a tight contact with a periphery of a neck of the barrel for sealing the barrel from outside.

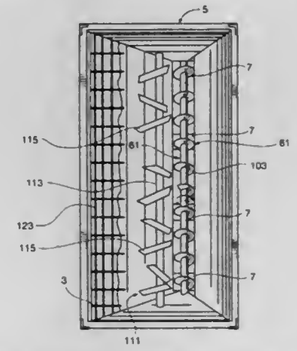
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**5,740,950**

**APPARATUS AND AGITATOR FOR DISPENSING FLUENT MATERIAL INTO CONTAINERS**

**Estacia Kanzler; James J. Kanzler, both of Round Lake, and Jack D. Eiler, Ingleside, all of Ill., assignors to The Sandbagger Corporation, Round Lake, Ill.**

**Filed Jan. 11, 1996, Ser. No. 585,219**
**Int. Cl.[6] G01F** *11/20*
**U.S. Cl. 222—238** **20 Claims**



18. A fluent material dispensing apparatus for filing containers with fluent material comprising:
(a) a hopper, having a top and bottom, for receiving and holding fluent material, the hopper's top being open and the hopper converging downwardly in a "V" shape towards the hopper's bottom, wherein multiple discharge openings are located at the hopper's bottom.
(b) a safety grid over the top opening to prohibit the entry of large objects into the hopper;
(c) multiple discharge chutes having top and bottom ends for dispensing fluent material, the top end of the discharge chutes being formed around each of the discharge openings;
(d) a support frame for supporting the hopper, the support frame comprising base members, a plurality of vertical legs extending between the hopper and the base members, diagonal struts extending between the vertical legs, the hopper and base members, and a table located below the hopper connected to the plurality of base members;
(e) swing gate means pivotally mounted to each discharge chute, the wing gate means being movable from an open to closed position over the bottom of the discharge chute for selectively covering the discharge chute to control the discharge of fluent material from the hopper;
(f) a swing gate arm fixed to the swing gate means;
(g) a swing gate actuating means for selectively moving the swing gate means between an open and a closed position; wherein the swing gate means includes a foot pedal mounted to one end of a lever arm having two ends, the lever arm being pivotally mounted to a pivot point, a linkage rod having two opposing ends pivotally connected at the end of the level arm opposite the foot pedal, the other end of the linkage rod being pivotally connected to the swing-gate arm, whereby when the foot pedal is depressed, the lever arm pushes the linkage rod, which in turn upwardly pushes the swing gate arm, which in turn pivots the swing gate means to selectively uncover the discharge chute;
(h) a spring means for quickly returning the foot pedal to resting position upon release of the foot pedal;
(i) rotatable auger means mounted in the hopper on auger bearings for moving fluent material over the discharge openings, the auger extending transversely within the length of the hopper;
(j) rotatable agitator means mounted transversely on agitator bearings in the hopper for moving a steady flow of material to the auger means, the agitator means extending transversely within the length of the hopper and parallel to and relatively above the auger means;

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(k) agitator and auger power means for rotating the auger means and agitator means within the hopper to move the fluent material over the discharge openings and to unblock any clogged discharge opening, the agitator and auger power means including a small-bore engine power source which is adapted to be connected to a hydraulic pump drive unit means for transmitting power from the power source to a hydraulic power system, wherein the hydraulic power system is adapted to be connected to a sprocket system means for rotating the auger and agitator;

(l) directional control means for selectively changing the rotational direction of the auger and agitator means and for selectively changing the auger and agitator to a non-rotational state; and

(m) pressure control means for limiting the pressure within the hydraulic power system.

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**5,740,951**

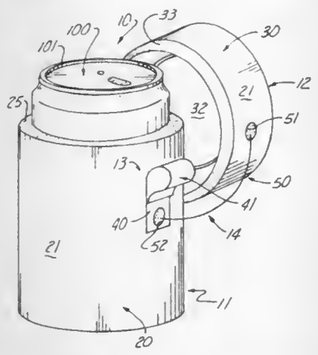
**INSULATED BELT ATTACHED BEVERAGE CAN HOLDER**

**Jeanette Jack, 56765 Scheuer Rd., Chesterfield, Mich. 48051**

**Filed Apr. 3, 1997, Ser. No. 826,579**

**Int. Cl.[6] A45F** *5/00*

**U.S. Cl. 224—148.3** **6 Claims**




1. An insulated belt attached beverage can holder for use with a user's belt to support a conventional beverage can wherein the beverage can holder comprises:

a receptacle member dimensioned to receive the lower portion of the conventional beverage can;

a receptacle lid member dimensioned to receive the upper portion of the beverage can;

first means associated with the receptacle member for captively engaging the user's belt; and

second means associated with the receptacle member and the receptacle lid member for captively engaging the user's belt in conjunction with the first means.

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**5,740,952**

**CONNECTOR FOR BINOCULAR STRAP**

**Claus O. Huckenbeck, Tehachapi, Calif., assignor to Bushnell Corporation, Overland Park, Kans.**

**Filed Jan. 11, 1996, Ser. No. 584,132**

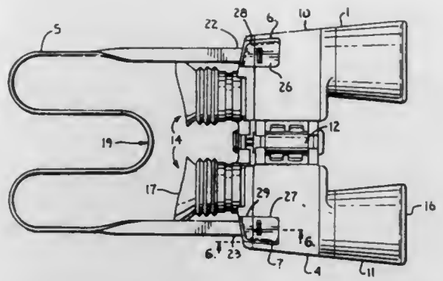
**Int. Cl.[6] A45F** *5/00;3/14;* **G02B** *23/18*

**U.S. Cl. 224—271** **2 Claims**

1. In binoculars having a binoculars body, a neck strap and first and second connectors for joining the strap to the body, the improvement comprising:

a) each of the connectors having a first portion removable joinable with a second portion thereof;

b) each of said connector first portions being fixedly joined to opposite respective ends of said strap;




c) each of said connector second portions being fixedly joined to opposite sides of said body;

d) structural members mounted on said binocular body allowing each of said connector first portions to be joined only with a respective one of said connector second portions and physically preventing each of said connector first portions from being joined to an opposite connector second portion;

e) each of said connector first portions includes an upper segment and a lower segment;

f) said upper segments being molded about a respective end of said strap and said lower segment including a male bayonet member;

g) each of said connector second portions including a female receptacle for slideably receiving said bayonet member;

h) each of said first connector upper segments includes an inner and an outer side wall extending sideways outward relative to a respective bayonet member; said outer side walls being wider then said inner side walls;

i) said binoculars body and said receptacles being sized and shaped so as to cooperate with said side walls and operably function as said structural members to allow each of said connector first portions to be received in only one of said connector second portions.

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**5,740,953**

**METHOD AND APPARATUS FOR CLEAVING SEMICONDUCTOR WAFERS**

**Colin Smith; Kalman Kaufman; Isaac Mazor; Elik Chen, and Dan Vilenski, all of Haifa, Israel, assignors to Sela Semiconductor Engineering Laboratories, Israel**

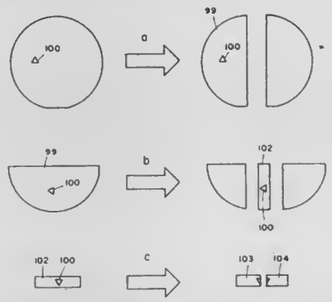
**PCT No. PCT/EP92/01867, § 371 Date May 17, 1994, § 102(e) Date May 17, 1994, PCT Pub. No. WO93/04497, PCT Pub. Date Mar. 4, 1993**

**PCT Filed Aug. 14, 1992, Ser. No. 193,188**

**Claims priority, application Israel, Aug. 14, 1991, 99191; Jul. 22, 1992, 102595**

**Int. Cl.[6] B26F** *3/00*

**U.S. Cl. 225—2** **10 Claims**




1. A method of cleaving a relatively thin article for inspecting a target feature on a large-area workface thereof circumscribed by small-area lateral faces defining the thickness of the article, comprising the steps:



(a) producing an indentation in a first small-area lateral face of the article on one side of the target feature;

(b) and inducing, in a second, small area lateral face of the article, on an opposite side thereof with respect to the target feature, a shock wave in alignment with said target feature and said indentation on the first lateral face, to split the article along a cleavage plane coinciding with said target feature and said indentation.

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**5,740,954**

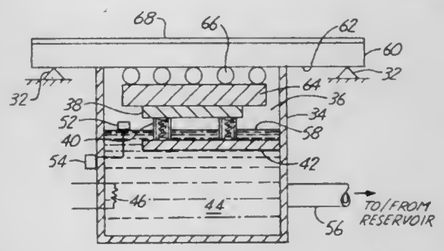
**APPARATUS FOR ATTACHING/DETACHING A LAND GRID ARRAY COMPONENT TO A CIRCUIT BOARD**

**Deepak Keshav Pai, Burnsville, Minn., and Allen Lee Bringewatt, Grantsburg, Wis., assignors to General Dynamics Information Systems, Inc., Falls Church, Va.**

**Filed Aug. 19, 1996, Ser. No. 699,570**

**Int. Cl.[6] H05K** *3/34;* **B23K** *3/00*

**U.S. Cl. 228—40** **6 Claims**




1. A system for detaching a component from a first surface of a circuit board, the component being surface mounted to the first surface by solid conductive connections that establish electrical conduction between the component and the circuit board and provides mechanical support for the component on the circuit board, the circuit board having a second surface, opposite the first surface, supporting printed wires, the solid conductive connections having a predetermined melting temperature, the system comprising:

a chamber for containing an inert liquid, the liquid having a level that is adjustable within the chamber;

a first mount for supporting a circuit board so that a component attached to the circuit board is below the circuit board and in the chamber;

a resilient mount at least partially in the chamber and at least partially below the component for supporting the component after it is detached from the circuit board and biasing the component against the circuit board;

a heater for heating inert liquid in the chamber to above the predetermined melting temperature; and

fluid level adjustment means for adjusting the level of inert liquid in the chamber between a first level below the component wherein the component is free of the inert liquid and a second level above the component wherein the component is immersed in the inert liquid,

so that solid conductive connections between the component and the circuit board may be uniformly melted by raising the level of the inert liquid in the chamber from its first level to its second level to immerse the component and the conductive connections in the inert liquid and the circuit board may be detached from the first mount leaving the component supported by the resilient mount.

**5,740,955**

**PROCESS FOR THE MANUFACTURE OF A STRUCTURAL ELEMENT CAPABLE OF CARRYING HIGH THERMAL LOADS**

**Günter Kneringer, Reutte; Florian Rainer, Lechaschau, and Laurenz Plochl, Breitenwang, all of Austria, assignors to Schwarzkopf Technologies Corporation, New York, N.Y.**

**Filed Apr. 15, 1996, Ser. No. 632,658**

**Claims priority, application Austria, May 2, 1995, 742/95**

**Int. Cl.[6] B23K** *35/00*

**U.S. Cl. 228—122.1** **9 Claims**

1. A process for manufacturing a structural element capable of carrying high thermal loads, wherein one or more components of high heat-resistant material comprising carbon fiber-reinforced graphite are joined with at least one metallic component, comprising the steps of:

coating the components of high heat-resistant material with a metallic, ductile intermediate layer on the surface to be joined; and

joining said one or more components of high heat-resistant material to said at least one metallic component by high-energy electron beam welding.

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**5,740,956**

**BONDING METHOD FOR SEMICONDUCTOR CHIPS**

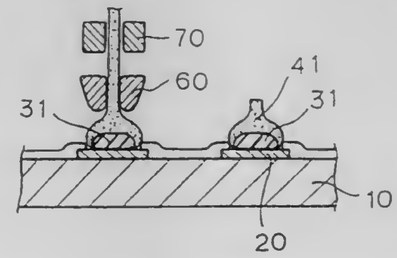
**Seong Min Seo, and Suck Ju Jang, both of Seoul, Rep. of Korea, assignors to Anam Industrial Co., Ltd, Seoul, Rep. of Korea, and Amkor Electronics, Inc., Chandler, Ariz.**

**Filed Dec. 12, 1995, Ser. No. 570,849**

**Claims priority, application Rep. of Korea, Sep. 4, 1995, 95-28772**

**Int. Cl.[6] H01L** *21/60*

**U.S. Cl. 228—180.22** **5 Claims**




1. A bonding method for connecting a semiconductor chip having aluminum bond pads to a substrate having a series of lead fingers comprising:

providing a wire ball bonding device;

forming Au bumps by Au wire ball bonding employing the wire ball bonding device onto the aluminum bond pads of the semiconductor chip;

then coating fully an outer surface of the Au bumps with Sn/Pb alloy bumps in an atmosphere of a gas mixture of $H_2$—Ar or $H_2$—$N_2$, by stacking said Sn/Pb alloy bumps onto said Au bumps by the wire ball bonding device, the resultant Sn/Pb coating having portions adhered to the aluminum bond pads; and

bonding the substrate to the semiconductor chip having said Sn/Pb alloy bumps which coat said Au bumps, said coated Au bumps being oriented face-down on the lead fingers of the substrate.

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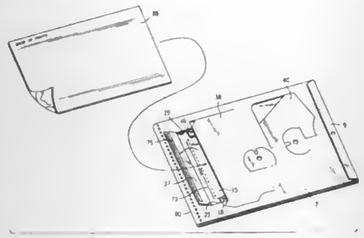


5,740,957

## FRAME AND MAILER FOR PHOTOGRAPHS

Gregory J. Wenkman, 6690 Shamrock Glen Cir., Middleton, Wis. 53562

Filed Aug. 22, 1995, Ser. No. 517,997
Int. Cl.[6] B42D *15/00*
U.S. Cl. 229—92.8 25 Claims



1. A blank sheet of foldable material for use in forming a photograph framing and mailing device, the blank sheet comprising:

a frame panel having two lateral edges and forming an aperture;

a back panel having first and second lateral edges, the first lateral edge of the back panel connected to a lateral edge of the frame panel at a fold line; and

an exterior panel being sized and shaped so as to cover the frame panel when positioned parallel and adjacent thereto, the exterior panel having two lateral edges, the first lateral edge of the exterior panel connected to the second lateral edge of the back panel along a fold line;

whereby, the panels of the blank sheet are juxtaposed such that when the device is assembled by folding the sheet along the fold lines, the panels form a structure within which a photograph is securable so as to be at least partially viewable through said aperture, and the exterior panel is moveable between a covering position adjacent and parallel to the frame panel and a revealing position spaced from the frame panel wherein the frame panel includes upper and lower edges, the blank further includes upper and lower flap panels connected at fold lines to the upper and lower edges of the frame panel respectively, and whereby when the device is assembled by folding the sheet along the fold lines, the upper and lower flap panels and the frame panel form the structure within the photograph is securable.

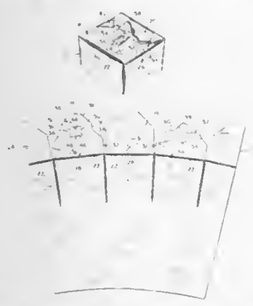
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5,740,958

## BEVERAGE CARTON

Liming Cai, West Chester, Pa., assignor to Dopaco, Inc., Exton, Pa.

Filed Mar. 4, 1997, Ser. No. 808,038
Int. Cl.[6] B65D *5/10;5/42*
U.S. Cl. 229—103.1 4 Claims



1. A carton including a hollow body defining an upwardly opening receptacle, said body having a peripheral upper edge forming a receptacle mouth, closure flaps integral with said upper edge and selectively foldable therefrom to overlie and close said receptacle mouth, said closure flaps including a pair of opposed upper and lower locking flaps, each with an outer edge remote from said upper edge of said body, said upper locking flap including a flange portion transversely across said upper locking flap adjacent the outer edge thereof, an inner locking tongue formed from and foldable from said upper locking flap immediately inward of said flange portion and directed away from said outer edge of said upper locking flap, said lower locking flap including a keeper for selectively receiving said tongue upon a locking of said flaps, said keeper comprising an opening through said lower locking flap having spaced first and second lock edges transverse of said lower locking flap and outward of said upper edge of said body, said first lock edge being closer to said outer edge of said lower locking flap than said second lock edge, said tongue, upon a locking of said flaps, being received through said keeper opening beneath said first lock edge and beneath said lower locking flap between said first lock edge and said outer edge of said lower locking flap, said flange portion and inner tongue being foldable about a fold line transversely of said upper locking flap, said flange portion and said inner tongue being positioned to opposite sides of said fold line wherein said flange portion, when upwardly folded, provides a corresponding downward folding of said inner tongue, a pair of keeper leaves selectively movable between a first position overlying said keeper opening and a second position moved away therefrom upon an insertion of said inner tongue, said keeper leaves being defined from said lower locking flap and inherently biased toward said first position, a second outer tongue integral with said flange portion and extending outward from said outer edge of said upper locking flap, said outer tongue, upon a locking of said flaps, being engaged beneath said second lock edge of said keeper opening, said closure flaps further including a pair of opposed inner support flaps selectively foldable over each other beneath said locking flaps and transversely thereof, one of said inner support flaps having a pair of crossed slits defined therethrough adjacent said body upper edge, said slits defining four flexible tabs adapted to be selectively moved to define an opening for the reception of a drinking straw therethrough, said overlying locking flaps, when locked, exposing said slits and the opening defined thereby.

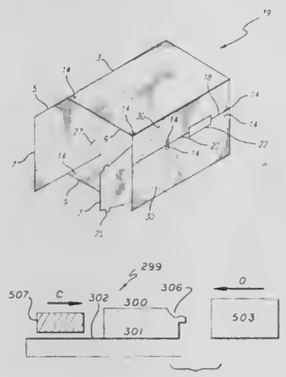
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5,740,959

## PRE-WRAPPED GIFT PACKAGE

Tommy R. Savage, 2871 Via Martens, Anaheim, Calif. 92806

Continuation-in-part of Ser. No. 933,493, Aug. 21, 1992, Pat. No. 5,245,815. This application Mar. 25, 1993, Ser. No. 15,209
Int. Cl.[6] B65D *75/08;77/24*
U.S. Cl. 229—103.3 6 Claims



1. A system for wrapping comprising:

a flattened, pre-wrapped gift box tube shaped to accommodate an article when erected; and

a cantilevered platform having a gift chamber for supporting the article when configured for insertion in the erected box tube, the platform being sized to fit within the box tube when partially erected so that the partially erected box tube may be positioned to surround the article supported by the platform.

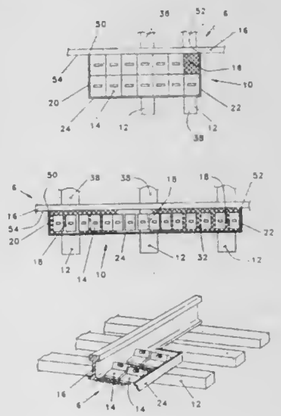


5,740,960

## METHOD AND APPARATUS FOR HANDLING RAILCAR BRAKE SHOES

Eddie Gene Hammett, 324 E. 5th St., Newton, Kans. 67114

Continuation of Ser. No. 359,275, Dec. 16, 1994, Pat. No. 5,531,379. This application Jun. 25, 1996, Ser. No. 670,331
Int. Cl.[6] E01B *26/00*
U.S. Cl. 238—1 9 Claims



5. A method for handling new railway car brake shoes comprising the steps of:

(a) providing a plurality of new railway car brake shoes;

(b) providing a railroad track having a pair of rail members secured to a plurality of railroad tie members;

(c) providing a rack assembly comprising an end wall member secured to a first side wall member and secured to a second side wall member;

(d) securing said rack assembly to at least one of said plurality of railroad tie members such that said end wall member is generally parallel to one of said pair of rail members;

(e) disposing said plurality of new railway car brake shoes in said rack assembly such that said new railway car brake shoes are contained by said first side wall member, said second side wall member, said end wall member, and said one of said pair of rail members.

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5,740,961

## RAILWAY CROSSING INSTALLATION

William E. Bruning, 13826 Pierce St., Omaha, Nebr. 68144

Filed Mar. 8, 1996, Ser. No. 613,213
Int. Cl.[6] E01C *9/04*
U.S. Cl. 238—8 18 Claims

1. A railway crossing installation comprising:

a pair of spaced apart elongated rails each having in transverse section a bottom horizontal flange, a vertically extending bight and a top ball with said ball having an upper surface and lower surface flanking said bight,

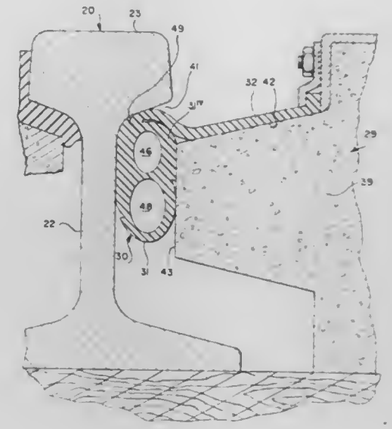
at least one relatively elongated concrete panel with each panel having a top surface generally aligned with said ball upper surface, each panel having elongated sides disposed adjacent said rails and ends disposed in confronting relation to any adjacent panels, said panel side adjacent a rail having an elongated projection spaced below said panel top surface, said projection extending toward said bight and having a vertical side spaced from said bight,

a resilient, elongated extrusion extending along each panel side between said projection side and said rail bight, said extrusion having a body part compressively stressed between a respective ball lower surface and a respective projection side, said body part when unstressed overlying said projection,

said extrusion also having a tail part integral with said body part, said tail part being secured to a respective panel side and said body part overlying said tail part when said body part is unstressed,

said body part being equipped with opening means extending therethrough for at least partial collapse when said body part is compressively stressed, and

said at least partial collapse of said opening means is essentially independent of a railroad wheel passing over said extrusion.



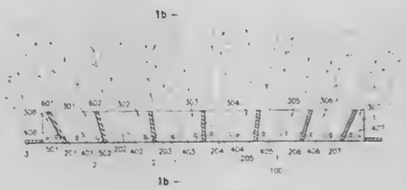
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5,740,962

## EQUIPMENT FOR SPRAYING OF PLANTS WITH A PLANT TREATING LIQUID INJECTED INTO TURBULENT PULSATING AIR STREAMS

Gedalyahu Manor, Haifa, and Amos Geva, Kiryat-Tivon, both of Israel, assignors to Gedalyahu Manor, Haifa, Israel

Filed Dec. 13, 1995, Ser. No. 571,611
Int. Cl.[6] B05B *1/20*
U.S. Cl. 239—77 38 Claims



1. Equipment for spraying plants and trees with a plant treating liquid injected into turbulent pulsating air streams, comprising:

at least one oblong air outlet structure having a plurality of air outlets (**301**, **302**), said outlets being relatively positioned with respect to each other and dimensioned to issue air streams in divergent mutually interacting directions and thereby create whorls, turbulences and pulsations between each adjacent two air streams.

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said air outlet structure having an oblong air inlet opening receiving pressurized air, said air outlets being arranged next to each other and extending outwardly from said air inlet opening,

said air outlets each having a respective axis which has an angle of inclination which differs with respect to the angle of inclination of an adjacent air outlet and thereby issuing the turbulent and pulsating air streams in said divergent directions; and

at least one spray nozzle arranged to inject a plant treating liquid into the turbulent pulsating air streams issued from said air outlet structure.

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**5,740,963**

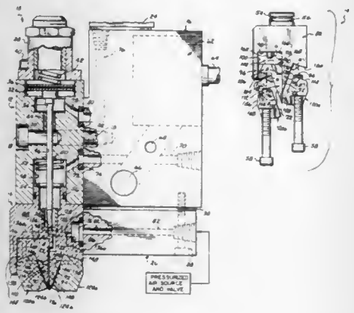
## SELF-SEALING SLOT NOZZLE DIE

**John M. Riney, Suwanee; Roger A. Ziecker, Lawrenceville, and Alan R. Ramspeck, Cumming, all of Ga., assignors to Nordson Corporation, Westlake, Ohio**

**Filed Jan. 7, 1997, Ser. No. 779,790**

**Int. Cl.[6] B05B** *7/16*

**U.S. Cl. 239—299** **20 Claims**



1. A self-sealing die for use with a coating dispenser which includes a coating material supply passage and a plunger movable within the supply passage, comprising:

a first die body having a first tapered projection defined by a substantially vertical inward surface and a tapered outer wall, said first die body further having a die seat disposed adjacent said substantially vertical inward surface;

a second die body having a second tapered projection defined by a substantially vertical inward surface and a tapered outer wall, said second die body being adapted to be slidably received in said die seat thereby to define a coating material outlet between said substantially vertical inward surfaces of said first and second tapered projections, said tapered outer walls respectively partially defining inward surfaces of two air channels disposed at an angle with respect to said coating material outlet; and

two air blocks, each having a tapered inward surface juxtaposed in operative disposition near one of said tapered outer walls of said first and second tapered projections to form one of said air channels therebetween, one of said air blocks being slidably received in said die seat and further being operable to cooperate with said die seat for translating said second tapered projection toward said first tapered projection to seal said first and second die bodies.

**5,740,964**

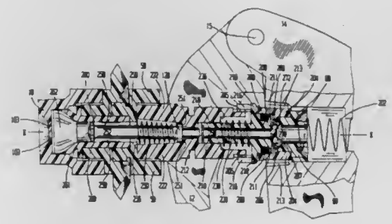
## HAND HELD SPRAY DISPENSER WITH ADJUSTABLE PRESSURE DELIVERY SYSTEM AND ROTATING NOZZLE

**David Crampton, Fountain Valley, Calif., assignor to Par-Way Group, St. Clair, Mo.**

**Continuation-in-part of Ser. No. 440,324, May 12, 1995, Pat. No. 5,667,138, which is a continuation-in-part of Ser. No. 243,366, May 16, 1995, Pat. No. 5,492,275. This application Sep. 14, 1995, Ser. No. 528,444**

**Int. Cl.[6] B05B** *9/043*

**U.S. Cl. 239—333** **12 Claims**



1. A manual pump spray dispenser wherein liquid is brought from a reservoir, pressurized to a predetermined pressure, flows through a delivery passageway and is dispensed to the atmosphere comprising:

a nozzle having a nozzle inlet, nozzle outlet means, and a nozzle center;

said nozzle in fluid communication with said delivery passageway;

pressure adjustment means to adjust said predetermined pressure between a pre-selected range of pressures;

said pressure adjustment means being accessible from the exterior of said manual pump spray dispenser for adjustment of the pressure without disassembly of the spray dispenser.

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**5,740,965**

## ADHESIVE SPRAYER FOR LIVING BODY

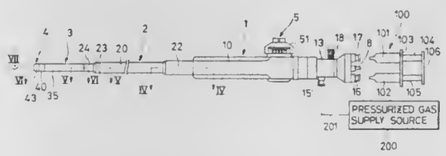
**Kunihiko Miyagi, and Hidetoshi Yoshizawa, both of Tokyo, Japan, assignors to Machida Endoscope Co., Ltd., Tokyo, Japan**

**Filed Apr. 18, 1996, Ser. No. 634,630**

**Claims priority, application Japan, Apr. 18, 1995, 7-115317; Jun. 21, 1995, 7-178265**

**Int. Cl.[6] B05B** *7/06*

**U.S. Cl. 239—423** **9 Claims**




6. An adhesive sprayer for a living body, said adhesive sprayer comprising:

(a) a sprayer body having an adhesive inlet port and a gas inlet port;

(b) a hard insert portion extending from the sprayer body;

(c) a bendable portion extending from a distal end of the hard insert portion; supply of the pressurized gas being formed between an inner peripheral surface of the gas injection port and an outer peripheral surface of the distal end portion of the first tube, an opening of the distal end portion of the first tube being provided as the adhesive discharge port; and

wherein said second passage means has a flexible second tube, a rear end of said second tube being continuous with said gas inlet port, a distal end of said second tube being connected to said nozzle portion and continuous with said gas injection port, said first tube being inserted into and extending through the interior of said second tube.



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**5,740,966**

## NEBULIZER NOZZLE

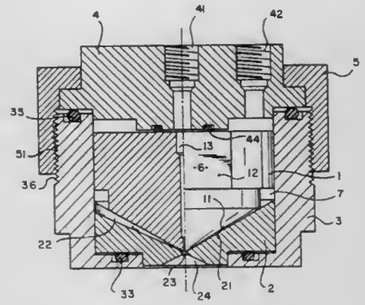
**Ales Blaha-Schnabel, Nürnberg, Germany, assignor to Paul Ritzau Pari-Werk GmbH, Starnberg, Germany**

**Continuation of Ser. No. 358,888, Dec. 19, 1994, abandoned. This application Dec. 6, 1996, Ser. No. 760,911**

**Claims priority, application European Pat. Off., Dec. 17, 1993, 93120417**

**Int. Cl.[6] B05B** *7/04*

**U.S. Cl. 239—424.5** **15 Claims**



1. A nebulizer for inhalation therapy, comprising:

a housing;

a nebulizer nozzle body in the housing for nebulizing a material to be nebulized for inhalation therapy, the housing being adapted to supply the material to be nebulized and compressed gas to the nozzle body, the nozzle body comprising:

a nozzle insert member having a contact surface and a passage for supply of material to be nebulized extending in a longitudinal direction through the nozzle insert member, the passage having an outlet disposed in the center of the contact surface; and

a nozzle receiving member for receiving the nozzle insert member, having a receiving surface that is complementary to the contact surface of the nozzle insert member, the contact surface engaging the receiving surface, the receiving surface being interrupted by a plurality of radially-extending grooves, the grooves being closed by the corresponding portions of the contact surface to form compressed gas supply channels for supplying gas to nebulize the material to be nebulized, a circular cylindrical mixing chamber having a mouth being disposed at the center of the receiving surface and extending through the nozzle receiving member, with the supply channels and the passage outlet opening into the mixing chamber,

wherein the sum of the minimum cross sectional areas of the supply channels is approximately equal to the cross sectional area of the mouth of the mixing chamber.

**5,740,967**

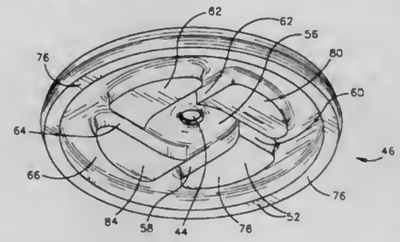
## SPRAY NOZZLE AND METHOD OF MANUFACTURING SAME

**Harold C. Simmons, Ellenton, Fla., and Rex J. Harvey, Mayfield Heights, Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio**

**Continuation of Ser. No. 494,740, Jun. 16, 1995, which is a division of Ser. No. 129,834, Sep. 30, 1993, Pat. No. 5,435,884. This application May 1, 1997, Ser. No. 848,791**

**Int. Cl.[6] B05B** *1/34*

**U.S. Cl. 239—494** **47 Claims**



1. An atomizing spray nozzle, comprising:

a metal disk member having a first side and a second side;

said first side of said disk member having a bowl-shaped swirl chamber therein shaped by etching with smooth, rounded, generally vertical side walls and a smooth, generally horizontal end wall, with a smooth and continuously-curving concave surface extending between and interconnecting the side walls and end wall such that liquid to be sprayed from said nozzle can move therein in a vortex motion toward the center of the swirl chamber;

a spray orifice in fluid communication with the center of the swirl chamber and extending substantially co-axial therewith such that liquid to be sprayed from the nozzle can move from the swirl chamber to said spray orifice and then exit the spray orifice in an active thin film, and

at least one feed slot shaped by etching in fluid communication with the swirl chamber, said at least one feed slot having smooth, rounded trough-shaped walls extending in non-radial relation to said swirl chamber and having a smooth, continuous junction between said trough-shaped walls of said at least one feed slot and said side walls and end wall of said swirl chamber for supplying liquid to be sprayed through said nozzle.

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**5,740,968**

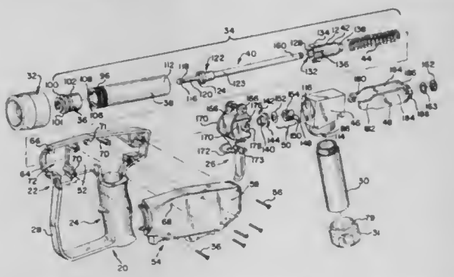
## INDUSTRIAL WASHDOWN GUN

**Theodore H. Mueller, 128 Turkey Run Rd., Cary, Ill. 60013**

**Filed Apr. 26, 1996, Ser. No. 638,357**

**Int. Cl.[6] B05B** *9/01*

**U.S. Cl. 239—526** **10 Claims**



1. A high pressure industrial washdown gun for applying water to an area to be washed, said gun comprising, in combination, a body having a hand grip portion, a trigger, a flow control valving

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system, and a conduit for directing water from a supply line to the interior of said gun body, said valving system comprising, in combination, a water impermeable containment sleeve, a connector having its outlet end affixed in water-tight relation to the rear end of said containment sleeve and its inlet end affixed to said conduit in water-tight relation, a nozzle assembly secured to the forward end of said containment sleeve, said nozzle assembly including a body portion having a central water flow passage extending therethrough, a tapered annular seat surrounding said flow passage and forming an entry to said water flow passage, and a seal providing a liquid-tight connection between said containment sleeve and said nozzle, a valving rod disposed in part within said containment sleeve, said valving rod including a nose portion adapted to cooperate with portions of said flow passage to form a desired flow pattern, an enlarged diameter head having a frustoconical, annular sealing surface cooperating in use with said nozzle seat to form a flow control valve, a portion for receiving and positioning a valving rod guide, and an elongated stem including an end portion extending through an opening in a portion of said connector, said valving rod guide having one portion surrounding said guide receiving portion of said valve stem and other, circumferentially spaced apart portions received in slidable contact within said containment sleeve and arranged so as to provide plural spaced apart axial flow water passages lying between said valve stem and said containment sleeve, a return spring biasing said valving rod toward a closed position thereof and a valving rod actuator forming an operative connection between a portion of said trigger and a portion of said valving rod, whereby moving said trigger causes said valving rod to move from a closed position wherein said head sealing surface and said nozzle seat are engaged, to an open position allowing water flow through said nozzle flow passage and to a tangent area.

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**5,740,969**

## PIEZO-CONTROL VALVE FOR FUEL INJECTION SYSTEMS OF INTERNAL COMBUSTION ENGINES

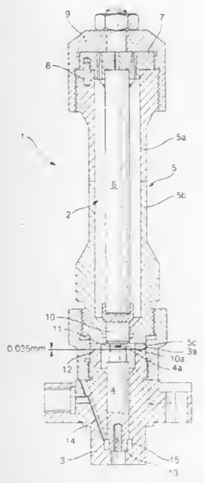
**Karl-Heinz Hoffmann, Stuttgart; Paul Schwerdt, Freudenstadt, and Gerd Huber, München, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany**

**Filed Oct. 9, 1996, Ser. No. 728,342**

**Claims priority, application Germany, Oct. 18, 1995, 195 38 791.0**

**Int. Cl.[6] F02M** *61/04*

**U.S. Cl. 239—533.2** **6 Claims**



1. A piezo control valve for fuel injection systems of internal combustion engines comprising:

a valve housing including a piezo-ceramic actuating rod having one end firmly mounted to one end of said valve housing, a nozzle body with a valve seat disposed at the other end of said valve housing, and a nozzle control needle which is disposed at the opposite end of said piezo-ceramic actuating rod and is normally seated on said valve seat and which, upon activation of said piezo-ceramic actuating rod, is lifted, by contraction of said piezo-ceramic actuating rod, from said valve seat to open said control valve, said valve housing surrounding said piezo-ceramic actuating rod including a sleeve-like portion consisting of a material compensating for any temperature-caused changes in length of the piezo-ceramic actuating rod.

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**5,740,970**

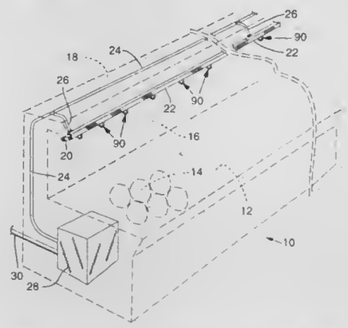
## MISTING SYSTEM

**Tim L. Edwards, Wilsonville, Oreg., assignor to Mistech, Inc., Wilsonville, Oreg.**

**Filed Nov. 27, 1996, Ser. No. 756,139**

**Int. Cl.[6] B05B** *1/14*

**U.S. Cl. 239—551** **4 Claims**



1. A misting assembly for controlled moisturization of a designated area comprising;

a water line;

mounting members mounting the water line in a spaced overhead position relative to a designated area to be moisturized;

a water source providing a water supply under a determined water pressure to said water line;

a water source control for controlling the on/off flow of water to the water line; and

mist tips installed directly into said water line at spaced intervals along said water line, said mist tips having an orifice that determines the direction of spray from said water line onto the designated area; and

said mounting of the water line containing said mist tips, said water pressure, and said water source control and said mist tips all cooperatively designed and arranged to produce a fine cloud like mist directed to a targeted portion of said designated area over an interval of time causing a spreading action of the spray as the spray settles onto the designated area to be turned off precisely as the designated area is covered by said cloud like mist.

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**5,740,971**

## APPARATUS FOR RECYCLING SYNTHETIC LEATHER

**Wu-Heng Hsu, P.O. Box 82-144, Taipei, Taiwan**

**Filed Nov. 17, 1995, Ser. No. 560,548**

**Int. Cl.[6] B02C** *19/12;23/08*

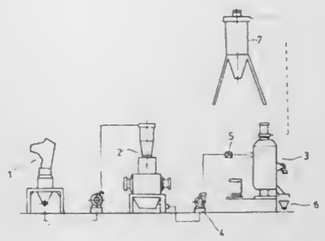
**U.S. Cl. 241—56** **1 Claim**

1. An apparatus for recycling synthetic leather comprising:

a coarse crushing device;

a fine crushing device connected with said coarse crushing device;





a separator including an upper housing and a lower housing fixedly connected with a lower end of said upper housing;

a motor arranged under said separator and having an axle extending upwardly into the lower housing of said separator;

a collar enclosing an intermediate portion of said axle within said lower housing, said collar being provided with a plurality of rods connected with an inner wall of said lower housing;

a first stirrer mounted above said collar within said lower housing;

a second stirrer mounted under said collar within said lower housing;

a first impeller mounted above said first stirrer;

a second impeller mounted under said second stirrer;

a blower connected with said fine crushing device at an end; and

a static processor connected between said separator and said blower.

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**5,740,972**

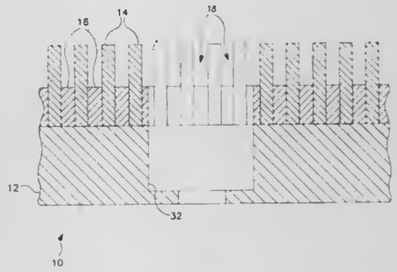
## PAPERMAKING REFINER PLATES

**John B. Matthew, 21 E. Rocks Rd., Norwalk, Conn. 06851**

**Filed Apr. 15, 1996, Ser. No. 632,215**

**Int. Cl.[6] B02C** *7/12*

**U.S. Cl. 241—298** **12 Claims**



1. A refiner filling comprising a supporting plate, a pattern of blades and spacers affixed to the supporting plate, the blades and spacers defining a working surface of the refiner filling including intervening grooves between the blades, the blades and spacers being fabricated of metallic materials having different corrosion resistance, with the spacer metallic material being less noble, according to the Electromotive-Force Series of Metals, than the material used for the blade so that the spacer will pit and corrode harmlessly in use, while the blade wear is greatly reduced.

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**5,740,973**

## METHOD AND APPARATUS FOR CROSS-WINDING A WINDING MATERIAL ON A BOBBIN

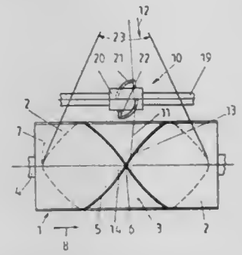
**Winfried Pöppinghaus, Bad Sooden-Allendorf, Germany, assignor to Georg Sahm GmbH & Co. KG, Eschwege, Germany**

**Filed Jul. 5, 1996, Ser. No. 675,794**

**Claims priority, application Germany, Jul. 6, 1995, 195 24 663.2**

**Int. Cl.[6] B65H** *59/00;54/28*

**U.S. Cl. 242—43.2** **15 Claims**



1. Winding apparatus for cross-winding a winding material on a bobbin, the winding apparatus comprising:

a winding drum composed of first and second end pieces and a central piece positioned between said end pieces, said end pieces and said central piece each having a thin outer wall which forms the periphery of said winding drum, said walls being arranged to form a bottomless continuous helical slit along the periphery of said winding drum, said continuous helical slit providing access to the interior of said winding drum and configured in the shape of a figure eight which extends along a longitudinal extent of said winding drum periphery such that said continuous helical slit crosses itself at a crossing point on said winding drum;

a drum shaft, said end pieces and said central piece being fixedly mounted to said drum shaft such that said winding drum can rotate with said drum shaft; and

a crossover guide positioned adjacent said winding drum periphery, said crossover guide having a guide shaft and a cylindrical sleeve mounted on said guide shaft opposite said central piece of said winding drum, said crossover guide further including at least one bow mounted on said cylindrical sleeve for urging the winding material along said continuous helical slit at said crossing point;

wherein the winding material is fed through said continuous helical slit to the bobbin as said winding drum and said crossover guide rotate on said drum shaft and said guide shaft respectively, said crossover guide maintaining the direction of travel of the winding material along the continuous helical slit at said crossing point.

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**5,740,974**

## YARN FEEDING DEVICE FOR A TEXTILE MACHINE, ESPECIALLY A KNITTING MACHINE

**Fritz Conzelmann, Albstadt, Germany, assignor to SIPRA Patententwicklungs-u. Beteilungsgesellschaft mbH, Albstadt, Germany**

**Continuation of Ser. No. 230,703, Apr. 21, 1994, abandoned. This application Nov. 18, 1996, Ser. No. 751,871**

**Claims priority, application Sweden, Apr. 21, 1993, 9301315**

**Int. Cl.[6] B65H** *51/00*

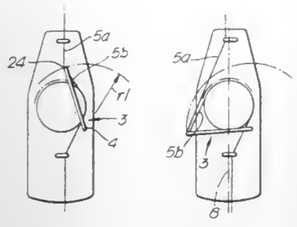
**U.S. Cl. 242—47.01** **14 Claims**

1. A yarn feeding device for a yarn-consuming textile machine, said yarn feeding device comprising:

a rotary yarn feeding element (**1.83**) for carrying a main yarn reserve (**84**) and for positively feeding yarn (**79**);

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motor means (**82**) for rotating said yarn feeding element (**1**,**83**) during yarn feeding intervals said yarn feeding element normally delivers said yarn at at a motor rotation speed according to a predetermined variable yarn consuming speed of said textile machine:

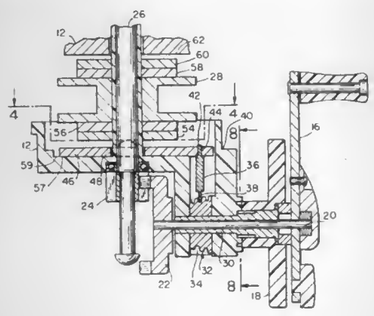
yarn reserve means (**3**,**78**; **20**, **77**) for building up or reducing an auxiliary yarn reserve comprising a portion of said yarn between said textile machine and said main yarn reserve when changes of said yarn consuming speed occur that are so rapid that said motor means (**82**) cannot accordingly accelerate or decelerate said yarn feeding element (**1**,**83**) to deliver said yarn at said yarn consuming speed because of an inertia of said motor means and said yarn feeding element;

means (**51**,**57**,**75**) for controlling said motor means (**82**) when said changes of said yarn consuming speed occur according to predetermined yarn consuming speed information regarding timings of said changes and amounts of said yarn consumed by said textile machine before and after each of said changes so that said yarn feeding element (**1**,**83**) is accordingly accelerated or decelerated to increase or decrease said motor rotation speed and hence a speed at which said yarn is delivered from said yarn feeding element; and

means for controlling said yarn reserve means (**3**,**78**; **20**,**77**) to decrease or increase said portion of said yarn in said auxiliary yarn reserve so that also during accelerating or decelerating of said yarn feeding element said yarn is fed to said textile machine substantially at said predetermined variable yarn consuming speed in spite of said inertia of said motor means and said yarn feeding element.

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**5,740,975**
**FISHING REEL DRAG MECHANISM**
**Won Hang Cho, Seoul, Rep. of Korea, assignor to Johnson Worldwide Associates, Inc., Sturtevant, Wis.**
**Filed Jan. 13, 1997, Ser. No. 782,954**
**Int. Cl.[6] A01K** *89/027*
**U.S. Cl. 242—244** **20 Claims**




**1**. A drag mechanism for a spin casting reel, having a frame upon which is supported a spool for rotation, comprising,

a rotatable cam having an axially extending spiral groove formed therein, a radial depth of said groove changing from one end of said groove to the other,

a manually rotatable member supported on the frame for rotating said rotatable cam,

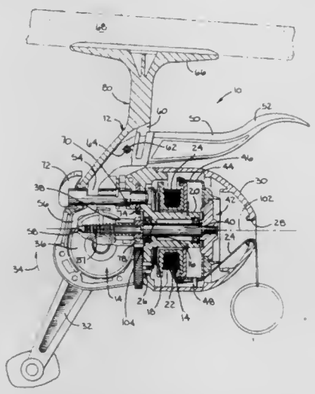
a cam follower, having first and second ends, said first end of said cam follower resting in said groove, said second end of said cam follower projecting radially away from said rotatable cam,

at least one braking element supported on the frame, coaxial with the spool, for applying a braking force to the spool when a braking force is applied thereto, and

a lever arm having first and second ends, said first end of said lever arm pivotally supported on the frame, said second end of said lever arm engaged by said second end of said cam follower, whereby when said manually rotatable member is rotated in a direction to move said cam follower radially outwardly, said second end of said lever arm is moved in a direction to pivot said lever arm about said first end to cause said lever arm to apply a braking force to said at least one braking element so as to apply a braking force to the spool.

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**5,740,976**
**ONE-PIECE FISHING REEL SUBASSEMBLY**
**Kent Zwayer, Tulsa, Okla., assignor to Zebco Division of Brunswick Corporation, Tulsa, Okla.**
**Filed Sep. 21, 1994, Ser. No. 309,664**
**Int. Cl.[6] A01K** *89/01*
**U.S. Cl. 242—311** **14 Claims**



**1**. A fishing reel having a front and rear, a top and bottom, and laterally spaced sides, said fishing reel comprising:

a deck plate having a forwardly facing surface and an opening therein extending in a fore and aft direction;

a reel operating mechanism;

first means for mounting at least a portion of the reel operating mechanism to the deck plate;

a housing for encasing at least a portion of the reel operating mechanism and having laterally oppositely facing side walls and a rear wall; and

second means for mounting the housing with the operating mechanism thereon to a fishing rod,

wherein there is a one-piece subassembly that defines at least a part of each of a) the deck plate, b) one of the side walls, and c) the rear wall,

the at least part of the deck plate extending substantially fully around the deck plate opening,

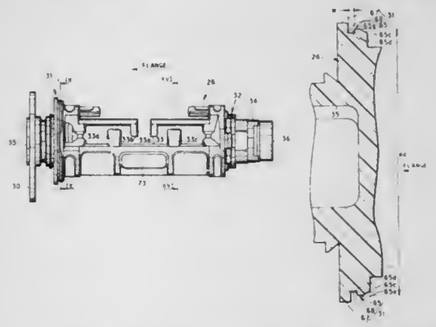
there further being a rearwardly facing undercut surface on the at least part of the deck plate defined by the subassembly, the rearwardly facing undercut surface extending around the deck plate opening,



wherein the operating mechanism includes a shaft which extends fully through the deck plate opening, the deck plate has a rearwardly facing surface with a counterbore defining the undercut surface and there is a bearing for the shaft in the counterbore in the rearwardly facing deck plate surface.

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**5,740,977**
**PHOTO FILM CASSETTE HAVING ASSEMBLY CHARACTERISTICS**
**Akimasa Kaya, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Dec. 27, 1995, Ser. No. 579,199**
**Claims priority, application Japan, Dec. 27, 1994, 6-324482**
**Int. Cl.[6] G03C** *3/00*
**U.S. Cl. 242—348.3** **19 Claims**



**1**. A photo film cassette containing photo film in a cassette shell in a form of a roll, wherein said photo film is advanced to an outside of said cassette shell when a spool core is rotated in a direction of unwinding said photo film, said photo film cassette comprising:

first and second flanges, which are flexible and secured respectively to first and second axial ends of said spool core, for regulating positions of edges of said photo film, first and second circular bearing holes being formed respectively in a middle of said first and second flanges, and through which said spool core is inserted, said first bearing hole having a first diameter;

at least one ring-like lip, formed integrally with a periphery of at least one of said first and second flanges, said ring-like lip being projected toward said roll of said photo film and contacted on an edge of an outermost turn of said roll for preventing said roll from being loosened;

a first stopper ring, disposed near said first axial end of said spool core, projected from said spool core in radial fashion, and contacted on an edge of said first bearing hole in said first flange supported in a receiving region of said spool core, for preventing said first flange from being moved away from said receiving region and toward said first axial end, said first stopper ring having a second diameter;

a second stopper ring, disposed opposite to said first stopper ring in relation to said receiving region, projected from said spool core in radial fashion, and contacted on said edge of said first bearing hole in said first flange supported in said receiving region, for preventing said first flange from being moved away from said receiving region and toward said second axial end, wherein said first flange is moved past said second stopper ring toward said first axial end to be mounted on said receiving region;

a circumference of said spool core including at least first and second sections;

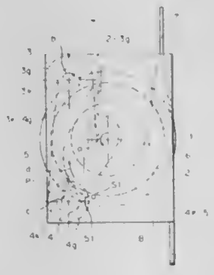
said second stopper ring including:

a first sector portion, disposed in said first section about said spool core, and having a third diameter greater than said first diameter; and

a second sector portion, disposed in said second section about said spool core, and having a fourth diameter greater than said third diameter, said fourth diameter being smaller than said second diameter of said first stopper ring.

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**5,740,978**
**AUTOMATIC SEAT-BELT DISPENSER**
**Martin Diez, Grandl-Str. 28, D-81247 Munchen, Germany**
**Filed Nov. 29, 1996, Ser. No. 757,671**
**Claims priority, application Germany, Nov. 28, 1995, 195 44 302.0**
**Int. Cl.[6] B60R** *22/34*
**U.S. Cl. 242—375.3** **8 Claims**



**1**. An automatic seat-belt dispenser having a multi-step-down gear disposed between a winder shaft (**1**), onto which a seat belt (**7**) can be wound and from which the seat belt (**7**) can be unwound, and an energy storage means (**6**) engaged to said multi-step down gear, the multi-step-down gear being made so that the course of the force required to unwind the seat belt (**7**) is substantially constant or decreases linearly, said multi-step-down gear comprising a circular pulley (**2**) provided on the winder shaft (**1**), at least one double pulley (**3**, **4**), and a pulley (**5**) having a substantially spiral circumferential line, by way of which energy is supplied to the energy storage means (**6**) or removed from said energy storage means (**6**) by a plurality of belts, said circular pulley, said double pulley and said pulley having a substantially spiral circumferential line being connected with one another by said plurality belts (**2**-**3***g*, **3***k*-**4***g*, **4***k*-**5**).

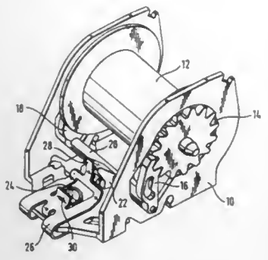
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**5,740,979**
**TRANSPORT GUARD DEVICE FOR A BELT RETRACTOR**
**Martin Röhrle, Mutlangen, Germany, assignor to TRW Occupant Restraint Systems GmbH, Alfdorf, Germany**
**PCT No. PCT/EP96/00227, § 371 Date Sep. 12, 1996, § 102(e) Date Sep. 12, 1996, PCT Pub. No. WO96/22201, PCT Pub. Date Jul. 25, 1996**
**PCT Filed Jan. 19, 1996, Ser. No. 704,667**
**Claims priority, application Germany, Jan. 19, 1995, 295 00 817.2**
**Int. Cl.[6] B60R** *22/40*
**U.S. Cl. 242—382** **2 Claims**

**1**. A transport guard device for a belt retractor for safety belts, more particularly a belt retractor with an integrated belt pretensioner drive, wherein the belt drum, which is rotatably supported in a housing and is provided with ratchet teeth means, is able to be locked against rotation by a pawl and the housing is secured on the vehicle by means of a bolt, characterized in that a clip (**26**) is provided on the housing (**10**) and has a resiliently elastic limb (**28**) engaging the pawl (**16**, **18**) and holding same in engagement with the ratchet teeth (**14**) on the belt drum (**12**) and in that the

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resiliently elastic limb (**28**) is pivoted by the bolt (**25**) out of position away from the pawl during assembly of the belt retractor.

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**5,740,980**

## SAFETY BELT REELING DEVICE WITH INCLINATION COMPENSATION FOR A VEHICLE-SENSITIVE SENSOR

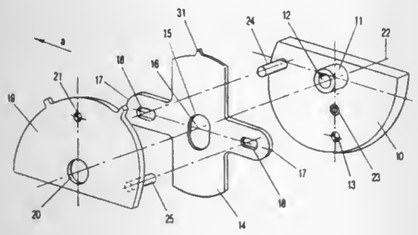
**Hans-Helmut Ernst, Ahrensburg, Germany, assignor to Autoliv Development AB, Vargarda, Sweden**

**Filed Aug. 2, 1996, Ser. No. 691,481**

**Claims priority, application Germany, Aug. 2, 1995, 195 28 153.5**

**Int. Cl.**[6] **A62B** *35/00;* **B65H** *75/48*

**U.S. Cl. 242—384.4** **6 Claims**



**1**. An inclination-compensatable safety belt reeling device connected to a vehicle seat, wherein the part of the vehicle seat to which said safety belt reeling device is connected is inclination-adjustable relative to an axis oriented to the center of the earth, said safety belt reeling device comprising:

a vehicle-sensitive acceleration sensor to be aligned in a nominal position to the center of the earth;

a pendulum mass, pivotable about a pivot point, acting on said acceleration sensor for returning said acceleration sensor into the nominal position when an inclination change occurs;

a first inertia mass in the form of a first instable compensation pendulum sensitive to acceleration forces, said first compensation pendulum being supported so as to be pivotable about said pivot point of said pendulum mass;

a first locking member coupled to said pendulum mass and said compensation pendulum;

a stationary blocking toothing;

said first locking member operatively connected to said first compensation pendulum for locking said pendulum mass in a relative position at said safety belt device when said first compensation pendulum is activated by acceleration forces;

wherein, when horizontal acceleration forces occur, said pendulum mass and said first compensation pendulum pivot in opposite directions and force said first locking member into engagement with said blocking toothing.

**5,740,981**

## METHOD OF WINDING A YARN TO A CROSS-WOUND PACKAGE

**Dieter Haak, Remscheid, Germany, assignor to Barmag AG, Remscheid, Germany**

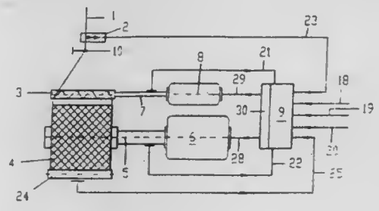
**PCT No. PCT/DE94/00906, § 371 Date Apr. 10, 1995, § 102(e) Date Apr. 10, 1995, PCT Pub. No. WO95/25510, PCT Pub. Date Sep. 28, 1995**

**PCT Filed Aug. 4, 1994, Ser. No. 416,693**

**Claims priority, application Germany, Aug. 14, 1993, 43 27 394.7**

**Int. Cl.**[6] **B65H** *63/00;54/28*

**U.S. Cl. 242—413.5** **6 Claims**



**1**. A method of winding an advancing yarn to form a cross wound package with a random wind, and comprising the steps of

advancing the yarn at a substantially constant speed to a stationary yarn guide,

traversing the advancing yarn at a location between the stationary yarn guide and a rotating yarn bobbin so as to form a cross wound package on the rotating bobbin,

generating basic control signals for the traversing speed and the rotational speed of the package respectively such that the yarn is deposited on the package at crossing angles which are substantially constant during the build of the package,

sensing the tension of the advancing yarn at a location upstream of the stationary yarn guide and producing a tension signal which is representative of the sensed tension, and

superimposing the tension signal upon the basic control signals to produce final control signals for respectively controlling the traversing speed and the rotational speed of the package such that the traversing speed and the rotational speed of the package are adjusted to maintain a desired tension in the advancing yarn and while maintaining substantially constant crossing angles of the yarn on the package.

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**5,740,982**

## APPARATUS FOR PRODUCING A SPLICE BETWEEN STRIPS ON SUCCEEDING REELS

**Bernd Kaufmann, Heidenheim, Germany, assignor to Voith Sulzer Papiermaschinen GmbH, Germany**

**Filed Jan. 25, 1995, Ser. No. 377,926**

**Claims priority, application Germany, Jan. 25, 1994, 44 01 963.7**

**Int. Cl.**[6] **B65H** *21/00;19/18;* **B31F** *5/00*

**U.S. Cl. 242—555.3** **23 Claims**

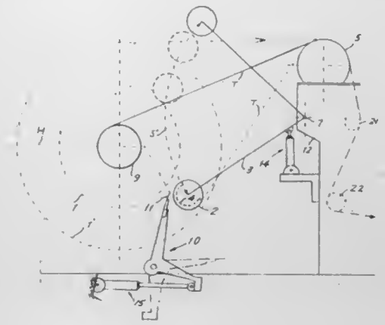
**1**. Apparatus for cutting a strip exiting a terminating reel for defining a strip end and for splicing the strip end of the terminating reel to the outer layer of a following reel, the apparatus comprising

a reel support for supporting the terminating reel or the following reel, the reel having an axis at the reel support;

a splicing tube having an axis extending generally along the same direction as the reel axis; and including means for holding the strip end to the splicing tube upon contact between the holding means and the strip end after the strip end has been cut;

strip guide means for guiding the strip from the terminating reel past a position of the splicing tube and defining a path of the strip past the splicing tube;





splicing tube moving means for moving the splicing tube transversely to the path of the strip past the splicing tube which is established by the strip guide means, for moving the splicing tube between a waiting position out of contact with the strip and an operating position wherein the splicing tube engages and moves the strip; and

a knife for cutting the strip and positioned between the reel and the operating position of the splicing tube so that upon the splicing tube moving to the operating position in contact with the strip, the strip is moved to a position where it can be engaged by the knife for being cut by the knife;

said operating position defining a knife cutting region wherein the knife can intersect the strip, the operating position defining the knife cutting region being non-critical with respect to the knife so that the knife can intersect the strip adjacent the splicing tube between the reel and the splicing tube at any of a plurality of positions.

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**5,740,983**

## TAPELESS SPLICING SYSTEM FOR PHOTOGRAPHIC FILMSTRIPS

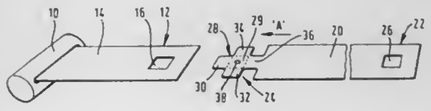
**Anthony Earle, Harrow, and Edward Charles Timothy Samuel Glover, London, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jul. 15, 1996, Ser. No. 680,742**

**Claims priority, application United Kingdom, Jul. 29, 1995, 9515631**

**Int. Cl.**[6] **B65H** *19/18*

**U.S. Cl. 242—556** **16 Claims**



**1**. A method of joining together at least two filmstrips to form a continuous length of filmstrip material, each filmstrip having a first end and a second end, the method comprising the steps of:

a) forming an aperture in the first end of each filmstrip;

b) forming a tongue portion in the second end of each filmstrip; and

c) inserting the tongue portion of one filmstrip into the aperture of another filmstrip to effect the join;

d) wherein the tongue portion of each filmstrip is larger than the aperture therein, the joint between two filmstrips being achieved by distorting the tongue portion of one filmstrip as it is pushed through the aperture of another filmstrip.

**5,740,984**

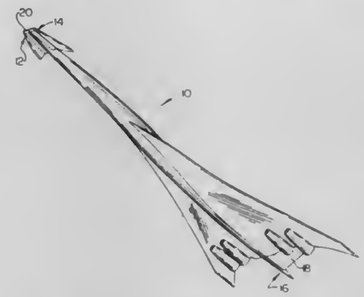
## LOW SONIC BOOM SHOCK CONTROL/ALLEVIATION SURFACE

**John M Morgenstern, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Saint Louis, Mo.**

**Filed Sep. 22, 1994, Ser. No. 310,495**

**Int. Cl.**[6] **B46C** *30/00*

**U.S. Cl. 244—1 N** **14 Claims**



**1**. A sonic control device that selectively reduces a sonic boom of an aircraft, comprising:

an aircraft that has a fore section and an aft section, said aircraft having a nose section at said fore section;

a first control surface located at said nose section of said fore section of said aircraft;

a first movement device that rotates said first control surface between a first position and a more upwardly inclined second position for flying over populated areas, wherein said first control surface provides a blunt nose to increase pressure at said nose section when rotated from the first position to the second position so that there is a positive pressure profile along said entire nose section and reduce the effects of the sonic boom created by said aircraft, wherein said first control surface provides a non-blunt and less inclined tapered nose profile when in the first position for flying over less populated areas.

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**5,740,985**

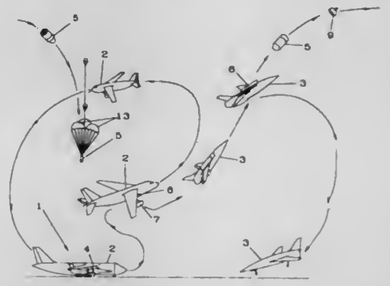
## LOW EARTH ORBIT PAYLOAD LAUNCH SYSTEM

**Harry Scott, 5546 W. 122nd St., Hawthorne, Calif. 90250, and Stephen G. Wurst, 4140 Derby Cir., Lancaster, Calif. 93536**

**Filed Sep. 16, 1996, Ser. No. 716,807**

**Int. Cl.**[6] **B64G** *1/14;1/40*

**U.S. Cl. 244—2** **8 Claims**



**1**. An orbital launch system comprising:

a) a turbofan aircraft modified with a means to carry and to release an aerospacecraft;

b) the aerospacecraft comprising:

i) a fuselage with a fore body, a midsection with a cargo bay having a plurality of cargo bay doors, and an aft body;

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ii) a pair of wings attached to the fuselage each defining a wing tip and having means for control to allow a high speed pull up maneuver and maneuver of the aerospacecraft and a tail with a rudder generally vertically mounted at a tail end;

iii) two ejector ramjet engines each in an engine nacelle wherein there is a nacelle inlet and a nacelle planar faring for each ejector ramjet engine all generally located under a plane defined by the wings and the ejector ramjet engines each having an engine exhaust nozzle at the tail end of the fuselage;

iv) a forward fuel tank and an aft fuel tank in the fuselage and connected to the ejector ramjet engines;

v) a plurality of attitude control rockets connected with a plurality of position fuel tanks and mounted in a nose end of the fore body and each wing tip;

vi) a means to carry and to launch a payload; and

vii) a means for a horizontal landing.

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**5,740,986**

## METHOD OF DETERMINING THE POSITION OF ROLL OF A ROLLING FLYING OBJECT

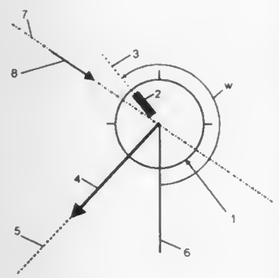
**Jens L. Seidensticker, Bodman-Ludwigshafen, and Wolfgang W. Kreuzer, Stockach, both of Germany, assignors to Oerlikon Contraves GmbH, Stockach, Germany**

**Filed May 15, 1996, Ser. No. 647,809**

**Claims priority, application Germany, Jun. 1, 1995, 195 20 115.9**

**Int. Cl.[6] F41G *7/00***

**U.S. Cl. 244—3.15** **1 Claim**




1. A method for determining the position of roll of a flying object where the velocity, position and vertical reference axis (VRA) of the flying object is known, comprising the steps of:

locating a magnetic field sensor in the flying object, the magnetic field sensor having a measurement axis with respect to the earth's magnetic field;

measuring with the magnetic field sensor the strength of the earth's magnetic field over time to generate a sinusoidal curve of the intensity of the magnetic field over time;

calculating the time interval (Tp) between maximum intensities of the measured magnetic field from the sinusoidal curve to determine roll frequency of the flying object; and

calculating the angle of roll of the flying object with respect to the known vertical reference axis (VRA) as a function of the roll frequency and time interval (Tp) so as to determine the position of roll of the flying object.

**5,740,987**

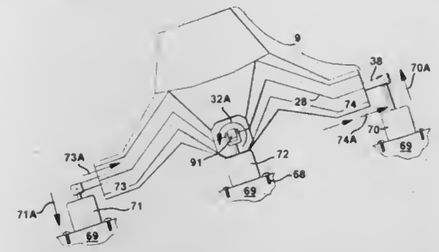
## HELICOPTER CYCLIC CONTROL ASSEMBLY

**Joseph J. Morris, P.O. Box 13158, South Lake Tahoe, Calif. 96151, and Gerard G. Grass, 7770 Yager Rd., North Bay, N.Y. 13123**

**Filed Dec. 1, 1995, Ser. No. 565,825**

**Int. Cl.[6] B64C *27/52***

**U.S. Cl. 244—17.25** **3 Claims**




I. A helicopter cyclic control assembly comprising:

A. a rotor disc control plate, the rotor disc control plate having a body,

I. the body having a body upper surface and a body lower surface,

II. the body having a body peripheral edge, the body peripheral edge joining the body upper surface and the body lower surface,

III. the body having a first vertical axis,

a. the first vertical axis being defined as a line running through a first point located on the body upper surface, the first point being equidistant from the body peripheral edge, and a second point located on the body lower surface, the second point being equidistant from the body peripheral edge,

IV. the body having an elongated neck,

a. the elongated neck being coaxial with the first vertical axis,

b. the elongated neck having a neck tube,

c. the elongated neck tube having a bore,

i. the neck tube bore passing through the elongated neck and the body coaxially with the first vertical axis,

ii. the neck tube bore having an open top end and an open bottom end, the open top end being locatable on the body upper surface and the open bottom end being locatable on the body lower surface,

d. the neck tube having a first inner surface,

i. the first inner surface being coextensive with the body upper surface and the body lower surface,

e. the neck tube bore having diameter,

V. the body having at least 3 arms radially and evenly spaced about it,

a. the arms having a first arm portion and a second arm portion,

i. the first arm portion and the second arm portion being continuous,

ii. the first arm portion extending outwardly from the body and downwardly, away from the neck tube bore open top end,

iii. the second arm portion extending outwardly from the first arm portion, perpendicular to the first vertical axis,

b. the arms having an arm upper surface, the arm upper surface being coextensive with the body upper surface,

c. the arms having an arm lower surface, the arm lower surface being coextensive with the body lower surface,

d. the arms having an arm peripheral edge, the arm peripheral edge being coextensive with the body peripheral edge,

e. the arms each having an arm tube located in the second arm portion, the arm tube having an arm tube bore,

i. the arm tube bore having an arm tube open end and an arm tube closed end,

aa. the arm tube open end being located at the arm peripheral edge,



bb. the arm tube closed end being at the end of the arm tube opposite the open end,

ii. the arm tube being coaxial with the second arm portion in which the arm tube is located,

iii. the arm tube bore having an arm tube bore diameter,

iv. the arm tube having a longitudinal axis, the longitudinal axis being one and the same with a line drawn from a center point of the arm tube bore diameter at the arm tube open end, to a center point of the arm tube bore diameter at the arm tube closed end,

VI. the body having a first machined area,

a. the first machined area being located at the neck tube bore open top end, and coaxial with the neck tube bore,

b. the first machined area having a first shoulder,

i. the first shoulder being perpendicular to the neck tube,

ii. the first shoulder having a diameter greater than the neck tube bore diameter,

c. the first machined area having a first collar,

i. the first collar being perpendicular to the first shoulder,

ii. the first collar being circumferentially disposed to the neck tube bore,

d. the first machined area having a second shoulder,

i. the second shoulder being parallel to the first shoulder and perpendicular to the first collar,

ii. the second shoulder intersecting the first collar, and forming a 90 degree angle between the first collar and the second shoulder,

iii. the second shoulder having a diameter greater than the first shoulder,

e. the first machined area having a second collar,

i. the second collar being perpendicular to the second shoulder,

ii. the second collar being circumferentially disposed to the neck tube bore,

VII. the body having a second machined area,

a. the second machined area being located at the neck tube bore open bottom end, and coaxial with the neck tube bore,

b. the second machined area having a third shoulder,

i. the third shoulder being perpendicular to the neck tube,

ii. the third shoulder having a diameter greater than the neck tube bore diameter,

c. the second machined area having a third collar,

i. the third collar being perpendicular to the third shoulder,

ii. the third collar being circumferentially disposed to the neck tube bore;

B. a means for reducing friction,

I. the means for reducing friction being sized to fit snugly into the first machined area,

II. the means for reducing friction be sized to fit snugly into the second machined area,

III. the means for reducing friction having a hole, the diameter of the hole being less than the diameter of the neck tube, and being sufficiently large to snugly accept the upper shaft;

C. a retaining plate for retaining in place the means for reducing friction,

I. the retaining plate being sized to fit snugly into the first machined area,

II. the retaining plate having a hole, the diameter of the hole being the same as the diameter of the neck tube,

III. the retaining plate having a means for fastening to the rotor disc control plate,

IV. the retaining plate having a retaining plate inner surface and a retaining plate outer surface;

D. at least 3 slide rods,

I. the slide rods having a proximal end and a distal end,

II. the slide rods having a diameter sized for closely and slidably inserting into the arm tube bore,

III. the distal end of the slide rods having a means for pivotal attachment to a means for pushing and pulling, the means for pushing and pulling being fastened to a helicopter body means;

E. an upper shaft,

I. the upper shaft having length and diameter,

a. the diameter of the shaft being less than the diameter of the neck tube bore,

II. the upper shaft having a distal end for attachment to a helicopter rotor blade assembly,

III. the upper shaft having a proximal end,

IV. the upper shaft having a means for attachment to a means for translating rotational motion to rotational motion, the means for attachment being located at the proximal end,

V. the upper shaft having a stop plate flange,

a. the stop plate flange extending radially and circumferentially from the upper shaft, perpendicular to the first vertical axis,

b. the stop plate flange having an inner surface and an outer surface, and a diameter greater than the neck tube bore diameter,

c. the stop plate flange being disposed toward the proximal end of the shaft so that when the upper shaft is rotatably engaged through the neck tube, the means for attachment to the means for translating rotational motion to rotational motion is located at a locus where the longitudinal axis of the arm tubes intersect the first vertical axis,

d. the diameter of the stop plate flange being less than the diameter of the second machined area, and greater than the neck tube diameter.

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**5,740,988**

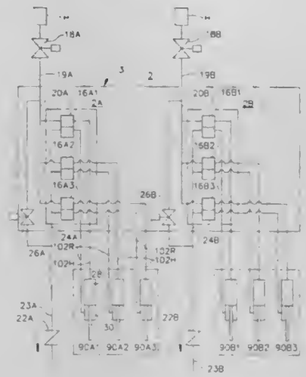
## AXISYMMETRIC VECTORING NOZZLE ACTUATING SYSTEM HAVING MULTIPLE POWER CONTROL CIRCUITS

**Robert M. Ausdenmoore, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio**

**Filed Apr. 13, 1995, Ser. No. 422,731**

**Int. Cl.[6] B64C *15/02***

**U.S. Cl. 244—52** **17 Claims**




1. A failsafe nozzle actuating system for an aircraft gas turbine engine axisymmetric vectoring exhaust nozzle having a vectoring ring operably linked to a plurality of pivotal flaps which are circumferentially disposed about a nozzle centerline and bounding an exhaust gas flowpath in the nozzle, said failsafe nozzle actuating system comprising:

a first vectoring actuating system having a first group of actuators circumferentially disposed about said nozzle centerline and operably connected to said vectoring ring and a first failsafe control means to control power to said first group of actuators,

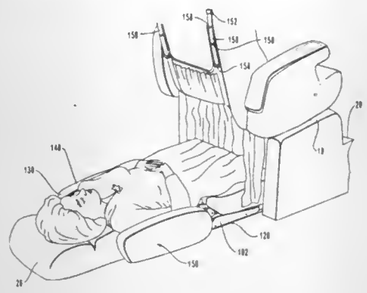
a second vectoring actuating system having a second group of actuators circumferentially disposed about said nozzle centerline and operably connected to said vectoring ring and a second failsafe control means to control power to said second group of actuators, each of said actuator having at least one independently controllable servovalve, and

said actuators of said first group are interdigitated with said actuators of said second group around the nozzle.

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**5,740,989**
**LAY DOWN SEAT MECHANISM**
**Paul H. Daines, 455 Washington, Montpelier, Id. 83254**
**Filed Dec. 26, 1995, Ser. No. 577,120**
**Int. Cl.[6] B64D** *11/06*
**U.S. Cl. 244—118.6** **11 Claims**



**1**. A lay down seat mechanism for a back seat of a seating system having a front row of seats resting on a platform raised from the floor of an aircraft and a foot rest spaced above the floor of the aircraft and a row of back seats, said lay down seat mechanism comprising

a seat bottom support frame;

a seat back support frame;

means selectively and releasably pivotally connecting said seat back support frame to said seat bottom support frame;

a pair of spaced apart rear legs each having one end pivotally connected to the aircraft floor and an opposite end pivotally connected to the seat back support;

a pair of guide tracks fixed to the aircraft floor and extending into the space beneath the platform raised from the floor;

a slide block slidable within each of said guide tracks; and

a front leg having one end pivotally connected to each of said slide blocks and each said front leg having another end pivotally connected to said seat bottom support frame, whereby said front legs move with said slide blocks as said front legs pivot about the pivot connection between the said legs and said slide blocks.

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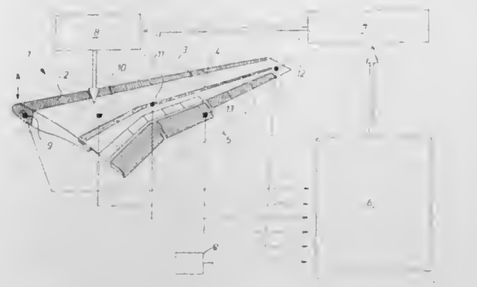
**5,740,990**

**Patent Not Issued For This Number**

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**5,740,991**
**METHOD AND APPARATUS FOR OPTIMIZING THE AERODYNAMIC EFFECT OF AN AIRFOIL**
**Wolfgang Gleine, Kakenstorf; Reinhard Hilbig, Delmenhorst, and Hans-Joachim Wendt, Buxtehude, all of Germany, assignors to Daimler-Benz Aerospace Airbus GmbH, Hamburg, Germany**
**Filed Feb. 5, 1996, Ser. No. 596,653**
**Int. Cl.[6] B64C** *13/16*
**U.S. Cl. 244—203** **30 Claims**

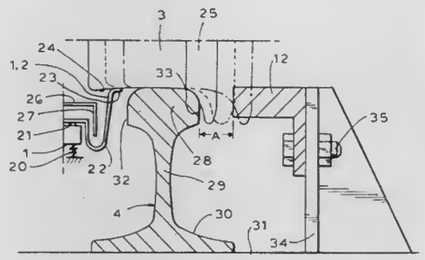
**1**. In an aircraft having at least one airfoil including a leading edge flap arranged at a leading edge of said airfoil, a high lift flap arranged at a trailing edge of said airfoil, a spoiler, an aileron, and driveable actuators respectively connected to said leading edge flap and said high lift flap, an apparatus for automatically optimizing the aerodynamic effect of said airfoil comprising a process computer with at least one memory area for storing actual flight data and parametric wing data, a plurality of pressure sensors arranged distributed across said airfoil with at least one of said pressure sensors arranged on said high lift flap, digital data lines connecting said pressure sensors with said process computer, at least one



movable connector lead that is interposed and connected between said at least one pressure sensor arranged on said high lift flap and said digital data lines and that is adapted to convey signals therethrough while allowing said high lift flap to move relative to a body of said airfoil, conductor lines connecting said actuators with said process computer, and respective input/output units connected between said pressure sensors and said data lines and between said actuators and said conductor lines.

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**5,740,992**
**APPARATUS FOR CONTINUOUSLY MEASURING THE POSITION OF A MOVING RAIL VEHICLE**
**Ulrich P. Vogt, Essen, Germany, assignor to Krupp Fordertechnik GmbH, Essen, Germany**
**Filed Feb. 11, 1997, Ser. No. 798,622**
**Claims priority, application Germany, Mar. 8, 1996, 196 09 036.9**
**Int. Cl.[6] B61L** *25/02*
**U.S. Cl. 246—122 R** **18 Claims**



**1**. A device for continuously measuring position of a moving railway vehicle along a stretch of track having rails, said vehicle having wheels each formed with a felly riding on a respective one of said rails and a flange adjacent the felly and disposed along a flank of said one of said rails, the device comprising:

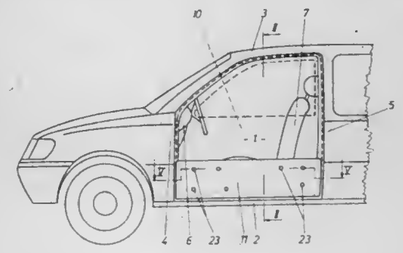
a row of switching elements distributed along said stretch and provided with mechanical sensors positioned for engagement by said vehicle for successive operation of said switching elements as said vehicle travels along said stretch of track;

a guide extending over the length of said stretch alongside said one of said rails and at a spacing from said flank of 30 to 50 mm for limiting movement of said vehicle away from said sensors as said vehicle travels along said stretch; and

a computer operatively connected with said switching elements for signaling the position of said vehicle along said track.



**5,740,993**
**VEHICLE DOOR WITH SEPARABLE COLLISION PROTECTOR**
**Wolfgang Siepe-Noll, Pulheim, Germany, assignor to Steyr-Daimler-Puch AG, Vienna, Austria**
**PCT No. PCT/AT95/00070, § 371 Date Oct. 15, 1995, § 102(e) Date Oct. 15, 1995, PCT Pub. No. WO95/28295, PCT Pub. Date Oct. 26, 1995**
**PCT Filed Apr. 6, 1995, Ser. No. 722,166**
**Claims priority, application Germany, Apr. 15, 1994, 44 12 935.1; Apr. 17, 1994, 44 13 022.8; Oct. 18, 1994, 44 37 219.1**
**Int. Cl.[6] B60J** *5/04*
**U.S. Cl. 296—146.6** **18 Claims**



**1**. A vehicle door adapted to be mounted between first and second spaced-apart door posts of a vehicle, the door comprising:

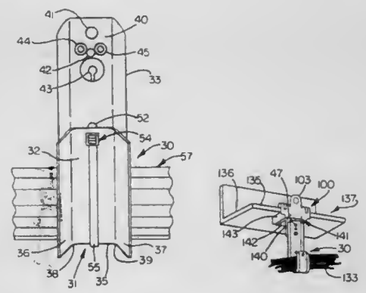
door panel means;

elongate collision-protection means comprising first and second end surface means adapted in a collision to be arrested against movement between the first and second door posts;

means for releasably connecting the door panel means to the collision-protection means such that when the collision-protection means is arrested between the first and second door posts the door panel means may be moved relative to the collision protection means.

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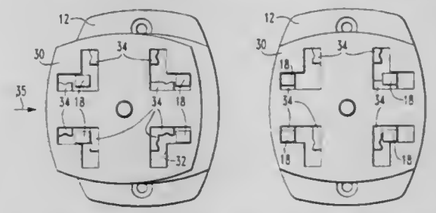
**5,740,994**
**CABLE SUPPORT AND METHOD**
**Raymond Scott Laughlin, Cuyahnga Falls, Ohio, assignor to Erico International Corporation, Solon, Ohio**
**Filed Dec. 26, 1996, Ser. No. 773,981**
**Int. Cl.[6] F16L** *3/22*
**U.S. Cl. 248—68.1** **45 Claims**



**1**. A low voltage communications cable support for supporting a plurality of horizontal runs of such cables with minimal cable sag on each side of the support comprising a semi-circular communications cable receiving saddle having a wide relatively flat center cylindrical surface section, and stiffening flanges at each outer edge of said flat surface section, said stiffening flanges projecting radially outwardly and downwardly around said semi-circular saddle at an obtuse angle to interior of said flat center cylindrical surface section to avoid sharp corners around said cable receiving saddle, and attachment means to secure said support to a structure.

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**5,740,995**
**DEVICE FOR SUPPORTING OBJECTS**
**Herbert Richter, Drosselweg 8, 75331 Engelsbrand, Germany**
**Filed Jun. 26, 1996, Ser. No. 670,459**
**Int. Cl.[6] F21V** *21/00*
**U.S. Cl. 248—220.21** **10 Claims**



**1**. A device for supporting objects, comprising a plate-like carrier member for supporting said objects, said carrier member including retaining means for holding the object supported thereon securely in place, a base having a substantially planar surface for removably supporting the plate-like carrier member thereon in lying position, and interlocking means for releasably interlocking said carrier member with said base, said interlocking means comprising a first array of interlocking elements disposed on said base, and a second array of interlocking elements disposed on said plate-like carrier member, the interlocking elements of one of said first and second arrays being shaped generally as inverted Ls, and the interlocking elements of the other array comprising lugs arranged so as to be slidable into and out of interlocking engagement with said inverted-L-shaped interlocking elements through movement of said plate-like carrier member on, and in a direction parallel to, said substantially planar surface.

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**5,740,996**
**DEVICE FOR MOUNTING PLATE-LIKE CONSTRUCTION COMPONENTS**
**Gido Genschorek, Eschenweg 2, D-15827 Dahlewitz, Germany**
**Filed Aug. 9, 1996, Ser. No. 695,313**
**Claims priority, application Germany, Aug. 9, 1995, 195 29 351.7**
**Int. Cl.[6] E04D** *13/18*
**U.S. Cl. 248—237** **9 Claims**

**1**. A device for mounting plate-like construction components on inclined surfaces, the plate-like construction components being longitudinally disposed on the inclined surface in rows with the lateral edges of an upper row overlapping the lateral edges of an adjacent lower row in a scale-like manner, the device comprising:

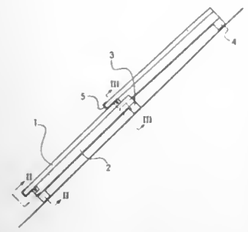
a plurality of horizontally disposed mounting supports adapted for coupling to the inclined surface;

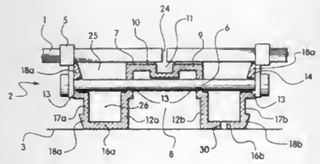
mounting profiles coupled to said mounting supports for extending longitudinally along the inclined surface, each of said mounting profiles having a material thickness, and an inverted U-shape with a first and second leg member coupled by a bridge member;

each of said first and second leg members having an inner and outer vertical leg coupled by a lower horizontal leg to create an open top chamber, said outer vertical legs laterally limiting said profile and having a top, a bottom, an inside surface and outside surface, each of said inner and outer vertical legs having a horizontal step disposed at the same vertical level, said step dividing said chambers of the first and second leg members into a top and bottom section, whereby the bottom section of a second profile is insertable into a top section of a first profile in an abutting relation; and

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at least one hook having one end releasably secured to said profile, and a second end for receiving and retaining a lateral edge of the plate-like construction component.

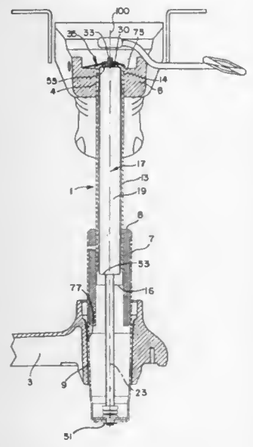
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**5,740,997**

**PNEUMATIC HEIGHT ADJUSTMENT COLUMN FOR A CHAIR**

**Steve Van Wieran, Grandville, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.**

**Filed Jun. 7, 1995, Ser. No. 486,716**
**Int. Cl.[6] F16M *11/00***
**U.S. Cl. 248—404** **53 Claims**



**47**. A pneumatic height adjustment column for a chair comprising:

a tube comprising a top portion having an opening, said tube having a longitudinal axis;

a pneumatic cartridge comprising a cylinder having a longitudinal axis and a hub disposed on a top portion of said cylinder, said cartridge coaxially disposed in said tube such that said hub extends through the opening in the top portion of said tube;

a hub fastener comprising a resilient member releasably engaging said hub, said hub fastener engaged with said hub by slidably moving said resilient member in a lateral inward direction relative to said longitudinal axis so that said resilient member is biased outwardly by said hub during said slidable movement.

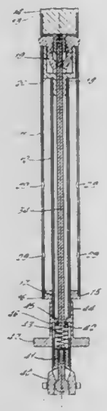
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**5,740,998**

**EXTENDIBLE ARMS**

**Richard Arthur Lindsay, Eye, and Robin Andrew Sayer, Bury St. Edmunds, both of Great Britain, assignors to Vitec Group plc, United Kingdom**

**Filed Mar. 7, 1996, Ser. No. 612,050**
**Claims priority, application United Kingdom, Mar. 10, 1995, 9504930**
**Int. Cl.[6] F16M *11/00***
**U.S. Cl. 248—407** **4 Claims**



**1**. An extendible arm for a stand comprising:

an outer elongate rigid sleeve,

an inner elongate rigid sleeve telescopically slidable within the outer sleeve to extend therefrom by a variable amount,

a detent mechanism located within a first end of the inner sleeve disposed within the outer sleeve for locking the inner sleeve in any of a number of positions of extension with respect to the outer sleeve, wherein the detent mechanism includes at least one rocker arm, the at least one rocker arm having a first camming surface located on a distal side of a pivot point of the at least one rocker arm and a second camming surface located on a proximal side of the pivot point,

a release member for the detent mechanism, the release mechanism being located at a second end of the inner sleeve which projects from the outer sleeve,

a connecting member extending within the inner sleeve from a proximal end coupled to the release member to a distal end coupled to the detent mechanism,

a shuttle member coupled to the distal end of the connecting member, wherein an outer surface of the shuttle member is formed as a contacting surface and wherein the shuttle is moveable slidably within the inner sleeve between a distal-most position in which the contacting surface contacts the first camming surface and in a proximal-most position, the contacting surface contacts the second camming surface.

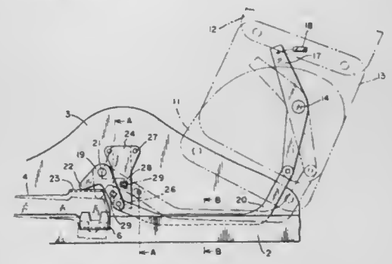


**5,740,999**

**SEAT SLIDING MECHANISM**

**Yukifumi Yamada, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan**

**Filed Jun. 29, 1995, Ser. No. 496,589**
**Claims priority, application Japan, Jul. 4, 1994, 6-173130**
**Int. Cl.[6] F16M *13/00***
**U.S. Cl. 248—429** **4 Claims**



**1**. A seat sliding mechanism comprising:

a lower rail attachable to a vehicle floor;

an upper rail slidably secured to the lower rail for supporting a seat cushion and seat back;

a locking lever pivotally connected to the upper rail and engageable with and disengageable from the lower rail;

a generally L-shaped crank-link pivotably attached to the upper rail and abutting the locking lever;

a connecting member connected to the crank-link and reciprocated to transmit a forwardly tilted movement of the seat back to the locking lever; and

an abutting point between the locking lever and the crank-link arranged along one linear line relative to a pivoted point of the crank-link, the locking lever and the crank-link being provided within a space defined by a cross section of the lower rail.

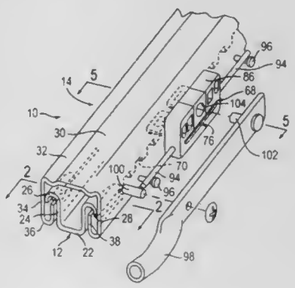
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**5,741,000**

**VEHICLE SEAT TRACK ASSEMBLY**

**Neil G. Goodbred, Royal Oak, Mich., assignor to Atoma International, Inc., Ontario, Canada**

**Filed Sep. 13, 1995, Ser. No. 527,727**
**Int. Cl.[6] F16M *13/00***
**U.S. Cl. 248—430** **26 Claims**



**1**. A vehicle seat track assembly comprising

an elongated fixed track structure constructed and arranged to be fixed to a vehicle floor,

a cooperating movable track structure constructed and arranged to support a portion of a seat thereon,

a plurality of rolling elements engaged between said track structures constructed and arranged to rollingly support said movable track structure on said fixed track structure for fore and aft horizontal movements into a plurality of different positions of adjustment with respect to said fixed track structure,

a plurality of guide elements molded from a plastic material engaged between said track structures constructed and arranged to effectively prevent relative vertical movements between said track structures in directions tending to vertically separate said track structures when in any position of adjustment and during the movement of said movable track structure with respect to said fixed track structure,

said guide elements being mounted on one of said track structures and having molded plastic surfaces through a portion of an exterior extent thereof and having generally vertically facing guide surfaces through another portion of the exterior extent thereof formed by material removal of said plastic material while said guide elements are in connected relation with said one track structure, said guide surfaces being positioned a common predetermined distance vertically from generally opposed spaced surfaces on said one track structure irrespective of tolerance variations between said individual guide elements and said one track structure,

said vertically facing guide surfaces slidably engaging generally oppositely facing surfaces of another of said track structures so as to effectively prevent relative vertical movement between said track structures in a direction tending to vertically separate said track structures;

said guide elements including connecting surfaces constructed and arranged to snap fit into connected relation with cooperating surfaces formed in one of said track structures,

said guide elements each including respective angular upper walls extending upwardly towards said vertically facing guide surfaces formed by material removal, said guide elements each further including respective peripheral walls extending downwardly from ends and sides of associated ones of said upper walls, said peripheral walls each having barb-like depending portions at opposite sides thereof and constructed and arranged to snap fit into an associated opening in said one track structure.

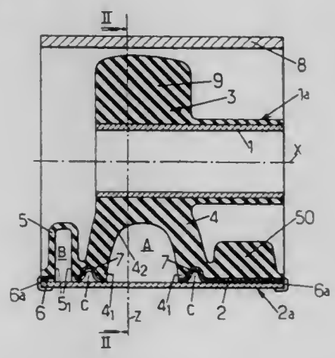
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**5,741,001**

**HYDRAULIC ANTIVIBRATION SUPPORTS**

**Alain Bellamy, Naveil; Denis Reh, and Pascal Petit, both of Chateaudun, all of France, assignors to Hutchinson, Paris, France**

**Filed Oct. 26, 1995, Ser. No. 548,547**
**Claims priority, application France, Oct. 27, 1994, 94 12889**
**Int. Cl.[6] F16M *13/00***
**U.S. Cl. 248—634** **3 Claims**



**1**. A hydraulic antivibration support for interposing between two rigid elements to damp vibration between the two elements in a main vibration direction, the support comprising:

first and second strength members suitable for being secured to respective ones of the two rigid elements which are to be united.

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said first strength member being an elongate member extending along an axis perpendicular to the main vibration direction, and

said second strength member being a base plate which extends in a general plane substantially perpendicular to the main vibrations direction, said base plate including a support face;

an elastomer body secured in a sealed manner to said support face of said base plate of said second strength member, said elastomer body having

a thick wall that connects the two rigid strength members together, said thick wall

having an inside surface defining part of a working chamber, said inside surface being free of projections into the working chamber,

being substantially bell-shaped, and

extending along the main vibration direction from a peripheral base secured to the second strength member to a crown secured to the first strength member,

a freely deformable thin elastomer wall, said thin wall

being integrally formed with the thick wall, and

defining part of a compensation chamber, and

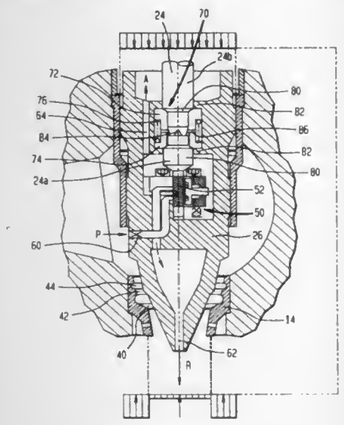
a narrow channel providing communication between the working chamber and the compensation chamber, said narrow channel and both said chambers being filled with a liquid;

an abutment means for limiting relative movement of said first and second strength members towards each other parallel to the main vibration direction in order to avoid completely crushing the working chamber, said abutment means including

an elastomer block belonging to the elastomer body and integrally formed therewith, said elastomer block being secured directly to said base plate and being located between a zone of said base plate of said second strength member that is displaced perpendicularly to the main vibration direction from the working chamber and from the compensation chamber and which faces a corresponding zone of said first strength member.

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**5,741,002**
**CONTROL VALVE**
**Karl Breyer, Ingelfingen, Germany, assignor to Herion-Werke KG, Fellbach, Germany**
**Filed Dec. 21, 1995, Ser. No. 576,153**
**Int. Cl.[6] F16K** *312/40*
**U.S. Cl. 251—30.04** **11 Claims**




1. A solenoid-operated control valve; comprising:

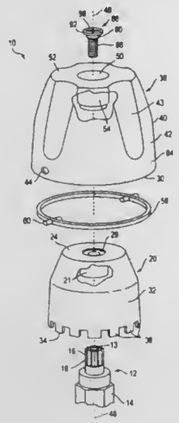
a valve body having an inlet port and an outlet port;

a plunger set within the valve body and being operatively connected to a stem for displacement in an axial direction, said valve body and said plunger defining a pressurizing chamber at a location above the plunger; and

a servo system including a slide gate linked to the stem for selectively connecting the pressurizing chamber to only one of the inlet port and the outlet port to thereby automatically maintain a desired position of the plunger.

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**5,741,003**
**CHILD-RESISTANT HANDLE**
**Donald James Segien, Jr., Chatsworth, Calif., assignor to Emhart Inc., Newark, Del.**
**Filed May 13, 1997, Ser. No. 855,479**
**Int. Cl.[6] F16K** *35/02*
**U.S. Cl. 251—95** **4 Claims**



1. A child-resistant handle assembly comprising;

a. a valve stem;

b. a cogwheel adapter affixed to and mounted to surround the valve stem;

c. a handle rotatable mounted to the valve stem and disposed about the cogwheel adapter in spaced relationship thereto;

d. the cogwheel adapter having a plurality of annular gear teeth lying in a plane perpendicular to the axis of the valve stem;

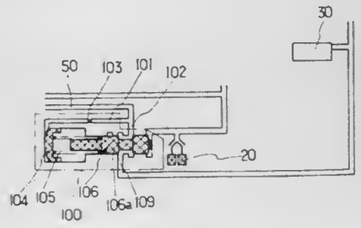
e. a pair of openings defining a pair of holes formed in the lower end of the handle lying in the plane of the annular gear teeth of the cogwheel adapter;

f. a resilient annular segmented member disposed to surround a portion of the cogwheel adapter inwardly of the handle; and

g. a clutch member having a pair of buttons affixed to the segmented member, with each of the buttons formed with an outer end and an inner end, and having the button resiliently and slidably carried in the holes of the handle and lying in the plane of the teeth of the cogwheel adapter with the outer ends of the buttons extending outwardly of the holes of the handle to be engaged and depressed to cause deformation of the segmented member and to force the inner ends of the buttons, normally out of engagement with the teeth of the cogwheel adapter, to engage the teeth of the cogwheel adapter, whereby rotation of the handle will cause the cogwheel adapter and the valve stem to turn.



**5,741,004**
**SHIFT VALVE FOR AN AUTOMATIC TRANSMISSION USED IN AUTOMOBILES**
**Kyung-Chul Lee, Kyunggi-do, Rep. of Korea, assignor to Kia Motors Corporation, Seoul, Rep. of Korea**
**Filed Jul. 30, 1996, Ser. No. 681,826**
**Claims priority, application Rep. of Korea, Jun. 4, 1996, 96-19722**
**Int. Cl.[6] F16K** *31/06*
**U.S. Cl. 251—129.07** **3 Claims**




1. A shift valve of a line pressure control system of an automatic transmission used in vehicles comprising:

a first input line having an orifice;

a plug which communicates with said first input line through the orifice;

a second input line;

an output line which communicates with a hydraulic pressure cylinder;

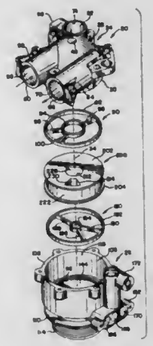
a valve spool for selectively communicating said second input line and said output line with each other; and

an elastic member for balancing the valve spool and said plug.

2. The shift valve of claim 1, wherein said valve spool is activated by electric solenoids.

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**5,741,005**
**ROTARY DISK CONTROL VALVE FOR A WATER CONDITIONING SYSTEM**
**Don Vaughan, Brookfield, and Greg A. Sebastian, Wauwatosa, both of Wis., assignors to Fleck Controls, Inc., Brookfield, Wis.**
**Filed Mar. 15, 1996, Ser. No. 618,422**
**Int. Cl.[6] F16K** *5/10*
**U.S. Cl. 251—208** **15 Claims**



1. A control valve for a water conditioning system having a tank including:

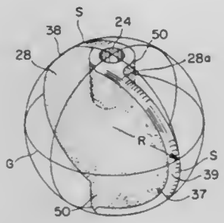
a housing having an upper body portion and a lower body portion, said housing defining a chamber between said upper body portion and said lower body portion, said upper body portion including a first upper port, a second upper port, and a third upper port, said lower body portion including a first lower port, a second lower port, and a third lower port, said first, second and third lower ports adapted to provide fluid communication with the tank;

a disk located within said chamber, said disk being selectively rotatable about a central axis, said disk including an upper face having a generally centrally located aperture and a peripherally located aperture, a lower face having a first peripherally located aperture and a second peripherally located aperture, a first fluid passage extending between said centrally located aperture in said upper face and said first peripherally located aperture in said lower face, and a second fluid passage extending between said peripherally located aperture in said upper face and said second peripherally located aperture in said lower face;

whereby rotation of said disk about said central axis provides selective fluid communication between said upper ports in said upper body portion and said lower ports in said lower body portion through said first and second fluid passages in said disk.

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**5,741,006**
**BUTTERFLY VALVE**
**Yoneo Murai, Gamo-gun, and Masaharu Fukuchi, Kanzaki-gun, both of Japan, assignors to Okumura Engineering Corp., Shiga, Japan**
**Continuation of Ser. No. 172,029, Dec. 22, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 470,331**
**Claims priority, application Japan, Dec. 1, 1993, 5-301724**
**Int. Cl.[6] F16K** *1/22*
**U.S. Cl. 251—305** **8 Claims**




1. A butterfly valve consisting of a main body, a seating ring mounted on an inside surface of said main body, and a single valve member opened and closed via valve shafts that are passed through shaft holes formed in said main body, said seating ring being provided with an inside projecting ridge which projects from an inside surface of said seating ring, and side edges of said projecting ridge providing pressure-contact sealing surfaces with which front and rear circumferential edges of said valve member come into contact; wherein

said valve member is formed substantially in a shape of a circular disk with an outer circumferential surface of said valve member formed as a spherical surface,

said seating ring is provided with shaft supporting portions through which valve shafts for said valve member are inserted, said shaft supporting portions formed curved inwardly so as to conform with said spherical surfaces of said valve member,

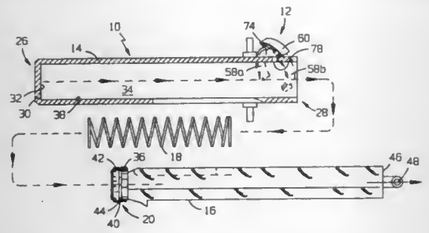
said circular disk further includes a shaft receptacle, and

said circular disk is divided into left and right hand vanes provided respectively on left and right hand sides of said shaft receptacle such that said right hand vane is upstream of said left hand vane with said front circumferential edge of said right hand vane and the rear circumferential edge of said left hand vane formed flat and in parallel.

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**5,741,007**
**DAMPER ROTATIONAL LATCH**
**Martin A. Witt, Tinley Park, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.**
**Filed Jun. 19, 1995, Ser. No. 492,310**
**Int. Cl.[6] F16F** *1/06*
**U.S. Cl. 267—64.12** **18 Claims**

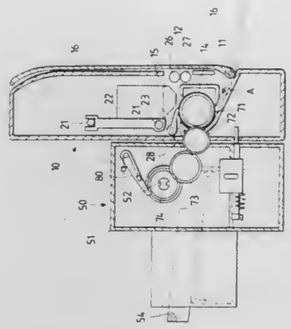



**1**. A damper device, comprising:
a body member including a chamber, an open front end, and an end wall;
a piston disposed telescopically within said body member such that a piston rod thereof projects partially outwardly from said chamber of said body member through said open front end of said body member;
spring means disposed within said chamber of said body member and interposed between said end wall of said body member and said piston so as to bias said piston outwardly from said chamber of said body member;
first latching means defined upon said piston rod; and
second latching means, for cooperating with said first latching means of said piston rod so as to retain said piston rod within said body member in a latched position until movement to an unlatched position is desired, comprising a one-piece latching member having first means for mounting said second latching means upon an external portion of said body member and a second means integral with said first means and projecting internally within said body member for engaging said first latching means of said piston rod.

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**5,741,008**
**AUTOMATIC PAPER FEED APPARATUS**
**Takehiko Kiyohara, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**
**Division of Ser. No. 200,359, Feb. 23, 1994, abandoned, which is a division of Ser. No. 29,958, Mar. 9, 1993, abandoned, which is a continuation of Ser. No. 666,922, Mar. 11, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 479,187**
**Claims priority, application Japan, Mar. 12, 1990, 2-60309; Mar. 12, 1990, 2-60310; Mar. 30, 1990, 2-84422; Mar. 30, 1990, 2-84423**
**Int. Cl.[6] B65H** *1/08*
**U.S. Cl. 271—127** **22 Claims**

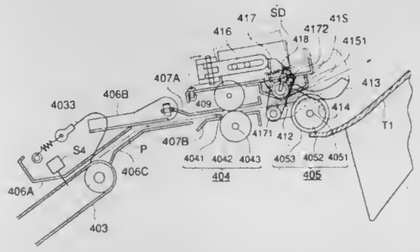
**1**. An automatic sheet feeding apparatus comprising: A frame;
sheet stacking means on the frame for supporting a plurality of sheets;
rotary sheet feeding means, provided on a drive shaft, for contacting an uppermost sheet of the sheets stacked on said sheet stacking means for feeding the uppermost sheet in a feeding direction when executing a feeding process but being disposed remote from the uppermost sheet when not executing the feeding process;
biasing means on the frame for biasing the sheets stacked on said sheet stacking means toward said rotary sheet feeding means;
a separating surface disposed inclined relative to the feeding direction of the sheets for separating the sheets one by one, by causing a leading edge of the sheet fed by said rotary sheet feeding means from said sheet stacking means to abut thereagainst; and




a free roller, rotatably mounted on a shaft provided on the frame of said apparatus and disposed parallel to the drive shaft, for maintaining a leading edge of the uppermost sheet at a position opposed to said separating surface against a biasing force of said biasing means when said rotary sheet feeding means does not execute the feeding process of the uppermost sheet.

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**5,741,009**
**SHEET SORTING APPARATUS**
**Minoru Kawano, Hachioji; Masaaki Sekiguchi, Asaka; Shigemi Yukizane, Chofu; Hirotaka Kataoka, Kawaguchi; Hirohiko Okabe, Tokorozawa, and Yoshiyuki Kikuiri, Tokyo, all of Japan, assignors to Konica Corporation, Japan**
**Filed Sep. 11, 1995, Ser. No. 526,628**
**Claims priority, application Japan, Sep. 14, 1994, 6-220296; Sep. 28, 1994, 6-233430**
**Int. Cl.[6] B65H** *29/68*
**U.S. Cl. 271—182** **16 Claims**

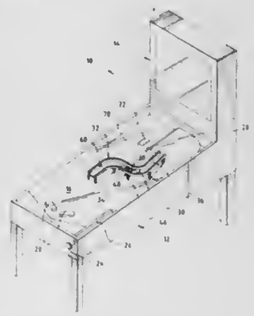



**1**. An apparatus for sorting sheets on a tray, comprising:
a shift device to shift a sheet held on a pair of rollers in a direction perpendicular to a sheet discharging direction toward the tray so that a stacking position of sheets is changed for each set number of sheets to one of different stacking positions on the tray;
a discharging device positioned between the shift device and the tray and discharging the shifted sheet to one of the different stacking positions, the discharging device including
a rotatable discharging roller to discharge the sheet;
a pressing member movable between a low position, wherein said pressing member contacts said discharging roller and reduces a discharging speed of said sheet, and a high position, wherein said pressing member is separated from said discharging roller;
a lower guide plate movable between a first position, wherein said lower guide plate is above said discharging roller, and a second position, wherein said discharging roller is lower than an upper portion of said discharging roller;
a sensor to detect a passage of a sheet;
a driving device to move the lower guide plate and the pressing member in response to a signal from the sensor.



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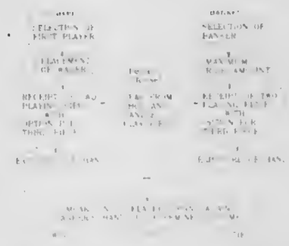
**5,741,010**
**TRAP DOOR PROVIDING FOR INTERLEVEL BALL TRAVEL FOR PINBALL GAME**
**Mark Weyna, 345 S. Warrington Rd., Des Plaines, Ill. 60016**
**Filed Dec. 20, 1996, Ser. No. 771,172**
**Int. Cl.[6] A63F** *7/30*
**U.S. Cl. 273—119 A** **26 Claims**



**1**. An apparatus for providing interlevel play for a pinball game comprising:
an inclined playfield
an elevated surface mounted above the playfield for supporting a rolling ball thereon, said elevated surface having an aperture therein for receiving said rolling ball therethrough;
a trap door movable between a closed position, wherein said trap door supports the rolling ball thereon, and an open position, wherein the rolling ball may be ejected through the aperture and onto said elevated surface; and
an ejecting mechanism adapted to eject said rolling ball from beneath the elevated surface, through the aperture, and onto the elevated surface.

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**5,741,011**
**METHOD OF PLAYING A GAME OF SKILL AND CHANCE**
**Bryan So, Torrance; Stephen A. Miller, Rolling Hills Estates, and Allan L. Nelson, Torrance, all of Calif., assignors to Normandie Casino, Gardena, Calif.**
**Filed Mar. 6, 1997, Ser. No. 810,804**
**Int. Cl.[6] A63F** *1/00*
**U.S. Cl. 273—292** **7 Claims**



**1**. A method of playing a game of chance by a dealer, a player/banker and at least one other player, comprising the steps of:
utilizing a plurality of decks randomly combined into one shoe, said decks comprising 34 playing cards each including 10 numeric pairs of a first color having individual designs and face values within the range of **10-10** to **1-1**, and 7 numeric pairs of a second color having individual designs and face values within the range of **7-7** to **1-1**, one of said cards being designated as a wild card, which, in combination, are capable of establishing an order of prevalence that enables a selection of one set of the playing cards to win over another selection of another set of the playing cards;
furnishing a first randomly selected set of the playing cards to a player;
furnishing a second randomly selected set of the playing cards to a player/banker;
furnishing an additional card to each of said player and said player/banker if requested;
comparing the first randomly selected set of playing cards to the second randomly selected set of playing cards, using predetermined rules of prevalence, to determine a winner or a tie therebetween, said predetermined rules comprising that the highest ranking hand is a pair of 10s of said first color, followed by numeric pairs from 9s to 1s of said first color, numeric pairs from 7s to 1s of said second color, and numeric combinations of any color with a maximum value of 9, with any hand containing 3 cards having a value of no greater than 9;
declaring the game a tie if the values of the first and second randomly selected set of cards are identical; and
otherwise, declaring the highest valued of the first and second randomly selected sets to be the winner.

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**5,741,012**
**METHOD OF PLAYING A GAME OF SKILL AND CHANCE**
**Bryan So, Torrance; Stephen A. Miller, Rolling Hills Estates, and Allan L. Nelson, Torrance, all of Calif., assignors to Normandie Casino, Gardena, Calif.**
**Filed Mar. 7, 1997, Ser. No. 814,742**
**Int. Cl.[6] A63F** *1/00*
**U.S. Cl. 273—292** **8 Claims**



**1**. A method of playing a game of chance by a dealer, a banker/player and at least one other player, comprising the steps of:
utilizing a deck of 34 playing cards including 10 numeric pairs of a first color having individual designs and values within the range of 10—10 to 1—1, a pair of cards of said first color bearing special markings distinguishing said pair of cards from all the remaining playing cards, and 7 numeric pairs of a second color having individual designs and values within the range of 7—7 to 1—1, which, in combination, are capable of establishing an order of prevalence that enables a selection of

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one set of the playing cards to win over another selection of another set of the playing cards;

furnishing a first randomly selected set of the playing cards to a player whose responsibility is to separate the first randomly selected set into front and back hands comprising subsets of the first randomly selected set;

furnishing a second randomly selected set of the playing cards to a banker/player whose responsibility is to separate the second randomly selected set into front and back hands comprising subsets of the second randomly selected set;

comparing the front hand of the player to the front hand of the banker/player using predetermined rules of prevalence to determine a winner or a tie therebetween, and comparing the back hand of the player with the back hand of the banker/player using said predetermined rules of prevalence to determine a winner or a tie therebetween, said predetermined rules comprising that the highest ranking hand is a pair of said first color bearing special markings, followed by numeric pairs of said first color, numeric pairs of said second color, and numeric combinations of any color;

declaring the game a tie if the banker/player wins on one hand and loses on the other hand;

declaring the player the winner if the player wins on both hands or wins on one hand and is equal to the banker/player on the other hand; and

otherwise, declaring the banker/player the winner.

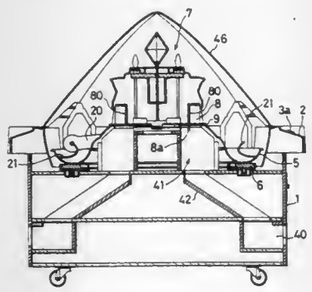
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**5,741,013**

## PRIZE CATCHING GAME MACHINE

**Takashi Hamano, Kawasaki, and Yuichiro Sagawa, Yamato, both of Japan, assignors to Konami Co., Ltd., Hyogo-ken, Japan**

**Filed Aug. 26, 1996, Ser. No. 703,291**
**Claims priority, application Japan, Aug. 28, 1995, 7-240469**
**Int. Cl.[6] A63F** *9/00*
**U.S. Cl. 273—447** **9 Claims**



1. A prize catching game machine comprising:

a table;

a prize catcher for catching a prize carried on the table and transferring the prize which has been caught to a predetermined position and releasing the prize at the predetermined position;

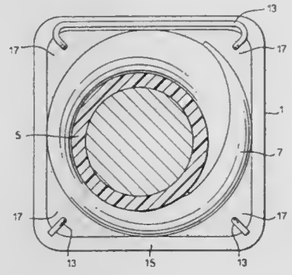
a prize receiver movable between a first position and a second position, said prize receiver having at least one receiving position between said first and second positions, said at least one receiving position underlying said prize catcher when said prize catcher is in said predetermined position such that release of the caught prize in said prize catcher when said prize catcher is in said predetermined position and said prize receiver is in said at least one receiving position effects transfer of said prize from said prize catcher to said prize receiver, said prize catcher including a prize catching member which has a larger width than that of the prize receiver.

**5,741,014**

## DUCT SEALING

**Alain Wambeke, Zoutleeuw, and Jean-Pierre Wandels, Lubbeek, both of Belgium, assignors to N.V. Raychem S.A., Kessel-Lo, Belgium**

**Filed Sep. 14, 1995, Ser. No. 528,088**
**Claims priority, application United Kingdom, Sep. 14, 1994, 9418516; May 31, 1995, 9510956**
**Int. Cl.[6] F16J** *15/46;* **H02G** *15/02*
**U.S. Cl. 277—1** **15 Claims**



1. A kit of parts for closing an end of a duct, the duct having a polygonal internal cross section, the kit comprising:

(a) a sealing member that can be inserted into the duct to form a seal therewith; and

(b) a device that can be inserted into the duct to provide sealing material therein, comprising a support and sealing material located on the support;

the support being in the form of a frame which, in use, is located around the sealing member, and which comprises at least three arms which extend, in use, longitudinally within the duct, each arm of the frame carrying a respective discrete portion of sealing material, whereby each discrete portion of sealing material is arranged at a corner of the polygonal internal cross section of the duct such that at least some of the sealing material of the device is located at the corners of a polygon, to form a seal, in use, between the sealing member and an internal surface of the duct at each corner of the polygonal internal cross-section thereof.

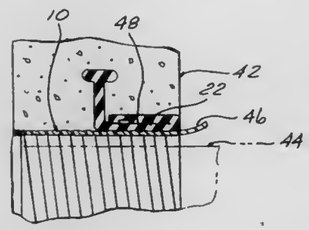
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**5,741,015**

## PIPE TO MANHOLE SEAL

**William O. Skinner, 5520 S. Bend Dr., Fort Wayne, Ind. 46804**

**Filed Jun. 17, 1996, Ser. No. 664,841**
**Int. Cl.[6] F16J** *9/00*
**U.S. Cl. 277—9.5** **8 Claims**



1. In combination, a seal arrangement and a perimeter wall of an opening in a structure, said combination enabling a sealed connection to be made with any of a range of sizes of pipes installed in said opening, said combination comprising:

a hollow cylindrical strippable sleeve core having a preweakening pattern formed therein allowing said sleeve core to be stripped by tearing along said preweakening pattern and collapsing said sleeve core;



an elastomeric sleeve having one segment stretched over said sleeve core;

said elastomeric sleeve having another segment axially offset from said one segment; and,

one end of said elastomeric sleeve another segment formed with a large headed feature extending annularly outward thereof lying radially outward from said one segment, said one end cast into a surrounding cast structure defining said opening perimeter wall.

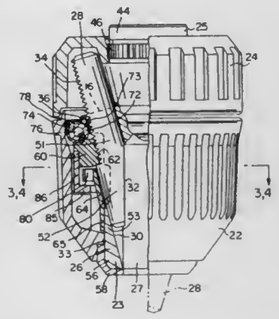
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**5,741,016**

## CHUCK

**Christopher B. Barton, and Stephen W. Steadings, both of Seneca, S.C., assignors to Power Tool Holders Incorporated, Wilmington, Del.**

**Filed Oct. 2, 1996, Ser. No. 720,665**
**Int. Cl.[6] B23B** *31/12*
**U.S. Cl. 279—62** **10 Claims**



1. A chuck for holding the shank of a tool to be used with a manual or powered driver having a rotatable drive shaft, said chuck comprising:

a) a generally cylindrical body member having a nose section and a tail section, said tail section having an axial bore formed therein to mate with the drive shaft of the driver, said nose section having an axial bore formed therein and a plurality of angularly disposed passageways formed therethrough and intersecting said axial bore of said nose section;

b) a plurality of jaws, a separate one of said jaws being slidably positioned in one of each of said angularly disposed passageways, each of said jaws having a jaw face formed on one side thereof and threads formed on the opposite side thereof;

c) a nut rotatably mounted relative to said body member and in engagement with said threads on said jaws;

d) a generally cylindrical sleeve member configured and disposed in driving engagement with said nut and overlying said nose section of said body member whereby rotation of said sleeve member with respect to said body member effects movement of said jaws;

e) a pawl member configured and disposed such that when said jaws are desirably gripping the shank of the tool, said pawl member can be disposed to become constrained against rotation with respect to said nut and said body member so that a predetermined releasing torque must be applied before said nut can rotate with respect to said body member;

f) a nut retainer configured and disposed with respect to said body member to limit travel of said nut in the axial direction relative to said body member, said nut retainer defining an engagement portion; and

g) wherein said pawl member being configured to engage said engagement portion when said jaws are desirably gripping the shank of the tool and said pawl member becomes thereby constrained against rotation with respect to said body member until a predetermined releasing torque is applied to permit said nut to rotate with respect to said body member.

**5,741,017**

## ADJUSTABLE BRAKE MECHANISM FOR ROLLER SKATES

**Henry Chen, 10F, No. 145, Sec. 2, Ming Sheng E. Road, Taipei, Taiwan**

**Filed Jul. 28, 1995, Ser. No. 508,535**
**Int. Cl.[6] A63C** *17/14*
**U.S. Cl. 280—11.2** **2 Claims**



1. A brake mechanism for roller skates, comprising a fixing member, a movable member, a fixing bolt member, and a brake block;

said fixing member having a longitudinally extended curved body with two lateral side faces thereof perpendicular to a top surface thereof, a front end of said fixing member being formed of a transversely extended cylindrical portion which has a central through hole extending a full length of said cylindrical portion for a fastening means to pass therethrough and thereby fixes said fixing member to a skate at a proper position near a rear end thereof, a top portion of said cylindrical portion forming an arched portion raised from said top surface of said fixing member, said fixing member further having a rear half which has a height lower than that of a front half thereof, forming a first step between said two halves, said rear half of said fixing member further having a middle raised part extending from a rear end of said fixing member to said first step, said raised part having a threaded through hole provided thereon at a proper position, and portions on said rear half of said fixing member at two sides of said raised part having toothed top surfaces;

said movable member having a substantially n-shaped cross section and an overall curvature substantially corresponding to that of said fixing member, a front portion of said movable member having a thickness less than that at a remaining rear part of said movable member and having the form of a plate part, such thickness difference forming a second step between the thinner plate part and said remaining rear part of said movable member, an oblong recess being formed on a top surface of said movable member at a predetermined position to extend in parallel to two lateral sides of said movable member, inside said oblong recess an oblong slot smaller than said oblong recess in width and length being further formed, two lateral side faces of said movable member perpendicular to said top surface thereof having toothed lower edges which may engage with said toothed top surfaces portions of said fixing member, near a rear bottom end of said movable member there being a downward extended lower plate member perpendicular to and having the same width as that of said top surface of said movable member, a fixing seat projecting from said lower plate member toward said rear bottom end of said movable member in a direction substantially parallel to said top surface of said movable member and perpendicular to said lower plate member, a threaded hole being formed and centered on said fixing seat to face rearwardly of said mov-

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able member, two protective covers separately downward extending from rear lateral sides of said movable member to be perpendicular to said top surface of said movable member, a fixing hole being provided on each of said protective covers at a lower end thereof for a bolt to pass therethrough and thereby pivotally fixing said protective cover to a hub of a last roller of said skate;

said fixing bolt member being an externally threaded bolt and having an enlarged-diameter head for conveniently turning said fixing bolt member; and

said brake block having a lower hole centered at a bottom side of said brake block to extend into said brake block for an adequate distance, and a through hole having a reduced diameter than a diameter of said lower hole and extending from an inner end of said lower hole to an upper side of said brake block substantially opposite to said bottom side thereof, and said brake block being fixedly attached to said movable member by extending a threaded bolt into said lower hole and threading through said reduced hole and into said threaded hole of said fixing seat at said rear bottom end of said movable member;

wherein said movable member is fitly covered on said fixing member with said n-shaped rear part thereof in contact with an upward arched curved body of said fixing member and said toothed lower edges of said movable member located over said toothed top surfaces of said fixing member, and is firmly attached to said fixing member by threading said fixing bolt member through a washer and into said oblong slot on the top of said movable member as well as said threaded through hole on the top of said raised part of said fixing member; and wherein said fixing bolt member can be loosened to allow said movable member to be slightly moved rearwardly relative to said fixing member until a desired position is obtained, and then said fixing bolt member can be tightly fastened into said threaded through hole of said fixing member to firmly attach said movable member to said fixing member.

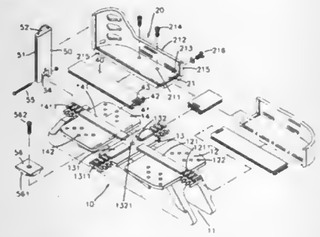
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**5,741,018**

**ADJUSTABLE ROLLER SKATE BOOT DEVICE**

**Yu-Lin Huang, 56, Min Sheng Street, Fengyuan, Taichung, Taiwan**

**Filed Apr. 7, 1997, Ser. No. 826,775**
**Int. Cl.[6] A63C** *17/00*
**U.S. Cl. 280—11.3** **2 Claims**



1. A roller skate boot device comprises:
a base seat,
a first plate mount disposed on the base seat,
a second plate mount disposed on the base seat,
a third plate mount disposed on the base seat,
a plurality of positioning plates disposed on the base seat,
four connecting plates,
a positioning block,
a boot casing having four boot plates,
the first plate mount having a first rail, a plurality of first grooves and a plurality of round holes,
the second plate mount having two second rails, a plurality of second grooves, a center hole and a spacing,
the third plate mount having a third rail, a plurality of third grooves and a plurality of circular holes,
each of the positioning plates having a rectangular hole, a recess and two C-shaped notches,
each of the boot plates having a boot wall, a round flange, a plurality of through holes and a plurality of slots formed on the boot wall,
each of the connecting plates having a retaining ring, an inserted hole and two C-shaped grooves,
the positioning block having four protruded flanges,
each of the positioning plates engaging with each of the corresponding rails via each of the corresponding recesses,
each of the inserted holes receiving each of the corresponding rails,
each of the connecting plate fastened on each of the corresponding rails,
each of the round flanges inserted in the corresponding C-shaped notches,
each of the protruded flanges inserted in each of the corresponding rectangular holes,
each of the connecting plates disposed between two corresponding boot plates,
the positioning block fastened on the second rail,
the boot plate fastened on the corresponding plate mount.

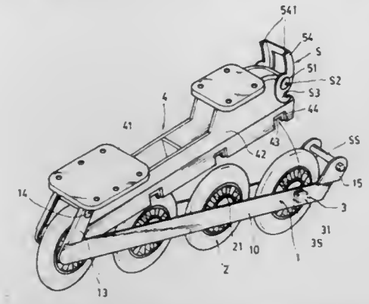
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**5,741,019**

**DETACHABLE FRAME DEVICE FOR IN-LINE ROLLER SKATE**

**Jinny Lu, P. O. Box 55-1670, Taipei (104), Taiwan**

**Filed Jun. 5, 1996, Ser. No. 659,152**
**Int. Cl.[6] A63C** *17/02*
**U.S. Cl. 280—11.22** **10 Claims**



1. A frame device for in-line roller skate comprising: a rack means having a plurality of wheels linearly detachably mounted on the rack means, each said wheel rotatably secured on the rack means by an axle means detachably secured on the rack means, a chassis secured to a boot of the roller skate and pivotally secured to the rack means, and a locking means for locking the chassis with the rack means when each said axle means is clamped in between the chassis and the rack means, whereby upon unlocking of the locking means to separate the chassis from the rack means, said wheel and said axle means are removable from the rack means for replacing a new wheel.

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**5,741,020**

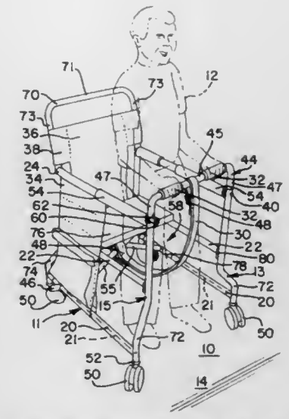
**COLLAPSABLE COMBINATION CHAIR WALKER**

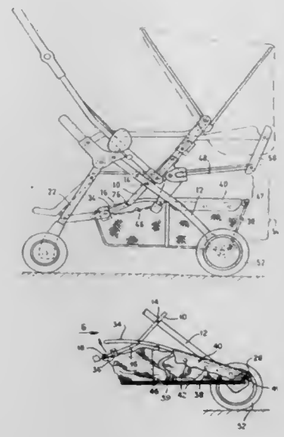
**Mary M. Harroun, 1357 Northmoor Ct., Northbrook, Ill. 60062, assignor to Mary M. Harroun, Hebron, Ill.**

**Filed Aug. 31, 1994, Ser. No. 299,051**
**Int. Cl.[6] B62B** *7/06*
**U.S. Cl. 280—42** **18 Claims**

1. A collapsible combination chair/walker; comprising
a pair of parallel spaced apart side frames, each side frame including a front leg, a rear leg, an upper arm rail, an intermediate level seat support rail and a lower foot rail;







a pair of cross bars intermediate said front and rear legs for permanently interconnecting said frames, each cross bar connected between a foot rail on a side frame and a seat rail on an opposite side frame;
pivot means for supporting opposite ends of at least one of said foot and seat rails for pivotal movement about a longitudinal axis thereof when said side frames are moved toward and away from one another between an expanded operative position and a folded up collapsed position;
slide means for supporting opposite ends of at least one of said seat and foot rails between said front and rear legs for vertical sliding movement between lower and upper positions when said side frames are moved between said operative position and said collapsed position;
seat means having a forward edge between said cross bars and said front legs detachably mounted on said seat rails for retaining said side frames in said operative position, providing a seating surface below said arm rails and an open space forwardly thereof for accommodating the legs of a person standing, walking or sitting;
frontal cross-bar means extending transversely between said side frames adjacent said front legs in a closed position for providing safety and a guide rail for moving said combination chair/walker and movable to an open position for providing ingress and egress to interior space between said side frames from the front and for permitting movement of said side frames toward said collapsed position from said operative position; and
back support means pivotally secured at one end to one of said side frames and detachably secured at an opposite end to an opposite one of said side frames by first releasable locking means, said back support means extending transversely between said side-frames adjacent said rear legs in a closed position for providing safety and back support for a user and for maintaining said side frames in said operative position and movable to an open position extending between said side frames for permitting movement of said side frames toward said collapsed position from said operative position.

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**5,741,021**

**STROLLER HAVING A BREAK-AWAY BASKET**

**Nathanael Saint, Morgantown, and Robert Tor Pike, Reading, both of Pa., assignors to Graco Children's Products Inc., Elverson, Pa.**

**Filed Sep. 15, 1995, Ser. No. 528,760**
**Claims priority, application Germany, Sep. 21, 1994, 94-15275.6**
**Int. Cl.[6] B62B** *7/06*
**U.S. Cl. 280—47.38** **22 Claims**

1. A stroller comprising:
a stroller frame having an extended and closed position;
a basket frame including at least one side leg, which is adapted for supporting a basket, movably mounted to the stroller frame, the basket frame being movable between a closed position and an open position while the stroller is in the extended position; and
at least one stop releaseably joining the stroller frame and at least one of the side legs of the basket frame together;
wherein the stop maintains the basket frame in the closed position and wherein a predetermined force applied to the releases the basket frame from the stop thereby allowing the basket frame to move downward with respect to the stroller frame.

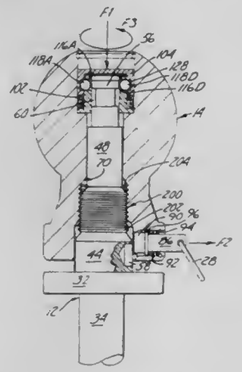
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**5,741,022**

**BALL-EXCHANGE TRAILER HITCH**

**Lloyd G. Wass, 1670 Blackhawk Cove, Eagan, Minn. 55122; Michael Nelson, Rte. 2, Box 100, Henry, S. Dak. 57243, and Kurt L. Drewelow, 214 E. Mound St., Shakopee, Minn. 55379**

**Continuation of Ser. No. 346,859, Nov. 30, 1994, abandoned. This application May 28, 1996, Ser. No. 654,011**
**Int. Cl.[6] B60D** *1/06*
**U.S. Cl. 280—507** **27 Claims**



1 A trailer towing device comprising:
a post configured for attachment to a vehicle, the post including an integral flange for rigidly supporting the trailer towing

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device when secured to a vehicle, and the post having a first and a second locking region; and

a unitary ball having a post aperture for receiving the post, the ball including a spherical portion for receiving a socket on a trailer, a neck portion, and a base portion, the ball having a first and a second locking mechanism;

wherein the first locking mechanism is spring biased inward to selectively interact with the first locking region and the second locking mechanism is positioned to selectively interact with the second locking region to secure the ball to the post when the post is received by the post aperture of the ball.

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**5,741,023**

**BINDING FOR TOURING SKI AND SNOWBOARD**

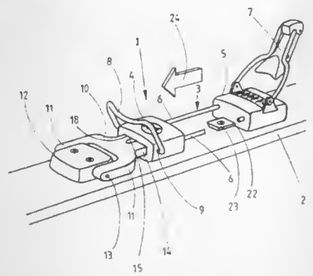
**Stefan Schiele, Forstinning, and Norbert Eugler, Karlsfeld, both of Germany, assignors to silvretta-sherpas Sportartikel GmbH, Karlsfeld, Germany**

**Filed Feb. 17, 1995, Ser. No. 389,873**

**Claims priority, application Germany, Feb. 17, 1994, 44 05 097.6**

**Int. Cl.[6] A63C** *9/00*

**U.S. Cl. 280—607** **11 Claims**



1. A binding for a touring ski and a snowboard, comprising:

a two part binding construction including a base part and a fastening part, said base part being provided with holders for a boot, said base part being employable for snowboard and touring ski use, said base part having a length less than approximately a snowboard width which allows this base part to be arranged on a snowboard substantially transversely thereto without projecting substantially beyond the snowboard, said fastening part taking the form of a lengthening piece connected to said base part, said fastening part being couplable in an articulated manner to a bearing part on a touring ski so as to be pivotable transversely to a longitudinal direction of the ski and forming a swivelable touring binding in combination with said base part, an insert enclosure being constructed at a front end of said base part of the binding to receive the lengthening piece in a positive engagement, and fastening means being provided for securing the lengthening piece in the insert enclosure.

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**5,741,024**

**AIRBAG MODULE COVER ATTACHMENT AND METHOD OF ATTACHING A MODULE COVER TO AN AIRBAG MODULE**

**Mark L. Enders, North Ogden, Utah, assignor to Morton International, Inc., Chicago, Ill.**

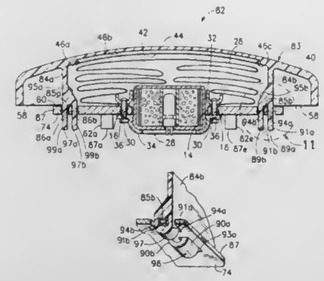
**Filed May 31, 1996, Ser. No. 656,404**

**Int. Cl.[6] B60R** *21/20*

**U.S. Cl. 280—728.3** **20 Claims**

1. An airbag module comprising:

A) a module housing defining a first set of openings and a second set of openings, the first set of openings in spaced, opposed relation to the second set of openings;



B) a folded, inflatable airbag cushion secured to the module housing between the first and the second sets of openings;

C) an airbag inflator secured to the module housing for providing inflation gas for inflating the airbag cushion; and

D) a module cover defining at least one tear seam, the module cover comprising:

a lid positioned over the airbag cushion, the lid having an inner surface and an outer surface;

a first attachment leg and a second attachment leg unitary with and extending from the inner surface of the lid and terminating at bottom edges butting against a first surface of the module housing, the first attachment leg and the second attachment leg in spaced, opposing relationship in alignment, respectively, with the first and the second sets of openings defined by the module housing, with the airbag cushion located between the attachment legs;

a plurality of spaced-apart stakes extending from the bottom edges of each of the first and the second attachment legs, each of the stakes extending through one of the openings of the first and second sets of openings and terminating in a distal end; and

joining means securing the distal ends of adjacent stakes against a second surface of the module housing opposite the first surface so that the stakes cannot be withdrawn from the openings.

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**5,741,025**

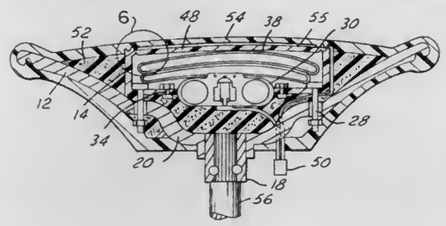
**INTEGRAL STEERING WHEEL AND AIR BAG ASSEMBLY**

**Leo Meyer, Tecumseh, and Saverio Paonessa, Windsor, both of Canada, assignors to KS Centoco Ltd., Windsor, Canada**

**Filed May 22, 1996, Ser. No. 650,247**

**Int. Cl.[6] B60R** *21/16*

**U.S. Cl. 280—731** **7 Claims**



1. A steering wheel and air bag assembly comprising:

a rigid skeleton including a central hub, a rim encircling the hub and a plurality of spokes disposed therebetween;

an air bag module mounted to the skeleton;

a quantity of filler plastic at least partially filling a space between the air bag module and the skeleton and surrounding the air bag module wherein the filler plastic fixes the air bag module relative to the skeleton; and



a continuous plastic coating distinct from the filler plastic disposed over at least a side of the skeleton hub facing a vehicle operator and the air bag module presenting a continuous surface to the vehicle operator when the steering wheel is mounted in a vehicle.

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**5,741,026**

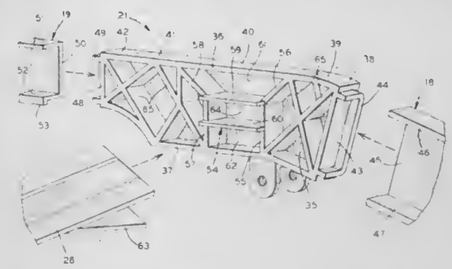
**CONNECTING AND SUPPORTING STRUCTURE FOR VEHICLE FRAME ASSEMBLY**

**Kenneth J. Bonnville, Fleetwood, Pa., assignor to Dana Corporation, Toledo, Ohio**

**Filed May 31, 1996, Ser. No. 656,368**

**Int. Cl.[6] B62D** *21/00*

**U.S. Cl. 280—781** **32 Claims**



1. A connecting and supporting structure adapted for use in a vehicle frame assembly comprising a one-piece body including:

a first joining portion adapted for connection to a first vehicle frame section, a second joining portion adapted for connection to a second vehicle frame section, such that the body and the first and second vehicle frame sections are aligned, and a supporting portion adapted for supporting a vehicle component.

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**5,741,027**

**FRONT STEER AXLE BEAM**

**Clinton Byron Stroh, Portage, and Daniel Earl Banks, Climax, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Jul. 10, 1996, Ser. No. 677,519**

**Int. Cl.[6] B62D** *21/00*

**U.S. Cl. 280—781** **5 Claims**



1. A front steer axle beam for use in a motor vehicle to pivotally support a pair of transversely spaced steerable right and left wheel spindle assemblies, the front steer axle beam comprising:

an elongated transverse beam member generally symmetrical about a center line and formed by a transverse center section having a pair of spaced apart spring mounting pads, a pair of distal ends positioned above the transverse center section for pivotally cooperating with the wheel spindle assemblies, and a pair of S-shaped sections extending between opposed ends of the transverse center section and the spaced apart pair of distal ends, the pair of S-shaped sections having an I-shaped cross-section defined by a single pair of vertically spaced apart flanges and an interconnecting web, each of the S-shaped sections including a pair of integral reinforcing ribs extending between the spaced apart flanges on opposite sides of the web to strengthen the S-shaped sections, thereby resisting bending loads resulting from opposed forces exerted on each distal end and its adjacent spring mounting pad

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**5,741,028**

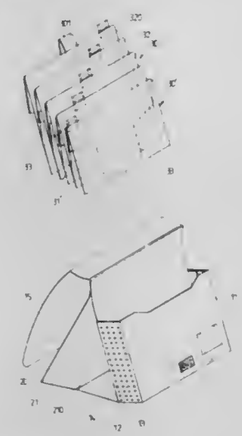
**FOLDER**

**Nobuaki Hatano, 9 Pinewood Cir., Wellesely, Mass. 02181, and Hsieh Feng-Chuan, 11F-2, No. 378, Sec. 1 Weh Hsin Rd., Taichung, Taiwan**

**Filed Feb. 25, 1997, Ser. No. 805,771**

**Int. Cl.[6] B42D** *3/00*

**U.S. Cl. 281—45** **3 Claims**



1. A folder comprising:

a body having a front wall, two side walls respectively extending from two opposite sides of said front wall, a bottom and a rear wall connected between said two side walls, a cover extending from an upper edge of said rear wall;

a stand device including a first plate and a second plate which is foldably connected to a lower edge of said rear wall and said first plate foldably extending from said second plate, said first plate having a free end fixedly connected to said rear wall near said upper edge of said rear wall, and

a plurality of envelopes disposed in said body, each of said envelopes having a front plate and a rear plate which is fixedly connected to said front plate along three of four sides of said front plate, each of said rear plates having a tongue foldably and rearwardly extending therefrom, said envelopes overlapping with each other in series wherein the first envelope is connected to said bottom of said body, each of said tongues except that of the last envelope being fixedly connected to a following envelope's front plate which faces to said tongue in front thereof.

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**5,741,029**

**PIPING ADAPTER**

**Lawrence G. Wilson, Howell, Mich., assignor to Tru-Flex Metal Hose Corporation, Ashburn, Va.**

**Filed Feb. 14, 1996, Ser. No. 601,103**

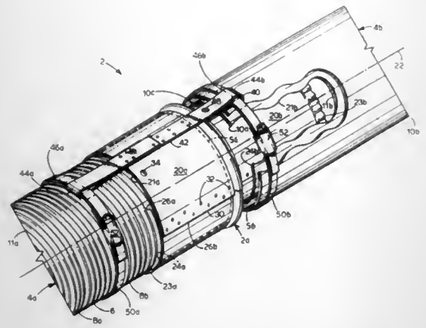
**Int. Cl.[6] F16L** *13/04*

**U.S. Cl. 285—114** **18 Claims**

1. An adapter for fluidically interconnecting first and second piping runs having first and second piping run ends respectively, which includes:

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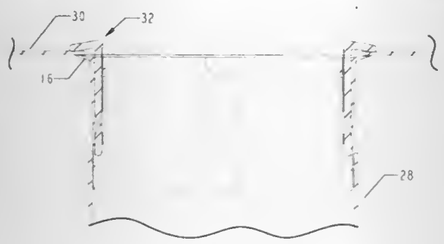




(a) a first section including means for fluidic interconnection to the first piping run end and including a first section end;
(b) a second section including means for fluidic interconnection to said second piping run end and including a second section end;
(c) a transition section interposed between said first and second sections and fluidically interconnecting same;
(d) first annular clamp means associated with said first and second sections and clampingly engaging one of the first section and the first piping run;
(e) second annular clamp means associated with said second section and clampingly engaging one of the second section and the second piping run; and
(f) a retainer with a base means for connection to one of the adapter sections and an end connected to one of the clamp means, said end forming a loop receiving said one of the clamp means.

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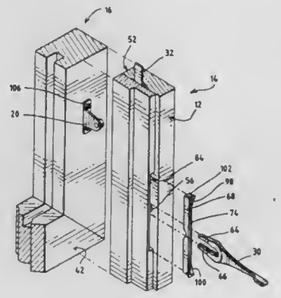
**5,741,030**
**AIR DUCT STARTING COLLAR WITH QUICK MOUNTING MEANS**
**Michael A. Moore, 2607 Williams St., and Scott M. Barhoza, 2621 Williams St., both of Dighton, Mass. 02715**
**Filed Dec. 31, 1996, Ser. No. 775,173**
**Int. Cl.[6] F16L** *55/00*
**U.S. Cl. 285—23** **4 Claims**



1. An air duct starting collar assembly for connection around a hole in a mounting surface comprising:
a collar to accommodate connection of an air duct;
said collar having a central axis
an annular radially outwardly facing flange on said collar to abut one side of the mounting surface when the collar is aligned with the hole;
a plurality of attachment means on said collar for retaining said flange in said abutment with said mounting surface comprising:
at least one assembly clip for engaging the side of the mounting surface opposite said collar, said clip having an insertion end and a mounting surface engaging portion;
guiding means for channelling and allowing movement of said assembly clip in a direction generally parallel to said central axis of said collar;
retaining means for engaging said clip insertion end to retain said clip and allow movement of said clip only in a direction which moves said mounting surface engaging portion closer to said flange;
said mounting surface engaging portion of said clip including a radially outwardly protruding leg to abut the mounting surface on the side opposite said flange when moved toward said flange to thereby sufficiently pinch the mounting surface between said leg and said flange for securing said collar to the hole in the mounting surface.

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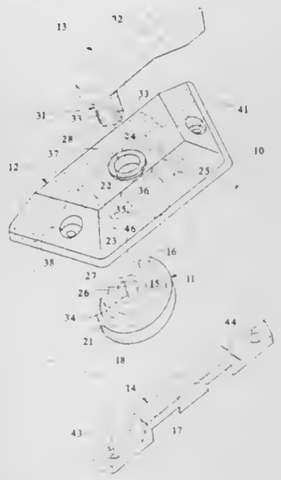
**5,741,031**
**CONCEALED WINDOW LOCK WITH DETACHABLE HANDLE AND ESCUTCHEON**
**Leonard P. Bauman, Byron; Eric P. Heim, Owatonna; Peter E. Braun, Faribault, and Joseph P. Landherr, Rose Creek, all of Minn., assignors to Truth Hardware Corporation, Owatonna, Minn.**
**Filed Mar. 18, 1996, Ser. No. 617,060**
**Int. Cl.[6] E05C** *1/06*
**U.S. Cl. 292—139** **5 Claims**



2. A window lock for selectively locking a window sash closed against a window jamb, the window lock comprising:
a first keeper securable to the window sash;
a first cam securable to the window jamb;
means for axially moving said first cam to selectively engage said first keeper when the sash is substantially closed against the jamb;
a link assembly rotatably mountable on said window jamb, said link assembly operably securable to said moving means to control movement of said first cam into and out of engagement with said first keeper;
a handle secured to said link assembly for rotation therewith;
two legs defining a fork at a distal end of said handle, said two leg of said handle cradling said link assembly when said handle is secured thereto;
two tabs on said link assembly and two recesses on opposite inner surfaces of said legs, wherein the two tabs and the two recesses engage to detachably and reattachably secure said handle to said link assembly,
an escutcheon detachably mountable to said window jamb adjacent said link assembly inside a cavity in said window jamb, said handle being pivotally disposed in said escutcheon;
a second keeper securable to the window sash; and
a second cam securable to the window jamb, said moving means interconnecting said first and second cams, wherein said cavity is disposed between said first and second keepers when said keepers are secured to the window sash.



**5,741,032**
**SASH LOCK**
**Ivanhoe E. Chaput, Torrence, Calif., assignor to Reflectolite Products Company, Inc., Sun Valley, Calif.**
**Continuation of Ser. No. 666,599, Jun. 18, 1996, abandoned. This application Jul. 30, 1997, Ser. No. 902,830**
**Int. Cl.[6] E05C** *3/04*
**U.S. Cl. 292—202** **16 Claims**

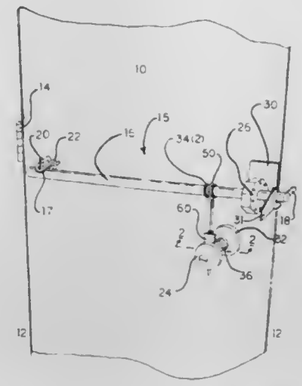


1. A sash lock comprising:
a keeper,
a lock mechanism comprising a rotatable cam disposed within a housing,
the cam comprising an outer circumferential surface, the outer circumferential surface comprising an outward projection that extends outward therefrom, the cam further comprising a channel for accommodating the keeper,
the housing having integral therewith two elongated walls that are parallel in a lengthwise direction that extend downward from an under surface of the housing, the walls being fixedly attached continuosly along a lengthwise edge of each wall to the housing, the cam being disposed between the parallel walls, one of said walls having a first recess and the other of said walls having a second recess for accommodating the projection, the walls being sufficiently resilient so that the projection is biased into the first recess when the cam is in an open position and the projection is biased into the second recess when the cam is in a closed position.

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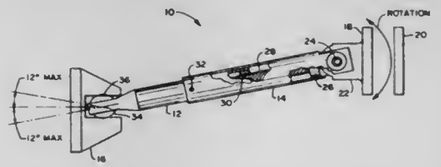
**5,741,033**
**SECURITY OPERATING DEVICE**
**James D. Everett, 1131 Bull Run, Richardson, Tex. 75080**
**Continuation of Ser. No. 172,583, Dec. 23, 1993, abandoned. This application Aug. 29, 1996, Ser. No. 705,018**
**Int. Cl.[6] E05C** *19/18*
**U.S. Cl. 292—289** **15 Claims**

1. A security operating device, in combination with a locking doorknob with an exposed shank, and an auxiliary latching mechanism, consisting of a crossbar extending across a door and over a door jamb and pivoting on said door at one point and providing a positive, nonfrictional latch at another point, said security operating device comprising:
(a) a collar disposed around said exposed shank of said locking doorknob and affixed thereto with set screws for rotation therewith;
(b) a cam block attached to said collar;
(c) an actuator shaft received into said cam block and having an end extending outwardly therefrom; and
(d) a ring connector on an opposing end of said actuator shaft receiving said crossbar therethrough which moves said crossbar into or out of positive latching engagement upon rotation of said locking doorknob, said ring connector defining an open portion of less than about 180°.



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**5,741,034**
**ELECTROMAGNETIC DOOR HOLDER APPARATUS**
**Gurdev S. Bains, Wolcott, Conn., and Hilario S. Costa, Sarasota, Fla., assignors to General Signal Corporation, Stamford, Conn.**
**Filed Oct. 2, 1995, Ser. No. 537,485**
**Int. Cl.[6] E05C** *17/44*
**U.S. Cl. 292—338** **2 Claims**



1. A door holder assembly for use with an associated electromagnet and an associated door having a pneumatic or hydraulic door closer mechanism mounted thereon which comprises:
an elongated body having first and second axial portions;
a threaded member coupled to said first axial portion and to said second axial portion, said threaded member being coupled to one of said axial portions by mating threaded surfaces whereby relative rotation of said first and second axial portions varies the combined axial extent of said elongated body;
said assembly further including a plate at one end of said elongated body and a base at the other end of said elongated body, said base and said plate each being mounted on said elongated body by means that allows relative angular movement therebetween, said means that allows relative angular movement at a first end of said elongated body is a pivot connection, said means that allows relative angular movement at a second end of said elongated body is a spherical member that is mounted between first and second opposed plates, each of said first and second opposed plates having spherical section shaped recesses therein meshing with said spherical member, said spherical member comprising first and second opposed hemisphere shaped elements;
said second end being tang shaped and said first and second opposed hemisphere shaped elements are mounted on opposed sides of said tang shaped second end and said appa-

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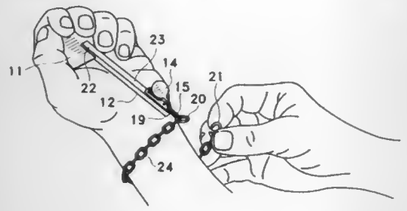


ratus further includes a screw extending through said first and second opposed hemisphere shaped elements and said tang shaped second end;

said screw has a head and said head is countersunk in one of said hemisphere shaped elements.

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**5,741,035**
**DEVICE TO ASSIST IN PUTTING ON FLEXIBLE BRACELETS AND NECKLACES**
**Leo Glass, 20 Hammond St., Monticello, N.Y. 12701**
**Filed Sep. 20, 1996, Ser. No. 716,994**
**Int. Cl.[6] A44B** *21/00;* **B25B** *27/00*
**U.S. Cl. 294—1.1** **7 Claims**




1. A hand held device to assist in putting on jewelry of the type having a fastening means at one end and an attaching means at the other end and being flexible therebetween, said device comprising:

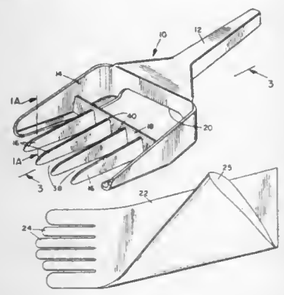
a strut member having a distal end, a proximal end, an upper surface and a lower surface;

stabilizing means fixedly attached to the distal end of said strut member for stabilizing the device in the hand of the user; and

clamp means fixedly attached to the upper surface of the proximal end of said strut member for grasping the attaching means of the jewelry.

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**5,741,036**
**PET WASTE SCOOP ASSEMBLY**
**Irving Ring, 214 Fourth St., Del Mar, Calif. 92014**
**Filed Dec. 12, 1996, Ser. No. 769,637**
**Int. Cl.[6] A01K** *29/00*
**U.S. Cl. 294—1.3** **10 Claims**



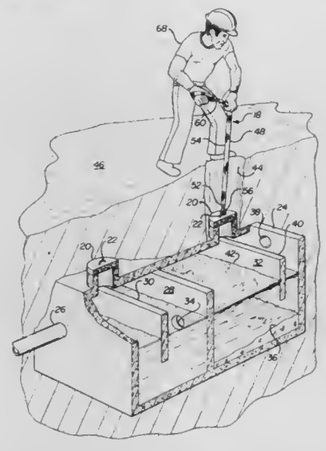

1. An animal waste scoop assembly, comprising:

a shovel member having a handle portion and a shovel portion projecting forwardly from the handle portion, the shovel portion having a series of spaced fingers; and

a disposable bag having an open end for fitting over the shovel and handle portion, the bag having a plurality of spaced fingers for fitting over the respective fingers of the shovel portion and an intermediate portion extending from the fingers to the open end of the bag for covering the remainder of the shovel member including the hand of a user gripping the handle portion beneath the bag.

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**5,741,037**
**SEPTIC TANK LID REMOVING TOOL**
**John R. Ewald, 89 S. Midland, Pontiac, Mich. 48392**
**Filed Jun. 12, 1996, Ser. No. 662,222**
**Int. Cl.[6] B65G** *7/12*
**U.S. Cl. 294—149** **5 Claims**




1. A lid removing tool for removing a lid from a septic tank opening of a septic tank, said lid removing tool comprising:

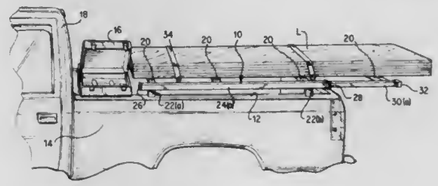
an extension member having a first end and second end and a flexible center portion extending along a predetermined length between said first and second ends;

a securing element fixedly secured to said first end for removably securing the lid to said extension member; and

a length adjuster disposed adjacent said second end of said extension member to adjust said predetermined length of said flexible center portion, said length adjuster including a clasp fixedly secured to said second end.

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**5,741,038**
**APPARATUS FOR EXTENDING EFFECTIVE DIMENSIONS OF TRUCK BED**
**Don Albert Fowler, 507 Gorman Ave., Laurel, Md. 20707, and Leslie Fowler, 524 Londontown Rd., Edgewater, Md. 21037**
**Filed Mar. 20, 1996, Ser. No. 618,795**
**Int. Cl.[6] B60P** *3/40*
**U.S. Cl. 296—3** **16 Claims**




1. An apparatus for extending the effective dimensions of a truck bed having opposing side panels, said apparatus comprising:



a pair of outer runners each having a plurality of first locating means at longitudinally spaced points along the length thereof;

means for attaching one of said runners above each side panel of the truck bed;

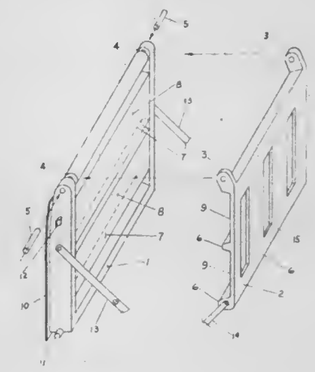
a plurality of center bars having first and second ends extending transversely between said pair of outer runners;

a pair of telescoping runners, each of said telescoping runners being received within one of said outer runners, and each having at least one second locating means thereon;

means for releasably locking said telescoping runners in a first position in which said second locating means is aligned with one of said plurality of first locating means, and in a second position, in which said second locating means is aligned with a different one of said plurality of first locating means.

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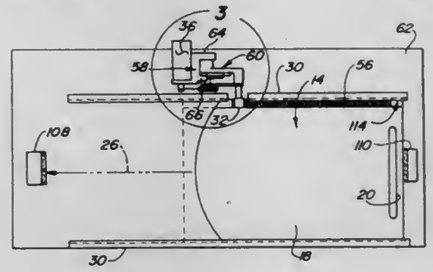
**5,741,039**
**CARGO BOX EXTENDING TAILGATE UTILIZING A TWO PANEL/INTERMESHING DESIGN**
**Edward P. Habdas, 2302 Cochran Rd., Panama City, Fla. 32408**
**Filed Mar. 10, 1997, Ser. No. 813,308**
**Int. Cl.[6] B62D** *25/00*
**U.S. Cl. 296—57.1** **3 Claims**




1. A tailgate assembly for extending the useful surface of the cargo bed of a pickup truck while providing security from axial loss of the cargo, which assembly consists of two panels of sheet metal construction, an outer panel made up of an inner metal sheet and an outer metal sheet and in rotational attachment to the rear of the cargo box and an inner panel made up of an inner metal sheet and an outer metal sheet and in rotational attachment to the outer panel wherein the inner metal sheet of the outer panel has a configuration in which one or more raised sections extend laterally to provide mechanical strength and in which one or more recessed sections extend laterally to receive corresponding raised sections of the inner metal sheet of the inner panel and wherein the inner metal sheet of the inner panel has a configuration in which one or more raised sections extend laterally to provide mechanical strength and in which one or more recessed sections extend laterally to receive corresponding raised sections of the inner metal sheet of the outer panel and wherein the inner panel and outer panel mate into an intermeshing relationship when they are abutting.

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**5,741,040**
**RECIPROCATING MECHANISM**
**Paul Gebauer, St. Clair Shores, and Jay R. White, Bloomfield Hills, both of Mich., assignors to Jay Roberts Company, Troy, Mich.**
**Continuation-in-part of Ser. No. 217,983, Mar. 25, 1994, Pat. No. 5,498,053. This application Sep. 21, 1995, Ser. No. 531,632**
**Int. Cl.[6] B60J** *3/00*
**U.S. Cl. 296—97.2** **18 Claims**




1. A reciprocating mechanism comprising:

a motor;

a drive wheel connected to and rotated by said motor;

an element having an obverse face and a reverse face along a longitudinally extending side;

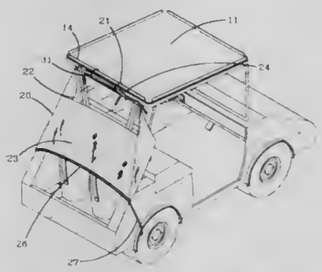
a resilient member biasingly maintaining said drive wheel in resilient contact with said obverse face for moving said element in a forward direction and for maintaining said drive wheel in resilient contact with said reverse face for moving said element in a backward direction;

a starting ramp on said obverse face and a starting ramp on said reverse face at opposite ends of said longitudinally extending side; and

a switch arranged to activate said motor when said element is moved with said drive wheel in contact with one of said starting ramps.

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**5,741,041**
**REAR COVER OF GOLF CARTS**
**Diane Sullivan, 609 Congressional Way, Deerfield Beach, Fla. 33442**
**Continuation of Ser. No. 555,612, Nov. 9, 1995, abandoned. This application Dec. 30, 1996, Ser. No. 774,391**
**Int. Cl.[6] B60P** *7/02*
**U.S. Cl. 296—100** **4 Claims**




1. A separate, removable, rear cover for a golf cart having a body portion attached to an upper frame, said body portion containing a rear area for storage of golf clubs; said cover comprising a flexible, thin, lightweight, removable weather-resistant sheet defined as having an upper edge, a bottom edge, unattached side edges, and an upper seam; said sheet having an upper transparent, plastic panel and a lower woven fabric panel; first shock cord

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means being provided for attaching the upper edge of said sheet to said upper frame; second shock cord means being provided for attaching the lower edge of said sheet to said body portion; said cover being characterized in that when extended, it covers said rear area, and it is capable of being rolled up and attached in rolled-up form to said upper frame by hooks attached to said upper seam, and has means for keeping the rolled-up cover from unraveling after being rolled up.

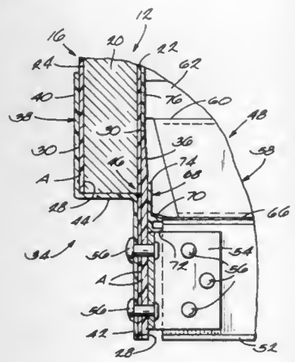
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**5,741,042**

## INTERMODAL CONTAINER INCLUDING DOUBLE LAP SHEAR JOINTS

**Douglas R. Livingston; Brent G. Schaffer, both of Janesville, and Randall V. Guest, Albany, all of Wis., assignors to Stoughton Composites, Inc., Brodhead, Wis.**

**Filed Mar. 23, 1995, Ser. No. 409,471**
**Int. Cl.[6] B62D** *33/00*
**U.S. Cl. 296—187** **22 Claims**



1. A vehicle body comprising
a plurality of interconnected walls forming a box-like structure, one of said walls including a lower extent and a skin member having opposite sides and a portion extending past said lower extent of said one wall, and
a first rail assembly interconnecting said one wall and another of said walls, said first rail assembly including first and second rail sections sandwiching said skin member of said one wall, said first rail section being adhesively bonded to one of said sides of said skin member, and said second rail section being adhesively bonded to the other of said sides of said skin member.

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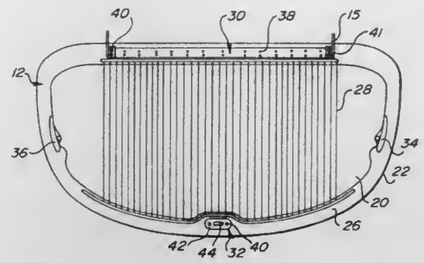
**5,741,043**

## VEHICLE WINDOW ASSEMBLY

**Patrick M. Palajac, Dearborn, and Sandy J. Emerling, Troy, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.**

**Filed Jan. 3, 1996, Ser. No. 582,547**
**Int. Cl.[6] B60J** *1/18*
**U.S. Cl. 296—201** **20 Claims**

1. A window assembly mounted within a rear hatch window opening formed in the body of a vehicle, the window assembly including:
a glass panel including an inner surface and a peripheral edge having a pair of side portions, said glass panel pivotally moveable between a closed position and an open position;
an adjustable support member for supporting said glass panel in said open position, said adjustable support member interconnecting said glass panel and the body of the vehicle, a first end of said adjustable support member being attached to the body of the vehicle; and



a mounting bracket for interconnecting said adjustable support member and said glass panel of said mounting bracket including a mounting portion mounted to said inner surface of said glass panel through an adhesive bond and without any structure extending into or through said glass panel, said mounting portion being elongated in a direction substantially parallel to a longitudinal centerline of the vehicle and having an end extending toward said longitudinal centerline such that said end functions to oppose a bending moment introduced by said adjustable support member.

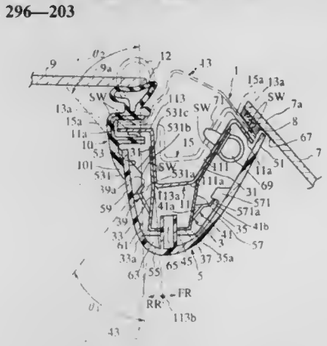
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**5,741,044**

## PILLAR GARNISH SUPPORT STRUCTURE FOR AUTOMOBILE

**Akira Kawai, Minami-ashigara; Tetsuo Maki, Yokosuka, and Shozo Suzuki, Iruma, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Feb. 26, 1996, Ser. No. 606,799**
**Claims priority, application Japan, Feb. 28, 1995, 7-040287**
**Int. Cl.[6] B62D** *25/04*
**U.S. Cl. 296—203** **7 Claims**



1. A pillar garnish support structure for a vehicle including a pillar inner panel having a substantially U-shaped cross section and having a front panel disposed vis-a-vis an end of a front window panel of the vehicle and a rear panel disposed vis-a-vis an end of a rear window panel of the vehicle and a garnish main body supported by the front panel and the rear panel of the pillar inner panel in such a way that an inner surface of the garnish main body confronts the internal surface of the pillar inner panel so that the pillar inner panel is covered by the garnish main body, the pillar garnish support structure comprising:
a bracket interposed between the garnish main body and the pillar inner panel, said bracket is provided with a projection having its apex displaced rearward from the rear panel of the automobile and said projection is provided with a through bore;
said projection of said bracket linearly contacting the inner surface of the garnish main body and receiving and supporting a boss of the garnish main body inserted into the through bore of said projection of said bracket.



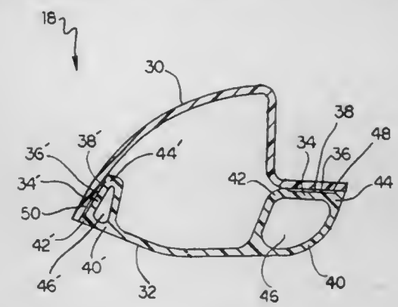
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**5,741,045**

## CAR BODY PART WITH HIDDEN BONDING SURFACE

**Delbert D. DeRees, Romeo, and Donald E. Jay, Troy, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.**

**Continuation of Ser. No. 545,062, Oct. 19, 1995, abandoned.**
**This application Jul. 1, 1997, Ser. No. 886,839**
**Int. Cl.[6] B62D** *25/00*
**U.S. Cl. 296—203** **8 Claims**



1. An automotive body component assembly, comprising:
a one-piece plastic inner panel having two spaced-apart longitudinal sealing walls, each said wall including a longitudinal bonding surface;
a one-piece plastic outer panel bonded to the inner panel at the two bonding surfaces of the inner panel thereby forming two joints, the bonded inner and outer panels forming a longitudinal hollow region between the joints,
the inner panel further having a supplemental wall corresponding to each sealing wall, each supplemental wall having a first side end and a second side end and being formed in one-piece with its corresponding sealing wall at its first and second side ends forming a longitudinal voided structure with a void between the sealing wall and its corresponding supplemental wall, the one-piece longitudinal voided structure having a top end and a bottom end,
each longitudinal voided structure having a top capping wall being formed in one-piece with the sealing and supplemental walls and sealing the top end of the longitudinal voided structure and a bottom capping wall being formed as one-piece with the sealing and supplemental walls and sealing the bottom end of the longitudinal voided structure, thereby enclosing the void.

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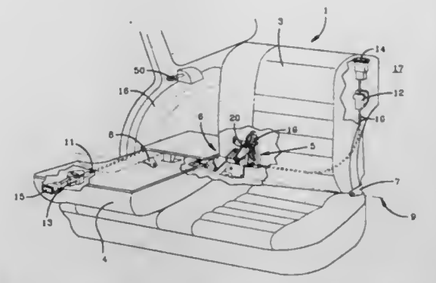
**5,741,046**

## MOTOR VEHICLE REAR SEAT WITH A DIVIDED BACK REST

**Andrew Leuchtmann, Bad Kreuznach, and Hans-Peter Gimbel, Trebur, both of Germany, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jan. 9, 1995, Ser. No. 370,279**
**Claims priority, application Germany, Feb. 24, 1994, 44 05 959.0**
**Int. Cl.[6] B60N** *2/02*
**U.S. Cl. 297—378.13** **7 Claims**

1. An arrangement of a folding rear seat in a body of a motor vehicle, the rear seat having a back split along a plane into a first seat back and a second seat back, the first and second seat backs having a first pivotal axis with the vehicle body, the first pivotal axis being horizontal and transverse to a direction of travel of the motor vehicle, the arrangement comprising:



first and second outboard hinges, each outboard hinge having a fastener member fixably connected to the motor vehicle body and a second member fixably connected to a respective seat back, the first and second outboard hinge fastener member and second member being pivotally connected along the pivotal axis;
at least a first inboard hinge located adjacent the split plane of the motor vehicle seat back, the inboard hinge including a fastener member fixed with the vehicle body at a location rearward of the outboard hinge fastener members;
a retraction mechanism for the first seat back and the second seat back, each retraction mechanism having at least a first and second generally equal scissors length links pivotally joined to one another approximately at their centers, the first scissors link being pivotally connected to the inboard hinge fastener member at one end, and the first scissors link being pivotally joined to a first intermediate link at the opposite end, the first intermediate link also being pivotally connected to the respective seat back, and the second scissors link being pivotally connected to the respective seat back at one end and pivotally connected to a second intermediate link at an opposite end, the second intermediate link being pivotally connected with the inboard hinge fastener member, and wherein the respective seat back describes a circular path around the first pivotal axis when the seat back is folded forward.

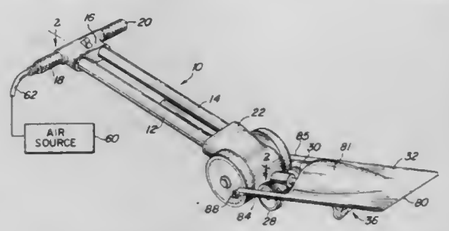
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**5,741,047**

## ROOFING MATERIAL STRIPPING MACHINE

**Rudy Ordonez, 3036 W. Mariposa, Phoenix, Ariz. 85017**

**Filed Apr. 9, 1996, Ser. No. 630,003**
**Int. Cl.[6] E04D** *15/02*
**U.S. Cl. 299—37.1** **12 Claims**




1. A machine for stripping material from a generally planar substrate comprising:
(a) a frame having an upper and lower end, said frame being supported on wheels and having guide means;
(b) power transmission means having power means and at least one drive wheel disposed at the lower end of said frame;
(c) a blade with a leading edge, said blade being supported on a fulcrum engageable with the substrate, said fulcrum being axially reciprocal along said guide means; and
(d) said blade having arms extending rearwardly and being eccentrically connected to said drive wheel whereby upon actuation of said power means, said blade is driven through

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said power transmission means in a reciprocatory, rotating motion to strip and remove material.

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**5,741,048**

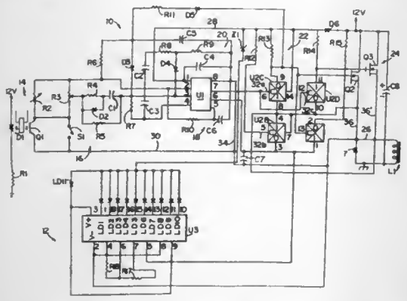
## CONTROLLER FOR ELECTRIC BRAKING SYSTEM

**Larry Eccleston, Marshall, Mich., assignor to Tekonsha Engineering Company, Tekonsha, Mich.**

**Continuation of Ser. No. 218,837, Mar. 28, 1994, abandoned, which is a continuation of Ser. No. 129,799, Sep. 30, 1993, abandoned, which is a continuation of Ser. No. 877,323, Apr. 30, 1992, abandoned, which is a continuation of Ser. No. 563,505, Aug. 7, 1990, Pat. No. 5,149,176, which is a continuation-in-part of Ser. No. 390,617, Aug. 7, 1989, Pat. No. 5,050,937. This application Dec. 6, 1994, Ser. No. 350,499**

**Int. Cl.[6] B60T** *13/72*

**U.S. Cl. 303—7** **12 Claims**



**1**. A method of electrically actuating brakes of a towed vehicle by using an electronic controller to apply power from an automotive power supply of at least one of a towing vehicle, which tows said towed vehicle, or said towed vehicle, comprising the steps of:

providing a MOSFET switching element;

providing a housing for the switching element, said housing being compact and having only a minimal amount of heat sink structure;

detecting an actuation and determining a magnitude of actuation of the towing vehicle's brakes;

controlling the output of the MOSFET switching element to produce a pulse width modulated current having a substantially low power loss and having an effective magnitude which is proportional to the determined magnitude of the detected actuation of the towing vehicle's brakes;

and applying the output of the MOSFET switching element to actuate the towed vehicle's brakes such that a minimal amount of heat is generated within the housing by use of the MOSFET switching element and thereby enabling the housing to be compact and have said minimal amount of heat sink structure.

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**5,741,049**

## BRAKE PROPORTIONING VALVE

**Ronald L. Sorensen, Erie, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.**

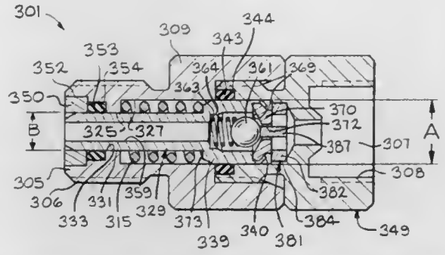
**Continuation-in-part of Ser. No. 460,522, Jun. 2, 1995, Pat. No. 5,522,651. This application Jun. 3, 1996, Ser. No. 659,077**

**Int. Cl.[6] B60T** *8/26*

**U.S. Cl. 303—9.75** **9 Claims**

**1**. A low atmospheric restrictive flow brake proportioning valve, comprising:

a sleeve having an inlet end and an outlet end, said sleeve having a bore of first diameter and a bore of second diameter, said bore of second diameter being larger in diameter than said bore of first diameter, said bore of first diameter located closer to said inlet end of said sleeve than said bore of second diameter;



a plunger having an inlet portion having a diameter providing a sliding fit within said bore of first diameter of said sleeve and an outlet portion having a diameter providing a sliding fit within said bore of second diameter, said inlet portion of said plunger terminating in an inlet end, said outlet portion of said plunger terminating in an outlet end, said plunger and said sleeve including stop means for allowing said plunger to travel a predetermined distance within said sleeve;

a through flow passage located within said plunger;

a check valve biased towards a closed position to block flow through said through flow passage;

said stop means including a first stop effective to limit the travel of said plunger in a direction toward said outlet end of said sleeve;

a check valve opening means effective to open said check valve when the position of the outlet end of said plunger is proximate said first stop;

a tensioning spring urging said plunger toward said first stop; and

an outlet fluid reservoir defined by said bore of said second diameter of said sleeve, whereby the proportioning valve is (i) open to flow from a master cylinder at said inlet end, through said through flow passage, across said valve seat and out said outlet and at lower brake apply pressures; (ii) closed to flow across said valve seat at higher brake apply pressures creating a pressure differential across said plunger sufficient to overcome said tensioning spring, and (iii) rapidly reopened across said valve seat when the aforesaid pressure differential is reduced to the point that the force of the tensioning spring is no longer overcome.

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**5,741,050**

## SWITCHABLE FAST-FILL HYDRAULIC CIRCUIT FOR USE IN VEHICLE BRAKING SYSTEMS

**Blaise J. Ganzel, and Gerald M. Sivulka, both of Ann Arbor, Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.**

**Filed Aug. 18, 1995, Ser. No. 516,784**

**Int. Cl.[6] B60T** *13/16*

**U.S. Cl. 303—10** **2 Claims**

**1**. A switchable fast-fill hydraulic control circuit for use in an antilock/traction control/vehicle stability braking system, the circuit comprising:

at least one normally open wheel cylinder isolation valve having an input port and an output port;

at least one normally closed dump valve having an input port connected to the output port of the at least one wheel cylinder isolation valve and to at least one wheel brake cylinder, the at least one dump valve further having an output port;

a low pressure accumulator having a low pressure accumulator port connected to the output port of the at least one dump valve;

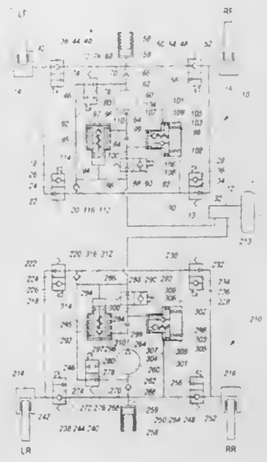
a hydraulic pump having an input port and an output port;

a low pressure accumulator check valve having an input port connected to the low pressure accumulator port and having an output port connected to the input port of the hydraulic pump;

a normally open pilot valve having an output port connected to the input port of the hydraulic pump and having an input port;

a normally open traction control isolation valve having an output port connected to a pressurizing chamber output port of a





master cylinder and to the input port of the pilot valve, the traction control isolation valve further having an input port;

a high pressure accumulator having a high pressure accumulator port connected to the output port of the traction control isolation valve and having a spring cavity input port connected to the output port of the hydraulic pump, the high pressure accumulator further including a high pressure accumulator bypass valve;

a fluid flow intensifier slidably including therewithin a stepped intensifier piston and defining therein an input chamber, an input chamber port connected to the input of the traction control isolation valve, an annular intermediate chamber, an intermediate chamber port connected to the low pressure accumulator port, an output chamber, and an output chamber port connected to the input port of the at least one wheel cylinder isolation valve, the fluid flow intensifier also including an intensifier check valve and an intensifier bypass valve, both being connected between the input chamber and the output chamber;

a flow restrictor connected between the output of the hydraulic pump and the input of the traction control isolation valve; and

an isolation check valve having an input port connected to the output port of the traction control isolation valve and having an output port connected to the input port of the at least one wheel cylinder isolation valve.

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**5,741,051**

## ACCELERATION SLIP CONTROL SYSTEM FOR MOTOR VEHICLE

**Seiichi Nakashima, and Taro Hirose, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Filed Feb. 1, 1996, Ser. No. 595,096**

**Claims priority, application Japan, Feb. 14, 1995, 7-025196**

**Int. Cl.[6] B60T** *8/58*

**U.S. Cl. 303—141** **9 Claims**

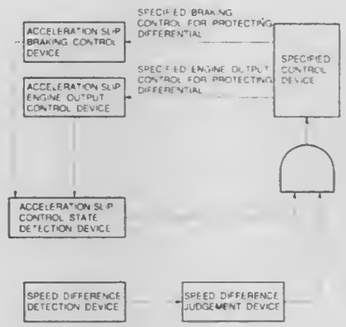
**1**. An acceleration slip control system for a motor vehicle having driving wheels, said system comprising:

braking control means for applying a braking force to at least one of the driving wheels to control acceleration slip;

engine output control means for regulating an engine output of the motor vehicle to control acceleration slip;

speed difference detecting means for detecting a rotational speed difference between the driving wheels;

speed difference comparison means for determining whether said speed difference between the driving wheels is equal to or greater than a predetermined value;




acceleration slip control detection means for detecting an acceleration slip control by at least one of said braking control means and said engine output control means; and

main control means for altering a method of acceleration slip control being performed so that at least said engine output control means further or newly reduces the engine output of the motor vehicle when said speed difference comparison means determines that a rotational speed difference between the driving wheels is equal to or greater than a predetermined value and said acceleration slip control is detected by said acceleration slip control detection means.

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**5,741,052**

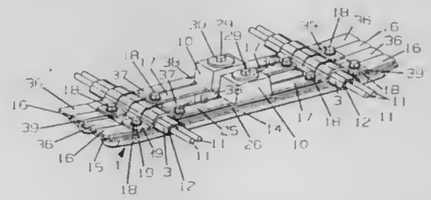
## TRACTOR ENDLESS TREAD

**Tyman H. Fikse, P. O. Box 1008, La Conner, Wash. 98257**

**Filed Jun. 19, 1996, Ser. No. 666,941**

**Int. Cl.[6] B62D** *55/215*

**U.S. Cl. 305—170** **7 Claims**

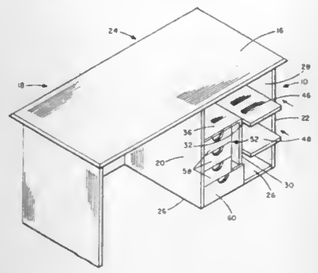


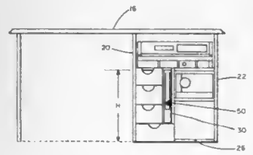
**1**. In a tractor endless tread including an endless string of grouser-mounting base plates and an endless loop of wire rope embedded in elastomer material disposed adjacent to said grouser-mounting base plates, adjacent grouser-mounting base plates being spaced lengthwise of the endless loop, the improvement comprising a clamping strip overlying each grouser-mounting plate and engaged with said endless loop, intermediate spacer strip means disposed coplanar with and bridging between adjacent clamping strips, tongue-and-groove joints between adjacent clamping strips and intermediate spacer strip means, each of said tongue-and-groove joints including grooves having outer sides formed by opposite margins of said grouser-mounting plates projecting beyond the opposite edges of their clamping strips, the bottoms of said tongue-and-groove joint grooves being formed by the edges of said clamping strips, groove inner side means overhanging opposite edges of said clamping strips for forming the inner sides of said tongue-and-groove joint grooves, and the tongues of said tongue-and-groove joints being formed by the opposite margins of said intermediate spacer strip means fitting in said grooves, and securing means for securing each of said clamping strips to its grouser-mounting base plate for anchoring said endless loop to such grouser-mounting base plate.

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**5,741,053**
**PEDESTAL FOR UTILIZING COMPUTER HARDWARE AND ACCESSORIES**
**Andreas Krestian Nielsen, Del Mar, Calif., assignor to Ladd Furniture, Inc., High Point, N.C.**
**Filed Jan. 21, 1997, Ser. No. 784,605**
**Int. Cl.[6] A47B *17/00***
**U.S. Cl. 312—194** **32 Claims**



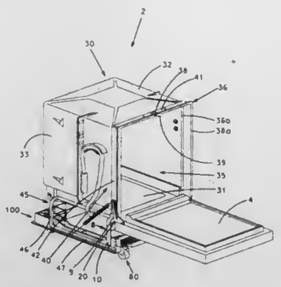


1. A pedestal for storing and readily utilizing computer hardware and ancillary computer equipment and supplies, said pedestal including:
a. first and second spaced-apart, opposite side walls and a base, said walls and base defining a substantially rectangular-shaped structure having a hollow interior and an open front wall;
b. an intermediate, fixed, vertical partition extending from the base to a pre-determined height within the interior portion, said vertical partition having a top end and a bottom end;
c. a fixed half shelf extending from the first side wall at a predetermined height to the top end of the vertical partition;
d. a first interior compartment formed between the vertical partition and the second side wall, said first interior compartment being specifically dimensioned for storing a vertical tower;
e. an adjustable half shelf positionable directly adjacent to the fixed half shelf and extending from the second side wall to the top end of the vertical partition and being removable therefrom, wherein said fixed half shelf and said adjustable shelf join together to define a horizontal shelf surface extending from the first side wall to the second side wall for storing a horizontal CPU; and
f. wherein said interior is easily customized to be specifically dimensioned for storing either a vertical tower or a horizontal CPU by selectively removing or adding the adjustable half shelf.

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**5,741,054**
**STRUCTURAL FOAM BASE FOR A PORTABLE DISHWASHER**
**Craig H. Becker, Fond-du-lac, Wis., and Bradley B. Hobday, Goldsboro, N.C., assignors to White Consolidated Industries, Inc., Cleveland, Ohio**
**Filed Aug. 9, 1996, Ser. No. 689,525**
**Int. Cl.[6] A47L *15/00***
**U.S. Cl. 312—228** **18 Claims**

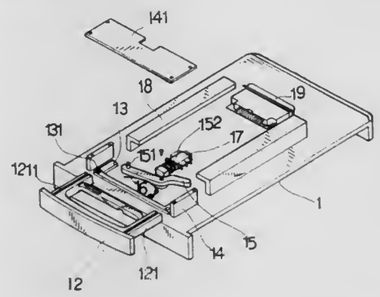
1. A movable support structure for a washer having a tub supported by a frame with legs, said support structure comprising:



a base with a plurality of vertical bores formed therein, said base being composed of a structural foam and including:
a front portion;
a rear portion defining a compartment for holding a mass of material; and
first and second side portions joined to the front and rear portions, said first and second side portions each having an upwardly-extending surface adjoining an inner side edge of a horizontal surface adapted to support one of the legs of the frame, said inner side edges each extending between the front and rear portions; and
a plurality of casters upon which the base is disposed, said casters each having an arcuate member rotatably secured to a mount with an upward-projecting pintle, said pintles being securely disposed within the vertical bores of the base.

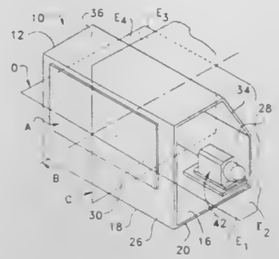
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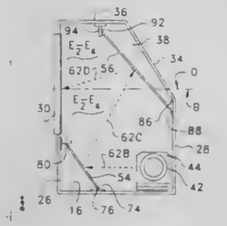
**5,741,055**
**DRAWER FOR A HARD DISK DRIVE**
**Teng-Chun Chen, No. 1-1, Lane 269, Fu-Teh 1st Rd., Hsi-Chih, Taipei Hsien, Taiwan**
**Filed Oct. 15, 1996, Ser. No. 730,194**
**Int. Cl.[6] G06F *1/16*; A47B *95/02*; H05K *7/14***
**U.S. Cl. 312—348.6** **4 Claims**



1. A hard disk converting drawer structure comprising a drawer and a fixing seat, wherein:
a pull handle is disposed at the front end of bottom side of the drawer, two lateral sides of the pull handle being disposed with two balance levers each of which is formed with an upper and a lower slide channels, whereby the pull handle is back and forth movable along a locating block disposed on each of two symmetrical plane boards, two vertical locating boards being disposed on outer sides of the plane boards for locking a cover board thereon, the cover board being disposed with two engaging blocks, whereby the pull handle can be stably slided without detachment, a transverse beam being disposed between the two balance levers of the pull handle, the transverse beam being formed with a slot in which a boss disposed at one end of an auxiliary lever is fitted to pull back and forth, the auxiliary lever being formed with a shaft hole for left and right swingably securing the auxiliary lever on the drawer, one side of the auxiliary lever being resiliently forced by a leaf spring, while the other side thereof being engaged with a touch switch, two opposite inward bent L-shaped guide rails being disposed on two lateral sides of the drawer;
the fixing seat is a box body for the drawer to insert therein, the front side of the fixing seat being formed with an opening for freely movably receiving the pull handle, two opposite outward bent L-shaped guide rails being disposed in the fixing seat, whereby the L-shaped guide rails of the drawer are inserted and retained therein.

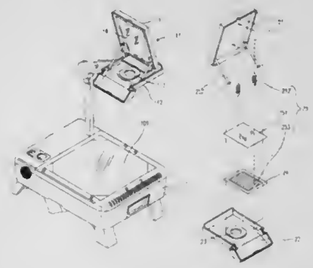






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**5,741,056**
**PROJECTION HEAD MECHANISM OF A PROJECTING MACHINE**
**Tom Liu, Taipei Hsien, Taiwan, assignor to Primax Electronics Ltd., Taipei Hsien, Taiwan**
**Filed Apr. 23, 1997, Ser. No. 839,076**
**Int. Cl.[6] G03B *21/14***
**U.S. Cl. 353—56** **2 Claims**



1. A projecting head mechanism of a projecting machine adapted to project an image generated by a non-reflective document which is penetrated through by a light beam from said projecting machine to a screen display, said projecting head mechanism comprising:
an upper cover having an internal surface area;
a lower cover engaged with said upper cover;
a focusing member mounted on said lower cover for causing said image to be focused;
a projecting member mounted on said internal surface area of said upper cover for projecting said focused image to said screen display; and
thermo-conducting means provided between said projecting member and said internal surface area of said upper cover for evenly distributing said heat generated by said light beam over an outer surface area of said projecting member.

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**5,741,057**
**DEVICE FOR DISPLAYING A PROJECTED IMAGE**
**Gerald K. Goldberg, 500 E. Wadsworth Ave., Philadelphia, Pa. 19119, and Richard J. Rhindress, 128 Spruce La., Collegeville, Pa. 19426**
**Filed Apr. 22, 1996, Ser. No. 636,026**
**Int. Cl.[6] G03B *21/28***
**U.S. Cl. 353—74** **3 Claims**

3. A device for displaying a projected image comprising:
a housing, said housing comprising a rectangular base, a major dimension defined by two long sides, and a minor dimension defined by two short sides, said major and minor dimensions being at right angles to each other,
a rear projection screen, said screen being supported along one of the sides of said base and extending in the same direction as said major dimension, said screen having a front surface and a rear surface, said rear surface facing the interior of said housing enclosed by said long and short sides and said floor,
a projector, said projector being supported in said housing on said base and being disposed so that it projects an image along a projection path that is in the same direction as said major dimension,
at least first, second and third reflector supported in said housing, said first reflector being disposed in the projection path emanating from said projector and being disposed at an angle relative to said projection path so that it changes the direction of said path,
said second and third reflectors being rectangular, being disposed along said major dimension of said housing and lying in perpendicular relation to said projection path,
a framework for supporting each of said second and third reflectors, each of said frameworks including means defining a pivotal connection for connecting it to the lower edge of its respective reflector so that the angles of said reflectors relative to the projection path can be adjusted so that the image projected by said projector is directed to the rear of said rear projection screen,
said projector and said reflectors define said projection path to enable an image emanating from said projector to be projected onto the rear surface of said rear projection screen, and
said projection path is longer than the distance between said two long sides.

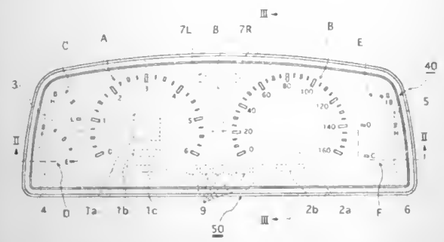
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**5,741,058**
**LED DISPLAY DEVICE**
**Akihiko Suzuki, Kagamigahara; Makoto Tamaki, Iwakura; Takemasa Yasukawa, Ichinomiya; Osamu Yamanaka, Aichiken, and Tadanobu Iwasa, Ichinomiya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Aichi, Japan**
**Filed Jul. 31, 1996, Ser. No. 688,837**
**Claims priority, application Japan, Jul. 31, 1995, 7-195615; Jul. 31, 1995, 7-195617; Aug. 1, 1995, 7-196820; Mar. 25, 1996, 8-068017**
**Int. Cl.[6] G01D *11/28***
**U.S. Cl. 362—27** **23 Claims**

1. A display device having a front side, a rear side and a display area, comprising:
a printed circuit board;
a first LED array including a plurality of LEDs disposed on said printed circuit board at a position corresponding to said display area;
a lens array including a plurality of lens elements, each of said lens elements having an incident surface facing at least one of said plurality of LEDs in said first LED array and a radiant

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surface diffusing incident light entering said incident surface so as to radiate said light toward said front side of said display device;

a cover lens disposed on said lens array at said front side of said display device, said cover lens having an end; and

a second LED array including a plurality of LEDs disposed on said printed circuit board such that said second LED array radiates light into said end of said cover lens;

said cover lens transmitting incident light from said plurality of LEDs of said second LED array from said end of said cover lens generally toward said lens array at said front side of said display device.

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**5,741,059**

**VEHICULAR HEADLAMP HAVING IMPROVED AIMING SCREW SUPPORTING STRUCTURE**

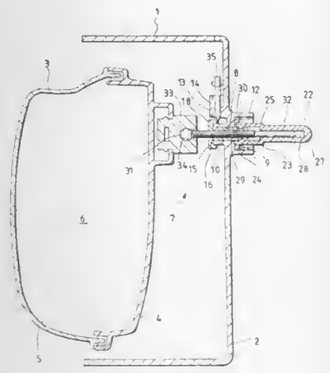
**Masahiro Kusagaya, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan**

**Filed Jul. 6, 1995, Ser. No. 499,552**

**Claims priority, application Japan, Jul. 28, 1994, 6-194588**

**Int. Cl.[6] B60Q** *1/068*

**U.S. Cl. 362—66** **30 Claims**



1. An aiming screw supporting structure for a vehicular headlamp, comprising:

an aiming screw member comprising a threaded part, a ball part integrally formed at a front end of said threaded part, and slide shaft part formed at a rear end of said threaded part, said slide shaft part being unthreaded and not circular in cross section;

a gear shaft member rotatably supported by a lamp housing for the headlamp, comprising a gear part having a threaded hole into which said threaded part of said aiming screw is threadably engaged; and

a fastener member prevented from rotating with respect to the lamp housing, said fastener member having formed therein a longitudinal slide hole within which said unthreaded slide shaft part of the aiming screw member is slidably engaged, said slide hole being unthreaded and not circular in cross section, and comprising a fixing part for fixing said gear shaft member to the lamp housing.

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**5,741,060**

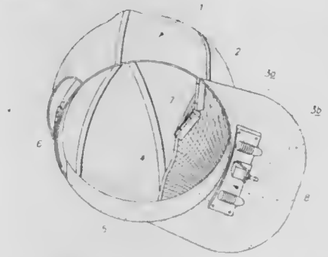
**BASEBALL CAP LIGHT**

**Thomas R. Johnson, 2217 NE. 6th Pl., Renton, Wash. 98056**

**Filed Aug. 28, 1996, Ser. No. 697,614**

**Int. Cl.[6] F21L** *15/14*

**U.S. Cl. 362—106** **10 Claims**



1. A combination baseball style cap and light assembly, the cap having a crown, a bill extending from the crown, a sweatband liner circumscribing a bottom edge of the cap, and a reinforcing crown liner, the combination including: a double light and switch assembly comprising first and second lamp sockets affixed to a mounting plate, which plate is in turn affixed to an underside of the bill of the cap; the two lamp sockets having axes that decline at an acute angle to the plate and converge at an acute angle to a line perpendicular to a front edge of the plate, setting a focal point of the lamps at a predetermined location directly out from and generally equidistant between a wearers eyes; a micro switch affixed to an integral mounting flange on the mounting plate located approximately on a center line of the mounting plate between the two sockets; first and second battery holders each affixed respectively to each side of a center line of a top edge of a reinforcing element of the crown of the cap and a top edge of the crown of the cap; and circuit means electrically coupling the micro switch, the lamp sockets and the battery holders.

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**5,741,061**

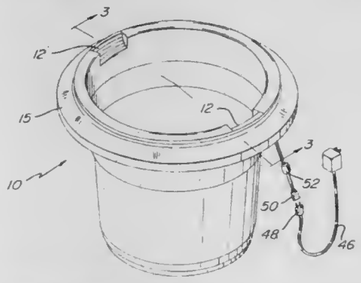
**LIGHT-UP PLANTER**

**Roger W. Lehmann, and Michael I. Satten, both of 3100 Woodbridge Ave. Suite 102, Edison, N.J. 08837**

**Filed Nov. 22, 1996, Ser. No. 755,043**

**Int. Cl.[6] F21V** *31/00*

**U.S. Cl. 362—154** **10 Claims**



1. A planter ring adapted to be secured to an upper lip of a planter, said ring incorporating at least one light source so oriented that when said ring is secured to said planter, the light source from said light will be directed upwardly at an approximately 45° angle in order to illuminate a plant contained within the planter.



**5,741,062**

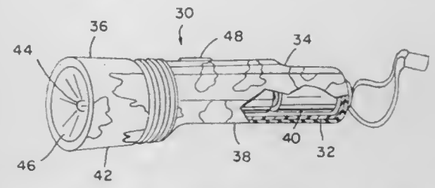
**INTEGRAL CAMOUFLAGE FLASHLIGHT**

**Stephen Shiu-Fai Man, Kwai Chung, Hong Kong, assignor to Rayovac Corporation, Madison, Wis.**

**Filed Aug. 16, 1996, Ser. No. 698,790**

**Int. Cl.[6] F21L** *15/00*

**U.S. Cl. 362—208** **5 Claims**



1. A camouflage patterned flashlight formed by the process comprising the steps of:

a) positioning a plurality of rubber pattern shapes on a rubber base layer to form a desired arrangement of colors, wherein the thickness of each pattern shape is less than the thickness of the base layer, and wherein the pattern shapes and base layer are formed of rubber of similar kind, except for color, and wherein the pattern shapes differ in color from the color of the base layer;

b) engaging the pattern shapes on the base layer to form a rubber multilayer assembly;

c) positioning the multilayer assembly in a compression mold;

d) heating the compression mold to cause a flowing of the pattern shapes and the base layer to fuse the pattern shapes to the base layer and form the multilayer assembly into the shape of a flashlight sleeve; and

e) removing the molded multilayer assembly from the compression mold and attaching the molded assembly to a flashlight body so that the arrangement of colors faces outwardly.

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**5,741,063**

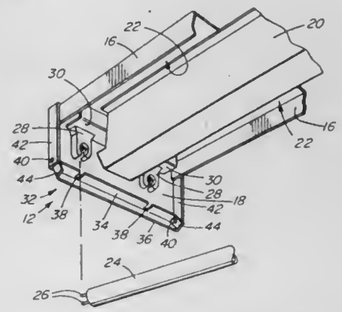
**WRAP-AROUND LIGHT FIXTURE FRAME WITH PIVOTING END FLANGE**

**Peter Kwan Wah Yeung, 4446 Frances Street, Burnaby, British Columbia, Canada, V5C 2R4**

**Filed Mar. 29, 1996, Ser. No. 623,537**

**Int. Cl.[6] F21S** *3/00*

**U.S. Cl. 362—217** **8 Claims**



1. In a light fixture frame for holding at least one tubular lamp having pins extending from either end thereof, said frame having opposed sidewalls, opposed end walls, and longitudinally aligned sockets mounted at either end of said frame adjacent said end walls for receiving said pins, the improvement comprising at least one flange pivotally coupled to at least one of said end walls and moveable between a closed position covering at least one of said sockets and an open position exposing said socket.

**5,741,064**

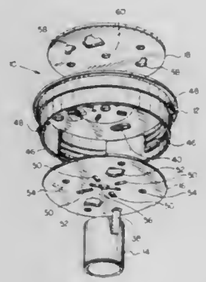
**LIGHTING FIXTURE WITH A SOCKET BASE HAVING A CLOSED AND COOL RUNNING BACK**

**Michael E. Chin; Ann Greene, both of Cranford, and Thomas Russello, Howell, all of N.J., assignors to The Genlyte Group Incorporated, Seacucus, N.J.**

**Filed Feb. 29, 1996, Ser. No. 610,090**

**Int. Cl.[6] F21V** *17/00*

**U.S. Cl. 362—448** **5 Claims**



1. A lighting fixture comprising:

a lamp socket;

a lamp socket base having an integral circular plate, said integral circular plate having a mounting surface and a back surface;

complementary means on said lamp socket base and lamp socket for securing said lamp socket to said mounting surface with no portion of said lamp socket extending to said back surface; and

a plurality of lugs extending from said mounting surface for spacing said lamp socket apart from said mounting surface.

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**5,741,065**

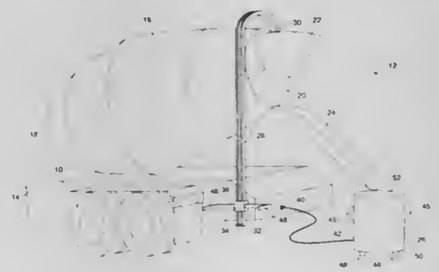
**CLEANING SYSTEM AND METHODS FOR A MIXING TRUCK**

**Foyster G. Bell, P.O. Box 418, Duchesne, Utah 84021, and William A. Strand, 4364 Fresno Dr., Las Vegas, Nev. 89120**

**Filed May 23, 1996, Ser. No. 652,772**

**Int. Cl.[6] B28C** *5/18;7/04*

**U.S. Cl. 366—541** **11 Claims**



8. A mixing truck, comprising:

a chassis;

a mixing drum operably attached to the chassis and having a front end and an open back end;

a loading hopper operably attached to the mixing drum;

a delivery chute extending from the back end of the mixing drum;

a rail having a top end and a bottom end, the rail being attached to the mixing truck such that the bottom end is near a ground surface and the top end is near the loading hopper;

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a canister that is movable between the delivery chute and the rail; and

a lifting mechanism movably attached to the rail, the lifting mechanism including a securing device so that the lifting mechanism may secure and transport the canister along the rail.

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**5,741,066**

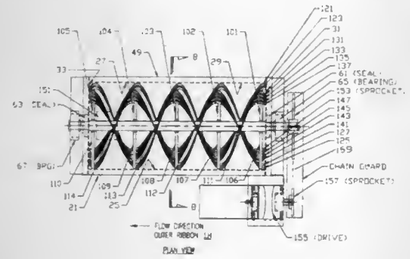
## HELICAL RIBBON MIXER

**Dale Presnell, Fort Worth, Tex., assignor to Hayes & Stolz Industrial Manufacturing Company Inc., Fort Worth, Tex.**

**Continuation-in-part of Ser. No. 731,329, Oct. 15, 1996, abandoned. This application Apr. 17, 1997, Ser. No. 840,862**

**Int. Cl.[6] B01F** *7/08*

**U.S. Cl. 366—320** **6 Claims**




1. An apparatus for mixing particulate materials, comprising:

a chamber having a given length, width, and height for receiving particulate material to be mixed,

said chamber having first and second spaced apart side walls, a bottom wall and first and second spaced apart end walls, the distance between said first and second end walls defining said length,

a shaft supported for rotation along an axis which extends between said first and second end walls,

two sets of outer ribbon members coupled to said shaft such that said two sets of outer ribbon members are located about 180 degrees apart and extend helically around said shaft along a substantial portion of the length of said shaft,

two sets of inner ribbon members coupled to said shaft such that said two sets of inner ribbon members are located about 180 degrees apart and extend helically around said shaft along a substantial portion of the length of said shaft,

drive means coupled to said shaft for rotating said shaft and hence said ribbon members about said axis,

said two sets of outer ribbon members being located radially outwardly of said two sets of inner ribbon members and spaced radially from said two sets of inner ribbon members,

each set of outer ribbon members comprising at least two spaced apart outer ribbon members each having a given thickness and a given width with said widths of said outer ribbon members on each side of said shaft being generally aligned radially,

each set of inner ribbon members comprising at least two spaced apart inner ribbon members each having a given thickness and a given width with said widths of said inner ribbon members on each side of said shaft being generally aligned radially,

one of said two sets of ribbon members having a left hand pitch and the other of said two sets of ribbon members having a right hand pitch.

**5,741,067**

## METHOD OF PREDICTING THE FORMATION OF WATER CONDENSATION

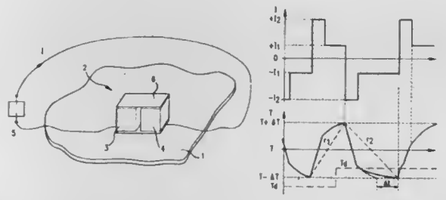
**Michel Gschwind, Plascassier, and Pascal Ancey, Grasse, both of France, assignors to Imra Europe SA, Valbonne, France**

**Filed Mar. 25, 1996, Ser. No. 620,532**

**Claims priority, application France, Mar. 23, 1995, 95 03413**

**Int. Cl.[6] G01N** *25/12*

**U.S. Cl. 374—16** **9 Claims**




1. A method of predicting the formation of water condensation on a surface in contact with humid air, comprising the steps of:

placing on the surface an element that adopts initially a temperature approximately equal to a temperature of the surface;

thermally cycling the element, each cycle including a cooling phase and a heating phase, wherein the cooling phase includes first and second consecutive steps;

supplying an electric current to a cooling mechanism in the first step of the cooling phase to decrease the temperature of the element to below the temperature of the surface; and

supplying an electric current to the cooling mechanism in the second step of the cooling phase to further decrease the temperature of the element, wherein the current of the first step is greater than the current of the second step such that the temperature of the element decreases more rapidly in the first step than in the second step;

whereby the formation of water condensation on the surface is predicted based upon the formation of water condensation on the element.

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**5,741,068**

## TEMPERATURE DERIVATIVE SENSING AND REGULATING DEVICE AND METHOD

**Johann Ludwig Hemmerich, Oxford; Paul Milverton, Oxon, both of United Kingdom, and Luigi Serio, Putignano, Italy, assignors to European Atomic Energy Community (Euratom), Plateau Du Kirchberg, Luxembourg**

**PCT No. PCT/EP94/02414, § 371 Date Jan. 29, 1996, § 102(e) Date Jan. 29, 1996, PCT Pub. No. WO95/04317, PCT Pub. Date Feb. 9, 1995**

**PCT Filed Jul. 21, 1994, Ser. No. 583,011**

**Claims priority, application United Kingdom, Jul. 29, 1993, 9315687**

**Int. Cl.[6] G01K** *17/00*

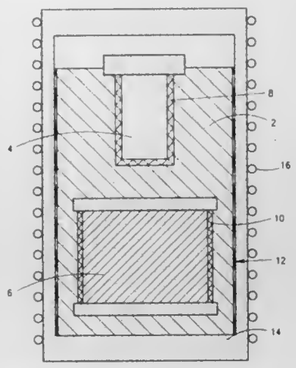
**U.S. Cl. 374—31** **15 Claims**

1. A temperature derivative sensing and regulating device to be used with a heat sensitive item, and which comprises an inertial mass of material having no internal heat sources, a thermal conductivity greater than 100 $Wm^{-1}K^{-1}$ and a specific heat capacity of 385$JK^{-1}kg^{-1}$ or greater, and a high heat capacity which is greater than the heat capacity of the heat sensitive item, means surrounding said inertial mass for conducting the flow of heat to and from said inertial mass, the heat flow $\Pi$, being proportional to the temperature derivative $\Theta$ in accordance with the equation

$$\Pi_i = \Theta C_i$$

where $C_i$ is the heat capacity of the inertial mass, means for generating a signal proportional to said heat flow and means






for interfacing with the controller of a heating or cooling means associated with an item, apparatus or other facility whose temperature is to be regulated.

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**5,741,069**

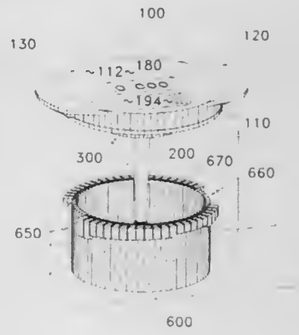
## COMBINED THERMOMETER AND RADIATOR CAP

**Kenneth D. Egel, 1523 231st St., Letts, Iowa 52754**

**Filed Apr. 16, 1996, Ser. No. 633,069**

**Int. Cl.[6] G01K** *1/14;13/00*

**U.S. Cl. 374—146** **7 Claims**




1. In combination with a filler neck of a vehicle's engine cooling system positioned under a normally closed hood of a vehicle, a closure device for the neck comprising:

a cap having upper and lower surfaces for covering an open end of the filler neck;

means for releasably securing said cap to the filler neck;

a temperature sensor assembly in said cap, said assembly including a temperature probe extending from said lower surface of said cap for extension through the filler neck and into the engine cooling system upon said securing of said cap thereto;

a numerical display assembly in communication with said temperature probe and positioned in said upper surface of said cap, said numerical display assembly having means therein for displaying a temperature corresponding to a temperature sensed by said probe; and

a light powered source in said cap configured to produce a charge upon an impingement of light thereon, said charged power source coupled to said display assembly for energizing said display means of said numerical display assembly upon the lifting of the vehicle hood to expose said display means said said power source to the impinging light, said cap upper surface displaying the sensed temperature of the engine cooling system upon said securing of said cap to the filler neck and the lifting of the vehicle hood.

**5,741,070**

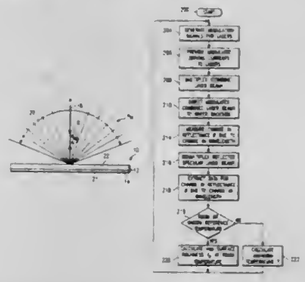
## APPARATUS FOR REAL-TIME SEMICONDUCTOR WAFER TEMPERATURE MEASUREMENT BASED ON A SURFACE ROUGHNESS CHARACTERISTIC OF THE WAFER

**Mehrdad Mahmud Moslehi, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 160,595, Nov. 30, 1993, Pat. No. 5,474,381. This application Jun. 7, 1995, Ser. No. 474,213**

**Int. Cl.[6] G01K** *11/00*

**U.S. Cl. 374—161** **4 Claims**



1. A temperature sensor for determining the temperature of a workpiece, comprising:

a radiation source for providing radiation to the workpiece;

a radiation detector for detecting specularly reflected radiation from the workpiece; and

a signal processing system coupled to said radiation detector, said signal processing system determining the temperature of the workpiece by presuming the intensity of radiation from said source and which is specularly reflected from a surface of said workpiece and detected by said detector depends upon the surface roughness of said workpiece, said surface roughness of said surface varying with temperature due to the thermal coefficient of expansion of the material of said workpiece.

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**5,741,071**

## RADIOMETER FOR THE DETERMINATION OF A TEMPERATURE OF A BODY BY MEASURING EMITTED THERMAL NOISE

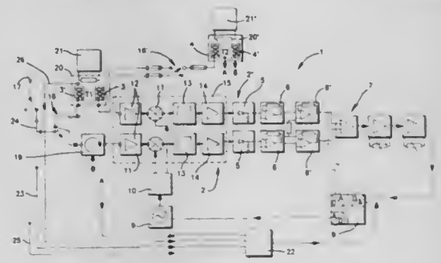
**Michel Weiss, Gries; Laurent Martinache, Haguenau, and Olivier Gonella, Wissembourg, all of France, assignors to Sadis Bruker Spectrospin Societe Anonyme de Diffusion de l'Instrumentation Scientifique Bruker Spectrospin, Wissembourg, France**

**Filed Aug. 21, 1995, Ser. No. 517,415**

**Claims priority, application France, Aug. 19, 1994, 94 10235**

**Int. Cl.[6] G01K** *7/30*

**U.S. Cl. 374—175** **14 Claims**



1. A radiometer for measuring thermal noise so as to determine the mean temperature of a body by means of a corresponding measuring antenna, the radiometer comprising

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a double amplification chain (**1**) of radiofrequency signals of thermal noises, having two structurally symmetrical independent branches (**2** and **2'**), one of said two branches (**2'**) measuring continuously a thermal noise signal generated by a first reference source (**3**), and the other of said two branches for measuring a thermal noise signal from the measuring antenna;

two identical converter circuit assemblies (**5**, **5'**, **6**, **6'**), each disposed in one of said two branches (**2**, **2'**) and each delivering a continuous signal whose value is proportional to a power of the thermal noise signal emitted by its respective one of said two branches (**2** or **2'**), said continuous signals being transmitted to a control unit (**8**), for process and evaluation; and

means (**9**, **10**, **11**) for changing a heterodyne frequency of the frequencies of the thermal noise signals processed in said two branches (**2** and **2'**), said heterodyne frequency being changed within a frequency transposition window of lower frequencies, the characteristics of said frequency transposition window being determined by the control unit (**8**) for process and evaluation, as a function of external interference signals.

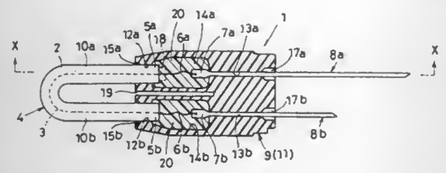
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**5,741,072**

## TEMPERATURE SENSOR ELEMENT FOR A TEMPERATURE-MEASURING DEVICE

**Ishine Yamaguchi, Akashi; Toshiyuki Kitaura, Kishiwada, and Hidekazu Ikemoto, Shiga-ken, all of Japan, assignors to Kawaso Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Sep. 13, 1995, Ser. No. 528,219**
**Claims priority, application Japan, Sep. 13, 1994, 6-244696**
**Int. Cl.[6] G01K** *7/06;1/14;* **H01L** *35/02*
**U.S. Cl. 374—179** **11 Claims**




**1**. A temperature sensor element in a temperature-measuring device comprising:

temperature-measuring means including a heat-resistant protective tube (**2**, **2***a*) having at least one end (**5**, **5***a*, **5***b*) and a thermocouple (**3**) inserted therein;

compensating conduction means (**8***a*, **8***b*) having connecting sections (**7***a*, **7***b*) which connect to a pair of extension sections (**6***a*, **6***b*) of said thermocouple each of which extend from the protective tube (**2**, **2***a*); and

support means (**9**) to join and hold both said temperature-measuring means and said compensating conduction means; wherein,

said support means (**9**) is formed with a block body (**11**) having at least one wall defining support hole means (**12**, **12***a*, **12***b*) at an end of the block body through which said at least one end of said protective tube (**2**, **2***a*) is inserted and held therein, insertion hole means (**13***a*, **13***b*) at the other end thereof through which said compensating conduction means (**8***a*, **8***b*) are inserted, and holding chamber means (**14***a*, **14***b*) formed therein which communicates the support hole means and the insertion hole means with each other,

said holding chamber means (**14***a*, **14***b*) being enlarged between the support hole means and the insertion hole means and formed in a concave shape with a bottom face formed by depressing a side of the block body (**11**) so as to form an opening thereon and having stopper means (**18**, **34**) in the holding chamber means in the vicinity of the support hole means (**12**, **12***a*, **12***b*), and

said at least one end (**5**, **5***a*, **5***b*) of the protective tube which is inserted into the support hole means (**12**, **12***a*, **12***b*) projects into the holding chamber means at first end and abuts said stopper means (**18**, **34**), said connecting sections (**7***a*, **7***b*) of the compensating conduction means which are respectively inserted into the insertion hole means (**13***a*, **13***b*) project into said holding chamber means at a second end thereof, and a filler (**20**) is introduced into and hardened in said holding chamber means (**14***a*, **14***b*) under a condition that the at least one end (**5**, **5***a*, **5***b*) of the protection tube (**2**, **2***a*) is fully supported by the at least one wall defining said support hole means (**12**, **12***a*, **12***b*) relative to said holding chamber means (**14***a*, **14***b*) and the extension sections (**6***a*, **6***b*) of the thermocouple are respectively connected with the connection sections (**7***a*, **7***b*) within the holding chamber means (**14***a*, **14***b*) to bury and fix said at least one end (**5**, **5***a*, **5***b*) of the protective tube, the extension sections (**6***a*, **6***b*) of the thermocouple, and the connection sections (**7***a*, **7***b*) of the compensating conduction means in said filler.

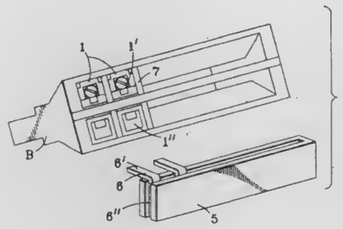
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**5,741,073**

## UNIFORM TEMPERATURE REFERENCE APPARATUS FOR USE WITH MODULAR TERMINAL BLOCK

**Kenneth A. Ribeiro, North Reading; Robert E. Goldschmidt, Needham; John Nelson, Worcester, and John R. Sullivan, Westford, all of Mass., assignors to Kaye Instruments, Inc., Bedford, Mass.**

**Filed Sep. 18, 1995, Ser. No. 529,356**
**Int. Cl.[6] G01K** *7/00;* **H01R** *4/50*
**U.S. Cl. 374—182** **15 Claims**




**7**. A uniform temperature reference block system for connection with input reference wires of a plurality of thermocouples and forming cold junctions therewith, said system comprising:

a metallic modular connector block having a plurality of insulated successive termination cavities formed therein;

a pair of openings communicating with each said cavity, one of said pair of openings receiving a terminal clamping device and a second of said pair of openings receiving a bared end of an input reference wire;

a thermally conducting bridging bar externally extending along the openings of the cavities of said block and provided with an electrically insulating covering, the bridging bar having extending therefrom and secured to the insulating covering thereof, inner legs of a plurality of thermally and electrically conducting uninsulated projections corresponding to the plurality of pairs of openings, the projection extensions being insertable into said cavities through said second openings, with each projection positioned in its corresponding second opening between the bared end of an input reference wire and a termination conductor;

whereby operating the terminal clamping devices presses the bared end of the corresponding reference wire to establish compressional electrical connection to one side of the corresponding projection, and to compress the opposite side of the projection into compressional electrical and thermal contact with the termination conductor.

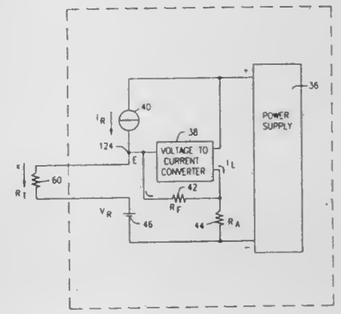


**5,741,074**

## LINEAR INTEGRATED SENSING TRANSMITTER SENSOR

**Theodore P. Wang, N. Caldwell; Michael G. Allen, Bergenfield, both of N.J., and Rienk Oldenkamp, Leiderdorp, Netherlands, assignors to Thermo Electrioc Corporation, Saddle Brook, N.J.**

**Filed Jun. 6, 1995, Ser. No. 467,950**
**Int. Cl.[6] G01K** *7/16*
**U.S. Cl. 374—185** **12 Claims**




**1**. A temperature sensor for measuring and reporting temperature, comprising:

an elongated tubular housing having a tip portion with a sealed end and a transition portion with a sealed end, said housing having an elongated cavity therethrough;

a resistance temperature detector contained within said tip portion of said housing said resistance temperature detector having a resistance value which increases with increasing temperature;

an elongated circuit board contained within said transition portion of said housing, said circuit board comprising a transmitter means for providing a current which is a linear function of the temperature sensed by said resistance temperature detector, said transmitter means including:

excitation current means connected to said resistance temperature detector at a common junction for exhibiting an electrical characteristic in response thereto;

converter means connected to said excitation current means and to said resistance temperature detector at said common junction for detecting a voltage at said common junction, said voltage at said common junction varying as the electrical characteristic of said resistance temperature detector varies, said converter means converting said voltage to a current;

feedback means for connecting said converter means to said common junction and having a feedback current flowing therethrough, said feedback means being responsive to said current at the output of said converter means for adjusting said feedback current so as to adjust the voltage at said common junction and said excitation current applied to said resistance temperature detector, thereby maintaining across said resistance temperature detector a voltage which is a linear function of a condition sensed by said resistance temperature detector; and

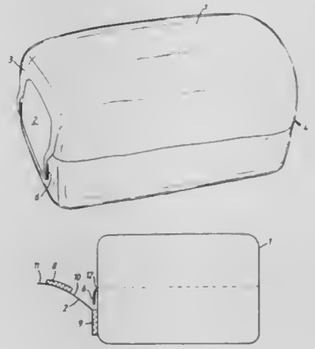
power supply means having a first terminal connected to said excitation current means and a second terminal connected to said resistance temperature detector for supplying power thereto.

**5,741,075**

## RECLOSABLE PACKAGING

**Ross Collins, Buckingham, England, and James Andrew Colwill, Schwellbrunn, Switzerland, assignors to Allied Bakeries Limited, London**

**Filed Sep. 18, 1996, Ser. No. 718,102**
**Claims priority, application United Kingdom, Sep. 19, 1995, 9519137**
**Int. Cl.[6] B65D** *33/34*
**U.S. Cl. 383—5** **5 Claims**




**1**. A package comprising a flexible plastic bag and a label, the bag having a closed end, the closed end being openable to provide an opening for access to the contents of the package, wherein, the closed end of the package is initially sealed at a sealing area and, wherein, the sealing area is provided with a line of perforations to define the opening and reclosable by means of the label, the label having on one face two areas of adhesive separated by a non-adhesive area extending across substantially the whole width of the label, the adhesive areas being adapted to adhere to the package, one to each side of the line of perforations, such that the non-adhesive area extends over the line of perforations, wherein, the closed end of the package is initially sealed at a sealing area and, wherein, the sealing area is provided with a line of perforations.

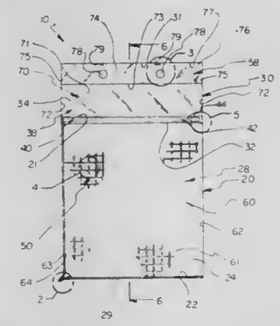
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**5,741,076**

## PRODUCE BAG

**Farrell D. Cammack, 1435 Lemon St., Blackfoot, Id. 83221**

**Continuation-in-part of Ser. No. 58,650, Aug. 9, 1996. This application Dec. 16, 1996, Ser. No. 767,209**
**Int. Cl.[6] B65D** *30/06*
**U.S. Cl. 383—9** **10 Claims**




**1**. A Produce Bag, comprising:

a bottom portion, said bottom portion comprising a bottom tubular body defining a pair of superimposed bottom panels in a flattened state, said bottom portion having a top end and a

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bottom end, and having an interior surface and an exterior surface, said top end being open and said bottom end being closed, said bottom end defined by a bottom seam joining said pair of superimposed bottom panels together, said bottom portion formed of a net material;

a top portion, said top portion comprising a top tubular body defining a pair of superimposed top panels in a flattened state, said top portion having a top end and a bottom end, and having an interior surface and an exterior surface, said top end and said bottom end being open, said top portion formed of a sheet material,

said top portion including a front panel having a top edge and a back panel, said back panel including an extended portion extending beyond said top edge of said front panel, said extended portion having a top edge,

said extended portion of said back panel having a pair of spaced holes and a pair of spaced slits provided therein, said pair of spaced slits provided between said pair of spaced holes and said top edge of said extended portion and positioned along a vertical axis of said pair of spaced holes, said pair of spaced slits contiguous with said top edge of said extended portion,

said bottom end of said top portion fitted within said top end of said bottom portion, whereby said top end of said bottom portion and said bottom end of said top portion overlap; and

an adhesive strip joining said top portion to said bottom portion, said adhesive strip having an adhesive side and a non-adhesive side,

said adhesive side of said adhesive strip positioned adjacent said exterior surface of said bottom portion along said top end of said bottom portion, said adhesive side contacting and adhering to said exterior surface of said bottom portion and contacting and adhering to said exterior surface of said top portion through said bottom portion, whereby said top end of said bottom portion is interposed between said adhesive strip and said bottom end of said top portion, wherein said top edge of said front panel of said top portion extends substantially beyond said top end of said bottom portion, whereby said top portion is adapted for use with a standard automatic bag filling machine and a standard automatic bag closure machine.

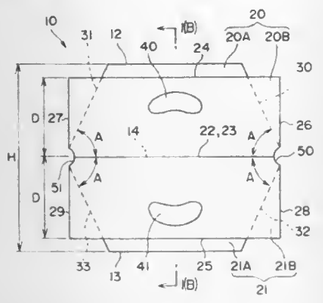
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**5,741,077**

## CARRY OUT BAG, METHOD OF PRODUCING THE SAME AND METHOD OF USING THE SAME

**Shigeya Sasaki; Shinji Kobayashi, and Shuichi Gotoh, all of Tokyo, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan**

**Filed Jun. 16, 1995, Ser. No. 491,283**
**Claims priority, application Japan, Jun. 17, 1994, 6-135496**
**Int. Cl.[6] B65D** *33/08*
**U.S. Cl. 383—10** **9 Claims**




1. A carry out bag, comprising:

a base portion having two opposed sides that face each other;

first side portions, each said first side portion in a folded state extending from a separate one of said sides of said base portion to a middle area of said base portion and having opposed side edges that are bonded to adjacent side edges of said base portion; and

second side portions, each said second side portion in said folded state extending from a separate one of said first side portions from said middle area of said base portion, over said first side portion, and projecting over said side of said base portion from which said first side portion extends so as to extend beyond said side of said base portion and having opposed side edges that are not bonded to said side edges of said base portion and said side edges of said first side portion.

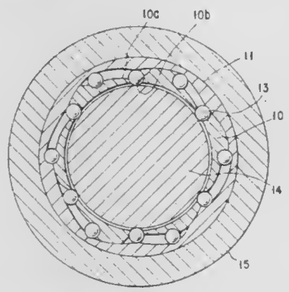
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**5,741,078**

## LINEAR BALL BEARING WITH SOLID LUBRICATING FILM

**Akira Sasaki, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Sep. 10, 1996, Ser. No. 709,844**
**Claims priority, application Japan, Sep. 13, 1995, 7-235353**
**Int. Cl.[6] F16C** *29/06*
**U.S. Cl. 384—43** **8 Claims**




1. A linear ball bearing, comprising:

a holder movably mounted to a stationary element and having a plurality of ball guide grooves formed therein a predetermined distance apart from each other such that each of said guide grooves forms a closed loop to face said stationary element, said guide groove being coated with a solid lubricating film;

an outer casing linearly movable relative to said stationary element, mounted to a movable element, and provided with a plurality of ball-sliding portions facing said ball guide grooves and coated with a solid lubricating film, said holder being inserted into said outer casing; and

a plurality of balls slidably interposed between the ball guide grooves formed in the holder and the ball-sliding portions of the outer casing, at least the surface region of said ball being porous, said balls being rolled in an interlocking fashion with the linear movement of said movable element such that some of the balls partly project out of the ball guide grooves so as to slide along the stationary element, and the solid lubricating films within the ball guide groove and in the ball sliding portion being transferred onto the porous surface region of the ball during the rolling of the ball.

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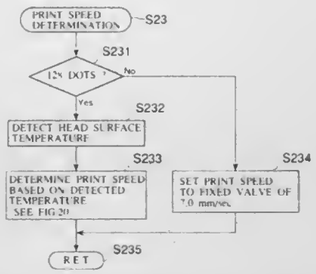
**5,741,079**

## PRINTING APPARATUS AND METHOD OF MAKING MASK PATTERN FOR EXPOSURE THEREBY

**Hitoshi Hayama; Yoshiyuki Yanagisawa, both of Nagano; Kenji Watanabe, Tokyo; Takanobu Kameda, Tokyo, and Tomoyuki Shimmura, Tokyo, all of Japan, assignors to Seiko Epson Corporation, and King Jim Co., Ltd., both of Tokyo, Japan**

**Filed Jan. 22, 1997, Ser. No. 786,316**
**Claims priority, application Japan, Jan. 23, 1996, 8-009269; Sep. 4, 1996, 8-253947**
**Int. Cl.[6] B41J** *2/365*
**U.S. Cl. 400—120.14** **20 Claims**

1. A printing apparatus having a thermal head, said printing apparatus applying a strobe pulse at a predetermined voltage to said thermal head based on information of dots of an image to be printed, to thereby heat said thermal head, and applying heat by said thermal head to an ink ribbon in an amount enabling thermal transfer of ink on said ink ribbon, said printing apparatus comprising:




temperature-detecting means for detecting a temperature of said thermal head;

split pulse-applying means for sequentially applying a plurality of split pulses obtained by dividing said strobe pulse, with quiescent periods respectively interposed between said plurality of split pulses;

pulse-applying data-storing means for storing pulse-applying data of settings of a cumulative period of split pulse-applying periods over which said plurality of split pulses are respectively applied, a number of said split pulses, said split pulse-applying periods, and said quiescent periods respectively interposed between said plurality of split pulses, which are defined in a manner corresponding to values of said temperature of said thermal head; and

control means for reading out appropriate pulse-applying data from said pulse-applying data-storing means according to said temperature of said thermal head detected by said temperature-detecting means, and controlling operation of said split pulse-applying means according to said appropriate pulse-applying data.

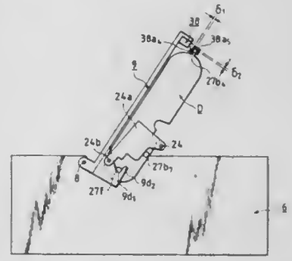
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**5,741,080**

## CASSETTE MOUNTING ON DOOR OF RECORDING APPARATUS

**Akihiro Tomoda, Yokohama; Yasushi Ishida; Takashi Awai, both of Tokyo; Minoru Yokoyama, and Masakatsu Yamada, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 93,709, Jul. 20, 1993, abandoned, which is a continuation of Ser. No. 728,512, Jul. 11, 1991, abandoned. This application Aug. 23, 1994, Ser. No. 294,763**
**Claims priority, application Japan, Jul. 13, 1990, 2-184119; Jul. 13, 1990, 2-184129**
**Int. Cl.[6] B41J** *35/28*
**U.S. Cl. 400—208** **35 Claims**




1. A recording apparatus for recording onto a recording medium with an ink sheet cartridge having an ink sheet containing ink, said apparatus comprising:



loading means for loading the ink sheet cartridge having the ink sheet containing ink, a first winding member for winding the ink sheet, a second winding member for winding the ink sheet, and a cartridge frame body for holding the first winding member and the second winding member rockably, wherein on both ends of the first winding member are provided first bearings for accepting the both ends, respectively, and on both ends of the second winding member are provided second bearings for accepting the both ends, respectively, said loading means for loading the ink sheet cartridge detachably;

positioning means for positioning the first winding member and said second winding member;

recording means for recording onto the recording medium by acting on the ink sheet;

a recording apparatus main body having an opening section; and

an opening/closing member for opening and closing the opening section of said recording apparatus main body, wherein said positioning means includes first contact portions provided on said opening/closing member for coming into contact with the first bearings and the second bearings, and second contact portions provided on said recording apparatus main body for coming into contact with the first bearings and the second bearings, wherein said positioning means positions the first winding member and the second winding member by carrying the first bearings and the second bearings between said first contact portion provided on said opening/closing member and said second contact portion provided on said recording apparatus main body, respectively, when the opening section of said recording apparatus main body is closed with said opening/closing member.

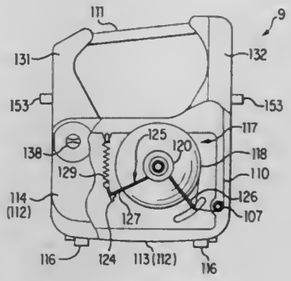
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**5,741,081**

## RIBBON CASSETTE WITH FEED MEMBER

**Takashi Yamamoto, Nagoya; Mutsuo Fukuoka, Ama-gun, and Masaya Funamoto, Kasugai, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Sep. 27, 1996, Ser. No. 722,569**
**Claims priority, application Japan, Mar. 12, 1996, 8-084748**
**Int. Cl.[6] B41J** *33/52;32/00*
**U.S. Cl. 400—234** **16 Claims**




1. A ribbon cassette, comprising:

a ribbon feed spool around which a ribbon is wrapped;

a first elastic member for forcing the ribbon drawn from the ribbon feed spool in a direction in which a tensile force of the ribbon increases; and

a second elastic member for forcing the first elastic member in the direction in which the tensile force of the ribbon increases, wherein the first elastic member includes an engaging lever section engaged with the ribbon drawn out of the ribbon feed spool, a curved section which resiliently holds a shaft portion of the ribbon feed spool, and a joint lever section connected to the second elastic member.

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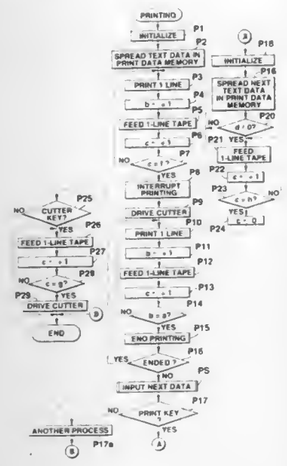


5,741,082

## TAPE PRINTERS HAVING CUTTER CONTROL

Masumi Toya, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1996, Ser. No. 714,224
Claims priority, application Japan, Sep. 19, 1995, 7-240042
Int. Cl.[6] B41J *11/70*
U.S. Cl. 400—615.2 6 Claims




1. A tape printer comprising:

an input section for separately inputting at least first and subsequent second text data, each of any characters, to the tape printer;

a printing section comprising a printing head for printing the inputted first and second text data separately on a tape, and a conveyance section for conveying the tape;

a print commanding section operated by an operator for commanding said printing section to separately print the first and second text data inputted by said input section on the tape while conveying the tape;

a cutter, provided at a position spaced a predetermined distance downstream from said printing head in the direction of conveyance of the tape, for cutting the tape;

a margin setting section for setting a margin at each of leading and trailing ends of each of the first text data at a distance shorter than a predetermined distance when the first and second text data are separately printed on the tape;

determining means for determining whether said print commanding section has commanded said printing section to print the second text data inputted by said input section after said printing section has printed the first text data inputted by said input section;

calculation means, responsive to said determining means determining that said print commanding section has commanded said printing section to print the second text data, for calculating a position on the tape where the printing and conveying operations of said printing section are interrupted, on the basis of a length of a margin set by said margin setting section for each of the first and second text data printed by said printing section and the predetermined distance between said printing head and said cutter section; and

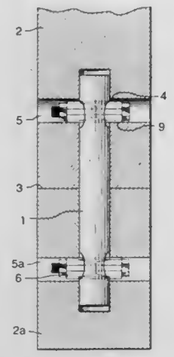
control means for interrupting a printing of the second text data by said printing section at the calculated position on the tape during the printing of the second text data, and for driving said cutter section to cut a tape portion on which the first text data present downstream from the second text data under printing is printed from a remaining portion of the tape.

5,741,083

## TIMBER CONNECTOR

Didier Schvartz, R.R.#3, Lakefield, Ontario, Canada, K0L 2H0

Filed Feb. 6, 1995, Ser. No. 383,846
Claims priority, application Canada, Mar. 23, 1994, 2119719
Int. Cl.[6] F16B *2/04*
U.S. Cl. 403—297 5 Claims




1. A fastening system for binding two members together at abutting surfaces of said members, said members being provided with aligned first holes generally perpendicularly to said abutting surfaces and with second holes intersecting said first holes in generally perpendicular fashion away from said abutting surfaces, said fastening system comprising:

an elongated coupling component insertable into said first holes in said members, said coupling component having a transverse hole near each end thereof; and

two pins insertable one through each of said transverse holes in said coupling component, via said second holes in said members, said pins being configured to protrude laterally from opposite sides of said coupling component, at least one of said pins being a user-operable pin, user-operable to bear against a distal edge of the corresponding transverse hole for progressively expanding a distance between said distal edge of said transverse hole and a proximal edge of the corresponding second hole in the corresponding member, immediately adjacent said coupling component and not extending as far as outer edge of said second hole, thereby being capable of displacing said members towards each other for firm engagement of said abutting surfaces.

5,741,084

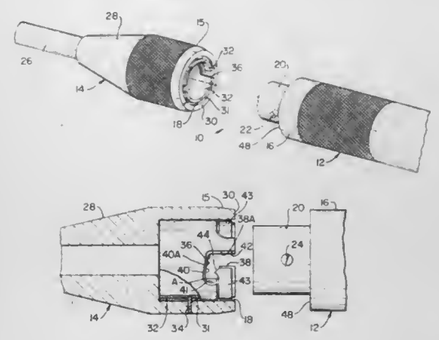
## WEAR COMPENSATING AXIAL CONNECTION

Eddy H. Del Rio, 11413 52nd Rd., Royal Palm Beach, Fla. 33411, and William E. Anspach, Jr., 4500 Riverside Dr., Palm Beach Gardens, Fla. 33410

Continuation of Ser. No. 410,980, Mar. 27, 1995, abandoned. This application Jan. 17, 1997, Ser. No. 784,476
Int. Cl.[6] F16B *7/20*; A61B *17/56*
U.S. Cl. 403—349 14 Claims

1. A bayonet-type connector between two members, one member having a cylindrical projection extending from a flat surface, a second member having an aperture with a flat end surface for receiving said cylindrical projection, said cylindrical projection having diametrically opposed pins spaced from said flat surface, a first sleeve in said aperture having diametrically opposed guide channels for guiding said pins to a position where said flat end surface is wedged against said flat surface, a second sleeve in said aperture having spring arms for acting on said pins in said channels to bias said flat surface and said flat end surface together.



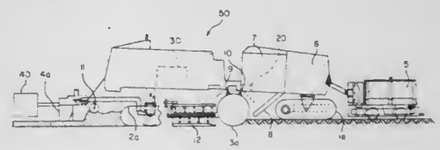



5,741,085

## PROCESS AND APPARATUS FOR THE REPAIR OF DAMAGED ROADS

Reinhard Wirtgen, Hohner Strasse 2, D- 5469 Windhagen, Germany

Continuation of Ser. No. 524,122, Aug. 25, 1995, abandoned, which is a continuation of Ser. No. 78,588, Jun. 17, 1993, abandoned. This application Feb. 18, 1997, Ser. No. 800,552
Claims priority, application Germany, Nov. 8, 1992, 42 37 512.6
Int. Cl.[6] E01C *23/12*
U.S. Cl. 404—75 13 Claims




11. A process for the stabilization or repair of damaged roads, by a cold-recycling process performed by a recycling machine, wherein a damaged road surface is milled off and a material covering the road surface is crushed on the site and is built-in again, the process comprising the steps of:

milling off the damaged road surface over the whole width of a road lane at a depth up to about 40 centimeters and crushing the milled-off material;

analyzing a sample of the crushed road material and determining materials to be added thereto in amounts necessary to obtain a composition of the road surface to be renewed;

adding to the crushed road material, mineral materials of grain size and amount depending on the composition of the road surface to be renewed, as obtained by analysis of the crushed material in said analyzing step, and binders pre-mixed with water so that the binders are added at a point of milling to the crushed road material in a suspension state,

blending the crushed road material with said mineral materials and said pre-mixed binders in suspension state on the recycling machine to obtain a renewed road material; and

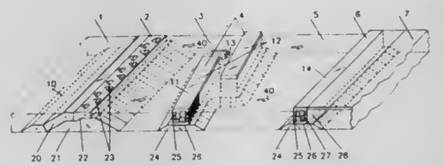
building-in said renewed road material as obtained in said blending step into said road surface to form a new road surface.

5,741,086

## INTEGRATED, MULTIPHASE, ENERGY-DISSIPATING ENVIRONMENTAL SYSTEM

Pedro Suarez Bores, Vegafria, 1-T 1, 28035, Madrid, Spain

Filed Jun. 4, 1993, Ser. No. 72,159
Claims priority, application Spain, Jun. 10, 1992, 9201211
Int. Cl.[6] E02B *3/06*
U.S. Cl. 405—30 5 Claims




1. An integrated, multiphase, energy-dissipating environmental system comprising:

spaced apart pair of separate low crown level stretches (**2**, **4**) generally parallel to each other and to a coast, the seaward stretch being an overflowable breakwater structural element (**10**) and the landward stretch being a permeable quay or dock structural element (**11**); and

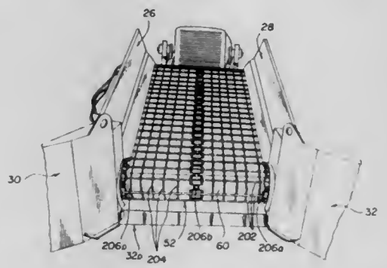
(B) intermediate said spaced apart pair of stretches, a navigable stilling channel acting as a hydrodynamic dissipator (**3**).

5,741,087

## CHAIN SEPARATOR FOR PADDING MACHINE

Mark Osadchuk, 10040 Happy Valley Rd., Scottsdale, Ariz. 85255

Continuation of Ser. No. 693,720, Aug. 5, 1996. This application Oct. 24, 1996, Ser. No. 735,905
Int. Cl.[6] B07B *13/0414*; E02F *5/2226*
U.S. Cl. 405—179 26 Claims

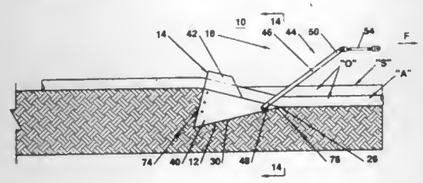



1. A padding apparatus for padding underground cable or pipeline by continuously separating excavated material piled alongside an excavated ditch into relatively fine padding material and relatively rough residual material as the apparatus moves forward and placing the relatively fine padding material in the ditch, the apparatus comprising: a frame for supporting and moving an endless openwork in an endless path for lifting excavated material in an elevating direction, said endless openwork having rods and transverse chain sections attached to said rods, whereby said rods and chain sections define openings that allow relatively fine padding material to pass therethrough; a discharge conveyor positioned to receive the relatively fine padding material and convey the padding material to the ditch for padding cable or pipeline therein.

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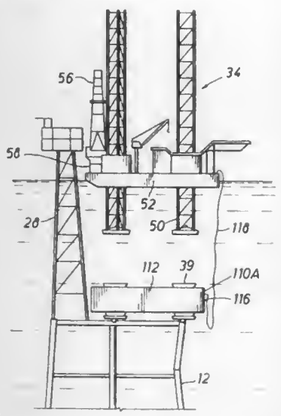
**5,741,088**
**APPARATUS FOR UNDERGROUND EXCAVATION**
**Gennady Kleyman, Brooklyn, N.Y., assignor to Environment 2000, Inc., Parsippany, N.J.**
**Filed Aug. 23, 1996, Ser. No. 702,834**
**Int. Cl.[6] F16L** *1/00*
**U.S. Cl. 405—181** **42 Claims**



1. An excavation apparatus for insertion below an overburden located beneath the surface of the ground and capable of being driven through the ground from the surface, said apparatus comprising:
a. wedge means for driving through the ground and for slidingly contacting and lifting the overburden substantially toward the surface of the ground, said wedge means comprising a leading edge disposed at the forwardmost end of said wedge means and further comprising opposite sides disposed at opposite ends of said leading edge;
b. driving attachment means attached to said opposite sides of said wedge means and capable of extending generally upwardly through the surface of the ground, for driving said wedge means below and substantially parallel to the surface of the ground; and
c. lateral support means attached to said opposite sides of said wedge means for guiding the overburden over said wedge means.

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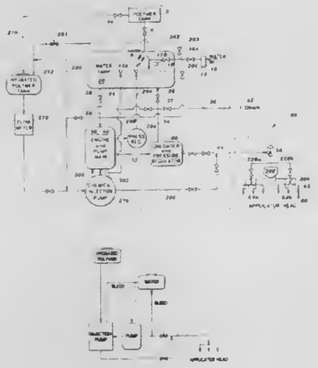
**5,741,089**
**METHOD FOR ENHANCED REDEPLOYABILITY OF HYJACK PLATFORMS**
**Dale Marion Gallaher, Metairie, and George Emanuel Sgouros, New Orleans, both of La., assignors to Shell Offshore Inc., New Orleans, La.**
**Filed Dec. 23, 1994, Ser. No. 370,767**
**Int. Cl.[6] E02B** *17/02;17/08;* **E02D** *25/00*
**U.S. Cl. 405—196** **10 Claims**



1. A method for redeploying an offshore platform structure from a first site to a second site of different water depth, comprising:
releasing the connection between a subsea jacket base and a plurality of piles which are anchored in the ocean floor at the first site, said releasing comprising cutting through a plurality of pile sleeves and the piles locked therein to remove pile-to-pile sleeve connections in an extended first stage of the pile sleeves;
vertically raising the offshore platform structure by pumping air into a plurality of the tank members, each being an elongated cylinder vertically aligned in load bearing relationship with underneath a discrete contact point of the subsea rig support interface corresponding to the to the footprint of a jack-up rig;
resizing a surface tower supported upon subsea jacket base while the jacket base is vertically raised;
towing the offshore platform structure to the second site;
vertically lowering the offshore structure by ballasting the tank member;
installing the platform at the second site with the surface tower above the ocean surface and a subsea rig support interface presented within the depth capability of a jack-up rig.

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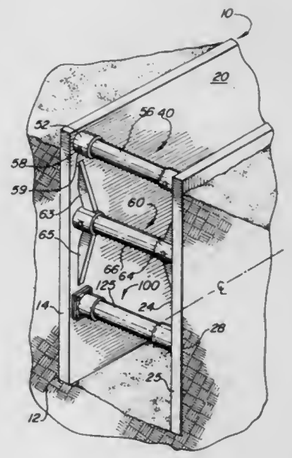
**5,741,090**
**INJECTOR FOR POLYMER PLACEMENT AND METHOD THEREFORE**
**Levant G. Dunning; Ardith Arlene Dunning, both of 8621 Coolwoods Way, Sacramento, Calif. 95828, and K. C. Doyle Forbes, P.O. Box 601071, South Lake Tahoe, Calif. 96153**
**Filed Mar. 6, 1995, Ser. No. 399,838**
**Int. Cl.[6] A01C** *23/00*
**U.S. Cl. 405—263** **134 Claims**



1. An apparatus for injecting polymer into an upper surface of the earth to facilitate water retention by the polymer holding water, comprising in combination:
a land vehicle,
a container having fluid inside on said land vehicle,
a bin having polymer therein and located on said land vehicle,
at least one injector means operatively connected to the land vehicle,
a conduit communicating between the fluid container and said injector means,
a passageway communicating between said bin and said injector means, and
means to fire said at least one injector means;
whereby polymer and fluid are first mixed by a chemical injector pump on said passageway at said at least one injector means and propelled into the upper surface.

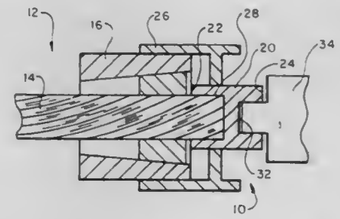


**5,741,091**
**SHORING DEVICE WITH LOAD OPTIONAL ENHANCING SPREADERS**
**Gregory L. St. George, Tempe, and Charles B. Jennings, Phoenix, both of Ariz., assignors to Safe-T-Shore, Tempe, Ariz.**
**Filed Feb. 5, 1996, Ser. No. 596,583**
**Int. Cl.[6] E02D** *3/02;5/00*
**U.S. Cl. 405—283** **3 Claims**



1. A shoring device for shoring the side walls of a trench like excavation comprising:
(a) a pair of shield walls each having a generally planar soil engaging exterior surface and a generally planar interior surface, said walls having an upper edge, a lower edge and opposite generally vertical sides;
(b) a first pair of spreader members extending transversely between the opposite interior surfaces of the shield walls at a location adjacent their upper edges and adjacent the sides of the shield walls;
(c) a second pair of spreader members extending transversely between the opposite interior surfaces of the said shield walls at a location adjacent the sides of the shield walls and disposed below said first pair of spreader members, said second pair of spreader members being detachably securable to said shield walls;
(d) a pair of auxiliary spreader members being detachably secured between the interior surfaces of the opposite shield walls at a location generally below the horizontal center line of the shield walls whereby the auxiliary spreader members may be selectively secured in place independently of said second pair of spreader members to achieve greater load factor or removed to achieve increased clearance; and
(e) said auxiliary spreader members each comprising:
(i) pads permanently secured to the interior shield walls at opposed locations having bores therein;
(ii) a spreader pipe having opposite ends;
(iii) a connector disposed at the opposite ends of said pipe, said connectors each including a generally cylindrical socket and a flange secured thereto, said flange defining bores alignable with said bores in said pads; and
(iv) removable fastener means engageable in said bores for securing said connectors to said pads.

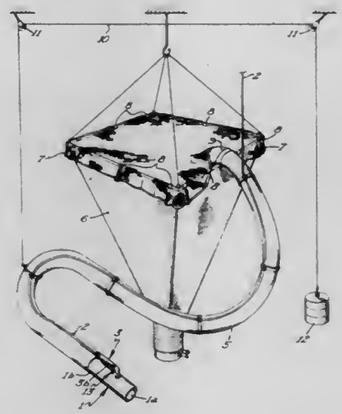
**5,741,092**
**CABLE BOLT DRIVER**
**Brian R. Castle, Rolla, Mo.; John C. Stankus, Canonsburg, and John G. Oldsen, Butler, both of Pa., assignors to Jennmar Corporation, Pittsburgh, Pa.**
**Filed Feb. 15, 1996, Ser. No. 601,991**
**Int. Cl.[6] E21D** *20/00*
**U.S. Cl. 405—302** **20 Claims**



1. A cable mine roof bolt driver for driving cable mine roof bolts, said cable mine roof bolt driver comprising:
a) a body having a front face and a rear face;
b) a cable receiving bore within said body extending into said body from said front face and adapted to releasably receive a cable of a cable mine roof bolt therein;
c) a cable engaging means within said cable receiving bore for releasably, directly, rotatably engaging the cable, wherein rotation of said body will rotate the mine roof bolt when said cable engaging means is directly engaging the cable; and
d) a body rotation means coupled to said body for providing rotation of said body.

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**5,741,093**
**APPARATUS FOR COLLECTING LIGHTWEIGHT OBJECTS**
**David J. Schonberg, 6595 Cord 4W SW., and Neal E. Fosdick, 1338 Hiebel Rd. SW., both of Alexandria, Minn. 56308**
**Filed Apr. 15, 1996, Ser. No. 632,288**
**Int. Cl.[6] B65G** *53/14*
**U.S. Cl. 406—153** **6 Claims**



1 A packaging peanut recovery system for recovering foam packing peanuts, the recovery system comprising:
an elongate, hand-held, tubular wand having an upstream inlet opening at an inlet end thereof and a downstream outlet opening at an outlet end thereof,
an elongate flexible hose having one end thereof connected to the outlet end of the wand,

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a receiving container for receiving the packaging peanuts therein, another end of said flexible hose extending into said container,

a mesh lid closing the container and permitting air under pressure to escape therethrough, and

an air valve mounted on said wand and connected in communicating relation to a conventional source of the air under pressure, said valve having a discharge orifice positioned within said wand for discharging the air under pressure in a downstream direction to produce a strong vacuum in the wand within a range of 0" to 3½" $H_2O$ for sucking the packing peanuts into the wand and through the flexible hose for delivery to the container, said valve including an actuating handle for opening and closing the air under pressure to said orifice, and for controlling an amount of the air under pressure discharged through said discharge orifice for varying the vacuum.

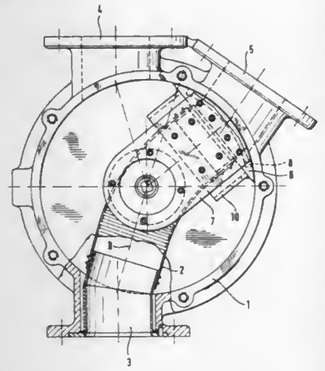
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**5,741,094**

## PIPE SHUNT FOR PHEUMATICALLY FED BULK GOODS

**Michael Heep, Weingarten, Germany, assignor to Motan-Fuller VerFahrenstechnik GmbH, Weingarten, Germany**

**Filed Mar. 20, 1997, Ser. No. 821,323**
**Int. Cl.[6] B65G** *53/56*
**U.S. Cl. 406—182** **9 Claims**



1. A pipe shunt for pneumatically fed bulk goods, comprising a housing with first, second and third pipe connections disposed in the housing and associated with one another; said first pipe connection being a pipe entrance and said second and third pipe connections each being a pipe drain, wherein the pipe entrance disposed in the housing of the pipe shunt communicates, one at a time, with each of the two pipe drains disposed in the housing through a flexible spiral hose that communicates with the pipe connections and is prestressed in curved fashion between them.

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**5,741,095**

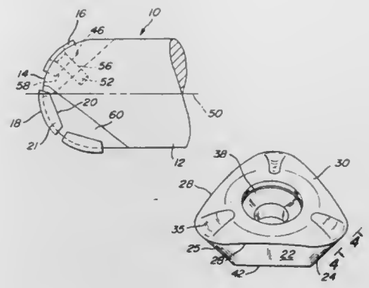
## CUTTING TOOL AND INSERT THEREFOR

**Mike Charron, Royal Oak; Foye Powell, Troy, and Lee Reiterman, Royal Oak, all of Mich., assignors to Valenite Inc., Madison Hts., Mich.**

**Continuation of Ser. No. 31,002, Mar. 12, 1993, abandoned. This application Jan. 13, 1997, Ser. No. 790,483**
**Int. Cl.[6] B23C** *5/20;5/02*
**U.S. Cl. 407—42** **20 Claims**

1. A cutting tool comprising:

a cylindrical shank terminating in a spherical cutting end and including at least one mounting cavity shaped for receipt in lay-down fashion of an indexable cutting insert, and means



mounting the indexable cutting insert to the mounting cavity, the indexable cutting insert comprising first and second polygonal major faces and flank surfaces forming the sides of a polygon, said second major face being planar and intersecting each flank forming an included angle of at least 90 degrees, the first major face including upwardly sloping convex portions, each convex portion intersecting a flank face to form an arcuate cutting edge along a side of the polygon, said convex portions including clearance face portions extending along said first major face rearwardly from said cutting edges, the slope of said clearance faces defining a clearance angle measured relative to a line drawn over the first major face parallel to the second major face and through the center of the insert normal to the second major face, said clearance angle being constant as measured around the entire perimeter of the insert, the cavity oriented such that an arcuate cutting edge of said insert placed in lay-down fashion in the cavity will extend radially outwardly from a longitudinal axis of the shank.

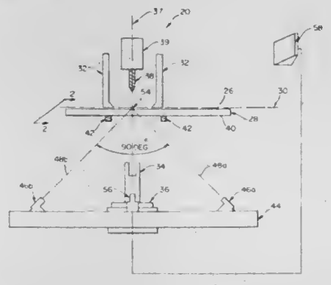
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**5,741,096**

## LINE-LASER ASSISTED ALIGNMENT APPARATUS

**Stephen P. Olds, Enumclaw, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed Nov. 30, 1995, Ser. No. 565,335**
**Int. Cl.[6] B23B** *35/00*
**U.S. Cl. 408—1 R** **11 Claims**



1. An apparatus for assisting in the alignment of a marked position on a marked surface of an object with a tool that is to perform an operation about an axis of the tool at the marked position, said apparatus comprising:

a first laser line generator radiating a first visible fan beam, which is visible on the marked surface of the object, in a first plane wherein the marked surface of the object is facing away from the tool; and

a second laser line generator radiating a second visible fan beam, which is visible on the marked surface of the object, in a second plane, the second visible fan beam intersecting the first visible fan beam of said first laser line generator along a reference axis that coincides with the axis of the tool.

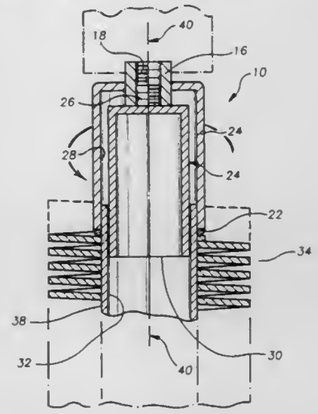


**5,741,097**

## HEAT EXCHANGER FIN REMOVER

**John W. Murphy, II, 202 Beach Ave., Woodbury Heights, N.J. 08097-1209**

**Filed Jun. 20, 1996, Ser. No. 665,672**
**Int. Cl.[6] B23C** *3/00*
**U.S. Cl. 409—180** **7 Claims**



1. A heat exchanger fin remover comprising:

(A) a first hollow cylindrically-shaped member having a closed end and an open end;

(a) said first member closed end being provided with a centrally disposed portion having a centrally disposed threaded aperture therein adapted to be received by a rotary source of power, and

(b) said first member open end being provided with an annular cutting ring portion disposed on the distal edge thereof; and

(B) a second hollow cylindrically-shaped member having a closed end and an open end, said second member being adapted to be received within said first hollow cylindrically-shaped member open end;

(a) said second member closed end being provided with a threaded centrally disposed extending portion adapted to be received by and cooperate with said first member centrally disposed threaded aperture when said second member is inserted into said first member, and

(b) said second member open end extending beyond said cutting ring portion disposed on the distal edge of said first member.

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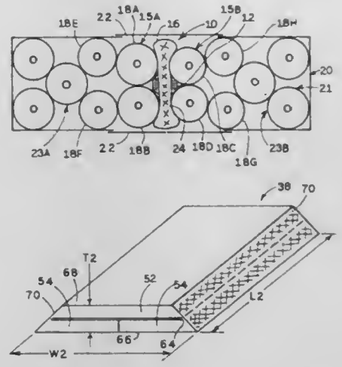
**5,741,098**

## SYSTEM FOR PROTECTING GOODS DURING TRANSPORT

**James C. Letts, III, Appleton, Wis., assignor to Hayes Manufacturing, Neenah, Wis.**

**Division of Ser. No. 501,402, Jul. 12, 1995, Pat. No. 5,647,708. This application Dec. 11, 1996, Ser. No. 763,396**
**Int. Cl.[6] B60P** *07/12*
**U.S. Cl. 410—47** **27 Claims**

1. A cushioning dunnage wedge precursor made with cushioning material having a first thickness, said cushioning dunnage wedge precursor having a length, a width, opposing first and second sides, and opposing first and second outer surfaces extending along the length and the width, said cushioning dunnage wedge precursor comprising a cushioning central panel, and first and second wing panels on opposing ends of said central panel, each of said first and second outer surfaces comprising a central element and first and second wing elements, severance lines defining facing edge surfaces on said central panel and said wing panels, extending into the cushioning material from the first surface to internal edges of said edge surfaces, thereby defining bridging members between the



internal edges and the second surface and distinguishing said central panel from said first and second wing panels, said wing panels pivoting with respect to said central panel at said bridging members to bring said first and second wing elements of said second outer surface into facing relationship with said central element of said second outer surface, to thereby form a wedge having a first wedge surface comprising said central element of said first outer surface and a second wedge surface comprising, in combination, said first and second wing elements of said first outer surface.

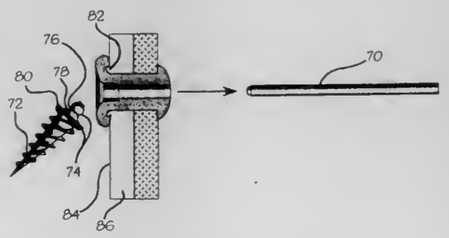
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**5,741,099**

## SELF TAPPING BLIND SETTING RIVET ASSEMBLY

**A. L. Pepper Aasgaard, Ohaha, Nebr., assignor to ASAR Group, Inc., Omaha, Nebr.**

**Filed Jul. 12, 1996, Ser. No. 679,540**
**Int. Cl.[6] F16B** *13/04;* **B23P** *11/02*
**U.S. Cl. 411—29** **11 Claims**



1. A self-tapping, blind setting rivet assembly comprising:

(a) a hollow rivet body having a tubular sleeve and an enlarged flattened head adapted to abut the surface of a work piece; and

(b) a mandrel disposed longitudinally within said rivet body comprising a screw tip having a diameter at least equal to the outer diameter of said sleeve so that said sleeve may pass through an aperture formed by said self-tapping screw tip separating and folding one or more work pieces, a shoulder section adjacent to the screw tip having an outer diameter greater than the inner diameter of said sleeve so that the shoulder section radially compresses and spreads the lower end of said sleeve as said mandrel is retracted rearward relative to said rivet body, and a shank having an area of reduced diameter spaced rearward from the shoulder section and sized to allow the screw tip and shoulder section of said mandrel to be detached from the shank upon application of predetermined tensile force applied to the shank.

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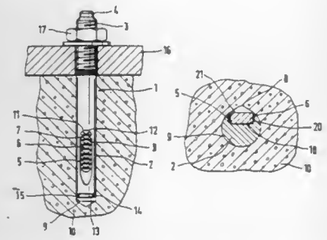


**5,741,100**

## EXPANSIBLE FIXING MEMBER

**Artur Fischer, Waldachtal, Germany, assignor to Fischerwerke, Artur Fischer GmbH & Co. KG, Waldachtal, Germany**

**Filed Nov. 13, 1995, Ser. No. 557,738**
**Claims priority, application Germany, Nov. 23, 1994, 44 41 750.0**
**Int. Cl.[6] F16B** *13/04*
**U.S. Cl. 411—79** **13 Claims**



1. A fixing element, comprising a shank having a rear end and a leading end; holding means arranged on said rear end for clamping an article to a building component; at least one expansion region extending from said leading end in a longitudinal direction for part of a length of said shank, said expansion region being formed by a longitudinal slot with a base surface raising toward said leading end; an expansion member inserted in said longitudinal slot, said base surface sloping upwardly and ending at an outer circumference of said shank at a distance from said leading end, said expansion member being formed as a wedge with a length substantially corresponding to a length of said longitudinal slot and lying on said base surface so as to be displaceable toward said leading end, said wedge having an outer surface provided with trapezoidal teeth which project beyond said shank at least by a part of a height of said teeth.

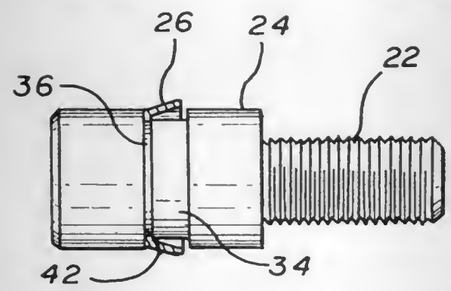
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**5,741,101**

## RELIABLE SNAP ACTION LOCKING FASTENER

**Bulent Gulistan, 20568 Pinnacle Way, Malibu, Calif. 90265**

**Filed Aug. 16, 1996, Ser. No. 698,844**
**Int. Cl.[6] F16B** *39/22*
**U.S. Cl. 411—107** **20 Claims**




1. A fastener for attaching an object to the outside of a panel having a normally inaccessible inner surface, comprising:

a threaded portion;

a cylindrical portion having a first diameter, wherein said cylindrical portion includes a first annular recess having a second diameter, and a second annular recess within said first annular recess having a diameter smaller than said second diameter;

a resilient washer engaged in said first annular recess;

said washer having a contoured outer surface with a smaller diameter that is slightly smaller than said first diameter and a larger diameter that is substantially larger than said first diameter;

said washer also having an inwardly extending flange that engages said second annular recess to keep said washer substantially concentric with said cylindrical portion and prevent said washer from being substantially displaced to one side of said first annular recess;

said washer also having a gap sufficient to allow said washer to be compressed to a diameter equal to or less than said first diameter; and

said washer being a single unitary part;

whereby said fastener can be pressed through a panel having a hole slightly larger than said first diameter and retained in said panel by said washer, which springs back to its decompressed shape after passing through said hole.

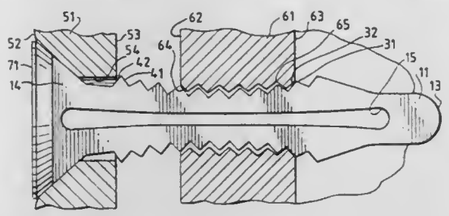
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**5,741,102**

## REMOVABLE QUASI-RATCHET FASTENER

**Gerald W. Everett, Normal, and Ralph R. Trimnell, Oak Park, both of Ill., assignors to Everett Industries Inc.**

**Filed Jul. 19, 1996, Ser. No. 684,945**
**Int. Cl.[6] F16B** *19/00;21/00*
**U.S. Cl. 411—339** **5 Claims**




1. A fastener comprising:

a shank, the shank having a long axis, a lateral axis, and a normal axis, the shank having a push-in end on the shank long axis the shank having a pull-out end on the shank long axis, and the shank being compressible along the normal axis and the shank having an elastic force acting along the normal axis caused by compression of the shank along the normal axis; and

teeth, the teeth protruding from the shank along the shank normal axis, each one of the teeth having a push-in incline, and each one of the teeth having a pull-out incline, the push-in incline causing a compression of the shank while the shank is being inserted from a first structure into an opening in a second structure, the compression allowing the shank to be fully inserted from the first structure into the opening without any rotation of the shank, the teeth fitting into screw thread grooves in the second structure while the shank remains fully inserted in the second structure, the teeth causing a continuing compression of the shank while the shank remains fully inserted in the second structure, the elastic force caused by the continuing compression resisting motion in the pull-out direction, the elastic force caused by the continuing compression increasing the pull-out incline of at least one of the teeth which is just through the opening in the second structure, the increased pull-out incline resisting motion out of the opening, the increased pull-out incline and the shank compressibility allowing the shank to be pulled out of the opening without damage to any of the shank, the teeth, and the second structure.

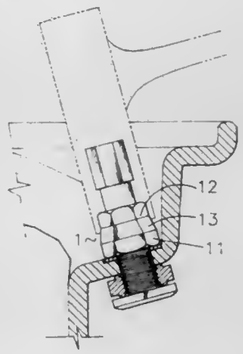


**5,741,103**

## SECURING STRUCTURE FOR AIR VALVES

**Ching-Jong Lee, 5F-1, No. 86, Lane 44, Sec. 3, Chung-Hua E. Rd., Tainan, Taiwan**

**Filed Feb. 4, 1997, Ser. No. 792,755**
**Int. Cl.[6] F16B** *35/06;37/00*
**U.S. Cl. 411—366** **2 Claims**




1. An air valve stem and nut assembly for tires comprising a threaded valve stem and nut having interior threads and threaded on the valve stem and adapted to tighten the air valve stem within a hole arranged on a rim of a wheel, the nut having a bottom with a large nut section, a middle with an intermediate nut section and a top with a small nut section; the small, intermediate and large nut sections arranged along an axial direction of the nut; a diameter of the large nut section is greater that a diameter of the small nut section, and the intermediate nut section has a gradient diameter increasing from the small nut section to the large nut section and beginning with a diameter matching the diameter of the small nut section and ending with a diameter matching the diameter of the large nut section, and

the small, intermediate and large nut sections respectively having an identical number of sides and corners adapted to receive an opening of a wrench for turning the nut; and respective corners of the small, intermediate and large nut sections are arranged to intersect a plane passing through the axis of the nut.

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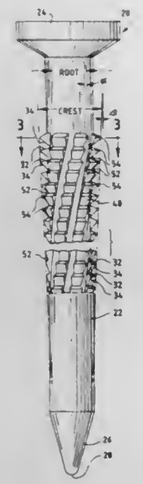
**5,741,104**

## STEEL FASTENER HAVING GROOVED SHANK

**Geronimo E. Lat, Prospect Heights; William L. Gabriel, Barrington, both of Ill.; Henry A. Sygnator, deceased, late of Sherwood, Wis., by Janet M. Allen, executrix; Henry W. Schniedermeier, Niles, and Frederick A. Kish, Wheeling, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.**

**Continuation of Ser. No. 651,552, May 22, 1996, abandoned, which is a continuation-in-part of Ser. No. 472,906, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 293,003, Aug. 19, 1994, Pat. No. 5,489,179. This application Jun. 5, 1997, Ser. No. 869,483**
**Int. Cl.[6] F16B** *15/06;15/08*
**U.S. Cl. 411—453** **12 Claims**

1. A steel fastener having an elongate shank, an enlarged head formed at one end of the shank, and a generally pointed tip formed at the other end of the shank, the shank having a grooved portion formed with helical grooves defining helical ribs and with annular grooves defining annular rings, wherein each of the annular grooves has a root where deepest, wherein the roots of the annular grooves define an imaginary cone diverging toward the tip, wherein each of the annular rings has a crest where largest, and wherein the crests of the annular rings define an imaginary cone converging toward the tip.



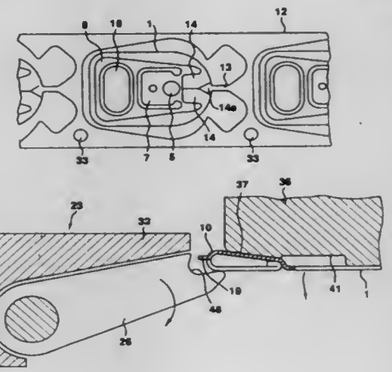

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**5,741,105**

## METHOD OF AND APPARATUS FOR MANUFACTURING TABS FOR EASY-OPEN CAN END

**James R. Schubert; John F. Schubert, both of Dayton, and Steven T. Cook, Bellbrook, all of Ohio, assignors to Dayton Systems Group, Inc., Dayton, Ohio**

**Filed Jan. 31, 1997, Ser. No. 792,895**
**Int. Cl.[6] B21D** *53/00*
**U.S. Cl. 413—25** **6 Claims**



1. A method of manufacturing a tab for attachment by a rivet to an easy-open can end, capable of opening the can end by tearing an openable area surrounded by a score on the end panel when a grip ring is lifted, comprising the steps of:

forming a tab from a strip of materials the tab having a nose end, an island with a rivet hole which receives the rivets and having a grip end at the opposite side of the rivet hole from the nose, the tab being attached at the nose by a joint to the strip; and severing the joint;

said severing step comprising

moving the strip to position a captured tab in a tab severing position;

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cutting the joint thereby to sever the captured tab from the strip leaving a protrusion having a cut edge from the tab nose;

bringing the protrusion of the tab into abutment against a curling surface on a distal end of a swing arm which has a proximal end pivotally supported on a side of a downward passage in which the tab is lowered, the swing arm being swingable in the downward passage and normally urged to swing upwardly and across the passage by urging means, said arm swinging downward as the tab is lowered; and

pressing said curling surface to curl the protrusion onto the tab in a pressing position as the arm is swung downward in the passage to move the curling surface against the tab.

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**5,741,106**

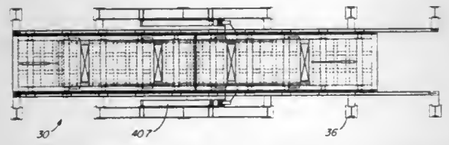
## MATERIALS HANDLING SYSTEM

**Sidney Sridhar, Richmond, Canada, assignor to Seabulk Systems Inc., Richmond, Canada**

**Continuation-in-part of Ser. No. 759,931, Dec. 4, 1996, which is a continuation of Ser. No. 414,027, Mar. 31, 1995, abandoned. This application Dec. 7, 1995, Ser. No. 569,047**

**Int. Cl.[6] B63B** *27/22*

**U.S. Cl. 414—142.3** **20 Claims**




1. A materials handling system for controlling the gravity discharge of material through a discharge opening onto a conveyor, which discharge opening has a width dimension and a length dimension in the horizontal direction, the system comprising:

a gate extending across said discharge opening and having a plurality of outlet openings therein for the through flow of material from the discharge opening through the gate and including closure members for said outlet openings;

first and second linkage members extending along said gate and a power source for moving the linkage members relative to the gate and independently of each other; and

coupling means for selectively coupling the closure members to either one or the other of said linkage members.

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**5,741,107**

## REFUSE COLLECTION VEHICLE

**Edgar Georg, Auf der Seelhardt 10, D-57638 Neitersen, Germany**

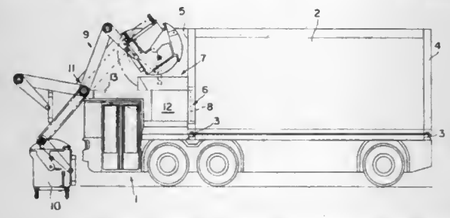
**PCT No. PCT/EP95/01791, § 371 Date Jun. 5, 1996, § 102(e) Date Jun. 5, 1996, PCT Pub. No. WO95/31388, PCT Pub. Date Nov. 23, 1995**

**PCT Filed May 11, 1995, Ser. No. 583,122**

**Claims priority, application Germany, May 13, 1994, 9407869 U**

**Int. Cl.[6] B65F** *3/04*

**U.S. Cl. 414—408** **4 Claims**




1. A vehicle for receiving and transporting refuse materials comprising:

a vehicle frame;

a cab disposed on the vehicle frame;

a collection container detachably connected to and disposed on the vehicle frame behind the cab, the collection container further having:

a front end wall at an end thereof closest to the cab, the front end wall defining a filling opening therein at a lower region thereof, the filling opening being bounded by a rigid frame; and

a door disposed at the front end wall and adapted to move for opening and closing the filling opening thereby defining a plane of movement;

an operating device operatively connected to the door for moving the door for opening and closing the filling opening;

a discharge hopper disposed behind the cab and defining an output opening in communication with the filling opening of the collection container, the output opening being bounded by a counterframe disposed adjacent the frame of the filling opening for defining a communication region between the discharge hopper and the collecting container, the discharge hopper further including a tubular extension extending into the filling opening up to the plane of movement of the door;

a press disposed in the discharge hopper and including:

a stamp movable into and out of an interior of the collection container through the filling opening thereby defining, respectively, an advancing motion and a retracting motion, the stamp having an inclined front surface whose upper edge is set back with respect to a lower edge thereof in a direction toward the interior of the collection container; and

a drive operatively connected to the stamp for moving the stamp into and out of the interior of the collection container, the operating device and the drive being configured such that, during a closing of the door, a lower edge of the door remains in contact with the front surface of the stamp during the retracting motion of the stamp until the door is completely closed;

a device for receiving a refuse container for emptying contents of the refuse container into the discharge hopper; and

a seal disposed on an end face of at least one of the frame and the counterframe for sealing the communication region between the collection container and the discharge hopper.

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**5,741,108**

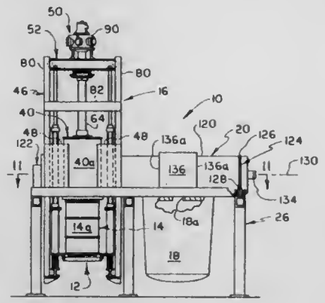
## DRUM EMPTYING APPARATUS

**John I. Rolfe, 337 Riverview Dr., Youngstown, N.Y. 14174**

**Filed Apr. 22, 1996, Ser. No. 636,037**

**Int. Cl.[6] B08B** *9/38*

**U.S. Cl. 414—416** **14 Claims**




1. An apparatus for removing material from drums of the type having a generally cylindrical side wall and an end opening bounded by an annular rim comprising:

a housing having a side wall provided with an open end bounded by an annular sealing flange sized to sealingly engage with said annular rim of one of said drums and a discharge opening communicating with said open end;



means for removably placing said annular rim of said drum in sealing engagement with said sealing flange;

scraper means supported for movement from within said housing through said open end and into said end opening for scraping material from within said drum;

a material conveyor supported for rotation about a generally horizontally disposed axis and having axially spaced material inlet and outlet openings, means for transporting material from said inlet opening to said outlet opening, said discharge opening of said housing communicating with said material inlet opening of said conveyor, and said conveyor supporting said housing and said drum sealingly engaged with said sealing flange for vertical tilting movement about said axis to facilitate movement of material scraped from said drum through said housing and into said material conveyor.

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**5,741,109**

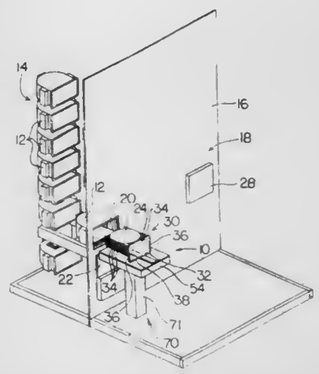
## WAFER TRANSFER SYSTEM HAVING VERTICAL LIFTING CAPABILITY

**Mordechai Wiesler, Lexington, Mass., and Mitchell Weiss, Haverford, Pa., assignors to PRI Automation, Inc., Billerica, Mass.**

**Filed May 22, 1996, Ser. No. 651,395**

**Int. Cl.[6] B65B** *1/06*

**U.S. Cl. 414—416** **25 Claims**




1. A semiconductor wafer transfer system for moving a wafer into and out of a wafer support device having opposed, paired shoulders on interior walls thereof to horizontally support the wafer, the support device further having a vertical opening therein, the wafer transfer system comprising:

a support structure positionable adjacent an opening in a wafer support device;

a finger structure mounted to the support structure to extend generally horizontally toward the opening in the support device and having a finger configuration sized to fit within the support device at a location inwardly of the shoulders to hold the wafer off the shoulders;

a generally horizontally reciprocal transport mechanism connected to the support structure to move the support structure into and out of the wafer support device with the finger structure aligned beneath the wafer; and

a lifting mechanism comprising a tilting mechanism disposed to tilt the finger structure through a vertical angle to provide a component of relative vertical motion between the support structure and the wafer support device sufficient to bring the finger structure into and out of contact with the undersurface of the wafer for lifting the wafer off and loading the wafer onto the shoulders of the support device.

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**5,741,110**

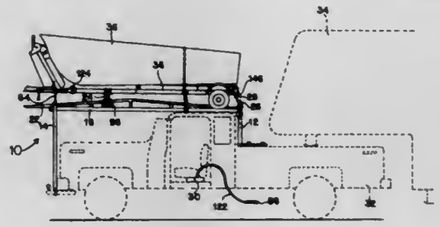
## FRONT LOADING TRUCK RACK FOR WHEELED LOADS

**Lloyd Grinage, Jr., 131 S. Machias Rd., Snohomish, Wash. 98290**

**Filed Jan. 3, 1997, Ser. No. 775,965**

**Int. Cl.[6] B60P** *3/10*

**U.S. Cl. 414—462** **8 Claims**




1. A front loading truck rack for carrying wheeled loads, for mounting on a pickup with a bed, a cab, a cab front, and a pickup front, comprising:

a rear frame with a first end and a second end, comprised of a rectangular frame for attachment to the front of the bed of the pickup behind the cab so that less than a minimum of bed space is utilized and which allows unobstructed turning of an attached fifth wheel trailer, and for support of the first and second wheel tracks and the load;

a front frame with a first end and a second end, comprised of a rectangular frame for attachment to the front of the pickup with its first end directly in front of the first end of the rear frame, and for support of the first and second wheel tracks and the load;

a first wheel track with a first end and a second end which attaches at its first end to the first end of the rear frame and at its second end to the first end of the front frame;

a second wheel track with a first end and a second end which attaches at its first end to the second end of the rear frame and at its second end to the second end of the front frame;

a first ramp with a first end and a second end, which attaches at its first end to the second end of the first wheel track;

a second ramp with a first end and a second end, which attaches at its first end to the second end of the second wheel track;

a guide wheel assembly for attachment to a load and for supporting the load on the first and second wheel tracks and first and second ramps, comprising a bar with a first and a second guide wheel which are attached at either end of the bar;

a winch for winding and unwinding winch cable and for lifting a load or lowering a load up or down the first and second ramps;

winch cable for attaching to the load while it is on the ground and pulling it up the first and second ramps and along the first and second wheel track by winding the winch cable onto or off of the winch, so that the operator is not required to lift any of the weight of the load;

a winch control module which is remote from the pickup, and which is in communication with the winch; and

a means of securing loads to the front or rear frame, or the wheel tracks.

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5,741,111

## ELECTRO-PNEUMATIC MACHINING JIG

Steven Edward Goostrey, 13 Emu Creek Road, Crows Nest, QLD 4353, Australia

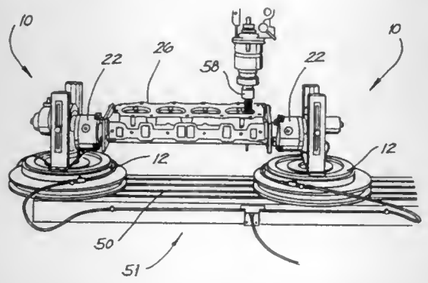
PCT No. PCT/AU94/00642, § 371 Date Jun. 10, 1996, § 102(e) Date Jun. 10, 1996, PCT Pub. No. WO95/11103, PCT Pub. Date Apr. 27, 1995

PCT Filed Oct. 19, 1994, Ser. No. 632,499

Claims priority, application Australia, Oct. 19, 1993, PM 1898; May 11, 1994, PM 5552; May 13, 1994, PM 5628

Int. Cl.[6] B23Q 3/06

U.S. Cl. 414—676 9 Claims




1. An electro-pneumatic machining jig adapted to be attached to the bed of a machine such as a milling machine, grinding machine or the like, to hold a work-piece for machining, said machining jig having a pair of jig stands for holding the work-piece, said jig stands adapted to be mounted in selected spaced relationship on the bed of the machine, each said jig stand having work-piece connection means on an adjustable stand on a base having air-float means and electro-magnetic means, the air-float means permits alignment of the work-piece between the jig stands whilst the bases are floating and when the air-float is terminated, the electro-magnetic means are energised to clamp each jig stand to a mounting plate on the machine.

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5,741,112

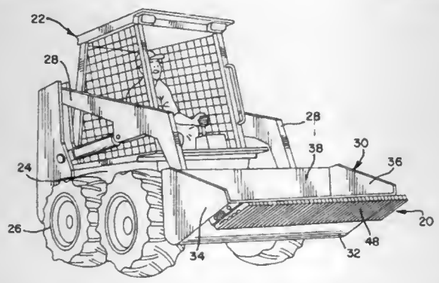
## FLOOR AND BUCKET PROTECTION DEVICE

Lewis G. Lakin; Gilbert M. Younger, both of Northfield, and Kurt Kenner, Wayne, all of Ill., assignors to Lakin General Corporation, Ill.

Filed Jan. 11, 1996, Ser. No. 584,251

Int. Cl.[6] E02F 3/14

U.S. Cl. 414—722 11 Claims




1. In a vehicle having a main body, lifting arms attached to said main body, and a bucket attached to said lifting arms, the improvement being in a floor and bucket protection device attachable to said bucket, said protection device comprising:

a frame;

means for attaching said frame to said bucket; and

a plurality of rubber pads having top, bottom, front and back edges mounted and aligned in said frame such that the bottom edges of the pads forms a wear surface, said rubber pads including a plurality of steel strands embedded in said rubber pads for reinforcing said rubber pads, and said plurality of rubber pads being mounted in said frame between thicker non-reinforced or fiber-reinforced rubber end pads,

whereby the steel-reinforcing strands strengthen the rubber pads thereby reducing the rate of wear of the pads and prevent tearing and chunking of the pads.

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5,741,113

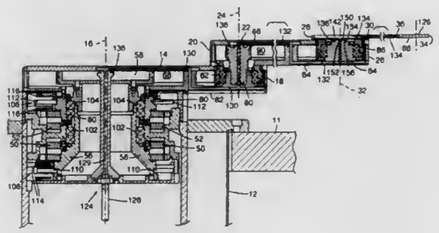
## CONTINUOUSLY ROTATABLE MULTIPLE LINK ROBOT ARM MECHANISM

Paul Bacchi, Novato, and Paul S. Filipski, Greenbrae, both of Calif., assignors to Kensington Laboratories, Inc., Richmond, Calif.

Filed Jul. 10, 1995, Ser. No. 499,963

Int. Cl.[6] B25J 9/06

U.S. Cl. 414—744.5 16 Claims



1. A robot arm mechanism, comprising:

an upper arm supporting a forearm and a hand and operable for rotation about a shoulder axis; the forearm having a first end that is supported by the upper arm for rotation about an elbow axis and having a second end that supports the hand for rotation about a wrist axis; the upper arm, forearm, and hand constituting link elements through which a fluid pressure conduit passes to deliver vacuum pressure to releasably secure a specimen to the hand; and the shoulder axis, elbow axis, and wrist axis defining rotary joints through which the fluid pressure conduit passes;

a rotary fluid slip ring fitted into least one of the rotary joints, the rotary fluid slip ring having a central aperture through which vacuum pressure is delivered and having first and second surfaces that form a vacuum pressure seal at an interface between the link elements forming the rotary joint into which the slip ring is fitted;

a first motor for rotatably positioning the forearm about the elbow axis;

a second motor for rotatably positioning the upper arm about the shoulder axis;

a mechanical linkage operatively connecting the upper arm and the forearm, the mechanical linkage forming an active drive link between the first motor and the forearm to cause the forearm to rotate about the elbow axis in response to operation of the first motor and a passive drive link between the forearm and the hand to cause the hand to rotate about the wrist axis in response to rotation of the forearm about the elbow axis; and

a controller coordinating the operation of the first and second motors in first and second states, the first state characterized by operating the second motor and holding stationary the first motor so that the mechanical linkage causes linear displacement of the hand and the second state characterized by operating the first and second motors so that the mechanical linkage causes angular displacement of the hand about the shoulder axis.



5,741,114

## METHOD FOR MOUNTING COMPONENTS AND APPARATUS THEREFOR

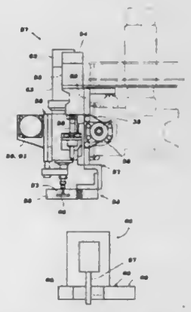
Hitoshi Onodera, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 9, 1993, Ser. No. 103,358

Claims priority, application Japan, Aug. 7, 1992, 4-211839

Int. Cl.[6] G01B 11/00

U.S. Cl. 414—783 75 Claims



1. A component handling apparatus adapted to pick and position components comprising a pick up portion for picking up, transporting, and depositing components, a sensing station adapted to sense a condition of an article, means for positioning said pick up portion in said sensing station for recognition of the identity of the pick up portion independently of a component which may be held by said pick up portion and means for positioning a component held by said pick up portion in said sensing station for detecting a condition of the component.

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5,741,115

## HANDLING SYSTEM FOR FLAT HOLLOW BODIES

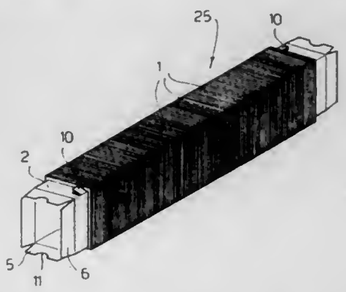
Luigi Goglio, Via Frua, 11 - 20146 Milano, Italy

Filed Oct. 28, 1996, Ser. No. 738,549

Claims priority, application Italy, Nov. 2, 1995, M195A2269

Int. Cl.[6] B65G 59/06

U.S. Cl. 414—797.9 17 Claims




1. A handling system for handling flat, hollow frames used with automatic packaging machines, comprising a tubular core having a shape corresponding to an inner profile of the frames, wherein said tubular core has end portions with notches at side edges defining opposite facing flaps, and a plurality of flat, hollow frames positioned on said tubular core in an orderly fashion.

5,741,116

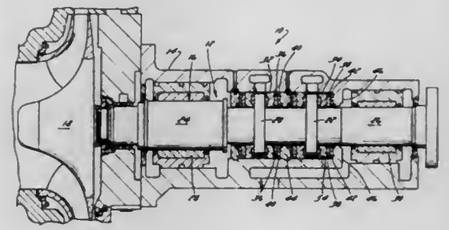
## COMPRESSOR THRUST BEARINGS

James H. Hudson, Appleton, Wis., assignor to Delaware Capital Formation Inc., Wilmington, Del.

Filed Dec. 18, 1996, Ser. No. 769,145

Int. Cl.[6] F01D 3/00

U.S. Cl. 415—104 9 Claims



1. A single stage compressor comprising:

a compressor casing;

a drive shaft disposed within the casing rotationally supported by the casing and having a first end extending out of the casing and adapted to be coupled to a rotational power source;

an impeller coupled to the drive shaft and disposed within the casing;

first and second thrust collars extending outward from the drive shaft;

first and second sets of tilting thrust bearing pads, each set radially disposed about the drive shaft such that the first set of tilting pads slidingly engages the first thrust collar, and the second set of pads slidingly engages the second thrust collar;

first and second base plates extending around the drive shaft and coupled to the respective first and second sets of pads whereby each of said set of pads tilts with respect to its respective base plate; and

a first resilient member disposed around the drive shaft and coupled between the first base plate and the casing, and

wherein the resilient member includes:

first and second annular plates; and

an elastomeric layer disposed between the first and second annular plates.

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5,741,117

## METHOD FOR COOLING A GAS TURBINE STATOR VANE

Douglas H. Clevenger, and Mary Curley Matyas, both of Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 22, 1996, Ser. No. 735,362

Int. Cl.[6] F01D 5/18

U.S. Cl. 413—115 15 Claims

1. A method for cooling a stator vane, comprising the steps of:

(a) providing a hollow stator vane having:

a leading edge;

a trailing edge;

a high pressure chamber, disposed within said hollow airfoil, adjacent said leading edge;

a standard pressure chamber, disposed within said hollow stator vane, adjacent said leading edge;

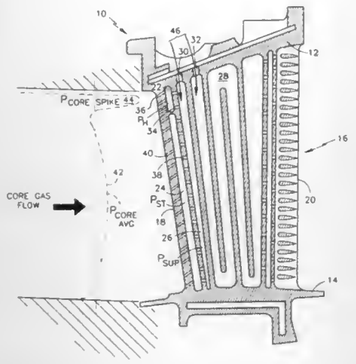
a supply chamber, disposed within said hollow stator vane, aft of said high and standard pressure chambers, and forward of said trailing edge;

a plurality of first inlet apertures, extending between said high pressure chamber and said supply chamber, said first inlet apertures having a first cross-sectional area;

a plurality of second inlet apertures, extending between said standard pressure chamber and said supply chamber, said second inlet apertures having a second cross-sectional area;

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a plurality of first exit apertures, extending from said high pressure chamber to outside of said stator vane, each having a third cross-sectional area; and

a plurality of second exit apertures, extending from said standard pressure chamber to outside of said stator vane, each having a fourth cross-sectional area;

(b) determining a gas flow pressure gradient facing said stator vane, including said gradient's magnitude and position relative to said stator vane;

(c) manipulating said first and second inlet and exit apertures such that pressure ($P_H$) in said high chamber is greater than pressure ($P_{ST}$) in said standard pressure chamber for a given pressure in said supply chamber ($P_{SUP}$);

(d) positioning said high pressure chamber along said leading edge to oppose a pressure spike in said gas flow pressure gradient.

**11**. A stator vane, comprising:

a leading edge;

a trailing edge;

a high pressure chamber, disposed within said hollow airfoil, adjacent said leading edge;

a standard pressure chamber, disposed within said hollow stator vane, adjacent said leading edge;

a supply chamber, disposed within said hollow stator vane, aft of said high and standard pressure chambers, and forward of said trailing edge;

a plurality of first inlet apertures, extending between said high pressure chamber and said supply chamber, said first inlet apertures having a first cross-sectional area;

a plurality of second inlet apertures, extending between said standard pressure chamber and said supply chamber, said second inlet apertures having a second cross-sectional area;

a plurality of first exit apertures, extending from said high pressure chamber to outside of said stator vane, each having a third cross-sectional area; and

a plurality of second exit apertures, extending from said standard pressure chamber to outside of said stator vane, each having a fourth cross-sectional area;

wherein said cross-sectional areas of said first and second inlet apertures and said first and second exit apertures are such that gas pressure within said high pressure chamber is greater than gas pressure within said standard pressure chamber for a given gas pressure in said supply chamber.

**5,741,118**

## MULTIBLADE RADIAL FAN AND METHOD FOR MAKING SAME

**Noboru Shinbara, and Makoto Hatakeyama, both of Kitakyushu, Japan, assignors to Toto Ltd., Fuknoka-ken, Japan**

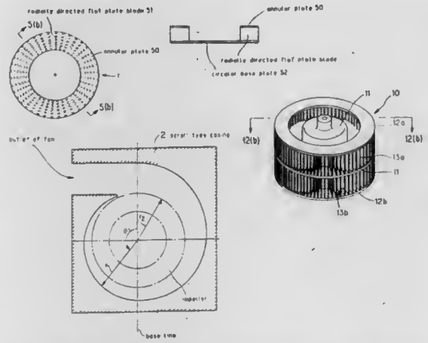
**PCT No. PCT/JP95/00789, § 371 Date Dec. 27, 1995, § 102(e) Date Dec. 27, 1995, PCT Pub. No. WO95/30093, PCT Pub. Date Nov. 9, 1995**

**PCT Filed Apr. 21, 1995, Ser. No. 578,513**

**Claims priority, application Japan, Apr. 28, 1994, 6-111747**

**Int. Cl.[6] B63H** *1/16*

**U.S. Cl. 416—186 R** **12 Claims**




**1**. A multiblade radial fan comprising an impeller having an inside radius $r_0$ and an outside radius $r_1$, and a number n of radially-directed blades, each blade having a thickness t, wherein the impeller satisfies the formula:

$$v \geq -0.857Z_1 + 1.009,$$

wherein $v = r_0/r_1$, and $Z_1 = (r_1 - r_0)/[r_1 - nt/(2\pi)]$.

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**5,741,119**

## ROOT ATTACHMENT FOR A TURBOMACHINE BLADE

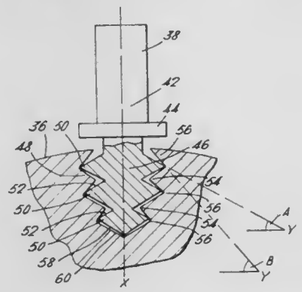
**Mark Heppenstall, Derby, England, assignor to Rolls-Royce plc, London, England**

**Filed Mar. 11, 1997, Ser. No. 815,454**

**Claims priority, application United Kingdom, Apr. 2, 1996, 9606963**

**Int. Cl.[6] F01D** *5/30*

**U.S. Cl. 416—219 R** **14 Claims**




**1**. A root attachment for a blade of a turbomachine, the attachment comprising a root on the blade which is arranged to engage within a shaped slot in a rotor, the root has a plurality of projections each one of which is arranged to engage against a corresponding projection in the slot, the projections on the root and slot have contacting surfaces to transfer load from the blade to the rotor, the contacting surface of each projection on the root is substantially planar, the contacting surface of each projection on the slot is substantially planar, at least one of the projections on the root and the corresponding projection on the slot are arranged such that the contacting surfaces of the projections are arranged with a predetermined difference in angles relative to a datum plane whereby in operation the difference in angles between the contacting surfaces of the projections relative to the datum plane reduces to increase the area of contact between the contacting surfaces.



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**5,741,120**

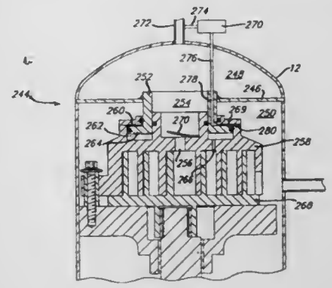
## CAPACITY MODULATED SCROLL MACHINE

**Mark Bass, Sidney; Roy J. Doepker, Lima; Jean-Luc M. Caillat, Dayton, and Wayne R. Warner, Piqua, all of Ohio, assignors to Copeland Corporation, Sidney, Ohio**

**Filed Jun. 7, 1995, Ser. No. 486,118**

**Int. Cl.[6] F04B** *49/00*

**U.S. Cl. 417—44.2** **102 Claims**




**1**. A scroll-type machine comprising:

a first scroll member having an end plate and a first spiral wrap extending therefrom;

a second scroll member having an end plate and a second spiral wrap extending therefrom, said first and second scroll members being positioned with said first and second spiral wraps interleaved with each other;

a structure for supporting said first and second scroll members for relative orbital movement therebetween whereby said first and second spiral wraps define moving fluid pockets therebetween,

a drive member for driving said first scroll member to effect said relative orbital movement between said first and second scroll members;

said first and second scroll members being movable between a first normal operating relationship in which sealing surfaces of said first and second scroll members are in sealing relationship to close off respective ones of said moving fluid pockets and a second relationship wherein at least one of said sealing surfaces of said first and second scroll members are spaced apart to define a leakage path between said moving fluid pockets; and

a force applying structure independent of said drive member and actuatable to apply a force to one of said scroll members to move said scroll member between said first relationship in which said scroll machine operates at substantially full capacity and said second relationship in which said scroll machine operates at substantially zero capacity while said drive member continues to operate whereby the capacity of said compressor is modulated.

**5,741,121**

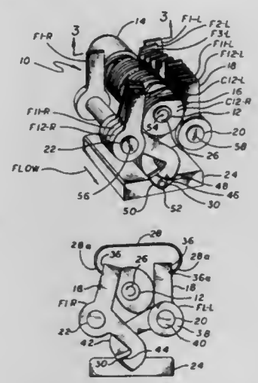
## IV FLUID DELIVERY SYSTEM

**Stephen H. O'Leary, Encinitas, Calif., assignor to Alaris Medical Systems, Inc., San Diego, Calif.**

**Continuation of Ser. No. 287,853, Aug. 8, 1994, Pat. No. 5,551,951. This application Mar. 8, 1996, Ser. No. 614,810**

**Int. Cl.[6] F04B** *43/12*

**U.S. Cl. 417—53** **12 Claims**







**1**. A method of delivering fluid through a resilient, deformable tube by using a pump mechanism having a pressure pad for supporting said tube, a plurality of fingers moving in different directions relative said pad, and drive means for actuating said fingers, wherein said fingers each include a protrusion, configured such that depression thereof causes each finger to pivot away from said pressure pad and an activator element biased to depress said protrusion and configured to retract from said protrusion as the pressure pad is brought into proximity of said fingers, said method comprising steps of:

placing said tube between said pressure pad and said fingers;

deforming and occluding said tube against said pressure pad in a peristaltic sequence under the force of said fingers directed in a first direction; and

restoring the cross-sectional area of said tube under force of said fingers against said pressure pad in a peristaltic sequence directed in a second direction;

swinging said pressure pad away from said fingers prior to placing said tube between said pressure pad and said fingers so as to cause said activator element to depress said protrusions; and

swinging said pressure pad toward said fingers after placing said tube between said pressure pad and said fingers so as to cause said activator element to retract from said protrusions.

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**5,741,122**

## VARIABLE DISPLACEMENT COMPRESSOR HAVING A SPOOL WITH A COATING LAYER

**Tomohiko Yokono; Masahiro Kawaguchi; Koji Kawamura; Shinichi Ogura, and Masanori Sonobe, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan**

**Filed Apr. 1, 1996, Ser. No. 625,360**

**Claims priority, application Japan, Mar. 30, 1995, 7-073666**

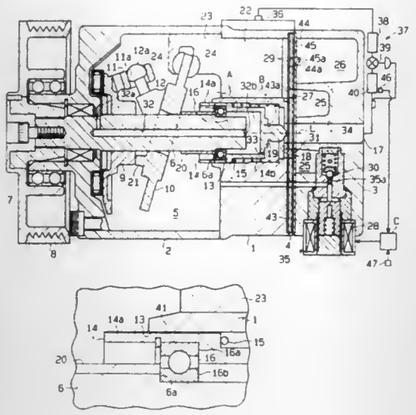
**Int. Cl.[6] F04B** *1/26*

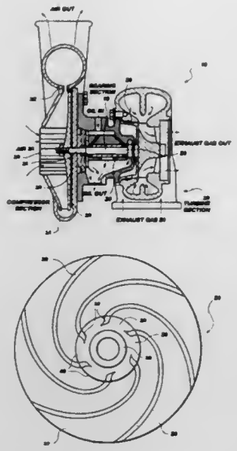
**U.S. Cl. 417—222.2** **29 Claims**

**1**. A compressor having a housing body which includes a crank chamber, a suction chamber and a discharge chamber therein, a drive shaft rotatably supported within the housing body, a cylinder bore in said housing body, a swash plate mounted on the drive shaft in the crank chamber, and a piston slidable within said cylinder bore and coupled to the swash plate, wherein said swash plate converts rotation of the drive shaft to reciprocating move-

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ment of the piston in said cylinder bore to vary the capacity of the cylinder bore, said piston compressing a gas supplied to the cylinder bore from an external circuit separately provided from the compressor by way of the suction chamber and discharging the gas to the discharge chamber, wherein said swash plate is tiltable between a maximum inclined position and a minimum inclined position with respect to a plane perpendicular to the longitudinal axis of the drive shaft according to differential pressure between the crank chamber and the suction chamber, and wherein said swash plate controls displacement of the compressor based on the inclination thereof, said compressor comprising:

a spool movable between a first position and a second position in response to the maximum and minimum inclinations of the swash plate, said spool connecting the external circuit with the suction chamber in the first position and disconnecting the external circuit from the suction chamber in the second position;

said housing body having a slide surface engaged by the spool; and

a coating layer provided on at least one of the spool and the slide surface to reduce frictional resistance occurring due to the sliding movement of the spool on the slide surface.

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**5,741,123**

**TURBOCHARGER COMPRESSOR FAN AND HOUSING**

**Lou Allen Pauly, 460 S. 500 East, Green River, Wyo. 82935**

**Continuation-in-part of Ser. No. 588,440, Jan. 18, 1996, abandoned. This application Dec. 6, 1996, Ser. No. 761,148**

**Int. Cl.[6] F04B** *17/00*

**U.S. Cl. 417—407** **8 Claims**

1. A turbocharger compressor fan and housing comprising:

said housing defining a gas inlet leading into an interior compression chamber with a seating structure,

an impeller rotatably mounted and seated within the seating structure in the interior compression chamber such that the impeller is in communication with the gas inlet, said impeller having

a. a drive segment comprising

i. a circular impeller disc with an elevated central mounded top forming a sloping surface and a bottom,

ii. a drive shaft attached to centrifugal drive means being mounted to the housing and attached to the center of the bottom of the impeller disc,

b. an auxiliary blade fan segment comprising

i. a cylindrical auxiliary blade fan defining an open top and having a bottom mounted on the central mounted top, the open top having an interior gas intake opening aligned in communication with the housing gas inlet,

ii. a plurality of fan blades surrounding the gas intake opening and defining fixed cross section fan blade outlets therebetween, and

c. an inducer segment surrounding the auxiliary blade fan segment comprising:

a plurality of curved downward sloping impeller inducer blades secured to the periphery of the fan blades proximate the fan blade outlets and the sloping surface of the top of the disc and extending radially therefrom in a radial sloping wheel configuration such that each impeller inducer blade

i. curves away from the disc's direction of rotation so the angle of curvature at the fan blade outlet allows the air entering the impeller inducer segment to be at approximately the same angle as the fan blades to minimize inlet losses; and

ii. has an inner elevated leading edge and an outer trailing edge so the height of each inducer blade decreases from the leading edge to the trailing edge to form with the seating structure surface flow channels which are downwardly open along their length and of a constant cross-section area throughout the length of each channel to minimize restriction of gas flows therethrough and out inducer gas outlets which are of the same cross-sectional area as the corresponding fixed cross sections of the fan blade outlets; and

centrifugal gas diffuser means having structure to surround and be in communication with each inducer gas outlet to collect gases accelerated by the impeller and slow the gases down to convert gas velocity energy into increased pressure gases and direct the increased pressure gases into an internal combustion engine.

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**5,741,124**

**DOUBLE INSULATED ELECTRICALLY DRIVEN WATER PUMP**

**Roberto Mazzucato, Milan; Carlo A. Cuneo, Crema, both of Italy, and Gus Alexander, Hoffman Estates, Ill., assignors to Officine Meccaniche FAIP S.r.l., Italy**

**Filed Aug. 17, 1995, Ser. No. 516,497**

**Int. Cl.[6] F04B** *17/00*

**U.S. Cl. 417—415** **11 Claims**

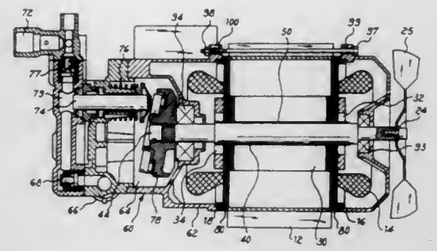
1. A high pressure water pump comprising:

an electric motor including a stator having a first end and a second end, and an electric cable coupled the stator;

said electric motor having a hollow rotor core with first and second open ends;

a fan adjacent the first end of said stator;





an axial drive pump adjacent the second end of the stator;

a drive shaft having a first end coupled to said fan and a second end coupled to the axial drive pump, said drive shaft being press fit into the hollow rotor core such that the first and second drive shaft ends extends beyond the first and second open rotor ends; and

a drive shaft insulator ring located between the stator second end and the axial drive pump.

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**5,741,125**

**PERISTALTIC PUMP DEVICE HAVING AN INSERT CASSETTE OF REDUCED COMPLEXITY**

**Frédéric Neftel, Lausanne, Switzerland, and Bernard Bouvier, Eragny, France, assignors to Deblotech S.A., Lausanne, Switzerland**

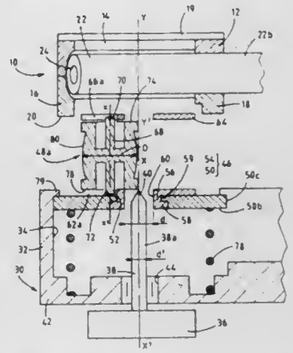
**PCT No. PCT/FR95/00617, § 371 Date Oct. 29, 1996, § 102(e) Date Oct. 29, 1996, PCT Pub. No. WO95/31643, PCT Pub. Date Nov. 23, 1995**

**PCT Filed May 11, 1995, Ser. No. 737,375**

**Claims priority, application France, May 11, 1994, 94 005794**

**Int. Cl.[6] F04B** *43/09*

**U.S. Cl. 417—477.7** **13 Claims**



1. A peristaltic pump system, characterized in that it comprises:

a first assembly comprising:

rotary drive means;

a shaft rotated by said drive means and having a free end;

a housing presenting a cavity into which said free end of said shaft projects;

a plurality of wheels, each wheel having a pivot axis and an active tread face that is symmetrical about said axis; and

mounting means for said wheels and comprising:

a plate mounted to move in said cavity along the axis of said shaft and having an orifice suitable for allowing the free end of said shaft to pass therethrough; and

movable means movable in rotation about the axis of said shaft relative to said plate, said movable means comprising means for substantially preventing said wheels from moving in translation relative to said plate along their pivot axes, for holding the pivot axes of said wheels parallel to said axis of the shaft, for allowing each wheel to rotate, and for guiding the axes of said wheels in translation along radial directions; and

a second assembly, independent of the first and comprising:

a wall including at least a cylindrical portion; and

a deformable tubular duct secured to the inside face of said wall;

whereby, by engaging said second assembly around the wheels of the first assembly, the tread walls of said wheels come into contact towards the axis of rotation of the mounting means in such a manner that a portion of each wheel is disposed facing said orifice; and

whereby, by pushing down said mounting means into the cavity of said first assembly, the free end of said shaft penetrates through said orifice so that the side wall of the shaft co-operates with said wheels to spread said wheels apart in radial directions away from the axis of the shaft, thereby causing said tubular duct to be locally squeezed between said wheels and said wall of said second assembly.

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**5,741,126**

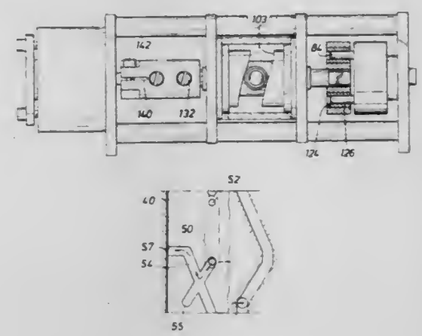
**VALVELESS METERING PUMP WITH CRISSCROSSED PASSAGE WAYS IN THE PISTON**

**Stanley D. Stearns, P.O. Box 55603, Houston, Tex. 77255, and Paul Werner, Moosgasse 6, CH-6210 Sursee, Switzerland**

**Filed Mar. 1, 1996, Ser. No. 609,849**

**Int. Cl.[6] F04B** *7/04*

**U.S. Cl. 417—490** **19 Claims**



1. A metering pump comprising:

(a) a closed end cylindrical pump housing including a first fluid port means for allowing fluid to flow into and a second fluid port means for allowing fluid to flow out of said cylindrical housing;

(b) piston means in said cylindrical housing to define with said cylindrical housing at said closed end a sealed pumping chamber and said piston means moves with reciprocation and rotation in said housing;

(c) wherein said first and second port means open into said sealed chamber;

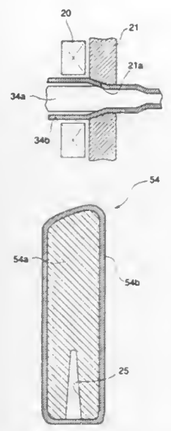
(d) means for rotating or rotating and reciprocating said piston means for alternately supplying fluid to said sealed pumping chamber and discharging fluid from said pumping chamber through said first and second port means wherein said piston means periodically dwells between movements thereof; and

(e) surfaces on said piston means moving with said piston means to positions relative to said first and second port means to sequentially meter fluid into said pumping chamber to fill said chamber from said first port means and discharge said chamber to meter fluid to said second port.

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**5,741,127**
**VANE FOR VANE COMPRESSOR**
**Toshihiro Murayama, and Tadashi Saito, both of Kounan-machi, Japan, assignors to Zexel Corporation, Tokyo, Japan**
**Filed Dec. 5, 1995, Ser. No. 567,604**
**Claims priority, application Japan, Dec. 20, 1994, 6-334973**
**Int. Cl.[6] F01C** *21/00*
**U.S. Cl. 418—178** **17 Claims**



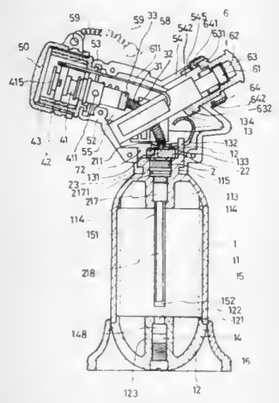

**1**. A vane for a vane compressor which includes a cam ring and a rotor received in said cam ring, wherein:

said vane is slidably inserted in a vane slit formed in said rotor so as to be movable out of said vane slit when said rotor rotates, such that a tip of said vane urgingly slides along an inner peripheral surface of said cam ring, said vane comprises an aluminum base metal, and a clad of a ferrous metal provided on a surface of said aluminum base metal, and

said aluminum base metal has a cavity formed therein.

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**5,741,128**
**HAND GAS TORCH**
**Chin-Lin Tsai, 3F, No. 94, Sec. 4, Chung Hsin Road, San Chung City, Taipei Hsien, Taiwan**
**Filed Aug. 21, 1997, Ser. No. 909,632**
**Int. Cl.[6] F23Q** *7/12*
**U.S. Cl. 431—255** **9 Claims**



**1**. A hand gas torch comprising:

a fuel gas tank having a gas outlet and an upright mounting rod a top side thereof and a bottom side sealed with a bottom cover, said bottom cover having a valve block at the center and a feed valve mounted in said valve block through which fuel gas is filled into said fuel gas tank;

a gas flow rate control valve assembly mounted in the gas outlet of said fuel gas tank and controlled to regulate the flow rate of fuel gas passing out of said fuel gas tank through its gas outlet;

a gas lever coupled to the upright mounting rod of said fuel gas tank and controlled to open said gas flow rate control valve assembly for permitting fuel gas to flow out of the gas outlet of said fuel gas tank;

a casing made by fastening two symmetrical half shells together and fastened to said fuel gas tank and covered over said gas flow rate control valve assembly, said casing comprising a tubular front end, an elongated switch hole at one side, an igniter holder extended from a rear side thereof and defining a receiving chamber, an opening at said igniter holder in communication with said receiving chamber, and two sliding grooves symmetrically disposed inside said igniter holder around said receiving chamber;

a flame nozzle assembly fastened to the tubular front end of said casing, said flame nozzle assembly comprising an outer tube fixedly fastened to the tubular front end of said casing, a heat insulative inner tube mounted within said outer tube, and a flame nozzle mounted in said heat insulative inner tube and connected to said gas flow rate control valve assembly to receive fuel gas from it, said flame nozzle having a radial air vent through which outside air is induced into the inside of said flame nozzle to mix with fuel gas for burning;

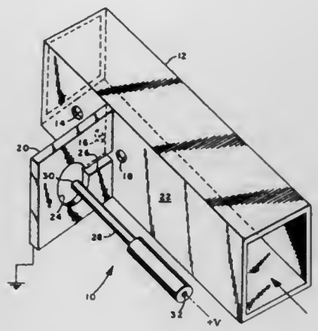
a fuel gas nozzle assembly connected between said flame nozzle assembly and said gas flow rate control valve assembly, said fuel gas nozzle assembly comprising a gas nozzle connected to said flame nozzle assembly, and a flexible gas tube having a bottom end connected to said gas flow rate control valve assembly and a top end connected to said gas nozzle;

a piezoelectric igniter unit mounted in said casing, said piezoelectric igniter unit comprising a piezoelectric device mounted in the receiving chamber of the igniter holder of said casing and controlled to produce sparks at said flame nozzle for igniting fuel gas, a press button controlled to trigger said piezoelectric device and to drive said gas lever in opening said gas flow rate control valve assembly, and a rotary cap fastened to the igniter holder of said casing and turned relative to the igniter holder of said casing to lock/unlock said press button, said press button comprising a downward pressure rod stopped above said gas lever, and a stop flange raised from the periphery, said rotary cap comprising two inside ribs respectively coupled to the inside sliding grooves of the igniter holder of said casing, and a stop flange moved with said rotary cap in the opening of the igniter holder of said casing between a first position in which the stop flange of said rotary cap is forced into engagement with the stop flange of said press button to stop said press button from downward movement, and a second position in which the stop flange of said rotary cap is disengaged from the stop flange of said press button for permitting said press button to be depressed; and

switch means mounted in the elongated switch hole of said casing and moved between a first position in which said gas lever is turned upwards to hold said gas flow rate control valve assembly in an open status for permitting fuel gas to continuously flow out of said fuel gas tank into said flame nozzle assembly, and a second position in which said gas lever is disengaged from said switch means and can be operated by said press button.



**5,741,129**
**IGNITING AND SENSING FLAME ON A FUEL GAS BURNER**
**Ceji Li, Carol Stream, Ill., assignor to Rauco Incorporated of Delaware, Wilmington, Del.**
**Filed Dec. 23, 1996, Ser. No. 780,021**
**Int. Cl.[6] F23Q** *3/00*
**U.S. Cl. 431—264** **7 Claims**




**4**. A method of igniting a gaseous fuel-air mixture flowing from a burner port comprising:

(a) providing a hollow burner having at least one flame generating port therein and flowing a gaseous fuel-air mixture through said port;

(b) disposing a plenum member adjacent said port and forming a plenum cut-out in said member;

(c) disposing an electrode in said cut-out and defining an air gap therebetween;

(d) applying a relatively high voltage potential to said electrode with respect to said plenum member and discharging a spark therebetween and igniting said fuel gas-air mixture; and,

(e) retaining at least a portion of the flame therefrom in said cut-out for current rectification flame sensing.

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**5,741,130**
**METHOD AND APPARATUS FOR MINIMIZING DISRUPTION CAUSED BY DEPOSITIONS ON A SUPPLY MEANS FOR A COMBUSTION OF GASIFICATION PLANT**
**Ulf G. Hagstrom, Ekerö, and Eric W. Norelius, Enskede, both of Sweden, assignors to Ecological Combustion i Stockholm AB, Sodertalje, Sweden**
**PCT No. PCT/SE93/00499, § 371 Date Nov. 30, 1994, § 102(e) Date Nov. 30, 1994, PCT Pub. No. WO93/25850, PCT Pub. Date Dec. 23, 1993**
**PCT Filed Jun. 4, 1993, Ser. No. 505,221**
**Claims priority, application Sweden, Jun. 5, 1992, 9201747**
**Int. Cl.[6] F24D** *00/00*; **F28G** *00/00*
**U.S. Cl. 432—2** **11 Claims**

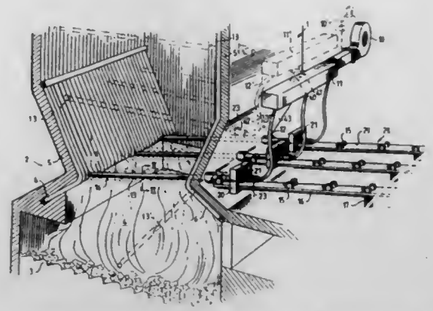
**1**. A method for enhancing the performance of a combustion plant, comprising the steps of:

a) slidably disposing a plurality of perforated, elongate tubes in a combustion chamber of the plant,

b) supplying one of a fluid and solid particles to the chamber through the tubes to support combustion within the chamber,

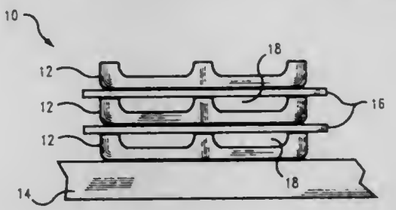
c) selectively axially withdrawing from the chamber and subsequently reinserting back into the chamber at least one of said tubes to control an emission level of a combustion process taking place within the chamber, and

d) simultaneously with such withdrawing and reinserting, cleaning an exterior surface of the tube to remove perforation clogging contaminants deposited on said surface by ash or slag-rich fuels.



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**5,741,131**
**STACKING SYSTEM FOR SUBSTRATES**
**Joseph Paul DeGeorge, Wappingers Falls; Kurt Elmer Bastian, Poughkeepsie, both of N.Y.; Michael Alan Cohn, Ramsey, N.J.; Christopher Neal Collins, Poughkeepsie, N.Y.; Italo DiNunzio, Yonkers, N.Y., and Ryan Wayne Wuthrich, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**
**Filed Jan. 31, 1996, Ser. No. 594,206**
**Int. Cl.[6] F27D** *5/00*
**U.S. Cl. 432—258** **8 Claims**




**1**. A system for stacking substrates to be fired at an elevated temperature, the system comprising:

a) a base;

b) a tile;

c) a frame circumscribing a space that rests on and within the perimeter of the base upon which the tile rests so as to separate the base and tile from each other, the frame having a height that varies along its perimeter to define recesses and a center support on each side of the frame that permit gas generated by a substrate within the space defined by the frame to escape the space without adversely affecting the substrate, the frame being capable of supporting the tile in a substantially level position; and

d) a support within the perimeter of the frame that is also capable of supporting the tile in a substantially level position.

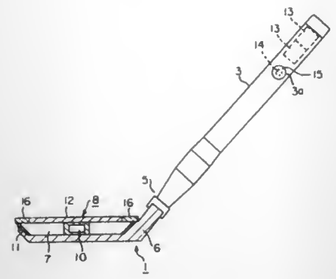
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**5,741,132**
**MIRROR FOR DENTAL EXAMINATION**
**Masayoshi Usui, Numazu, Japan; Yoshiki Oshida, DeWitt, N.Y., and Seiichi Hata, Hachiouji, Japan, assignors to Usui Kokusai Sangyo Kaisha Ltd., Japan**
**Filed Mar. 13, 1996, Ser. No. 615,709**
**Int. Cl.[6] A61B** *1/24*
**U.S. Cl. 433—30** **11 Claims**

**1**. A mirror for dental examination comprising: an elongate holding member formed from a corrosion resistant, heat resistant

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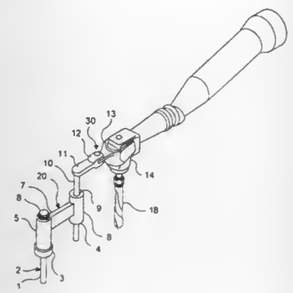
material and having a proximal end for griping by a dental examiner and an opposed distal end; and an examination unit comprising a housing formed from a corrosion resistant, heat resistant material and comprising a planar base wall, a side wall projecting upwardly and outwardly from said planar base wall, said side wall having a reflective inwardly facing surface and a substantially circular edge on portions remote from said base wall, a stem projecting from said side wall and secured to said distal end of said holding member, a substantially planar mirror wall sealingly secured to said circular edge of said side wall and disposed in spaced parallel relationship to said planar base wall, said mirror wall including a mirrored surface facing away from said base wall and a light transmitting portion disposed at least on portions of said mirror wall adjacent said circular edge, and illuminating disposed between said mirror wall and said planar base wall for directing light toward the reflective surface of said side wall and heating means, separate from said illuminating means, for heating said mirror, whereby light from said illuminating means reflects from said reflective surface of said side wall and is transmitted through said light transmitting portion of said mirror wall for illuminating selected portions of an intraoral cavity, and whereby said heating means heats said mirror for preventing fogging.

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**5,741,133**
**APPARATUSES AND PROCESS FOR PARALLEL PLACEMENT OF BONE-INTEGRATED CYLINDRICAL TYPE IMPLANTS IN DENTISTRY**

**Antonio Jose Gordils, CCCT 1a. Etapa- Oficina 126-A, Piso 1, Caracas, Venezuela, and Nicolas Antonio Volpe, Av. Rafael Rangel, Santa Fe Norte, Quinta San Antonio Caracas, Venezuela**

**Filed Mar. 21, 1996, Ser. No. 619,307**
**Claims priority, application Venezuela, Dec. 7, 1995, 2131-95**
**Int. Cl.[6] A61C** *3/02*
**U.S. Cl. 433—76** **7 Claims**



1. An apparatus for guiding a dental instrument in drilling, in the alveolus of a patient, a second longitudinal perforation that is parallel to a first longitudinal perforation, said apparatus comprising:

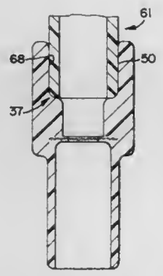
(a) a first shaft having a lower portion that is insertable into the first longitudinal perforation, an upper portion and a butt therebetween, said butt having a diameter that is greater than a diameter of the lower portion such that the butt abuts a surface of the jaw of the patient with the lower portion inserted into the first longitudinal perforation;
(b) a sleeve defining a longitudinal bore for receiving another shaft, said sleeve having a bottom surface and a top surface; and
(c) first arm means, including a first arm, for connecting the upper portion of the first shaft to the sleeve with the bore disposed parallel to the first shaft and with the bottom surface of the sleeve disposed above the butt with the first shaft in a vertical orientation such that, when the first shaft is inserted in the first perforation with the butt abutting the surface of the jaw of the patient, the bottom surface of the sleeve is spaced above the jaw;
(d) a second shaft insertable into the bore; and
(e) second arm means, including a second arm, for connecting an upper end of the second shaft to a head of the dental instrument such that the second arm is disposed above the top surface of the sleeve with the bore disposed in the vertical orientation and with the second shaft inserted in the bore.

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**5,741,134**
**FILTER AND UNIVERSAL ADAPTER FOR USE WITH DENTAL ASPIRATOR TIPS**

**Ralph L. Davis, Genoa City, Wis., assignor to Filtertek Inc., Hebron, Ill.**

**Filed Jun. 7, 1995, Ser. No. 479,135**
**Int. Cl.[6] A61C** *17/06;17/14*
**U.S. Cl. 433—91** **27 Claims**



1. A filter-adapter device for connecting variable sizes of dental aspirator tips to a suction hose, said device comprising:
a) a substantially cylindrical, hollow body having a first end, a second end, and a middle portion, said ends having a substantially circular cross-section, an outer surface, and an inner surface, said inner surface defining a flowpath through said body;
b) said first end having an outer surface diameter adapted to sealably fit one of said sizes of aspirator tips and a first inner surface diameter adapted to sealably fit another one of said sizes of aspirator tips;
c) said second end having an outer surface diameter adapted to sealably fit said suction hose and a ledge projecting from said outer surface, said ledge being of sufficient height to prevent said filter-adapter from being drawn through said suction hose;
d) said middle portion including a second inner surface diameter smaller than said first inner surface diameter of said first end and located between the filter and said first inner surface diameter, said second inner surface diameter adapted to sealably fit another one of said sizes of aspirator tips through said first end;
e) a substantially planar filter element secured across said flowpath between said middle portion and said second end; and
f) an inner ledge projecting towards said flowpath from said inner surface of said middle portion, said inner ledge being of sufficient thickness to prevent an aspirator tip adapted to fit the inner surface diameter of said middle portion from being inserted from said first end through to said second end.

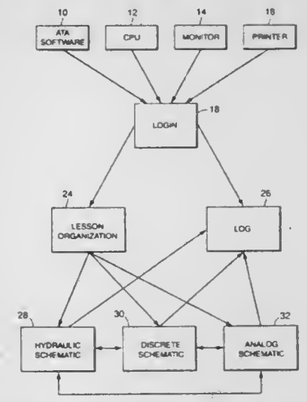
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**5,741,135**
**AUTOMATED TRAINING AIDS METHOD**

**Steven James Bennett, Maple Grove, Minn., assignor to United Defense LP, Arlington, Va.**

**Continuation of Ser. No. 254,858, Jun. 6, 1994, abandoned. This application Sep. 24, 1996, Ser. No. 719,111**
**Int. Cl.[6] G09B** *19/00*
**U.S. Cl. 434—118** **6 Claims**




1. A method for providing training lessons by animating hydraulic, mechanical, electro-mechanical and electronic circuits using a simulation software comprising the steps of:
integrating the simulation software with a computer;
providing a login function key;
providing a log text box;
providing a lesson organization key;
providing a set of training lessons within said lesson organization key, wherein said set of training lessons include segments of a schematic of said hydraulic, mechanical, electro-mechanical and electronic circuits animated by means of various colors to indicate a present status of said segments; and
providing a communication between said lesson organization key, said log text box and said login function key, such that said present status of said segment of said hydraulic, mechanical, electro-mechanical and electronic circuits are animated as selected by a user.

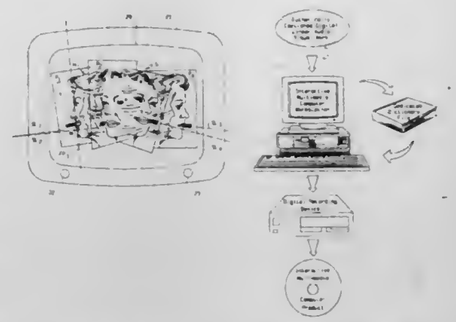
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**5,741,136**
**AUDIO-VISUAL WORK WITH A SERIES OF VISUAL WORD SYMBOLS COORDINATED WITH ORAL WORD UTTERANCES**

**William E. Kirksey, and Kyle S. Morris, both of New York, N.Y., assignors to Readspeak, Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 209,168, Feb. 24, 1994, abandoned, which is a continuation-in-part of Ser. No. 126,341, Sep. 23, 1993, abandoned. This application Sep. 22, 1994, Ser. No. 310,458**
**Int. Cl.[6] G09B** *5/00*
**U.S. Cl. 434—169** **58 Claims**

1. A teaching audio-visual work including pictorial scenes with natural communication situations for presentation to a viewer-listener comprising



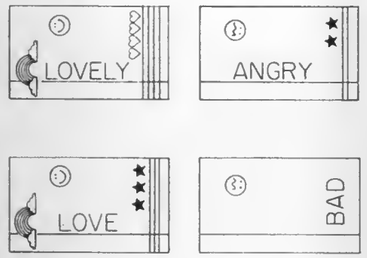
(a) at least one pictorial scene comprising frames capable of having their visual portion displayed on a screen and their audio portion heard;
(b) a series of word utterances by at least one utterer with each utterer having a head in successive frames of such scene presentation;
(c) a series of visual word symbols, each such word symbol
(i) corresponding to and associable with each such word utterance,
(ii) capable of teaching the viewer-listened the visual appearance of the uttered word;
(iii) appearing adjacent the head of the utterer;
(iv) appearing briefly in such frames of the pictorial scenes, at the same time the word utterances are heard so that each such utterance and each such corresponding word symbol are associable at the same time by the viewer-listener as viewed, and
(v) visually appearing in the frame alone so that when the viewer-listener hears an utterance he or she can see only the corresponding words symbol and no other word symbol,
whereby the viewer-listener may associate each such utterance with each such word symbol to learn the visual appearance of the uttered word and the sound of the word symbol.

33. A teaching audio-visual work including pictorial scenes with natural communication situations for presentation to a viewer-listener comprising
(a) at least one pictorial scene comprising frames capable of having its visual portion displayed on a screen and its audio portion heard;
(b) a series of word utterances by at least one utterer with each utterer having a head in successive frames of such scene presentation;
(c) a series of visual word symbols, which are shaped and angled to appear in three-dimensions, one word symbol displayed in a frame portion near the head of the utterer and at least one other word symbol displayed in the frame portion remote from such head, each such word symbol displayed in the near frame portion
(i) corresponding to and associable with each such word utterance,
(ii) capable of teaching the viewer-listener the visual appearance of the uttered word;
(iii) appearing in the near frame portion so that the viewer-listener has an opportunity to be able to make such association, and
(iv) appearing in such frames of the pictorial scenes, at the same time the word utterances are heard so that each such utterance and each such corresponding word symbol are associable at the same time and for such length of time by the viewer-listener,
whereby the viewer-listener does associate each such utterance with each such word symbol to learn the visual appearance of the uttered word and the sound of the word symbol.

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5,741,137
**EDUCATIONAL CARDS TEACHING EMOTIONAL EXPRESSIONS**
**Prasad V Aduvala, 270 Queens Quay #3007, Toronto, Ontario, Canada, M5J 2N4**
**Filed May 2, 1997, Ser. No. 850,373**
**Int. Cl.[6] G09B** *19/00*
**U.S. Cl. 434—236** **6 Claims**




1. A set of educational cards, comprising:
a first plurality of cards, each card in said first plurality of cards having a word disposed thereon which represents a personal attribute;
a second plurality of cards, each card in said second plurality of cards having a word disposed thereon which represents a societal attribute; and
said first and second plurality of cards further including a symbol disposed on each of the cards which indicates whether the personal attributes and societal attributes are positive or negative attributes.

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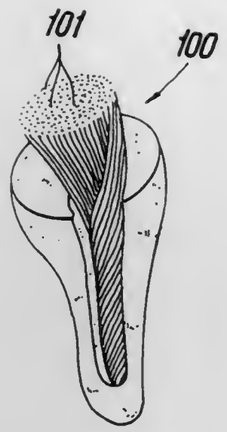
5,741,138
**ORAL COMPOSITIONS**
**David Earl Rice, Cincinnati, and Brian Joseph McCormick, Loveland, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**
**Filed Aug. 12, 1996, Ser. No. 695,486**
**Int. Cl.[6] A61C** *15/00*
**U.S. Cl. 433—216** **2 Claims**

1. A method of reducing plaque on the enamel surfaces of a human or lower animal susceptible to plaque or calculus formation by applying to said enamel surfaces a safe and effective amount of an oral composition comprising:
(a) a safe and effective amount of a water insoluble noncationic antibacterial agent;
(b) an agent selected from the group consisting of an extract of honeysuckle flowers, and an extract of golden thread and mixtures thereof, and
(c) a carrier suitable for use in the oral cavity.

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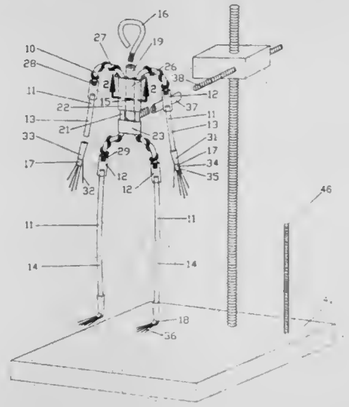
5,741,139
**FLEXIBLE POST IN A DENTAL POST AND CORE SYSTEM**
**Robert J. Sicurelli, Jr., Muttontown, and Samuel Masyr, Brooklyn, both of N.Y., assignors to Tru-Flex Post Systems, Inc., Muttontown, N.Y.**
**Continuation-in-part of Ser. No. 126,631, Sep. 27, 1993, Pat. No. 5,518,399. This application May 20, 1996, Ser. No. 651,805**
**Int. Cl.[6] A61C** *5/08*
**U.S. Cl. 433—220** **38 Claims**

1. A dental post and core device comprising inelastic flexible post means automatically adjusting to the contours of a root canal during placement, said post means comprising a post having a coronal end and an apical end and including a plurality of fibers, wherein at least one of said fibers extends non-axially with respect to a straight axis extending between the coronal and the apical end of said post.




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5,741,140
**ADJUSTABLE ARMATURE ASSEMBLY DEVICE**
**Kent L. Bristol, 1210 Belleforte, Oak Park, Ill. 60302**
**Filed Sep. 20, 1995, Ser. No. 530,985**
**Int. Cl.[6] G09B** *19/10*
**U.S. Cl. 434—82** **6 Claims**

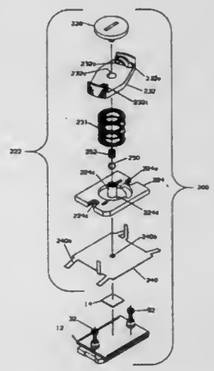


1. An adjustable armature assembly device for construction of a human figure armature for receiving pliable, clay like material which comprises:
a plurality of flexible, sturdy, wire like, bendable appendage members;
a plurality of hand members and foot members having a tubular end and an opposite end crimped portion securing flexible wires to simulate fingers and toes;
a flexible, sturdy, wire like head member having a head portion and a neck portion;
a torso member having a plurality of clamping tubes where an upper clamping tube secures freely formed hip, waist and shoulder members and an L-shaped tubular sleeve and a lower clamp secures only freely formed hip, waist and shoulder members; and
a plurality of tubular sleeve connector segments.



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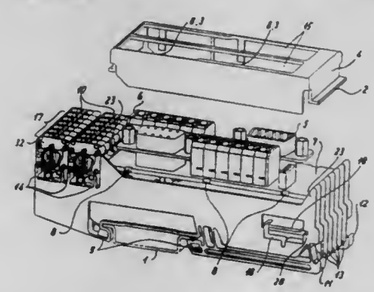
5,741,141
**NON-DESTRUCTIVE INTERCONNECT SYSTEM FOR SEMICONDUCTOR DEVICES AND A CARRIER ASSEMBLY FOR USE THEREWITH**
**Austin S. O'Malley, Rehoboth, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.**
**Filed Sep. 20, 1996, Ser. No. 717,030**
**Int. Cl.[6] H01R** *9/09*
**U.S. Cl. 439—73** **8 Claims**



1. A carrier assembly for carrying a semiconductor device comprising:
a substrate assembly including a substrate, a plurality of contact bumps on a top surface of the substrate for contacting bond pads on a semiconductor device, the substrate also including a plurality of conductive pads electrically connected to the contact bumps, a back plate having opposite side ends and a top surface and a bottom surface,
means for contacting a top surface of the semiconductor device to force the bond pads of the semiconductor device against the contact bumps including,
a pair of posts extending from the substrate, each of the posts having a shaft having a first diameter and a head having a second diameter greater than the first diameter
a lid having a pair of openings through which the posts extend,
a latch having a pair of openings, each of the openings in the latch having a first portion larger than the head of an associated one of the posts and a second portion smaller than the head of an associated one of the posts,
the lid having a bore extending through the lid to a lower, force applying surface, said bore having a reduced diameter portion,
a first spring position between said lid and said latch,
an ejector member having a spherical surface portion of a selected diameter larger than the reduced diameter portion of the bore received in the bore having at least a portion of the spherical portion movable beyond the bore on the force applying surface of the lid, and
a second spring member placing a force on the ejector member in a direction to move the ejector member out of the bore at the force applying surface.

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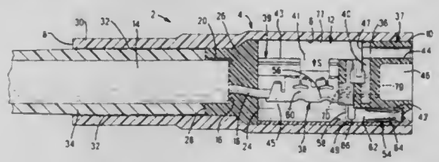
5,741,142
**GROUND BUS COUPLING MODULE**
**Dietmar Dux; Walter Hanning, both of Detmold; Uwe Fiene, Steinheim; Michael Schnatwinkel, Herford; Rudolf Steinmeier; Manfred Wilmes, both of Detmold; Christian Hamann, Holzminden; Eckhard Beins, Detmold; Christoph Zebermann, Beverungen; Hans-Georg Glathe, Detmold; Martin Herms, Lemgo; Matthiass Liesenjohann, Lage; Stefan Steinkämper, Detmold; Bernhard Schuster, Detmold, and Gerhard Eggert, Detmold, all of Germany, assignors to Weidmüller Interface GmbH & Co.**
**Filed Oct. 27, 1995, Ser. No. 549,069**
**Claims priority, application Germany, Oct. 31, 1994, 44 38 805.5**
**Int. Cl.[6] H01R** *9/26*
**U.S. Cl. 439—76.1** **25 Claims**



1. A field bus connection module for coupling a local bus conductor with a field bus system, comprising
(a) a housing formed of a plurality of aligned terminal blocks comprising at least one feed block (**12**), at least one grounded conductor block (**11**), and at least one spacing element (**13**);
(b) at least one functional printed circuit board (**7**) removably mechanically connected with said housing and for adapting signals of the local bus conductor to the field bus system;
(c) first connection means (**10**) for removably electrically connecting said functional printed circuit board with the local bus connector; and
(d) second connection means (**5,6**) for electrically connecting said functional printed circuit board with the field bus system, whereby when said functional printed circuit board is removed from said housing, said the electrical connection with the local bus connect or is severed and said second connection means maintain the electrical connection with the field bus system.

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5,741,143
**COMBUSTION CHAMBER SENSOR CONNECTOR**
**Gheorghe Hotea, Griesheim, and Michael Karl Albin Wenzel, Alzenau, both of Germany, assignors to The Whitaker Corporation, Wilmington, Del.**
**Filed Jul. 11, 1996, Ser. No. 679,352**
**Claims priority, application United Kingdom, Jul. 26, 1995, 9516285**
**Int. Cl.[6] H01R** *13/658*
**U.S. Cl. 439—86** **12 Claims**



1. A combustion chamber sensor connector comprising an outer housing securely fixable to a sensor, the outer housing having a

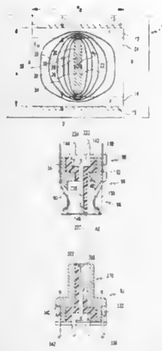
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cavity extending therethrough for receiving a shielded sensor cable therein at one end and contacts of the sensor at the other end, the connector further comprising a connection section mounted in the outer housing for interconnecting leads of the cable to the sensor contacts, wherein the connection section comprises a discrete insulative housing and terminals for connection to the leads, and a conductive shield member mounted transverse to the outer housing cavity, the shield member being made of a conductive plastic or conductive elastomeric material, and wherein an outer periphery of the shield member protrudes beyond an outer surface of the insulative housing for compression against an inner surface of the cavity, for electrical connection thereto.

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**5,741,144**
**LOW CROSS AND IMPEDANCE CONTROLLED ELECTRIC CONNECTOR**
**Richard A. Elco, Mechanicsburg, and David F. Fusselman, Middletown, both of Pa., assignors to Berg Technology, Inc., Reno, Nev.**
**Continuation of Ser. No. 452,020, Jun. 12, 1995, abandoned. This application Apr. 23, 1997, Ser. No. 842,197**
**Int. Cl.[6] H01R** *13/648*
**U.S. Cl. 439—101** **24 Claims**

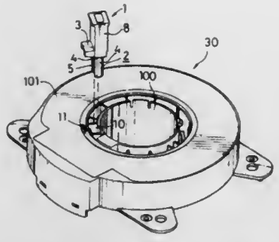


1. An electrical connector comprising a first member comprising a first plurality of a metallic contacts and a dielectric base having a grounding means wherein the metallic contacts project generally perpendicularly from the dielectric base and a second member comprising a second plurality of metallic contacts and a second dielectric base wherein the second plurality of metallic contacts projects generally perpendicularly from the second dielectric base so that each of said plurality of metallic contacts protecting from the first member is in electrical contact which one of said second plurality of metallic contacts projecting from the second member.

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**5,741,145**
**LOCKING MECHANISM FOR AN ELECTRICAL CONNECTING DEVICE**
**Tomoyoshi Kikkawa; Tetsurou Muramatsu, and Hiromi Masuda, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan**
**Filed May 8, 1996, Ser. No. 646,858**
**Claims priority, application Japan, May 11, 1995, 7-113136**
**Int. Cl.[6] H01R** *35/04*
**U.S. Cl. 439—164** **20 Claims**

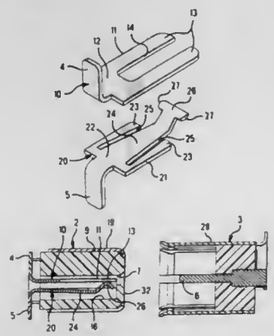
1. A locking mechanism for an electrical connecting device. comprising:
a fixed member;
a turning member freely turnable about said fixed member and electrically connected to said fixed member through a flexible flat cable; and
a locking member including:



an engaging part insertable into an engaging hole in one of said fixed member and said turning member, said engaging part including a sway preventing means for substantially preventing the engaging part from swaying in said engaging hole, and a slip-off preventing means located adjacent said sway preventing means for lockingly engaging said engaging hole, and
a latching part initially integral with said engaging part but separable from the engaging part, said latching part including a protruding part for engaging the other of said turning member and said fixed member when the engaging part is inserted in said engaging hole,
said locking member unlocking said turning member by separating said latching part from said engaging part when said engaging part is inserted in said engaging hole.

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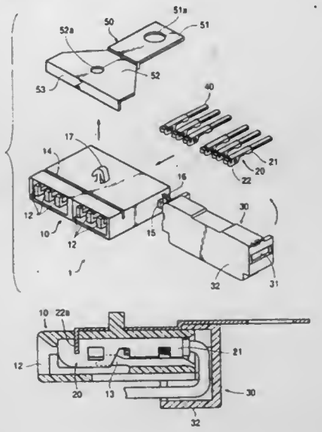
**5,741,146**
**COAXIAL SWITCH**
**Randall Robert Henry, Harrisburg, and Michael John Phillips, Camp Hill, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.**
**Filed Oct. 29, 1996, Ser. No. 740,460**
**Int. Cl.[6] H01R** *29/00*
**U.S. Cl. 439—188** **9 Claims**



1. A switch comprising:
a housing having a cavity for receiving a pin of a mating connector, the cavity being dimensioned to accommodate a pin envelope which is defined as a volume occupied by the pin when the pin is installed in the cavity;
a first contact held by the housing, the first contact including a pair of first contact arms which are aligned in a plane that is coincident with a pin-receiving axis of the cavity, the pair of first contact arms straddling the pin envelope so as to be clear of the pin envelope; and
a second contact held by the housing, the second contact having a resilient contact arm which is normally engaged with the first contact, the resilient contact arm including a portion disposed in the pin envelope and arranged to be deflected by the pin, wherein the second contact becomes disengaged from the first contact when the pin is installed in the cavity.



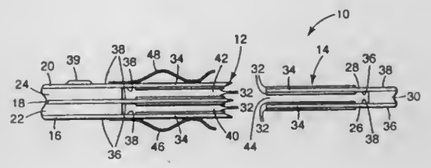
**5,741,147**
**JOINT CONNECTOR**
**Hisashi Konoya, and Hitoshi Okumura, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan**
**Filed Jan. 11, 1996, Ser. No. 584,972**
**Claims priority, application Japan, Jan. 10, 1995, 7-018596**
**Int. Cl.[6] H01R** *29/00*
**U.S. Cl. 439—189** **12 Claims**



1. An electrical connector comprising a housing, a plurality of terminals mounted within the housing, and a connector plate for electrically connecting the terminals, the connector plate having an elongate plate member projecting therefrom, the housing being formed with an elongate slit for receiving the plate member, and with connection means for detachable engagement with complementary connection means formed on the connector plate, the connection means of the connector plate and the housing being engageable to fix the connector plate to the housing with the plate member extending into the slit and into electrical contact with each of the terminals, and the connector plate further having a connection member for connecting the connector plate to an earthed conductor, the connection member extending from the connector plate at an edge other than that from which the plate member projects.

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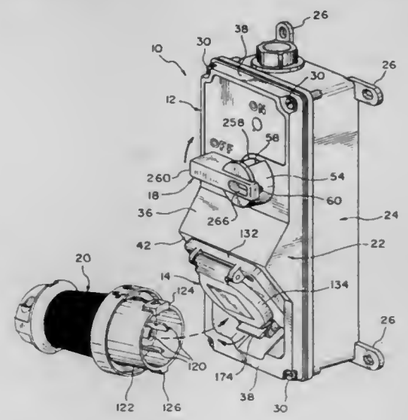
**5,741,148**
**ELECTRICAL CONNECTOR ASSEMBLY WITH INTERLEAVED MULTILAYER STRUCTURE AND FABRICATION METHOD**
**Rolf W. Biernath, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Continuation of Ser. No. 346,735, Nov. 30, 1994, abandoned. This application Apr. 17, 1997, Ser. No. 839,280**
**Int. Cl.[6] H01R** *13/28*
**U.S. Cl. 439—284** **37 Claims**



1. A multilayer electrical connector assembly comprising:
(a) a first connector structure comprising at least a first connector layer, said first connector layer comprising an edge portion and a plurality of conductive contact surfaces disposed along the edge portion; and
(b) a second connector structure comprising:
(i) at least one separation layer with an upper surface and a lower surface,
(ii) a second cantilevered connector layer comprising a resiliently deformable dielectric material selected from the group consisting of a printed·circuit board and a flex circuit, wherein a first end of the second connector layer is attached to the upper surface of each separation layer, and wherein a second end of the second connector layer has an edge portion with a plurality of conductive contact surfaces disposed thereon, and
(iii) a third cantilevered connector layer comprising a resiliently deformable dielectric material selected from the group consisting of a printed circuit board and a flex circuit, wherein a first end of the third connector layer is attached to the lower surface of each separation layer, and wherein a second end of the third connector layer has an edge portion with a plurality of conductive contact surfaces disposed thereon, and
wherein the second end of the second connector layer and the second end of the third connector layer define a gap therebetween adjacent the edge portions of the second and third connector layers, and wherein said first connector layer is oriented to engage said gap upon engagement of said first connector structure and said second connector structure, thereby biasing the second and third connector layers to compressively maintain contact between at least some of the conductive contact surfaces of the first connector layer to at least some of the conductive contact surfaces of the second and third connector layers.

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**5,741,149**
**SHROUDED LOCKING TYPE ELECTRICAL CONNECTOR WITH LOCKING MEMBER**
**John C. Anthony, Fairfield, Conn., assignor to Hubbell Incorporated, Orange, Conn.**
**Filed May 17, 1995, Ser. No. 442,839**
**Int. Cl.[6] H01R** *4/50*
**U.S. Cl. 439—333** **31 Claims**



1. An electrical connector adapted to be coupled to a complementary locking type electrical connector by initial relative axial movement therebetween and subsequent relative rotational movement therebetween, comprising:

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an insulated housing having a first detent formed thereon and a tubular body portion for nesting with a portion of the complementary locking type electrical connector adapted to be coupled thereto, said tubular body portion having a mating surface with a first polarizing member for cooperating with a complementary polarizing member of the complementary locking type electrical connector;

a set of electrical contacts coupled to said housing for electrically coupling with the complementary locking type electrical connector by relative axial movement followed by subsequent rotational movement; and

a locking ring rotatably coupled to said housing between an unlocked position and a locked position upon relative rotational movement between the complementary locking type electrical connector, said locking ring including a second polarizing member for cooperating with the complementary polarizing member of the complementary rotatable locking type electrical connector, and a second detent for overridably engaging said first detent of said housing upon relative rotational movement of the complementary locking type electrical connector to said locked position for preventing inadvertent disconnection therebetween.

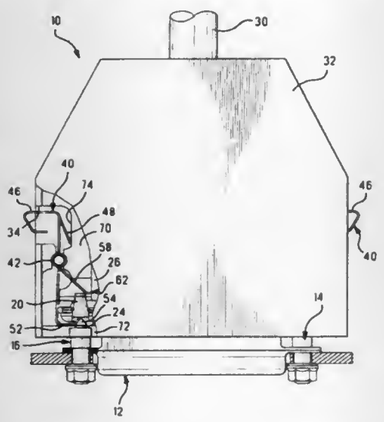
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**5,741,150**

**UNITARY SPRING LATCH FOR AN ELECTRICAL CONNECTOR ASSEMBLY**

**James Christopher Stinson, Roanoke, and Thomas Leon Fix, Buena Vista, both of Va., assignors to The Whitaker Corporation, Wilmington, Del.**

**Filed Dec. 19, 1996, Ser. No. 770,105**
**Int. Cl.[6] H01R** *13/627*
**U.S. Cl. 439—358** **6 Claims**




1. An electrical connector assembly adapted for mating connection with a mating connector having a latch post extending along the direction of relative linear movement between the connector assembly and the mating connector during mating/unmating, the latch post having an enlarged head at its forward end, the assembly comprising:

a primary connector supporting a plurality of electrical terminals exposed along a mating face of the primary connector;

a two-part housing with an interior cavity adapted to encircle and contain the primary connector with the primary connector mating face being accessible from outside the housing along a forward end of the housing, the housing further having an interior cavity open to said housing forward end for receiving thereinto a latch post along each side of the primary connector; and

a unitary spring latch associated with each latch post and supported within said housing for pivotal movement about a pivot axis orthogonal to said direction of relative linear movement, each spring latch including:

an engagement end extending into said latch post receiving cavity and adapted for engagement with the latch post behind the enlarged head;

an actuating end across said pivot axis from said engagement end and extending outwardly from said housing, said actuating end adapted for inward pivoting movement to release said engagement end from engagement with said latch post;

biasing means for yieldably biasing said actuating end outwardly from said housing; and

a spring arm extending into said latch post receiving cavity and adapted to bear against the forward end of said latch post and provide a yieldable biasing force to said latch post in a direction outwardly from said latch post receiving cavity, to aid ejection of said latch post from said latch post receiving cavity.

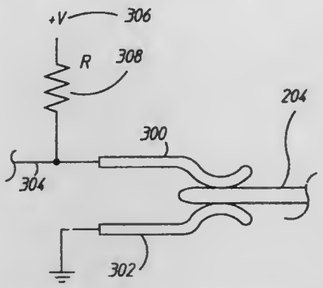
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**5,741,151**

**ELECTRICAL CONNECTOR CONTACT ENABLING DETECTION OF THE PRESENCE OF A MATING CONNECTOR CONTACT**

**Kevin J. Youngers, Greeley, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Oct. 27, 1995, Ser. No. 549,364**
**Int. Cl.[6] H01R** *3/00*
**U.S. Cl. 439—489** **10 Claims**




1. A connection indication system for an automatic termination system for a bus device comprising:

a device connector on the bus device;

a sense line;

a female contact in the device connector, the female contact further comprising a first part and a second part, the first part electrically isolated from the second part, the first part further electrically connected to the sense line and the second part electrically connected to a voltage potential; and

the sense line electrically connected to the automatic termination system.

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**5,741,152**

**ELECTRICAL CONNECTOR WITH INDICATOR LIGHTS**

**Kamal Shawiky Boutros, Richmond Hill, Canada, assignor to Amphenol Corporation, Wallingford, Conn.**

**Filed Apr. 25, 1995, Ser. No. 428,697**
**Int. Cl.[6] H01R** *13/00*
**U.S. Cl. 439—490** **7 Claims**

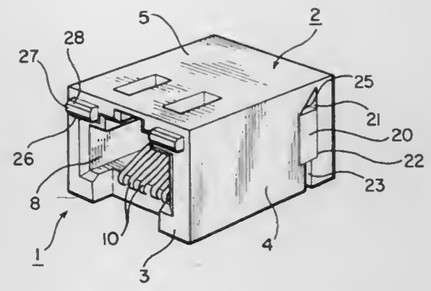
1. In a connector, comprising:

a housing;

at least one electrical connector contact positioned in the housing; and

at least one indicator light, the improvement wherein:






the indicator light is positioned at a rear portion of the housing which is remote from a face of the housing through which the light is to be viewed, and wherein the connector further comprises discrete light guide means for guiding light from the indicator light to said face,

wherein the housing is made of a transparent material and the indicator light is positioned such that light from the indicator light travels through said rear portion to reach said face, and

wherein the indicator light is positioned in a cavity extending parallel to said face and said light guide means comprises an end portion engaged with a top surface of said cavity, said end portion being at an angle relative to the indicator light to cause light emitted by the indicator light to be diffracted towards said face of the housing.

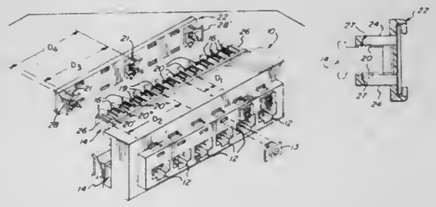
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**5,741,153**

**MODULAR CONNECTORS INCLUDING TERMINATED REAR CONNECTOR DESIGNATION FOR INSULATION DISPLACEMENT CONNECTORS**

**Walter Schwer, Westerly, R.I., assignor to Ortronics, Inc., Pawcatuck, Conn.**

**Filed Jul. 27, 1995, Ser. No. 508,023**
**Int. Cl.[6] H01R** *3/00*
**U.S. Cl. 439—491** **14 Claims**



1. A communication connection assembly comprising:

an insulation displacement connector having an end wall and having a plurality of teeth; said teeth having top and bottom surfaces;

attachment means connected to said top and bottom surfaces of said teeth;

a designation strip attached to said connector; said designation strip including:

a planar base having a back surface;

a plurality of attachment flanges connected to said back surface for attachment to said connector;

said attachment flanges having means to engage said attachment means of said connector;

at least one side wall connected to said back surface of said designation strip to align said engaging means of said strip with said attachment means of said connector, thereby aligning said strip with said connector during attachment, and to prevent said strip from becoming misaligned after attachment.

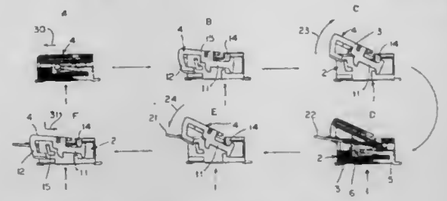
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**5,741,154**

**ELECTRICAL CONNECTOR FOR FLAT CABLE**

**Mitsuo Fujikura, Sagamihara; Shinsuke Kunishi, Hadano, and Minoru Fukushima, Yokohama, all of Japan, assignors to Molex Incorporated, Lisle, Ill.**

**Filed Sep. 24, 1996, Ser. No. 710,889**
**Claims priority, application Japan, Nov. 24, 1995, 7-013435 U**
**Int. Cl.[6] H01R** *9/07*
**U.S. Cl. 439—495** **9 Claims**



1. An electrical connector for a flat cable, comprising:

a dielectric housing mounting a plurality of conductive terminals, the housing having a front end adapted for receiving the flat cable in engagement with the terminals, a rear end and opposite sides;

an actuator pivotally mounted on the housing for pivotal movement between a first position allowing insertion of the flat cable into engagement with the terminals and a second position biasing the cable against the terminals;

an independent engagement part mounted on the housing and including pivot means about which the actuator is pivotable between said positions; and

complementary interengaging mounting means between the housing and the engagement part for mounting the engagement part at the rear of the housing.

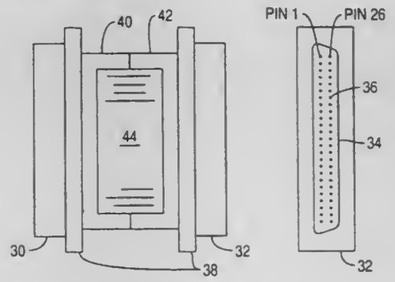
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**5,741,155**

**CABLE CONNECTOR GENDER CHANGER**

**Steven Charles Herman, Poway, Calif., assignor to NCR Corporation, Dayton, Ohio**

**Filed Dec. 20, 1995, Ser. No. 580,013**
**Int. Cl.[6] H01R** *11/00*
**U.S. Cl. 439—502** **11 Claims**




1. A cable assembly comprising:

(a) a plurality of cables for connecting together a plurality of devices, each of the cables comprising a plurality of conductors, a male connector electrically connected to the conductors

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at a first end of the cable and a female connector electrically connected to the conductors at a second end of the cable;

(b) a pass-thru bulkhead assembly for clamping together the cables, wherein the pass-thru bulkhead assembly comprises one or more guides for each of the clamped-together cables, each of the guides providing an aperture for the cable to pass therethrough, and wherein the pass-thru bulkhead assembly is EMI shielded;

(c) means for mounting the pass-thru bulkhead assembly in an aperture of a cabinet bulkhead; and

(d) one or more cable connector gender changers, each of the cable connector gender changers being coupled to a male connector on one of the cables, and each of the cable connector gender changers comprising a first metal socket comprising a first connector shell connectable to the male connector, a second metal socket comprising a second connector shell, an intermediate portion comprising a mounting plate for connecting the first and second metal sockets, and a plurality of electrical connections extending from the first metal socket to the second metal socket through the intermediate portion, wherein the first connector shell, the second connector shell, and the intermediate portion are attached together by the mounting plate into a single unit to form a continuous EMI shield covering said plurality of electrical connections, and wherein the first and second metal sockets are of a same gender type.

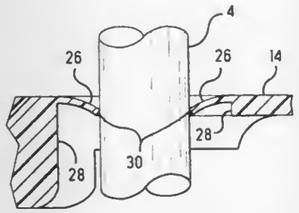
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**5,741,156**

**PROTECTIVE COVER FOR ELECTRICAL CONNECTOR**

**Richard Dwayne Wilson, Greensboro, N.C., assignor to The Whitaker Corporation, Wilmington, Del.**

**Filed Nov. 8, 1996, Ser. No. 747,118**
**Int. Cl.[6] H01R** *13/52*
**U.S. Cl. 439—521** **16 Claims**




1. A protective cover for an electrical connector, comprising:

a shell having a wall and an aperture extending through the wall, the aperture being surrounded by a flexible skirt unitary with the wall and having an inner edge which defines a cross-sectional dimension of the aperture, the cross-sectional dimension being less than a cross-sectional dimension of a wire which is to be installed through the aperture, wherein the skirt is sealingly engageable with the wire.

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**5,741,157**

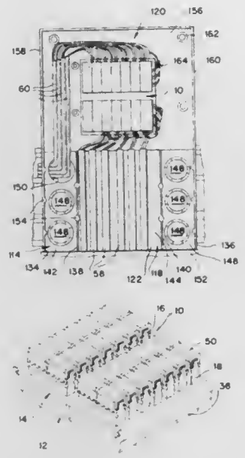
**RACEWAY SYSTEM WITH TRANSITION ADAPTER**

**Michael R. O'Connor, Seymour, and Robert A. Aekins, Stratford, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.**

**Filed Sep. 30, 1996, Ser. No. 724,255**
**Int. Cl.[6] H01R** *13/60*
**U.S. Cl. 439—532** **19 Claims**

1. A raceway system for different multiple conductor cables, comprising:

a raceway conduit having at least one channel for receiving first multiple conductor cables;




a device box mounted on said raceway conduit having a first passageway for receiving the first cables extending from said channel and a second passageway for receiving second multiple conductor cables which do not pass through said channel; and

a transition adapter for connecting respective conductors of the first and second cables mounted in said device box, said transition adapter including

a board holder having a base member and wall members extending from opposite edges of said base member,

a printed circuit board mounted on said board holder and having first input contact areas, first output contact areas and first conductive traces connecting each of said first input contact areas with the respective first output contact areas, and

a first input connector and a first output connector mounted on said circuit board and having first input contacts and first output contacts, respectively, each of said contacts being parallel and having a wire receiving portion and a terminal portion, said terminal portions of said first input contacts engaging said first input contact areas, said terminal portions of said first output contacts engaging said first output contact areas.

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**5,741,158**

**COMMUNICATIONS OUTLET HAVING TERMINATION AID PLATFORM**

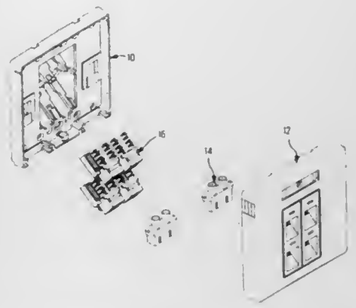
**Carl Gene Reed, Clemmons, and Terry Lee Pitts, Greensboro, both of N.C., assignors to The Whitaker Corporation, Wilmington, Del.**

**Filed Jul. 29, 1996, Ser. No. 681,588**
**Int. Cl.[6] H01R** *13/74*
**U.S. Cl. 439—536** **11 Claims**

1. A communications outlet comprising:

a base which is mountable on an outlet box to permit interconnections with wires in the outlet box, the base including a plate member having a front face and a rear face, a mounting cage disposed rearwardly of the rear face in which an electrical connector having insulation displacement terminals can be mounted after the wires are terminated to the terminals, a support platform on the front face which is specially configured to support the connector during insulation displacement termination of the wires to the terminals, and the plate member having an opening through which the connector can be






inserted for installation in the mounting cage while the base is mounted on the outlet box.

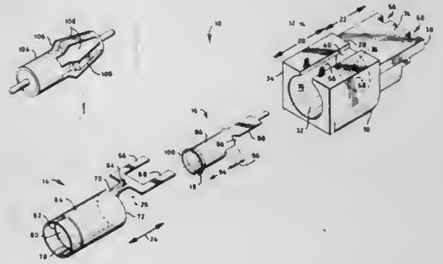
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**5,741,159**

**CONNECTOR AND CONNECTOR KIT**

**John O. Wright, York, Pa., assignor to Osram Sylvania Inc., Danvers, Mass.**

**Filed Feb. 19, 1997, Ser. No. 803,054**
**Int. Cl.[6] H01R** *17/04*
**U.S. Cl. 439—668** **18 Claims**




1. A connector comprising:

an insulative housing having a first length and a second length extending from said first length, said first length and said second length extending in the direction of a longitudinal axis of said housing, a first surface, an opposite second surface, a cavity extending into said first length from said first surface towards said opposite second surface, said cavity further extending in the direction of said longitudinal axis from a first end of said housing to said second length and a bore extending through said second length in the direction of said longitudinal axis from an opposite second end of said housing to said cavity, said bore opening into said cavity, said first surface comprising a slot which extends in the direction of said longitudinal axis between said first end and said second length, said slot extending through said housing from said first surface to said cavity, said bore having a bore surface which comprises a first abutment spaced from said opposite second end, said opposite second end comprising at least one groove;

a conductive shell extending in the direction of said longitudinal axis and comprising a first segment and a second segment extending from said first segment, said first segment being positioned in said cavity and said second segment extending through said slot and out of said cavity, said second segment being adjacent a surface of said second length and having at least one leg which is folded into said at least one groove; and

a contact extending in the direction of said longitudinal axis and comprising a first portion and a second portion extending from said first portion, said first portion being positioned in said bore and said second portion extending from said bore at said opposite second end, said first portion comprising a mating second abutment which contacts said first abutment.

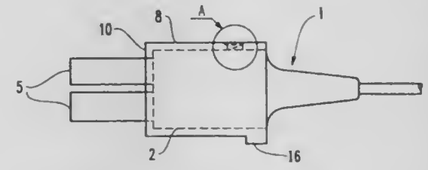
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**5,741,160**

**MULTIPLE PLUG ARRANGEMENT WITH A PLURALITY OF INDIVIDUAL PLUGS**

**Werner Arnold, Georgstrasse 13, 41363 Jüchen, Germany**

**Filed Nov. 12, 1996, Ser. No. 747,565**
**Claims priority, application Germany, Nov. 10, 1995, 195 41 936.7**
**Int. Cl.[6] H01R** *13/502;13/514*
**U.S. Cl. 439—701** **5 Claims**




1. A multiple plug arrangement, comprising:

a plurality of individual plugs with essentially rectangular plug housings, said plug housings having exterior sides;

a holder that receives said plug housings arranged side by side, said plug housings abut one another within said holder;

a lid, said holder being closable on a top thereof by said lid;

a bottom opposite said lid; and

side walls connecting said bottom and said lid with one another to form a rectangular cylinder being open at its ends, with said holder holding said individual plugs in position in an axial direction by a form fit, wherein said plug housings have each, on that exterior side directed toward said bottom of said holder, a window-like recess, wherein said bottom is provided with projections matching said window-like recesses, and said lid, when closed, holds, said plug housings in an active engagement of said window-like recess of said plug housing and said projection of said bottom.

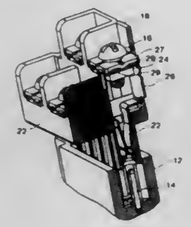
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**5,741,161**

**ELECTRICAL CONNECTION SYSTEM WITH DISCRETE WIRE INTERCONNECTIONS**

**James E. Cahaly, West Newbury, and George M. Williams, III, Medford, both of Mass., assignors to PCD Inc., Peabody, Mass.**

**Filed Aug. 27, 1996, Ser. No. 709,199**
**Int. Cl.[6] H01R** *9/22*
**U.S. Cl. 439—709** **8 Claims**




1. An electrical connection apparatus comprising:

a housing constructed and arranged with an upper portion and a bottom portion, a lower row of apertures and an upper row of apertures formed in said upper portion, wherein said apertures in said upper row are staggered with respect to said lower row of apertures, said adjacent apertures in the upper and the

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lower rows defining a first spacing therebetween, wherein said first spacings accommodate discrete electrical lead wire connections,

said apertures in the lower and the upper rows connected by through holes to a row of apertures in the bottom portion of the housing, said apertures in said bottom portion defining a second spacing therebetween, wherein said first spacings are larger than said second spacings

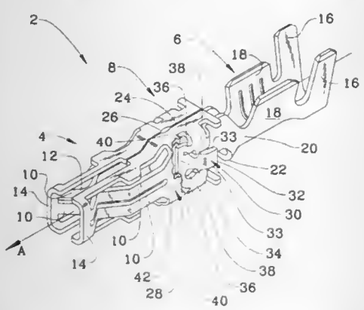
electrical contacts arranged and constructed in and extending substantially through said housing from said apertures in said upper portion of said housing to said apertures in said bottom portion, wherein said electrical contacts are designed to accommodate said stagger, said electrical contacts having two ends, a first end having contact area for connecting to said discrete electrical lead wire, and a second end including a contact area for connecting to a male or female contact of a mating header.

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**5,741,162**
**ELECTRICAL CONTACT HAVING IMPROVED LOCKING LANCES**

**Friedrich Josef Alois Kourimsky, Bensheim, and Gheorghe Hotea, Griesheim, both of Germany, assignors to The Whitaker Corporation, Wilmington, Del.**

**Continuation of Ser. No. 519,904, Aug. 28, 1995, abandoned. This application Apr. 16, 1997, Ser. No. 838,241**
**Claims priority, application United Kingdom, Sep. 1, 1994, 9417572**
**Int. Cl.[6] H01R** *13/432*
**U.S. Cl. 439—748** **10 Claims**

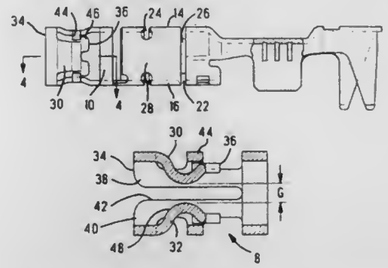



1. An electrical contact receivable in a passageway of a connector housing to be retainable therein, the contact comprising a contact portion and a conductor engaging portion joined together by a channel-like body portion having an interior defined by an outer shell wall where the body portion includes a pair of spaced apart and opposing resilient arms formed from the outer shell wall, each of the arms extending from an end fixed to the body portion to an opposed end where the opposed ends are joined together spaced from opposed ends of the contact to define a U-shaped support member defining a base deflectable into the interior during contact insertion, a locking lance extends from the base in cantilevered fashion between the two resilient arms to a free end disposed outward from the body portion, whereby upon insertion of the contact into the passageway the locking lance interferes with the housing thereby deflecting the opposed ends of the resilient arms into the interior thus allowing contact insertion into the housing, and upon full contact insertion the resilient arms resile forwardly of a housing shoulder along the passageway thereby bringing the free end of the locking lance into position to interfere with the shoulder such that withdrawal of the contact is prevented.

**5,741,163**
**ELECTRICAL RECEPTACLE TERMINAL**

**Gheorghe Hotea, Griesheim, Germany, assignor to The Whitaker Corporation, Wilmington, Del.**

**Filed Jul. 11, 1996, Ser. No. 677,553**
**Claims priority, application United Kingdom, Jul. 26, 1995, 9516408**
**Int. Cl.[6] H01R** *11/22*
**U.S. Cl. 439—852** **7 Claims**



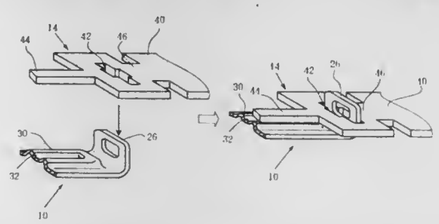

1. An electrical receptacle terminal comprising a connection section, an intermediate section and a contact section for mating with a complementary tab or pin contact, the contact section extending from a mating end to the intermediate section and having side walls and top and bottom walls, the contact section comprising a pair of contact arms extending from opposing side walls respectively and having contact protrusions, characterized in that the top and bottom walls comprise spring beams substantially planar with the top and bottom walls and joined to the contact arms at an attachment portion proximate the mating end for providing resiliency to the contact arms, the contact arms extending therefrom towards free ends detached from the side walls and proximate the intermediate section, the contact arms being formed from the portion of the side walls between the intermediate section and mating end, and wherein the spring beams attached respectively to each contact arm are separated by a slot extending from the mating end to the intermediate section.

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**5,741,164**
**TERMINAL DEVICE OF COIL**

**Kazushi Yasuno, and Tsutomu Hasegawa, both of Saitama, Japan, assignors to Toyodenso Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 13, 1996, Ser. No. 662,522**
**Claims priority, application Japan, Jun. 13, 1995, 7-145960**
**Int. Cl.[6] H01R** *13/02*
**U.S. Cl. 439—889** **11 Claims**




1. A terminal device of a coil comprising:

a first terminal, to one end of which a winding terminal of the coils connected;

a second terminal disposed in the same longitudinal direction as the first terminal and having its top end positioned to overlap the other end of the first terminal, thereby connecting the top end of the second terminal to the other end of the first terminal by soldering; and



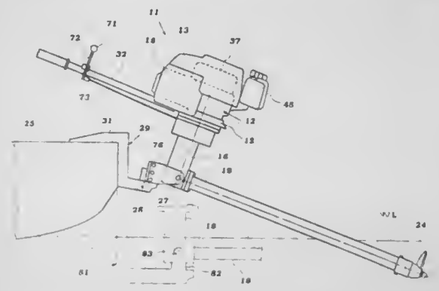
means projecting outwardly at approximately ninety degrees from at least one of said first terminal and said second terminal and being provided on one of the first terminal or the second terminal for positively limiting displacement in longitudinal direction of the first terminal and the second terminal for preventing stress from being applied to the soldered portion.

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**5,741,165**
**MARINE PROPULSION SYSTEM**

**Chitose Saito, and Yasunari Okamoto, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kbushiki Kaisha, Hamamatsu, Japan**

**Continuation-in-part of Ser. No. 609,174, Mar. 1, 1996. This application Jan. 27, 1997, Ser. No. 789,527**
**Claims priority, application Japan, Mar. 3, 1995, 7-43974; Jan. 26, 1996, 8-033046**
**Int. Cl.[6] B63H** *5/125*
**U.S. Cl. 440—57** **8 Claims**




1. A marine propulsion system adapted to be attached at the rear of a watercraft hull for propelling the watercraft, said propulsion system comprising a powering internal combustion engine, a drive shaft housing and lower unit journaling a propeller shaft that is driven by said engine and which extends generally horizontally rearwardly from the watercraft hull, a propulsion device driven by the rear end of the propeller shaft, means for supporting said propulsion system for steering and tilting movement about respective vertically and horizontally extending transverse axes which are disposed below and to the rear of the portion of the hull to which the marine propulsion system is attached, and a tiller affixed to the upper end of said drive shaft housing and lower unit and extending forwardly into the watercraft for operator control of the steering and trim of said propulsion system, the distance between said trim axis and the propulsion device being greater than the distance between the forward end of the tiller and said trim axis.

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**5,741,166**
**ELECTRICALLY CONTROLLED HYDRAULIC POWER BOAT CONTROLS**

**James O. Newman, 920 Iris Dr., Delray Beach, Fla. 33483**

**Filed Sep. 8, 1995, Ser. No. 524,587**
**Int. Cl.[6] B60K** *41/00*
**U.S. Cl. 440—84** **7 Claims**

1. A boat control system for controlling the operation of control components on a boat, said control system comprising:

a source of electrical power;

a source of pressurized hydraulic fluid;

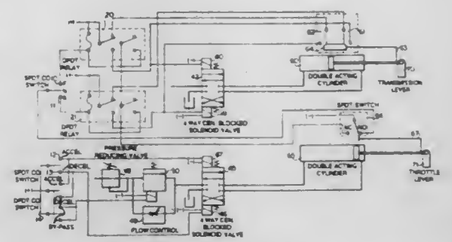
electrical lines;

fluid transfer lines;

a first electric solenoid operated hydraulic valve;

a first hydraulic cylinder;

a control station;




a first electric relay being connected by said electrical lines to said control station;

said control station having a first electric control switch for controlling the supply of said electrical power to said first electric relay;

said first electric relay being connected by said electrical lines to said first electric solenoid operated hydraulic valve and controlling the flow of said electrical power to said first electric solenoid operated hydraulic valve;

said first electric solenoid operated hydraulic valve being connected by said fluid transfer lines to said source of pressurized hydraulic fluid and to said first hydraulic cylinder and controlling the flow of said pressurized hydraulic fluid to said first hydraulic cylinder;

said first hydraulic cylinder being connected to a means for moving one of said control components;

said first hydraulic cylinder being a double acting cylinder having a movable element;

said movable element having first and second sides;

said movable element extending from said cylinder when said pressurized hydraulic fluid is supplied to said first side of said movable element, and retracting into said cylinder when said pressurized hydraulic fluid is supplied to said second side of said movable element;

said first electric solenoid operated hydraulic valve having: a first position, wherein said pressurized hydraulic fluid is directed through said hydraulic valve and through said fluid transfer lines to said first side of said movable element when said hydraulic valve is in said first position; a second position, wherein said pressurized hydraulic fluid is directed through said hydraulic valve and through said fluid transfer lines to said second side of said movable element when said hydraulic valve is in said second position; and a third position, wherein said pressurized hydraulic fluid is blocked from passage through said hydraulic valve;

a second electric relay being connected by said electrical lines to said first electric solenoid operated hydraulic valve and controlling the flow of said electrical power to said first electric solenoid operated hydraulic valve;

said first electric control switch having a first closed position wherein said electrical power is supplied to said first electric relay to energize said first electric relay; a second closed position wherein said electrical power is supplied to said second electric relay to energize said second electric relay; and an open position wherein neither said first electric relay nor said second electric relay is energized.

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**5,741,167**
**REMOTELY CONTROLLABLE SIGNAL GENERATING PLATFORM**

**James D. Hagerty, Tiverton, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Oct. 30, 1995, Ser. No. 550,038**
**Int. Cl.[6] B63B** *21/52*
**U.S. Cl. 441—13** **18 Claims**

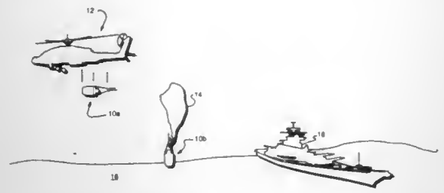
1. A remotely controllable signal device comprising:

a platform;

a radio receiver disposed on said platform, for receiving radio signals;

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a decoding device disposed on said platform and coupled to said radio receiver and responsive to said encoded audio signals for decoding said signals and for providing at least one decoded signal;

a power supply disposed on said platform and joined to said radio receiver and decoding device for providing power; and

at least one visual location signaling device disposed on said platform and responsive to a predetermined at least one decoded signal, for providing a visual indication of the location of said device.

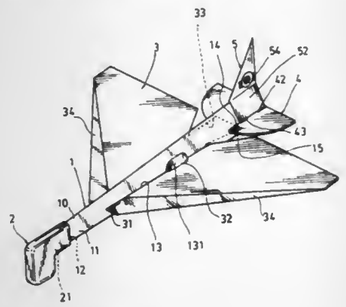
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**5,741,168**

**TOY GLIDER AS FOLDED AND ASSEMBLED FROM TWO-DIMENSIONAL ELEMENTS**

**Ming-Sheng Chen, c/o Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei, Taiwan**

**Filed Jun. 21, 1996, Ser. No. 667,623**
**Int. Cl.[6] A63H** *27/01*
**U.S. Cl. 446—66** **4 Claims**



1. A toy glider comprising:

a fuselage (**1**) cut out from a planar sheet and including: a pair of bifurcated members (**11**) folded along a central folding line (**10**) defined at a longitudinal center of the fuselage (**1**) to form a generally triangular prism tapered forwardly, a front head portion (**12**) formed on a front portion of the fuselage (**1**) and engaged in a nose member (**2**), securing said nose member (**2**) on the front head portion (**12**) of the fuselage (**1**), a pair of wing slits (**13**) juxtapositionally slotted in a central portion of the fuselage (**1**) for transversely inserting the wing member (**3**) in the wing slits (**13**), a pair of rear slits (**14**) juxtapositionally slotted in a rear portion of the fuselage for transversely inserting the stabilizer (**4**) in the rear slits (**14**), and a pair of tail flap portions (**15**) disposed on a rear portion of the fuselage adjacent to the pair of the rear slits (**14**), with each wing slit (**13**) and rear slit (**14**) being horizontally parallel to each other;

a wing member (**3**) cut out from the planar sheet and horizontally transversely fixed in a middle portion of the fuselage (**1**), said wing member (**3**) having a rear blade portion (**33**) protruding rearwardly to be spaced between the pair of tail flap portions (**15**) of the fuselage (**1**);

a stabilizer (**4**, **4***a*, **4***b*) cut out from the planar sheet and selectively horizontally secured on a rear portion of said fuselage;

a rudder (**5**) cut out from the planar sheet and vertically secured on the rear portion of the fuselage (**1**) and having a pair of rudder lugs (**53**) formed on a lower end portion of the rudder; said stabilizer (**4**, **4***a*, **4***b*) operatively adjusting a pitching angle of the fuselage as subjected to different wind resistance on said stabilizer and said fuselage; and

said stabilizer including a central stem (**41**) spaced between the two bifurcated members (**11**) of the fuselage (**1**), a pair of control slits (**42**, **42***a*, **42***b*) juxtapositionally slotted in a rear portion of the stabilizer to be engaged with the pair of tail flap portions (**15**) of the fuselage (**1**), and a pair of retaining slits (**43**, **43***a*, **43***b*) juxtapositionally slotted in a middle portion of the stabilizer each retaining slit engaging each said rudder lug (**53**) of the rudder (**5**).

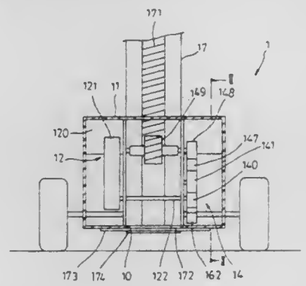
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**5,741,169**

**DEVICE CAPABLE OF CLIMBING ON TOP OF AN OBSTRUCTION**

**Hwa-Lo Chen, 5F, No. 56, Chin-Chiang St., Chung-Cheng Dist., Taipei City, Taiwan**

**Filed Mar. 4, 1997, Ser. No. 812,996**
**Int. Cl.[6] A63H** *17/40;29/00;* **A61G** *5/02*
**U.S. Cl. 446—441** **6 Claims**



1. A device capable of climbing on top of an obstruction, comprising:

a hollow housing having top and bottom walls with front and rear portions, aligned rack openings formed respectively at said rear portions of said top and bottom walls, and a front wall interconnecting said front portions of said top and bottom walls and formed with an aperture;

a rotary drive unit mounted inside said housing and provided with a rotary output shaft;

a direction changing gear set disposed inside said housing and including a main drive gear coupled to said output shaft, a transmission gear meshing with said main drive gear, first and second direction changing gears disposed above said main drive gear, a driven gear driven rotatably by one of said first and second direction changing gears, and a bevel gear mounted coaxially on said driven gear;

a rotary wheel set including front and rear drive gears mounted rotatably in said housing and front and rear wheel units coupled respectively and coaxially on said front and rear drive gears for rotation therewith, said front and rear wheel units being capable of supporting said housing on a ground surface, said rear drive gear being driven rotatably by said transmission gear to drive rotatably said front and rear wheel units and move said housing on the ground surface;

a shift unit disposed in said housing and extending out of said aperture in said front wall of said housing, said shift unit having said first and second direction changing gears mounted rotatably thereon and being retractable into said housing upon bumping into the obstruction to move said first and second direction changing gears from a first operating state, where said first direction changing gear meshes with said main drive gear and drives rotatably said driven gear, to a second operating state, where said second direction changing gear meshes with said transmission gear and drives rotatably said driven gear; and

a climbing unit including a rack which extends through said aligned openings in said top and bottom walls of said housing and which meshes with said bevel gear, said rack being movable upward relative to said housing when said first and second direction changing gears are in the first operating state and being movable downward relative to said housing when said first and second direction changing gears are in the second operating state.



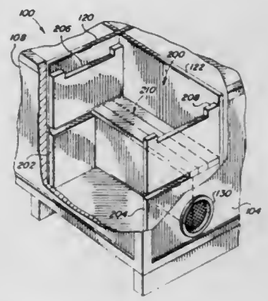
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**5,741,170**

**MODULAR BEEHIVE**

**Darryl W. Orletsky; Katherine D. Orletsky, both of P.O. Box 2975, Mesa, Ariz. 85214, and Gilbert J. Hinz, 1903 S. Standage Cir., Mesa, Ariz. 85202**

**Filed Jul. 25, 1996, Ser. No. 687,241**
**Int. Cl.[6] A01K** *47/00*
**U.S. Cl. 449—7** **2 Claims**



1. A hive system for housing a plurality of bee colonies, the hive system comprising:

a) a hive system body, said hive system body having four exterior perimeter walls, including two front walls and two side walls, a floor and a hive system interior space;

b) a center divider wall, said center divider wall extending between said two side walls and dividing said hive system interior space into two hive system interior space portions;

c) a plurality of sub-divider walls, each of said plurality of sub-divider walls extending from one of said two front walls to said center divider wall, said plurality of sub-divider walls further dividing said two hive system interior space portions into a plurality of hive chambers for housing a plurality of bee colonies; and

d) at least two lower frame rests for each of said plurality of bee chambers and further comprising at least two upper frame rests for each of said plurality of bee chambers.

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**5,741,171**

**PRECISION POLISHING SYSTEM**

**Ori Sarfaty, Ramat Hasharon; Yossi Hay, Herzlia, and Dan Gunders, Reut, all of Israel, assignors to Sagitta Engineering Solutions, Ltd., Ramat Gan, Israel**

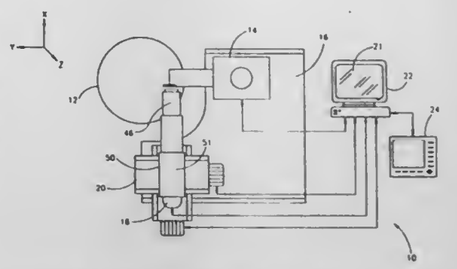
**Filed Aug. 19, 1996, Ser. No. 699,309**
**Int. Cl.[6] B24B** *49/00*
**U.S. Cl. 451—6** **23 Claims**

1. A polishing system, comprising:

a base;

an X-Y table mounted onto said base;

a microscope assembly mounted onto said X-Y table, said microscope assembly for inspecting a sample during polishing;



a polishing wheel assembly mounted onto said base, said polishing wheel assembly comprising a polishing wheel;

a holding arm assembly mounted onto said base, said holding arm assembly comprising a holding arm for even guidance of the sample during polishing, said holding arm assembly providing movement of the sample in the z-axis direction;

a force control unit coupled to said holding arm, said force control able to vary the amount of force applied to said holding arm;

a gripper assembly coupled to one end of said holding arm, said gripper assembly for holding a sample to be polished in a fixed position relative to said polishing wheel assembly during polishing and during inspection using said microscope assembly; and

a controller for controlling the operation of said polishing system, including said X-Y table, said holding arm assembly, said force control unit, said microscope assembly and said polishing wheel assembly for accurate polishing of the sample.

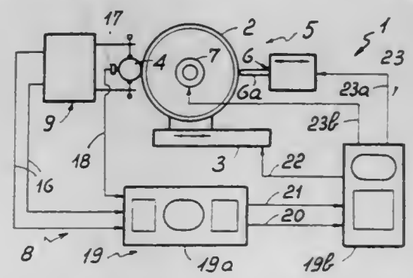
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**5,741,172**

**DRIVE AND CONTROL DEVICE AND RELATED PROCESS FOR A GRINDING MACHINE**

**Gianni Trionfetti, Agrate Brianza, and Andrea Guidotti, Milan, both of Italy, assignors to Balance Systems S.r.L., Milan, Italy**

**Filed May 10, 1996, Ser. No. 644,196**
**Claims priority, application Italy, May 12, 1995, MI95A0977**
**Int. Cl.[6] B24B** *49/00*
**U.S. Cl. 451—21** **5 Claims**



1. A drive and control device for a grinding machine of the type for grinding a rotatable piece, said piece having at least one circular cross section, the device comprising:

a rotatable grinding wheel;

means for translating said grinding wheel relative to the rotatable piece to be ground;

restoring means for restoring said grinding wheel, said restoring means including a diamond-resetting member for dressing said grinding wheel and a balancing member for balancing said grinding wheel;

circularity means for detecting the circular roundness of said piece at said circular cross section and for generating signals of circular roundness;

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electronic means processing said signals and generating actuating signals for selectively operating said diamond-resetting member and said balancing member when a circular roundness of said piece is different from a predetermined circular roundness and for successively operating both said diamond-resetting member and said balancing member when a difference, of said circular roundness of said piece from said predetermined circular roundness, persists over a predetermined time interval.

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**5,741,173**

## METHOD AND APPARATUS FOR MACHINING SEMICONDUCTOR MATERIAL

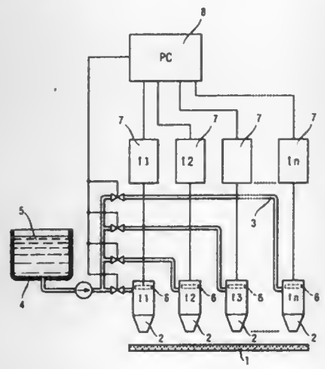
**Holger Lundt, Burghausen, Germany; Karl Kobler, Mattighofen, Austria, and Hanifi Malcok, Burghausen, Germany, assignors to Wacker Siltronic Gesellschaft für Halbleitermaterialien AG, Burghausen, Germany**

**Filed Oct. 21, 1996, Ser. No. 734,687**

**Claims priority, application Germany, Dec. 15, 1995, 195 46 988.7**

**Int. Cl.[6] B24B *53/007***

**U.S. Cl. 451—56** **8 Claims**




1. A method for machining semiconductor material with a grinding tool while feeding a liquid cleaning agent to a working surface of the grinding tool, comprising

directing the liquid cleaning agent in the form of at least two cleaning agent jets against the working surface of the grinding tool;

exposing each of said at least two cleaning agent jets to sound waves of a different frequency; and

whereby the liquid cleaning agent is exposed to sound waves having a specific frequency and a specific intensity.

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**5,741,174**

## MULTIPLE GRINDING MACHINE WITH CONTOURING FEED UNITS

**Russell E. Kaiser, Jr., Mercersburg; Ricky L. Mowen; Timothy W. Hykes, both of Greencastle; Dennis A. Fortney, Waynesboro, and Dennis F. Rice, Chambersburg, all of Pa., assignors to Western Atlas Inc., Waynesboro, Pa.**

**Division of Ser. No. 953,799, Sep. 30, 1992, Pat. No. 5,371,973. This application Sep. 12, 1994, Ser. No. 304,233**

**Int. Cl.[6] B24B *5/16;41/00***

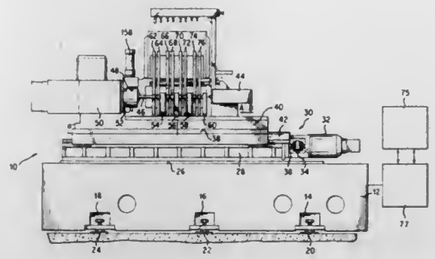
**U.S. Cl. 451—307** **16 Claims**

1. A belt grinding machine comprising

a) a bed,

b) a platform extending transversely across said bed,

c) a first base secured to said platform,




d) a carriage mounted on said first base for lateral movement therealong,

e) a first motor, and first coupling means for delivering power from said first motor to said carriage to move same along said first base,

f) means atop said carriage for receiving and retaining a workpiece,

g) a second base fastened to said platform perpendicular to said first base,

h) a positioning slide mounted on top of said second base for longitudinal movement there along,

i) a second motor, and second coupling means for delivering power from said second motor to said positioning slide to move said positioning slide along said second base,

j) a contouring head assembly mounted upon said positioning slide for movement therewith,

k) said contouring head assembly including several contouring feed units,

l) each said contouring feed unit including a back-up shoe, means for entraining an abrasive belt in operative relation to said back-up shoe, a coupling, bearing means, and a DC motor for delivering power, through said coupling to said bearing means to move said back-up shoe relative to said abrasive belt,

m) each contouring feed unit having a front face for contacting said abrasive belt and a rear face remote from said abrasive belt,

n) the invention being characterized by an enclosure secured about said rear face of said contouring head assembly to surround said DC motors, said enclosure preventing dust and debris from entering said DC motors and causing same to deteriorate.

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**5,741,175**

## FLEXIBLE SHIELD FOR A TILE SAW

**Richard E. Voege, 2560 Jacob St., Hayward, Calif. 94541**

**Continuation-in-part of Ser. No. 543,384, Oct. 16, 1995, Pat. No. 5,577,955. This application Nov. 26, 1996, Ser. No. 753,535**

**Int. Cl.[6] B23Q *11/08;* B23D *47/00***

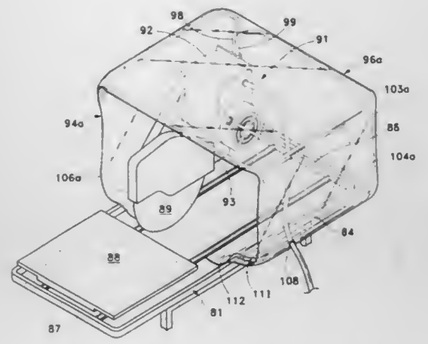
**U.S. Cl. 451—455** **9 Claims**

1. In combination with a tile saw having a tray with sides and a back and carrying a liquid bath and the tile saw having fixed structure including a motor driving a cutting blade over which the liquid passes and a movable stage on rollers facilitating movement of the stage by an operator toward and under the cutting blade to cut a tile carried on the stage, a tile saw shield positioned to substantially prevent liquid from spraying or splashing out from the tile saw and beyond the tray, comprising:

a support frame formed of at least one rod contoured into generally an upper plane above the motor and having at least left and right sides and a back side thus defining an open frame, and including means for securing the support frame on fixed structure of the tile saw and for quick removal of the frame from the fixed structure, and

a canopy formed of flexible sheet material, the canopy having a top configured to fit generally on said upper plane of the support frame, and a back and two sides, the canopy having






bottom edges extending down sufficiently to curve or fold back into the tray in a position such that liquid spraying or splashing out from the tile saw will drain down interior sides and back of the canopy and into the tray, and the canopy being of such size as to fit over the support and at least one side frame so as to drape downwardly with its back and at least one side extending out at least as far as the side and back edges of the tray,

whereby relatively large tiles may be cut without interference from the tile saw shield.

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**5,741,176**

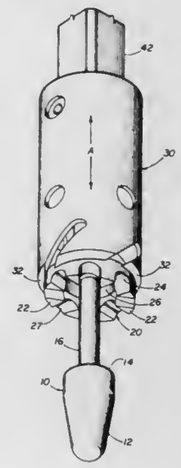
## SKIN-HOLDING VENT CUTTER

**William W. Lapp; Marcus M. Moore; Joseph M. Walker, all of Gainesville, and Raymond F. Strawn, Flowery Branch, all of Ga., assignors to Stork Gamco Inc., Gainesville, Ga.**

**Filed Jul. 26, 1996, Ser. No. 687,756**

**Int. Cl.[6] A22C *21/06***

**U.S. Cl. 452—122** **20 Claims**




1. Apparatus for removing the vent from a slaughtered animal, the apparatus comprising:

a. means, movable relative to the animal, for cutting the vent;

b. means for centering the cutting means within the vent; and

c. means for holding the skin of the animal near the vent, the holding means comprising a face surface having a series of grooves that roughen the face surface and capture the skin in order to form folds in the skin so that the centered cutting means cuts a section of the skin near the vent.

**5,741,177**

## TISSUE SAMPLING AND ANALYSIS

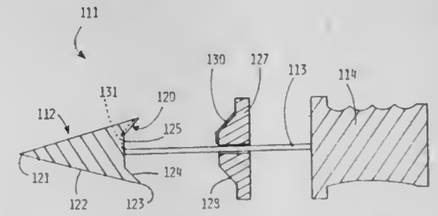
**Denis William Roberts, Shelley; David Steven Woodhouse, Byford; David Pethick, Hamilton Hill, and John Christian Bensink, Brisbane, all of Australia, assignors to Meat Research Corporation, Sydney, Australia**

**Filed Jun. 28, 1995, Ser. No. 495,981**

**Claims priority, application Australia, Jun. 28, 1994, PM6477; Mar. 17, 1995, PN1803**

**Int. Cl.[6] A22B *5/00***

**U.S. Cl. 452—198** **19 Claims**




1. A process for obtaining an early indication of the quality of meat such as defective meat, the process comprising the steps of:

taking a sample of muscle tissue from an animal,

disrupting the sample of muscle tissue so as to activate and accelerate the conversion of glycogen to lactic acid and achieve an accelerated reduction of the pH,

incubating the sample after the disrupting step at a temperature to progress the conversion of glycogen to lactic acid,

and providing an indication of the pH of the tissue sample after incubation.

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**5,741,178**

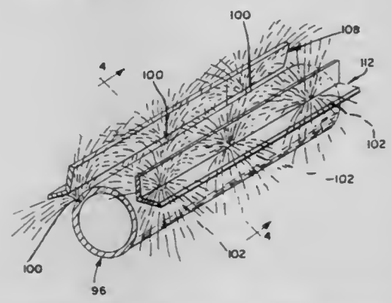
## REDUCING AREA, INCREASING VELOCITY PAINT BOOTH STRUCTURE AND METHOD

**Steve E. Telchuk, Mundelein, Ill., assignor to Binks Manufacturing Company, Franklin Park, Ill.**

**Continuation of Ser. No. 353,128, Dec. 9, 1994, abandoned. This application Jun. 7, 1996, Ser. No. 660,806**

**Int. Cl.[6] B05B *15/12***

**U.S. Cl. 454—54** **41 Claims**




14. A paint spray booth for painting articles comprising a painting section, means for painting articles in said painting section, means for providing air flow in said painting section, means for enclosing said painting section to contain said air flow, said means for enclosing said painting section having a decreasing cross-sectional area in the direction of air flow in the locale where painting is to occur, said means for enclosing said painting section including wall, ceiling and floor elements, at least one of said elements cooperating with the other of said elements to provide said decreasing cross-section and to cause an increasing air flow velocity in the direction of air flow, an air entrance area spaced upstream of the locale where painting is to occur and an air exit

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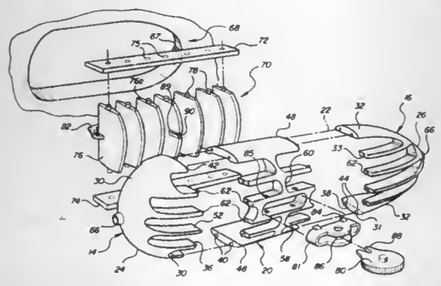
area spaced downstream of the locale where painting is to occur, said air entrance area being greater than said air exit area, said air exit area being adjacent and including paint overspray eliminating means, said means for enclosing said painting section increasing the velocity of the air from that before painting to a value of about 1.66 or more times in the locale of painting, said means for enclosing said painting section reducing the cross-sectional area from that before painting to about 0.60 or less times in the locale of painting, said means for providing air flow providing air at an initial velocity, of at least 50 fpm whereby the air flow in the booth in the locale where painting occurs is of increasing velocity.

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**5,741,179**
**MODULAR AIR OUTLET ASSEMBLY AND METHOD OF MAKING SAME**

**Andy Kwan-Leung Sun, North York, Canada, and Michael Stephen Mikowski, Lake Leelanau, Mich., assignors to Manchester Plastics, Inc., Troy, Mich.**

**Filed May 17, 1996, Ser. No. 649,089**
**Int. Cl.[6] B60H *1/34***
**U.S. Cl. 454—155** **27 Claims**



13. A modular outlet assembly having sides extending between first and second ends, said assembly comprising:

a first end module forming the first end and having arms extending therefrom establishing a portion of the sides and forming a first open side;

a second end module forming the second end and having arms extending therefrom establishing a portion of the sides and forming a second open side;

interconnecting members connected in said arms of each of said first and second end modules along said open sides for interconnecting said first and second ends forming a first outlet housing; and

a third end module having arms extending therefrom and forming a third open end with interconnecting members connected to said arms and of a contour different from said second end module, said third end module selectively replaceable with said second module forming a outlet housing of different shape from said first outlet housing.

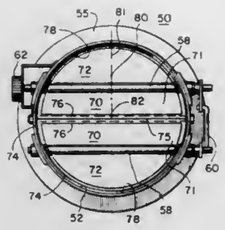
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**5,741,180**
**FRESH AIR FLOR MODULATION DEVICE**

**Lunxi Peter Xia, La Crescent, Minn.; Rolf M. Hanson, Holmen, Wis.; Nels R. Ebbesen, Winona; Michael G. Lunacek, Crescent, both of Minn.; Robert M. Swanson, La Crosse, Wis.; Dennis R. Dorman, La Crosse, Wis., and Jeffrey A. Moore, La Crosse, Wis., assignors to American Standard Inc., Piscataway, N.J.**

**Division of Ser. No. 377,321, Jan. 24, 1995, Pat. No. 5,674,125.**
**This application Apr. 11, 1997, Ser. No. 843,066**
**Int. Cl.[6] F24F *7/00;13/04***
**U.S. Cl. 454—327** **14 Claims**

1. A device for monitoring and modulating the admission of fresh air into a building, the device comprising:



a housing;

a sensor, associated with the housing and operable to measure airflow through the housing; and

a damper including at least two damper blades wherein each damper blade is substantially planar with a first substantially straight edge and a second curved edge;

wherein each damper blade includes a shaft rotatably attached to the housing at least at a first shaft end;

wherein the shaft is located on a surface of the damper blade so as to divide the surface into first and second substantially equal areas; and

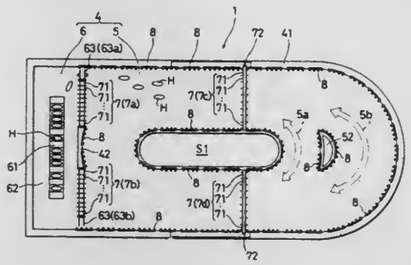
wherein the shaft is not located on the surface at the midpoint of a perpendicular line taken from the midpoint of the first straight edge.

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**5,741,181**
**COURSE GUIDE APPARATUS USED FOR A COMPETITIVE GAME SIMULATION MACHINE**

**Toshiaki Nakagawa; Takashi Yamaguchi, both of Zama, and Kohichi Hayashida, Yamato, all of Japan, assignors to Konami Co., Ltd., Hyogo-ken, Japan**

**Filed Aug. 5, 1996, Ser. No. 692,215**
**Claims priority, application Japan, Aug. 7, 1995, 7-201028**
**Int. Cl.[6] A63F *9/22***
**U.S. Cl. 463—6** **10 Claims**



1. A course guide apparatus used for a competitive game machine having a plurality of race courses, and a plurality of moving objects competing a certain game, the course guide apparatus comprising:

a course indicator for indicating the course on which the plurality of moving objects compete in the certain game and the course indicator is mounted along a lengthwise direction of the plurality of race courses;

a controller for controlling the course indicator so as to indicate the course,

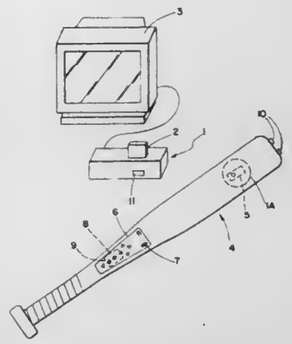


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**5,741,182**
**SENSING SPATIAL MOVEMENT**

**John D. Lipps, Kent; Stephen J. Szczecinski, Fairview Park, and Robert W. Baskette, Chagrin Falls, all of Ohio, assignors to Sports Sciences, Inc., Twinsburg, Ohio**

**Filed Jun. 17, 1994, Ser. No. 261,597**
**Int. Cl.[6] A63F *9/00***
**U.S. Cl. 463—36** **2 Claims**



1. Apparatus for providing and responding to electromagnetic radiation or other energy, comprising

means comprising a physical object that is moved spatially during operation of the apparatus,

means comprising a physical object that is to remain substantially stationary during operation of the apparatus,

one said physical object including means for providing the electromagnetic radiation or other energy; and

means for receiving and responding to said radiation or other energy;

the apparatus being so constructed and arranged that at least one characteristic of the radiation or other energy as received by the responding means is responsive to spatial movement of said object that is moved;

the means for providing the energy being included in the physical object that is moved;

the energy providing means in the object that is moved comprising inertial means for modifying a characteristic of the energy;

the inertial means comprising switching means;

the apparatus including a video type of sport simulating game having a visual monitor and software that is responsive to digital input, and wherein the object that is moved in the said apparatus comprises an elongate implement having the shape of an elongate implement that is swung in playing the sport simulated by the game; wherein the inertial means comprises centrifugal switching means having an activating member that is movable substantially along the axis of the implement;

the energy providing means comprising infrared light emitting diodes;

the energy from the elongate implement being provided by a combination of components and connections thereof in the implement substantially as follows:

an inertial switch (S1) for sensing the player's swing, comprising a small mass that is free to move in such a way as to operate the contacts of the switch (S1) when the bat is swung;

pushbutton switches (S2–S9) serving as a keypad to allow the player to make menu selections and select other functions of the game;

a configuration switch (S10) to set up the operation of the device to be compatible with a variety of baseball games, said configuration switch allowing the inertial switch to act in parallel with at least one of the standard pushbutton circuits to send a swing command to the game;

a slide switch (S11) to set a player number one or player number two mode of operation;

an IR encoder chip (U1) for scanning the pushbutton switches to determine whether a switch is closed, the encoder generating an output signal suitable for driving a LED, and the signal output being decoded by an IR remote receiver;

an oscillator circuit comprising the combination of a crystal (X1) and capacitors (C4, C5) providing a clock circuit for the IR encoder chip;

a MOSFET driver transistor (Q1) for controlling the drive current to the IR transmitter LEDs;

infrared LEDs (D1, D2) for converting the drive current signals of the circuit to infrared light signals; and

decoupling capacitors (C2, C3, C6) to minimize the effect of transients on the power supply;

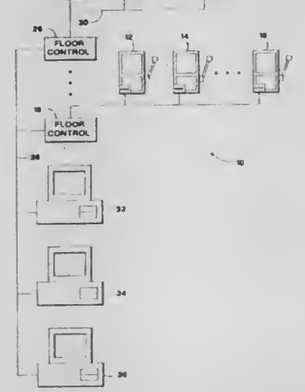
or by a substantially equivalent combination of components and connections.

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**5,741,183**
**METHOD AND APPARATUS FOR OPERATING NETWORKED GAMING DEVICES**

**John F. Acres; Alec Ginsburg, and David Wiebenson, all of Corvallis, Oreg., assignors to Acres Gaming Inc., Corvallis, Oreg.**

**Division of Ser. No. 322,172, Oct. 12, 1994, Pat. No. 5,655,961.**
**This application Jun. 6, 1995, Ser. No. 465,942**
**Int. Cl.[6] A63F *9/24***
**U.S. Cl. 463—42** **24 Claims**




1. A method for connecting a plurality of gaming devices to a computer comprising:

associating an interface circuit with each gaming device;

interconnecting the interface circuits with a computer via a computer network;

connecting a memory device bearing a unique identification number to one end of each cable;

connecting the other end of each cable to selected control terminals in an associated gaming device; and

connecting the memory device to selected control terminals in the associated interface circuit.

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**5,741,184**

**GAME HALL SYSTEM UTILIZING STORAGE MEDIA**

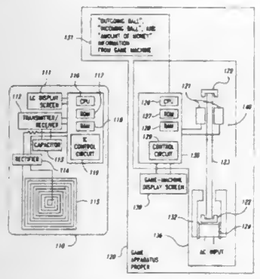
**Takatoshi Takemoto, and Kazunari Kawashima, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ace Denken, Tokyo, Japan**

**PCT No. PCT/JP93/00193, § 371 Date Aug. 17, 1995, § 102(e) Date Aug. 17, 1995, PCT Pub. No. WO94/19076, PCT Pub. Date Sep. 1, 1994**

**PCT Filed Feb. 17, 1993, Ser. No. 507,222**

**Int. Cl.[6] A63F** *7/02;9/22*

**U.S. Cl. 463—43** **21 Claims**



1. A game hall system having a plurality of game machines each of which is equipped with a game execution section for executing a game, the system comprising a storage medium in which information items about the game are stored, wherein:

said storage medium includes a storage-medium transmitter/receiver which transmits and receives by radio, a storage-medium controller which controls the transmission and reception of the storage-medium transmitter/receiver, a memory portion in which the information items transmitted and received by said storage-medium transmitter/receiver are stored, and a power supply circuit which is chargeable; and

each of said game machine includes a game-machine transmission/reception section which transmits and receives information to and from said storage medium, and a game-machine controller which controls the transmission and reception of the game-machine transmission/reception section and controls said execution section, wherein said game-machine transmission/reception section includes a game-machine setting port in which said storage medium is inserted, a game-machine transmitter/receiver which transmits and receives by radio to and from the storage medium inserted in said game-machine setting port, and a charging circuit which charges said power supply circuit of the storage medium inserted in said game-machine setting port.

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**5,741,185**

**INTERACTIVE LIGHT-OPERATED TOY SHOOTING GAME**

**David Chu Ki Kwan, Hon Kong, Hong Kong; Steven Lebensfeld, Laurel Hollow, N.Y.; Carmine Russo, West Islip, N.Y.; Frank Landi, Great Neck, N.Y., and Ng Wing Kwong, Hong Kong, Hong Kong, assignors to Toymax Inc., Plainview, N.Y.**

**Filed Feb. 5, 1997, Ser. No. 795,895**

**Int. Cl.[6] F41J** *5/02;* **A63F** *9/02*

**U.S. Cl. 463—51** **39 Claims**

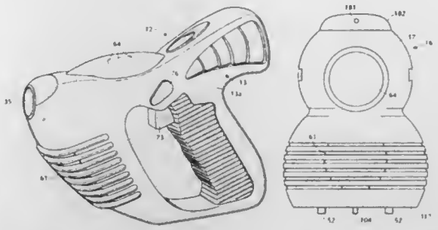
1. A toy light projector used in a toy shooting game, comprising:

a housing;

a light source carried by said housing positioned to project light therefrom;

an electrical circuit carried by said housing coupled to said light source which controls energization of said light source according to a selectable code and thereby causes said light source to emit light with the selected code;

a first manually actuatable trigger control carried by said housing coupled to said electrical circuit;



a second manually actuatable control carried by said housing coupled to said electrical circuit;

said electrical circuit controlling energization of said light source according to a first code representing a firing of said toy light projector in response to activation of said first control to cause said light source to emit light with said first code, and controlling energization of said light source according to a second code in response to activation of said second control to cause said light source to emit light with said second code;

said electrical circuit comprising a modulating circuit which modulates energization of said light source during a first time period corresponding to said first code in response to activation of said first control and during a second time period corresponding to said second code in response to activation of said second control.

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**5,741,186**

**IMPULSE TORQUE GENERATOR FOR A HYDRAULIC POWER WRENCH**

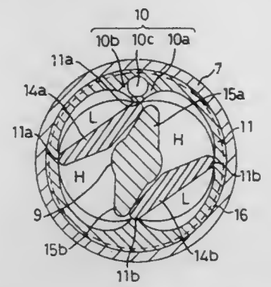
**Koji Tatsuno, Osaka, Japan, assignor to URYU Seisaku, Ltd., Osaka, Japan**

**Filed Apr. 7, 1995, Ser. No. 418,464**

**Claims priority, application Japan, Apr. 8, 1994, 6-095753**

**Int. Cl.[6] B25B** *21/02*

**U.S. Cl. 464—25** **5 Claims**




1. An impulse torque generator for a hydraulic power driven wrench, said impulse torque generator comprising:

a rotor;

a liner, operatively connected to said rotor, having a first end, a second end, and at least two pairs of sealing surfaces spaced about an inner peripheral surface of said liner, wherein said liner defines a hydraulic fluid cavity;

a main shaft rotatably and coaxially mounted within said liner, and having at least two projections; and

at least two driving blades mounted within said liner, and having a first longitudinal edge portion and a second longitudinal edge portion, respectively, wherein said first longitudinal edge portion and said second longitudinal edge portion of said respective driving blades form sealing surfaces which, upon mating with one of said pair of sealing surfaces on said liner, form high pressure and low pressure chambers and the pressure in the high pressure chamber acts on one of said main shaft projections through said driving blade to impart an impulse torque to said main shaft.



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**5,741,187**

**FLEXIBLE SHAFT-COUPLING**

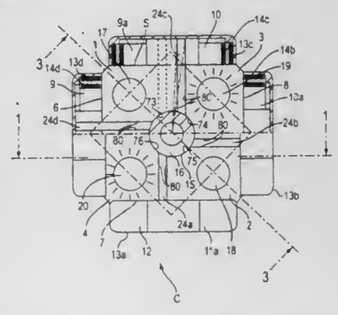
**Franz Josef Wolf, Bad Soden-Salmunster, and Kurt Fiedler, Zeppelinring 3, D-67433 Geinsheim, both of Germany, assignors to Kurt Fiedler, Geinsheim, Germany**

**Continuation of Ser. No. 110,823, Aug. 24, 1993, abandoned. This application Dec. 18, 1995, Ser. No. 573,911**

**Claims priority, application Germany, Aug. 27, 1992, 42 28 488.0**

**Int. Cl.[6] F16D** *3/50*

**U.S. Cl. 464—55** **25 Claims**



1. A flexible shaft-coupling, comprising:

a first coupling component including a first anchoring element and a second anchoring element arranged mutually diametrically opposite each other with respect to a coupling axis of the shaft-coupling;

a second coupling component including a third anchoring element and a fourth anchoring element arranged mutually diametrically opposite each other with respect to the coupling axis;

said anchoring elements each being positioned in a radial plane of the coupling perpendicular to the coupling axis such that said first anchoring element and said second anchoring element are each adjacent said third and fourth anchoring elements;

a first strap, a second strap, a third strap and a fourth strap, said first strap connecting said first and third anchoring elements, said second strap connecting said third and second anchoring elements, said third strap connecting said second and fourth anchoring elements and said fourth strap connecting said first and fourth anchoring elements; and

a first elastomeric damper being positioned between said first and second coupling components.

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**5,741,188**

**WATER OPERATED RIDE-ON TOYS AND GARDEN TOOLS**

**Hanoch Levin, 45 Haoren, 30095 Ramat Yishay, and Ehud Nagler, 73 Hadeganiot, 36054 Kiryat Tivon, both of Israel**

**Filed Aug. 9, 1996, Ser. No. 693,659**

**Int. Cl.[6] A63G** *31/00*

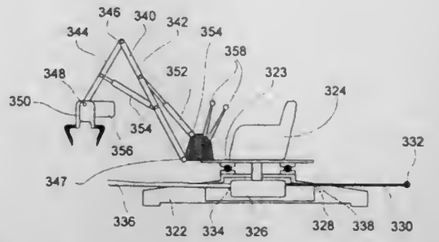
**U.S. Cl. 472—128** **5 Claims**

1. A household water pressure operated device comprising an apparatus selected from the group consisting of a ride-on toy and a garden tool, the apparatus including:

(i) a stationary element;

(ii) a movable element movably connected to said stationary element;

(iii) a water pressure operating rotating motor for moving said moveable element with respect to said stationary element;



(iv) a water inlet for directing the household water into said rotating motor, said water inlet being in communication with a household water source;

(v) a water outlet for directing the household water out from said rotating motor; and

(vi) a valve for controlling the flow of the water through said rotating
motor.

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**5,741,189**

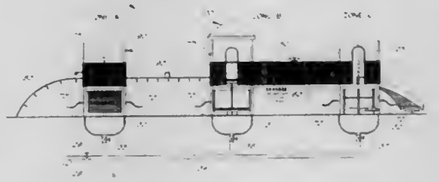
**RETROFIT WATER PLAY STRUCTURE AND METHOD**

**Rick A. Briggs, 64 Maple Grove, Springfield, Ill. 62707**

**Filed Dec. 23, 1996, Ser. No. 772,499**

**Int. Cl.[6] A63G** *31/00*

**U.S. Cl. 472—128** **35 Claims**



1. A method for installing an interactive water play element in a hollow support member of a play structure, comprising the following steps:

forming an opening in said support member;

inserting a water forming element in said opening formed in said support member;

inserting one or more water supply conduits inside said hollow support member, said supply conduit having an external diameter that is less than the internal diameter of said hollow support member;

placing one end of said supply conduit in communication with a source of water and placing the other end of said supply conduit in communication with said water forming element; and

providing a control valve in the path of water flow from said source to said water forming element, thereby enabling play participants to adjust the velocity, amount or direction of water provided to said water forming element.

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**5,741,190**

**Patent Not Issued For This Number**

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**5,741,191**

**Patent Not Issued For This Number**

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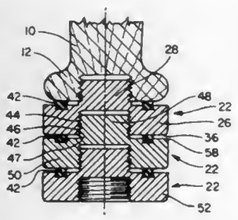
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5,741,193

## BASEBALL BAT AND PRACTICE DEVICE COMBINATION

Timothy J. Nolan, Antioch, Ill., assignor to Paul V. Smith, Sr., and Paul V. Smith, Jr., both of Lombard, Ill., part interest to each

Filed Jan. 3, 1996, Ser. No. 580,985
Int. Cl.[6] A63B 69/00
U.S. Cl. 473—457 6 Claims




1. A baseball bat sized and configured to conform to official baseball bat regulations and standards for use of the baseball bat in official baseball games and in combination with a practice device for use in training, comprising: the baseball bat having a knob end disposed at one end of the bat adjacent to a cyclindrically shaped handle portion of the bat, the knob end having a socket hole in axial alignment with the bat, the socket hole having internal threads and a bottom, the socket hole and internal threads formed integral with the knob end of the bat so that the bat conforms to official baseball bat regulations and standards when the baseball bat is used without the practice device, the practice device including a first weight structure having a weight sized for positioning in coaxial engagement with the knob end of the baseball bat, the weight being formed of material having a density greater than that of the baseball bat and having a mass in the range of one to forty-eight ounces, the weight structure having a bolt with external threads threadingly engageable with the internal threads of the socket hole to secure the practice device in fixed assembly with the knob end of the baseball bat for use in training, a lower surface of the weight having a second socket hole having internal threads adapted for threaded engagement with external thread of a second bolt of a second weight structure for positioning the second weight structure in coaxial engagement with the weight and, gripping means are attached to an upper surface of the second weight structure to securely hold the second weight structure in coaxial engagement with the weight structure when the second weight structure is manually rotated to cause the external threads of the second bolt to move axially of the second socket hole to tighten the engagement of the second weight structure against the first weight structure.

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5,741,194

## ADJUSTABLE BOUNDARY LAYOUT AND APPARATUS AND GAMES THEREFORE

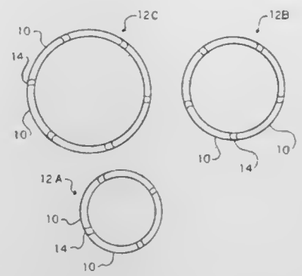
William D. Simunek, 334 Archer Rd., Mahopac, N.Y. 10541

Filed Jun. 27, 1996, Ser. No. 671,403
Int. Cl.[6] A63B 71/00
U.S. Cl. 473—490 15 Claims

1. An adjustable boundary layout and apparatus for marking boundaries and outlining any shape comprising:

a) a plurality of flexible demarcation elements and

b) a plurality of connecting elements,




c) detachable connecting means for attaching said demarcation elements to said connecting elements and for detaching of said demarcation elements from said connecting elements, improvement whereby the overall length and configuration are determined by the end-user at time of each usage, whereby several separate and distinct usages can exist simultaneously,

d) detachable connecting means used to intersect and overlap said demarcation elements at any point along said demarcation element, improvement whereby said connecting element can be attached to said demarcation element and adjustably positioned at any point along said demarcation element,

e) spooling means for collecting, unwinding, and transporting said demarcation elements attached to said connecting elements as a continuous form, without tangling, bulging, disconnecting.

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5,741,195

## HIGH VISIBILITY INFLATED GAME BALL

Michael J. Sullivan, Chicopee, and R. Dennis Nesbitt, Westfield, both of Mass., assignors to Lisco, Inc., Tampa, Fla.

Continuation-in-part of Ser. No. 316,699, Sep. 30, 1994, Pat. No. 5,470,058. This application Nov. 22, 1995, Ser. No. 561,792
Int. Cl.[6] A63B 41/02;41/08;43/06
U.S. Cl. 473—570 23 Claims

1. A game ball, comprising:

a central inflated portion, and

a cover formed over said central inflated portion, said cover being formed frown a cover material comprising a crosslinked metallocene catalyzed polyolefin, said cover material including at least one visibility enhancing agent selected from the group consisting of reflective particles having faces with a reflectance of at least 75% and a tinting agent which imparts to at least a portion of said game ball a reflectance of at least 75% in a part of the visible spectrum.

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5,741,196

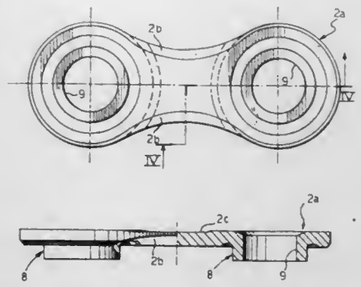
## TRANSMISSION CHAIN PARTICULARLY FOR A BICYCLE

Valentino Campagnolo, Vicenza, Italy, assignor to Campagnolo S.r.l., Vicenza, Italy

Filed Jan. 28, 1997, Ser. No. 790,023
Claims priority, application Italy, Mar. 18, 1996, TO96A0206
Int. Cl.[6] F16G 13/02
U.S. Cl. 474—226 6 Claims

1. Transmission chain, particularly for a bicycle, comprising a plurality of chain links articulated to each other and constituted hy pairs of elongated, parallel and spaced apart plates alternatively arranged outside and inside of each other, so as to define outer chain links alternated to inner chain links, said links being articulated to each other by pins fixed at their ends to the plates of the outer chain links,






wherein the outwardly facing surface of each plate of each inner chain link has a depressed surface portion at a central area intermediate between the two ends of the plate.

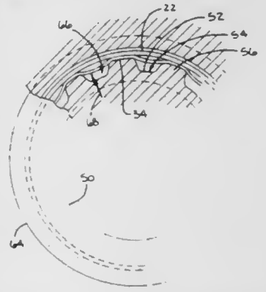
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5,741,197

## POWER TRANSMISSION BELT AND METHOD OF MANUFACTURING THE SAME

Kazuhiro Akita, and Hiroo Osada, both of Hyogo, Japan, assignors to Mitsuboshi Belting Ltd., Hyogo, Japan

Division of Ser. No. 349,821, Dec. 6, 1994, Pat. No. 5,536,214. This application Feb. 22, 1996, Ser. No. 602,105
Claims priority, application Japan, Dec. 7, 1993, 5-340651; Dec. 7, 1993, 5-340652
Int. Cl.[6] F16G 1/04
U.S. Cl. 474—268 16 Claims




16. A method of forming a power transmission belt/belt sleeve comprising the steps of:

providing a mold defining a mold space;

placing a non-woven fabric with individual fibers thereon in the mold space;

injecting a liquified matrix material into the mold space and thereby causing fibers to separate from the non-woven fabric in the mold space;

curing the liquified matrix material; and

separating the power transmission belt/belt sleeve from the mold.

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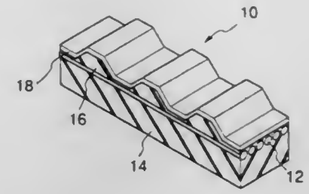
5,741,198

## TOOTHED BELT

Toru Fujiwara, Tokorozawa; Yoshinori Itoh, Hanno, and Masato Tomobuchi, Sakado, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Nov. 20, 1995, Ser. No. 558,751
Claims priority, application Japan, Nov. 22, 1994, 6-311294
Int. Cl.[6] F16G 1/28
U.S. Cl. 474—271 3 Claims

1. A toothed belt including a cured molding body, a tensile body embedded therewithin and a tooth sheet, said cured molding body




compounding partial hydrogenated nitrile rubber with iodine value of from 12 to 20, a sulfur-based crosslinking agent and a vulcanization accelerator, wherein said vulcanization accelerator comprises:

tellurium dithiocarbamate compound represented by the following:

$$\left[\begin{array}{c} R_1-N-C-S \\ \quad\quad | \quad\; || \\ \quad R_2 \quad S \end{array}\right]_4 -Te$$

($R_1$, $R_2$: Alkyl group)

zinc dithiocarbamate compound represented by the following:

$$\left[\begin{array}{c} R_3-N-C-S \\ \quad\quad | \quad\; || \\ \quad R_4 \quad S \end{array}\right]_2 -Zn$$

($R_3$, $R_4$: Alkyl group)

tetramethylthiuram disulfide; and

tetraethylthiuram disulfide.

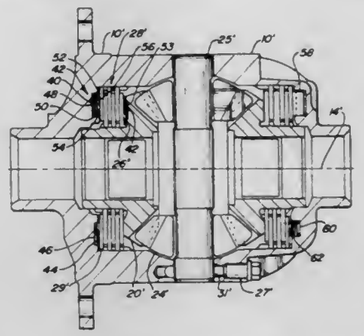
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5,741,199

## LIMITED SLIP DIFFERENTIAL RECESSED SPRING DESIGN

John H. Tanser, Punta Gorda, Fla.; George Korol, Shelby Township, and John P. Walsh, Madison Hts., both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Feb. 6, 1996, Ser. No. 597,135
Int. Cl.[6] F16H 3/44
U.S. Cl. 475—235 12 Claims




1. A limited slip differential having a housing supported for rotation about an axis, first and second side gears provided in the housing, and clutch means provided between the housing and the first side gear, comprising:

a clutch pack having multiple clutch plates provided between the housing and the first side gear, a first one of said clutch plates

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fixed to the side gear and a second one of said clutch plates fixed to said housing;

the first side gear having a first radial surface adjacent the housing;

the housing having a second radial surface with an annular groove provided therein adjacent the first side gear; and

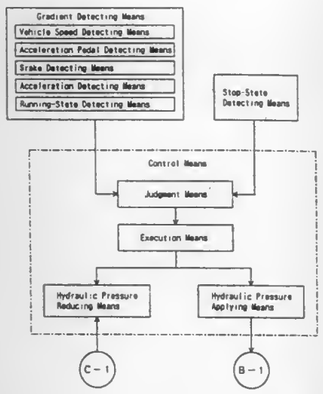
a biasing means provided in said annular groove for urging the clutch plates into mutual frictional engagement, said biasing means having an uncompressed axial thickness and a compressed axial thickness whereat the biasing means is damaged, and the groove has an axial depth less than the uncompressed axial thickness of the biasing means and greater than the compressed axial thickness of the biasing means.

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**5,741,200**
**CONTROL APPARATUS FOR AN AUTOMATIC TRANSMISSION**

**Takao Taniguchi, Okazaki; Kazumasa Tsukamoto, Toyota; Masahiro Hayabuchi, Anjo; Masaaki Nishida, Anjo; Hiroshi Tsutsui, Nishio; Muneo Kusafuka, Anjo; Masamichi Unoki, Nishio, and Junichi Nishimura, Anjo, all of Japan, assignors to Aisin AW Co., Ltd., Aichi-ken, Japan**

**Filed Jun. 28, 1996, Ser. No. 673,364**
**Claims priority, application Japan, Jun. 30, 1995, 7-186707**
**Int. Cl.[6] B60K** *41/20*
**U.S. Cl. 477—93** **7 Claims**




1. A control apparatus of an automatic transmission of a vehicle, comprising:

a fluid transmission gear for transmitting the rotation of an engine to transmission apparatuses;

a clutch which is engaged when a forward running range is selected to couple said fluid transmission gear to said transmission apparatuses;

a one-way clutch which is locked by engagement of said clutch to achieve a forward 1st gear ratio of said transmission apparatuses;

a brake for locking said one-way clutch by the engagement in order to prevent an output shaft of said transmission apparatuses from rotating in a reverse direction;

a first hydraulic servo for engaging said clutch by a hydraulic pressure applied thereto;

a second hydraulic servo for engaging said brake by a hydraulic pressure applied thereto;

a stop-state detecting means for determining that the vehicle is in a halted state when a speed of the vehicle is virtually zero, an acceleration pedal is released and a foot-brake pedal is stepped on;

a gradient detecting means for detecting the gradient of a road; and

a control means for controlling hydraulic pressures applied to said first and second hydraulic servos in accordance with signals generated by said stop-state detecting means and said gradient detecting means,

wherein said control means comprises:

a judgment means for determining in accordance with said signal output by said gradient detecting means whether an uphill road is steep enough to cause said brake to slip, with said brake engaged;

a hydraulic pressure reducing means for reducing a hydraulic pressure applied to said first hydraulic servo in order to place said clutch in an all but released state;

a hydraulic pressure applying means for applying a hydraulic pressure to said second hydraulic servo in order to place said brake in an engaged state; and

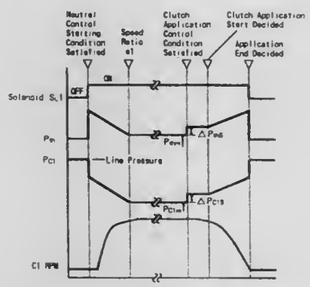
an execution means for permitting said hydraulic pressure reducing means to reduce a hydraulic pressure applied to said first hydraulic servo and said hydraulic pressure applying means to apply a hydraulic pressure to said second hydraulic servo only if a stop state is detected by said stop-state detecting means and said judging means determines that an uphill road is not steep enough to cause said brake to slip.

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**5,741,201**
**CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION**

**Hiroshi Tsutsui, Nishio; Masahiro Hayabuchi; Masaaki Nishida, both of Anjo, and Yoshihisa Yamamoto, Nishio, all of Japan, assignors to Aisin Aw Co., Ltd., Japan**

**Filed May 10, 1996, Ser. No. 645,958**
**Claims priority, application Japan, May 12, 1995, 7-138378**
**Int. Cl.[6] F16H** *61/20*
**U.S. Cl. 477—116** **4 Claims**




1. A control system for an automatic transmission receiving rotational torque from an engine in a vehicle, comprising:

an input clutch, applied responsive to selection of a forward running range, for transmitting the rotational torque from the engine to the transmission;

a hydraulic servo for selectively applying and releasing said input clutch;

stop state detecting means for determining a stop state for the vehicle when the forward running range is selected, vehicle speed is zero, an accelerator pedal is released and a brake pedal is depressed;

starting operation detecting means for detecting a starting operation to start the vehicle moving;

application state detecting means for detecting the application state of said input clutch; and

control means for controlling an oil pressure fed to said hydraulic servo responsive to signals from said stop state detecting means, said starting operation detecting means and said application state detecting means, said control means including:

release means for lowering, according to a predetermined rate and responsive to detection of a stop state, oil pressure to said hydraulic servo to release said input clutch to a predetermined released state and for holding said input clutch in said predetermined release state;

decide means for deciding, responsive to detection of a starting operation, whether or not the release of said input clutch has arrived at a specific released state which immediately precedes start of application of said clutch, on the basis of signals from application state detecting means; and

apply means, responsive to detection of a starting operation, for feeding, if said decide means decides that said input clutch is in said specific released state, said hydraulic servo with a total oil pressure which is the sum of an initial application oil pressure at which engagement of said input clutch starts and a release oil pressure, and then raising oil pressure to said hydraulic servo from said total oil pressure to apply said input clutch, and for raising oil pressure to said hydraulic servo, if said decide means decides that said input clutch is not in said specific released state, on the basis of a predetermined relationship between pressure and another parameter.

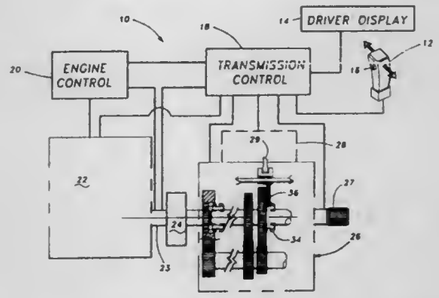


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**5,741,202**
**SHIFT BY WIRE TRANSMISSION SYSTEM**

**Jon M. Huber, Laurinburg, N.C., assignor to Meritor Heavy Vehicle Systems, LLC**

**Filed May 20, 1996, Ser. No. 650,749**
**Int. Cl.[6] B60K** *41/08*
**U.S. Cl. 477—124** **9 Claims**




1. A method of controlling a manual vehicle transmission having a plurality of gears using an electronic transmission control unit, comprising the steps of:

(A) determining a condition when the vehicle is moving;

(B) determining a condition when the transmission is manually placed into a neutral gear;

(C) determining an engine condition when the conditions of steps (A) and (B) exist;

(D) choosing a vehicle acceleration condition when the conditions of steps of (A) and (B) exist; and

(E) automatically engaging one of the plurality of gears based upon the engine condition from step (C) and the vehicle acceleration condition chosen in step (D).

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**5,741,203**
**AUTOMATIC TRANSMISSION CONTROL APPARATUS**

**Motoharu Nishio, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Jun. 12, 1996, Ser. No. 662,369**
**Claims priority, application Japan, Jun. 12, 1995, 7-144707**
**Int. Cl.[6] F16H** *61/06*
**U.S. Cl. 477—154** **8 Claims**

1. An apparatus for use with an automatic transmission including hydraulic friction elements having input and output sides, each of the friction elements being operable between engaged and disengaged positions in response to a working pressure of hydraulic fluid supplied thereto so as to produce a selected one of a plurality of modes of gear change in the automatic transmission, comprising:



a control unit operable through successive operating modes including a precharge mode of precharging the hydraulic fluid to a corresponding one of the friction elements to complete a loss stroke of the friction element, a critical pressure retaining mode of retaining the working pressure at a critical value and a feedback control mode of controlling the working pressure;

means for sensing a speed of the input side of the friction element;

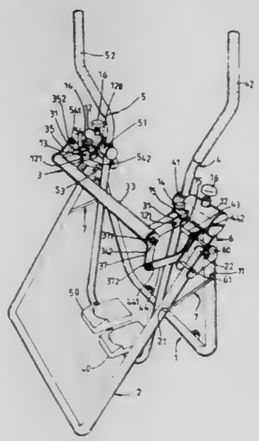
the control unit including means for detecting an average rate of change of the sensed friction element input side speed during the precharge mode, means for detecting a rate of change of the sensed friction element input side speed during the critical pressure retaining mode, means for calculating a difference of the detected friction element input side speed changing rate from the detected average friction element input side speed changing rate, and means for correcting the critical working pressure value in a direction to decrease the calculated difference.

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**5,741,204**
**STRUCTURE OF JOGGER EXERCISER**

**Kuo-Ron Lee, No. 61, Mai Jou II Rd., Yi Lan City, Taiwan**

**Filed Feb. 6, 1997, Ser. No. 796,732**
**Int. Cl.[6] A63B** *22/00;71/00*
**U.S. Cl. 482—51** **2 Claims**



1. A jogger exerciser comprising:

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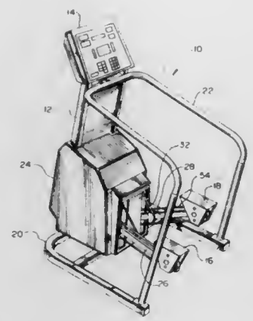


a first support frame formed from a U-shaped pipe having a transverse lower portion and two upwardly extended vertical portions;
two unions respectively mounted on the vertical portions of said first support frame;
a first knuckle member and a second knuckle member respectively and fixedly mounted on the vertical portions of said first support frame;
a second support frame formed from a U-shaped pipe having a transverse lower portion and two upwardly extended vertical portions respectively pivoted to said unions;
two struts respectively connected between the vertical portions of said first support frame and the vertical portions of said second support frame;
a transverse top frame connected between said knuckle members, said transverse top frame comprising a transverse bar, and two backward bars perpendicularly extended from two opposite ends of said transverse bar and respectively connected to said knuckle members;
a first swing member having a top end terminating in a hand grip, a bottom end terminating in a foot plate, and a first connecting member fixedly secured thereto below the hand grip of said first swing member and pivoted to said first knuckle member; and
a second swing member having a top end terminating in a hand grip, a bottom end terminating in a foot plate, and a first connecting member fixedly secured thereto below the hand grip of said second swing member and pivoted to said second knuckle member;
wherein:
said transverse bar of said transverse top frame comprises an axial hole, a pivot mounted in said axial hole and having a first end and a second end respectively extended out of two opposite ends of said axial hole;
said first swing member is provided with a second connecting member parallel to and below the respective first connecting member;
said second swing member is provided with a second connecting member parallel to and below the respective first connecting member;
a first front link and a first rear link are pivoted together and coupled between the first end of said pivot of said transverse bar and the second connecting member of said first swing member, said first front link having a bottom end pivoted to the first end of said pivot and a top end, said first rear link having a top end pivoted to the top end of said first front link and a bottom end pivoted to the second connecting member of said first swing member;
a second front link and a second rear link are pivoted together and coupled between the second end of said pivot of said transverse bar and the second connecting member of said second swing member, said second front link having a top end pivoted to the second end of the pivot of said transverse bar and a bottom end, said second rear link having a rear end pivoted to the bottom end of said second front link and a front end pivoted to the second connecting member of said second swing member; and
a frictional means located within said first and second knuckle members for adjusting the resistance to rotation of said first connecting members.

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**5,741,205**
**EXERCISE APPARATUS PEDAL MECHANISM**
**James W. Doll, Gurnee; David J. Thum, Chicago, both of Ill.; Michael A. Niemotka, Gainsville, Fla.; Steven M. Lenz, Naperville, and Mark C. Termion, Winfield, both of Ill., assignors to Life Fitness, Franklin Park, Ill.**
**Filed Dec. 7, 1995, Ser. No. 568,699**
**Int. Cl.[6] A63B** *22/04*
**U.S. Cl. 482—52** **18 Claims**

1. A simulated stairclimbing apparatus comprising:
a stationary frame;



a foot pedal;
a substantially rigid pedal member having a first end rotatably secured to said foot pedal and a second end pivotally secured to said frame so as to permit limited arcuate movement of said foot pedal in a substantially vertical direction between an upper step position and a lower step position;
a flexible transmission member connected to said pedal member;
resistance means secured to said frame for applying a resistance force to said pedal member;
transmission means operatively connected to said resistance means and said flexible transmission member for transmitting said resistance force to said pedal member;
a first flexible member having a first end rotatably connected to said frame and its second end rotatably connected to said foot pedal; and
a second flexible member of substantially equal length to said first flexible member having a first end rotatably connected to said frame and its second end rotatably connected to said foot pedal wherein said pedal member is located between said first and second flexible members so that the rotatable connections of the first and second flexible members are located symmetrically above and below the rotatable connections of the pedal member wherein said rotatable connections of said first and second flexible members are effective to maintain said first and second flexible members substantially parallel to said pedal member so as to maintain said foot pedal level throughout the motion of said foot pedal.

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**5,741,206**
**BODY CONTOURED WEIGHT FOR PHYSICAL FITNESS HAVING AN INTEGRAL HANDLE**
**Christopher Anastasi, 26433 Portola, Mission Viejo, Calif. 92692**
**Filed Apr. 15, 1996, Ser. No. 632,562**
**Int. Cl.[6] A63B** *21/065;21/072*
**U.S. Cl. 482—105** **1 Claim**



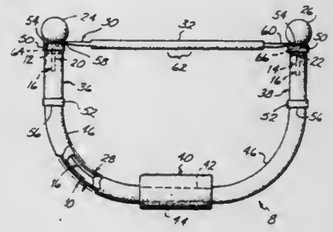
1. A curvilinear exercise weight comprising a rigid plate having a central opening sized and configured to receive an end of an exercise bar, wherein said rigid plate may be used as a weight on a barbell or dumbbell;



first and second openings on said rigid plate spaced from and located on opposite sides of said central opening, each of said first and second openings sized and configured to permit a user to grasp the exercise weight between a respective opening and an edge of the rigid plate;
said rigid plate having a concave curvature; and
a strap passing through said first and second openings, wherein said strap is used to secure said rigid plate to the user's body and said concave curvature of the plate conforms to the contour of the user's body.

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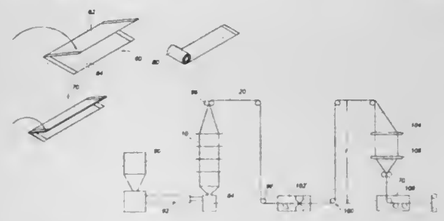
**5,741,207**
**PORTABLE WHOLE BODY EXERCISE DEVICE**
**Nick J. Buoni, 5074 White Hall, Memphis, Tenn. 38117, and Willis Y. Jordan, 3507-B Old Montgomery Hwy., Birmingham, Ala. 35209**
**Continuation of Ser. No. 372,765, Jan. 13, 1995, Pat. No. 5,514,058. This application Jan. 23, 1996, Ser. No. 590,204**
**Int. Cl.[6] A63B** *21/02*
**U.S. Cl. 482—124** **20 Claims**



1. A portable exercise device, comprising:
a rigid hollow tube having a substantially semicircular shape, and a first opening and a second opening at respective ends of said tube;
a first elastic cord extending through and slidable in said tube, said first cord having a first end extending outwardly from said first opening and a second end extending outwardly from said second opening;
gripping means attached to each of said first and second ends of said first cord; and
a second elastic cord having a first end and a second end, said second cord connected between respective said ends of said tube.

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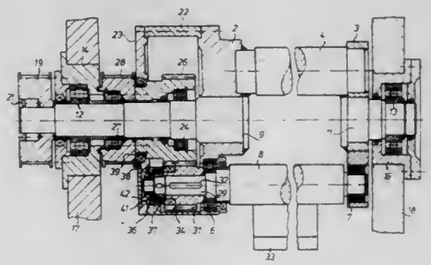
**5,741,208**
**ENVIRONMENTAL CONTAINER LINER AND METHOD OF MANUFACTURE**
**Landal B. Moak, Orange, Tex., assignor to Industrial Transportation, Inc., Beaumont, Tex.**
**Filed Oct. 15, 1996, Ser. No. 735,449**
**Int. Cl.[6] B31B** *1/26*
**U.S. Cl. 493—195** **5 Claims**



1. A method of producing a waste container liner, comprising the steps of:
(a) providing a continuous tubular web of pliable material;
(b) flattening the tubular web to form a flattened web of two adjoining material layers, the flattened web having two longitudinal edges;
(c) slitting the flattened web along one longitudinal edge;
(d) sealing the two adjoining material layers at regular intervals across the entire width of the flattened web to form lateral seals;
(e) providing perforations in the lateral seals across the width of the flattened web;
(f) folding the flattened web substantially along the web centerline to form a once-folded web, the folding of the flattened web occurring as the web is moving essentially vertically downward;
(g) folding the once-folded web substantially along its centerline to form a twice-folded web, the folding of the once-folded web occurring as the web is moving essentially vertically downward; and
(h) rolling up the twice folded web longitudinally to form a folded and rolled liner.

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**5,741,209**
**DRIVE FOR A FOLDING BLADE**
**Bernd Anton Hillebrand, Bergrheinfeld, and Horst Bernhard Michalik, Höchberg, both of Germany, assignors to Koenig & Bauer-Albert Aktiengesellschaft, Wurzburg, Germany**
**Filed Mar. 25, 1996, Ser. No. 621,463**
**Claims priority, application Germany, Mar. 25, 1995, 195 11 054.4**
**Int. Cl.[6] B31F** *1/08;1/10*
**U.S. Cl. 493—424** **6 Claims**



1. A drive for a folding blade in a folding drum of a printing press comprising:
first and second axle journals supporting said folding drum for a rotation about a folding drum axis of rotation;
a folding blade spindle rotatably supported in said folding drum and having at least a first folding blade spindle axle journal, said folding blade spindle supporting said folding blade for movement in said folding drum;
a spindle drive gear secured to said folding blade spindle axle journal;
a drive gear wheel rotatably supported on one of said first and second folding drum axle journals and in engagement with said spindle drive gear; and
a spindle drive wheel connected to said drive gear wheel and rotatably supported on said one of said first and second folding drum axle journals, said spindle drive wheel having a driving force applied to it to rotate said folding blade spindle.

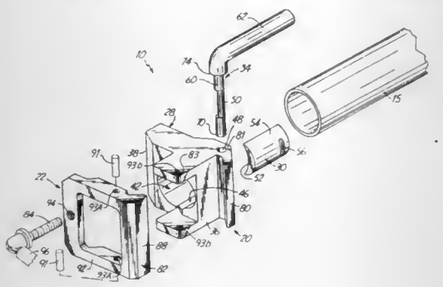
VOL 1209 ISS 3 AP 21 1998 UMI



### 5,741,210
### CLAMPING DEVICE FOR A SURGICAL RETRACTOR

Walter J. Dobrovolny, St. Paul, Minn., assignor to Minnesota Scientific, Inc., Minneapolis, Minn.

Filed Oct. 10, 1995, Ser. No. 541,689
Int. Cl.[6] A61B *1/02*
U.S. Cl. 600—227 5 Claims



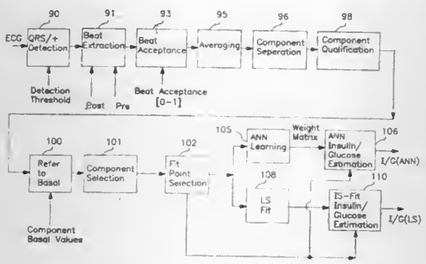
1. A surgical retractor support comprising:
a table rail support;
a tube to which surgical retraction tools are affixed; and
a clamp member engaging the tube and for engaging the table rail, the clamp member comprising:
a first clamp member for clamping the tube, the first clamp member having a first opening in which the tube is disposed;
a wedge section disposed adjacent the tube; and
a cam surface for moving the wedge section between a non-engaging first position and a locking second locking position in which the wedge section locks the tube in a selected vertical position.

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### 5,741,211
### SYSTEM AND METHOD FOR CONTINUOUS MONITORING OF DIABETES-RELATED BLOOD CONSTITUENTS

Alexis C. M. Renirie, Berg En Dal; Richard Houben, Bergen Terblijt, and Frank van Leeuwen, Maastricht, all of Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 26, 1995, Ser. No. 548,784
Int. Cl.[6] A61B *5/00*
U.S. Cl. 600—300 44 Claims

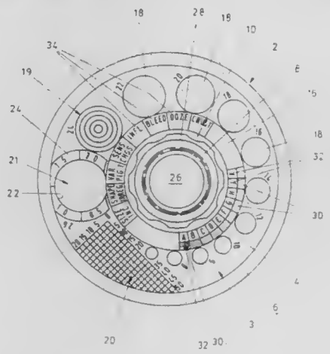



8. A system for providing an indication of blood insulin level of a patient, comprising
ECG sensor means for sensing ECG signals of said patient,
processing means for processing said ECG signals and obtaining therefrom a measure of patient blood insulin, wherein the processing means include means for comparing the sensed ECG against a reference value, and
output means responsive to said insulin measure for outputting an indication of patient insulin level.

### 5,741,212
### BLEMISH ASSESSOR

Michael Weston Bertie Matthews, 37 Manor Road., Dorchester, Dorset, DT1 2AY, United Kingdom

PCT No. PCT/GB95/00466, § 371 Date Aug. 21, 1996, § 102(e) Date Aug. 21, 1996, PCT Pub. No. WO95/23553, PCT Pub. Date Sep. 8, 1995
PCT Filed Mar. 3, 1995, Ser. No. 700,517
Claims priority, application United Kingdom, Mar. 4, 1994, 9404235
Int. Cl.[6] A61B *5/107*
U.S. Cl. 600—300 24 Claims



1. A device for the assessment of skin blemishes, comprising:
at least two blemish assessment elements, each of said blemish assessment elements being circular and having a circular or arcuate-form graduated scale, or sequence, of blemish criteria, said blemish assessment elements mounted for rotational movement relative to each other and alongside each other, so that a skin blemish is able to be positioned adjacent the graduated scale, or the sequence, of blemish criteria of each said blemish assessment element and thereby matched with a relevant portion of the graduated scale, or the sequence, of blemish criteria on each blemish assessment element simultaneously; and,
a lens mounted centrally of said blemish assessment elements for optically inspecting a blemish.

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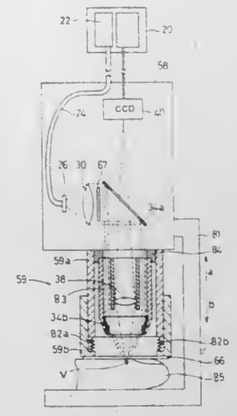
### 5,741,213
### APPARATUS FOR ANALYZING BLOOD

Yasuhiro Kouchi; Kaoru Asano, both of Kobe, and Ken Ishihara, Takarazuka, all of Japan, assignors to Toa Medical Electronics Co., Ltd., Hyogo, Japan

Filed Oct. 25, 1996, Ser. No. 736,822
Claims priority, application Japan, Oct. 25, 1995, 7-302088
Int. Cl.[6] A61B *5/00;* G06K *9/00*
U.S. Cl. 600—310 12 Claims

1. An apparatus for analyzing blood including an image capturing device for capturing an image including at least one object blood cell and an analysis device for analyzing the captured image as an image F(x, y) in an x-y coordinate system, the analysis device comprising:
edge calculation means for calculating an edge intensity distribution E(x, y) representing an outline of the image F(x, y);
weight storage means for prestoring a weight distribution W(i, j) corresponding to an average outline of the at least one object blood cell;
assessment value calculation means for obtaining an assessment value C(x, y) at each point (x, y) by calculating a degree of correspondence between the edge intensity distribution E(x, y) and the weight distribution W(i, j) for each point (x, y); and
extraction means for extracting a point (x, y) at which the assessment value C(x, y) is larger than a predetermined value,





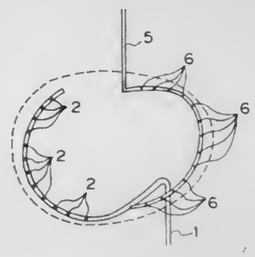
thereby determining that the at least one object blood cell is present at the point (x, y), so that the at least one object blood cell is identified.

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### 5,741,214
### ACCESSORY PATHWAY DETECTING/CAUTERIZING APPARATUS

Teruhiko Ouchi, and Kunimasa Katayama, both of Nakai-machi, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,319
Claims priority, application Japan, Dec. 20, 1993, 5-319705
Int. Cl.[6] A61B *5/042;17/39;* A61N *1/05*
U.S. Cl. 600—374 39 Claims

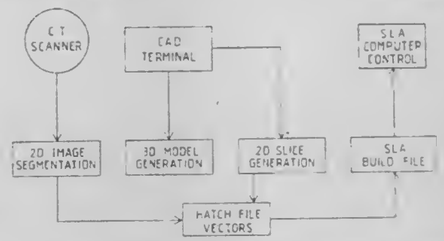


1. An accessory pathway detecting apparatus for detecting an accessory pathway in an object to be tested, comprising:
a first electrode member having a plurality of electrodes located along a longitudinal extent of the first electrode member, said first electrode member having a wire shape capable of being inserted in a coronary sinus to acquire action potentials at a plurality of locations along the coronary sinus;
a second electrode member having a plurality of electrodes located along a longitudinal extent of said second electrode member, said second electrode member having a wire-like shape capable of being inserted in a coronary artery to acquire action potentials at a plurality of locations along the coronary artery;
measuring means for simultaneously measuring the action potentials at the plurality of locations by using said first and second electrode members; and
output means for visually outputting measurement results obtained by said measuring means.

### 5,741,215
### STEREOLITHOGRAPHIC ANATOMICAL MODELLING PROCESS

Paul Steven D'Urso, Coorparoo, Australia, assignor to The University of Queensland, St. Lucia, Australia

PCT No. PCT/AU94/00536, § 371 Date Apr. 25, 1996, § 102(e) Date Apr. 25, 1996, PCT Pub. No. WO95/07509, PCT Pub. Date Mar. 16, 1995
PCT Filed Sep. 12, 1994, Ser. No. 596,237
Claims priority, application Australia, Sep. 10, 1993, PM1195
Int. Cl.[6] A61F *2/00;* G06F *15/42*
U.S. Cl. 600—407 19 Claims



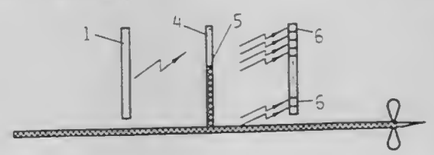

1. A method for stereolithographic construction of models including an implantable surgical prosthesis and/or an anatomical pathology model, said method comprising the steps of:
inputting into a data storage means scanning data relating to internal and/or external surfaces of anatomical pathology;
computing the stored scanning data according to a predetermined algorithm to reconstruct a plurality of parallel two dimensional cross-sectional images of the anatomical pathology:
computing said plurality of two dimensional cross-sectional images according to a predetermined algorithm to generate a three dimensional co-ordinate data set for the anatomical pathology; and
generating a three dimensional representation of said anatomical pathology by stereolithographic modelling of a cross linkable liquid polymer using selected sequential two dimensional image data sets computed from said three dimensional co-ordinate data set, said two dimensional image data sets being computed in parallel planes which are not parallel to the planes in which said two dimensional cross-sectional images are obtained by scanning.

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### 5,741,216
### PRESSURE MONITOR

Allan Hemmingsen, Espergaerde, and Bo Steffensen, Stenloese, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK93/00122, § 371 Date Nov. 4, 1994, § 102(e) Date Nov. 4, 1994, PCT Pub. No. WO93/20865, PCT Pub. Date Oct. 28, 1993
PCT Filed Apr. 1, 1993, Ser. No. 313,183
Claims priority, application Denmark, Apr. 10, 1992, 0480/92
Int. Cl.[6] A61B *5/02*
U.S. Cl. 600—488 10 Claims



1. An apparatus for directly monitoring the pressure of a liquid in a catheter, the apparatus comprising:
a light emitting device;

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a photo sensitive device spaced from said light emitting device; and

a catheter having a light transmissible measuring zone, said measuring zone being disposed between said light emitting device and said photo sensitive device;

wherein said photo sensitive device receives light from said light emitting device transmitted through said measuring zone of said catheter, said photo sensitive device transforms the received light into electric signals reflecting an amount of light transmitted through said measuring zone of said catheter.

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**5,741,217**

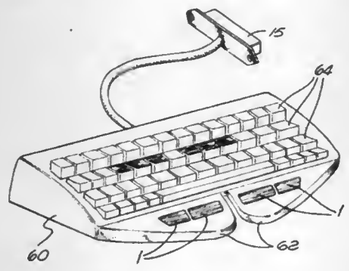
**BIOFEEDBACK APPARATUS**

**Jeffrey Gero, 5907 Carell Ave., Agoura Hills, Calif. 91301**

**Filed Jul. 30, 1996, Ser. No. 688,512**

**Int. Cl.[6] A61B *5/05***

**U.S. Cl. 600—547** **13 Claims**




1. A manually operated computer input device for simultaneously sensing a physiological characteristic of a user and for providing input of data unrelated to the physiological characteristic, said device comprising:

a housing having a surface in at least intermittent contact with the user's skin;

at least one electrode disposed on said surface;

means coupled to said electrode for sensing the physiological characteristic of the user; and

manually operated means for inputting data to the computer, said data unrelated to the physiological characteristic.

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**5,741,218**

**VERTICALLY RECIPROCATING PAIRS OF MASSAGE RINGS**

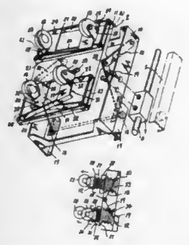
**Yasuo Fujii, Kobe, Japan, assignor to Family Co., Ltd., Osaka, Japan**

**Filed Mar. 18, 1997, Ser. No. 828,176**

**Claims priority, application Japan, Apr. 5, 1996, 8-119438**

**Int. Cl.[6] A61H *15/00***

**U.S. Cl. 601—90** **2 Claims**



1. A massager comprising a massage unit which is movable back and forth in the vertical direction, wherein the massage unit comprises

a base frame supported movably up and down on a main body frame of the massager,

a driving mechanism for moving the base frame up and down,

a swing plate disposed on the side of the front surface of the base frame and having its center in the vertical direction swingably supported on the base frame through a swinging mechanism including a support shaft extending in the horizontal direction,

first and second right and left pairs of swinging members respectively provided in the upper half on the front surface of the swing plate, and respectively having plates in their leading ends, the plates being mounted on the swing plate so as to be rotatable about their base ends in opposite directions forward from a state where they are almost flush with each other,

third and fourth right and left pairs of swinging members respectively provided in the lower half on the front surface of the swing plate, and respectively having plates in their leading ends, the plates being mounted on the swing plate so as to be rotatable in opposite directions forward from a state where they are almost flush with each other,

kneading rings respectively provided in such a state as to be projected forward in the swinging members,

two rear air cells respectively disposed between an upper part of the swing plate and the base frame and between a lower part of the swing plate and the base frame and expanding and contracting by supply and exhaust of air, and

four front air cells respectively disposed between the plates of the swinging members and the swing plate and expanding and contracting by supply and exhaust of air,

various types of movements being given to the kneading rings by controlling the supply and exhaust of air to and from the rear air cells and the front air cells.

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**5,741,219**

**ROLLING MASSAGE DEVICE WITH PAIRS OF TEETH**

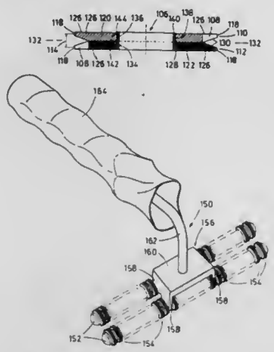
**Günter Schweisfurth, Am Glaskopf 76, 57567 Daaden, Germany**

**Filed Oct. 25, 1994, Ser. No. 328,680**

**Claims priority, application European Pat. Off., Oct. 28, 1993, 93117467; Dec. 23, 1993, 93120695**

**Int. Cl.[6] A61H *15/00***

**U.S. Cl. 601—119** **17 Claims**



1. A massage device for carrying out a rolling massage of skin areas and reflex zones of the human body, the massage device comprising a handle, at least one shaft attached to the handle, a plurality of ring-shaped rolling bodies mounted on the at least one shaft, each rolling body having a plurality of projections uniformly distributed in a circumferential direction thereof, the projections being arranged in two rows, wherein the projections within one row of projections are spaced apart from each other by a division distance, wherein the projections of adjacent rows of projections on each rolling body are arranged staggered relative to each other in the circumferential direction, and wherein the projections of



adjacent rows of projections are spaced apart from each other in circumferential direction by a stagger distance, the stagger distance corresponding to approximately half the division distance, wherein each rolling body comprises two disk members attached to each other in a mirror-inverted arrangement, each disk member having one of the rows of projections, the projections being teeth having outer and inner side surfaces, the disk members having outer surfaces and inner surfaces, the disk members being attached to each other at the inner surfaces in a common center plane, the outer side surfaces of the teeth being in alignment with the outer surfaces of the disk members, and the inner side surfaces of the teeth being inclined away from the center plane.

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**5,741,220**

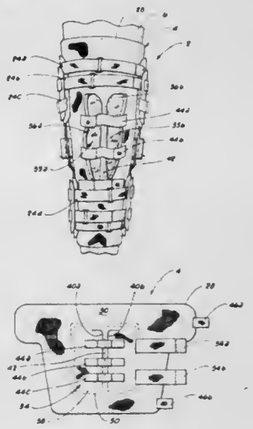
**JOINT BRACE ASSEMBLY AND METHOD**

**N. Keith Brink, Oklahoma City, Okla., assignor to Dura-Kold Corporation, Oklahoma City, Okla.**

**Filed Apr. 17, 1996, Ser. No. 633,571**

**Int. Cl.[6] A61F *5/01;7/00***

**U.S. Cl. 602—14** **3 Claims**



1. A joint brace assembly, comprising:

a brace, including:

proximal support means for supporting said brace against a jointed limb proximally of the joint;

distal support means for supporting said brace against the limb distally of the joint;

brace means connecting said proximal support means and said distal support means so that said proximal support means and said distal support means are spaced up to a maximum distance apart; and

means for securing said brace means to the limb so that said proximal support means and said distal support means support said brace on opposite sides of the joint; and

a therapeutic wrap including:

an integral pad having a length at least equal to said maximum distance;

means for securing said pad on the limb on opposite sides of the joint such that one end of said pad underlies said proximal support means and another end of said pad underlies said distal support means when said joint brace assembly is mounted on the limb;

a pouch defined with said pad for removably receiving a temperature pack to provide heat or cold therapy to the joint of the limb;

indicia on said pad defining a cutting perimeter along which said pad is defined to be cut to produce a smaller therapeutic wrap for use without said brace; and

means, connected to said portion of said pad included in said smaller therapeutic wrap, for securing said smaller therapeutic wrap to a body portion.

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**5,741,221**

**KNEE-JOINT ORTHESIS HAVING DIFFERENT MEDICAL AND LATERAL HINGE MECHANISMS**

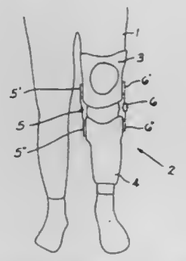
**Hans Henning Wetz, Weingartenstrasse 23, CH-8708 Männedorf, and Hilaire Jacob, Gernstrasse 128, CH-8409 Winterthur, both of Switzerland**

**Filed Oct. 10, 1995, Ser. No. 541,451**

**Claims priority, application European Pat. Off., Oct. 7, 1994, 94115801**

**Int. Cl.[6] A61F *5/00***

**U.S. Cl. 602—26** **3 Claims**




1. A knee-joint orthesis comprising in combination, mounting means for mounting the orthesis respectively to the thigh and to the lower leg, a pair or respective rotation elements for rotatively coupling the respective thigh and lower leg mounting means located respectively on medial and lateral knee sides of the orthesis, wherein one of said pair of rotation elements comprises a cross-over quadruple joint mechanism producing a movable point of rotation displaceable relative to the mounting means as the knee-joint is bent, and the other one of said pair of rotation elements comprises a simple rotary joint having a fixed axis of rotation as the knee-joint is bent located on the medial knee side of the orthesis.

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**5,741,222**

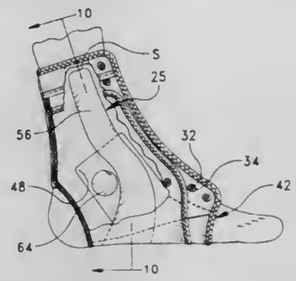
**ANKLE JOINT SUPPORT**

**Russell D. Fiore, 6 Red Chimney Dr., Lincoln, R.I. 02865**

**Continuation-in-part of Ser. No. 258,221, Jun. 10, 1994, abandoned. This application Oct. 5, 1995, Ser. No. 539,625**

**Int. Cl.[6] A61F *5/00***

**U.S. Cl. 602—27** **10 Claims**




1. An ankle-joint support adapted to be worn over the foot of a human so as to support the ankle and ankle joint thereof, comprising a first member defining a flexible envelope and resultant foot receiving cavity and having a generally U-shaped body having a bottom and opposed sides adapted to fit around the bottom and

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opposed sides of the human foot and defining a toe opening at a front thereof and a heel opening at a rear thereof and a second member in the form of a one piece non-elastic, flexible yet relatively rigid generally U-shaped brace, said brace having a pair of upwardly rearwardly extending arms and an integral connecting base portion, said second member generally fixedly positioned with relation to said first member with said second member base portion positioned to conform to a portion of the envelope passing underneath the posterior arch of a wearer's foot with said arms upwardly extending from said base portion to points essentially forward of both the inner and outer malleolus of the wearer and means associated with said first member for releasably retaining said support on the ankle of the wearer.

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**5,741,223**

## DEVICE AND METHOD FOR SEALING PUNCTURE WOUNDS

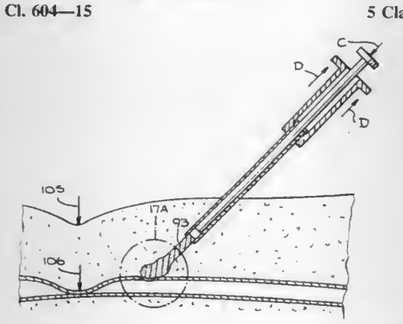
**Ernst Janzen, Laren, Netherlands; Gunter Ruttgers, Stolberg, Germany; Lawrence Saper, New York, and Sid Wolvek, Brooklyn, both of N.Y., assignors to Datascope Investment Corp., Montvale, N.J.**

**Continuation of Ser. No. 318,380, Oct. 5, 1994, which is a division of Ser. No. 746,339, Aug. 16, 1991, Pat. No. 5,391,183, which is a continuation-in-part of Ser. No. 634,478, Dec. 27, 1990, abandoned. This application Sep. 12, 1996, Ser. No. 712,774**

**Claims priority, application European Pat. Off., Sep. 21, 1990, 90118186**

**Int. Cl.[6] A61F *13/20***

**U.S. Cl. 604—15** **5 Claims**




1. A device for inserting hemostatic material through a tissue channel and toward the outside wall of a blood vessel of a patient, said blood vessel having a puncture therein, comprising

(a) hemostatic material;

(b) a hollow insertion sheath adapted to pass through said tissue channel and having an inner diameter sized for slidably receiving said hemostatic material;

(c) a pusher for advancing said hemostatic material through said hollow insertion sheath to a position outside of said vessel wall; and

(d) preventing means for preventing said hemostatic material from entering the blood vessel through the puncture as said hemostatic material is advanced into contact with the vessel wall so it is never freely exposed within the blood vessel.

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**5,741,224**

## IONTOPHORETIC MATERIAL

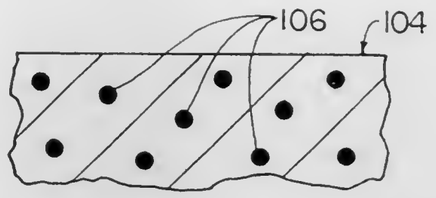
**Fredric L. Milder, Brookline; Barry D. Weitzner, Acton, and Lev Ludin, Brookline, all of Mass., assignors to Implemed, Inc., Watertown, Mass.**

**Filed Apr. 16, 1996, Ser. No. 632,843**

**Int. Cl.[6] A61N *1/30*; A61M *5/32***

**U.S. Cl. 604—20** **9 Claims**

1. An iontophoretic structure comprising:




an ion permeable base material having an outer, exposed surface; and

a plurality of discrete iontophoretic bodies embedded within said base material beneath the outer, exposed surface of said base material, each of said discrete iontophoretic bodies releasing ions that migrate through said ion permeable base material to said outer, exposed surface of said base material; wherein each iontophoretic body comprises two dissimilar metals.

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**5,741,225**

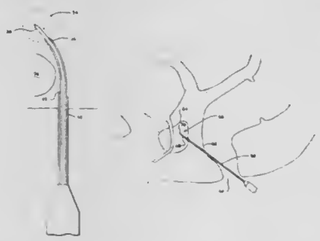
## METHOD FOR TREATING THE PROSTATE

**Ronald G. Lax, Grass Valley; Stuart D. Edwards, Los Altos, and Hugh R. Sharkey, Redwood Shores, all of Calif., assignors to Rita Medical Systems, Mountain View, Calif.**

**Continuation-in-part of Ser. No. 148,441, Nov. 8, 1993, Pat. No. 5,486,161, which is a continuation-in-part of Ser. No. 929,638, Aug. 12, 1992, abandoned, Ser. No. 12,370, Feb. 2, 1993, Pat. No. 5,370,675, Ser. No. 62,364, May 13, 1993, Pat. No. 5,435,805, Ser. No. 61,647, May 13, 1993, Pat. No. 5,421,819, and Ser. No. 61,072, May 14, 1993, abandoned. This application Jan. 23, 1996, Ser. No. 589,111**

**Int. Cl.[6] A61B *17/39***

**U.S. Cl. 604—22** **19 Claims**



1. A method of medical treatment of the prostate, comprising:

providing an ablation apparatus including a cannula, an electrode at least partially positioned in the cannula, and an insulation sleeve positioned in a surrounding relationship to at least a portion of the electrode;

positioning a distal end of the cannula in a rectum of a patient;

advancing the distal end of the cannula through a rectal wall of the rectum;

advancing a distal end of the electrode from the cannula into the prostate;

delivering electromagnetic energy from the electrode to the prostate; and

creating an ablation zone in the prostate.



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**5,741,226**

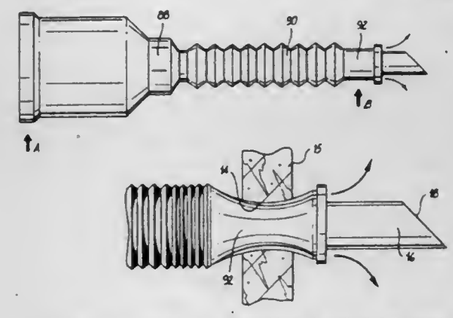
## PHACOEMULSIFICATION HANDPIECE, SLEEVE, AND TIP

**Igor Strukel, New York, and William Banko, New York, both of N.Y., assignors to Surgical Design Corporation, Long Island City, N.Y.**

**Division of Ser. No. 458,409, Jun. 2, 1995. This application Jun. 7, 1996, Ser. No. 664,249**

**Int. Cl.[6] A61M *1/00***

**U.S. Cl. 604—35** **10 Claims**




1. A surgical instrument for removing a cataract through an incision in an eye, comprising:

irrigation means for providing a liquid;

aspiration means for aspirating the liquid;

a handpiece;

a infusion sleeve fluid tightly connected to said handpiece and connected to said irrigation means, said sleeve having a distal end and a proximal end, said sleeve containing within said sleeve a needle connected to said aspiration means, said sleeve including at least one infusion port for infusing a liquid from said irrigation means, wherein said sleeve includes an accordion section, a reduced diameter forward end for forming an eye seal with respect to the incision in the eye and an enlarged diameter distal tip proximate to said reduced diameter forward end; and

wherein said needle having at least one aspiration port for aspirating the liquid.

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**5,741,227**

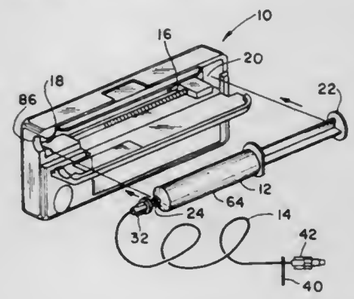
## METHOD OF STERILE PREPARATION OF IV PUMP SYRINGE

**Andrew I. Sealfon, 24 Carpenter Rd., Chester, N.Y. 10918**

**Filed Apr. 11, 1997, Ser. No. 827,871**

**Int. Cl.[6] A61M *31/00***

**U.S. Cl. 604—49** **2 Claims**




1. A method of preparing for loading under maintained sterile conditions into a syringe pump a syringe of a type having a barrel filled with sterile fluid medicant adapted to be forced in exiting flow from a barrel outlet by a piston urged in a power stroke movement longitudinally of said barrel, said syringe pump for said syringe being of a type having at one end piston barrel-engaging means and in clearance position therefrom at an opposite end a barrel outlet-engaging means, said method comprising the steps of providing a sterile tubing set with inlet and outlet opposite ends for attachment to said barrel outlet preparatory to delivering said fluid medicant from said syringe to a patient, selecting a sterile site maintained under sterile conditions for preparing said syringe for subsequent patient use at a remote site, attaching at said sterile site a disk adjacent said inlet end of said sterile tubing set, gripping with a first hand said barrel and with a second hand removing said plug from said barrel outlet, gripping with said second hand said tubing set from behind said disk so as to obviate contact with said exposed barrel outlet and interconnecting said tubing set inlet end to said barrel outlet, filling at said sterile site said syringe barrel with fluid medicant by withdrawing said piston in a directional movement away from barrel outlet, closing at said sterile site said tubing set outlet with a plug, delivering to said remote site said filled syringe with said attached tubing set, and inserting said interconnected tubing set and syringe in said clearance of said syringe pump with said disk behind said barrel outlet-engaging means and said piston in front of said piston-engaging means, whereby said disk contributes both to maintaining the sterile condition of said syringe during the interconnection of said tubing set thereto and also to holding said syringe barrel stationary during the power stroke movement of said piston longitudinally thereof.

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**5,741,228**

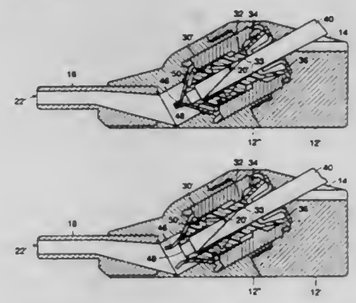
## IMPLANTABLE ACCESS DEVICE

**Gregory H. Lambrecht, Mamaroneck; Joshua Makower, Nanuet, both of N.Y.; Sangeeta N. Bhatia, Cambridge, Mass.; David McDonald, Watertown, Mass.; Ashish Khera, Burlington, Mass.; J. Christopher Flaherty, Topsfield, Mass.; Alan K. Plyley; Russell J. Redmond, both of Goleta, Calif., and Claude A. Vidal, Santa Barabara, Calif., assignors to Strato/Infusaid**

**Filed Feb. 17, 1995, Ser. No. 390,014**

**Int. Cl.[6] A61M *11/00***

**U.S. Cl. 604—93** **7 Claims**




1. An implantable access device comprising a housing having at least one entry port and at least one exit port with a passageway extending therebetween, said housing further comprising an elongated open entrance guidance channel disposed therein having a tenth and communicating with said entry port, said channel having a substantially constant transverse cross sectional area substantially along the length, with substantially constant cross sectional area substantially along the length, with said channel further being adaptable to receive a filament for guiding said filament toward and into said entry port, and with said housing further including a valve assembly disposed and into said entry port, and with said housing further including a valve assembly disposed in said passageway, said valve assembly adapted to be activated by said filament after passage of said filament through said entry port, said valve assembly being normally closed but adapted to be opened by said filament to allow access through said exit port, wherein said

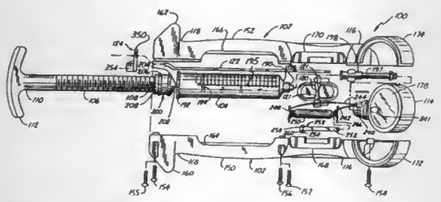
VOL 1209 ISS 3 AP 21 1998 UMI



valve assembly comprises a sealing element and a valve disposed in said passageway, with said sealing element being positioned closer to said entry port than is said valve, said filament and said sealing element coacting to first create a seal about said filament before said valve opens to allow said access, and wherein said sealing element comprises an elastomeric member with a first end and a second end and an open conduit therebetween, said first end being substantially fixed in position within said housing and said second end having a resilient cap affixed thereto, said cap being adapted to withstand repeat contact with said filament, resisting passage of said filament such that when said filament is advanced through said conduit the filament makes contact with said cap causing said elastomeric member to stretch and collapse around said filament.

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**5,741,229**
**BALLOON CATHETER INFLATION DEVICE**
**David B. Robinson, Chanhassen; Daniel O. Adams, Blaine; William H. Penny, St. Anthony, and Gerald G. Voegele, St. Bonifacius, all of Minn., assignors to SCIMED Life Systems, Inc., Maple Grove, Minn.**
**Continuation of Ser. No. 227,026, Apr. 13, 1994, abandoned, which is a continuation of Ser. No. 861,955, Apr. 1, 1992, Pat. No. 5,429,606, which is a continuation of Ser. No. 482,828, Feb. 21, 1990, Pat. No. 5,147,300, which is a division of Ser. No. 165,600, Mar. 8, 1988, Pat. No. 5,019,041. This application Jul. 14, 1995, Ser. No. 502,079**
**Int. Cl.[6] A61M** *29/00*
**U.S. Cl. 604—97** **13 Claims**

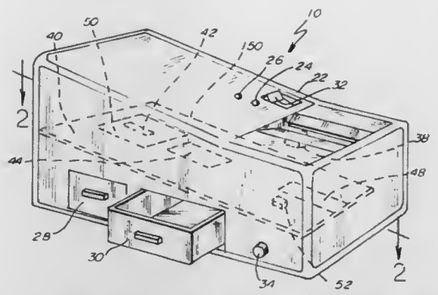


1. An angioplasty system, comprising: an inflation device and a balloon type angioplasty catheter, the inflation device comprising:
a. a barrel defining a chamber therein;
b. a plunger slidably disposed in the barrel;
c. a housing connected to the barrel;
d. a pressure gauge for measuring and displaying the pressure within the chamber, the pressure gauge connected to the housing and in fluid communication with the chamber;
e. a timer for measuring and displaying time durations of inflation of the balloon type angioplasty catheter, the timer connected to the housing, the timer including a reset switch for resetting the timer to zero and an electrical power source; and
f. a means for connecting the inflation device to the balloon type angioplasty catheter.

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**5,741,230**
**HYPODERMIC NEEDLE EXTRACTION DISPOSAL SYSTEM AND DEVICE**
**Gary E. Miller, 16510 County Rd. 122, Mayer, Minn. 55360**
**Filed Jul. 31, 1996, Ser. No. 690,565**
**Int. Cl.[6] A61M** *5/00*
**U.S. Cl. 604—110** **17 Claims**

1. A hypodermic needle extraction device comprising:
(a) a transfer carriage assembly for carrying a syringe said transfer carriage assembly comprising a gear rack, a transfer carriage motor having a gear engaged to said gear rack for providing motion to said transfer carriage;
(b) a barrel clamp assembly for grasping said syring;
(c) a cartridge heater assembly for heating said syringe;



(d) a needle extraction assembly adjacent to said cartridge heater assembly for grasping a needle of said syringe and separating said needle from said syringe; and
(e) a needle tip contactor adjacent to said needle extraction assembly, said needle tip contactor comprising a means for heating of said needle.

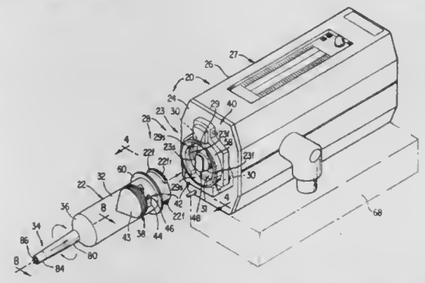
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**5,741,231**

**Patent Not Issued For This Number**

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**5,741,232**
**FRONT LOADING MEDICAL INJECTOR AND SYRINGE FOR USE THEREWITH**
**David M. Reilly, Glenshaw; Joseph B. Havrilla; Eugene A. Gelblum, both of Pittsburgh, and Daniel Kazousky, Trafford, all of Pa., assignors to Medrad, Inc., Indianola, Pa.**
**Continuation of Ser. No. 359,087, Jan. 19, 1995, abandoned, which is a division of Ser. No. 929,926, Aug. 17, 1992, Pat. No. 5,383,858. This application Dec. 23, 1996, Ser. No. 780,012**
**Int. Cl.[6] A61M** *37/00*
**U.S. Cl. 604—154** **27 Claims**

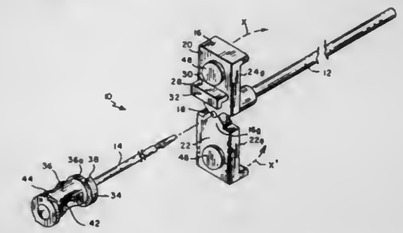


1. An injector for injecting a liquid from a syringe, said syringe including a plunger, said injector comprising:
a housing having a front wall;
readily releasable mounting means on said housing front wall for supporting the syringe for an injection operation, said readily releasable mounting means including retaining means for releasably engaging a retaining portion on the syringe;
drive means in said housing movable through said housing front wall for controlling the movement of the plunger in the syringe;
a tubular pressure jacket having a rearward end mounted on the front wall of said housing and having a forward open end for receiving the syringe therethrough for connection of the syringe plunger to said drive means;
said retaining means of said readily releasable mounting means being on said pressure jacket adjacent the forward open end thereof, with said retaining portion on the syringe also being adjacent a forward end thereof;
wherein said pressure jacket includes inner slotted means for receiving said retaining portion on the syringe therethrough, so that said syringe retaining portion and an inner surface of said retaining means on said pressure jacket can be engaged upon rotation of the syringe in said pressure jacket; and
stop means for preventing over-rotation of the syringe as the syringe is rotated into a mounted position.



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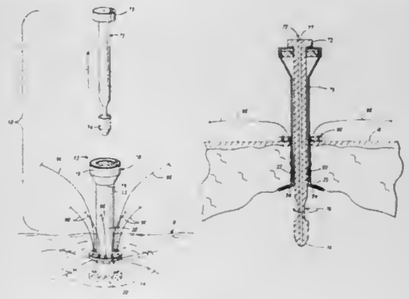
**5,741,233**
**INTRODUCER DEVICE AND METHODS OF USE THEREOF**
**Richard S. Riddle, Keene, N.H.; Matthew Muraski, Maple Grove, Minn.; Jerome W. Frederick, III, Rindge, and Jonathan A. LeClair, Keene, both of N.H., assignors to TFX Medical, Incorporated, Jaffrey, N.H.**
**Filed Oct. 20, 1995, Ser. No. 545,999**
**Int. Cl.[6] A61M** *5/178*
**U.S. Cl. 604—165** **23 Claims**



1. An introducer device for inserting of a catheter or guide wire into a patient, the device comprising:
a a dilator and sheath, the sheath having a bore adapted to receive the dilator for insertion into a patient while circumscribed by the sheath,
the dilator and sheath comprising a releasable lock that prevents relative axial movement of the dilator and sheath that circumscribes the dilator, the releasble lock engaged and disengaged by relative axial rotation of the dilator and sheath,
the dilator and sheath comprising a plurality of mating surfaces to provide tactile indication to a device user of whether the dilator and sheath are locked or unlocked.

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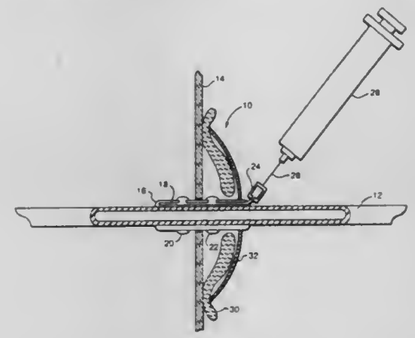
**5,741,234**
**ANATOMICAL CAVITY ACCESS SEALING CONDIT**
**Walid Nagib Aboul-Hosn, 3462 Bridgeford Dr., Sacramento, Calif. 95834**
**Filed Jul. 16, 1996, Ser. No. 680,929**
**Int. Cl.[6] A61B** *17/34*
**U.S. Cl. 604—174** **6 Claims**



1. A sealing member, comprising:
a. a cylindrical member, said cylindrical member having a distal end and a proximal end with a continuous, longitudinally aligned central lumen formed therein;
b. an annular lip structure formed on said distal end of said cylindrical member, said annular lip structure capable of being disposed between a retracted position inside said cylindrical member and an extended position on said distal end of said cylindrical member, said annular lip structure capable of preventing the outward migration of said cylindrical member in a portal when said cylindrical member is inserted therein and said annular lip structure is extended from said cylindrical member;
c. a removable penetrating member longitudinally disposed inside said cylindrical member, said penetrating member capable of supporting said cylindrical member when said cylindrical member is inserted into a portal said penetrating member being an elongated structure with a distal end and a relieved area formed adjacent thereto said relieved area having an ohter shape and being located on said penetrating member so that said annular lip structure may be disposed in a retracted position inside said cylindrical member within said relieved area when said penetrating member is disposed inside said cylindrical member, said penetrating member also being sufficient size so that said annular lip structure disposed inside said cylindrical member may be forcibly moved outward from said cylindrical member when said penetrating member is moved longitudinally downward inside said cylindrical member,
d. An upper sealing member capable of moving downward longitudinally along said cylindrical member and pressed against the outside surface of the tissue surrounding a portal formed therein, said upper sealing member capable of sealing said portal and preventing the inward migration of said cylindrical member through the portal; and,
e. A moving means capable of selectively moving said annular lip structure from a restricted position to an extended position from said cylindrical member, said moving means also capable of moving said upper sealing member along said cylindrical member to force said upper sealing member and said annular lip structure together to securely hold and form a seal around said portal.

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**5,741,235**
**RETENTION DEVICE FOR MEDICAL DRAINAGE TUBES AND BILLARY STENTS**
**John R. Knight, 23 Hornbeck Ridge, Poughkeepsie, N.Y. 12603**
**Filed Oct. 29, 1996, Ser. No. 741,405**
**Int. Cl.[6] A61M** *5/32*
**U.S. Cl. 604—174** **2 Claims**



1. An apparatus for maintaining the position of a transcutaneous device comprising a transcutaneous inflatable bladder, said inflatable bladder sized and shaped to allow a transcutaneous device to pass therethrough, said inflatable bladder comprising at least one

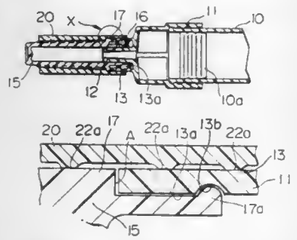
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pair of inflatable discs, a fist disc or said disc pair located interior a patient's epidermis and a second disc of said disc pair located exterior said patient's epidermis and opposite said first disc and a means for inflating said disc pair with a bio-inert medium such that when said discs are inflated, they abut the epidermis and form a secure grommet-like fit to hold said transcutaneous device in position.

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**5,741,236**
**PREFILL SYRINGE**
**Makoto Kakiuti, Takahagi, Japan, assignor to Arte Corporation, Tokyo, Japan**
**Filed Jun. 11, 1996, Ser. No. 665,015**
**Claims priority, application Japan, Jun. 16, 1995, 7-150748; Nov. 28, 1995, 7-309594; Feb. 14, 1996, 8-027156**
**Int. Cl.[6] A61M** *5/32*
**U.S. Cl. 604—192** **20 Claims**

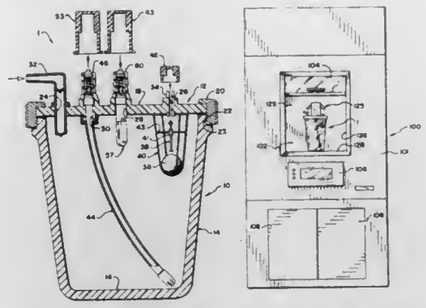


1. A prefill syringe provided with:
a cylindrical cartridge into which a rubber stopper is inserted, having a needle holder at one end and a collar at the other end thereof, said needle holder being capable of receiving a needle assembly comprised of a cannula and a needle;
wherein a cap for protecting the needle holder is attached to the needle holder situated at one end of the cartridge while leaving a gap between said needle holder and said cap so as to enable vapor or gas to enter into said cartridge during vapor or gas sterilization performed prior to filling said cartridge with a drug, and an elastic cylindrical member is externally engaged to span the needle holder and the cap so as to cover a gap formed between said needle holder and said cap in order to seal said cartridge after said cartridge has been filled with the drug.

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**5,741,237**
**SYSTEM FOR DISPOSAL OF FLUIDS**
**Kenneth Gordon Walker, 109 - 549 Dansey, Coquitlam, Canada, V3K 3G1**
**Filed Apr. 3, 1996, Ser. No. 627,011**
**Claims priority, application Canada, Apr. 10, 1995, 2146673; Apr. 19, 1995, 2147292**
**Int. Cl.[6] A61M** *1/00;* **B08B** *3/00*
**U.S. Cl. 604—317** **15 Claims**

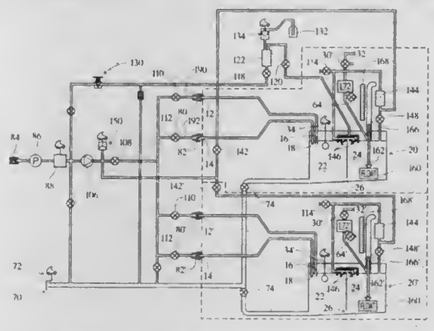
1. A system for collecting and disposing of body fluids comprising:
(a) a canister for receiving said body fluids, comprising:
a body having side walls and a bottom and adapted to sealably receive a removable lid;
a removable lid for sealably covering said body;
a first inlet port in said lid for inflow of body fluids into said canister;
a second inlet port in said lid for inflow of cleaning fluid into said canister;
spraying means in fluid communication with said second inlet port for spraying said cleaning fluid within said canister;
means for closing said second inlet port during said inflow of body fluids into said canister;



an outlet port in said lid for sectioning body fluids and said cleaning fluid from said canister;
a removable suction tube in fluid communication with said outlet port and extending to said bottom of said canister;
means for closing said outlet port during said inflow of body fluids into said canister;
a vacuum port in said lid for application of vacuum to said canister for inducing said inflow of body fluids into said canister; and,
a check valve on said lid operably coupled to said vacuum port for stopping the inflow of body fluids into said canister when the level of body fluids in said canister reaches a predetermined level;
(b) a servicing unit for removing said body fluids from said canister and cleaning said canister, comprising:
first fluid conduit means to conduct fluid in said canister to a drain;
second fluid conduit means to conduct cleaning fluid from a source of said cleaning fluid to said second inlet port;
connector means for detachably connecting said first fluid conduit means to said outlet port of said canister and for detachably connecting said second fluid conduit means to said second inlet port of said canister;
suction means to induce a flow of fluid from said suction tube in said canister through said first fluid conduit means; and
means to induce a flow of cleaning fluid to said canister through said second fluid conduit means.

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**5,741,238**
**MEDICAL AND BIOLOGICAL FLUID COLLECTION AND DISPOSAL SYSTEM**
**John R. Bradbury, Strongsville, Ohio; Richard L. Terry, DeSoto, and Clayton W. Spangler, Dittmer, both of Mo., assignors to Steris Corporation, Mentor, Ohio**
**Filed Mar. 2, 1995, Ser. No. 398,161**
**Int. Cl.[6] A61M** *1/00*
**U.S. Cl. 604—322** **18 Claims**



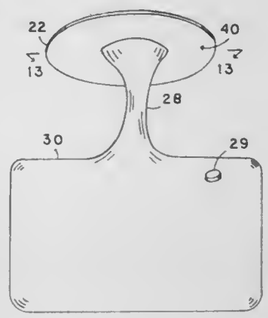
1. An apparatus for handling biological and medical fluid wastes, the apparatus comprising:



at least one inlet fitting for interconnection with a flexible tube which is connected with a source of the fluid waste, the inlet fitting including a first connector for interconnection with the flexible tube and a second connector disposed adjacent the first connector;
a collection vessel connected with the inlet fitting such that received fluid waste flows into the vessel;
a drain line and a drain valve connected with the vessel for draining the vessel;
a disinfectant liquid source which supplies a disinfectant liquid;
a bell fitting connected with the source of disinfectant liquid and connectable with the second connector with the first connector received in and displaced from the bell fitting, such that a fluid circulation region is defined between the bell fitting and the first connector such that the disinfectant liquid flows around and through the first connector to the vessel;
a vent line and a first vent valve connected between the vessel and one of (1) a vacuum source and (2) the atmosphere for removing gases displaced by collected fluid waste from the vessel;
a level sensor for sensing a level of fluid waste in the vessel;
an automatic shut-off circuit connected with the level sensor and the vent valve for blocking the removed gases from the vessel in response to the level sensor sensing that the fluid level in the vessel is approaching a preselected capacity to slop the vessel from receiving the fluid waste.

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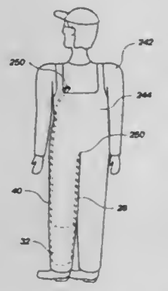
**5,741,239**
**INTRA-RECTAL DRAIN AND RECEPTACLE FOR FECAL INCONTINENCE**
**Kevin J. Mulholland, R.R. 1, Box 2522, Huntington, Vt. 05462**
**Continuation-in-part of Ser. No. 276,354, Jul. 19, 1994, Pat. No. 5,520,669. This application May 24, 1996, Ser. No. 653,621**
**Int. Cl.[6] A61F** *5/44*
**U.S. Cl. 604—328** **15 Claims**



1. An intra-rectal drain and receptacle device for fecal incontinence having an insertable sealing ring with a wide flat smooth bottom annular sealing surface which rests on and distributes pressure over a substantial area of a patient's rectal mucosal tissue creating a seal therebetween, the device comprising:
a rubberlike springy annular sealing ring having a broad smooth flat annular bottom sealing surface with a large surface area which is adapted to rest on and distribute pressure over the substantial area of the patient's rectal mucosal tissue for laying flat against the tissue on the interior of the pelvic diaphragm for surrounding the opening above the internal anal sphincter for occluding the external anal sphincter and for allowing fecal matter to flow from the rectum through the annular sealing ring for creating a water-tight seal between the device and the mucosal tissue to prevent leakage while being capable of exerting low pressure on the mucosal tissue so that the device does not cut off the blood supply and avoids irritated and ulcerated tissue, and a wide inwardly sloping upper surface for directing the fecal matter through the sealing ring, which annular sealing ring is collapsible to a linear configuration and automatically expansible to an annular configuration;
a resilient water-tight collapsible neck extending downwardly from the sealing ring and attached thereto by a water-tight connecting means, the neck tapering downwardly in a funnel shape from the sealing ring;
a resilient water-tight receptacle flexibly connected to the neck with a water-tight seal so that the fecal matter would be confined within the system, never contacting the skin of the patient or any external clothing or bed covers.

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**5,741,240**
**FLOAT TUBE URINAL**
**Mark B. Olsen, 7415 S. 700 East, Midvale, Utah 84047**
**Filed Oct. 17, 1996, Ser. No. 732,905**
**Int. Cl.[6] A61F** *5/44*
**U.S. Cl. 604—353** **18 Claims**



1. A containment device for receiving and containing urine and being capable of direct attachment and support along a leg of an individual between the leg and external forces that would tend to collapse the containment device against the leg, the containment device being configured for use by a person using a float tube, said device comprising:
a substantially rigid case having opposing inner and outer walls, said inner wall being configured for support against the leg of the individual, said outer wall being configured for counter support against the external forces, said rigid case defining a containment volume between the inner and outer walls for receiving and temporarily containing the urine;
support means extending between the inner and outer walls for maintaining the containment volume and resisting collapse of the outer wall against the inner wall in response to the external forces;
a fluid containment compartment positioned within the containment volume;
inlet means for transporting urine from the individual to the containment compartment; and
vent means disposed in communication with the containment volume between the inner and outer walls for venting air from the containment volume to thereby facilitate receiving and temporarily containment of urine within the containment volume, the vent means comprising a flexible tube configured for extending from the case to a position out of a pair of waders to vent air from the containment area.

17. A method of making a float tube urinal, the method comprising:
a) selecting a compression resistant housing;
b) attaching a urine inflow tube from the user to the housing for channeling urine from a user to the housing; and
c) attaching a flexible vent tube to the housing so as to vent air in the housing when urine is received from the urine inflow tube, the flexible vent tube being sufficiently long to extend out of a pair of waders worn by a user, when the housing is attached to the user's leg.

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18. A method for using a float tube urinal by a person wearing waders, and the method comprising:

a) selecting a housing having an inner containment volume and being configured to resist compressive forces, said housing and inner containment volume having a urine inflow tube and a flexible vent tube;

b) attaching the urine inflow tube to the person such that urine excreted by the person flows down the urine inflow tube and into the housing; and

c) positioning the flexible vent tube so that an end of the vent tube extends beyond the waders such that flow of urine into the housing forces air out of the housing and out of the opposing end of the event tube.

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5,741,241

**ABSORBENT BODY FOR AN ABSORBENT ARTICLE**

**Ted Guldotti, Göteborg, and Eje Österdahl, Västra Frölunda, both of Sweden, assignors to SCA Molnlycke AB, Gothenburg, Sweden**

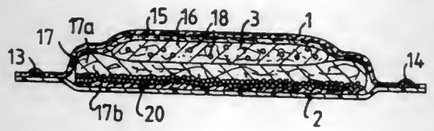
**PCT No. PCT/SE93/00348, § 371 Date Oct. 14, 1994, § 102(e) Date Oct. 14, 1994, PCT Pub. No. WO93/21882, PCT Pub. Date Nov. 11, 1993**

**PCT Filed Apr. 21, 1993, Ser. No. 318,771**

**Claims priority, application Sweden, Apr. 28, 1992, 9201333**

**Int. Cl.[6] A61F** *13/15*

**U.S. Cl. 604—368** **20 Claims**




1. An absorbent body, comprising:

a first fibre-based absorbent layer of fluff pulp which is intended to lie proximal to a wearer in use,

a second fibre-based absorbent layer of fluff pulp which is intended to lie distal to the wearer in use,

the second absorbent layer exhibiting a high liquid-dispersing ability,

the first absorbent layer includes a superabsorbent material of high gel-strength which is admixed essentially uniformly in fibre material of the first layer within at least one area of the first layer, said first absorbent layer containing between 2 and 30% superabsorbent material calculated on the total dry weight of the layer in the at least one area in which the superabsorbent is admixed, and

the second absorbent layer includes upper and lower layers of fibre-based fluff-pulp material and at least one layer of superabsorbent material disposed between the upper and lower fibre layers within at least one area of the second layer, the second absorbent layer containing between 2 and 60% superabsorbent material calculated on the total dry weight of the layer in the at least one area in which the superabsorbent material is distributed, and wherein the at least one layer of superabsorbent material is substantially not mixed with the upper and lower layers of fibre-based material.

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5,741,242

**INFUSION DEVICE WITH FILL ASSEMBLY**

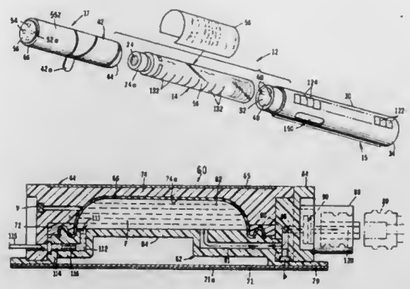
**Marshall S. Kriesel, Saint Paul, Minn., assignor to Science Incorporated, Bloomington, Minn.**

**Filed Dec. 22, 1995, Ser. No. 577,059**

**Int. Cl.[6] A61B** *19/00*

**U.S. Cl. 604—403** **23 Claims**

1. A fill assembly for use with a fluid delivery apparatus including a base having a receiving chamber having a pierceable cannula and a stored energy means for forming, in conjunction with the




base, a fluid reservoir having an inlet in communication with said piercing cannula, and an outlet, said stored energy means being adapted to expel fluid from the fluid chamber, said fill assembly comprising:

(a) a container subassembly including:

(i) a container having a body portion provided with spaced-apart indicia, said body portion having a fluid chamber and first and second open ends;

(ii) closure means for sealably closing said first open end of said container, said closure means comprising a pierceable septum adapted to be pierced by the piercing cannula of the base; and

(iii) a plunger telescopically movable within said container from a first location proximate said second open end to a second, spaced-apart location;

(b) an adapter subassembly comprising a hollow housing adapted to be received within the receiving chamber of the base of the fluid delivery apparatus, said hollow housing having a first open end for telescopically receiving said container of said container subassembly and a second closed end, said hollow housing further including pusher means for engagement with said plunger to move said plunger within said container toward said second location; and

(c) a cover subassembly including a cover having a first open end for telescopically receiving a part of said body portion of said container of said container subassembly and a second end, said cover being removable from said container to expose said closure means.

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5,741,243

**METHOD OF ALTERING COMPOSITION OF NUTRITIONAL PRODUCT DURING ENTERAL TUBE FEEDING**

**Ronita Kay Geckle, Columbus; Terrence Bruce Mazer, Reynoldsburg; Joseph Edward Walton, Westerville; Carl Joseph Piontek, Powell, all of Ohio; Susan Beth Duel, Laurinburg, N.C.; Andre Daah-Krzykowski, Columbus, Ohio; Mark Anthony McCamish, Worthington, Ohio; Robert Louis Joseph, Columbus, Ohio, and William Guy Pierson, Canal Winchester, Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.**

**Continuation of Ser. No. 372,408, Jan. 13, 1995, Pat. No. 5,531,734. This application Jul. 1, 1996, Ser. No. 673,941**

**Int. Cl.[6] A61K** *9/22*

**U.S. Cl. 604—890.1** **9 Claims**

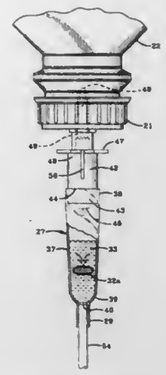
1. A method of modifying a liquid enteral nutritional product during the flow thereof from a supply container to a feeding tube leading into the gastrointestinal tract of a patient, comprising the steps of:

providing an apparatus comprising:

a formulation chamber having an inlet and an outlet, said inlet fluidly connected to a supply container containing a liquid enteral nutritional product having a viscosity of at least about 3 centipoises;

at least one beneficial agent in at least one controlled release dosage form unit disposed in the formulation chamber so as to be wetted by or immersed in the liquid enteral nutritional






product in the formulation chamber, each beneficial agent being selected from the group consisting of nutrients, medicaments, probiotics, diagnostic agents, and chemically and physiologically compatible combinations thereof, each beneficial agent being dispersible in the liquid enteral nutritional product; and

fluid communication means capable of fluidly connected to the outlet of the formulation chamber to a device that feeds the liquid enteral nutritional product into the gastrointestinal tract of a patient;

flowing the liquid enteral nutritional product from the supply container through the formulation chamber, and into the device that feeds.

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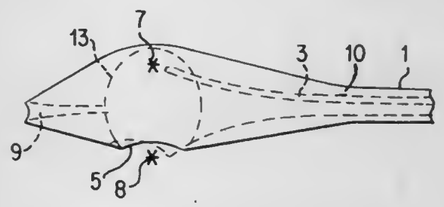
**PROBE FOR THE SUCTIONING OF OCULAR TISSUE**

**Dieter Klaas, Bahnhofstrasse 5, D-86316 Friedberg, Germany**

**Filed Mar. 13, 1995, Ser. No. 402,177**

**Int. Cl.[6] A61B** *17/36*

**U.S. Cl. 606—4** **8 Claims**




1. A probe for suctioning of ocular tissue comprising:

a hollow suction needle having a lateral opening in a needle region capable of being placed on the ocular tissue to be suctioned;

a laser radiation source for generating laser radiation;

a hollow mirror surface defining an ellipsoidal cavity within said needle region and forming a reflective device with a first focal point within said cavity and a second focal point outside of said cavity for location in the tissue to be suctioned; and

a light guide device disposed within and extending through said suction needle and interconnecting the laser radiation source and the ellipsoidal cavity;

said laser radiation being directed by the light guide device to said first focal point and reflected by the hollow mirror surface to said second focal point.

5,741,245

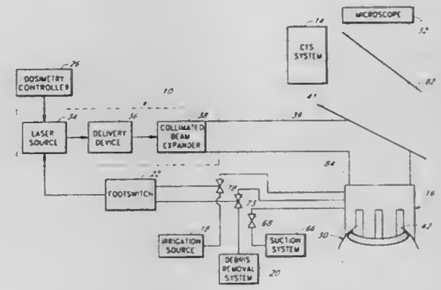
**CORNEAL SCULPTING USING LASER ENERGY**

**Colette Cozean, El Toro; Robert J. Freiberg, Mission Viejo, and HeeJung Koh Wescoat, Garden Grove, all of Calif., assignors to Premier Laser Systems, Inc., Irvine, Calif.**

**Continuation of Ser. No. 250,641, May 27, 1994, abandoned, which is a continuation of Ser. No. 821,009, Jan. 15, 1992, abandoned. This application Feb. 6, 1995, Ser. No. 384,243**

**Int. Cl.[6] A61N** *5/06*

**U.S. Cl. 606—5** **9 Claims**




1. A method of removing corneal tissue from a cornea of an eye of a patient, comprising:

forming a layer of liquid which is reactive to laser radiation of a predetermined wavelength on a surface of the cornea at a thickness selected to cause microexplosions in said liquid at the surface of the cornea when subjected to said laser radiation of said predetermined wavelength;

directing said laser radiation of said predetermined wavelength onto said liquid; and

using said microexplosions in said liquid to remove particles of corneal tissue from said cornea.

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5,741,246

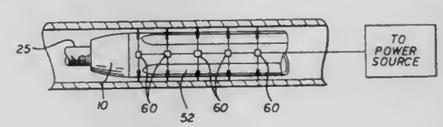
**METHOD AND APPARATUS FOR LASER BALLOON ANGIOPLASTY TREATMENT OF MEDICAL CONDITIONS**

**Marvin A. Prescott, 833 Meraga Dr., Ste. 15, Los Angeles, Calif. 90049**

**Filed Apr. 15, 1996, Ser. No. 632,630**

**Int. Cl.[6] A61B** *17/36*

**U.S. Cl. 606—7** **22 Claims**




1. A balloon catheter extending from a proximal end to a distal end, the catheter comprising:

a guidewire disposed within the catheter;

an inflatable balloon surrounding a portion of the guidewire proximate the distal end of the catheter;

means for inflating the balloon connected to the balloon;

a flexible sleeve surrounding the balloon;

a first electrically conductive flexible strip arranged longitudinally adjacent a portion of the balloon and embedded within the sleeve;

a first plurality of vertical cavity surface-emitting lasers disposed on a surface of the conductive strip; and

means for delivering power to the vertical cavity lasers.

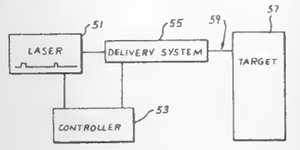
VOL 1209 ISS 3 AP 21 1998 UMI



### 5,741,247
### ATOMIZED FLUID PARTICLES FOR ELECTROMAGNETICALLY INDUCED CUTTING

**Ioana M. Rizoiu, Capistrano Beach, and Andrew I. Kimmel, San Clemente, both of Calif., assignors to Biolase Technology, Inc., San Clemente, Calif.**

**Filed Aug. 31, 1995, Ser. No. 522,503**
**Int. Cl.[6] A61N** *5/02*
**U.S. Cl. 606—10** **13 Claims**




**1**. An apparatus for imparting mechanical forces onto a target surface, comprising:

an atomizer for placing atomized fluid particles into an interaction zone, the interaction zone being defined as a volume above the target surface;

an electromagnetic energy source for focusing electromagnetic energy into the interaction zone, the electromagnetic energy having a wavelength which is substantially absorbed by the atomized fluid particles in the interaction zone, the absorption of the electromagetic energy by the atomized fluid particles causing the atomized fluid particles to impart disruptive mechanical forced onto the target surface;

a user control for accepting a user input, which specifies a cutting efficiency of the apparatus; and

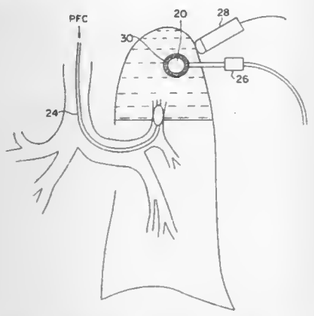
wherein at least one physical characteristic of the atomized fluid particles is controlled by the user input.

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### 5,741,248
### FLUOROCHEMICAL LIQUID AUGMENTED CRYOSURGERY

**Robert G. Stern, Philadelphia; Thomas H. Shaffer, Lansdowne, and Marla R. Wolfson, Philadelphia, all of Pa., assignors to Temple University-of the Commonwealth System of Higher Education, Philadelphia, Pa.**

**Filed Jun. 7, 1995, Ser. No. 487,386**
**Int. Cl.[6] A61B** *17/36*
**U.S. Cl. 606—21** **66 Claims**




**61**. A method for cryogenic treatment of a lesion comprising the steps of:

delivering the fluorochemical liquid into the vicinity of a lesion; and

ablating at least a portion of the lesion by subjecting the lesion to a low temperature;

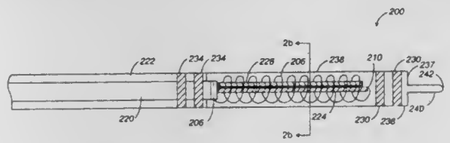
wherein the fluorochemical liquid facilitates the ablation of the lesion.

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### 5,741,249
### ANCHORING TIP ASSEMBLY FOR MICROWAVE ABLATION CATHETER

**Jon F. Moss, Antioch; Peter Sturzu, Cupertino, and Hiep P.H. Nguyen, Fremont, all of Calif., assignors to Fidus Medical Technology Corporation, Fremont, Calif.**

**Filed Nov. 25, 1996, Ser. No. 755,998**
**Int. Cl.[6] A61B** *17/39*
**U.S. Cl. 606—33** **21 Claims**




**1**. An ablation catheter comprising:

an elongated flexible tubular member adapted to be inserted into a vessel in the body of a patient, the flexible tubular member including a proximal portion and a distal portion, the distal portion having a first diameter;

a transmission line disposed within the tubular member, the transmission line having proximal and distal ends, wherein the proximal end of the transmission line is suitable for connection to an electromagnetic energy source;

a transducer coupled to the transmission line for generating an electric field sufficiently strong to cause tissue ablation; and

a flexible anchoring tip extension immovably attached to and integrally formed with the distal portion of the catheter, the anchoring tip extension being more flexible than the distal portion of the elongated flexible tubular members wherein the anchoring tip extension is not arranged to penetrate a body wall of the patient during use.

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### 5,741,250
### ELECTROSURGICAL INSTRUMENT FOR EAR SURGERY

**Jon C. Garito, and Alan G. Ellman, both of 1135 Railroad Ave., Hewlett, N.Y. 11557**

**Filed Jan. 29, 1996, Ser. No. 593,011**
**Int. Cl.[6] A61B** *17/38;17/36*
**U.S. Cl. 606—45** **11 Claims**

**1**. An electrosurgical electrode for incising of tissue, comprising:

(a) a handle,

(b) an electrically-conductive shaft member having a first end mounted to the handle and a second end,

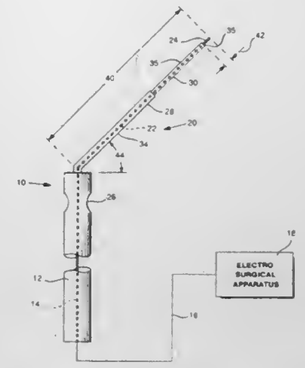
(c) said second end having an active, electrically-conductive, solid tip portion having a bare length of about 2–3 mm terminating in a free end and a first diameter,

(d) said active tip portion being exposed electrically for applying electrosurgical currents to said tissue when said shaft is connected to a source of electrosurgical currents,

(e) the portions of said shaft member adjacent said exposed tip portion being electrically-insulating to prevent contact and passage of electrosurgical currents to areas adjacent to or surrounding the tissue to be incised,

(f) the portions of said shaft member adjacent said exposed tip portion having a larger diameter than the first diameter of said tip portion forming a shoulder spaced from the free end of the tip portion a distance not exceeding about 3 mm and being





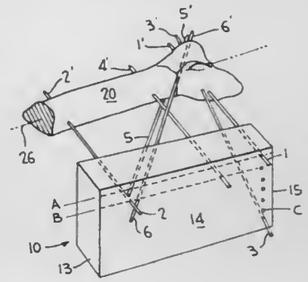

sufficiently large to act as a stop preventing tissue penetration of the active tip portion beyond its length.

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### 5,741,251
### DEVICE AND METHOD FOR REDUCING AND STABILIZING A BONE FRACTURE

**Louis Benoist, 1400 Bellinger St., Eau Claire, Wis. 54703**

**Filed Jan. 7, 1997, Ser. No. 779,522**
**Int. Cl.[6] A61B** *17/64*
**U.S. Cl. 606—54** **15 Claims**



**1**. A fixator for stabilizing bone fragments in a fractured radius bone comprising a block template, said template having a top, a first end, a second end, a first side and a second side, said template having a plurality of holes extending from said first side to said second side, each of said plurality of holes being sized to receive a wire for insertion, after being passed from said first side to said second side of said template, into bone fragments with the plurality of holes being located in said template as follows:

a first hole adjacent to the top and a first end of said template, said first hole extending from said first side through said template in a straight line to exit at said second side;

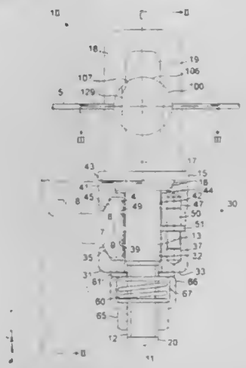
a second hole spaced at a level below said first hole in said template and spaced toward said second end of said template, said second hole extending through said template at an upward angle whereby said hole enters the first side of said block at a first level and exits from the second side of said template at a second level higher than said first level;

a third hole adjacent to said first end of said template and spaced below and in line with said first hole and passing through said template at a 30° angle ±2° whereby a wire passing through said first hole and a wire passing through said third hole forms a 30° plus or minus 2° angle, said template constructed and arranged in order that wires passing through said plurality of holes in said template and into fragments of a fractured radius bone, holds said fractured radius bone in a desired shape while mending.

### 5,741,252
### ADJUSTABLE CLAMP FOR BONE FIXATION ELEMENT

**Michael Mazzio, Schwenksville; Beat Schenk, Paoli, and Dianne Herrin, Brandamore, all of Pa., assignors to Synthes U.S.A., Paoli, Pa.**

**Continuation of Ser. No. 622,433, Mar. 25, 1996, abandoned. This application Jun. 10, 1997, Ser. No. 872,089**
**Int. Cl.[6] A61B** *17/62*
**U.S. Cl. 606—54** **24 Claims**



**22**. A clamp for attaching a bone fixation element with a longitudinal axis to an external frame, comprising:

a frame clamping assembly having opposing laws for clamping the external frame;

a fixation element clamping assembly depending from said frame clamming assembly; and

a spring urging said opposing jaws of said frame clamping assembly to a clamping position on the frame,

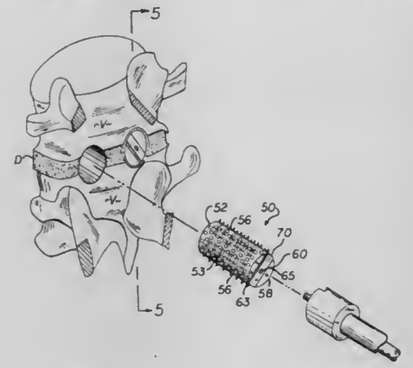
wherein said frame clamp assembly permits rotation of the bone fixation element about a first axis other than said longitudinal axis, and said fixation element clamping assembly permits rotation of the bone fixation element about a second axis other than said first axis and said longitudinal axis.

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### 5,741,253
### METHOD FOR INSERTING SPINAL IMPLANTS

**Gary Karlin Michelson, 438 Sherman Canal, Venice, Calif. 90291**

**Continuation of Ser. No. 698,674, May 10, 1991, abandoned, which is a division of Ser. No. 205,935, Jun. 13, 1988, Pat. No. 5,015,247. This application Oct. 29, 1992, Ser. No. 968,240**
**Int. Cl.[6] A61B** *17/56*
**U.S. Cl. 606—61** **85 Claims**



**1**. A method for inserting an implant across the disc space and into two adjacent vertebrae through a tubular member comprising

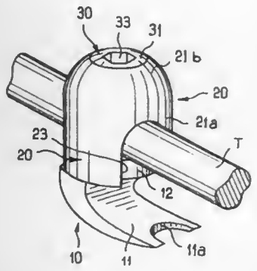
VOL 1209 ISS 3 AP 21 1998 UMI

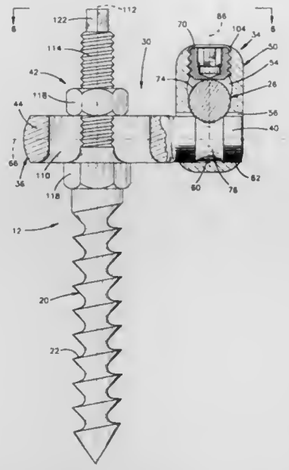


the steps of: inserting a tubular member having means to engage said two adjacent vertebrae; placing through said tubular member a drill having a diameter greater than said disc space; drilling an opening across the disc space and into a portion of each of the two adjacent vertebrae through said tubular member; removing said drill; inserting an implant in the opening through the tubular member; and then removing said tubular member.

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**5,741,254**
**IMPLANT FOR AN OSTHEOSYNTHESIS DEVICE, IN PARTICULAR FOR THE SPINE**
**Patrick Henry; Philippe Lapresle, both of Neuilly-Sur-Seine, and Gilles Missenard, Paris, all of France, assignors to Stryker Corporation, Kalamazoo, Mich.**
**PCT No. PCT/FR94/00435, § 371 Date Oct. 19, 1995, § 102(e) Date Oct. 19, 1995, PCT Pub. No. WO94/23660, PCT Pub. Date Oct. 27, 1994**
**PCT Filed Apr. 18, 1994, Ser. No. 535,279**
**Claims priority, application France, Apr. 19, 1993, 93 04584**
**Int. Cl.[6] A61B *17/70***
**U.S. Cl. 606—61** **16 Claims**




**1**. An implant for an osteosynthesis device, comprising:
an anchoring portion for anchoring to bone;
a body having a channel opening sideways in said body for receiving a rod and having a tapped hole, said channel sloping toward said anchoring portion from an outside portion thereof towards a center of said body;
a hollow cover fitting over and surrounding said body, said cover having a dome-shaped top portion with a opening extending therethrough and having two notches for receiving the rod on either side of said body, said opening facing said tapped hole; and
a screw having a head bearing against said top portion of said cover and a threaded portion extending through said opening and threadedly engaged in said tapped hole in said body to affix said cover on said body.

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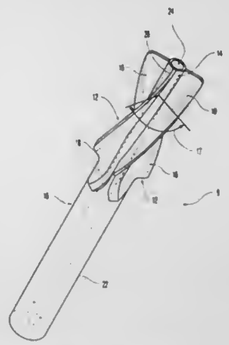
**5,741,255**
**SPINAL COLUMN RETAINING APPARATUS**
**Martin H. Krag, Colchester, Vt., and Craig Glascott, Twinsburg, Ohio, assignors to AcroMed Corporation, Cleveland, Ohio**
**Filed Jun. 5, 1996, Ser. No. 658,749**
**Int. Cl.[6] A61B *17/70***
**U.S. Cl. 606—61** **2 Claims**

**1**. An apparatus for use in retaining portions of a spinal column of a patient in a desired spatial relationship, said apparatus comprising:
a fastener having a thread convolution for threadly engaging a portion of the spinal column, said fastener having a first axis and being rotatable about said first axis;
a longitudinal member which is implantable along the spinal column of the patient at a location offset from said fastener, said longitudinal member having a second axis;
a transverse member having a first portion with an opening through which a portion of said fastener extends, said portion of said fastener being coaxial with said thread convolution, said transverse member having a second portion connectable with said longitudinal member, said transverse member extending transverse to said first and second axes when connected with said fastener and said longitudinal member; and a retainer block having a first opening portion into which said longitudinal member extends and a second opening portion into which said transverse member extends, said first and second opening portions communicating with each other and having third and fourth axes perpendicular to each other;
said retainer block also having a threaded opening communicating with said first opening portion;
said retainer block and transverse member being relatively rotatable between a plurality of relative positions when said transverse member is in said second opening portion;
said retainer block including a first plurality of retainer teeth;
said transverse member including a second plurality of retainer teeth which are disposed out of engagement with said first plurality of retainer teeth when said retainer block and said transverse member relatively rotate, said first and second plurality of retainer teeth when engaged blocking relative rotation of said retainer block and said transverse member; and
a set screw for screwing into said threaded opening in said retainer block and engaging said longitudinal member to force said longitudinal member and said transverse member into engagement with each other and to hold said first and second plurality of retainer teeth in engagement to prevent relative rotation of said retainer block and said transverse member after said retainer block and said transverse member have been positioned in one of said plurality of relative positions;
said second portion of said transverse member being circular in cross section, said second plurality of retainer teeth extending from said circular cross section of said transverse member transverse to said third axis, said first plurality of retainer teeth extending from a surface of said retainer block defining said second opening transverse to said third axis.



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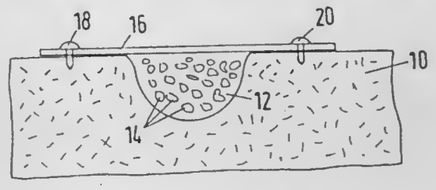
**5,741,256**
**HELICAL OSTEOSYNTHETIC IMPLANT**
**Stephen Bresina, Davos Platz, Switzerland, assignor to Synthes (U.S.A.), Paoli, Pa.**
**Filed Jan. 13, 1997, Ser. No. 782,231**
**Int. Cl.[6] A61B *17/78***
**U.S. Cl. 606—62** **26 Claims**



**26**. An implant for setting a broken bone comprising:
a nail for implantation in a bone fragment and having a plurality of blades helically twisted along a common helical axis and being less than 180° out of helical phase; and
a securing member being securable to an elongate portion of the bone and configured for receiving the nail and preventing obstruction of movement of the nail substantially along the helical axis as the bone fragment compresses towards the elongate portion of the bone.

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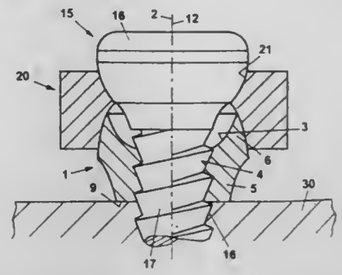
**5,741,257**
**MEMBRANE FOR TEMPORARILY COVERING A BONE SURGERY SITE**
**Axel Kirsch, Talstrasse 23, D70794 Filderstadt, Germany**
**Division of Ser. No. 188,584, Jan. 28, 1994, abandoned. This application Jun. 22, 1995, Ser. No. 493,588**
**Int. Cl.[6] A61B *17/56***
**U.S. Cl. 606—69** **21 Claims**




**1**. A method for promoting bone knitting at a bone recess in endogenic bone tissue comprising:
filling a recess in endogenic bone tissue with an osteogenic material;
covering the recess filled with the osteogenic material with a membrane consisting of a plurality of layers of woven membrane material with respectively different weave openness and said membrane having a resorbability gradient from a first side of said membrane to a second side of said membrane with said resorbability gradient decreasing from a highest resorbability at said first side to a lowest resorbability at said second side; and
temporarily attaching said membrane over said recess with said second side of said membrane facing said endogenic bone to cause said membrane material to be more rapidly resorbed from said first side than from said second side.

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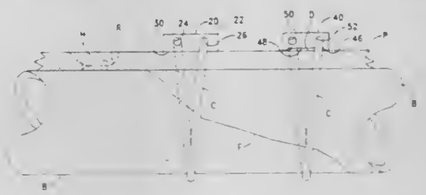
**5,741,258**
**LOCK WASHER FOR BONE PLATE OSTEOSYNTHESIS**
**Kaj Klaue, Bern, Switzerland, and Jeffrey W. Mast, Grosse Pointe Park, Mich., assignors to Synthes (U.S.A.), Paoli, Pa.**
**Continuation of Ser. No. 302,968, Sep. 12, 1994, abandoned. This application May 27, 1997, Ser. No. 864,002**
**Int. Cl.[6] A61B *17/80***
**U.S. Cl. 606—70** **16 Claims**




**1**. Lock washer for use in attaching a bone screw to a bone plate having a bore hole, said washer comprising a substantially cylindrical body having a central axis, a bore hole having internal threading for receiving a bone screw, a lower section having a surface adapted to abut the surface of a bone and an upper section, wherein the upper section is shaped to be retained in the plate bore hole and is curvedly tapered to form a surface shaped to engage a corresponding surface in the plate bore hole, and the lower section is smaller in average width than the upper section.

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**5,741,259**
**SURGICAL FASTENER DEVICE FOR USE IN BONE FRACTURE FIXATION**
**Kwan-Ho Chan, 4803 1st Pl., Lubbock, Tex. 79416**
**Filed Feb. 22, 1996, Ser. No. 604,868**
**Int. Cl.[6] A61B *17/58***
**U.S. Cl. 606—74** **14 Claims**



**1**. A surgical fastener device for use in bone fracture fixation, said device comprising:
a top block portion having bore means extending therethrough, an uppermost top surface, and four side surfaces depending from edges of said top surface; and
a protrusion integral with and extending from an underside of said top block portion centrally lengthwise and widthwise of said top block portion, said underside being bounded by said four side surfaces; and said top block side surfaces defining the lateral extent of said device.

VOL 1209 ISS 3 AP 21 1998 UMI

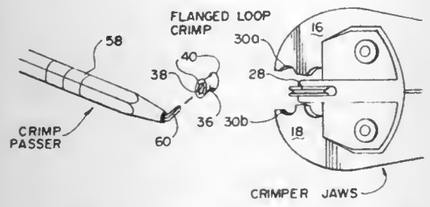


5,741,260

## CABLE SYSTEM FOR BONE SECURANCE

Matthew N. Songer, Marquette, and Francis J. Korhonen, Nequanee, both of Mich., assignors to Pioneer Laboratories, Inc., Marquette, Mich.

Division of Ser. No. 569,707, Dec. 8, 1995, which is a division of Ser. No. 201,614, Feb. 24, 1994, Pat. No. 5,536,270. This application Feb. 20, 1997, Ser. No. 803,503
Int. Cl.[6] A61B *17/82*
U.S. Cl. 606—74 6 Claims




1. A malleable metal, tubular crimp for securing a plurality of cable sections together, said crimp defining a bore of generally oval cross-section extending entirely through said crimp to permit a plurality of said cable portions to extend therethrough in side-by-side relation, said crimp having a pair of opposed ends which each define an outwardly protecting flange.

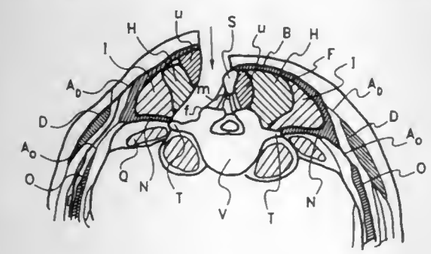
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5,741,261

## MINIMALLY INVASIVE SPINAL SURGICAL METHODS AND INSTRUMENTS

Peter A. Moskovitz, Washington, D.C.; Scott Boden, Atlanta, Ga.; William F. McKay, and Joseph Moctezuma, both of Memphis, Tenn., assignors to SDGI Holdings, Inc., Memphis, Tenn.

Filed Jun. 25, 1996, Ser. No. 670,351
Int. Cl.[6] A61B *17/56*
U.S. Cl. 606—79 19 Claims



1. A minimally invasive method for arthrodesis of a spinal motion segment of a patient including a cephalad vertebra and a caudal vertebra, comprising the steps of:
making a transverse incision in the skin of the patient of about 2.5 cm at a generally posterolateral location about 10 cm from the midline at the level of a spinous process of the cephalad vertebra and centered over the border of the reflection of the thoracolumbar fascia;
exposing the posterior leaf of the thoracolumbar fascia beneath the skin;
making a second incision of about 2.5 cm through the thoracolumbar fascia in the direction of the fibers of the thoracolumbar fascia, the second incision centered beneath the transverse incision;
creating a channel through the transverse incision and the second incision to the intertransverse interval of the cephalad vertebra and the caudal vertebra, including
dissecting the lateral border of the iliocostalis lumborum from the anterior leaf of the thoracolumbar fascia;
dissecting the iliocostalis lumborum and longissimus thoracis muscles from the fascia medially about 0.5 cm dorsal to the junction of the transverse process and the lateral cortex of the cephalad articular facet; and
medially dissecting the intertransverse process membrane to the hiatus of the posterior rami of the segmental nerve and vessels;
inserting a probe through the channel to the intertransverse interval;
inserting a cannula into the channel and over the probe to the intertransverse interval;
removing the probe from the cannula;
inserting a burr into the cannula;
decorticating the transverse process of the caudal vertebra with the burr;
decorticating the transverse process of the cephalad vertebra with the burr; and
delivering graft material to the intertransverse interval after the decorticating steps.

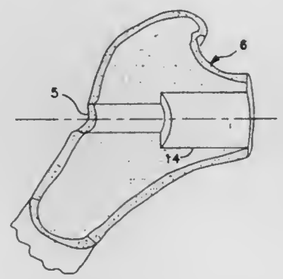
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5,741,262

## HIP JOINT PROSTHESIS

Bjorn Albrektsson; Magnus Jacobsson, both of Gothenburg; Lars Carlsson; Tord Rostlund, both of Kullavik, and Stig Wennberg, Angered, all of Sweden, assignors to Astra Aktiebolag, Sodertalje, Sweden

Division of Ser. No. 290,915, Aug. 22, 1994. This application Jun. 6, 1995, Ser. No. 473,564
Claims priority, application Sweden, Feb. 28, 1992, 9200597
Int. Cl.[6] A61B *17/56*
U.S. Cl. 606—80 8 Claims




1. A method for permanent anchoring of a fixture for a hip joint prosthesis in the neck of a human femur comprising the steps of:
resecting the head of the femur to expose a section of the femur neck,
drilling into the femur neck through the exposed femur neck section in a predetermined forward direction towards a position below the greater trochanter to form a cylindrical bore in the femur neck which extends in the predetermined forward direction and which is stepped into a rearward portion of a first diameter having an open end in the exposed femur neck section and a coaxial forward portion of a second diameter less than the first diameter extending forwardly from the rearward portion,
providing a fixture having a cylindrical anchoring portion of stepped screw threaded outer surface profile and diameters corresponding essentially to those of the bore, and
anchoring the fixture in the femur neck by inserting the cylindrical anchoring portion of the fixture into the bore by translation of the fixture in the predetermined forward direction.

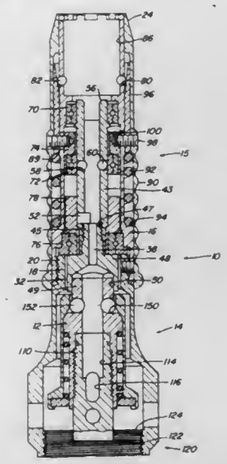


5,741,263

## MUTIPLE FLAT QUICK RELEASE COUPLING

Ray E. Umber, Arlington; Larry Dale Estes, North Richland Hills, and Townesend R. Scantlebury, Arlington, all of Tex., assignors to Midas Rex Pneumatic Tools, Inc., Fort Worth, Tex.

Filed Apr. 18, 1997, Ser. No. 837,445
Int. Cl.[6] A61B *17/56*
U.S. Cl. 606—80 14 Claims



1. A surgical instrument having a motor with a spindle on a forward end and an axis, comprising in combination:
a surgical tool having a shank, a cutting tip, an annular recess on the shank, and a torque shoulder formed on the shank for transmitting torque to the cutting tip;
a tubular shaft rotated by the spindle, the tubular shaft having a bore that aligns with the axis and a forward end that is open for receiving the tool shank;
a plurality of apertures in the tubular shaft;
a ball in each of the apertures for engaging the recess in the tool shank;
an axially moveable cam sleeve surrounding the tubular shaft for engaging and releasing the balls from the recess of the tool shank; and
a plurality of axially-spaced torque shoulders within the tubular shaft, at least one of the shoulders engaging the torque shoulder on the tool shank for transmitting torque from the tubular shaft to the tool.

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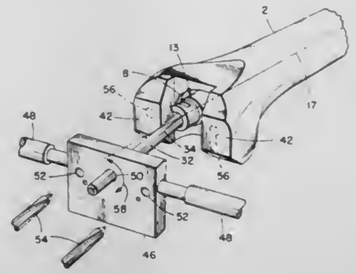
5,741,264

## INSTRUMENT FOR IMPLANTING A FEMORAL KNEE PROSTHESIS

George B. Cipolletti, Wilton, Conn., assignor to Joint Medical Products Corporation, Stamford, Conn.

Continuation of Ser. No. 197,405, Feb. 16, 1994, abandoned. This application Jun. 21, 1996, Ser. No. 662,932
Int. Cl.[6] A61B *17/56*
U.S. Cl. 606—85 16 Claims

1. An instrument for use in the preparation of at least a portion of the anterior surface, the posterior surface, or both the anterior surface and the posterior surface of the distal femur bone of a patient comprising:
(a) a body for insertion into the distal end of a patient's femur bone, said body having a three dimensional outer envelope at least a portion of which has a shape which generally corresponds to the inner surface of the hard bone in the region of the distal end of the femur, said portion having a longitudinal axis and a cross-section transverse to said longitudinal axis whose perimeter is substantially egg shaped;



(b) means associated with the body for receiving a guide; and
(c) a guide mounted on said means for use in cutting at least a portion of the anterior surface, the posterior surface, or both the anterior surface and the posterior surface of a patient's distal femur bone;
whereby the cutting of at least a portion of the anterior surface, the posterior surface, or both the anterior surface and the posterior surface of a patient's distal femur bone is referenced to the location of the body within the inner surface of the hard bone of said distal femur bone.

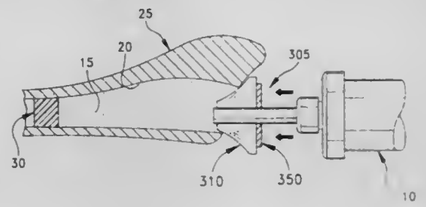
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5,741,265

## BONE CANAL PRESSURIZER

Kwan-Ho Chan, 4803 1st Pl., Lubbock, Tex. 79416

Filed Feb. 21, 1996, Ser. No. 604,179
Int. Cl.[6] A61F *2/28*
U.S. Cl. 606—94 11 Claims



1. A bone canal pressurizer for use in conjunction with the nozzle of a bone cement dispenser for compacting bone cement into the bone canal of a bone, said bone canal pressurizer comprising:
a body of soft foam material, said body having a planar proximal surface and a planar distal surface, said planar surfaces being parallel, said proximal surface having a greater surface area than said distal surface, and a side wall extending between said proximal surface and said distal surface, said side wall including a base portion normal to said proximal surface and an inclined portion extending from an edge of said base portion to said distal surface, said body defining a bore extending from said proximal surface to said distal surface, said bore having a diameter smaller than the outer diameter of the cement dispenser's nozzle; and
a rigid plate fixed to said proximal surface and having a hole extending therethrough, said hole being aligned with said bore extending through said body, and said hole having a diameter larger than the outer diameter of said cement dispenser's nozzle, said plate having planar and parallel distal and proximal surfaces, said plate proximal surface being devoid of protrusions extending therefrom so as to be configured to receive in abutting engagement a cement dispenser portion there against, an outer edge of said plate being spaced inwardly from said body side wall base portion and being normal to said body proximal surface;

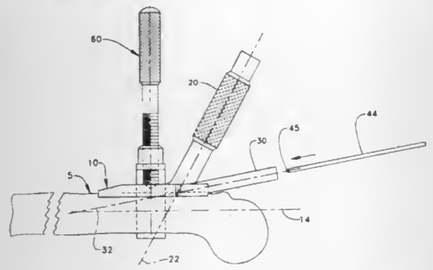
VOL 1209 ISS 3 AP 21 1998 UMI



said distal surface of said body being sized so as to be small enough to fit within the bone canal of a bone, and said rigid plate being sized so as to be larger than the bone canal of that same bone.

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**5,741,266**
**PIN PLACEMENT GUIDE AND METHOD OF MAKING A BONE ENTRY HOLE FOR IMPLANTATION OF AN INTRAMEDULLARY NAIL**
**Michael C. Moran, Palos Heights, Ill., and Robert Border, Bourbon, Ind., assignors to Biomet, Inc., Warsaw, Ind.**
**Filed Sep. 19, 1996, Ser. No. 716,086**
**Int. Cl.[6] A61F** *5/04*
**U.S. Cl. 606—96** **9 Claims**

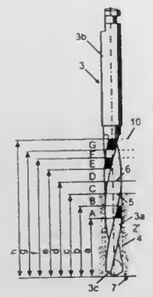



1. A method of making an entry hole for implanting an intramedullary nail across a fracture in an elongated bone having a longitudinal axis comprising the steps of:
providing a pin placement guide having a base with a bone contact surface and a guide portion attached to said base, and having a guide bore with a guide axis extending through said guide portion and said bone contact surface of said base;
clamping said pin placement guide on said elongated bone with a clamp so that said guide axis is at a relatively small angle greater than zero but less than twenty degrees with respect to said longitudinal axis and said bone contact surface is substantially aligned with said longitudinal axis;
inserting a guide pin with a tip through said guide bore;
boring a guide hole along said guide axis into said elongated bone with said guide pin;
removing said clamp and said pin placement guide from said elongated bone; and
reaming said guide hole into an entry hole with an entry axis that is at an angle with respect to said longitudinal axis that is equal to or less than said guide axis.

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**5,741,267**
**DEPTH-MARKING SYSTEM ARRANGEMENT FOR IMPLANT HOLES IN THE JAWBONE**
**Lars Jorneus, Frillesas, Sweden, and Richard Sullivan, Westmont, Ill., assignors to Nobel Biocare AB, Goteborg, Sweden**
**PCT No. PCT/SE95/00137, § 371 Date Dec. 5, 1995, § 102(e) Date Dec. 5, 1995, PCT Pub. No. WO95/21590, PCT Pub. Date Aug. 17, 1995**
**PCT Filed Feb. 10, 1995, Ser. No. 530,383**
**Claims priority, application Sweden, Feb. 14, 1994, 9400479**
**Int. Cl.[6] A61B** *17/16*
**U.S. Cl. 606—102** **18 Claims**

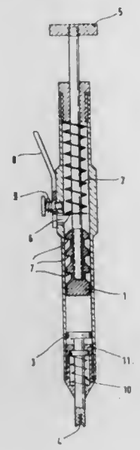
1. A depth marking system for use in connection with forming holes for receiving implants in a jawbone, the implants having a nominal length less than an actual length, comprising:
at least one band marking arranged on a tool for performing at least one function selected from the group consisting of forming the implant holes and measuring the implant holes, said at least one band marking including a first line that




indicates an actual hole depth, the actual hole depth including any lower cone-shaped portion of the hole, said at least one band marking also including a second line above said first line that indicates a position of an uppermost portion of a unit arranged on the implant when the implant is in a final position in the hole and the unit is arranged in a final position on the implant.

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**5,741,268**
**TACKING DEVICE AND TACKING NAILS FOR SURGERY**
**Frank-Ullrich Schütz, Anne-Frank-Strasse 33, D-97082 Wurzburg, Germany**
**Filed Mar. 15, 1996, Ser. No. 618,415**
**Claims priority, application Germany, Mar. 18, 1995, 195 09 966.4**
**Int. Cl.[6] A61B** *17/58*
**U.S. Cl. 606—104** **11 Claims**



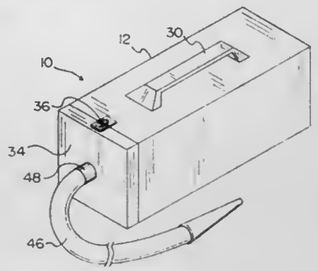

1. A tacking device for surgery, such as dental surgery, for affixing membranes which are impermeable to tissue cells, said tacking device comprising:
a plunger;
a limit stop for limiting endwise movement of said plunger;
a holding device located at one end of said plunger, said holding device being capable of receiving a head portion of a tacking nail;
a striker disposed collinearly to the axis of said plunger, at a distance from said plunger, with said striker being displaceable in the direction of said plunger;
spring means for biassing said striker in the direction of said plunger, said spring means affixed endwise upon said striker; and



a releasable means for blocking said spring means from biassing said striker in the direction of said plunger.

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**5,741,269**
**MEDICAL VACUUM DEVICE**
**Doug McCredy, 28 Monroe St., Matawan, N.J. 07747**
**Filed Nov. 18, 1996, Ser. No. 752,172**
**Int. Cl.[6] A61B** *17/00*
**U.S. Cl. 606—106** **2 Claims**

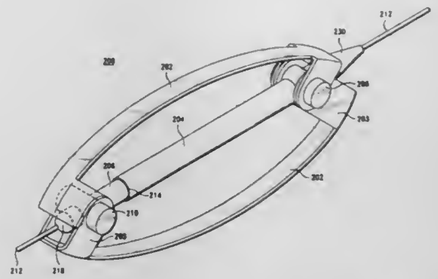



1. A medical vacuum device for dislodging food stuck in a choking victims throat comprising, in combination:
a housing having a rectangular configuration, the housing having an open front, a closed rear, a top, a bottom, and opposed sides, the housing having a suction pump disposed therein inwardly of the open front, the housing having a rechargeable battery disposed therein in cooperation with the suction pump, a recharging plug extending outwardly of the closed rear of the housing for coupling with an electrical outlet, the top having a handle secured thereto, the bottom having four short legs disposed in four corners thereof, the open front having a lid removably secured thereover, the lid having a central aperture therethrough leading into communication with the suction pump;
a hose having an open first end and an open second end, the open first end received within the central aperture in the lid and into communication with the suction pump, the open second end being internally threaded; and
a flexible and transparent suction tube having a conical configuration, the flexible and transparent suction tube having an open wide end and an open tapered end, the open wide end having a threaded flange extending outwardly therefrom, the threaded flange coupling with the internally threaded open second end of the hose.

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**5,741,270**
**MANUAL ACTUATOR FOR A CATHETER SYSTEM FOR TREATING A VASCULAR OCCLUSION**
**Gerald Hansen, Newark; E. Richard Hill, III, Berkely, and Charles Milo, Union City, all of Calif., assignors to LuMend, Inc., Menlo Park, Calif.**
**Filed Feb. 28, 1997, Ser. No. 808,092**
**Int. Cl.[6] A61F** *11/00*
**U.S. Cl. 606—108** **34 Claims**

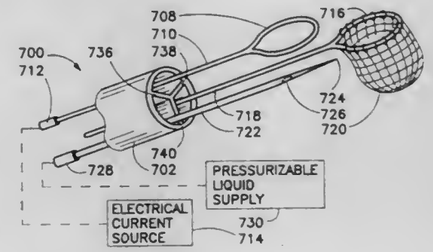
1. A manual actuator for retracting and advancing a therapeutic working element of an intravascular catheter system via an actuation shaft, the manual actuator comprising:
a hollow cylindrical bracing member including an open proximal end and a distal end;
a hollow cylindrical retracting member, the retracting member being slidable into the open proximal end of the bracing member, the retracting member having a proximal end;
an actuation shaft, a proximal end of the actuation shaft being secured to the proximal end of the retracting member, a distal




end of the actuation shaft being secured to the therapeutic working element, and
at least one resilient connecting member having a proximal end attached proximate the proximal end of the retracting member, and a distal end attached proximate the distal end of the bracing member,
whereby a manually applied external force applied to the at least one resilient connecting member urges the retracting member in a proximal direction with respect to the bracing member, thereby retracting the actuation shaft and operating the working element of the catheter system.

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**5,741,271**
**SURGICAL RETRIEVAL ASSEMBLY AND ASSOCIATED METHOD**
**Naomi L. Nakao, 303 E. 57th St., New York, N.Y. 10022, and Peter J. Wilk, 185 W. End Ave., New York, N.Y. 10023**
**Continuation-in-part of Ser. No. 333,363, Nov. 2, 1994, which is a continuation-in-part of Ser. No. 213,196, Mar. 14, 1994, Pat. No. 5,486,182, which is a continuation-in-part of Ser. No. 12,657, Feb. 1, 1993, Pat. No. 5,336,227, which is a continuation-in-part of Ser. No. 788,035, Nov. 5, 1991, Pat. No. 5,201,740, and Ser. No. 892,214, Jun. 2, 1992, Pat. No. 5,190,542, said Ser. No. 333,363 is a continuation-in-part of Ser. No. 957,416, Oct. 5, 1992, Pat. No. 5,374,273. This application Aug. 8, 1996, Ser. No. 700,562**
**Int. Cl.[6] A61B** *17/24;17/26*
**U.S. Cl. 606—114** **20 Claims**




1. A surgical instrument assembly for use in snare cauterization operations, comprising:
a tubular member, said tubular member having a diameter sufficiently small so that said tubular member can be inserted through a biopsy channel of a flexible endoscope;
a cauterization loop;
an electrically conductive wire operatively connected to said cauterization loop, said cauterization loop and said wire being disposed at least partially in said tubular member;
electrical means operatively connected to said wire for feeding an electrical current to said cauterization loop via said wire;
an auxiliary loop;

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an elongate flexible shifting member connected at one end to said auxiliary loop, said auxiliary loop and said shifting member being at least partially disposed in said tubular member;

a flexible web member connected to said auxiliary loop so as to form a capture pocket, said auxiliary loop defining a mouth opening of said pocket;

an elongate flexible tube provided at a distal end with a needle point and an aperture, said flexible tube being disposed at least partially in said tubular member; and

fluid feed means operatively connected to said flexible tube for feeding fluid thereto for ejection through said aperture.

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**5,741,272**

**APPARATUS FOR THE FRAGMENTATION OF CONCRETIONS IN THE MEDICAL FIELD**

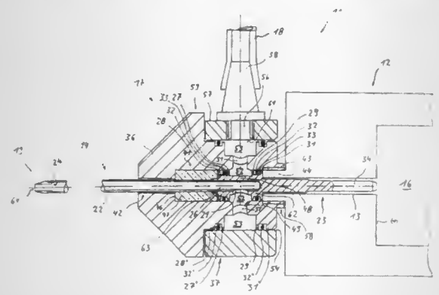
**Udo Kühne, Kanderstegstrasse 22, CH-3714 Frutigen, Switzerland**

**Filed Jan. 11, 1996, Ser. No. 585,301**

**Claims priority, application Germany, Jan. 13, 1995, 195 00 893.6**

**Int. Cl.[6] A61B** *17/22*

**U.S. Cl. 606—128** **40 Claims**



1. An apparatus for fragmentation of concretions comprising:

a housing (**12**),

a hollow prove (**14**) having a first end arranged to face a concretion to be fragmented and a second end received by said housing,

a drive arrangement (**16**) arranged in said housing for producing and conducting energy to said second end of said hollow probe, wherein said hollow probe has at least one lateral outlet opening (**21**), said at least one lateral outlet opening (**21**) being spaced at a distance from said first end of said hollow probe,

a connecting device (**17**) surrounding said at least one lateral outlet opening, and

a suction tube (**18**),

said connecting device (**17**) comprising a connecting body (**36**) and a connecting sleeve (**37**) arranged rotatably on said connecting body (**36**) to which said suction tube (**18**) is connected.

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**5,741,273**

**ELASTIC BAND LIGATION DEVICE FOR TREATMENT OF HEMORRHOIDS**

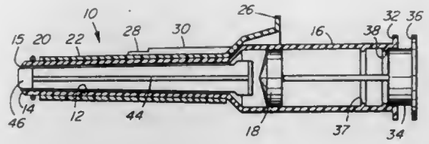
**Patrick J. O'Regan, 912-750 West Broadway, Vancouver, B.C., Canada, V5Z 1H2**

**Filed Mar. 8, 1996, Ser. No. 614,074**

**Int. Cl.[6] A61M** *1/00*; **A61B** *17/22*

**U.S. Cl. 606—140** **13 Claims**

1. A single operator elastic band ligation device for treatment of hemorrhoidal tissue, comprising:



a plastic inner tubular member for retaining a stretched elastic band over a front end, the inner tubular member extending for a sufficient length for insertion into the rectum of a patient, and having a plunger in the tubular member with a handle means extending away from the front end, the handle means for sliding the plunger away from the front end of the inner tubular member to provide a suction for drawing hemorrhoidal tissue into the inner tubular member through an opening at the front end, and

a plastic outer tubular pusher sleeve fitting and having a limited friction fit over the inner tubular member, with an insertion end of the outer tubular sleeve adjacent the stretched elastic band, and having an opposite end of the outer tubular pusher sleeve with thumb push means for an operator to push the outer tubular pusher sleeve towards the front end of the inner tubular member and release the elastic band from the front end of the inner tubular member to engage hemorrhoidal tissue through the opening in the inner tubular member.

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**5,741,274**

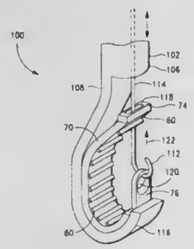
**METHOD AND APPARATUS FOR LAPAROSCOPICALLY REINFORCING VASCULAR STENT-GRAFTS**

**Jay A. Lenker, Los Altos Hills, Calif.; Edward V. Kinney, Louisville, Ky.; Christopher K. Zarins, and Thomas J. Fogarty, both of Portola Valley, Calif., assignors to Cardio Vascular Concepts, Inc., Portola Valley, Calif.**

**Filed Dec. 22, 1995, Ser. No. 577,729**

**Int. Cl.[6] A61B** *17/02*

**U.S. Cl. 606—142** **2 Claims**



1. A tool used in conjunction with a reinforcing member for laparoscopically reinforcing a vascular endoluminal prosthesis, comprising:

a catheter insertable through a trocar, for laparoscopically inserting a reinforcing member to adjacent an aneurismic blood vessel, the catheter having a proximal end and a distal end;

a guide attached to the distal end for guiding the reinforcing member about a blood vessel, the guide has an arcuate arm which extends from the distal end of the catheter and holds the reinforcing member, the reinforcing member has a first end which defines a loop, and a second end, the guide holds the reinforcing member, the moveable means includes a hook which extends through the loop to pull the second end of the reinforcing member through the loop to lock the reinforcing member;

an actuator attached to the proximal end of the catheter; and

a moveable means attached to the actuator, the moveable means being movably mounted on the distal end of the catheter to lock the reinforcing member about the endoluminal prosthesis in response to the actuator,

whereby, when the catheter laparoscopically inserts a reinforcing member through the trocar into a body to adjacent an aneurismic blood vessel, the actuator locks the reinforcing member to reinforce the endoluminal prosthesis.



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**5,741,275**

**DEVICE FOR THE INTENTIONAL AND CONTROLLABLE DISTRIBUTION OF A LIQUID OR VISCOUS MATERIAL**

**Max Wyssmann, Hochstrasse 7, Herzogenbuchsee, CH-3360, Switzerland**

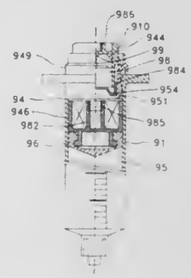
**PCT No. PCT/CH93/00151, § 371 Date Feb. 14, 1994, § 102(e) Date Feb. 14, 1994, PCT Pub. No. WO93/25841, PCT Pub. Date Dec. 23, 1993**

**PCT Filed Jun. 10, 1993, Ser. No. 196,074**

**Claims priority, application Switzerland, Jun. 15, 1992, 1870/92**

**Int. Cl.[6] A61M** *37/00*

**U.S. Cl. 604—143** **37 Claims**



1. A device for selective, controllable release of a fluid, a viscous mass or a suspension of solid particles in a fluid, comprising:

a cylindrical container;

a top enclosing a first end of the container, in combination with a funnel-shaped container seal;

a bottom enclosing a second end of the container opposite to the first end, wherein the bottom includes a clamping device for receiving electrical components, the electrical components including an electrochemical gas evolution cell, an adjustable load resistor and electrical contacts which combine to develop an external current circuit, wherein the gas evolution cell has a tablet-shaped construction including a metal enclosure receiving a gas diffusion electrode, a counter electrode and an aqueous electrolyte, and wherein the external current circuit is connected with the gas evolution cell to activate the gas evolution cell; and

a cylindrical piston slidingly received within the container and dividing the container into a pressurized gas chamber and a mass chamber, wherein the funnel-shaped container seal faces the mass chamber of the container, and wherein the piston includes a circumference provided with an annular seal and a coupled pair of coaxial plugs for causing telescoping movement of the piston

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**5,741,276**

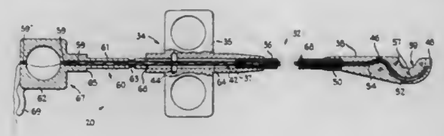
**APPARATUS FOR FACILITATING THE PERFORMANCE OF SURGICAL PROCEDURES SUCH AS THE PLACEMENT OF SUTURES, LIGATURES AND THE LIKE**

**Alexandr Poloyko, Morton Grove, and Raymond Firfer, Lincolnshire, both of Ill., assignors to Innovative Surgical Instruments, Northbrook, Ill.**

**Filed Jan. 28, 1996, Ser. No. 623,154**

**Int. Cl.[6] A61B** *7/04*

**U.S. Cl. 606—144** **22 Claims**



1. An apparatus for performing surgical procedures involving the placement and controlled manipulation of a thread, via a distal member, relative to tissues in a patient's body, the apparatus comprising:

a cannula member having a distal end and a proximate end,

the cannula member including means for releasably holding a first member, the means for releasably holding a first member, being connected to the distal end of the cannula member, a stylet member having a distal end and a proximate end,

the cannula member and means for releasably holding a first member together forming an elongated, substantially rigid, substantially completely enclosed structure for facilitated placement and handling of first member, prior to deployment of same, the stylet member being operably configured to be insertably received, at least along a portion of its length, by the cannula member,

the stylet member further including means for selectively ejecting a first member from the means for releasably holding a first member; and

means for facilitating handling of at least a portion of a thread affixed to a first member, during deployment of a first member, towards facilitating protection of the portion of a thread from undesired contact with potentially contaminated surfaces external to the apparatus,

the means for facilitating handling including a passage extending entirely through the stylet member, for insertably receiving therethrough a thread affixed to a first member,

the cannula, the means for releasably holding a first member, and the stylet being operably configured so as to completely enclose a thread, being insertably received completely internally therethrough, during passage of the thread through the apparatus, until deployment of a first member, to which the thread is affixed, and further enabling the facilitated retraction of an ejected first member.

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**5,741,277**

**ENDOSCOPIC SUTURE SYSTEM**

**Norman S. Gordon, Irvine; Robert P. Cooper, Yorba Linda, and Gordon C. Gunn, Corona Del Mar, all of Calif., assignors to Laurus Medical Corporation, Irvine, Calif.**

**Continuation of Ser. No. 205,042, Mar. 2, 1994, Pat. No. 5,540,704, which is a continuation-in-part of Ser. No. 57,699, May 4, 1993, Pat. No. 5,458,609, which is a continuation-in-part of Ser. No. 941,382, Sep. 4, 1992, Pat. No. 5,364,408. This application Jun. 25, 1996, Ser. No. 673,665**

**Int. Cl.[6] A61B** *17/00*

**U.S. Cl. 606—144** **14 Claims**

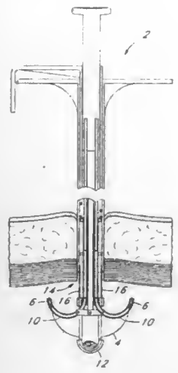
1. A suturing instrument comprising:

an elongate body member having a longitudinal axis;

a needle deployment system located at a distal end portion of said elongate body member, said needle deployment system comprising a curved needle carrier positioned in a plane

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which is substantially parallel to said elongate body member longitudinal axis, said curved needle carrier dimensioned to receive and hold a surgical needle having a suture attached thereto;

a deployment controller having a proximal end, a distal end, a retracted position and a deployed position wherein the path followed by the deployment controller from said retracted position to said deployed position is substantially parallel to said elongate body member longitudinal axis, said deployment controller extending substantially along the longitudinal axis of said elongate body member to the distal end portion of said elongate body member where it is coupled to said curved needle carrier, wherein said curved needle carrier is driven along a path which exits said needle deployment system in a direction which is lateral to said elongate body member longitudinal axis when said deployment controller moves from said retracted position to said deployed position; and

a needle catch positioned proximate to said distal end portion of said elongate body member such that said curved needle carrier path is intercepted by said needle catch as said deployment controller approaches said deployed position.

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**5,741,278**

**ENDOSCOPIC SUTURE PLACEMENT TOOL**

**Jon A. Stevens, Condado, Puerto Rico, assignor to Tahoe Surgical Instruments, San Juan, Puerto Rico**

**Continuation of Ser. No. 292,088, Aug. 17, 1994, Pat. No. 5,573,542. This application Oct. 16, 1996, Ser. No. 731,601**

**Int. Cl.[6] A61B** *17/04*

**U.S. Cl. 606—144** **6 Claims**

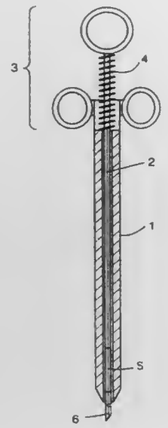
1. A surgical tool including:

a tubular, elongated housing having a proximal end, a distal end, and a passage defining a rod axis therethrough;

a tissue piercing tip including means for supporting a ligature;

a suture tip drive rod positioned within said passage, and moveable along the length thereof from a drive rod retracted position, wherein the tissue piercing tip is coaxial with the tip drive rod, to a drive rod extended position; and

deflecting means comprising a shape memory portion secured on a first end to a distal portion of said drive rod and on a second end to said tissue piercing tip for deflecting said tissue piercing tip from said axis when said rod is in said extended position.



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**5,741,279**

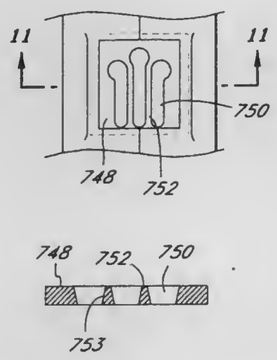
**ENDOSCOPIC SUTURE SYSTEM**

**Norman S. Gordon, Irvine, Calif., and Robert P. Cooper, Yorba Linda, Calif., assignors to Laurus Medical Corporation, Irvine, Calif.**

**Division of Ser. No. 311,967, Sep. 26, 1994, Pat. No. 5,578,044, which is a continuation-in-part of Ser. No. 205,042, Mar. 2, 1994, Pat. No. 5,540,704, which is a continuation-in-part of Ser. No. 57,699, May 4, 1993, Pat. No. 5,458,609, which is a continuation-in-part of Ser. No. 941,382, Sep. 4, 1992, Pat. No. 5,364,408. This application Nov. 6, 1996, Ser. No. 743,886**

**Int. Cl.[6] A61B** *17/04*

**U.S. Cl. 606—144** **10 Claims**



1. A needle catch made by the process comprising the steps of:

selecting a substantially planar foundation having a first surface and a second surface; and

forming at least one aperture in said substantially planar foundation, wherein a first surface lateral dimension of said aperture on said first surface of said foundation is larger than a second surface lateral dimension of said aperture on said second surface of said foundation.



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**5,741,280**

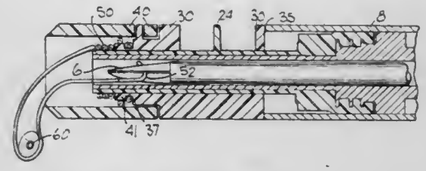
**KNOT TYING METHOD AND APPARATUS**

**Richard P. Fleenor, Englewood, Colo., assignor to Coral Medical, Englewood, Colo.**

**Continuation-in-part of Ser. No. 182,609, Jan. 18, 1994, abandoned. This application Nov. 13, 1995, Ser. No. 556,662**

**Int. Cl.[6] A61B** *17/00*

**U.S. Cl. 606—148** **7 Claims**



1. A knot placement apparatus, comprising:

a knot carrier spool having a proximal end and a distal end;

a knot slider slidably attached to the knot carrier spook;

thread having a first end and a second end and an at least partially formed knot between the two ends, the thread being initially wound around the knot carrier spool and the at least partially formed knot being initially positioned on the knot carrier spool distal to the knot slider;

whereby sliding the knot slider distally pushes the at least partially formed knot distal to the knot carrier; and

wherein the knot slider is a sheath that snugly fits around the knot carrier spool at a position proximal to the at least partially formed knot, and a thread segment containing the second end of the thread is attached to the sheath; and

wherein the sheath contains an annular notch and a portion of the thread segment attached to the sheath is wound around the annular notch.

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**5,741,281**

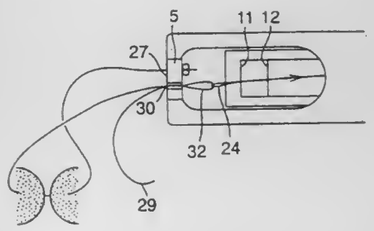
**SUTURE SECURING APPARATUS**

**Christopher Martin, New South Wales, Australia, assignor to Smith & Nephew, Inc., Andover, Mass.**

**Continuation of Ser. No. 97,694, Jul. 27, 1993, abandoned. This application May 7, 1996, Ser. No. 643,855**

**Int. Cl.[6] A61B** *17/00*

**U.S. Cl. 606—148** **22 Claims**



1. A suture securing apparatus for positioning a suture securing device having a passage therethrough, the apparatus comprising:

(i) a holding member having at one end a handle and at the other end means for engaging the suture securing device;

(ii) suture recovery means, slidably associated with said holding means, for drawing a loop of suture through the passage in the suture securing device, said suture recovery means including a snare passable through the passage of the suture securing device and retractable through the passage such that when said snare is passed through the passage and a portion of suture is snared, the snare may be retracted through the passage bringing with it a loop of the suture, said snare being a loop of filament; and

(iii) suture clamping means, associated with said holding means, for securely engaging suture which has been passed through the loop in said suture securing device.

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**5,741,282**

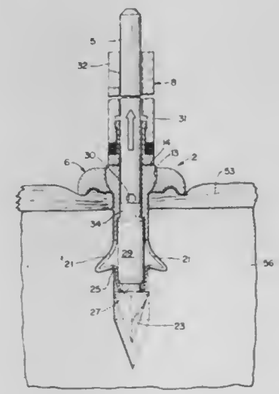
**SOFT TISSUE FASTENER DEVICE**

**William E. Anspach, III, Stuart, and Eddy H. Del Rio, Royal Palm Beach, both of Fla., assignors to The Anspach Effort, Inc., Palm Beach Gardens, Fla.**

**Filed Jan. 22, 1996, Ser. No. 589,779**

**Int. Cl.[6] A61B** *17/00*

**U.S. Cl. 606—151** **18 Claims**



1. An expandable fastener device for attaching soft body tissue to bone located in a cavity of a patient, said fastener device having an annular body, a head being attached to the top of said annular body for contacting the soft body tissue, a retractable shaft extending through said annular body and a portion thereof being accessible from outside of said cavity, angular adjusting means responsive to the contour of said bone for angular adjustment of said head in relation with said annular body, said shaft having a drill point below said annular body for extending through the soft the and drilling in bone for placing the soft body tissue against the bone, said drill point having a contact surface opposite said the point of said drill point and being engageable with said annular body, said annular body being expandable radially and ingressing into the bone when compressed when said shaft is retracted for fixing said annular body in place.

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**5,741,283**

**VESSEL AND DUCT SALVAGE DEVICE AND METHOD**

**Gregory M. Fahy, Gaithersburg, Md., assignor to LRT, Inc., and Organ, Inc., both of Chicago, Ill.**

**Continuation of Ser. No. 409,706, Mar. 24, 1995, abandoned. This application Jan. 6, 1997, Ser. No. 778,746**

**Int. Cl.[6] A61B** *17/00*

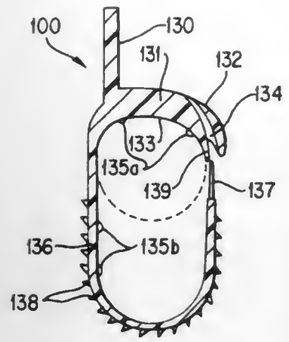
**U.S. Cl. 606—157** **23 Claims**

1. A vessel repair device for encircling a vessel, the vessel repair device able to perform at least one of sealing a breach in a wall of the vessel, correcting an aneurysm in the vessel, and reversibly applying pressure to an elongated portion on the exterior of the vessel, the device comprising:

a strap having a width substantially greater that its thickness for surrounding an elongated portion of the exterior of the vessel, the strap having a laterally extending elongated surface for contacting the elongated portion of the vessel, and an exterior surface; and

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a closure device including a continuous inner wall defining an enclosed aperture that extends therethrough for releasably holding the strap in a closed position around the vessel,

wherein the width of the strap is substantially constant along a length extending between a first end adjacent the closure device and a second end and wherein the width of the laterally extending elongated surface of the strap is sufficiently wide and configured for at least one of covering a breach in the wall of the vessel, correcting an aneurysm in the vessel, and reversibly applying pressure to the elongated portion of the exterior of the vessel.

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**5,741,284**

**DIALYSIS COMBINATION AND MICRODIALYSIS PROBE AND INSERTION DEVICE**

**Hans Karlsson, Sollentuna, Sweden, assignor to CMA/ Microdialysis Holding AB, Solna, Sweden**

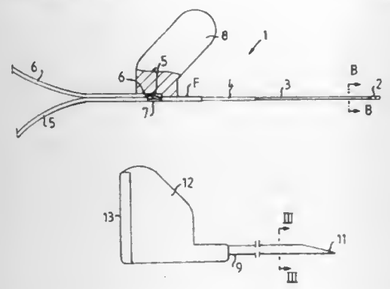
**PCT No. PCT/SE95/00096, § 371 Date Jul. 31, 1996, § 102(e) Date Jul. 31, 1996, PCT Pub. No. WO95/20991, PCT Pub. Date Aug. 10, 1995**

**PCT Filed Feb. 1, 1995, Ser. No. 682,745**

**Claims priority, application Sweden, Feb. 4, 1994, 9400378**

**Int. Cl.[6] A61M** *5/178*

**U.S. Cl. 604—160** **6 Claims**




1. In a dialysis probe combination comprising a microdialysis probe which includes a semi-permeable membrane located and supported between two tubular members, with an inner tube which is provided with an opening at its distal end, and an outer mantle which includes the membrane, wherein the inner tube and the space defined between the inner tube and the outer mantle are each connected to a respective connecting pipe at the proximal end of the probe, and an insertion device which includes a removable cannula tube which is pointed at its distal end and which functions to stiffen the probe, the improvement wherein the cannula tube has a slot which extends along the full length of the cannula tube, and includes at its proximal end centrally opposite the slot a slot-exposing gripping element which is provided with at least one handle means which projects laterally outwards; the outer mantle and the two tubular members are slidably accommodated within the cannula tube wherein at least the tubular members are held generally firm against lateral movement by virtue of their fit in the cannula tube; a proximal end of the probe having at least one narrow part which fits in the slot, thereby enabling the cannula with the microdialysis probe inserted therein to be inserted through the skin and into the underlying tissue, wherein after insertion the narrowed probe part can be withdrawn through the slot in the cannula tube at the proximal end of said slot when the probe is located outside the skin, whereafter the complete cannula tube can be withdrawn with the slot passing beyond the stationary narrow part of the probe.

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**5,741,285**

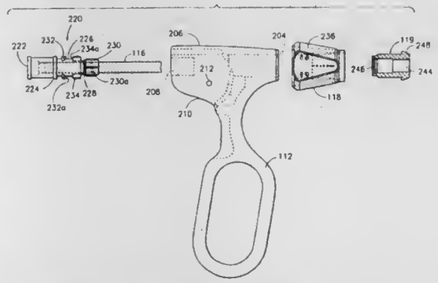
**ENDOSCOPIC INSTRUMENT HAVING NON-BONDED, NON-WELDED ROTATING ACTUATOR HANDLE AND METHOD FOR ASSEMBLING THE SAME**

**Michael Sean McBrayer, Miami; Charles R. Slater, Fort Lauderdale; Juergen Andrew Kortenbach, Miami Springs, and Saul Gottlieb, Miami, all of Fla., assignors to Symbiosis Corporation, Miami, Fla.**

**Continuation of Ser. No. 284,794, Aug. 2, 1994, abandoned, which is a continuation-in-part of Ser. No. 91,177, Jul. 13, 1993, Pat. No. 5,395,369. This application Jun. 21, 1996, Ser. No. 667,375**

**Int. Cl.[6] A61B** *17/00*

**U.S. Cl. 606—170** **20 Claims**




17. An endoscopic instrument, comprising:

a) a hollow tube having a proximal and a distal end;

b) a push rod having a proximal and a distal end and extending through said hollow tube;

c) at least one end effector mounted for rotation at said distal end of said tube and coupled to said distal end of said push rod;

d) a handle having a through bore with a reduced diameter distal end;

e) a tube sleeve which is fixed to said proximal end of said hollow tube, said tube sleeve having a proximal stop surface and a distal exterior frictional engagement member;

f) a ferrule having a through bore and an interior frictional engagement member; and

g) a lever pivotally coupled to said handle and coupled to said proximal end of said push rod, wherein

said tube sleeve extends through said through bore and is prevented from passing entirely through said through bore by said proximal stop ring surface, said interior frictional engagement member of said ferrule frictionally engages said distal exterior frictional engagement member, one of said interior frictional engagement member of said ferrule and said exterior frictional engagement member of said tube sleeve having a locking structure which engages the other of said interior frictional engagement member of said ferrule and said exterior frictional engagement member of said tube sleeve and prevents rotational movement of said ferrule relative to said tube sleeve, such that rotation of said ferrule causes rotation of said tube sleeve and said hollow tube relative to said handle.



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**5,741,286**

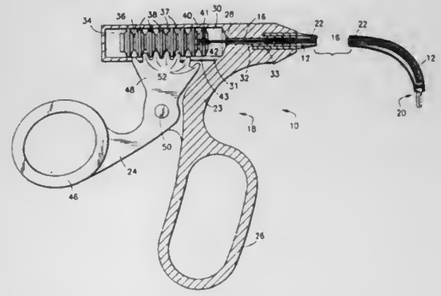
**LAPAROSCOPIC INSTRUMENT KIT INCLUDING A PLURALITY OF RIGID TUBES**

**Daniel Recuset, Miami, Fla., assignor to Symbiosis Corporation, Miami, Fla.**

**Filed Jun. 7, 1996, Ser. No. 660,395**

**Int. Cl.[6] A61B** *17/32*

**U.S. Cl. 606—170** **20 Claims**




1. A laparoscopic surgical instrument, comprising:

a) a flexible tuhular member;

b) a control member extending through said flexible tubular member;

c) an end effector coupled to said control member and said flexible tubular member;

d) an actuation handle coupled to said control member and said flexible tubular member for moving said control member and said flexible tubular member relative to each other so as to effect movement of said end effector; and

e) a substantially rigid tubular member extending over substantially all of said flexible tubular member distal of said actuation handle, said end effector extending distally beyond said substantially rigid tubular member,

said substantially rigid tubular member being coupled to one of said flexible tubular member and said actuation handle.

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**5,741,287**

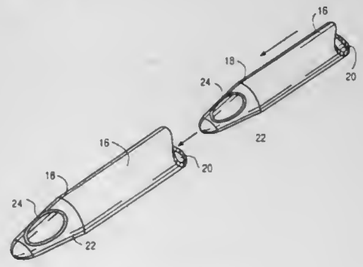
**SURGICAL TUBULAR CUTTER HAVING A TAPERING CUTTING CHAMBER**

**Donald L. Alden, Sunnyvale, and Jeffrey J. Christian, San Jose, both of Calif., assignors to Femrx, Inc., Sunnyvale, Calif.**

**Filed Nov. 13, 1996, Ser. No. 746,541**

**Int. Cl.[6] A61B** *17/32;17/20*

**U.S. Cl. 606—170** **15 Claims**




1. A tubular surgical cutter comprising:

a tubular body having a proximal end, a distal end, and a lumen therebetween;

an outer tip extending distally from the distal end of the tubular body, the outer tip having an aperture and an inner surface bordering a chamber, the chamber being in communication with the lumen of the tube and the aperture; and

an inner tip rotatably disposed within the chamber of the outer tip, the inner tip having an inner surface bordering a chamber and an aperture which cooperates with the aperture of the outer tip to sever tissues which protrude into the chamber when the inner tip rotates;

wherein the chamber of the inner tip receives the tissues along an axial cutting zone when the inner and outer apertures align, wherein a proximal end of one of the apertures defines a proximal end of the axial cutting zone, wherein a distal end of one of the apertures defines a distal end of the axial cutting zone, and wherein at least one of the chambers has a radius which decreases distally substantially throughout the axial cutting zone.

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**5,741,288**

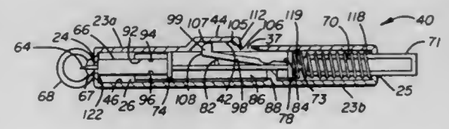
**RE-ARMABLE SINGLE-USER SAFETY FINGER STICK DEVICE HAVING RESET FOR MULTIPLE USE BY A SINGLE PATIENT**

**Douglas Earl Rife, Palo Alto, Calif., assignor to Chemtrak, Inc., Sunnyvale, Calif.**

**Filed Jun. 27, 1996, Ser. No. 670,513**

**Int. Cl.[6] A61B** *17/32*

**U.S. Cl. 606—181** **18 Claims**




1. A finger stick device for producing a plunge incision into the skin of a patient; said device comprising:

a housing having a first aperture;

a sharp lancet tip initially disposed within said housing;

a lancet support body disposed within said housing and connected to said lancet tip for supporting said lancet tip;

resettable force means coupled to said support body for storing energy and for releasing said stored energy to linearly move said lancet tip from a location inside said housing through said first aperture to a predetermined location outside of said housing;

resettable latch means for latching said force means in an energy storing state; and

resettable release means for releasing said latch means to allow said force means to release said stored energy to drive said lancet tip outwardly from said housing

wherein said resettable force means and resettable release means make up an autologous re-use feature, such that the finger stick device can be reset for use on the same patient in the event of an accidental release of stored energy producing linear movement of the lancet tip outwardly from the housing or in the event that a supplemental plunge incision is desired on the same patient,

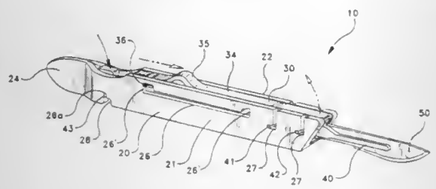
and a disabling means adapted to permanently disable the finger stick device comprising a plunger connected to said support body by a frangible neck section, said frangible neck adapted to be broken by rotation of said plunger relative to said support body,

wherein said rotation of the plunger is not automatic or coincident with the movement of the lancet through the aperture the retraction of the lancet and can be voluntarily and manually performed.

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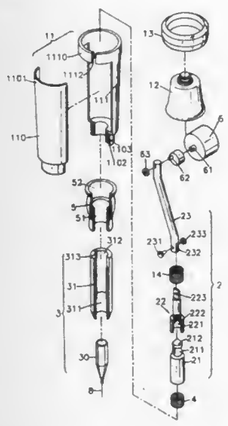
**5,741,289**
**CLEANABLE GUARDED SURGICAL SCALPEL WITH SCALPEL BLADE REMOVER**
**Neil Jolly, Brighton, Mass.; Craig D. Newman, New York, N.Y., and Robert W. Pierce, Wrentham, Mass., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.**
**Continuation of Ser. No. 547,699, Oct. 19, 1995. This application Nov. 25, 1996, Ser. No. 756,300**
**Int. Cl.[6] A61B *17/14***
**U.S. Cl. 606—181** **13 Claims**



1. A guarded surgical scalpel, comprising:
the elongate handle;
a guard mounted to the handle for longitudinal movement between an extended position and a retracted position and rotary movement with respect to the handle;
a blade carrier mounted to the guard for longitudinal movement with respect to the guard and rotary movement with respect to the handle; a blade mounted on the blade carrier and
a wedge movably mounted to the blade carrier, the wedge being movable to a position toward the blade carrier to facilitate removal of the blade from the blade carrier.

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**5,741,290**
**EYEBROW TATTOOING TOOL**
**Ta-Ching Hsieh, Taipei, Taiwan, assignor to Te-Shih Huang, Pan Chiao, Taiwan**
**Continuation-in-part of Ser. No. 290,328, Aug. 15, 1994, abandoned. This application Oct. 10, 1995, Ser. No. 541,560**
**Int. Cl.[6] A61B *17/34***
**U.S. Cl. 606—186** **4 Claims**



1. An eyebrow tattooing tool, comprising:
(a) a needle cannula for making punctures;
(b) a transmission shaft comprising a front section detachably inserted coupled to said needle cannula, an intermediate section detachably inserted to the front section, and a rear section detachably fixed to the intermediate section;
(c) a driving means detachably coupled to the rear section of said transmission shaft for driving said transmission shaft for reciprocating motion;
(d) a casing having a front casing and a rear casing for housing said driving means, a switch for controlling said driving means and a socket detachably connected to a power supply;
(e) a front cap housing said needle cannula;
(f) a rear cap detachably engaging with said front cap, for housing the front section of said transmission shaft; and
(g) a locking member detachably connected to said rear cap and securing said rear cap to said casing;
wherein said needle cannula, the front section, the intermediate section, the rear section of said transmission shaft, said front cap, said rear cap, and said locking member are detachable and disposable; and
wherein the front section is detachably inserted into the intermediate section of said transmission shaft and comprises:
an insertion member consisting of two split elastic pieces and having a small-diameter portion; and the intermeditate section comprises
a reception hole, said reception hole having a constricted portion detachably coupled to the small-diameter portion of said insertion member so as to secure the insertion member in position.

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**5,741,291**
**ACUPUNCTURE OF THE BLEEDING**
**Tae Woo Yoo, 807, 1-Dong, Hanyang, Apt. 32-5, Banpo-dong, Seocho-ku, Rep. of Korea**
**Filed May 20, 1996, Ser. No. 650,863**
**Claims priority, application Rep. of Korea, Feb. 23, 1996, 96-2699**
**Int. Cl.[6] A61B *17/34***
**U.S. Cl. 606—189** **14 Claims**

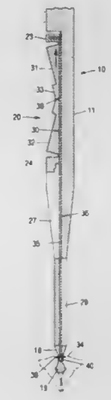


1. An acupuncture needle assembly comprising:
a portion tube including:
an open upper end, and
an open lower end;
an operating bar slidably positioned in said portion tube wherein said operating bar has an upper part extending out through said open upper end, said operating bar having means at a lower end thereof for holding one end of a needle such that an opposite end of said needle can extend through the open lower end of said portion tube;
an adjustment nut positionable at any of a plurality of different positions along said upper part of said operating bar to limit downward movement of said operating bar through said portion tube; and
a spring having one end applying a force against said operating bar and an opposite end applying a force against said portion tube, such that the operating bar is upwardly biased by the spring in said portion tube and such that the opposite end of said needle is retracted by the spring into said portion tube;
wherein depression of an upper end of said operating bar causes said operating bar to move downwardly in said portion tube against the force of said spring, by a distance limited by the adjustment nut, such that the opposite end of the needle exits the open lower end of said portion tube by a predetermined distance.



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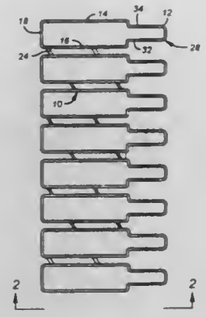
**5,741,292**
**PUNCTUM DILATING AND PLUG INSERTING INSTRUMENT WITH PUSH-BUTTON PLUG RELEASE**
**Richard Mendius, Millington, Tenn., assignor to Eagle Vision, Memphis, Tenn.**
**Continuation of Ser. No. 548,480, Oct. 26, 1995, abandoned. This application Apr. 28, 1997, Ser. No. 843,127**
**Int. Cl.[6] A61B *17/00***
**U.S. Cl. 606—191** **5 Claims**



1. A combination of a punctum plug and an instrument for retaining and releasing said punctum plug, comprising:
an elongated body having a forward end and a rear end, said elongated body having a recess extending longitudinally thereon;
a punctum plug positioned against said forward end of said body;
an elongated button positioned within said recess and flush with an outer surface of said elongated body, said button having a fixed end fixedly attached to said elongated body at one end of said recess and a slidable end slidable along said recess, said fixed end being positioned between said slidable end and said forward end of said body, said button having an outwardly bowing inner surface spaced from a bottom surface of said recess, so that when said button is depressed, said outwardly bowing inner surface is moved inwardly against said bottom surface of said recess, and said slidable end is moved longitudinally along said body away from said fixed end; and
a wire slidably positioned longitudinally along said body, said wire having an outer end extending from said forward end of said body and frictionally fitted in a mounting hole in said punctum plug, said wire having an inner end fixedly attached to said slidable end of said button, so that before said button is depressed, said punctum plug is retained against said forward end of said body by said wire, and when said button is depressed, said wire is pulled by said slidable end of said button away from said mounting hole of said punctum plug to release said punctum plug from said instrument.

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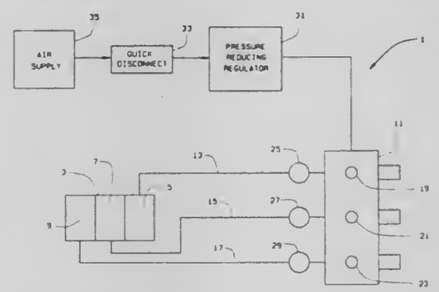
**5,741,293**
**LOCKING STENT**
**Bandula Wijay, 1903 Carriage Creek Dr., Friendswood, Tex. 77546**
**Filed Nov. 28, 1995, Ser. No. 563,375**
**Int. Cl.[6] A61M *29/00***
**U.S. Cl. 606—198** **34 Claims**



1. A stent, comprising:
a plurality of spaced-apart components having opposed ends, said components capable of being rolled into a tubular shape, by overlapping one end on said other end on said plurality of components without any one end passing through its respective component and further comprising a locking assembly which allows said rolled components to expand to at least one predetermined dimension and to lock such position against recoil by locking overlapping ends;
at least one crosstie connecting said components.

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**5,741,294**
**METHOD OF FIXSANGUINATION OF A LIMB**
**Brent B. Stromberg, 450 N. New Ballas Rd., Suite 250, St. Louis, Mo. 63141**
**Continuation of Ser. No. 634,361, Apr. 18, 1996, abandoned, which is a continuation of Ser. No. 337,972, Nov. 14, 1994, abandoned. This application Feb. 24, 1997, Ser. No. 803,778**
**Int. Cl.[6] A61H *1/00***
**U.S. Cl. 606—201** **1 Claim**




1. A method of exsanguination of a limb, comprising the steps of:
a) placing an unpressurized, multichambered tourniquet with substantially parallel and adjacent chambers around the limb proximal to and not covering the site to be exsanguinated;
b) pressurizing the most distal chamber to a pressure sufficient to stop the flow of blood in the limb;
c) maintaining the pressure in the most distal chamber while pressuring the adjacent chamber to substantially the same pressure as the most distal chamber;

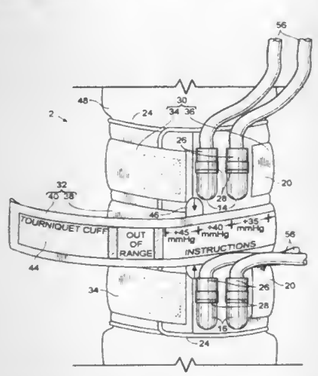
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d) maintaining the pressure in at least the most recently pressurized chamber while pressurizing the next proximal and adjacent chamber to substantially the same pressure as the most distal chamber;
e) repeating the above step until the most proximal chamber is pressurized;
f) maintaining the pressure of the most proximal chamber while the distal chambers are depressurized to allow any blood remaining in the distal part of the limb to flow under the distal chambers;
g) pressurizing the most distal chamber to a pressure sufficient to stop the flow of blood in the limb;
h) depressurizing the most proximal chamber;
i) repeating steps c–h, above, until degree of exsanguination is achieved; and
j) maintaining the exsanguination by slowing the cycling action of the chambers or by stoping the cycling action of the chambers and leaving at least one chamber pressurized to a level sufficient to prevent the flow of blood into the exsanguinated portion of the limb.

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**5,741,295**
**OVERLAPPING TOURNIQUET CUFF SYSTEM**
**James A. McEwen, 10551 Bamberton Drive, Richmond, Canada, V7A 1K6, assignor to James A. McEwen, Richmond, Canada**
**Continuation-in-part of Ser. No. 211,389, Jul. 25, 1994, Pat. No. 5,578,055, which is a continuation-in-part of Ser. No. 767,812, Sep. 30, 1991, Pat. No. 5,312,431. This application Jul. 10, 1996, Ser. No. 677,737**
**Int. Cl.[6] A61B *17/00***
**U.S. Cl. 606—202** **15 Claims**




1. An overlapping tourniquet cuff system comprising:
an inflatable bladder having a length selected to be greater than the circumference of a limb at a desired location;
a sheath containing the bladder and having an inner side adapted to face the limb, an outer side adapted to face away from the limb and a length greater than the length of the bladder, thereby establishing an inflating portion and a non-inflating portion of the sheath along the length of the sheath;
first sheath securing means having a first element on the outer side of the sheath, and a second element attached to the inner side of the sheath at a selected location on the non-inflating portion so that the second element engages the first element to secure the sheath when the sheath is applied around the limb;
second sheath securing means for securing the overlapping sheath in a substantially circumferential direction around the limb such that the sheath remains overlapped and secured if the second element of the first sheath securing means does not engage the first element of the first sheath securing means or becomes ineffective while the bladder is inflated to a pressure sufficient to occlude flow in blood vessels in the limb encircled by the sheath, and wherein the length of the sheath is sufficient for the inflating portion to overlap upon itself and for the non-inflating portion of the sheath to overlap the inflating portion when the sheath is applied circumferentially around the limb at the desired location, with the first and second sheath securing means securing the sheath around the limb; and
pressure regulator means adapted to supply the inflating portion of the sheath with pressurized gas.

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**5,741,296**
**INSTRUMENT FOR THE APPLICATION OF PROSTHESES INSIDE THE BODY**
**Lutz Freitag, Easen, Germany, assignor to Karl Storz GmbH & Co., Tuttlingen, Germany**
**PCT No. PCT/DE94/01269, § 371 Date Apr. 1, 1996, § 102(e) Date Apr. 1, 1996, PCT Pub. No. WO95/12356, PCT Pub. Date May 11, 1995**
**PCT Filed Oct. 28, 1994, Ser. No. 637,808**
**Claims priority, application Germany, Nov. 2, 1993, 43 37 370.4; May 26, 1994, 44 18 449.2**
**Int. Cl.[6] A61B *17/00***
**U.S. Cl. 606—205** **3 Claims**



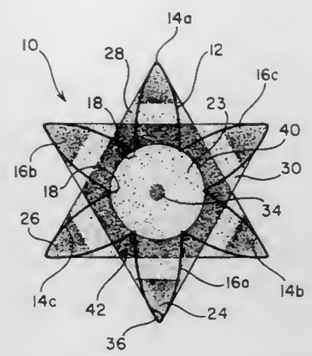
1. An instrument for inserting and holding a prosthesis in a body cavity comprising:
a shaft;
a pair of jaws mounted to said shaft, at least one of which jaws is movable relative to the other for closing and opening movement, respectively to grasp and to release a prosthesis;
a pair of handles mounted to said shaft, at least one of which is pivotally mounted and operatively connected to said jaws to cause said closing and opening movement respectively when brought toward one another or spread apart from one another;
releasable detention means so disposed and arranged as to latch said lever means together at a selected closed position to hold the prosthesis without maintaining a closure force on said lever means;
a sliding element slidably attached to said shaft, said sliding element having a spine extending adjacent to said shaft and a support element so disposed and arranged on said spine as be retractable from said jaws, and to be extendible beyond them, whereby a prosthesis held by the jaws may be engaged by the support while held by the jaws and inserted into the body and may remain in place to hold the prosthesis in position when the jaws release the prosthesis and the jaws and shaft are thereafter withdrawn from the body.

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**5,741,297**
**DAISY OCCLUDER AND METHOD FOR SEPTAL DEFECT REPAIR**
**Morris Simon, 8 Otis Pl., Boston, Mass. 02108**
**Filed Aug. 28, 1996, Ser. No. 697,832**
**Int. Cl.[6] A61B *17/08***
**U.S. Cl. 606—213** **29 Claims**

**29**. A septal defect occluder comprising:
a frame adapted to be inwardly radially collapsed from an expanded configuration to a collapsed configuration,
said frame in the expanded configuration including a first plurality of spaced arms extending radially in a first plane, said first arms each having a base end,
a second plurality of spaced arms extending radially in a second plane substantially parallel to and spaced from said first plane, said second arms each having a base end,

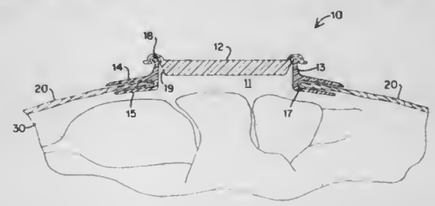




and a plurality of spaced loop joinder links extending between the base ends of said first and second arms, the base end of each of said first arms being connected by said plurality of loop joinder links to base ends of two arms in said second plurality of arms,
a first sheet of material supported by and extending over said first arms, and
a second sheet of material supported by and extending over said second arms.

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**5,741,298**
**METHOD AND DEVICES FOR VIDEO-ASSISTED SURGICAL TECHNIQUES**
**Cathel MacLeod, 244 Foreside Rd., Cumberland, Me. 04110**
**Continuation-in-part of Ser. No. 431,126, Apr. 28, 1995, abandoned. This application Nov. 26, 1996, Ser. No. 756,761**
**Int. Cl.[6] A61B *17/00***
**U.S. Cl. 606—213** **18 Claims**

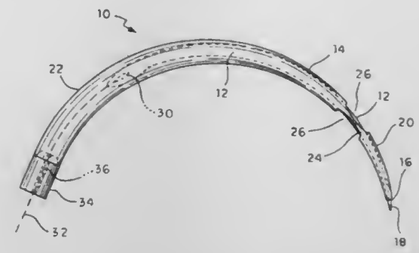


1. A device for sealing an incision made in a body wall having an exterior surface and an interior surface, said device comprising a compliant low-profile sealing ring and a sealing cap connectable to said sealing ring, said sealing ring having an inner opening region, a first section connected to a second section, and a third section connected to said second section, wherein said device is designed to be fitted into said incision such that said first section is in contact with said exterior surface surrounding said incision and said third section is in contact with said interior surface, wherein a thickness of said first section is designed to extend slightly above said exterior surface so as to minimize limitations on lateral movement within and below a level of said incision.

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**5,741,299**
**PUNCTURE-PROOF SUTURE NEEDLE ASSEMBLY**
**Louis L. Rudt, 1617 Crescent Ridge Rd., Daytona Beach, Fla. 32118**
**Filed Mar. 5, 1997, Ser. No. 811,899**
**Int. Cl.[6] A61B *17/04***
**U.S. Cl. 606—224** **8 Claims**

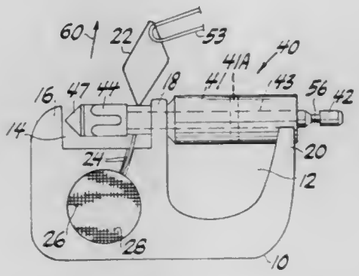
1. A puncture-proof suturing needle assembly comprising:



a surgical needle having a distal end with a sharp tip and a proximate end for securing a suturing medium to said surgical needle;
a casing closely sheathing said surgical needle and allowing freely slidable movement therein, said casing having a distal end and a proximate end, said distal end being tapered to a reduced diameter from said proximate end, said proximate end defining a first aperture for receiving the surgical needle therethrough and said distal end defining a second aperture for limiting protrusion of said sharp tip, said casing dimensioned in length to substantially exceed the length of said surgical needle; and
a suture guide for removably plugging said first aperture, said suture guide defining an eye hole for threading of said suturing medium therethrough.

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**5,741,300**
**SURGICAL ANCHOR AND PACKAGE AND CARTRIDGE FOR SURGICAL ANCHOR**
**Lehmann K. Li, Milford, Conn., assignor to Li Medical Technologies, Inc., Shelton, Conn.**
**Filed Sep. 10, 1996, Ser. No. 711,988**
**Int. Cl.[6] A61B *17/04***
**U.S. Cl. 606—232** **39 Claims**

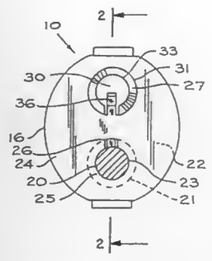


1. A cartridge for holding a surgical fastener in position for ease of handling, comprising:
a holder having a surface for grasping by a user, the holder having a concave surface for engagement with the surgical fastener and for fixing the fastener in position on the holder; and
a threading loop extending from the holder for extending through an aperture in the surgical fastener.

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**5,741,301**
**SELF LOCKING SUTURE LOCK**
**Anthony C. Pagedas, 8401 W. Edgerton, Greenfield, Wis. 53129**
**Continuation of Ser. No. 607,421, Feb. 28, 1996. This application Apr. 14, 1997, Ser. No. 840,287**
**Int. Cl.[6] A61B** *17/04*
**U.S. Cl. 606—232** **2 Claims**




1. A method for using a one-piece self locking suture lock with suture material at a surgical site by utilizing a laparoscopic tube, the self locking suture lock including a body having a front side, a back side, a first stitch lock opening, and a second stitch lock opening; said first stitch lock opening being cone-shaped, having an outer edge, and having a larger diameter on said front side and a smaller diameter on said back side; said second stitch lock opening being cone-shaped, having an outer edge, and having a larger diameter on said back side and a smaller diameter on said front side; said first stitch lock opening having an integral tongue connected to said outer edge of said first stitch lock opening near said front side and extending diametrically at an angle from said front side toward said back side; said second stitch lock opening having an integral tongue connected to said outer edge of said second stitch lock opening near said back side and extending diametrically at an angle from said back side toward said front side, said method comprising the steps of:
passing said self locking suture lock through said laparoscopic tube to said surgical site;
threading said suture material through said first opening in said self locking suture lock;
passing said suture material through the tissue to be sutured;
threading said suture material through said second opening in said self locking suture lock.

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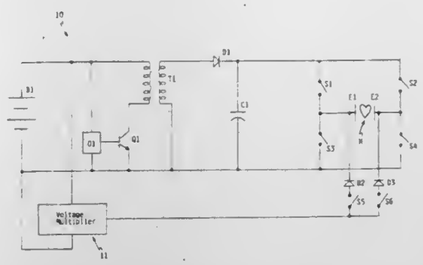
**5,741,302**

**Patent Not Issued For This Number**

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**5,741,303**
**ELECTRODE BACK-CHARGING PRE-TREATMENT SYSTEM FOR AN IMPLANTABLE CARDIOVERTER DEFIBRILLATOR**
**Mark W. Kroll, 651 Carnellon Ct., Simi Valley, Calif. 93065, and Kai Kroll, 5217 W. Mill Rd., Minnetonka, Minn. 55345**
**Continuation of Ser. No. 119,487, Sep. 13, 1993, abandoned. This application Sep. 5, 1995, Ser. No. 523,718**
**Int. Cl.[6] A61N** *1/39*
**U.S. Cl. 607—5** **6 Claims**

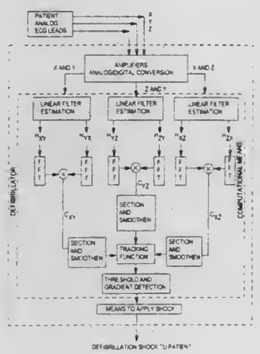
1. An improved implantable cardioverter defibrillator apparatus for producing a capacitive-discharge cardioversion/defibrillation countershock to be delivered through defibrillation electrodes adapted to be implanted in a human patient, the apparatus being a self-contained human implantable device including a pulse-generating capacitor system that stores an electrical charge, a battery system that internally charges the capacitor system, a sensing system that senses cardiac activity of the human patient




and detects cardiac dysrythmias, and a control system which, in response to a detected cardiac dysrhythmia, selectively charges and discharges the capacitor system through the defibrillation electrodes to generate the capacitive-discharge cardioversion/defibrillation countershock, the improvement comprising:
means to deliver a back-charging pretreatment pulse to the defibrillation electrodes immediately prior to delivery of the cardioversion/defibrillation countershock, the back-charging pretreatment pulse being a low-energy pulse having a polarity opposite from an initial polarity of the cardioversion/defibrillation countershock such that an inter-electrode impedance of the defibrillation electrodes is reduced and a current of the cardioversion/defibrillation countershock is increased.

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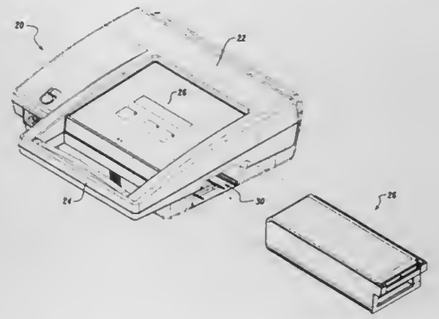
**5,741,304**
**MULTIDIRECTIONAL ECG COHERENT OPTIMAL TIMING OF DEFIBRILLATION SHOCKS**
**Abhijit R. Patwardhan, and Fabio M. Leonelli, both of Lexington, Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.**
**Filed Oct. 17, 1995, Ser. No. 544,301**
**Int. Cl.[6] A61N** *1/39;* **A61B** *5/046*
**U.S. Cl. 607—5** **11 Claims**




1. A method of determining an optimal time to apply a defibrillation shock to a heart which comprises the steps of:
obtaining an electrocardiogram of a heart in at least two directions;
determining a time-coherency of said electrocardiogram based upon each of said at least two directions;
computing a tracking function from said time-coherency; and
locating a local maximum of said tracking function which exceeds a preset defibrillation threshold, which local maximum represents an optimal time to apply a defibrillation shock to said heart; and
delivering a defibrillation shock to the heart at said optimal time.



**5,741,305**
**KEYED SELF-LATCHING BATTERY PACK FOR A PORTABLE DEFIBRILLATOR**
**Stephen T. Vincent, Redmond; Shawn R. Bertagnole, Seattle, and Richard J. Cardin, Duvall, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.**
**Filed May 6, 1996, Ser. No. 643,467**
**Int. Cl.[6] A61N** *1/39*
**U.S. Cl. 607—5** **4 Claims**

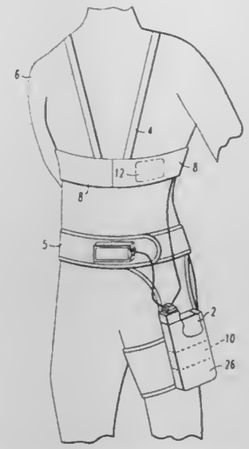



1. A battery pack for use in a portable defibrillator having a battery well, the battery pack comprising:
(a) a parallelepiped body having a front and a back;
(b) a cell having a positive terminal and a negative terminal contained within the body;
(c) a pair of conductive contacts located on the back of the body, one of the pair of conductive contacts coupled to the positive terminal of the cell and the other of the pair of conductive contacts coupled to the negative terminal of the cell;
(d) a latch located on the front of the body, the latch having a latch member that is movable between an extended position wherein the latch member protrudes from the body, and a retracted position wherein the latch member does not protrude from the body; and
(e) biasing means to bias the latch member in the extended position, wherein partial insertion of the battery pack into the battery well causes the latch member to move to the retracted position, the biasing means returning the latch member to the extended position after the battery pack is fully inserted in the battery well in order to secure the battery pack in the battery well of the defibrillator.

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**5,741,306**
**PATIENT-WORN ENERGY DELIVERY APPARATUS**
**John A. Glegyak, Washington County, and David J. Peduzzi, Westmoreland County, both of Pa., assignors to Lifecor, Inc., Pittsburgh, Pa.**
**Filed May 23, 1996, Ser. No. 651,274**
**Int. Cl.[6] A61N** *1/39*
**U.S. Cl. 607—5** **32 Claims**

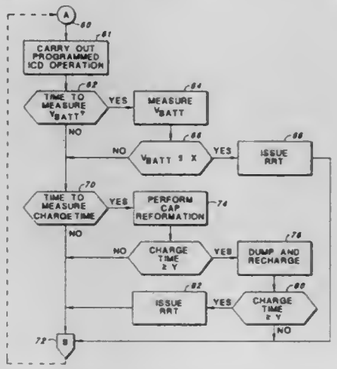
1. A patient-worn energy delivery apparatus for imparting electrical therapy to the body of a patient responsive to an occurrence of a treatable condition, the apparatus comprising:
a. a voltage converter for converting electrical energy from an initial voltage to a final voltage, the converter converting the energy at a plurality of charging rates, the converter including an inductive-boost generator having an output voltage level;
b. a defibrillator adapted to be electrically coupled between the converter and the patient, the defibrillator having an energy reservoir for receiving the electrical energy at the plurality of charging rates from the converter, the defibrillator producing preshaped electrical pulses therefrom, the electrical pulses being one of defibrillation pulses and cardioversion pulses; and




c. an energy delivery controller adapted to be electrically coupled to the patient and the converter and the defibrillator, the controller causing the converter to provide the electrical energy to the defibrillator at selected ones of the plurality of charging rates, the controller causing the defibrillator to apply a selectable portion of the electrical energy in the form of one of the defibrillation pulses and the cardioversion pulses to the body of the patient, responsive to the occurrence of the treatable condition.

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**5,741,307**
**METHOD FOR DETERMINING AN ICD REPLACEMENT TIME**
**Mark W. Kroll, Simi Valley, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.**
**Filed Jan. 21, 1997, Ser. No. 784,566**
**Int. Cl.[6] A61N** *1/39*
**U.S. Cl. 607—5** **30 Claims**




1. In an implantable cardioverter/defibrillator (ICD) having a battery, a capacitor and control logic and timing circuitry, an improved method of determining when to issue a recommended replacement time (RRT) signal corresponding to a recommended time to replace the ICD, the method comprising:
a) periodically measuring a first indicator of battery strength;
b) comparing the first measurement with a first predetermined threshold;
c) issuing an RRT signal in the event the first measurement is equal to or falls beyond the first predetermined threshold;

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d) periodically measuring a second indicator of battery strength, which indicator is affected by the internal impedance of the battery and wherein the period between measurements is selected independently of the period between measurements of the first indicator;

d) comparing the second measurement with a second predetermined threshold; and

f) issuing an RRT signal in the event the second measurement is equal to or falls beyond the second predetermined threshold.

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**5,741,308**

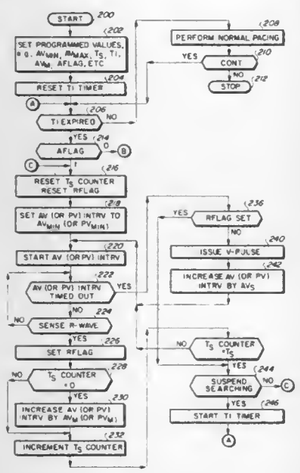
**DUAL-CHAMBER IMPLANTABLE PACEMAKER AND METHOD OF OPERATING SAME FOR AUTOMATICALLY SETTING THE PACEMAKER'S AV INTERVAL AS A FUNCTION OF A NATURAL MEASURED CONDUCTION TIME**

**Jason A. Sholder, Beverly Hills, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.**

**Continuation-in-part of Ser. No. 225,226, Apr. 8, 1994, abandoned, which is a continuation-in-part of Ser. No. 219,065, Mar. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 976,153, Nov. 13, 1992, Pat. No. 5,334,220. This application May 15, 1995, Ser. No. 440,599**

**Int. Cl.[6] A61N** *1/365*

**U.S. Cl. 607—9** **16 Claims**




1. A method of operating a dual-chamber implantable pacemaker, the pacemaker having sensing means for sensing atrial and ventricular activity, generating means for generating atrial and ventricular stimulation pulses, and timing means for setting an AV interval that defines the maximum time permitted by the pacemaker after atrial activity before a ventricular stimulation pulse (V-pulse) is generated, and wherein sensed atrial activity comprises a natural atrial depolarization (P-wave) and sensed ventricular activity comprises a natural ventricular depolarization (R-wave),the method comprising:

(a) sensing P-waves and R-waves with the sensing means;

(b) generating atrial and ventricular stimulation pulses with the generating means for maintaining a specified cardiac rhythm;

(c) determining an AR interval as the time interval between atrial activity and a sensed R-wave, where atrial activity comprises either a sensed P-wave or the generation of an atrial stimulation pulse (A-pulse) by the generating means, whichever occurs first in a given cardiac cycle; and

(d) setting the AV interval of the pacemaker to be equal to the determined AR interval ±þ, where þ is a time increment ranging from 1 to 100 msec.

**5,741,309**

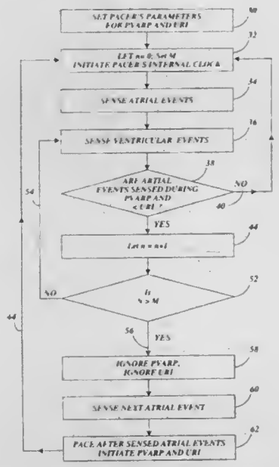
**BREAK ALGORITHM FOR PR+PVARP BLOCK**

**Albert Maarse, SX Aalsmeer, Netherlands, assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.**

**Filed Feb. 18, 1997, Ser. No. 802,543**

**Int. Cl.[6] A61N** *1/362*

**U.S. Cl. 607—9** **11 Claims**




1. A method of pacing the heart of a congestive heart failure patient, said method utilizing a dual chamber cardiac pacer of the type having means for sensing atrial and ventricular events, a microprocessor-based controller coupled to the sensing means, and means controlled by the microprocessor-based controller for pacing the atrium and ventricles of a heart, the method comprising the steps of:

a) sensing atrial activity and transmitting a signal associated with said atrial activity to said microprocessor-based controller;

b) sensing ventricular activity and transmitting a signal associated with said ventricular activity to said microprocessor-based controller;

c) selecting a mode of the cardiac pacer to sense an atrial event and pace a corresponding ventricle after a preselected lapse of time following the sensed atrial event wherein a timing interval between sensing the atrial event and pacing the corresponding ventricle is controlled by said microprocessor based controller;

d) establishing in the micro-processor based controller a post ventricular atrial refractory period (PVARP) and an upper rate interval (URI); then

e) detecting an atrial event occurring during said PVARP; and

f) then, resetting the timing interval of the microprocessor based controller after detecting an atrial event occurring during said PVARP.

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**5,741,310**

**SYSTEM AND METHOD FOR HEMODYNAMIC PACING IN VENTRICULAR TACHYCARDIA**

**Frederik H. M. Wittkampf, Bilthoven, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.**

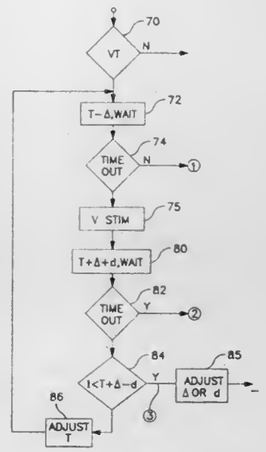
**Filed Oct. 26, 1995, Ser. No. 548,541**

**Int. Cl.[6] A61N** *1/365;1/37*

**U.S. Cl. 607—14** **23 Claims**

1. An implantable cardiac pacing system, having a controllable pulse generator for generating pacing pulses and a lead for delivering pacing pulses to a patient's ventricle and for sensing natural heartbeats in said patient's ventricle, VT means for detecting when said patient is in ventricular tachycardia, response means for






responding to detected VT by controlling said pulse generator to deliver pace pulses in a 1:2 relation to the patient's natural cardiac rhythm during said VT, said response means having:

measure means for determining a measure of the patient's natural rhythmic interval (T) during said VT;

determining means operative after a sensed natural heartbeat for determining, based on said measure of T, a time of expected occurrence of the patient's next natural heartbeat; and

control means for controlling said pulse generator to generate a pacing pulse following a ventricular sense and before the said next expected natural heartbeat, said pacing pulse to precede said next expected heartbeat by a predetermined time greater than 30 ms and less than 150 ms.

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**5,741,311**

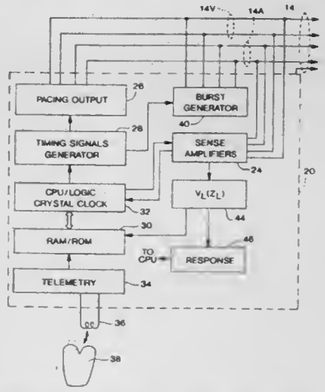
**IMPLANTABLE MEDICAL DEVICE SYSTEM WITH METHOD FOR DETERMINING LEAD CONDITION**

**Rick D. Mc Venes, Isanti; Brent A. Bahr, Big Lake, and Terrence R. Hudrlik, Blaine, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.**

**Filed Jun. 27, 1996, Ser. No. 671,437**

**Int. Cl.[6] A61N** *1/37*

**U.S. Cl. 607—28** **17 Claims**




1. An implantable pacemaker system, comprising a pacemaker and a lead, the pacemaker having means for delivering pace pulses to a patient's heart through the lead and the pacemaker having means for sensing patient heart signals through the lead, the system having lead impedance means for obtaining a measure of a lead impedance, said lead impedance means further comprising a controllable burst generator for delivering to said lead an AC burst having a duration in a range of 50–125 ms and a limited current, and timing means for controlling the timing of said burst to follow a delivered pace pulse so that said burst is delivered substantially within a refractory period of the patient's heart following delivery of said pace pulse.

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**5,741,312**

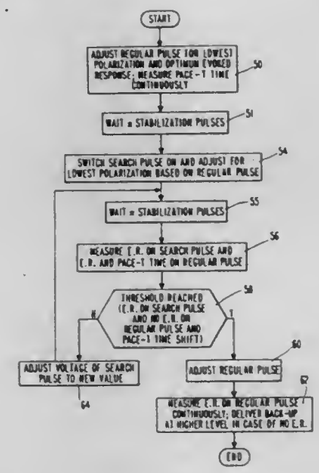
**PACEMAKER SYSTEM AND METHOD WITH IMPROVED CAPTURE DETECTION AND THRESHOLD SEARCH**

**Bernardus F. M. Vonk, Wehl; Geeske van Oort, Nieuwleusen, and Johannes S. van der Veen, Dieren, all of Netherlands, assignors to Vitatron Medical, B.V., Dieren, Netherlands**

**Filed Mar. 12, 1997, Ser. No. 820,445**

**Int. Cl.[6] A61N** *1/362*

**U.S. Cl. 607—28** **20 Claims**




17. A cardiac pacemaker system, having a stimulus generator for generating stimulus pulses, lead delivery means for delivering said pulses to at least one electrode positioned in a patient's heart,

sensing means for sensing electric signals at said electrode following delivery of a stimulus pulse, and capture means for determining when a delivered stimulus has evoked a cardiac response, said capture means comprising:

polarization control means for adjusting at least one parameter of said stimulus pulses so as to minimize polarization at said electrode resulting from a delivered pace pulse, stabilization control means for determining when said stimulus generator has generated said adjusted stimulus parameters for at least a predetermined stabilization interval, and

detection means operative after said stabilization interval for sensing the signals at said electrode following one or more delivered adjusted stimulus pulses, and for determining from said sensed signal or signals whether said stimulus pulse is capturing the patient's heart.

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5,741,313

## IMPLANTABLE MEDICAL DEVICE WITH A REDUCED VOLUMETRIC CONFIGURATION AND IMPROVED SHOCK STABILIZATION

Dion Frank Davis, Palmdale; Buehl E. Truex, Glendora; Clyde K. Nason, Valencia, and William H. Stutz, Jr., Eagle Rock, all of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.

Filed Sep. 9, 1996, Ser. No. 711,012
Int. Cl.[6] A61N *1/375*
U.S. Cl. 607—36 34 Claims



1. An implantable cardiac stimulation device having internal components optimally configured to reduce the overall volumetric displacement of the device comprising:

a container defining an interior region for holding an assembly of electronic components, the electronic components operating to deliver an electric shock to a patient in response to a cardiac arrhythmia, the assembly of electronic components comprising:

a voltage discharge module generating a high-voltage electric charge for delivering the electric shock to the patient, the voltage discharge module having an electrical substrate formed with an aperture therethrough;

a battery connected to the voltage discharge module for supplying electrical energy to generate the high-voltage electric charge; and

a cardiac discharge capacitor assembly connected to the voltage discharge module for temporarily storing the high-voltage electric charge, the cardiac discharge capacitor assembly having an electrical connector lead directly inserted through the substrate aperture for establishing electrical communication with the voltage discharge module and achieving a reduced volumetric configuration for the stimulation device; and

adhesive tape means for joining the voltage discharge module, the battery, and the capacitor assembly into a single, rigid assembly, thereby stabilizing the assembly against shock movement within the housing.

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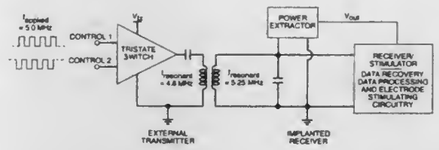
5,741,314

## EMBEDDED DATA LINK AND PROTOCOL

Christopher Newton Daly, 95 Cheryl Crescent, Bilgua Plateau, NSW 2107, and Hugh McDermott, 51 Neill Street, Carlton, Victoria 3053, both of Australia

Filed Sep. 4, 1996, Ser. No. 708,348
Claims priority, application WIPO, Oct. 19, 1995, PCT/AU95/00694
Int. Cl.[6] A61N *1/00*
U.S. Cl. 607—60 73 Claims

1. A transmission system comprising an RF transmitter coil; an RF receiver coil in close wireless proximity to said transmitter coil; means for applying to said transmitter coil an RF transmission signal representing a first bit value by N successive cycles of an RF carrier frequency and representing a second bit value by the suppression of RF carrier transmission for M successive cycles; the degree of inter-coil interaction determining the number of cycles of RF carrier frequency induced in said receiver coil in response to the transmission of successive bits of said first value, said inter-coil interaction being affected by inter-coil coupling, inter-coil distance and the Q values of said transmitter and receiver coils; and means for operating on the RF signal induced in said receiver coil to unambiguously determine the number P of transmitted bits of said first value; said operating means including means for counting modulo N, after an initial offset, the number of RF cycles induced in said receiver coil, and said inter-coil interaction being limited to a range that allows a unique number of induced cycles to be counted for each number P of transmitted bits of said first value.



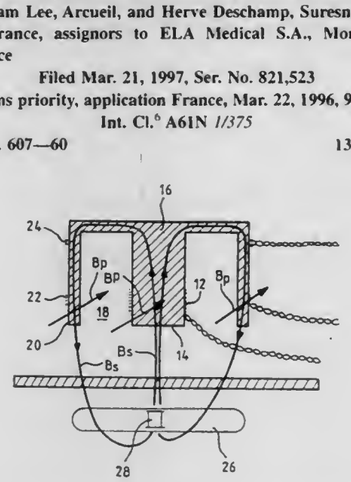

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5,741,315

## APPARATUS FOR RECEIVING TELEMETRY SIGNALS FROM ACTIVE IMPLANTABLE MEDICAL DEVICES

Chik Yam Lee, Arcueil, and Herve Deschamp, Suresnes, both of France, assignors to ELA Medical S.A., Montrouge, France

Filed Mar. 21, 1997, Ser. No. 821,523
Claims priority, application France, Mar. 22, 1996, 96 03607
Int. Cl.[6] A61N *1/375*
U.S. Cl. 607—60 13 Claims




1. Apparatus for the reception of a signal emitted by an active implanted medical device (**26**) comprising a means for collecting a signal (**10**) having magnetic induction field lines for the reception of magnetic induction comprising a useful component ($B_s$) emitted by the implanted device and a parasitic component ($B_p$) of external origin, characterized in that the signal collectors means comprises at least one collecting coil (**12**) wound on a first portion (**14**) of a magnetic circuit and at least one compensation coil (**22**) wound on a second portion (**20**) of said magnetic circuit, the first and second portions of the magnetic circuit comprising a common magnetic element (**16**) and being configured in a manner such that, when the signal collection means is disposed proximate to the implanted device, the collecting coil is crossed once by the magnetic induction field line of the useful component ($B_s$) and the compensation coil is crossed twice, in opposite directions, by said same magnetic induction field lines.

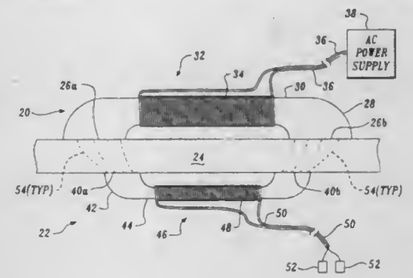


5,741,316

## ELECTROMAGNETIC COIL CONFIGURATIONS FOR POWER TRANSMISSION THROUGH TISSUE

James C. Chen, Bellevue; Brian D. Wilkerson, Redmond; Darrin Huston, and David J. Brown, both of Enumclaw, all of Wash., assignors to Light Sciences Limited Partnership, Issaquah, Wash.

Filed Dec. 2, 1996, Ser. No. 756,945
Int. Cl.[6] A61N *1/378;1/36;1/00*
U.S. Cl. 607—61 34 Claims




10. A system for transferring power transcutaneously to energize an implanted medical device within a patient's body, comprising:

(a) a transmitter coil adapted to be disposed external to the patient's body, said transmitter coil including:

(i) a transmitter corn of a magnetically permeable material having a first pole face coupled to a second pole face by an intermediate section; and

(ii) a plurality of turns of an electrical conductor wound around said intermediate section;

(b) a receiver coil adapted to be disposed subdermally, inside the patient's body, said receiver coil including:

(i) a receiver core of a substantially solid and magnetically permeable material having a first pole face coupled to a second pole face by an intermediate section, said first and second pole faces having a substantially different transverse cross-sectional area than the first and second pole faces of the transmitter coil; and

(ii) a plurality of turns of an electrical conductor wound around said intermediate section and having ends adapted to couple to the medical device; and

(c) a power supply adapted to couple to the turns of the electrical conductor wound around the intermediate section of the transmitter core, said power supply supplying a time varying electrical current to energize the transmitter coil, producing an electromagnetic field that couples transcutaneously with the receiver coil, causing a corresponding electrical current to flow in the receiver coil for energizing the medical device implanted inside the patient's body.

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5,741,317

## SUBMERSIVE THERAPY APPARATUS

Alvin Stewart Ostrow, Raanana, Israel, assignor to Electromagnetic Bracing Systems, Ltd., Ra'anana, Israel

Filed Jun. 14, 1996, Ser. No. 665,092
Claims priority, application Israel, Jun. 15, 1995, 114162
Int. Cl.[6] A61H *33/00*
U.S. Cl. 607—85 7 Claims

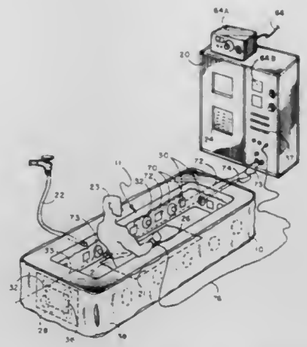
1. A submersive therapy apparatus comprising:

a tub having a floor, sides and an inner lining;

an aqueous solution disposed within said tub;

a multiple arrangement of electrodes housed around said sides and floor of said inner lining of said tub, said tub being of various shapes and sizes;

an electrotherapy device for providing alternating positive and negative currents to said electrodes to be used in contact with said aqueous solution for physiotherapy or iontophoresis treatment;




an ultrasound device for providing ultrasound treatment by an array of multiple ultrasound treatment heads disposed around said sides and floor of said inner lining of said tub,

a magnetotherapy device for providing magnetotherapy by an array of magnetotherapy coils contained within said sides of said tub;

said apparatus characterized by being versatile and compatible with commercially available ultrasound and electrotherapy stimulation devices, said apparatus further including means for connecting an adapter console with a male or female jack adapter to accommodate said commercially available ultrasound and said commercially available electrotherapy stimulation devices for the providing of physiotherapy and enhanced drug delivery depth penetration by physical stimulation and acceleration of metabolic absorption resulting from enhanced membrane permeability of a patient's skin by acoustic, electrical, or electromagnetic energies.

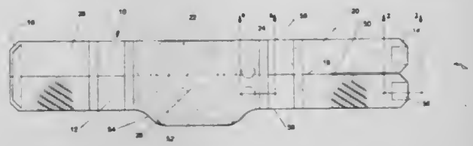
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5,741,318

## ELASTIC BACK WRAP HAVING DIAMOND-SHAPED THERMAL PATTERN AND ANTI-SLIP MEANS

William R. Ouellette, Cincinnati, Ohio; Sandra H. Clear, Longwood, Fla.; Kurt E. Holstein, Cincinnati, Ohio; Elizabeth M. Harvey; Timothy A. Burkett, both of West Chester, Ohio, and Jean Mallett, Lebanon, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 496,373, Jun. 29, 1995. This application Jul. 26, 1996, Ser. No. 686,800
Int. Cl.[6] A61F *7/10*
U.S. Cl. 607—108 1 Claim



1. A disposable elastic back wrap comprising:

a) a substantially rectangular piece of flexible web having a first end and a second end and an elastic portion therebetween stretchable along a longitudinal axis of said piece of flexible web, said piece of flexible web having a length great enough to encircle a user's waist such that said first and second ends overlap, said first end having a reclosable fastening system for attaching said first end to said piece of flexible web near said second end in order to hold said piece of flexible web around said user's waist when said piece of flexible web is stretched, said fastening system having a plurality of hook members which engage loop fibers of said piece of flexible web anywhere along said piece of flexible web in order to adjust said wrap to a variety of user waist sizes and to attain a comfortable level of elastic tension;

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b) a plurality of individual heat generating thermal elements encapsulated within said piece of web, said plurality of the thermal elements having an oxygen activated chemistry and a substantially planar diamond-shaped pattern which approximates the shape of erector muscles in the user's back; and

c) a means for increasing friction between said piece of flexible web and a user's body in order to reduce slippage of said back wrap during use.

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**5,741,319**

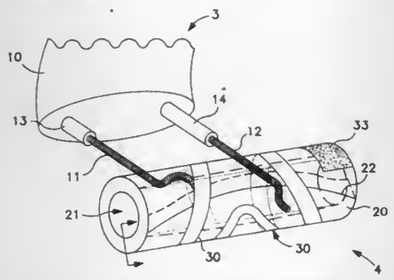
**BIOCOMPATIBLE MEDICAL LEAD**

**Jean Woloszko, Jupille, Belgium; Patrick T. Cahalan, Geleen, Netherlands; Marc Hendriks, Hoensbroek, Netherlands, and Michel Verhoeven, Maastricht, Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.**

**Filed Jan. 27, 1995, Ser. No. 379,423**

**Int. Cl.[6] A61N *1/05***

**U.S. Cl. 607—118** **23 Claims**




1. A system for stimulating body tissue comprising:

a pulse generator;

a conductor having a first end and a second end, the conductor covered between the first end and the second end by an insulator, the first end connected to the pulse generator;

a biocompatible member, wherein the biocompatible member is a cuff, the second end of said conductor connected to the biocompatible member, the biocompatible member constructed from collagen, the member further having a first layer and a second layer, the first layer cross-linked to a first percentage and the second layer cross-linked to a second percentage, whereby the second layer is interior of the first layer, the second layer adapted to be positioned adjacent a body tissue to be stimulated wherein the cuff further comprises a ribbon member biasing the cuff into a first position.

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**5,741,320**

**CATHETER CONTROL SYSTEM HAVING A PULLEY**

**Peter Thornton, Los Altos; Tracy D. Maahs, San Jose; Robert C. Hayzelden, Canyon Lake, and Miriam H. Taimisto, Anaheim Hills, all of Calif., assignors to Heart Rhythm Technologies, Inc., Temecula, Calif.**

**Filed May 2, 1995, Ser. No. 433,229**

**Int. Cl.[6] A61M *37/00***

**U.S. Cl. 607—122** **41 Claims**

1. A catheter having a deflectable distal tip, the catheter comprising:

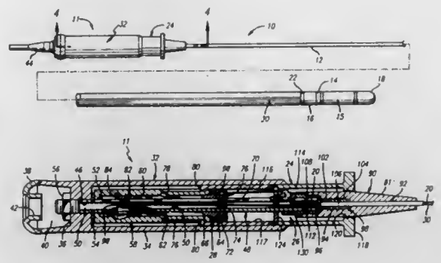
a resilient body member having a distal end and a proximal end;

a manipulation handle attached to the proximal end of the body member having first and second elements movable in relation to each other;

a pulley bracket mounted in the handle and movable in relation to the first and second elements;

a pulley rotatably mounted to the pulley bracket;

a pulley cable engaged with the pulley having first and second ends, the first end of the cable affixed to the first element and the second end of the cable affixed to the second element;



a deflection control line mounted in the body member and connected at a proximal end to the pulley bracket and extending into and attached at the distal end of the body member; and

whereby movement of the first and second elements in relation to each other results in movement of one end of the pulley cable to cause the pulley bracket to move the control line in the distal end of the body member causing deflection of the distal end of the body member with greater mechanical advantage.

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**5,741,321**

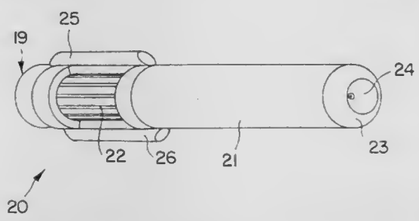
**ACTIVE FIXATION MEDICAL ELECTRICAL LEAD HAVING IMPROVED TURNING TOOL**

**Kenneth R. Brennen, Fridley, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.**

**Filed Jan. 11, 1996, Ser. No. 585,218**

**Int. Cl.[6] A61N *1/05***

**U.S. Cl. 607—127** **6 Claims**




1. A medical electrical lead system comprising:

a medical electrical lead, the lead having a fixation helix coupled to a first end of a coiled conductor, a second end of the coiled conductor coupled to a connector pin, the coiled conductor covered between the first end and the second end by an insulative sheath, a sealing ring mounted to a proximal end of the insulative sheath; and

a turning tool coupled to the connector pin, the turning tool having a housing, the housing having proximal end and a distal end, the distal end having a distal lumen, the distal lumen sized to frictionally engage the sealing ring, a roller assembly mounted with the housing and rotatable relative to the housing, the roller assembly having a inner lumen having an inner lumen diameter, the inner lumen diameter sized to frictionally engage the connector pin whereby rotation of the roller assembly relative to the housing causes the connector pin to rotate relative to the sealing ring.



**5,741,322**

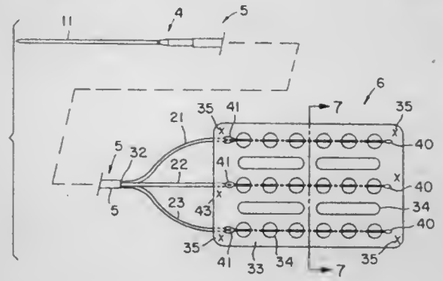
**TEMPORARY MEDICAL ELECTRICAL LEAD**

**Hormoz Mehmanesh; Werner Saggau, both of Heidelberg, Germany; Karel F. A. A. Smits, Oirsbeck, and Chrit W. Dreessen, Stein, both of Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.**

**Continuation of Ser. No. 184,712, Jan. 21, 1994, Pat. No. 5,527,358. This application Feb. 1, 1996, Ser. No. 596,395**

**Int. Cl.[6] A61N *1/04***

**U.S. Cl. 607—129** **10 Claims**




1. A temporary medical electrical lead comprising:

a pad having at least one hole; and

a member, the member comprising a conductor having a distal region and a proximal region and an insulative sleeve covering the proximal region of conductor, the distal region of the conductor mounted within the pad in a position in which the member intersects the at least one hole, the distal region of the conductor having a means for temporarily affixing the conductor to the pad.

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**5,741,323**

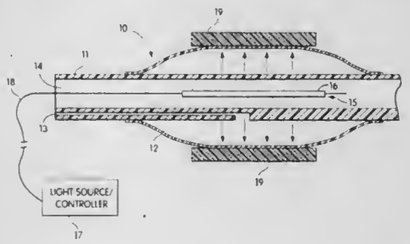
**POLYMERIC ARTICLE FOR INTRALUMINAL PHOTOTHERMOFORMING**

**Chandrashekhar P. Pathak, Waltham; Amarpreet S. Sawhney, Newton; Jeffrey A. Hubbell, Concord; Stephen J. Herman, Andover, all of Mass.; Laurence A. Roth, Windham, N.H.; Patrick K. Campbell, Georgetown; Kevin M. Berrigan, Woburn, both of Mass.; Peter K. Jarrett, Southbury, Conn., and Arthur J. Coury, Boston, Mass., assignors to Focal, Inc., Lexington, Mass.**

**Continuation-in-part of Ser. No. 54,385, Apr. 28, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 477,370**

**Int. Cl.[6] A61F *2/06***

**U.S. Cl. 623—1** **24 Claims**




1. An article constructed and arranged for paving or stabilizing an irregularly contoured tissue surface of a lumen or hollow organ of a mammal, comprising:

a polymeric structure having a surface that is softenable and thereby moldable in vivo, under conditions tolerable by a tissue surface, into intimate and conforming contact with the tissue surface; and

a chromophore, added to the polymeric structure, selected to absorb a predetermined wavelength range of electromagnetic radiation thereby rendering the surface of the polymeric structure softenable and moldable in vivo under the conditions tolerable by the tissue surface.

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**5,741,324**

**METHOD FOR MANUFACTURING A STENT AND STENT OBTAINED WITH SAID METHOD**

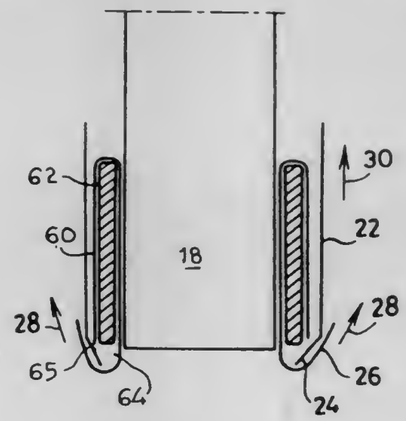
**Hendrik Glastra, Enschede, Netherlands, assignor to Cordis Corporation, Miami, Fla.**

**Filed Jan. 24, 1996, Ser. No. 590,903**

**Claims priority, application Germany, Jan. 26, 1995, 9500147**

**Int. Cl.[6] A61F *2/06***

**U.S. Cl. 623—1** **20 Claims**




1. A method for manufacturing an implantable stent having inner and outer walls enclosing a curable material, comprising the steps of:

forming a cylindrical sleeve from a biocompatible foil having a diameter approximately equal to the desired diameter of the implantable stent, the sleeve having opposing first and second ends;

grasping the first end of said sleeve and folding it onto itself so as to define a skirt which extends lengthwise along said sleeve which forms a double-wall sleeve portion, the second end of said sleeve extending lengthwise past said sleeve first end, said skirt and said sleeve cooperating to define an annular space therebetween;

inserting a curable material within the annular space along said double-wall sleeve portion;

grasping said second end of said sleeve and folding it back upon said first end of said sleeve to completely envelop said curable material with said sleeve and within said annular space thereof; and,

connecting said sleeve second end to said sleeve proximate to said sleeve first end to seal said curable material within said sleeve.

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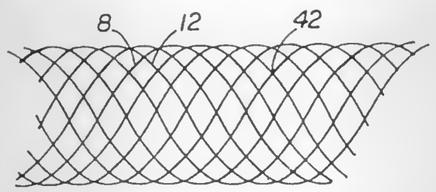


5,741,325

## SELF-EXPANDING INTRALUMINAL COMPOSITE PROSTHESIS

Elliot L. Chaikof, Dunwoody, and Peter J. Ludovice, Atlanta, both of Ga., assignors to Emory University, and Georgia Tech Research Corp., both of Atlanta, Ga.

Continuation of Ser. No. 131,156, Oct. 1, 1993, abandoned. This application May 3, 1996, Ser. No. 657,975
Int. Cl.[6] A61F 2/06;2/04
U.S. Cl. 623—1 22 Claims




1. A self-expanding intraluminal composite prosthesis, comprising: an elongated hollow tubular shaped member having a body portion, the body portion being formed by at least one layer of a composite material, the composite material being comprised of a plurality of strands of a reinforcing fiber and a plurality of strands of a sealing fiber, wherein the fibers are interwoven in a biaxially braided design thereby forming the composite material that is capable of isotropic deformation along its longitudinal axis, the hollow tubular shaped member having an expanded diameter, a radially contracted diameter, and an operable diameter which is intermediate the expanded and radially contracted diameters, the tubular shaped member being radially compressible along its longitudinal axis between the expanded and contracted diameters to permit intraluminal delivery of the tubular shaped member through a body passage to a predetermined delivery site wherein the tubular shaped member can self-expand within the body passage to its operable diameter.

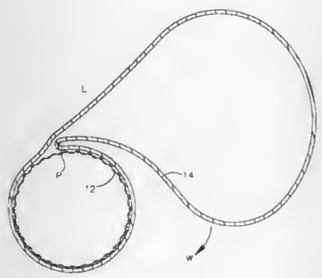
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5,741,326

## LOW PROFILE THERMALLY SET WRAPPED COVER FOR A PERCUTANEOUSLY DEPLOYED STENT

Kenneth S. Solovay, Fort Lauderdale, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Jul. 15, 1996, Ser. No. 680,435
Int. Cl.[6] A61F 2/06
U.S. Cl. 623—1 16 Claims




1. An endoprosthesis assembly for implantation at a treatment site within a patient's body, the assembly comprising:

a) an expandable stent releasably affixed to a delivery catheter, the stent being in a first configuration during deployment of the assembly to the treatment site and adapted to be expanded to a second expanded configuration and to detach from the catheter during implantation of the assembly at the treatment site; and

b) a stent cover affixed to the stent and wrapped around an outer surface of the stent when the stent is in the first configuration, the cover being releasably set to maintain a wrapped configuration during deployment of the assembly to the treatment site within the body and adapted to at least partially unwrap during implantation to conform to the outer surface of the stent when the stent is expanded to the second expanded configuration, the stent cover being wrapped around the outer surface of the stent such that the stent cover has a substantially uniform cross sectional area over an entire length of the stent cover along a longitudinal axis of the stent cover when the stent cover is in the wrapped configuration.

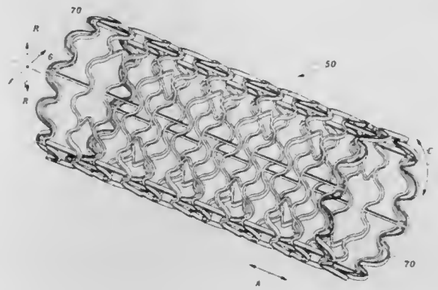
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5,741,327

## SURGICAL STENT FEATURING RADIOPAQUE MARKERS

John J. Frantzen, Copperopolis, Calif., assignor to Global Therapeutics, Inc., Broomfield, Colo.

Filed May 6, 1997, Ser. No. 852,016
Int. Cl.[6] A61F 2/06
U.S. Cl. 623—1 10 Claims




1. A radiopaque radially expandable stent for surgical implantation into a body lumen, such as an artery, said stent having a generally cylindrical contour both before and after expansion thereof, said stent further comprising in combination:

a first end and a second end opposite said first end;

at least two marker elements including a first marker element and a second marker element, each marker element being homogeneous and formed from a material which is radiopaque; and

said first marker element attached to said first end and said second marker element attached to said second end;

wherein said stent includes a means to attach said first marker element and said second marker element to said stent, said attachment means located on at least two discreet locations at said first end of said stent and on at least two discreet locations at said second end of said stent; and

where said attachment means includes at least one receiver extending from said first end of said stent and at least one tab extending from a side of said first marker element facing said first end, at least a portion of said tab having a tab contour which matches a receiver contour of at least a portion of said receiver, said tab of said first marker element located adjacent said receiver of said first end with said tab contour abutting said receiver contour.

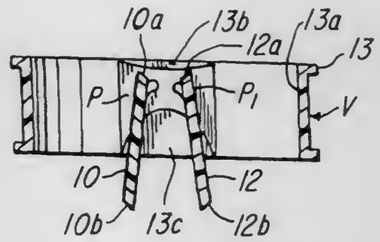


5,741,328

## PIVOT FOR MECHANICAL HEART VALVE PROTHESIS

Thomas H. Reif, Vero Beach, Fla., assignor to TRI Technologies Inc., Tortola, Virgin Islands (Br.)

Division of Ser. No. 36,687, Mar. 24, 1995, Pat. No. Des. 383,208. This application Sep. 13, 1996, Ser. No. 712,609
Int. Cl.[6] A61F 2/24
U.S. Cl. 623—2 11 Claims




1. A pivot mechanism for a mechanical heart valve prothesis having a flow area, comprising: an orifice ring having an inner wall that is tapered along portions thereof and having internal recesses on an inside surface thereof and including portions of the orifice ring near the recesses being tapered, to reduce flow resistance and turbulence without any protrusions from the inside surface of the orifice ring into the flow area to improve hemodynamic efficiency of the heart valve prosthesis, to reduce hemolytic potential thereof, and to reduce thrombogenicity thereof without any regions of stasis within the recesses, the pivot mechanism according to the foregoing in which pivotable leaflets are provided having tabs of predetermined length therewith, the, recesses being generally triangular in shape, such that entire length of tabs of the inflow side of the leaflets contact the recesses in both fully open and closed positions.

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5,741,329

## METHOD OF CONTROLLING THE PH IN THE VICINITY OF BIODEGRADABLE IMPLANTS

Chandra Mauli Agrawal, and Kyriacos A. Athanasiou, both of San Antonio, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Dec. 21, 1994, Ser. No. 361,332
Int. Cl.[6] A61F 2/02
U.S. Cl. 623—11 19 Claims




1. A method for preventing changes in pH surrounding an implantable device comprising:

placing a device comprising a pH-controlling substance, and a biodegradable polymer in an environment that degrades the biodegradable polymer; wherein when said polymer produces acidic breakdown products, said pH-controlling substance is an alkaline substance present in an amount between about 5% and about 30% by volume based on the volume of the polymer, sufficient to achieve alkaline material release commensurate with the rate of acidic polymer degradation product.

17. A method for preventing changes in pH surrounding an implantable device comprising:

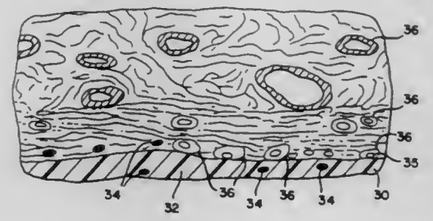
placing a device comprising sodium bicarbonate and a biodegradable polymer in an environment that degrades the biodegradable polymer.

5,741,330

## CLOSE VASCULARIZATION IMPLANT MATERIAL

James H. Brauker, Harvard; Robert C. Johnson, Bartlett; Laura A. Martinson, Chicago, and Ronald S. Hill, Grayslake, all of Ill., assignors to Baxter International, Inc., Round Lake, Ill.

Division of Ser. No. 210,068, Mar. 17, 1994, abandoned, which is a continuation of Ser. No. 933,871, Aug. 21, 1992, abandoned, which is a continuation of Ser. No. 735,401, Jul. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 606,791, Oct. 31, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 485,632
Int. Cl.[6] A61F 2/02
U.S. Cl. 623—11 8 Claims




1. A method for implanting a device into host tissue comprising the steps of:

(a) providing an implantable device;

(b) surrounding at least a portion of the device with a wall comprising:

(i) a second zone of semipermeable material which is impermeable to host immune cells; and

(ii) a first zone of porous material outside of the second zone having a nominal pore size from about 0.6 to about 20 microns which comprises frames of elongated strands of material that are less than 5 microns in all but the longest dimension wherein said frames define apertures which interconnect to form three dimensional cavities which permit substantially all inflammatory cells migrating into the cavities to maintain a rounded morphology and wherein the first zone promotes vascularization adjacent but not substantially into the first zone upon implantation into the host tissue; and

(c) embedding the wall within host tissue.

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5,741,331

## BIOSTABLE ELASTOMERIC POLYMERS HAVING QUATERNARY CARBONS

Leonard Pinchuk, Miami, Fla., assignor to Corvita Corporation, Miami, Fla.

Filed Jul. 29, 1996, Ser. No. 681,809
Int. Cl.[6] A61F 2/02;2/06
U.S. Cl. 623—11 32 Claims



1. A non-biodegradable article of manufacture comprising: crack-resistant implantable prosthesis or implant formed of a polyolefin copolymer;

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said polyolefin copolymer having a backbone in which the majority of polymer linkages along the copolymer chain are alternating quaternary and secondary carbon atoms;

said polyolefin copolymer being a reaction product of a first rubbery component having a quaternary carbon atom which when homopolymerized produces a polymer having a low level of hardness, and a second hardening component which when homopolymerized produces a polymer having a high level of hardness;

said polyolefin copolymer reaction product of said first and second components being elastomeric and having a hardness intermediate said low and high levels of hardness; and said copolymer is crack-resistant when in vivo implanted.

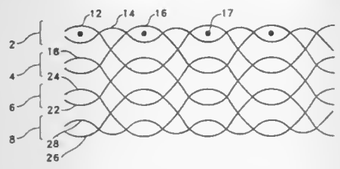
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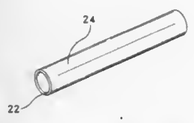
**5,741,332**

## THREE-DIMENSIONAL BRAIDED SOFT TISSUE PROSTHESIS

**Peter J. Schmitt, Garnerville, N.Y., assignor to Meadox Medicals, Inc., Oakland, N.J.**

**Continuation of Ser. No. 376,898, Jan. 23, 1995, abandoned.**
**This application Oct. 19, 1995, Ser. No. 545,060**
**Int. Cl.[6] A61F *2/04;2/06***
**U.S. Cl. 623—12** **15 Claims**




1. An implantable tubular prosthesis, comprising:

a continuous elongate hollow three-dimensional braided structure having a plurality of layers in which at least one yarn of each layer extends into an adjacent layer to interlock said layers, said structure having an intraluminal fluid contacting surface and an outer tissue contacting surface along its length thereof; and

wherein at least one of said layers includes a fusible component which upon melting integrally bonds said layers for enhanced resistance to ravelling and fraying.

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**5,741,333**

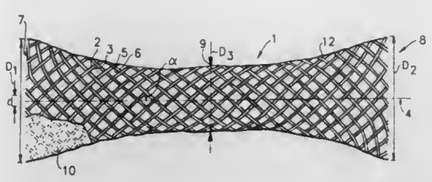
## SELF-EXPANDING STENT FOR A MEDICAL DEVICE TO BE INTRODUCED INTO A CAVITY OF A BODY

**Noureddine Frid, Beersel, Belgium, assignor to Corvita Corporation, Miami, Fla.**

**Filed Apr. 3, 1996, Ser. No. 626,933**
**Claims priority, application Belgium, Apr. 12, 1995, 09500335**
**Int. Cl.[6] A61F *2/04***
**U.S. Cl. 623—12** **20 Claims**

1. A self-expanding stent for introduction into a cavity of a human or animal body, comprising:

a tubular body which is radially expandable and axially retractable between a compressed state and a resting state, and is axially expandable and radially retractable between said resting state and said compressed state, and having first filaments having elastic memory wound along a first direction around a longitudinal axis of said tubular body, and second filaments having elastic memory wound along a second direction, opposite to said first direction, around said longitudinal axis, each filament wound in one of said directions crossing filaments wound in the other direction according to a plaited arrangement, wherein, in said resting state prior to introduction into a cavity, said tubular body includes a middle portion of a first diameter and two flared end portions starting with said first diameter and of increasingly larger diameter as they extend away from said middle portion, wherein each of said flared end portions has an axial length along said longitudinal axis greater than an axial length of said middle portion.



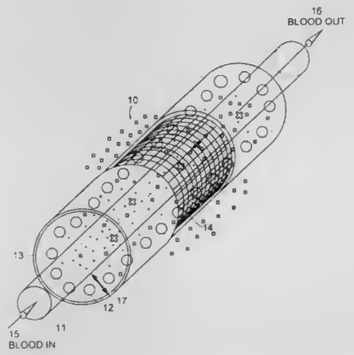

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**5,741,334**

## ARTIFICIAL PANCREATIC PERFUSION DEVICE

**Claudy Jean Paul Mullon, Framingham, and Karen E. Dunleavy, Billerica, both of Mass., assignors to Circe Biomedical, Inc., Lexington, Mass.**

**Continuation of Ser. No. 488,033, Jun. 7, 1995, abandoned.**
**This application Oct. 16, 1996, Ser. No. 732,146**
**Int. Cl.[6] A61F *2/04***
**U.S. Cl. 623—12** **21 Claims**




1. An artifical pancreatic perfusion device, comprising:

a. a hollow fiber having a porosity ranging from about 25 Kd to about 200 Kd; said hollow fiber having a first end adapted to be connected to a blood vessel for receiving blood and a second end adapted to be connected to a blood vessel for returning blood;

b. islets of Langerhans surrounding said hollow fiber, wherein the fiber provides for a directly continuous blood flow between said receiving blood vessel and said returning blood vessel; and

c. a housing for said hollow fiber and islets, comprised in whole or in part by a semipermeable membrane; said housing having a pore size small enough to offer protection to the islets and host from immune reactive substances.

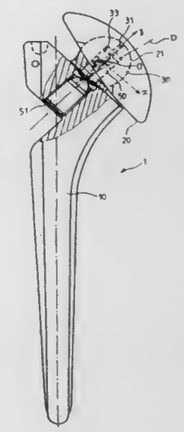


**5,741,335**

## TOTAL SHOULDER PROSTHESIS

**Christian Gerber, Zumikon, Switzerland, and Yves Pequignet, Chalonvillars, France, assignors to Cedior, Etupes Cedex, France, a part interest**

**Filed Jun. 11, 1996, Ser. No. 665,017**
**Int. Cl.[6] A61F *2/40;2/32***
**U.S. Cl. 623—19** **8 Claims**




1. A total shoulder prothesis comprising:

a humeral stem designed to be implanted within a patient's humeral canal,

a head portion with a spherical shape generated by revolution about an axis designed to cooperate with the glenoid cavity of the shoulder,

a link assembly connecting said head portion to the humeral stem, said link assembly comprising 1) a ball fixed to a proximal end of said stem and 2) a spherical socket located in said head portion and forming a housing for said ball, an axis of revolution of the head portion being offset with respect to the center of said ball, the socket and the ball constituting a joint capable of making the orientation of the head portion vary in relation to the stem by rotation about said center of the ball, and

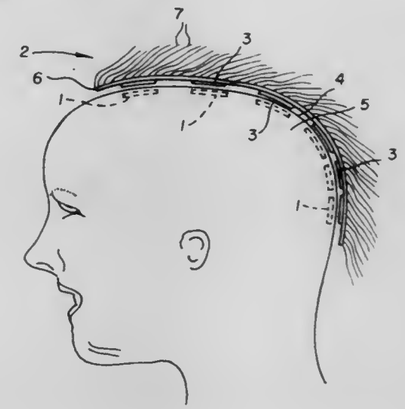
means for selectively locking the head portion in position on the ball so as to prevent any motion of the head portion with respect to the ball.

**5,741,336**

## MAGNETICALLY SECURED HAIRPIECES

**William A. Fraser, 3001 Audubon Ter., N.W., Washingtn, D.C. 20008**

**Filed Aug. 27, 1996, Ser. No. 703,912**
**Int. Cl.[6] A61F *2/10***
**U.S. Cl. 623—15** **22 Claims**




1. A method of securing a hairpiece to a defined portion of a person's scalp, comprising the steps of:

a) obtaining a plurality of hypoallergenic first magnets;

b) implanting the first magnets between the skin of the defined portion of the person's scalp and the person's skull;

c) obtaining a hairpiece adapted to cover the defined portion of the person's scalp, said hairpiece comprising a base fabric and a plurality of fibers having one end secured to one side of the base fabric;

d) obtaining a plurality of second magnets;

e) fastening the second magnets to the side of the base fabric of the hairpiece other than the side to which the fibers are adhered; and

f) fastening the hairpiece to the person's scalp by covering the desired portion of the person's scalp with the hairpiece and magnetically adhering the surgically implanted first magnets to the second magnets fastened to the hairpiece;

with the proviso that the second magnets are fastened to the hairpiece in such a way that when the hairpiece is positioned on the desired portion of the person's scalp, each of the second magnets directly overlies one of the first magnets.

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**5,741,337**

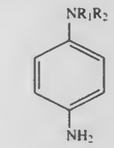
## PROCESS FOR THE OXIDATIVE DYEING OF KERATINOUS FIBRES WITH A COMPOSITION WHICH CONTAINS AN OXIDATION DYE PRECURSOR, A COUPLER, AND AN OXIDANT AT AN ACIDIC PH

**Eric Bone, Clichy, and Roland de la Mettrie, Le Vesinet, both of France, assignors to L'Oreal, France**

**Continuation of Ser. No. 437,800, May 9, 1995, abandoned. This application May 6, 1996, Ser. No. 643,498**
**Claims priority, application France, May 9, 1994, 94-05688**
**Int. Cl.[6] A61K** *7/13*
**U.S. Cl. 8—412** **34 Claims**

I. A composition for the oxidation dyeing of keratinous fibres, which comprises a mixture containing a composition (A) and a composition (B), wherein said composition (A) comprises, in a medium appropriate for dyeing,

at least one oxidation dye precursor selected from compounds of formula (L):

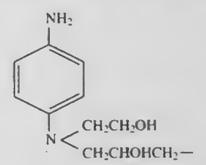



(I)

in which:

$R_1$ represents a hydrogen atom or a $C_2$–$C_6$ mono- or polyhydroxyalkyl radical;

$R_2$ represents a $C_2$–$C_6$ mono- or polyhydroxyalkyl radical, β-aminoethyl or a group of formula (II):




(II)

and cosmetically acceptable salts thereof; and

at least one coupler selected from meta-aminophenol, 2-methyl-5-aminophenol, meta-diphenol, 2-methyl-1,3-dihydroxybenzene and cosmetically acceptable salts thereof;

wherein said composition (B) comprises, in a medium appropriate for dyeing, at least one oxidizing agent selected from the group consisting of hydrogen peroxide, urea peroxide, alkali metal bromates and persalts;

wherein said mixture contains an amount of composition (A) relative to composition (B) in a ratio by weight which ranges from 0.5:1 to 5:1, wherein said mixture has a pH which ranges from 2 to less than 7, and wherein the components of said mixture are present in amounts effective to oxidatively dye said keratinous fibres.

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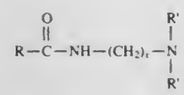
**5,741,338**

## BIODEGRADABLE DYE LEVELER COMPOUNDS FOR ACRYLIC FIBERS

**Terry E. Singleton, Jamestown, N.C., assignor to High Point Chemical Corporation, High Point, N.C.**

**Filed Mar. 7, 1997, Ser. No. 813,250**
**Int. Cl.[6] D06P** *3/76; 1/41*
**U.S. Cl. 8—606** **23 Claims**

17. A process of cationic dyeing of an acrylic fabric in the substantial absence of foam which comprises adding to the dyebath about 1.5 to 5% on weight of fabric in the dyebath an amidoamine compound which has been quaternized, wherein prior to quaternization the amidoamine compound has the following formula:




wherein R is a straight chain or branched alkyl group containing 7 to 9 carbon atoms; each R' is an alkyl group having 1 to 3 carbon atoms; and x is an integer from 2 to about 4.

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**5,741,339**

## VERTICAL WALL PLANTER

**Paul H. DuMars, and Jennifer L. DuMars, both of 44105 Dahlia St., Lancaster, Calif. 93535**

**Filed Sep. 27, 1996, Ser. No. 721,884**
**Int. Cl.[6] E04B** *1/34*
**U.S. Cl. 8—611** **8 Claims**




1. A built-in cantilevered planter block comprising:

a cantilevered planter body having a front, back and side walls each having an exterior and interior surfaces, wherein each said exterior surface is parallel to a respective interior surface; said walls defining a hollow therebetween;

said planter body further includes a substantially flat top surface, a substantially parallel exterior bottom surface, and a generally non-parallel interior bottom surface declining from said front and back walls toward a longitudinally centered low line intersecting a plurality of weep holes;

said front, back, bottom and side walls having a thickness determined by maximum hollow interior area;

a plurality of protruding vertical mounting walls being formed on said back wall and extending away from said planter body; said mounting walls spanning the distance from said top surface to said bottom surface; said mounting walls comprising top surfaces each of which being indented with a vertical groove; said grooves are positioned at the end portion of the mounting walls away from said planter body;

a support module for said planter body comprising a generally rectilinear body defining an open-faced unit; said support module includes a rear wall and three generally parallel vertical walls formed integrally with said rear wall and extending perpendicular therefrom; one of said vertical walls is positioned at each end of said rear wall and one said vertical walls is positioned at the center of said rear wall; a second groove is formed on the end portion of each vertical wall away from said rear wall;

said planter body is connected to said support module such that said mounting walls of said planter body being interposed to said three vertical walls of said support module, and all the grooves are aligned to receive a reinforcing rod;

said planter block is adapted to be set between a plurality of blocks of a wall, wherein the exterior face of said rear wall of said support module is adapted to be flush with one of the

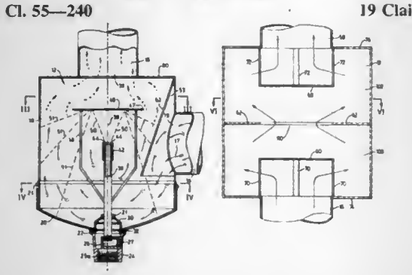
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vertical faces of the wall, and said planter body is adapted to extend outwardly beyond the other vertical face of said wall.

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**5,741,340**
**AIR VENTING UNIT**
**Roland Klemmer, 222 McCraney Street West, Oakville, Ontario L6H 1H7, Canada**
**Filed Aug. 18, 1995, Ser. No. 517,163**
**Int. Cl.[6] B01D** *47/06*
**U.S. Cl. 55—240** **19 Claims**

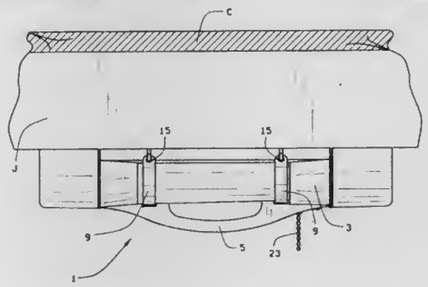


1. An air venting apparatus for removing odours or particles from an airstream comprising:
an air-water interaction chamber having an air inlet in a sidewall thereof, an air outlet located in an upper region of said chamber, a drain outlet operative to continually drain said chamber of water, and a bottom which is dish-shaped with said drain outlet centrally located in said bottom, said bottom sloping radially inwardly and downwardly towards said drain outlet;
a substantially horizontal deflector plate mounted in said chamber, said plate having a circumferential edge spaced from said sidewall of the chamber, an annular gap for passage of said airstream being formed between said circumferential edge and said sidewall;
a spray nozzle mounted in said chamber below and spaced from said deflector plate, said nozzle being arranged to direct a water spray upwardly towards said deflector plate, said nozzle and said plate coacting to cause said spray to deflect from the plate in an outwardly and downwardly directed conical pattern extending from the plate to the sidewall whereby to form a water screen in said chamber between said air inlet and said air outlet so that most or all of the airstream which enters through said air inlet is required to pass upwardly through said water screen, thereafter pass directly through said annular gap, and thereafter pass upwardly into said air outlet; and
pipe means for supplying water under pressure to said spray nozzle.

11. An air venting apparatus for venting an airstream indoors, comprising:
an air-water interaction chamber having an air inlet located in a vertically extending sidewall thereof, an air outlet located in a top wall thereof, and a drain positioned in a bottom of said chamber for draining water out of the chamber;
spray means, mounted in said chamber, for generating within the chamber a cleansing water spray substantially spanning the breadth of at least a major section of the chamber, thereby ensuring that substantially all of an airstream flowing from said inlet to said air outlet interacts with the cleansing spray; and
a condensation chamber having an intake opening at one end thereof, its own outlet at an opposite end thereof, and fixed baffles mounted therein, wherein the intake opening is connected to said air outlet of the interaction chamber by means of a pipe having an internal diameter substantially less than the horizontal internal width of said interaction chamber said condensation chamber having a substantially larger transverse cross-sectional area than the intake opening, whereby water vapour present in the airstream is condensed therefrom and wherein said condensation chamber is mounted above said interaction chamber in a manner permitting any water present in the condensation chamber to flow into said interaction chamber through said intake end.

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**5,741,341**
**PORTABLE/MOUNTABLE AIR CLEANER**
**Terrence L. Stanek, St. Charles, Mo., assignor to Emerson Electric Co., St. Louis, Mo.**
**Continuation-in-part of Ser. No. 514,995, Aug. 14, 1995, abandoned. This application Jul. 18, 1996, Ser. No. 683,711**
**Int. Cl.[6] B01D** *29/00*
**U.S. Cl. 55—356** **17 Claims**



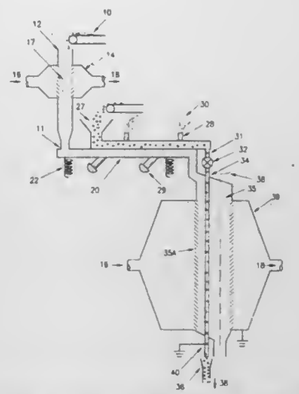
4. A portable/mountable air cleaner comprising:
an elongated body containing an air cleaner including a power driven fan blade;
a support base extending from the elongated body for resting on a supporting surface;
a carrying handle extending from the elongated body generally opposite the supporting base; and
spaced suspension straps associated with the elongated body for mounting the elongated body to a ceiling or wall structure wherein:
the spaced suspension straps are detachably associated with the elongated body;
the spaced suspension straps extend transversely to the elongated body; and
the spaced suspension straps extend through spaced slots formed in the elongated body.

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**5,741,342**
**APPARATUS AND METHOD FOR PREHEATING RAW MATERIALS FOR GLASS MAKING**
**Jeffery C. Alexander, Kent, United Kingdom, assignor to Edmeston AB, Vastra Frolunda, Sweden**
**Filed May 22, 1996, Ser. No. 651,081**
**Int. Cl.[6] C03B** *3/02*
**U.S. Cl. 65—136.1** **13 Claims**

1. A method for pre-heating glass manufacturing raw materials entering a glass melting furnace with hot exhaust gases from said furnace which comprises the following sequential steps:
a) separating different glass manufacturing raw materials by size and other physical characteristics into a first stream material comprising larger sized particles having one set of physical characteristics and a second stream material comprising smaller sized particles having another set of physical characteristics including moisture content,
b) introducing said first stream material to the top of a first moving bed,
c) passing hot exhaust gases from said glass melting furnace through said first moving bed so that heat is transferred directly from said gases to said first stream material,
d) removing first stream material from the top of a first moving bed,

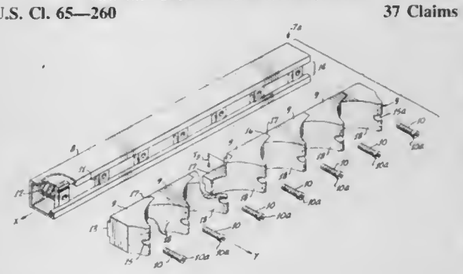




e) transferring heat from said first stream material previously heated by furnace exhaust gases to the second stream material to remove moisture from said second stream material,
f) introducing said first stream material to the top of a second moving bed after it has transferred heat to the second stream material,
g) providing one or more heat transferring conduits which are immersed in, but pass through, said second moving bed with no openings in the conduits at any point the conduits are in contact with the second moving bed,
h) causing the dried second stream material to flow through the inside of said heat transferring conduits passing through said second moving bed,
i) gassing hot glass making furnace exhaust gases through second moving bed so that heat is transferred from the gases to said first stream material and through said conduits from the gases to said second stream material and from first stream material to second stream material, and
j) feeding the heated first stream material and heated second stream material to said glass making furnace.

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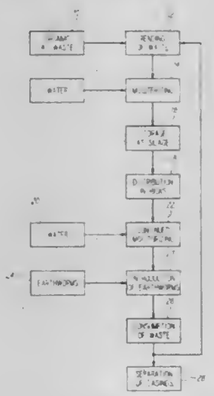
**5,741,343**
**ADJUSTABLE HOT GLASS TRANSFER DEVICE**
**Patrick H. Lloyd, Decatur; Jeff R. Long, Keller; Timothy A. Stover, Ponder; Steven Richard Hubbard, Decatur, and Michael E. Easley, Terrin, all of Tex., assignors to Union Oil Company of California, El Segundo, Calif.**
**Filed Jul. 28, 1995, Ser. No. 508,646**
**Int. Cl.[6] C03B** *9/04;9/44;11/00;13/00*
**U.S. Cl. 65—260** **37 Claims**



1. A stacker bar assembly for pushing hot glass articles into an annealing oven comprising:
a support member; and
a plurality of pads substantially composed of a nonmetallic material and attached to said support member, wherein each of said pads comprises a support connection surface, a tongue portion, a groove portion, and an arcuate glass-contact surface, and wherein the adjoining arcuate glass-contact surfaces of said pads form an adjustable tongue-in-groove surface capable of contacting a plurality of hot glass articles having different sizes.

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**5,741,344**
**CONVERSION OF AGRICULTURAL WASTE USING WORMS**
**Robert K. Warkentin, 2834 S. Kent, Visalia, Calif. 93277**
**Filed Dec. 7, 1995, Ser. No. 568,679**
**Int. Cl.[6] C05F** *9/04*
**U.S. Cl. 71—9** **10 Claims**



1. A method for processing organic agricultural waste, comprising
rending the waste into small pieces for handling and compaction;
wetting the rent waste to a moisture content of about at least 60%;
forming a rick of rent waste;
introducing earthworms into the rick;
maintaining the moisture content of the rick at about at least 60% until the waste is at least substantially consumed;
progressively forming an additional rick of rent waste on top of the first formed rick once each preceding rick is at least substantially consumed.

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**5,741,345**
**COMBINATION OF ACTIVE INGREDIENTS FOR INHIBITING OR CONTROLLING AMMONIA NITRIFICATION IN ARABLE TOPSOIL AND SUBSOIL**
**Margrit Grabarse, Seelingstädt; Sieghard Lang, Cunnersdorf; Hans-Jürgen Michel, Machem, and Hartmut Wozniak, Cunnersdorf, all of Germany, assignors to SKW Stickstoffwerke Piesteritz GmbH, Lutherstadt Wittenberg, Germany**
**PCT No. PCT/DE95/00243, § 371 Date Aug. 13, 1996, § 102(e) Date Aug. 13, 1996, PCT Pub. No. WO95/22514, PCT Pub. Date Aug. 24, 1995**
**PCT Filed Feb. 20, 1995, Ser. No. 693,142**
**Claims priority, application Germany, Feb. 21, 1994, 44 05 393.2**
**Int. Cl.[6] C05C** *13/00*
**U.S. Cl. 71—11** **6 Claims**

1. A composition for use in inhibiting and controlling the nitrification of ammonium nitrogen in arable soils and substrates, said composition comprising:
a first compound selected from the group consisting of substituted pyrazole, its salt and metallic complex thereof;
a second compound represented by dicyanodiamide; and
a third compound selected from the group consisting of ammonium thiosulfate, biguanide and ammonium rhodanide.

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wherein the mixing ratio of the second compound to the third compound ranges from 4:1 to 1:4 and the mixing ratio of a combination of the second and third compounds to the first compound ranges from 35:1 to 5:1.

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**5,741,346**
**MINERAL AND ORGANIC FERTILIZER**
**Alexander S. Glover, Winston-Salem, N.C., assignor to Vulcan Materials Company, Winston Salem, N.C.**
**Filed May 30, 1996, Ser. No. 657,728**
**Int. Cl.[6] C05F *3/00***
**U.S. Cl. 71—15** **12 Claims**

1. A fertilizer composition consisting essentially of a blend of animal manure and mineral fines derived from crushed rock other than zeolites said crushed rock being selected from the group consisting of igneous, metamorphic and sedimentary rock and said absorbency having substantially no base substitution capacity or moisture absorbency wherein the ratio of manure to the mineral fines is in the range of about 20:80 to about 80:20.

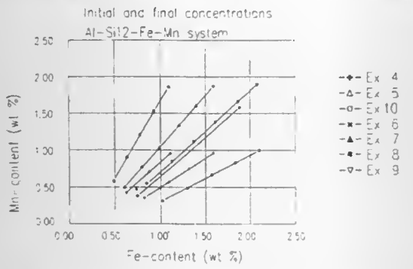
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**5,741,347**
**METHOD FOR PRODUCING COPPER POWDER**
**Hisashi Miki, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan**
**Filed Feb. 5, 1996, Ser. No. 596,671**
**Claims priority, application Japan, Feb. 24, 1995, 7-037206**
**Int. Cl.[6] B22F *9/24***
**U.S. Cl. 75—373** **13 Claims**

1. A method for producing a copper powder which comprises combining a liquid consisting essentially of an aqueous acidic solution containing $Cu^{2+}$ with a hydrazine compound reducing agent until the aqueous solution has a pH value in the range of about 7 to 9 whereby the $Cu^{2+}$ is reduced to form copper powder.

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**5,741,348**
**METHOD FOR REFINING AN ALUMINIUM SCRAP SMELT**
**Henricus Matheus Van Der Donk, Velserbroek, and Gerrit Hein Nijhof, Heemstede, both of Netherlands, assignors to Hoogovens Aluminium BV, Ijmuiden, Netherlands**
**Filed May 28, 1996, Ser. No. 654,342**
**Claims priority, application Netherlands, May 31, 1995, 1000456**
**Int. Cl.[6] C22B *21/06***
**U.S. Cl. 75—384** **6 Claims**




1. Method of refining a melt of aluminum scrap material which comprises metallic aluminum and impurities including iron, and in some cases, Mn and Si comprising the steps of

(i) determining the initial amounts, in % by weight, in the composition of said melt of aluminum scrap material of the elements Mn, Fe and Si, these amounts being identified below as $[Mn_0]$, $[Fe_0]$ and $[Si_0]$;

(ii) adding a quantity $Mn_x$ of Mn to the melt, so as to obtain in the melt, after refining of the melt by steps (iii), (iv) and (v) below, a ratio δ given by

$$\delta=[Mn_1]/[Fe_1]$$

wherein $[Mn_1]$ and $[Fe_1]$ are the amount in % by weight of Mn and Fe in the melt after the refining of the melt, $[Fe_1]$ being a desired target level of Fe and $[Mn_1]$ being given by

$$[Mn_1]=A-B*[Fe_1]$$

wherein

$$1.86-0.17*[Si_0]+0.004*[Si_0]^2<A<2.21-0.17*[Si_0]+0.005*[Si_0]^2$$

and

$$0.42+0.50*exp\ (-0.28*[Si_0])<B<0.57+0.50*exp\ (-0.28*[Si_0]).$$

said added quantity $Mn_x$ of Mn being given by

$$Mn_x=\delta*Fe_0-Mn_0$$

wherein $Fe_0$ and $Mn_0$ are the initial quantities of Fe and Mn in the melt of aluminium scrap material;

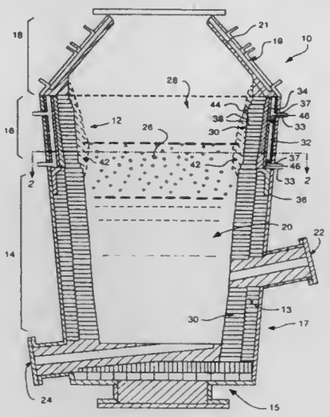
(iii) homogenizing the melt by heating after step (ii);

(iv) cooling the melt after step (iii) and maintaining the melt at a super-eutectic holding temperature T for a holding time t to form solid intermetallic compounds comprising iron and manganese;

(v) separating the solid intermetallic compounds from the melt, to obtain the refined melt having a reduced iron content as compared to the melt of aluminum scrap material.

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**5,741,349**
**REFRACTORY LINING SYSTEM FOR HIGH WEAR AREA OF HIGH TEMPERATURE REACTION VESSEL**
**David H. Hubble, Export, Pa., and Klaus H. Ulrich, Duisburg, Germany, assignors to Steel Technology Corporation, Washington, D.C.**
**Filed Oct. 19, 1995, Ser. No. 543,861**
**Int. Cl.[6] C21B *15/00***
**U.S. Cl. 75—500** **20 Claims**



1. A smelting method for use in a vessel including a refractory lining having a surface that faces the interior of the vessel, and a hollow cooler disposed exterior to the refractory lining, the cooler including a cooler hot face surface in thermal contact with the refractory lining, and a coolant heat transfer surface in contact with a moving coolant having a thermal conductivity, the method comprising the steps of:

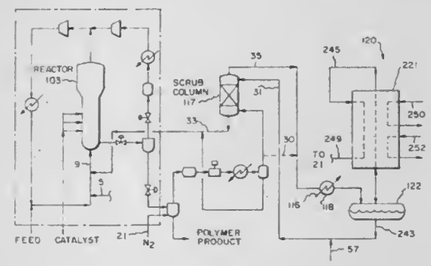
forming a layer of slag on a melt in the vessel, the slag in said layer of slag having a softening point temperature range; and

forming a protective frozen layer of slag on the interior facing surface of the refractory lining in at least a portion of a zone where the interior facing surface contacts the layer of slag, and maintaining the protective frozen layer of slag in or about the softening point temperature range of the slag.



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**5,741,350**
**RECOVERY OF HYDROCARBONS FROM POLYALKENE PRODUCT PURGE GAS**
**Howard Charles Rowles, Center Valley, and Lee Jarvis Howard, Allentown, both of Pa., assignors to Air Products And Chemicals, Inc., Allentown, Pa.**
**Continuation-in-part of Ser. No. 375,881, Jan. 20, 1995, Pat. No. 5,533,437. This application Jul. 8, 1996, Ser. No. 677,673**
**Int. Cl.[6] B01D *53/34***
**U.S. Cl. 95—42** **18 Claims**




1. A method for the recovery of hydrocarbons from product purge gas (**23**) generated in the synthesis of a polyalkene product from a feed gas (**1**) comprising alkene monomer and one or more intermediate hydrocarbons in a polymerization reactor (**103**), wherein said product purge gas (**23**) is generated by purging said polyalkene product with an inert gas (**21**), and wherein said product purge gas (**23**) comprises said inert gas, unreacted alkene monomer, one or more heavy hydrocarbons formed as byproducts in said polymerization reactor, and one or more intermediate hydrocarbons having volatilities intermediate said alkene monomer and said one or more heavy hydrocarbons, said method comprising the steps of:

(a) contacting said product purge gas (**23**) in a gas-liquid absorption zone (**117**) with a scrub liquid feed (**31**) comprising at least of one of said one or more intermediate hydrocarbons, thereby absorbing at least a portion of said one or more heavy hydrocarbons in said scrub liquid (**31**);

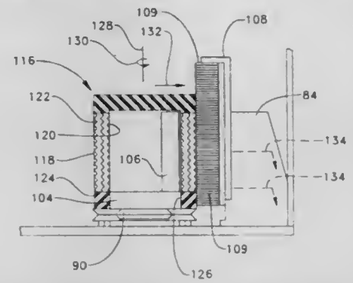
(b) withdrawing from said absorption zone (**117**) a vapor overhead (**35**) comprising said inert gas and at least a portion of said alkene monomer and an absorber bottoms scrub liquid (**33**) comprising at least a portion of said one or more heavy hydrocarbons;

(c) recovering said alkene monomer from said vapor overhead (**35**) by cooling, condensing, and rectifying the overhead in a dephlegmator system (**120**) to yield a hydrocarbon stream (**243**) rich in alkene monomer and intermediate hydrocarbons and a warmed light vapor enriched in inert gas (**249**); and

(d) recycling at least a portion of said absorber bottoms scrub liquid (**33**) to said polymerization reactor (**103**).

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**5,741,351**
**APPARATUS AND METHOD FOR CLEANING AN AIR FILTER OF A VEHICLE**
**Ronald C. Beal, Pekin; Duane K. Edwards, East Peoria, and John Styfhoorn, Dunlap, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.**
**Filed Oct. 15, 1996, Ser. No. 732,797**
**Int. Cl.[6] B01D *46/04;29/68***
**U.S. Cl. 95—279** **17 Claims**



1. A method for cleaning a filter, comprising the steps of:

supporting a turn table and an air flow director with a support frame;

supporting said filter on said turn table;

directing a flow of air against said filter with said air flow director;

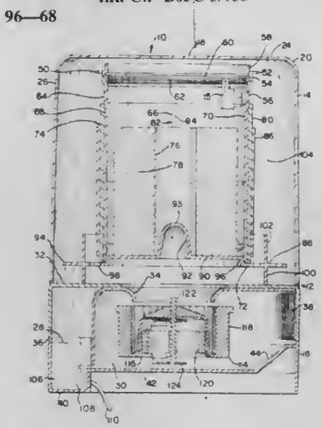
rotating said turn table in relation to said support frame during an entire filter cleaning operation;

maintaining said air flow director fixed in relation to said support frame during said entire filter cleaning operation; and

generating said flow of air with an air flow generator having a turbocharger engine component.

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**5,741,352**
**AIR CLEANER**
**Joseph E. Ford, Cary; Donald N. Jursich, Chicago, both of Ill., and Raymond Chan, Vancouver, Canada, assignors to Jing Mei Industrial Holdings, Ltd., Cook Islands**
**Filed Aug. 19, 1996, Ser. No. 699,547**
**Int. Cl.[6] B03C *3/155***
**U.S. Cl. 96—68** **5 Claims**



1. An air cleaner, comprising:

a housing providing a casing with an upper housing portion and a lower housing portion, said upper portion having a substantially circular top providing a cover and a skirt comprising an annular wall extending integrally downwardly from said top, said top having a series of radial ribs and defining a substan-

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tially circular set of radial inlet passageways between said ribs providing an air intake for entrance of influent air laden with particulates of dust, pollen, smoke, soot or other pollutants, said lower housing portion providing a base positioned below and supporting said upper housing portion, said base having at least one ion generator compartment and a blower compartment positioned in proximity to said ion generator compartment, said base having an upper lid defining a blower opening communicating with said blower compartment and said upper housing compartment, said base having sidewalls extending integrally downwardly from said lid and a duct defining an outlet opening providing an air exhaust in proximity to said blower compartment;

an ionizer assembly comprising a circular array of negatively charged ion emitters comprising ion-emitting pins or needles for emitting ions to ionize said influent air and negatively charge said particulates;

said ion emitters being disposed in proximity to said intake, an upright tubular superstructure comprising an electrically insulating rigid plastic annular shell providing an ion emitter-support stand, said shell having an upper emitter-support portion for supporting said ion emitters, said ion emitters being circumferentially and aliquotly spaced from each other and extending radially outwardly from said upper emitter-support portion, said shell having a substantially horizontal annular coil-support portion extending below said upper emitter-support portion, an electrical coil positioned about said coil-support portion and connected to said ion emitters, said shell having an upright elongated support portion extending downwardly below said coil-support portion, said upright support portion defining at least one upright paper-dispensing slot and having a bottom section and said upright support portion having an outer collector plate-engaging surface and an inner paper roll-facing surface;

a collector assembly comprising an upright roll of disposable paper for collecting said negatively charged particulates, said roll of paper being peripherally and annularly surrounded by said shell and being disposed inwardly of said shell, positively charged curved collector plates positioned against said outer collector plate-engaging surface of said shell, said collector plates comprising diametrically opposed imperforate fluid-impervious metal collector plates, each of collector plates being arcuate with convex exterior paper-supporting surface facing said housing and a concave interior surface abutting against and securely engaging said collector plate-engaging surface of said shell, said collector plates being circumferentially spaced from each other to provide a dispenser defining an upright dispensing opening aligned in registration with said upright paper-dispensing slot of said shell for dispensing and passing paper from said roll onto said exterior paper-supporting surface of said collector plates, said dispensed paper including a paper portion detachably covering a substantial portion of said exterior paper-supporting surface of said collector plates and said paper portion being positively charged by said collector plates for attracting and collecting said negatively charged particulates;

a paper roll-support stand comprising a substantially circular raised support platform and an upwardly extending spindle with a rounded apex for supporting said roll of paper, said paper roll-support stand having an annular flange providing a rim extending radially outwardly of and at an elevation slightly below said raised support platform, a substantially circular annular shoulder positioned about and extending downwardly from an upper edge of said raised support platform, said shoulder connecting said raised support platform, said shoulder connecting said rim to said raised support platform, said rim abuttingly engaging and supporting said bottom section of said ion emitter-support stand at a position adjacent said shoulder, said rim defining a set of air holes positioned radially outwardly of said emitter-support stand and said collector plates for communicating with said blower opening, said paper roll-support stand having an annular leg portion extending integrally downwardly from said rim at a location radially outwardly of said holes for seating upon said lid of said base, and an annular support wall extending upwardly from said leg portion;

said collector plates being spaced from and cooperating with said housing to define an annular air passageway positioned between and communicating with said intake and said air holes of said rim;

a negative ion generator and a positive ion generator disposed in said ion generator compartment, said negative ion generator comprising a negative power supply connected to said ion emitters, and said positive ion generator comprising a positive power supply connected to said collector plates;

an air blower assembly positioned in the blower compartment for drawing air through said intake into said annular air passageway past said ion emitters and said positively charged paper portion on said collector plates and through said air holes into said blower opening and for blowing cleaner air having a substantially lower concentration of particulates than said influent air through said exhaust, said blower assembly comprising an induction motor having a stator, a rotor positioned within said stator, an upright shaft rotatably disposed within and extending substantially vertically through at least part of said rotor and stator, and a blower wheel comprising a fan extending below and connected to said shaft and communicating with said blower opening and said exhaust for blowing cleaner air through said exhaust out of said air cleaner.

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**5,741,353**

## AQUEOUS PAINTING AGENT

**Heinrich Schnorrer, Schwandorf, Germany, assignor to J.S. Staedtler GmbH & Co., Nürnberg, Germany**

**Filed Jun. 27, 1996, Ser. No. 671,350**

**Claims priority, application Germany, Jun. 29, 1995, 195 23 368**

**Int. Cl.[6] C09D** *17/00*

**U.S. Cl. 106—31.29** **16 Claims**

1. An aqueous painting agent for use as a liquid or pasty application material, the agent comprising 40% to 80% by weight water, 10% to 50% by weight wax in an emulsified or dispersed state, 0.1% to 2% by weight surface-active agent, 0.1% to 10% by weight coloring agent, and 0.01% to 20% by weight additives selected from the group consisting of preservatives, thickening agents and fillers.

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**5,741,354**

## AQUEOUS INK COMPOSITION FOR BALL-POINT PEN

**Toshimitsu Kawasumi, and Yoshiko Yamaoka, both of Osaka, Japan, assignors to Sakura Color Products Corporation, Osaka, Japan**

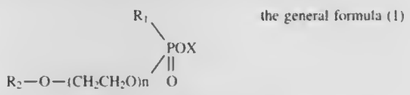
**Filed Jul. 1, 1996, Ser. No. 673,559**

**Claims priority, application Japan, Jul. 5, 1995, 7-270750**

**Int. Cl.[6] C09D** *11/18*

**U.S. Cl. 106—31.85** **8 Claims**

1. An aqueous ink composition for ball-point pen comprising an aqueous ink mixture containing at least a pigment or colored polymer emulsion, a dispersant, a water-soluble organic solvent and water, and a compound of the general formula (1):



the general formula (1)

wherein R 1 - is -OX or R 2 -O-(CH 2 CH 2 O)n-;

R 2 is C 8 to C 18 which is alkyl group, alkenyl group, or alkylphenyl group;

n=1 to 30;

X is an alkali metal, amine or alkanolamine.



**5,741,355**

## PEARLESCENT PIGMENT, AND PAINT COMPOSITION, COSMETIC MATERIAL, INK AND PLASTICS BLENDED WITH THE NEW PEARLESCENT PIGMENT

**Masaru Yamamoto; Akitsugu Ando, and Tetsushi Kosugi, all of Toyohashi, Japan, assignors to Topy Industries, Limited, Tokyo, Japan**

**Filed Jan. 3, 1996, Ser. No. 582,427**

**Claims priority, application Japan, Jan. 27, 1995, 7-030182; Jan. 27, 1995, 7-030188; Mar. 31, 1995, 7-097520**

**Int. Cl.[6] C04B** *14/20*

**U.S. Cl. 106—417** **24 Claims**

1. A pearlescent pigment, comprising a synthetic mica coated with a metal oxide, whereby average refractive index of said synthetic mica is not more than 1.58, surface of synthetic mica particles is smoothed and made flaky, the synthetic mica contains iron in not more than 0.1 weight %, and said synthetic mica has a pearl parameter given by the following equation:

Pearl parameter=Specific volume $(A)$×Powder luster value $(B)\geqq 10$.

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**5,741,356**

## PROCESS FOR SURFACE-TREATED ORGANIC PIGMENTS

**Ibraheem T. Badejo, N. Charleston; Charles E. Shannon, Summerville, both of S.C., and Guenter G. Franke, Leverkusen, Germany, assignors to Bayer Corporation, Pittsburgh, Pa.**

**Filed Dec. 20, 1996, Ser. No. 769,478**

**Int. Cl.[6] C08K** *5/17*

**U.S. Cl. 106—493** **13 Claims**

1. A process for preparing a pigment composition comprising

(a) treating an organic pigment with

(1) about 0.1 to about 100% by weight, relative to the organic pigment, of a sterically hindered and/or bulky primary amine,

(2) 0 to about 100% by weight, relative to the organic pigment, of a surfactant, and

(3) about 5 to about 15 parts by weight per part by weight of the organic pigment of a liquid in which the organic pigment is substantially insoluble,

thereby forming a suspension of the surface-treated pigment composition in the liquid:

(b) exposing the suspension to ultrasound; and

(c) collecting the pigment composition.

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**5,741,357**

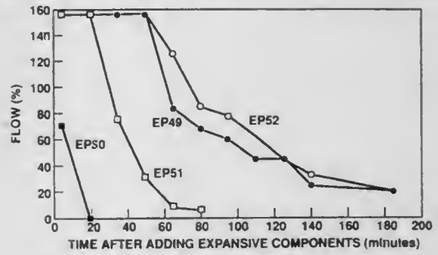
## HYDRATED HIGH ALUMINA CEMENT

**Shamim A. Sheikh, 325 Bogert Ave., #505, Willowdale, Ontario, Canada, M2N 1L8**

**Continuation-in-part of Ser. No. 184,477, Jan. 21, 1994, abandoned. This application Aug. 21, 1995, Ser. No. 517,713**

**Int. Cl.[6] C04B** *7/32;7/51*

**U.S. Cl. 106—692** **27 Claims**




1. A cement composition formed by mixing:

(a) a Portland cement component; and

(b) an expanding component, comprising:

(i) a partially hydrated high alumina cement powder consisting of coated particles, said particles consisting of an inner core consisting of unhydrated high alumina cement and an outer coating consisting of hydration products of high alumina cement, said coating delaying reaction between the high alumina cement of the core of the particles and other materials in the cement composition; and

(ii) a calcium sulfate substance selected from the group consisting of anhydrous calcium sulfate, hemihydrate calcium sulfate and dihydrate calcium sulfate;

said partially hydrated high alumina cement powder being formed independently and prior to mixing with the remainder of the composition.

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**5,741,358**

## CORROSION INHIBITING COMPOSITION FOR TREATING ASBESTOS CONTAINING MATERIALS

**Judithann Ruth Hartman, Columbia, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.**

**Filed Sep. 27, 1996, Ser. No. 721,853**

**Int. Cl.[6] B09B** *3/00*

**U.S. Cl. 106—699** **7 Claims**

1. A method of treating a cementitious building material containing chrysotile asbestos, wherein said building material has been applied to a substrate in a building, comprising:

(a) providing an admixture composition derived by admixing (i) water, (ii) at least about 30% by weight of an inorganic acid, an inorganic acid salt or mixtures thereof, and (iii) a corrosion inhibiting amount of a corrosion inhibiting component selected from the group consisting of thiourea, lower alkylthioureas, $C_8$–$C_{15}$ alkylpyridinium halides and mixtures thereof;

(b) applying said admixture composition to the chrysotile asbestos-containing building material;

(c) permitting said admixture composition to penetrate into the building material and contact the chrysotile asbestos contained therein; and

(d) allowing said composition to remain in contact with the chrysotile asbestos for a sufficient period of time to reduce the amount of chrysotile asbestos contained therein to less than 1% by weight.

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**5,741,359**

## METHOD AND APPARATUS FOR ZONE-MELTING RECRYSTALLIZATION OF SEMICONDUCTOR LAYER

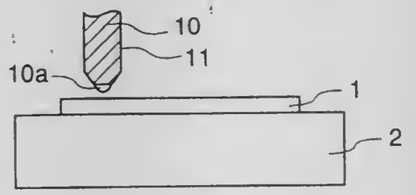
**Takashi Motoda, and Manabu Kato, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 7, 1995, Ser. No. 524,776**

**Claims priority, application Japan, Sep. 8, 1994, 6-214567**

**Int. Cl.[6] C30B** *13/06*

**U.S. Cl. 117—43** **14 Claims**




1. A method for zone-melting recrystallization of a semiconductor layer comprising:

heating a spot of a semiconductor layer; and

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spirally moving the heated spot relative to the semiconductor layer to melt and recrystallize the semiconductor layer, thereby producing a large-area monocrystalline region in the semiconductor layer.

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**5,741,360**

## METHOD OF GROWING A CRYSTAL OF A COMPOUND SEMICONDUCTOR AT A LOW TEMPERATURE

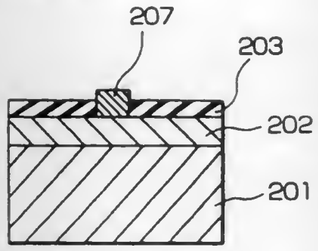
**Shigeo Goto; Yasuhiko Nomura, both of Ibaraki; Yoshitaka Morishita, Tokyo; Seikoh Yoshida, Ibaraki, and Masahiro Sasaki, Kanagawa, all of Japan, assignors to Optoelectronics Technology Research Corporation, Tokyo, Japan**

**Filed Aug. 11, 1995, Ser. No. 514,229**

**Claims priority, application Japan, Aug. 12, 1994, 6-190666; Aug. 23, 1994, 6-198337**

**Int. Cl.° C30B** *23/04*

**U.S. Cl. 117—94** **14 Claims**




1. A method of selectively growing a compound semiconductor which includes first and second elements, said method comprising the steps of:

preparing a substrate member which has a first portion covered with a mask and a second portion uncovered with said mask;

preparing a metallic gallium as said first element, together with a reactive gas which includes a compound of said second element and at least one of amines bonded to said second element; and

selectively depositing said compound semiconductor only on said second portion of the substrate without deposition of said compound semiconductor on said first portion, by using said reactive gas and said metallic gallium.

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**5,741,361**

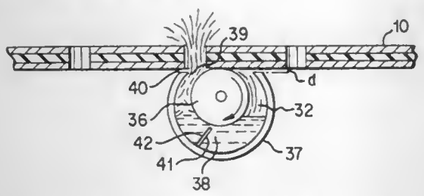
## METHOD FOR FLUID TRANSPORT

**Allan H. McKinnon, 1405 Wagonwheel Ct., Irving, Tex. 75061; Charles R. Kidd, Irving, Tex., and Michael Gulla, Osprey, Fla., assignors to Allan H. McKinnon, Irving, Tex.**

**Filed Jul. 6, 1995, Ser. No. 498,981**

**Int. Cl.[6] B05C** *1/06*

**U.S. Cl. 118—258** **22 Claims**




1. An apparatus for treatment of a planar substrate with a treatment fluid, said apparatus comprising a fluid treatment chamber, means for conveying planar substrates through said fluid treatment chamber, and at least one roller assembly within said treatment chamber, said roller assembly comprising a roller within a shroud filled with treatment fluid, a plenum having a plurality of openings placed within the shroud positioned to constrict the flow fluid through the shroud, and means for rotating said roller, said roller having a major portion of its circumference within said shroud and a minor portion of its circumference protruding above the shroud positioned to enable contact of the roller with planar substrates passing through the treatment chamber, said roller being positioned within said shroud so as to define an elongated gap between the roller and the shroud along a major portion of the length of the shroud, and the top of the shroud being positioned with respect to the planar substrate whereby said roller, the top of said shroud and said planar substrate define a confined space whereby treatment fluid discharged from the roller assembly through said gap into said confined space and into contact with a planar substrate is in the form of an entrapped pressurized wedge of fluid when the roller is rotated within the shroud and the substrate is in contact with the roller.

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**5,741,362**

## WAFER SURFACE TREATING APPARATUS USING CHEMICAL

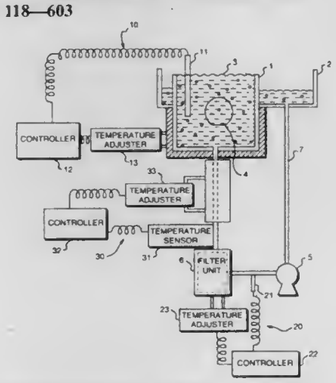
**Takaaki Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Oct. 16, 1995, Ser. No. 543,286**

**Claims priority, application Japan, Oct. 18, 1994, 6-252029**

**Int. Cl.° B05C** *11/00*; **B08B** *3/00*

**U.S. Cl. 118—603** **5 Claims**




1. A wafer surface treating apparatus, comprising:

an overflow treating tank for holding therein a chemical in which a wafer is to be soaked with to perform a surface treatment of the wafer;

a first temperature regulating mechanism for keeping a temperature of the chemical, in said treating tank at a predetermined temperature;

a piping for circulating the chemical overflowing out of said treating tank back into said treating tank;

a filter unit for filtering the chemical, passing through said piping to remove foreign articles from the chemical; and

a second temperature regulating mechanism for regulating the temperature of the chemical in said filter unit to a temperature at which no deposit is produced from the chemical in said filter.

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**5,741,363**

## INTERIORLY PARTITIONED VAPOR INJECTOR FOR DELIVERY OF SOURCE REAGENT VAPOR MIXTURES FOR CHEMICAL VAPOR DEPOSITION

**Peter C. Van Buskirk, Newtown, Conn.; James A. Fair, Mountain View, Calif., and David E. Kotecki, Hopewell Jct., N.Y., assignors to Advanced Technology Materials, Inc., Danbury, Conn.; International Business Machines Corporation, Armonk, N.Y., and Varian Corporation, Palo Alto, Calif.**

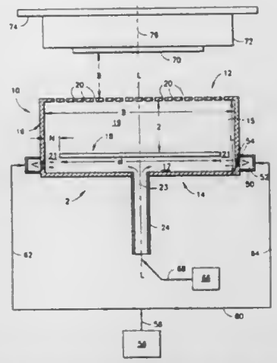
**Filed Mar. 22, 1996, Ser. No. 621,088**

**Int. Cl.[6] C23C** *16/00*

**U.S. Cl. 118—715** **18 Claims**

1. A showerhead disperser device for mixing plural fluid streams, comprising:





a housing including front and rear walls in spaced apart relation to one another, and a side wall therebetween, defining within the housing an interior volume;

the front wall having a multiplicity of mixed fluid discharge openings therein, for discharging mixed fluid from the interior volume of the housing exteriorly thereof;

flow passages joined to the housing for introducing into the interior volume of the housing respective fluids to be mixed therein; and

at least one baffle plate mounted in the interior volume of the housing, intermediate the front and rear walls of the housing, the baffle plate having an edge in spaced relation to the side wall to form an annular flow passage therebetween and the baffle plate having at least one of the respective fluids directed against a central portion thereof upon introduction thereof through one of the flow passages to the interior volume of the housing, for outward flow thereof towards the annular flow passage and subsequent distribution thereof in the interior volume of the housing;

another of said flow passages introducing at least another of the respective fluids for flow into the annular flow passage against the outwardly flowing fluid and mixing therebetween in the annular flow passage, forming mixed fluid for flow through the interior volume of the housing to the front wall thereof and discharge through the mixed fluid discharge openings in said front wall.

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**5,741,364**

## THIN FILM FORMATION APPARATUS

**Jun Kodama, Kawasaki, and Shin Araki, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Division of Ser. No. 201,486, Feb. 23, 1994, Pat. No. 5,522,343. This application Dec. 11, 1995, Ser. No. 570,711**

**Claims priority, application Japan, Sep. 14, 1988, 63-228806; Feb. 16, 1989, 1-034987; Feb. 27, 1989, 1-043269**

**Int. Cl.[6] C23C** *16/00*

**U.S. Cl. 118—723 MP** **27 Claims**

1. Thin film formation apparatus for depositing hydrogenated amorphous substances on a substrate comprising:

a reactor vessel;

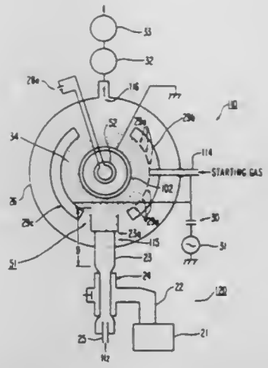
a starting gas source for introducing starting gas into said reactor vessel;

a plasma generator in said reactor vessel for producing a plasma from the starting gas;

a hydrogen source providing hydrogen for introduction into said vessel; and

a hydrogen radical generator generating hydrogen radicals by decomposing the hydrogen.

said hydrogen radical generator including a microwave oscillator, an elongated hydrogen radical distribution vessel including an elongated hydrogen radical blowing port in said reactor vessel for distributing hydrogen radicals uniformly over the substrate, a hydrogen introducing conduit supplying hydrogen from said source thereof to said distribution vessel, an antenna in said distribution vessel receiving microwaves from said microwave oscillator, and a shield positioned at said blowing port allowing flow of hydrogen radicals and preventing microwaves from entering the reactor vessel.




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**5,741,365**

## CONTINUOUS METHOD FOR CLEANING INDUSTRIAL PARTS USING A POLYORGANOSILOXANE

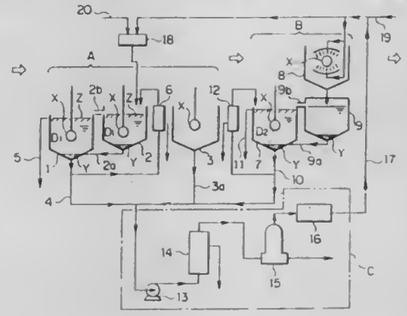
**Minoru Inada, Yokohama; Kimiaki Kabuki, Tokyo; Yasutaka Imajo, Hachioji; Takayuki Oguni; Noriaki Yagi, both of Yokohama; Nobuhiro Saitoh, Ota; Akitsugu Kurita, Ota, and Yoshiaki Takezawa, Ota, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Division of Ser. No. 651,370, Feb. 28, 1991, Pat. No. 5,443,747. This application May 5, 1995, Ser. No. 436,026**

**Claims priority, application Japan, Oct. 26, 1989, 1-280860; Nov. 21, 1989, 1-302580; Mar. 16, 1990, 2-065841; Mar. 16, 1990, 2-065842**

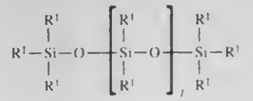
**Int. Cl.[6] B08B** *7/04*; *3/04*

**U.S. Cl. 134—1** **54 Claims**



1. A continuous method for cleaning or removing liquid from industrial parts comprising:

cleaning a part or removing liquid from a part by contacting the part with a cleaning composition consisting essentially of at least one polyorganosiloxane not-compatible with water selected from the group consisting of a straight chain polyorganosiloxane represented by the formula:

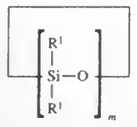


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wherein l is an integer from 0 to 5, and

a cyclic polyorganosiloxane represented by the formula:



wherein $R^1$ in each of the above formulas is independently selected from the group consisting of methyl, ethyl, propyl, butyl, phenyl, trifluoro-methyl, amino, amide, acrylic acid ester and mercaptan; l is an integer from 0 to 5; and m is an integer from 3 to 7, wherein the cleaning composition is substantially free of water, and

recovering the polyorganosiloxane of the cleaning composition and recycling it back into the method for cleaning of another part and

removing the cleaning composition from the part.

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**5,741,366**

**METHODS FOR TREATMENT OF LEAD-CONTAINING SURFACE COATINGS AND SOIL**

**Joseph Zelez, R.R. 2, Box 473E, Henryville, Pa. 18332; Anthony Peter Balestrieri, 2019 Lake Dr., Folsom, N.J. 08037-9115, and Robert Howard, 11A Oak Dr., Shamong Township, N.J. 08088**

**Filed Feb. 9, 1996, Ser. No. 599,632**

**Int. Cl.[6] B08B** *3/08;* **C23G** *1/02*

**U.S. Cl. 134—2** **16 Claims**

1. A method for removing lead-based paint from a surface coated with said paint comprising: (a) applying an aqueous composition comprising about 10 to 20 percent by volume of 30% hydrogen peroxide, about 10 to 20 percent by volume ammonium hydroxide, about 10 to 20 percent by volume concentrated nitric acid, about 10 to 20 percent by volume glacial acetic acid, the remainder being water, to said painted surface and (b) neutralizing said surface by pouring water on said surface.

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**5,741,367**

**METHOD FOR DRYING PARTS USING A POLYORGANOSILOXANE**

**Minoru Inada, Yokohama; Kimiaki Kabuki, Tokyo; Yasutaka Imajo, Hachioji; Takayuki Oguni; Noriaki Yagi, both of Yokohama; Nobuhiro Saitoh, Ota; Akitsugu Kurita, Ota, and Yoshiaki Takezawa, Ota, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Division of Ser. No. 651,370, Feb. 28, 1991, Pat. No. 5,443,747. This application Jun. 7, 1995, Ser. No. 485,906**

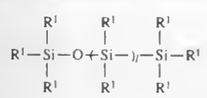
**Claims priority, application Japan, Oct. 26, 1989, 1-280860; Nov. 21, 1989, 1-302580; Mar. 16, 1990, 2-065841; Mar. 16, 1990, 2-065842**

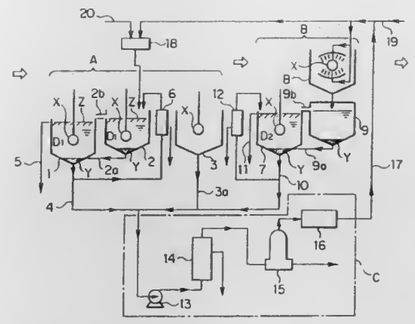
**Int. Cl.[6] B08B** *7/04;3/04*

**U.S. Cl. 134—10** **24 Claims**

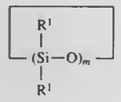
1. A continuous method for drying an industrial object comprising:

a step of substituting liquid on said object with at least one polyorganosiloxane selected from the group consisting of a straight chain polyorganosiloxane represented by the formula;





and a cyclic polyorganosiloxane represented by the formula:



wherein $R^1$ in each of the above formulas is independently selected from the group consisting of methyl, ethyl, propyl, butyl, phenyl, trifluoro-methyl, amino, amide, acrylic acid ester and mercaptan; l is an integer from 0 to 5; and m is an integer from 3 to 7,

wherein said polyorganosiloxanes are substantially free of water, and

removing said at least one polyorganosiloxane from the object so as to give a dry object.

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**5,741,368**

**DIBASIC ESTER STRIPPING COMPOSITION**

**Javad J. Sahbari, San Jose, Calif., assignor to Silicon Valley Chemlabs, Santa Clara, Calif.**

**Filed Jan. 30, 1996, Ser. No. 593,628**

**Int. Cl.[6] B08B** *7/04*

**U.S. Cl. 134—38** **13 Claims**

1. A method for removing photoresist from a substrate comprising:

contacting said substrate with a stripping solution for a time sufficient to remove said photoresist from said substrate, wherein said stripping solution comprises

(a) from about 5% to about 95% by weight of one or more dibasic esters having the general formula

$$R_1CO_2—(CH_2)_n—CO_2R_2$$

where $R_1$ and $R_2$ are alkyl groups of 1–4 carbons and n=1–5;

(b) from about 1% to about 65% by weight of tetrahydrofurfuryl alcohol or of a water soluble alcohol, glycol, glycol ether, or mixture thereof, having general formula

$$R—(CHOH)_n—R'$$

where R and R' are selected from the group consisting of a hydrogen atom, an alkyl group of 1–7 carbon atoms, and an alkoxyl group of 1 to 4 carbon atoms, n=1–3; and

(c) from about 5% to about 60% by weight deionized water; and thereafter

collecting the stripping solution; and

adding water to the collected stripping solution to increase the weight percentage of water until the stripping solution separates into an aqueous phase and an organic phase, whereby stripped photoresist is segregated in to the organic phase.



**5,741,369**

**PLATE-LIKE BODY STRUCTURE WITH SOLAR BATTERY FOR SOUND INSULATION WALL**

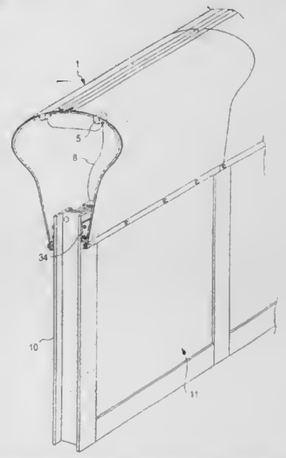
**Shinta Yamamura, Kanagawa; Naoyuki Furuta; Tadanori Mizukami, both of Tokyo; Yutaka Tazaki, Kanagawa, and Takashi Mikami, Saitama, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan**

**Filed May 28, 1996, Ser. No. 654,345**

**Claims priority, application Japan, May 30, 1995, 7-154058**

**Int. Cl.[6] H01L** *31/048;* **E01F** *8/00*

**U.S. Cl. 136—251** **10 Claims**



1. A sound insulation wall with a built-in solar battery, comprising:

a first type plate-like body having a gently curved, convex arcuate portion, and a flexible amorphous silicon solar battery disposed on said arcuate portion, said first type plate-like body being mounted on a top end portion of a sound insulation wall; and

at least one electrical connector provided in a circumferential edge portion of said first type plate-like body so as not to project over said circumferential edge.

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**5,741,370**

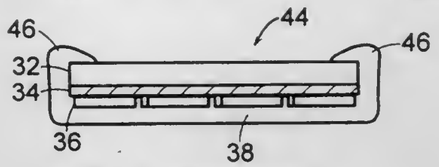
**SOLAR CELL MODULES WITH IMPROVED BACKSKIN AND METHODS FOR FORMING SAME**

**Jack I. Hanoka, Brookline, Mass., assignor to Evergreen Solar, Inc., Waltham, Mass.**

**Filed Jun. 27, 1996, Ser. No. 671,415**

**Int. Cl.[6] H01L** *31/048;31/18*

**U.S. Cl. 136—251** **20 Claims**



1. A laminated solar cell module comprising:

a from support layer formed of light transmitting material and having first and second surfaces;

a transparent encapsulant layer disposed adjacent the second surface of the front support layer;

a plurality of interconnected solar cells having a first surface disposed adjacent the transparent encapsulant layer; and

a backskin layer formed of a thermoplastic olefin comprising at least a first ionomer and a second ionomer and having a first surface disposed adjacent a second surface of the interconnected solar cells;

wherein the transparent encapsulant layer and the backskin layer, in combination, encapsulate the interconnected solar cells.

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**5,741,371**

**METHOD AND DEVICE FOR CONTROLLING THE CO CONTENTS OF A FURNACE ATMOSPHERE FOR CARBURIZATION AND CARBONITRIDING OF METALLIC WORK PIECES**

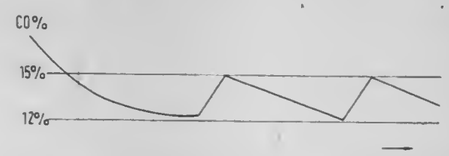
**Max Roggatz, Goch, Germany, assignor to Ispen Industries International GmbH, Kleve, Germany**

**Filed Apr. 22, 1996, Ser. No. 637,328**

**Claims priority, application Germany, Apr. 22, 1995, 195 14 932.7**

**Int. Cl.[6] C23C** *8/20;8/30*

**U.S. Cl. 148—216** **7 Claims**




1. A method for controlling CO contents of a furnace atmosphere for carburizing and carbonitriding metallic workpieces in a furnace, said method comprising the steps of:

directly feeding a mixture of an oxidizing reagent and a hydrocarbon-containing fuel into the furnace for producing a CO-containing furnace atmosphere;

measuring the CO contents of the furnace atmosphere;

comparing the measured CO contents to a preset minimal CO value;

introducing methanol into the furnace atmosphere when the measured CO contents is no longer greater than the preset minimal CO value.

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**5,741,372**

**METHOD OF PRODUCING OXIDE SURFACE LAYERS ON METALS AND ALLOYS**

**Saveliy M. Gugel, 109-10 Park La. S., #B3, Richmond Hill, N.Y. 11418**

**Filed Nov. 7, 1996, Ser. No. 744,972**

**Int. Cl.[6] C23C** *8/16*

**U.S. Cl. 148—276** **10 Claims**

1. A method of producing oxide surface layers on metals and alloys, comprising the steps of delivering a metal or alloy into a working chamber preheated to temperature from 200° C. to below its melting point so that the metal or alloy is heated in the working chamber to a temperature from 100° C. to below a melting point of the metal or alloy in waterless atmosphere; and introducing into the working chamber a water solution of substances which contain alloying elements so that water steam and volatile oxides of the alloying elements are formed directly into the working chamber and interact with a surface of the metal or alloy to produce an alloyed surface layer of the metal or alloy.

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5,741,373

## FE BASED SOFT MAGNETIC ALLOY, MAGNETIC MATERIALS CONTAINING SAME, AND MAGNETIC APPARATUS USING THE MAGNETIC MATERIALS

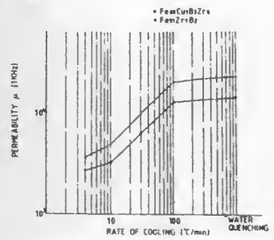
Kiyonori Suzuki, Sendai; Akihiro Makino, Nagaoka; Tsuyoshi Masumoto, 8-22 3chome, Uesugi, Aoba-ku, Sendai-shi, Miyagi-ken; Akihisa Inoue, Sendai, and Noriyuki Kataoka, Sendai, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, and Tsuyoshi Masumoto, Sendai, both of Japan

Continuation of Ser. No. 201,135, Feb. 24, 1994, Pat. No. 5,449,419, which is a continuation of Ser. No. 690,201, Apr. 23, 1991, abandoned. This application Apr. 14, 1995, Ser. No. 422,720

Claims priority, application Japan, Apr. 24, 1990, 2-108308; Aug. 3, 1990, 2-230135; Sep. 7, 1990, 2-237752; Sep. 7, 1990, 2-237753; Sep. 7, 1990, 2-237754; Sep. 7, 1990, 2-237755; Sep. 7, 1990, 2-237757; Sep. 7, 1990, 2-237758; Sep. 13, 1990, 2-243589; Sep. 13, 1990, 2-243590; Nov. 27, 1990, 2-324518; Nov. 27, 1990, 2-324519

Int. Cl.[6] H01F *1/47*

U.S. Cl. 148—306 14 Claims




1. An Fe-based soft magnetic alloy consisting essentially of a composition represented by the formula (I):

$$(Fe_{1-a}Q_a)_bB_xT_yT'_z \quad (1)$$

wherein Q represents at least one element selected from the group consisting of Co and Ni; T represents at least one element selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Mo and W, with T always including one of (i) Zr, (ii) Hf and (iii) Zr and Hf; T' represents at least one element selected from the group consisting of Cu, Ag, Au, Ni, Pd and Pt; a, b, x, y and z are real numbers satisfying the relationships:

$0 \leqq a \leqq 0.05$,

$75 < b \leqq 93$ atomic %,

$0.5 \leqq x \leqq 16$ atomic %,

$4 \leqq y \leqq 10$ atomic %,

$0 \leqq Z \leqq 4.5$ atomic %;

wherein the soft magnetic alloy has been heat treated at a temperature greater than the crystallization temperature of the soft magnetic alloy, and then cooled from the temperature at a rate greater than 120° C./minute.

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5,741,374

## HIGH STRENGTH, DUCTILE, CO-FE-C SOFT MAGNETIC ALLOY

Lin Li, Reading, Pa., assignor to CRS Holdings, Inc., Wilmington, Del.

Filed May 14, 1997, Ser. No. 856,456

Int. Cl.[6] C23C *8/22*

U.S. Cl. 148—319 20 Claims

1. A magnetically soft alloy that provides a unique combination of strength, ductility, and magnetic induction consisting essentially of, in weight percent, about

| | |
|---|---|
| Carbon | 0.05–0.50 |
| Manganese | 0.5 max. |
| Silicon | 0.5 max. |
| Phosphorus | 0.01 max. |

-continued

| | |
|---|---|
| Sulfur | 0.01 max. |
| Chrominum | 1.0 max. |
| Nickel | 1.0 max. |
| Molybdenum | 0.25 max. |
| Cobalt | 14–28 |
| Vanadium | 0.1 max. |
| Niobium | 0.1 max. |
| Tungsten | 0.1 max. |

and the balance is essentially iron.

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5,741,375

**Patent Not Issued For This Number**

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5,741,376

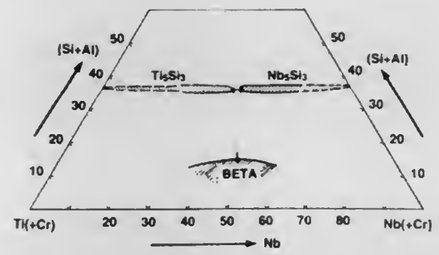
## HIGH TEMPERATURE MELTING NIOBIUM-TITANIUM-CHROMIUM-ALUMINUM-SILICON ALLOYS

P. R. Subramanian, Dayton; Madan G. Mendiratta, and Dennis M. Dimiduk, both of Beavercreek, all of Ohio, assignors to The United States of America as Represented by the Secretary of the Air Force, Washington, D.C.

Filed May 9, 1996, Ser. No. 647,215

Int. Cl.[6] C22C *27/02*

U.S. Cl. 148—422 13 Claims




1. A high temperature melting niobium-titanium-chromium-aluminum-silicon alloy having good low temperature damage resistance and high temperature strength and creep resistance to about 1500° C., comprising:

(a) an alloy composition of niobium, titanium, chromium, aluminum and silicon in the ranges of 31 to 41 atom percent Nb, 26 to 34 atom percent Ti, 8 to 10 atom percent Cr, 6 to 12 atom percent Al, and 9 to 18 atom percent Si;

(b) wherein the alloy composition includes a ductile beta first phase matrix containing from about 29 to 44 atom percent, Nb, 32 to 42 atom percent Ti, 10 to 13 atom percent Cr, 7 to 18 atom percent Al, and less than 1 atom percent Si in solution, wherein the ratio of Nb to Ti is from about 0.7 to 1.35; and,

(c) wherein the alloy composition includes at least one of a discrete high temperature melting intermetallic second phase and a discrete high temperature melting intermetallic third phase substantially uniformly distributed within said first phase matrix, said second phase being a $Nb_5Si_3$-base silicide containing about 34 to 42 atom percent Nb, 21 to 28 atom percent Ti, 0.5 to 3 atom percent Cr, 1 to 7 atom percent At, and 28 to 35 atom percent Si, and said third phase being a $Ti_5Si_3$-base silicide containing about 21 to 31 atom percent Nb, 30 to 40 atom percent Ti, 1 to 3 atom percent Cr, 2 to 7 atom percent Al, and 29 to 34 atom percent Si.



5,741,377

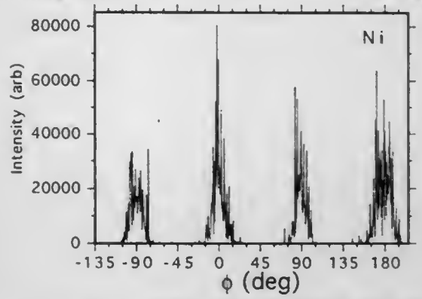
## STRUCTURES HAVING ENHANCED BIAXIAL TEXTURE AND METHOD OF FABRICATING SAME

Amit Goyal, Knoxville; John D. Budai, Oak Ridge; Donald M. Kroeger, Knoxville; David P. Norton, Knoxville; Eliot D. Specht, Knoxville, and David K. Christen, Oak Ridge, all of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Apr. 10, 1995, Ser. No. 419,583

Int. Cl.[6] C22F *1/00*

U.S. Cl. 148—512 16 Claims




1. A method of preparing a biaxially textured alloy article comprising the steps of:

a. rolling and annealing a base metal preform to form a biaxially textured substrate having a surface, said base metal preform having a face-centered cubic, body-centered cubic, or hexagonal close-packed crystalline structure, said biaxially textured substrate being characterized by an x-ray diffraction phi scan peak of no more than 20° FWHM;

b. depositing onto said surface of said biaxially textured substrate an alloying agent to form a laminate; and,

c. heating the laminate to a sufficient temperature and for a sufficient time to cause interdiffusion of said base metal and said alloying agent, while maintaining the biaxial texture of said biaxially textured substrate, while transferring the biaxial texture to said alloying agent and while preventing homogeneous melting, to form a biaxially textured alloy article.

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5,741,378

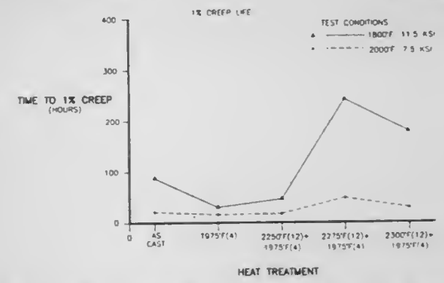
## METHOD OF REJUVENATING COBALT-BASE SUPERALLOY ARTICLES

Norman Pietruska, Durham, and S. Michael Kurpaska, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 279,989, Jul. 26, 1994, Pat. No. 5,549,767, which is a continuation of Ser. No. 879,022, May 6, 1992, abandoned. This application Jan. 30, 1996, Ser. No. 594,340

Int. Cl.[6] C22C *19/07*

U.S. Cl. 148—674 4 Claims




4. A method of rejuvenating a cobalt-base alloy gas turbine engine component, said alloy having complex carbides and a carbide solvus temperature, consisting essentially of the steps of:

a. selecting a component which has been exposed to high temperatures and pressures for extended periods of time;

b. solution heat treating the component in vacuum or inert atmosphere at a solution heat treat temperature above the carbide solvus temperature for one to twelve hours to dissolve the complex carbides; and

c. aging the component at approximately 1965° F.–1975° F. for two to twenty-four hours, whereby creep life is improved and the component is rejuvenated.

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5,741,379

## PROCESS FOR PREPARING AN INSULATING BOARD

Christof Tschernuth, Villach, Austria, assignor to Heraklith Baustoffe AG, Furnitz, Austria

Filed Jul. 18, 1995, Ser. No. 503,680

Claims priority, application Germany, Jul. 19, 1994, 44 25 472.5; Sep. 30, 1994, 44 34 991.2

Int. Cl.[6] B27N *3/00*

U.S. Cl. 156—62.6 6 Claims

1. A process for preparing an insulation board, in which fibers are first processed into a primary mat and subsequently further processed into a secondary mat by multiple folding the primary mat and in which the fibers are impregnated with an impregnating agent, characterized in that the primary mat is subjected to an impregnation treatment prior to the multiple folding into the secondary mat, wherein the impregnating agent is sprayed in the liquid form as a mist onto both sides of the primary mat.

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5,741,380

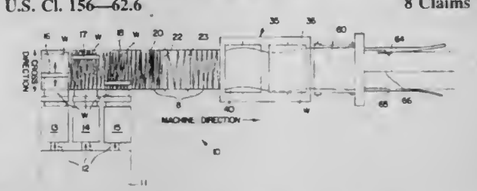
## MULTI-DENSITY BATT

William Clark Hoyle, Rockwell, and Jerry Lee Nealy, Statesville, both of N.C., assignors to Cumulus Fibres, Inc., Charlotte, N.C.

Filed Feb. 13, 1996, Ser. No. 600,853

Int. Cl.[6] B32B *17/00*

U.S. Cl. 156—62.6 8 Claims




1. A method of fabricating a multi-density batt, comprising the steps of:

(a) forming a homogeneous blend of thermoplastic matrix fibers and thermoplastic binder fibers, said binder fibers having a relatively low predetermined melting temperature and said matrix fibers having a relatively high predetermined melting temperature;

(b) forming said blend of matrix and binder fibers into a fiber web of indeterminate length;

(c) overlaying a plurality of said web layers to form the batt;

(d) varying the number of said web layers overlaid according to a predetermined pattern wherein the batt has at least one integrally-formed, high density region extending in both a cross direction and a machine direction, and at least one integrally-formed relatively thin, low density region extending in both the cross direction and machine direction;

(e) compressing said batt;

(f) heating the batt while compressed to a temperature at or above the melting temperature of said binder fibers and below the melting temperature of said matrix fibers while compressed to fuse the matrix and binder fibers to each other to form a batt having intimately interconnected and fused web layers and intimately interconnected and fused matrix and binder fibers; and

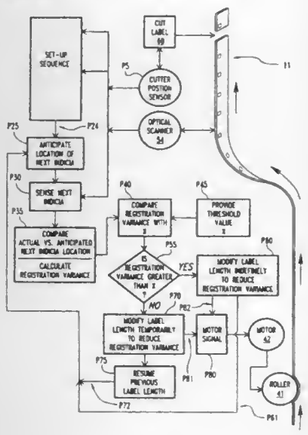
VOL 1209 ISS 3 APR 21 1998 UMI



(g) cooling the batt to form a compressed batt having regions of differing thickness and density corresponding to the predetermined pattern.

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**5,741,381**
**LABELLING SYSTEM AND METHOD**
**Dale E. Dolence, Evansville, Ind., and Roger Williams, Sr., Ellenwood, Ga., assignors to R. W. Packaging, Inc., Monroe, Ga.**
**Continuation of Ser. No. 1,279, Jan. 7, 1993, abandoned. This application May 22, 1996, Ser. No. 650,259**
**Int. Cl.[6] B32B** *31/00*
**U.S. Cl. 156—64** **25 Claims**




**17**. A process for providing cut labels for labelling a series of containers with labels providing images to be displayed, comprising the steps of:

providing an elongated flexible label base carrying a series of images printed thereon and wound into a supply roll, said images including registration indicia along the elongated label base, said registration indicia being located along said elongated label base corresponding to locations to be cut across said elongated label base;

passing said label base through means for sensing said registration indicia and through a cutter;

sensing input data from two sources, namely:

(1) sensing a first registration indicia with said means for sensing said registration indicia to provide first location data to a digital means for processing data; and thereafter sensing a subsequent second registration indicia with said means for sensing said registration indicia to provide second location data to said digital means for processing data; and,

(2) sensing a cutter position of said cutter to provide cutter position data to said digital means for processing data;

calculating a first label length with said digital means for processing data based on said sensed first location data and said sensed second location data;

driving a controlled speed motor in response to signalling from said digital means for processing to advance said elongated label base through said cutter at a first base feed rate corresponding to said first label length and to said cutter position;

determining an anticipated location of a third registration indicia with said digital means for processing data based on said location data and said first label length;

sensing a third registration indicia with said means for sensing said registration indicia to provide actual third location data to said digital means for processing data;

comparing said anticipated location of the third registration indicia with said actual third location data with said digital means for processing data to determine a first registration variance;

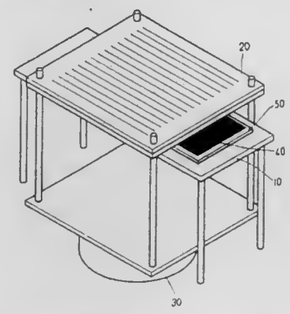
modifying said calculated first label length with said digital means for processing data based on said first registration variance to establish a calculated second label length;

modifying said first base feed rate to a second base feed rate by signalling said controlled speed motor with said means for processing data to synchronize the label feed rate and said cutter; and,

sequentially cutting singular labels with said cutter at said predetermined locations to be cut on said elongated flexible label base.

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**5,741,382**
**METHOD FOR PREPARING ORIENTED DISCONTINUOUS LONG FIBER REINFORCED THERMOPLASTIC RESIN COMPOSITE SHEET PRODUCT**
**Chen-Chi Martin Ma, and Shih-Hsiung Lin, both of Hsinchu, Taiwan, assignors to National Science Council, Taipei, Taiwan**
**Filed May 7, 1996, Ser. No. 643,943**
**Int. Cl.[6] B32B** *31/16*
**U.S. Cl. 156—73.6** **16 Claims**




**1**. A method for preparing an oriented discontinuous long fiber reinforced thermoplastic resin composite sheer product, said method comprising the steps of:

(a) feeding a plurality of rectangular prepreg strips of a fiber-reinforced thermoplastic resin composite to a horizontal sieve plate in vibration, said rectangular prepreg strips each having a length ranging between 1 cm and 20 cm, a width ranging between 0.01 cm and 0.2 cm, said horizontal sieve plate having a plurality of ditches parallel to one another, said ditches having a length greater than the length of said prepreg strips, and a width greater than the width and the thickness of said prepreg strips, with said width of said ditches being in a range of 1–5 mm wherein said rectangular prepreg strips have substantially the same dimensions and each is formed by cutting a prepreg sheet of a continuous fiber reinforced thermoplastic resin composite which has a thickness ranging between 0.01 cm and 0.2 cm.;

(b) disposing said prepreg strips onto a stationary mold plate or thermoplastic resin sheet product positioned under said horizontal sieve plate, said vibration causing said prepreg strips to pass through said ditches and fall evenly over a plane of said stationary mold plate or thermoplastic resin sheet product;

(c) horizontally removing, with said strips, said mold plate or said thermoplastic resin sheet product from underneath said horizontal sieve plate; and

(d) heating and pressing said prepreg strips deposited on said mold plate or on said thermoplastic resin sheet product, such that an oriented discontinuous long fiber reinforced thermoplastic resin composite sheet product is formed.



**5,741,383**
**PROCESS FOR BONDING A VEHICLE WINDOW**
**Andrew R. Kneisel, Royal Oak, Mich., assignor to Essex Specialty Products, Inc., Clifton, N.J.**
**Filed Aug. 18, 1992, Ser. No. 931,737**
**Int. Cl.[6] B60J** *1/00;* **E06B** *3/00;5/00;7/00*
**U.S. Cl. 156—108** **20 Claims**

**1**. A process for bonding a vehicle window to a vehicle flange comprising the sequential steps of:

a) applying a liquid masking composition to a vehicle flange;

b) painting the vehicle, and drying or curing the liquid masking composition sufficiently to form a removable mask;

c) removing the mask from the flange; and

d) adhesively bonding the vehicle window to the vehicle flange.

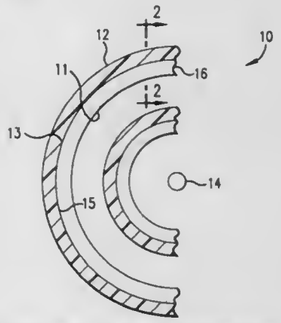
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**5,741,384**
**PROCESS FOR MAKING GLASS FIBER-REINFORCED COMPOSITE MATERIAL**
**Bernhard Pfeiffer, Kelkheim; Detlef Skaletz, Mainz; Anne Texier, Lille; Horst Heckel, Darmstadt, and Joachim Heydweiller, Rüsselsheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Fankfurt, Germany**
**Filed May 25, 1994, Ser. No. 249,156**
**Claims priority, application Germany, May 27, 1993, 43 17 649.6**
**Int. Cl.[6] B32B** *31/06;31/20*
**U.S. Cl. 156—182** **4 Claims**

**1**. A process for the preparation of a glass fiber-reinforced composite material by melt pultrusion, which comprises drawing the glass fiber strand through an agitated aqueous powder dispersion of a coupling agent over a deflection body, removing the dispersing agent, melting the powder onto the glass fiber strand and subsequently impregnating the pretreated fiber strand with polyolefins in a melt pultrusion.

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**5,741,385**
**METHOD OF STORING ACTIVE FILMS**
**Alan S. Weinberg, Taylors, S.C., assignor to W.R. Grace & Co.-Conn., Duncan, S.C.**
**Filed May 25, 1994, Ser. No. 248,901**
**Int. Cl.[6] B31C** *81/00*
**U.S. Cl. 156—192** **5 Claims**




**1**. A method for storing a film having an active film material which comprises the steps of:

providing at least one strip of oxygen scavenging material with each said strip having two major surfaces and a lateral width;

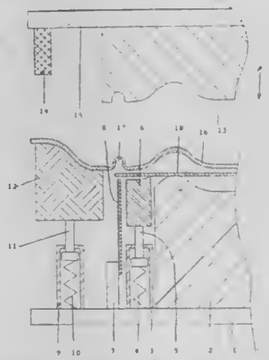
providing a carrier film with a lateral width greater than the lateral width of the at least one strip of oxygen scavenging material;

positioning said at least one strip of oxygen scavenging material with respect to said carrier film; and

rolling said carrier film and said at least one strip of oxygen scavenging material so that said at least one strip is isolated along its two major surfaces from the environment while said carrier film and said at least one strip are in a rolled condition.

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**5,741,386**
**APPARATUS AND METHOD FOR SQUEEZE-GLUING DECORATIONS**
**Masanori Tomioka, Hoi-gun; Kiyoshi Matsuura, Toyokawashi; Hitoshi Yamashita, Toyokawa, and Tomohisa Nakamura, Gamagohri, all of Japan, assignors to Sintokogio, Ltd., Nagoya, Japan**
**Filed Jul. 19, 1996, Ser. No. 685,455**
**Claims priority, application Japan, Jul. 21, 1995, 7-207584**
**Int. Cl.[6] B32B** *31/00*
**U.S. Cl. 156—212** **4 Claims**



**1**. A method of squeeze-gluing a glued decoration onto a cast comprising

putting lower peripheral surfaces of the glued decoration on a lower mold,

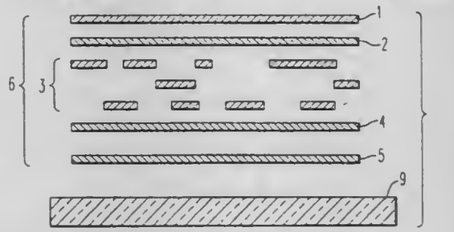
placing the cast over the decoration and gluing outer parts of the decoration onto parts of the cast corresponding thereto.

after gluing the outer parts of the decoration to the parts of the cast corresponding to said outer parts of the decoration, pressing inner parts of the decoration against parts of the cast corresponding thereto so as to glue the inner parts to the corresponding parts of the cast, and

simultaneously with the pressing step squeezing a peripheral part of the decoration into a squeezing groove in the cast.

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**5,741,387**
**LITHOGRAPHIC PRINTING PROCESS AND TRANSFER SHEET**
**Kenneth R. Coleman, Palm Beach Gardens, Fla., assignor to Riverside Industries, Inc., Palm Beach Gardens, Fla.**
**Filed Aug. 15, 1995, Ser. No. 515,411**
**Int. Cl.[6] B41M** *5/40*
**U.S. Cl. 156—240** **19 Claims**




**1**. A laminated image transfer sheet, comprising:

a backing sheet;

a heat release layer on said backing sheet;

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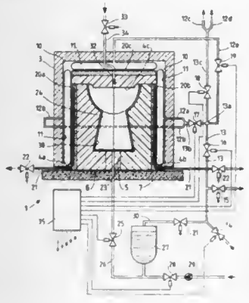


an ink design layer on said heat release layer;
a polymer layer containing a water-dispersible polymer on said ink design layer; and
a mask layer on said polymer layer, wherein said mask layer outlines an ink design in said ink design layer, but does not cover said ink design and allows transfer of only said heat release layer, said ink design and said polymer layer within said outlined ink design.

11. A process for heat transferring an ink image from an image transfer sheet to a substrate, comprising the steps:
contacting a substrate with the mask layer of the laminated image transfer sheet of claim 1,
applying heat and pressure to the backing sheet sufficient to transfer said ink design to said substrate to form an imaged substrate, and
removing said laminated image transfer sheet from said imaged substrate.

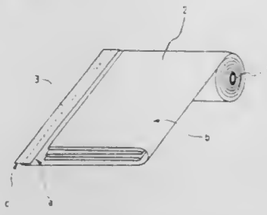
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**5,741,388**
**PROCESS AND APPARATUS FOR SLIP CASTING OF CERAMIC PARTS**
**Thomas Gerster, Laufen; Gerold Spieler, Dornach; Konrad Düblin, Laufen, and Stefan Bitter, Wallbach, all of Switzerland, assignors to Keramik Holding AG Laufen, Laufen, Switzerland**
**Filed Jun. 29, 1995, Ser. No. 496,595**
**Claims priority, application Switzerland, Jun. 29, 1994, 2068/94; Feb. 9, 1995, 375/95**
**Int. Cl.[6] B28B** *1/26*
**U.S. Cl. 156—245** **14 Claims**



1. A method of slip casting of ceramic parts, comprising the steps of:
providing a chamber without a fluid-tight seal and formed by a vertically displaceable bell;
arranging at least a first mold having a cavity and formed of porous mold parts in the chamber, so that the first mold is surrounded, at least partially, by an intermediate space in which a plurality of inflatable bladders is provided;
filling the plurality of inflatable bladders provided in the intermediate space with fluid and subjecting the fluid in the inflatable bladders to a pressure, which is at least equal to a first pressure by which slip is introduced into the mold cavity, in order to restrain the first mold in the chamber;
thereafter, filling the cavity of the first mold by introducing slip under the first pressure which is greater than an ambient air pressure;
subjecting, during a casting process, the slip, which fills the cavity of the first mold to a second pressure, with a result that water from the slip enters the mold parts, of which the first mold is formed, until a ceramic part of a predetermined thickness is formed inside the cavity;
simultaneously, subjecting the fluid, which fills the inflatable bladders, to a pressure at least equal to the second pressure to hold the first mold together in a pressure-resistant manner during the casting process;
after formation of the ceramic part, removing residual slip from the mold cavity and removing the ceramic part from the first mold.

**5,741,389**
**MASKING FILM ROLL FOR USE IN PAINTING, METHOD FOR PRODUCING IT, AND TUBULAR FILM FROM WHICH IT IS PRODUCED**
**Takashi Yoshino, Hachioji, Japan, assignor to Yoshino Kasei Company Limited, Tokyo, Japan**
**Filed Jan. 11, 1996, Ser. No. 584,143**
**Int. Cl.[6] B32B** *1/08*
**U.S. Cl. 156—272.6** **2 Claims**



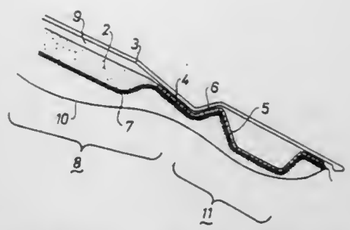
1. A method for producing a masking film roll to be used in painting which comprises:
a step 1 of inflating a polyolefinic resin to form a tubular film having an outer surface and having an inner surface, that the inner surface having opposed sides that define a passageway,
a step 2 of bringing the outer surface of the tubular film into contact with at least a pair of electrodes having a high-voltage current, running a gas through the tubular film passageway so that the opposed sides of the inner surface of the tubular film are not stuck together but are separated from each other by a distance of 1 to 7 mm due to the gas located therebetween, whereby the inner surface of the tubular film is subjected to a corona discharge able to provide an elevated wetting tension of 40 dyn/cm or more,
a step 3 of making an axial break in the corona discharged tubular film while the film is being conveyed in the axial direction, thereby producing a first and a second portion,
a step 4 of flattening the tubular film having the break therethrough, by means of rollers,
a step 5 of turning by 180 degrees the upper part of the flattened film that exists in either the first portion or the second portion as separated by the break that has been imparted to the film in the previous step 3, around the first or second end of the film in the axial direction of the film, thereby exposing the inner surface of the film,
a step 6 of attaching an adhesive tape to the exposed, corona-discharged surface of the film along the axial edge of the film in such a way that the adhesive layer of the tape is made to face the corona-discharged surface of the film while the tape is left to be partly non-attached to the film,
a step 7 of folding the film only in the parallel, axial direction toward the corona-discharged surface thereof, and
a step 8 of winding up the film as obtained in step 7 around a tubular core.

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**5,741,390**
**SOUND-INSULATING VEHICLE BODY PART**
**Jean-Claude Schmuck, Camerel; Claude Jeannot, Poissy, and Claude Buisson, Hemorine, all of France, assignors to Rieter Automotive (International) AG, Zollikon, Switzerland**
**Division of Ser. No. 200,538, Feb. 22, 1994, Pat. No. 5,567,922, which is a continuation of Ser. No. 873,832, Apr. 27, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 474,121**
**Claims priority, application Switzerland, Apr. 26, 1991, 1265/91**
**Int. Cl.[6] B32B** *31/22;* **E04B** *1/82*
**U.S. Cl. 156—280** **1 Claim**

1. Method for the production of an inherently stable self-supporting composite part for engine hoods for acoustic screening of noise sources, comprising the steps of:





a. cutting and trimming a prefabricated outer membrane blank part to form an outside sheet;
b. providing a prefabricated inside packing with fastening elements for fastening components to said inside packing, and providing said inside packing with a removable protective film attached to an exposed surface of said inside packing;
c. bonding the outside sheet directly to said inside packing, said outside sheet and said inside packing cooperating to form a self-supporting structure independent of the engine hood;
d. applying a primer to at least a portion of the outside sheet of the self-supporting structure formed in step c; and
e. applying a lacquer to the primer; and removing the protective film.

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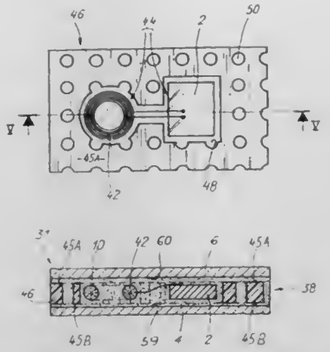
**5,741,391**
**METHOD FOR THE PREPARATION OF BOARD**
**Timo Ollila, Joensuu, Finland, assignor to Schauman Wood Oy, Savonlinna, Finland**
**Continuation of Ser. No. 331,748, Oct. 31, 1994, abandoned. This application Mar. 1, 1996, Ser. No. 609,486**
**Int. Cl.[6] B32B** *31/00*
**U.S. Cl. 156—283** **9 Claims**

1. A method of making a wooden board having a thermoplastic layer joined to a surface of said board, said method comprising the steps of:
applying a glue on the surface of said board;
spreading particles on the glued surface;
spreading granules of a thermoplastic on said particles;
melting the thermoplastic granules to form a thermoplastic layer in contact with the particles; and
cooling the thermoplastic layer.

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**5,741,392**
**CARD COMPRISING AT LEAST ONE ELECTRONIC ELEMENT AND METHOD OF MANUFACTURE OF SUCH A CARD**
**Francois Droz, Rue de la Prairie 46, CH-2300 La Chaux-de-Fonds, Switzerland**
**Division of Ser. No. 59,664, May 12, 1993, Pat. No. 5,399,847. This application Nov. 2, 1994, Ser. No. 333,349**
**Claims priority, application France, May 19, 1992, 92 06169**
**Int. Cl.[6] B32B** *3/10;31/06;* **G11B** *5/80*
**U.S. Cl. 156—295** **16 Claims**

1. A method of manufacture of an electronic information bearing plastic card to be carried on a person of a user comprising at least one coil electrically connected to an electronic element including the following steps:
1A) bringing onto a work surface a first outer layer formed from a solid plastic material;
1B) placing said coil and said electronic element onto said first outer layer in a form in which said coil and said electronic element are not commonly encased in a carrier element;
1C) applying a binding material onto said coil, said electronic element and said first outer layer in a liquid form;
1D) bringing a second outer layer formed from a solid plastic material onto said liquid binding material and facing said first outer layer;
such steps being succeeded by the following step:
1E) applying pressure on said first and second outer layers until such first and second outer layers are located at a predetermined distance relative to one another, said binding material being thereby caused to spread out and fill an intermediate region between said first and second outer layers by eliminating substantially all air bubbles and air cavities in this intermediate region so as to form a completely filled intermediate layer having a predetermined thickness and having at least one dimension equal to a corresponding exterior dimension of the resulting card in a direction in a general plane of the resulting card, said first and second outer layers having respectively first and second internal surfaces defined respectively by the entire surfaces of these first and second outer layers facing one another, at least a major portion of said first and second internal surfaces being covered over by said binding material so as to assure cohesion of said first and second outer layers with said intermediate layer, said coil and said electronic element each being embedded in said binding material forming said intermediate layer.



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**5,741,393**
**SOLVENTLESS CARBOXYLATED BUTADIENE-VINYLIDENE CHLORIDE ADHESIVES FOR BONDING RUBBER TO METAL**
**I. Glen Hargis, Tallmadge; Richard A. Miranda, Berlin Center, and John A. Wilson, Akron, all of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio**
**Division of Ser. No. 239,079, May 6, 1994, Pat. No. 5,478,654. This application Sep. 28, 1995, Ser. No. 535,596**
**Int. Cl.[6] C09J** *5/02*
**U.S. Cl. 156—307.5** **10 Claims**

1. A process for using a water-based adhesive for adhering a metal substrate to a crosslinked or crosslinkable rubber composition having an interfacial bond area, comprising:
(a) supplying a metal substrate or phosphitized metal substrate having an interfacial bond area to which no organic coating has been applied prior to step (b),
(b) applying a water-based adhesive coating to at least a portion of the interfacial bond area of said crosslinked or crosslinkable rubber composition and/or to at least a portion of the interfacial bond area of said metal substrate forming one or more coated workpieces,
said water-based adhesive coating comprising:
(1) a diene-vinylidene chloride polymer in the form of a water-based latex, said diene-vinylidene chloride polymer having 30 to 95 weight percent of its repeat units from conjugated dienes which are free of halogens and have from 4 to 6 carbon atoms; 5 to 70 weight percent of its repeat units from vinylidene chloride; up to 20 weight percent of repeat units from styrene or alkyl substituted styrene; and up to 20 weight percent of repeat units from other ethylenically unsaturated monomers having from 3 to 12 carbon atoms, and optionally containing one or more oxygen and/or nitrogen atoms,
(2) from 50 to 150 parts by weight of one or more aromatic polynitroso compounds,
(3) from 25 to 75 parts by weight of one or more bismaleimides.

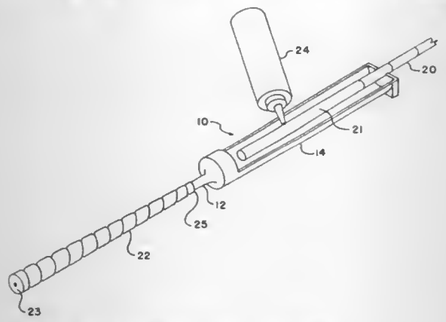
VOL 1209 ISS 3 AP 21 1998 UMI



(c) drying said one or more coated workpieces,
(d) contacting said interfacial bond areas of said metal substrate and said rubber composition at least one of which is a coated workpiece and simultaneously or subsequently applying heat to form a bond between said rubber composition and said metal substrate wherein said parts by weight are based on 100 parts by weight of said diene vinylidene chloride polymer.

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**5,741,394**
**APPARATUS FOR ATTACHING A GOLF CLUB GRIP TO A GOLF CLUB SHAFT**
**Patrick Kennedy, 908 S. Prospect St., Burlington, Vt. 05401**
**Filed Mar. 18, 1996, Ser. No. 617,118**
**Int. Cl.[6] A63B** *57/00;* **B25G** *3/00*
**U.S. Cl. 156—391** **9 Claims**

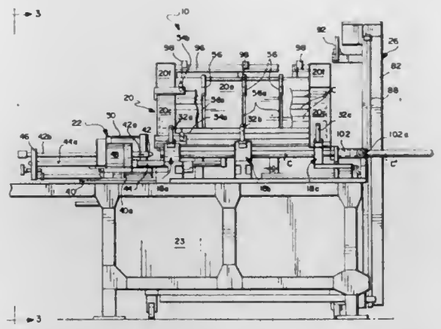


1. A golf club grip assembly tool, comprising:
a) an elongated container portion that is sized and dimensioned to capture and subsequently contain substantially all excess liquid that will run off of a horizontally positioned golf club shaft when the liquid is poured along a substantial length of the golf club shaft without having relative motion between the container portion and the golf club shaft;
b) pouring means, attached to the container portion, for pouring liquid from the container portion; and
c) golf club shaft securing means, mounted to the container portion, for aligning a golf club shaft to the container portion;
d) a stabilizer portion, permanently attached to a bottom side of the container portion, sized and dimensioned both to orient the container portion in a horizontal position on a horizontal support surface, and to prevent the container portion from being tipped over if the container portion is lying on the support surface during the capture and subsequent containment of substantially all excess liquid poured onto a length of the golf club shaft; and
e) securing means, located at an end of the pouring means, sized and dimensioned for releasably securing a mouth of a golf club grip thereon during the time when the liquid is poured from the container portion through the pouring means and into the releasably secured golf club grip.

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**5,741,395**
**APPARATUS FOR INTEGRALLY JOINING ELONGATE PREFORMED THERMOPLASTIC ELEMENTS BY FRICTION WELDING**
**Brian Mozelack, White Hall, Md.; Robert D. Connor, Spring Grove, and Robert J. Schmitt, Stewartstown, both of Pa., assignors to Memtec America Corporation, Timonium, Md.**
**Division of Ser. No. 686,012, Jul. 25, 1996, Pat. No. 5,653,833.**
**This application Dec. 4, 1996, Ser. No. 758,813**
**Int. Cl.[6] B23K** *20/12;* **B29C** *65/06*
**U.S. Cl. 156—458** **16 Claims**

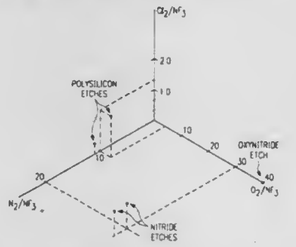
1. An apparatus for integrally joining preformed elongate thermoplastic elements comprising:



positioning means for coaxially positioning at least one pair of preformed elongate thermoplastic elements in abutted end-to-end relationship;
friction-welding means for effecting relative rotation between said coaxially positioned elements to friction-weld the abutted ends thereof; and
transport means for rotating and axially translating said thermoplastic elements during friction welding by said friction-welding means.

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**5,741,396**
**ISOTROPIC NITRIDE STRIPPING**
**Lee M. Loewenstein, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**
**Filed Apr. 29, 1994, Ser. No. 235,819**
**Int. Cl.[6] H01L** *21/00*
**U.S. Cl. 156—643.1** **11 Claims**



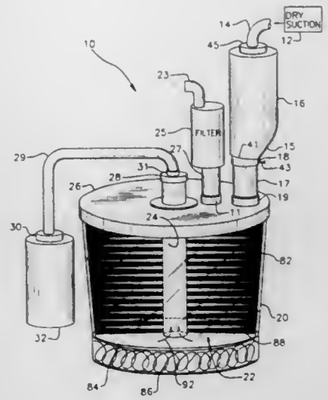

1. A method of isotropic dry etching silicon nitride, comprising the steps of:
(a) exposing silicon nitride to a gas mixture including fluorine and chlorine sources plus a control gas selected from the group consisting of an oxygen source, a nitrogen source, and a mixture thereof, whereby said silicon nitride is removed.

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**5,741,397**
**DENTAL WASTE SEPARATOR**
**Mark P. Kraver, 3001 Del Prado Blvd., Cape Coral, Fla. 33904**
**Filed Jan. 11, 1996, Ser. No. 584,343**
**Int. Cl.[6] C02F** *1/08;* **B01D** *1/24;* **A61L** *2/04;2/24*
**U.S. Cl. 159—25.2** **20 Claims**

1. An apparatus for processing combined liquid and solid dental waste from a patient's mouth such that the solid waste is separated from the liquid waste and sterilized, said apparatus comprising:
suction means for removing the combined solid and liquid dental waste from the patient's mouth;
a single, stationary separation chamber;
means for transmitting the combined solid and liquid dental waste from said suction means to said separation chamber;

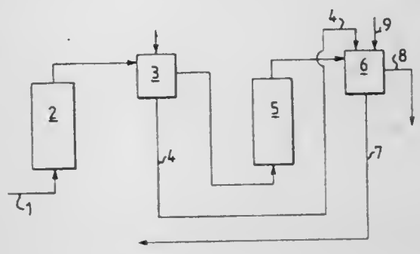





means for raising the temperature and pressure inside said separation chamber to a level that evaporates the liquid dental waste and sterilizes the solid dental waste;
means for venting the evaporated liquid from said chamber;
means for extracting mercury vapors from the evaporated liquid; and
means for collecting the sterilized solid waste residue from said separation chamber.

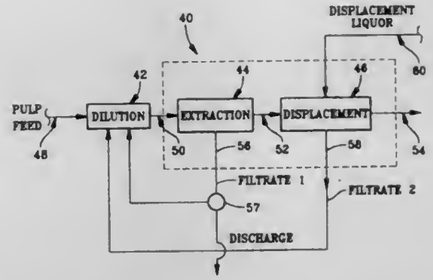
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**5,741,398**
**METHOD OF REMOVING METAL IONS DISSOLVED IN THE BLEACH PLANT WASTE WATER**
**Ulf Germgård, Sundsbruk, and Solveig Nordén, Njurunda, both of Sweden, assignors to Sunds Defibrator Industries Aktiebolag, Sweden**
**Continuation of Ser. No. 392,803, Feb. 28, 1995, abandoned.**
**This application Jan. 3, 1997, Ser. No. 779,255**
**Claims priority, application Sweden, Aug. 28, 1992, 9202464; Apr. 7, 1993, 9301160**
**Int. Cl.[6] D21C** *11/00*
**U.S. Cl. 162—37** **6 Claims**



1. A method of treating water containing metal ions comprising:
providing a pulp comprising lignocellulose-containing material,
washing said pulp so as to produce a process water therefrom, said process water containing said metal ions dissolved therein,
bleaching said washed pulp with a bleaching agent selected from the group consisting of hydrogen peroxide and ozone, and contacting said process water, including said dissolved metal ions, with said bleached pulp at a pH of greater than about 10 and at a temperature of from about 70° to about 120° C., whereby at least a portion of said metal ions are removed from said process water.

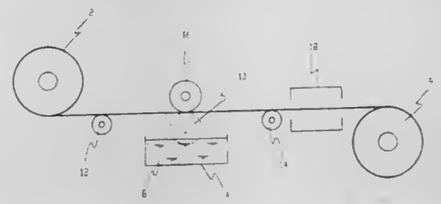
**5,741,399**
**PULP WASHING METHOD**
**John S. Antkowiak, Francestown, N.H., assignor to Beloit Technologies, Inc., Wilmington, Del.**
**Filed Jun. 24, 1996, Ser. No. 669,678**
**Int. Cl.[6] D21C** *9/02*
**U.S. Cl. 162—43** **5 Claims**




1. A process for washing pulp which includes a dilution step, an extraction step and a subsequent displacement step, the improvement comprising:
diluting the pulp;
passing the diluted pulp to the extraction step;
developing a first filtrate from the extraction step;
passing the pulp from the extraction step to the displacement step;
developing a second filtrate from the displacement step;
segregating the first and second filtrates from each other;
providing the second filtrate to the dilution step;
providing a determined minimum volume of the first filtrate needed for the dilution step; and
eliminating the remaining volume of the first filtrate from further use in the washing of pulp.

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**5,741,400**
**METHOD FOR MANUFACTURING A MUG-WORT IMPREGNATED PAD**
**Chang Keun Kwak, 1129, Jegi-Dong, Dongdaemun-Ku, Seoul, Rep. of Korea**
**Filed Jul. 19, 1996, Ser. No. 684,545**
**Claims priority, application Rep. of Korea, Mar. 12, 1996, 96-6431**
**Int. Cl.[6] D21H** *17/21*
**U.S. Cl. 162—158** **13 Claims**



1. A method for mass-producing hygienic bands containing mugwort concentrate, comprising the steps of:
continuously transmitting a roll of pad above a reservoir containing a mugwort concentrate; and
spreading the mugwort concentrate on the pad by contacting a roller, which is sunk into the mugwort concentrate and continuously rotated.

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**5,741,401**

## HEADBOX OF A PAPER MACHINE

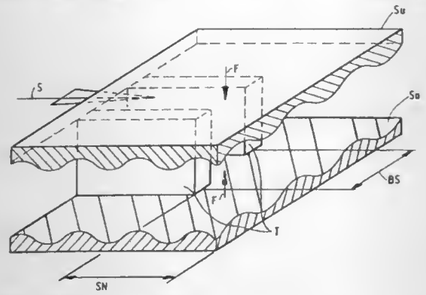
**Helmut Heinzmann, Böhmenkirch, Germany, assignor to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany**

**Continuation of Ser. No. 531,009, Sep. 20, 1995, abandoned. This application Feb. 13, 1997, Ser. No. 799,443**

**Claims priority, application Germany, Sep. 20, 1994, 44 33 445.1**

**Int. Cl.[6] D21F *1/06***

**U.S. Cl. 162—216** **18 Claims**




1. Headbox of a paper machine, comprising:

a flow chamber having a width equal to a width of the paper machine, an inlet and an outlet region and a turbulence insert incorporated into the flow chamber defining a turbulence region disposed upstream from said outlet region with respect to a direction of flow of pulp suspension through the headbox, said insert comprising at least one row of channels, said row extending along the flow chamber width, each of the channels in said row of channels defined by at least one boundary surface having turbulence-producing surface formations extending along an entire length of the insert with respect to the direction of flow of pulp suspension through the headbox and wherein, when viewing a cross-section of the turbulence insert, said cross-section cut in a direction perpendicular to the flow of pulp suspension through the headbox, each said channel of said at least one row of channels has a shorter dimension and a longer dimension, the longer dimension being at least twice as large as the shorter dimension, an average cross-section of each channel of said at least one row of channels remaining substantially constant along the entire length of the insert.

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**5,741,402**

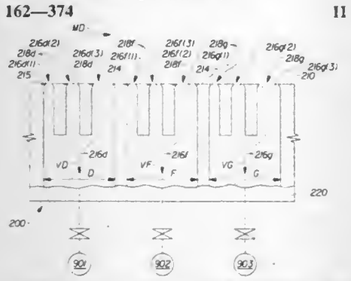
## VACUUM APPARATUS HAVING PLURALITY OF VACUUM SECTIONS FOR CONTROLLING THE RATE OF APPLICATION OF VACUUM PRESSURE IN A THROUGH AIR DRYING PAPERMAKING PROCESS

**Paul Dennis Trokhan, Hamilton, and Donald Eugene Ensign, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Sep. 3, 1996, Ser. No. 706,920**

**Int. Cl.[6] D21F *1/48***

**U.S. Cl. 162—374** **11 Claims**




1. A vacuum pick up shoe in a papermaking machine for transferal of a paper web from a forming wire to a papermaking belt, said vacuum pick up shoe having a machine direction and a cross-machine direction perpendicular to said machine direction, a head with a web-facing surface designed to support a papermaking belt traveling in said machine direction, and a body joined to said head, said vacuum pick up shoe comprising:

a plurality of sequenced vacuum sections successively spaced in said machine direction from a first vacuum section to a last vacuum section, each said vacuum section having a resulting open area on said web-facing surface and a vacuum applied therethrough, each said vacuum section comprising a plurality of sequenced vacuum slots successively spaced in said machine direction from a first vacuum slot to last vacuum slot and defining said resulting open area of said each vacuum section, said vacuum slots being in fluid communication with said web-facing surface and extending therefrom to said body which is in further fluid communication with a vacuum source through said vacuum slots designed to have a vacuum applied therethrough, each of said vacuum slots defining an aperture on said web-facing surface, the areas of said apertures increasing in said machine direction, whereby the vacuum pressure applied through said vacuum slots increases in said machine direction.

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**5,741,403**

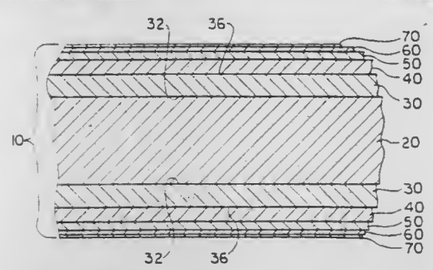
## CERAMIC SUBSTRATES AND MAGNETIC DATA STORAGE COMPONENTS PREPARED THEREFROM

**Michael A. Tenhover, East Amherst, and Irving B. Ruppel, Kenmore, both of N.Y., assignors to The Carborundum Company, Niagara Fass, N.Y.**

**Division of Ser. No. 536,716, Sep. 29, 1995, Pat. No. 5,616,426, which is a division of Ser. No. 288,386, Aug. 10, 1994, Pat. No. 5,480,695. This application Dec. 18, 1996, Ser. No. 769,165**

**Int. Cl.[6] G11B *11/10***

**U.S. Cl. 204—192.2** **10 Claims**




1. A process for preparing a substrate adapted for use in magnetic data storage components, the process comprising:

providing a non-oxide ceramic base substrate having a density of at least about 90 percent of theoretical density and a coefficient of thermal expansion of from about 2 to about 7 ppm/°C.;

coating at least one surface of the base substrate with a smoothing layer comprised of an amorphous, non-stoichiometric silicon carbide corresponding to the formula $SiC_x$ wherein x is the molar ratio of carbon to silicon and is greater than 1; and

polishing the smoothing layer to a surface roughness of less than about 100 Å Ra.

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**5,741,404**

## MULTI-PLANAR ANGULATED SPUTTERING TARGET AND METHOD OF USE FOR FILLING OPENINGS

**David A. Cathey, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.**

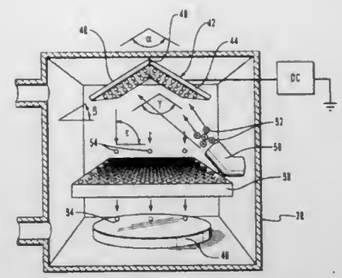
**Filed May 24, 1996, Ser. No. 653,512**

**Int. Cl.[6] C23C *14/46***

**U.S. Cl. 204—192.11** **46 Claims**

1. A method of sputtering material from a sputtering target onto a surface of a semiconductor structure using ion bombardment, the method comprising the steps of:






providing a sputtering target formed with a plurality sheets in contact one to another;

bombarding the sputtering target at a focal point with a plurality of ions at a primary trajectory from an ion acceleration grid to sputter target material at a primary angle of incidence relative to and onto the semiconductor structure surface;

varying the focal point on the sputtering target bombarded by the plurality of ions in order to vary the primary trajectory of the plurality of ions and thereby vary the primary angle of incidence relative to the semiconductor structure surface.

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**5,741,405**

## SPOTTER-DEPOSIT METHOD AND APPARATUS

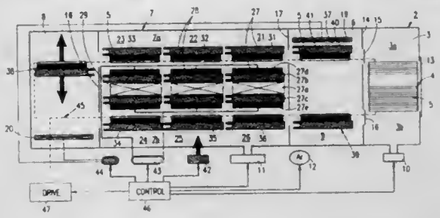
**Boris Sh. Statnikov, Nazareth Illit; Victor B. Gutkin, Kibbutz Ein Carmel, both of Israel, and Vasily N. Trofimiack, Kiev, Ukraine, assignors to IPMMS (Development and Production), Migdal Haemek, Israel**

**Filed Jul. 23, 1996, Ser. No. 681,518**

**Claims priority, application Israel, Oct. 22, 1995, 115713**

**Int. Cl.[6] C23C *14/34;14/54;14/56***

**U.S. Cl. 204—192.14** **32 Claims**




1. A method of sputter-depositing a layer of a metallic material on a printed circuit board substrate in a vacuum, characterized in that the layer is applied to the substrate by sequentially effecting a plurality of partial sputter-deposits thereon during plurality of operational periods each including a sputter-deposit time interval followed by a non-deposit time interval of at least equal duration to the sputter-deposit time interval.

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**5,741,406**

## SOLID OXIDE FUEL CELLS HAVING DENSE YTTRIA-STABILIZED ZIRCONIA ELECTROLYTE FILMS AND METHOD OF DEPOSITING ELECTROLYTE FILMS

**Scott Alexander Barnett, Evanston, and Tsepin Tsai, Chicago, both of Ill., assignors to Northerwestern University, Evanston, Ill.**

**Filed Apr. 2, 1996, Ser. No. 630,725**

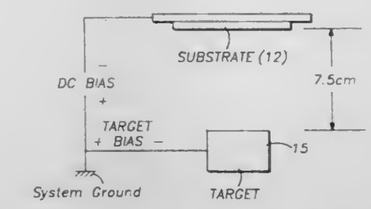
**Int. Cl.[6] C23C *14/00***

**U.S. Cl. 204—192.15** **4 Claims**

1. The method of fabricating a thin film solid oxide fuel cell which comprises the steps of

forming a LSM substrate/air electrode.

placing a Zr—Y sputter target in a sputter deposition chamber,




placing the LSM substrate/air electrode in said sputter deposition chamber spaced from said sputter target,

applying a negative DC bias voltage between 75 and 150 volts to said substrate,

sputtering material from said target onto said substrate/air electrode while the negative bias voltage is applied to said substrate to deposit a thin dense YSZ film on the substrate, and

sputtering a thin fuel electrode film on the surface of the YSZ film.

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**5,741,407**

## METHOD OF MANUFACTURING A SILVER-PLATED ALUMINUM CONDUCTOR, APPARATUS FOR IMPLEMENTING THE METHOD, AND A CONDUCTOR OBTAINED THEREBY

**Ning Yu, Montmirail, France, assignor to Axon' Cable S.A., Montmirail, France**

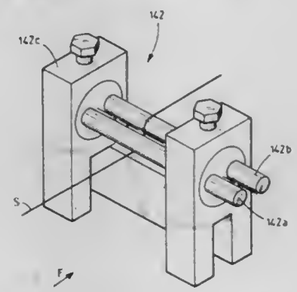
**PCT No. PCT/FR94/00395, § 371 Date Oct. 6, 1995, § 102(e) Date Oct. 6, 1995, PCT Pub. No. WO94/24339, PCT Pub. Date Oct. 27, 1994**

**PCT Filed Apr. 8, 1994, Ser. No. 532,676**

**Claims priority, application France, Apr. 9, 1993, 93 04243**

**Int. Cl.[6] C25D *17/00***

**U.S. Cl. 204—206** **3 Claims**




1. Apparatus for continuously coating a conductor whose core is based at least partially on aluminum, the apparatus comprising means for electroplating at least one layer of silver, the apparatus comprising a line of tanks for containing various baths in which the conductor is immersed in succession, at least one current generator electrically connected firstly to the conductor to be coated via at least one connector in contact with said conductor, and secondly to at least one anode-forming electrode immersed in at least one electroplating bath, a winder disposed at one of the ends of the line of tanks to co-operate with a payout reel disposed at the other end to displace the conductor from one bath to the next at a determined travel speed, wherein the connectors are comprised of pairs of parallel rods disposed perpendicularly with a direction of displacement of said conductor and between which the conductor slides, said pairs of rods being rotatable about a common axis to alter relative positions of said rods with respect to said conductor to obtain optimum mechanical tension for establishing determined electrical contact as a function of a diameter of the conductor and as a function of its travel speed, and wherein the connectors

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are disposed along the conductor at intervals that correspond to its electrical resistance to avoid any evolution of hydrogen in the electroplating baths.

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**5,741,408**
**POLYMER ELECTROLYTE MEMBRANE FOR USE IN FUEL CELLS AND ELECTROLYSIS CELLS**

**Freddy Helmer-Metzmann, Mainz; Frank Osan, Kelkheim/Taunus; Arnold Schneller, Mainz; Helmut Ritter, Wuppertal; Konstantin Ledjeff, Krozingen; Roland Nolte, Freiburg, and Ralf Thorwirth, Wuppertal, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany**

**Division of Ser. No. 75,219, Jun. 10, 1993, Pat. No. 5,438,082. This application May 19, 1995, Ser. No. 444,392**
**Claims priority, application Germany, Dec. 17, 1979, 42 42 692.8; Jun. 13, 1992, 42 19 412.1**
**Int. Cl.[6] C25B *13/08*; C25C *7/04***
**U.S. Cl. 204—252** **4 Claims**

1. A fuel cell containing a polymer electrolyte membrane as a proton-conducting solid electrolyte membrane, which membrane is from sulfonated, aromatic polyether ketone, and produced by a process in which

an aromatic polyether ketone of the formula (I),

$$\text{H}\{\text{Ar}-\text{O}\}_P\text{Ar}\{+\text{CO}-\text{Ar}'\}_X\text{O}-\text{Ar}\}_M\{+\text{CO}-\text{Ar}'\}_Y\text{--}\ \text{O}-\text{Ar}\}_N\text{CO}+ \quad (I)$$

in which

Ar is a phenylene ring having p- and/or m-bonds,

Ar' is a phenylene, naphthylene, biphenylylene, or anthrylene divalent aromatic unit,

X, N and M, independently of one another are 0 or 1,

Y is 0, 1, 2 or 3,

P is 1, 2, 3 or 4,

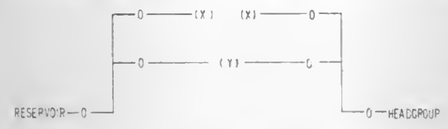
is sulfonated, the sulfonic acid is isolated and dissolved in an organic solvent, and the solution is converted into a film, which comprises converting at least 5% of the sulfonic acid groups in the sulfonic acid into sulfonyl chloride groups, reacting the sulfonyl chloride groups with an amine containing at least one ethylenically unsaturated polymerizable radical or a furfuryl functional group, where from 5% to 25% of the original sulfonic groups are converted into sulfonamide groups, subsequently hydrolyzing unreacted sulfonyl chloride groups, isolating the resultant aromatic sulfonamide and dissolving it in an organic solvent, converting the solution into a film, and then crosslinking the ethylenically unsaturated polymerizable radicals and/or furfuryl functional groups in the film.

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**5,741,409**
**SENSOR MEMBRANES**

**Burkhard Raguse, Gordon; Bruce A Cornell, Neutral Bay; Vijoleta L Braach-Maksvytis, Dulwich Hill, and Ronald J Pace, Farrer, all of Australia, assignors to Australian Membrane and Biotechnology Research Institute, North Ryde, and The University of Sydney, Sydney, both of Australia**

**Division of Ser. No. 406,853, May 17, 1995, Pat. No. 5,637,201. This application Apr. 9, 1997, Ser. No. 833,786**
**Claims priority, application Australia, Oct. 1, 1992, PL5069; Jul. 8, 1993, PL9863**
**Int. Cl.[6] C25B *13/00***
**U.S. Cl. 204—296** **8 Claims**



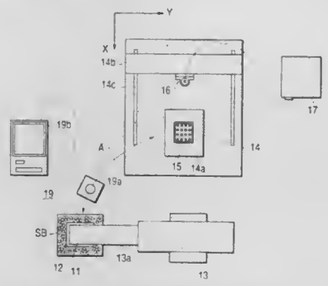

1. An electrode membrane combination comprising an electrode and an ionically insulating monolayer membrane, the membrane comprising a closely packed array of amphiphilic molecules and a plurality of ionophores dispersed therein, said amphiphilic molecules comprising within the same molecule a hydrophobic region, an attachment region attached to the electrode, a hydrophilic region intermediate said hydrophobic and attachment regions, the space formed by said hydrophilic region between the electrode and the membrane being sufficient to allow the flux of ions through the ionophores, and a head group attached to the hydrophobic portion of the molecule at a site remote from the hydrophilic region.

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**5,741,410**
**APPARATUS FOR FORMING SPHERICAL ELECTRODES**

**Kuniaki Tsurushima, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Dec. 6, 1995, Ser. No. 568,281**
**Claims priority, application Japan, Dec. 6, 1994, 6-302227**
**Int. Cl.[6] C25D *17/06*; B25B *11/00***
**U.S. Cl. 204—297 M** **7 Claims**



1. An apparatus for forming spherical shaped electrode elements, comprising:

a holder for holding the spherical shaped electrode elements arranged in the form of ball-like electrodes by vacuum suction, the holder being formed of a transparent material;

a mechanism for aligning the spherical shaped electrode elements when held by the holder with electrode pads provided on a semiconductor substrate, the spherical shaped electrode elements when held by the holder and the electrode pads being viewed through the holder, and the mechanism for bringing the spherical shaped electrode elements when held by the holder into contact with a fixing agent applied to the electrode pads provided on the semiconductor substrate; and

a heat source for melting the fixing agent, by transmitting heat to the fixing agent through the holder when the spherical shaped electrode elements contact the fixing agent.

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**5,741,411**
**MULTIPLEXED CAPILLARY ELECTROPHORESIS SYSTEM**

**Edward S. Yeung; Qingbo Li, and Xiandan Lu, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa**

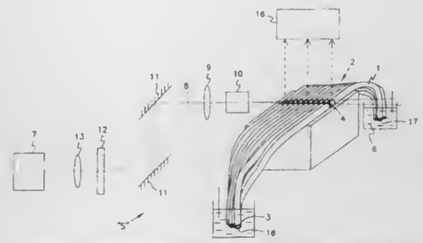
**Division of Ser. No. 444,565, May 19, 1995, Pat. No. 5,582,705. This application Jun. 18, 1996, Ser. No. 665,800**
**Int. Cl.[6] G01N *27/26;27/447***
**U.S. Cl. 204—452** **59 Claims**

1. A method for detecting fluorescent target species in a sample using multiplexed capillary electrophoresis, comprising:

(a) providing a capillary array comprising a plurality of coplanar parallel capillaries, each capillary having an intake end, an outflow end, and an annular wall with a first transparent portion defining a transparent path extending through the capillary array perpendicular to the capillaries;

(b) introducing a sample containing a fluorescent target species into the intake end of at least one capillary such that the sample migrates through the capillary toward the outflow end;





(c) inducing fluorescence emission from the target species by irradiating the species with a beam of coherent light having a wavelength of about 200–1500 nm directed along the transparent path; and

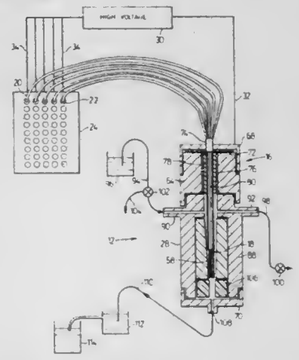
(d) detecting fluorescence emission from the target species.

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**5,741,412**
**MULTIPLE CAPILLARY BIOCHEMICAL ANALYZER**

**Norman J. Dovichi, and Jian Zhong Zhang, both of Edmonton, Canada, assignors to University of Alberta, Canada**

**Continuation of Ser. No. 413,108, Mar. 29, 1995, Pat. No. 5,584,982, which is a continuation of Ser. No. 072,096, Jun. 3, 1993, Pat. No. 5,439,578. This application Oct. 23, 1996, Ser. No. 735,540**
**Int. Cl.[6] G01N *27/26;27/447***
**U.S. Cl. 204—602** **24 Claims**



1. An analyzer for analyzing an organic sample, the analyzer comprising:

a plurality of capillary tubes arrayed side by side, each capillary tube having first and second ends, the second ends of the capillary tubes terminating adjacent each other and the first ends being connectable to a source of organic sample;

a flow chamber having an interior cavity, the second ends of the capillary tubes terminating inside the interior cavity;

means to supply sheath fluid into the interior cavity of said flow chamber to provide a flow of sheath fluid past the second ends of the capillary tubes such that any organic sample in said capillary tubes is drawn by the flow of sheath fluid in individual sample streams from the second ends of the capillary tubes;

means to force said organic sample through the capillary tubes from the first ends of the capillary tubes to the second ends of the capillary tubes;

a detector positioned to detect organic sample in the individual sample streams emerging from the capillary tubes; and

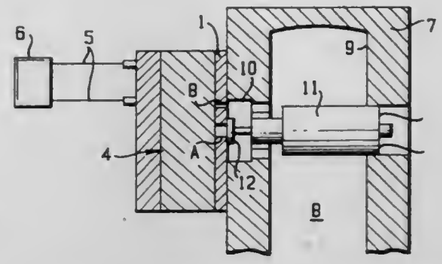
a non-capillary sized waste outlet, independent of said means to force organic sample, positioned in said flow chamber for draining said sheath flow fluid and entrained sample streams directly from said flow chamber to waste, said waste outlet draining the entrained sample streams and associated sheath flow fluid from a plurality of said capillary tubes.

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**5,741,413**
**GAS SENSORS AND METHOD OF USING SAME**

**Constantine Dean Capetanopoulos, Dobbs Ferry, N.Y., assignor to Sem Corporation, Westbury, N.Y.**

**Continuation-in-part of Ser. No. 358,915, Dec. 19, 1994, abandoned. This application Jun. 26, 1996, Ser. No. 670,425**
**Claims priority, application United Kingdom, Dec. 18, 1993, 9325916**
**Int. Cl.[6] G01N *27/404***
**U.S. Cl. 205—783** **16 Claims**



1. A method of calibrating a device for determining the concentration of an active gas in a gas mixture the device comprising a gas sensor which consumes active gas by reaction at a sensing element and which produces an output signal proportional to the rate of reaction of active gas, the sensor having a gas diffusion barrier means between the gas mixture and the sensing element, valve means actuable to close or restrict said gas diffusion means, means for recording output signals from the sensor and means for processing said output signals, wherein the method of calibrating the gas sensor includes the steps of passing a gas of known concentration at constant temperature and pressure over the sensor to provide a constant output from the sensor, actuating the valve means to close or restrict the gas diffusion barrier means, recording a first output signal at a first time subsequent to the closing or restricting of said gas diffusion barrier means, recording a second output signal at a second time subsequent to the first time, recording the time interval therebetween, and processing the output signals and the time interval to calculate a constant for the device at constant temperature and pressure for the active gas.

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**5,741,414**
**METHOD OF MANUFACTURING GAS OIL CONTAINING LOW AMOUNTS OF SULFUR AND AROMATIC COMPOUNDS**

**Toshio Waku, and Masanari Akiyama, both of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Japan**

**Filed Sep. 1, 1995, Ser. No. 522,973**
**Claims priority, application Japan, Sep. 2, 1994, 6-234206**
**Int. Cl.[6] C10G *69/02***
**U.S. Cl. 208—89** **16 Claims**

1. A method of manufacturing gas oil containing low amounts of sulfur and aromatic compounds, comprising contacting distilled petroleum with hydrogen gas in the presence of at least one hydrotreating catalyst to reduce the sulfur concentration to not higher than 0.05 weight percent, introducing the hydrotreated petroleum into a first high temperature high pressure gas liquid separator to thereby separate the hydrotreated distilled petroleum into gaseous and liquid components and introducing hydrogen into the liquid component, introducing the hydrogen treated liquid into a second high temperature high pressure gas liquid separator to thereby separate the material into gaseous and liquid components and introducing hydrogen into the liquid component, and contacting the resultant liquid component with at least one noble metal hydrogenation catalyst to reduce the aromatic compound concentration thereof.

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### 5,741,415
## METHOD FOR THE DEMERCAPTANIZATION OF PETROLEUM DISTILLATES

**A. M. Mazgarov; A. F. Vildanov, and N. G. Bazhirova, all of Kazen, Russian Federation, assignors to Chevron U.S.A. Inc., San Francisco, Calif.**

**Filed Sep. 27, 1994, Ser. No. 313,635**
**Int. Cl.[6] C10G** *37/04*
**U.S. Cl. 208—195** **8 Claims**

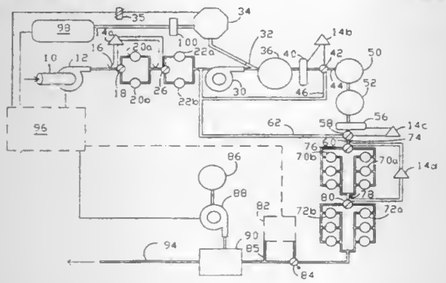
1. A method for the demercaptanization of mercaptan-containing petroleum distillates by oxidizing said mercaptans in the presence of a heterogeneous catalyst, said method comprising contacting said mercaptans with oxygen in the presence of a catalyst comprising a water-soluble salt of copper, iron, nickel, or cobalt, in an amount ranging from about 0.01 to about 10.0 mass %, said water-soluble salt being deposited onto a fibrous carbonaceous material in the form of a woven fabric, felt or twisted strand, said material containing oxides of metals of variable valence; said method being carried out at a temperature falling within the range of about 80° to about 200° C.

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### 5,741,416
## WATER PURIFICATION SYSTEM HAVING PLURAL PAIRS OF FILTERS AND AN OZONE CONTACT CHAMBER

**Gerard F. Tempest, Jr., Durham, N.C., assignor to Tempest Environmental Systems, Inc., Durham, N.C.**

**Filed Oct. 15, 1996, Ser. No. 721,309**
**Int. Cl.[6] B01D** *17/12;36/02*
**U.S. Cl. 210—90** **2 Claims**



1. A system for purifying contaminated water characterized by being self-contained, portable and having means operative during operation of the system and dependent on factors measured within the system for taking clogged filters out of service, placing unclogged filters in service and for recirculating for repeated treatment of both ozone treated water and organic contaminated filtered water during operation of the system, comprising:

(a) a first pump having an intake port connected to a source of contaminated water to be treated by said system and a discharge port through which water pumped by said pump is discharged;

(b) a first pair of replaceable cartridge filters each having intake and exhaust ports;

(c) a first signal controlled valve having an intake port connected to receive water from said first pump discharge port and having a pair of discharge ports each being separately connected to an intake port of one of said first pair of filters enabling water received through the intake port of said first signal controlled valve to be directed to the intake port of a selected one of said first pair of cartridge filters according to a first pressure related control signal applied to said first signal controlled valve;

(d) a second pair of replaceable cartridge filters each having intake and exhaust ports.

(e) a second signal controlled valve having an intake port connected to the exhaust ports of said first pair of cartridge filters to receive water filtered therefrom and having a pair of discharge ports each of which is connected to the intake port of a selected one of said second pair of filters thereby enabling water received through the intake port of said second signal controlled valve to be directed to the intake port of a selected one of said second pair of cartridge filters according to a second pressure related control signal applied to said second signal controlled valve;

(f) a first pressure probe and a second pressure probe being operative to continuously monitor the water pressure on the respective intake sides of said first and second valves and develop said first and second pressure related control signals corresponding thereto;

(g) first control means responsive to said first and second pressure related signals for generating first and second pressure related valve control signals transmitted to said first and second signal controlled valves for switching said first and second signal controlled valves and enabling a filter in either said first or second pair of filters to be taken out of service and the other filter of said pair to be placed in service while the system continues to operate;

(h) a second pump having an intake port connected to the exhaust ports of said second pair of filters and a discharge port;

(i) an ozone generator providing pressurized substantially dry ozone and having an outlet for discharging said ozone from said ozone generator and connected to said second pump discharge port;

(j) an ozone contact chamber having an inlet connected to both said ozone generator outlet and said second pump discharge port thereby enabling water filtered by one of said first pair and one of said second pair of filters and discharged from said second pump discharge port to be mixed within said chamber with ozone from said ozone generator for discharge through an outlet formed on said chamber;

(k) a third signal controlled valve connected on an intake side to said chamber outlet for receiving ozone treated water discharged therefrom and having a first discharge port and a second discharge port, said first discharge port being connected through a first return line to said second pump intake port enabling ozone treated water discharged through said chamber outlet to be directed through either said first discharge port for repeated introduction of ozone and passage through said second pump and ozone contact chamber or to said second discharge port of said third signal controlled valve according to a first oxidation reduction potential (ORP) related valve control signal applied to said third signal controlled valve;

(l) a first ORP probe operative to continuously monitor the oxidation reduction potential of water discharged through said chamber outlet and develop said first ORP signal corresponding thereto;

(m) second control means responsive to said first ORP signal developed by said first ORP probe for generating a third valve control signal transmitted to said third signal controlled valve for switching said third signal controlled valve while the system continues to operate, enabling ozone treated water received by said third signal controlled valve to be directed to either said third signal controlled valve first discharge port for recirculation through said second pump and ozone contact chamber or to said third signal controlled valve second discharge port for further treatment;

(n) a third pair of granulated active carbon (GAG) filters, a first of said pair of GAC filters having an intake port connected to the third signal controlled valve second discharge port and a discharge port connected to an intake port of a second of said third pair of GAC filters and the second of said pair of GAC filters having a discharge port;

(o) a fourth signal controlled valve connected on an intake side to the discharge port of the second of said pair of GAC filters and having first and second discharge ports the first of which is connected to said second pump intake port through a second return line enabling water treated by said GAC filters to be directed through either said fourth signal controlled valve first discharge port for passage through said second pump and repeated introduction of ozone or to the second discharge port of said fourth signal controlled valve for further treatment according to a second ORP related valve control signal applied to said fourth signal controlled valve;

(p) a second ORP probe operative to continuously monitor the oxidation reduction potential of the water discharged from the second of said pair of GAC filters and generate a second ORP signal corresponding thereto;

(q) third control means responsive to said second ORP signal generated by said second ORP probe for generating a second ORP related valve control signal and applied to said fourth signal controlled valve for switching said fourth signal controlled valve according to the ORP level indicated by said second ORP signal enabling water discharged from the second of said GAC filters to be directed to either said fourth signal controlled valve first discharge port for recirculation through said second pump, said ozone contact chamber and both said GAC filters or to said fourth signal controlled valve second discharge port for further treatment;

(r) first and second banks of plural filters, each said bank having respective intake and exhaust ports;

(s) third and fourth banks of plural filters, each said bank having respective intake and exhaust ports:

(t) a fifth signal controlled valve connected on an intake side to receive water from said second discharge port of said fourth signal controlled valve and having a pair of discharge ports each being separately connected to the respective intake ports of said first and second banks of filters enabling water received from said fourth signal controlled valve second discharge port to be selectively directed by said fifth signal controlled valve to one or the other of the intake ports of said first or second banks of filters according to a third pressure related control signal applied to said fifth signal controlled valve;

(u) a sixth signal controlled valve connected on an intake side to the exhaust ports of said first and second banks of filters to receive water discharged therefrom and having a pair of discharge ports each being separately connected to the respective intake ports of said third and fourth banks of filters enabling water received from said first and second banks of filters to be selectively directed by said sixth control valve to one or the other of the intake ports of said third and fourth banks of filters according to a fourth pressure related control signal applied to said sixth signal controlled valve;

(v) a third and a fourth pressure probe operative to continuously monitor the water pressure on the respective intake sides of said fifth and sixth signal controlled valves and generate third and fourth pressure indicating signals corresponding thereto;

(w) fourth control means responsive to the pressure indicator signals generated by said third and fourth pressure probes for developing respecitive third and fourth pressure related valve control signals applied to said fifth and sixth signal controlled valves for switching said fifth and sixth signal controlled valves according to the respective pressures indicated by the respective third and fourth pressure indicating signals thereby enabling filters in either said first or second banks of filters or in said third or fourth banks of filters to be taken out of service and other filters of said first or second bank of filters or of said third or fourth bank of filters placed in service when the corresponding indicated pressures so require and while the system continues to operate;

(x) a biocidal mixing tank having an intake port connected to the discharge ports of said third and fourth banks of filters and a discharge port for discharging water after being treated within said biocidal mixing tank;

(y) a biocide storage tank containing a biocide;

(z) a third pump connected to pump biocide from said biocide storage tank to said biocide mixing tank thereby enabling water discharged from said third and fourth banks of filters to be treated with said biocide immediately prior to being discharged from said system; and

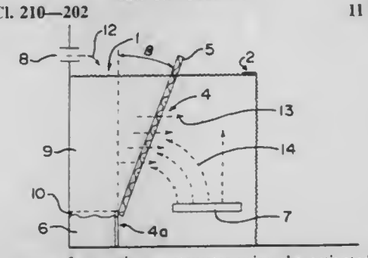
(aa) a microprocessor operatively associated with said first, second, third and fourth control means.



### 5,741,417
## SYSTEM FOR BIOLOGICALLY TREATING WASTEWATER

**Jürgen Patzig, Chemnitz, and Jürgen Lüddeke, Neustadt, both of Germany, assignors to List Abwassertechnik GmbH, Chemnitz, Germany**

**Filed Jul. 26, 1996, Ser. No. 690,338**
**Claims priority, application Germany, Oct. 20, 1995, 195 39 042.3**
**Int. Cl.[6] C02F** *3/30*
**U.S. Cl. 210—202** **11 Claims**



1. A system for treating wastewater using the activated sludge biological process by retaining and degrading biodegradable coarse solids contained in the wastewater comprising:

a receiving well containing a pre-separator stage and an activation chamber arranged one after the other in a direction of through-flow of the wastewater;

said pre-separator stage having a sand catcher disposed at its bottom for receiving undegradable solids;

said activation chamber having a ventilation device; and

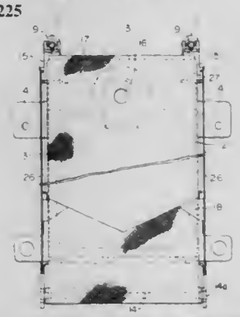
a partition, with an upper and lower section, disposed within said receiving well between said pre-separator stage and said activation chamber, said lower section comprising a wall separating said sand catcher from said activation chamber, at least a portion of said upper section comprising a screen for retaining coarse solids in said preseparator stage, wherein said screen is inclined with respect to a vertical line into said activation chamber, by greater than 0° up to 30° so that said pre-separator stage is widened in an area above said sand catcher.

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### 5,741,418
## FILTER CLOTH SUSPENDING APPARATUS IN FILTER PRESS

**Akitoshi Iwatani, Marugame, and Hiroichi Kawasaki, Sakaide, both of Japan, assignors to Ishigaki Company Limited, Tokyo, Japan**

**PCT No. PCT/JP95/01646, § 371 Date Jun. 17, 1996, § 102(e) Date Jun. 17, 1996, PCT Pub. No. WO96/05904, PCT Pub. Date Feb. 29, 1996**
**PCT Filed Aug. 21, 1995, Ser. No. 632,510**
**Claims priority, application Japan, Aug. 23, 1994, 6-222518**
**Int. Cl.[6] B01D** *25/34*
**U.S. Cl. 210—225** **4 Claims**



1. In a filter press having plurality of vertically disposed filter plates (3) supported in parallel between a a pair of horizontal guide rails (2), means to shift the plates (3) to one of an open and a

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closed position relative to each other along said guide rails, a filter cloth (**12**) disposed between adjacent filter plates (**3**), the filter cloth (**12**) having upper and lower edges and an intermediate portion extending between said upper and lower edges, a drive wheel (**11**) mounted above each of the filter plates (**3**) to upper ends of the filter plates, a driving means (**15**) having first and second ends and an intermediate portion extending between said first and second ends, wherein the intermediate portion of the drive means is wound around an upper half of the drive wheel (**11**), the filter cloth (**12**) having its upper edge connected to the first end of the driving means (**15**), a guide roll (**14**) connected to a lower end of the filter plate, wherein the intermediate portion of the filter cloth extends around a lower half of the guide roll, wherein the lower edge of the filter cloth (**12**) is attached to the second end of the driving means (**15**) and is positioned above the guide roll, wherein the driving means (**15**) is adapted to raise and lower the filter cloth (**12**),

wherein the improvement comprises a filter cloth suspending apparatus comprising:

an upper supporting bar (**13**), the supporting bar (**13**) being attached to the upper edge of the filter cloth (**12**), the first end of the driving means (**15**) being connected to the supporting bar (**13**), the filter cloth (**12**) having side edges connected to the lower edge of the filter cloth, the lower edge of the filter cloth (**12**) being cut out to form a central concave portion and lower corners at the side edges, wherein the upper edge and the corners at the lower edge of the filter cloth (**12**) are connected to the driving means;

a guide bar (**26**) attached to the filter plate (**3**) adjacent each of the side edges of the filter cloth (**12**); and

a pair of tension rings (**29**), each said tension ring (**29**) freely encircling a respective one of the guide bars (**26**), each of the lower corners of the filter cloth (**12**) being secured to a respective tension ring (**29**).

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**5,741,419**

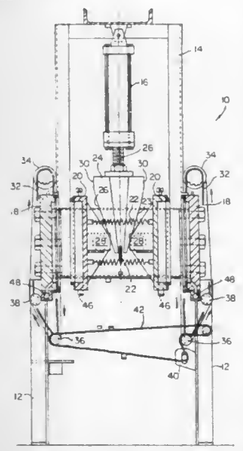
**FILTER PRESS FOR FILTERING LIQUID SLURRIES**

**Thomas D. Baxter, Greenville, Miss., assignor to Environmental Treatment Facilities Inc., Greenville, Miss.**

**Filed Sep. 24, 1996, Ser. No. 719,962**

**Int. Cl.[6] B01D** *25/127*

**U.S. Cl. 210—227** **14 Claims**



**1**. A liquid slurry filter apparatus for separating a liquid from solids entrained therein comprising: a frame;

a pair of mutually spaced filter assemblies each filter having a fixed, outer plate mounted on said frame and a movable, inner plate, said inner plates movable into and out of engagement with said fixed plates; bias means interconnecting said inner plates and normally urging said plates out of engagement with respective outer plates; movable wedge means supported by said frame and disposed between said pair of inner plates for driving said inner plates into engagement with said outer plates to assemble said filters and releasable locking means carried by said wedge means for blocking movement of said inner and outer plates out of engagement with each other;

filter media cloth extending between each of said inner and outer plates and means for advancing said cloth along a path of travel between said inner and outer plates when said plates are out of engagement with each other; and

means for introducing said slurry into said assemblies, means for forcing said slurry under pressure against said filter cloth to separate solids and liquid therein and means for removing said separated liquid and solids therefrom.

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**5,741,420**

**DEW FORMING PREVENTION APPARATUS**

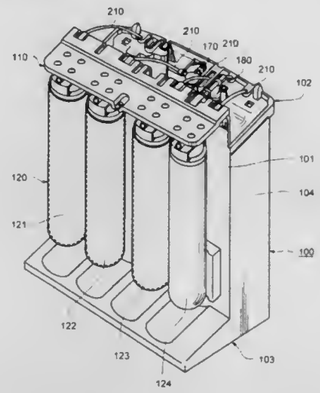
**Sang-Wook Suh, Pyungtaek, and Jae-Young Jang, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Mar. 11, 1997, Ser. No. 814,709**

**Claims priority, application Rep. of Korea, Mar. 25, 1996, 96-8151**

**Int. Cl.[6] B01D** *27/08;35/30*

**U.S. Cl. 210—232** **2 Claims**



**1**. A water purifier comprising an injection-molded body, a bracket mounted on an upper portion of the body, a plurality of filter members mounted to the bracket, a first connecting hose for supplying fresh water to one of the filter members, additional connecting hoses for conducting fresh water from the first filter member sequentially to other filter members, a pump for pressurizing fresh water supplied to at least one of the filter members, and thermal insulators surrounding at least the first connecting hose and at least one of the filter members to prevent the formation of dew thereon.

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**5,741,421**

**FILTER DEVICE**

**Hans Erdmannsdoerfer, Dobel; Helmut Storz, Benningen, and Manfred Wagner, Stuttgart, all of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany**

**Filed Nov. 21, 1995, Ser. No. 561,619**

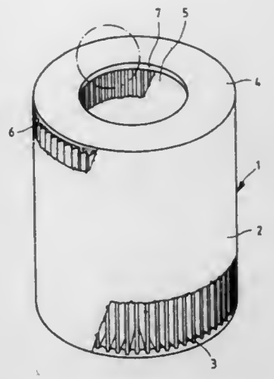
**Claims priority, application Germany, Nov. 23, 1994, 44 41 608.3**

**Int. Cl.[6] B01D** *27/06*

**U.S. Cl. 210—450** **9 Claims**

**1**. A filter device comprising:





a pleated filter element which is arranged around a cylinder axis and through which a medium to be filtered passes, and

a seal on at least one end of said filter element and extending radially inwardly of said filter element so as to contact a central tube on which the filter element is to be mounted;

wherein said seal is produced by a process comprising disposing a curable elastic melt-reaction composition on said end and heating the melt-reaction composition, whereby the composition first softens and flows into the pleats of the filter element and then hardens so as to fix the pleats of the filter element and seal the end of the filter, the hardened composition having sufficient residual elasticity to seal the filter element with respect a central tube on which it is to be mounted.

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**5,741,422**

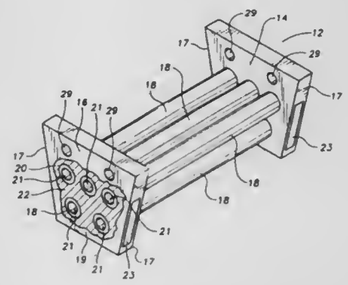
**MOLTEN METAL FILTER CARTRIDGE**

**David J. Eichenmiller, Chesterland; Richard S. Henderson, Solon, both of Ohio, and Robert Karel Franken, Krimpen, Netherlands, assignors to Metaullics Systems Co., L.P., Solon, Ohio**

**Filed Sep. 5, 1995, Ser. No. 524,005**

**Int. Cl.[6] B01D** *29/17*

**U.S. Cl. 210—516.1** **14 Claims**



**1**. A molten metal filter medium comprising at least two opposed wedge-shaped plates having at least one hollow generally oblong member comprised of porous ceramic material attached at a first end to one of said plates and at a second end to said second plate, at least one of said plates including a passage to an outlet communicating with said hollow member, wherein molten metal is filtered through said porous ceramic material of said hollow member exiting through said passage in said end plate.

**5,741,423**

**LIQUID-LIQUID EXTRACTION**

**John Bates, Tamarisk House, High Street, Colne, Huntingdon, Cambridgeshire PE17 3ND, and John David Edwards, Sylvan Hurst, Tower Hill, Dorking, Surry RH4 2AN, both of United Kingdom**

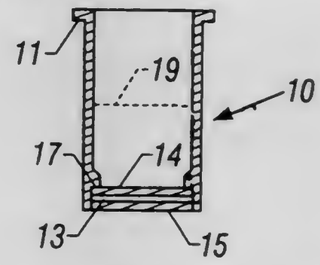
**PCT No. PCT/GB95/02003, § 371 Date Apr. 18, 1997, § 102(e) Date Apr. 18, 1997, PCT Pub. No. WO96/05902, PCT Pub. Date Feb. 29, 1996**

**PCT Filed Aug. 23, 1995, Ser. No. 793,263**

**Claims priority, application United Kingdom, Aug. 23, 1994, 9417014; Jan. 9, 1995, 9500321; Feb. 17, 1995, 9503114**

**Int. Cl.[6] B01D** *11/04*

**U.S. Cl. 210—634** **12 Claims**



**7**. A method for extracting a substance from a first, carrier liquid into a second, extraction liquid, said first and second liquids being immiscible and having different densities, the method comprising:

(a) finely dividing a first liquid containing the substance and introducing the finely divided first liquid into a second liquid;

(b) admixing the first and second liquids so as to transfer at least a portion of the substance from the first liquid to the second liquid; and

(c) separating the first liquid from the second liquid, wherein (c) includes introducing a separator member between the first and second liquids such that only the second liquid is on one side of the separator member.

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**5,741,424**

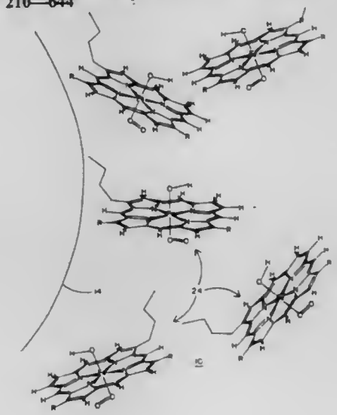
**METHOD OF FACILITATING OXYGEN TRANSPORT IN BLOOD OXYGENATORS**

**Sean D. Plunkett, Mission Viejo, and Henry W. Palermo, Burbank, both of Calif., assignors to Medtronic, Inc., Minneapolis, Minn.**

**Filed Apr. 30, 1996, Ser. No. 643,146**

**Int. Cl.[6] A61M** *1/14;1/16;* **B01D** *61/00*

**U.S. Cl. 210—644** **7 Claims**



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1. A method of facilitating oxygen transfer into blood plasma flowing along a microporous membrane whose other side is exposed to oxygen and which provides a blood-oxygen interface in a blood oxygenator, comprising the steps of:

a) bonding to the blood-contacting surface of said membrane at said interface an oxygen-carrying chemical; and

b) exposing said chemical to oxygen at said interface.

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**5,741,425**

**Patent Not Issued For This Number**

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**5,741,426**

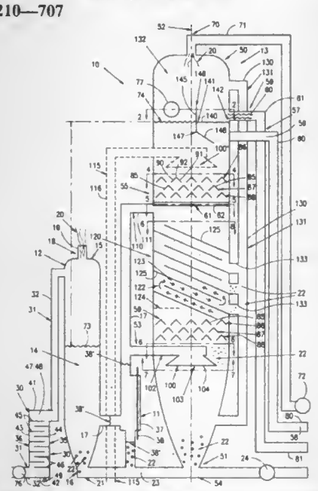
## METHOD FOR TREATMENT OF CONTAMINATED WATER

**Derald L. McCabe, and Jack K. Helm, both of P.O. Box 964, Gatesville, Tex. 76528**

**Filed Dec. 5, 1995, Ser. No. 567,433**

**Int. Cl.[6] C02F *1/463***

**U.S. Cl. 210—707** **11 Claims**



1. A method for treating contaminated water contaminated with undesired solid, liquid, and gaseous materials, the method comprising the steps of

flowing the contaminated water into a holding tank of an apparatus for treatment of contaminated water, the apparatus comprising a holding tank, having a top and a bottom, the holding tank including a means for venting the undesired gaseous materials from the contaminated water, and having a means for removing undesired solid materials from the contaminated water; and a separation tower, having upper and lower ends and a longitudinal axis, in fluid communication with the holding tank, the separation tower, including: a water inlet for the flow of contaminated water from the holding tank into the separation tower; a means for removing undesired solid materials from the contaminated water in the separation tower; deflection means in the separation tower for deflecting undesired solid materials in the contaminated water downwardly toward the lower end of the separation; a vacuum apparatus including a vacuum pump, the vacuum apparatus for applying a vacuum in and at the top of the separation tower for drawing the contaminated water from the holding tank through the water inlet and upwardly into, and through, the separation tower and for removing undesired gaseous materials from the contaminated water; electro-floculation means for disassociating ions from the undesired solid material and contaminated water and for releasing undesired gaseous materials contained in the contaminated water; a water level sensor in the separation tower for sensing a level of contaminated water therein, the water level sensor in communication with the vacuum pump for controlling the level of contaminated water in the separation tower,

drawing the contaminated water from the holding tank into the separation tower with the vacuum apparatus, removing undesired gaseous materials from the contaminated water by the vacuum apparatus,

disassociating ions from the undesired solid material and contaminated water and releasing undesired gaseous materials contained in the contaminated water by flowing the contaminated water through electro-floculation means,

sensing a level of water in the separation tower,

controlling the level of water in the separation tower with the vacuum apparatus in coordination with a level of water in the holding tank,

flowing the contaminated water as the contaminated water is drawn upwardly through the separation tower against a first deflection means and deflecting undesired solid materials downwardly toward the lower end of the separation tower,

flowing the contaminated water against a second deflection means to deflect undesired solid materials downwardly toward the lower end of the separation tower,

removing treated water from the separation tower, from a first location proximate the upper end of the separation tower and above the first deflection means,

removing undesired liquid material from the separation tower from a second location proximate the upper end of the separation tower and above the first location, and removing undesired solid materials from the holding tank and from the lower end of the separation tower.

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**5,741,427**

## SOIL AND/OR GROUNDWATER REMEDIATION PROCESS

**Richard J. Watts, Pullman, Wash., and Richard S. Greenberg, Mendham, N.J., assignors to Anesys Corp., Wilmington, Del.**

**Filed Mar. 14, 1996, Ser. No. 615,976**

**Int. Cl.[6] C02F *1/72***

**U.S. Cl. 210—747** **4 Claims**

1. A reagent for use in the treatment of contaminants in an in situ environment comprising a reaction product complex produced by the process comprising:

(a) preparing a first aqueous solution comprising an effective amount of a ligand donor selected from at least one member of the group consisting of a mixture of phosphoric acid and monopotassium phosphate, a mixture of phosphoric acid, monopotassium phosphate and sulfuric acid, and combinations thereof;

(b) preparing a second aqueous solution comprising an effective amount of a metal catalyst selected from at least one member of the group consisting of Fe (II) salts, Fe (III) salts, Fe (II) iron chelates, Fe (III) iron chelates and combinations thereof; and

(c) combining said first and second aqueous solutions at a molar ratio of said second aqueous solution to said first aqueous solution in the range of from about 0.5 to 1.5:1.

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**5,741,428**

## RAPID CENTRIFUGAL PROCESS FOR PREPARING FIBRIN MONOMER SOLUTION

**Niels Erik Holm, Birkerød, Denmark, assignor to E.R. Squibb & Sons, Inc., Princeton, N.J.**

**Division of Ser. No. 421,599, Apr. 12, 1995, Pat. No. 5,603,845, which is a continuation-in-part of Ser. No. 155,984, Nov. 19, 1993, abandoned. This application Oct. 31, 1996, Ser. No. 739,664**

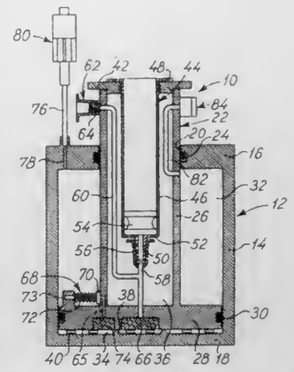
**Int. Cl.[6] B01D *21/26***

**U.S. Cl. 210—749** **9 Claims**

1. A process for preparing a fibrin monomer from blood comprising:

introducing a fixed volume of blood into a first annular chamber of a centrifuge apparatus where the annular chamber is





defined by a cylindrical outer wall and a cylindrical inner wall, both walls extending coaxially about a common axis, as well as by a top wall and a bottom wall where the top wall or the bottom wall is formed by a piston body displaceable within the first chamber;

rotating said centrifuge apparatus about said common axis to substantially centrifugally separate said blood into a cell fraction and a plasma fraction;

transferring said plasma fraction into a second chamber by action of said piston while continuing said centrifugation so as to maintain said separation in said first chamber, said second chamber defined by a cylindrical outer wall extending coaxially about said common axis;

subjecting said plasma fraction in said second chamber to a enzyme wherein said plasma fraction is separated into a fluid fraction and a fraction containing non-crosslinked fibrin polymer;

removing said fluid from said second chamber; and

solubilizing said non-crosslinked fibrin polymer to provide a fibrin monomer-containing solution.

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**5,741,429**

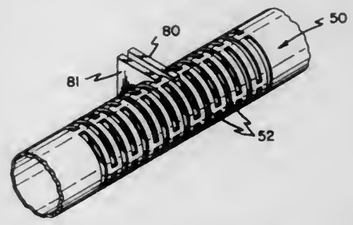
## FLEXIBLE TUBULAR DEVICE FOR USE IN MEDICAL APPLICATIONS

**James V. Donadio, III, Chaska; David R. Holmes; Robert S. Schwartz, both of Rochester, all of Minn., and David Berry, Longmont, Colo., assignors to Cardia Catheter Company, St. Paul, Minn.**

**Continuation-in-part of Ser. No. 329,691, Oct. 26, 1994, Pat. No. 5,573,520, which is a continuation of Ser. No. 940,657, Sep. 4, 1992, abandoned, which is a continuation-in-part of Ser. No. 755,614, Sep. 5, 1991, abandoned. This application May 31, 1995, Ser. No. 455,331**

**Int. Cl.[6] B44C *1/22*; C23F *1/02*; A61M *25/00***

**U.S. Cl. 216—8** **26 Claims**



1. A method for producing a flexible tubular device comprising:

a. providing a tubular element including an outer surface, the tubular element being sized for intravascular insertion within a human body;

b. providing a light source; and

c. creating a desired pattern on the tubular element by:

1) applying a photoresistive material to at least a portion of the outer surface of the tubular element;

2) providing a mask intermediate the tubular element and the light source, at least a portion of the mask including a mask pattern having locations translucent to light from the light source;

3) activating the light source to selectively expose the photoresistive material on the outer surface of the tubular element, such that exposed and unexposed locations are created on the photoresistive material;

4) developing the photoresistive material on the tubular element; and

5) removing segments of the tubular element corresponding to either the exposed or unexposed locations of the photoresistive material such that the tubular element is provided with the desired pattern, the desired pattern including a plurality of apertures that extend completely through the tubular element between an inner and outer diameter of the tubular element, the plurality of apertures being arranged and configured for providing the tubular element with in a desired flexibility suitable for intravascular operations.

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**5,741,430**

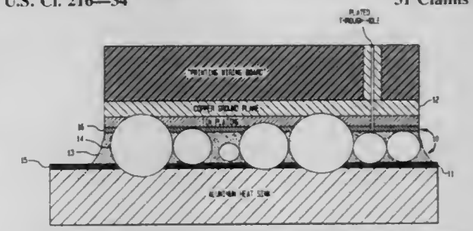
## CONDUCTIVE ADHESIVE BONDING MEANS

**Donald William Dahringer, Glen Ridge, and Alan Michael Lyons, New Providence, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Apr. 25, 1996, Ser. No. 638,003**

**Int. Cl.[6] B44C *1/22***

**U.S. Cl. 216—34** **31 Claims**



1. A method of electrically and mechanically bonding a conductive surface made of a material on which unstable oxides form to a target surface using a conductive adhesive, the method comprising the steps of:

a. preparing the conductive surface so that a microscopically rough surface is formed to insure a substantially strong mechanical bond, said microscopically rough surface being coated with an oxide layer;

b. placing the conductive adhesive between said microscopically rough surface and the target surface to form a stack, the conductive adhesive having an amount of conductive particles that have a hardness at least as hard as said microscopically rough surface, said target surface and an underlying metal of said conductive surface, said amount insuring electrical conductivity between said underlying metal of said conductive surface and said target surface; and

c. simultaneously applying heat and pressure to said stack to cure said conductive adhesive such that said conductive particles make contact with said target surface and pierce through said microscopically rough surface to make direct contact with said conductive surface thereunder.

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**5,741,431**

## LASER ASSISTED CRYOETCHING

**Ming-Chang Shih, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan**

**Filed May 15, 1997, Ser. No. 857,163**

**Int. Cl.[6] B44C *1/22*; H01L *21/302***

**U.S. Cl. 216—65** **19 Claims**

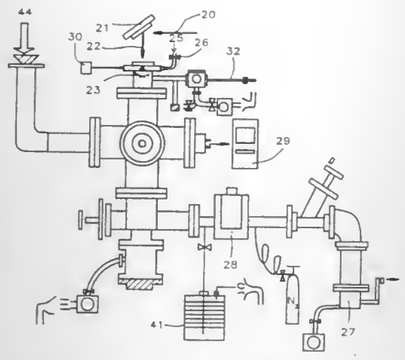
1. A process for etching a material, comprising:

cooling said material to a temperature;

immersing said material in an atmosphere of chlorine and methane that is at a pressure; and

VOL 1209 ISS 3 AP 21 1998 UMI





irradiating the material with laser pulses having a fluence and a repetition rate.

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5,741,432

## STABILIZED NITRIC ACID COMPOSITIONS

**Kwee C. Wong, Londonderry, N.H., assignor to The Dexter Corporation, Industry, Calif.**

**Filed Jan. 17, 1995, Ser. No. 373,594**

**Int. Cl.[6] C23F *1/16;1/18***

**U.S. Cl. 216—108** **1 Claim**

1. A method of stripping unwanted material from a metal substrate comprising treating said substrate with a composition comprising an aqueous solution of nitric acid and an additive having the formula



or a salt thereof,

said additive being present in an amount sufficient to improve the oxidative stability of said aqueous solution of nitric acid relative to the oxidative stability of said aqueous solution in the absence of said additive, and said composition being essentially free of hydrogen peroxide.

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5,741,433

## CONTROLLED RELEASE SUPPLEMENTAL COOLANT ADDITIVE

**Wayne A. Mitchell; Kurt D. Heinz, both of Crystal Lake, Ill.; Clifford Alvin Ferrin, Jr., Baltimore, Md., and Narender Pal Luthra, Simpsonville, S.C., assignors to BetzDearborn Inc., Trevose, Pa.**

**Filed Jun. 21, 1996, Ser. No. 668,171**

**Int. Cl.[6] C09K *3/18;5/00***

**U.S. Cl. 252—74** **11 Claims**

1. A method of maintaining a minimum concentration level of about 800 ppm of nitrite ($NO_2$) or a mixture of nitrite ($NO_2$) and molybdate ($MoO_4$) in a diesel engine coolant system comprising introducing into said diesel engine coolant system by circulating at least a portion of the coolant in the cooling system through a coolant filter in which a controlled release supplemental coolant additive is disposed, said controlled release supplemental coolant additive comprising:

a) a core containing a water-soluble composition comprising a supplemental coolant additive composition, wherein the supplemental coolant additive composition comprises at least one ingredient selected from the group consisting of an alkali metal or ammonium nitrite and a mixture of (a) at least one alkali metal or ammonium molybdate and (b) at least one alkali metal or ammonium nitrite; and

b) a water insoluble, water permeable, polymeric coating material encapsulating said core comprising terpolymers containing vinyl acetate, vinyl versatate, end alkyl(meth)acrylate monomer subunits.

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5,741,434

## LEATHER OILING PREPARATIONS AND THEIR USE

**Wolfgang Ritter, Hann; Hans-Dieter Sitz, Rommerskirchen; Rudolf Zauns-Huber, Duesseldorf, and Emil Ruscheinsky, Leverkusen, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany**

**Continuation of Ser. No. 367,268, Feb. 17, 1995, Pat. No. 5,567,343. This application Jun. 28, 1996, Ser. No. 672,753**

**Claims priority, application Germany, Jul. 14, 1992, 42 23 111.6**

**Int. Cl.[6] C14C *9/00***

**U.S. Cl. 252—8.57** **11 Claims**

1. Water-dispersible and water-emulsifiable amphiphilic co-oligomers for the oiling of leather and skins, said co-oligomers comprising the reaction product of

a. fatty crotonates and

b. radical-copolymerizable, hydrophilic ethylenically unsaturated acids and anhydrides and optionally,

c. other copolymerizable monomers.

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5,741,435

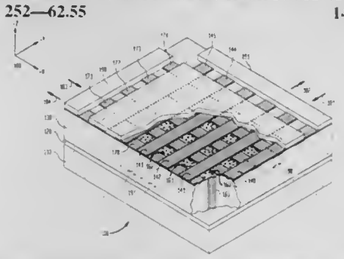
## MAGNETIC MEMORY HAVING SHAPE ANISOTROPIC MAGNETIC ELEMENTS

**Charles P. Beetz, Jr., New Mildford, Conn.; John Steinbeck, Fitzwilliam, N.H.; Robert W. Boerstler, Woodbury, and David R. Winn, Wilton, both of Conn., assignors to Nano Systems, Inc., Oxford, Conn.**

**Filed Aug. 8, 1995, Ser. No. 512,555**

**Int. Cl.[6] B41B *27/10;* G11C *11/14;* H01L *21/8229;21/8239***

**U.S. Cl. 252—62.55** **14 Claims**



1. A magnetically anisotropic material comprising a plurality of elongated ferromagnetic particles each having a magnetically soft portion adjacent one end and a magnetically hard portion adjacent the other end, at least the soft portion of each said particle being magnetically shape-anisotropic and a non-magnetic matrix surrounding and supporting said particles.

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5,741,436

## ANTIFREEZE CONCENTRATES AND COMPOSITIONS COMPRISING NEODECANOIC ACID CORROSION INHIBITORS

**Aleksei V. Gershun, Oakville; William C. Mercer, Brookfield, and Peter M. Woyciesjes, Woodbury, all of Conn., assignors to Prestone Products Corp., Danbury, Conn.**

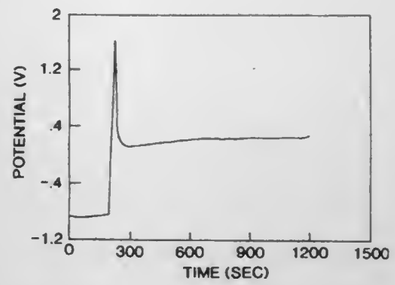
**Filed Dec. 5, 1995, Ser. No. 567,639**

**Int. Cl.[6] C09K *5/00***

**U.S. Cl. 252—76** **14 Claims**

1. An antifreeze coolant concentrate comprising a liquid alcohol, which functions as a freezing point depressant, and a corrosion inhibitor composition comprising: (1) a major amount of a $C_8$






mono-carboxylic acid, or isomer, or salt, or mixtures thereof; and (2) a neo-decanoic acid, or isomer, or salt, or mixtures thereof; wherein the corrosion inhibitor composition is present in an amount such that the total mono-carboxylic acid in the concentrate is from about 2.0% to about 5.0% (by weight).

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5,741,437

## N-ALKYL AMMONIUM ACETONITRILE BLEACH ACTIVATORS

**James W. Arbogast, Dublin; James E. Deline, Livermore; Lafayette D. Foland, Dublin; Thomas W. Kaaret, Alamo; Kevin A. Klotter, Livermore; Michael J. Petrin, Antioch; William L. Smith, and Alfred G. Zielske, both of Pleasanton, all of Calif., assignors to The Clorox Company, Oakland, Calif.**

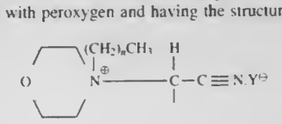
**Continuation of Ser. No. 475,292, Jun. 7, 1995, abandoned. This application Oct. 1, 1996, Ser. No. 720,602**

**Int. Cl.[6] C09K *3/00;* C01B *15/10;* C11D *3/39;3/395***

**U.S. Cl. 252—186.39** **26 Claims**

1. A method of bleaching an article comprising:

providing a nitrile, the nitrile including at least one moiety reactive with peroxygen and having the structure



where n is an integer of 0 to about 8 and Y is a counterion; and,

reacting the nitrile in an alkaline solution, the alkaline solution having peroxygen therein, to form a bleaching agent;

wherein the said formed bleaching agent is contacted with an article to be bleached.

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5,741,438

## OPTICALLY ACTIVE BIPHENYL DERIVATIVE, PROCESS FOR PREPARATION THEREOF, LIQUID CRYSTAL COMPOSITION CONTAINING THE SAME AS AN EFFECTIVE COMPONENT, AND LIQUID CRYSTAL ELEMENT USING THE SAME

**Isan Kurimoto, Toyonaka; Takayuki Higashii, Takatsuki; Shoji Toda, Ibaraki; Masayoshi Minai, Moriyama; Chizu Sekine, and Takeshi Tani, both of Tsukuba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

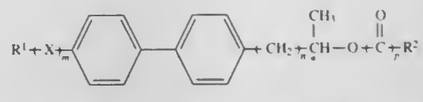
**Continuation of Ser. No. 88,588, Jul. 9, 1993, abandoned, which is a continuation of Ser. No. 511,325, Apr. 19, 1990, abandoned. This application May 30, 1995, Ser. No. 452,720**

**Claims priority, application Japan, Apr. 25, 1989, 1-106659; Apr. 25, 1989, 1-106660; May 30, 1989, 1-138333; May 30, 1989, 1-138334; Feb. 20, 1990, 2-040539**

**Int. Cl.[6] C09K *19/12;* C07C *41/00;69/76***

**U.S. Cl. 252—299.66** **7 Claims**

1. An optically active biphenyl derivative represented by the formula



wherein R' denotes an alkyl group of 3–20 carbon atoms, $R^2$ denotes an alkyl or alkoxyalkyl group of 1–20 carbon atoms optionally substituted with at least one halogen atom, X denotes —O—, —COO— or —OCO—, m denotes 0 or 1, n denotes an integer of 1–6, wherein p is 0, and the symbol * indicates an asymmetric carbon atom.

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5,741,439

## SILICONE EMULSION COMPOSITIONS

**Stephen Armstrong, Braine L'Alleud, and Andre Detrembleur, Chenee, both of Belgium, assignors to Dow Corning S. A., Seneffe, Belgium**

**Continuation of Ser. No. 292,306, Aug. 18, 1994, abandoned. This application Nov. 22, 1996, Ser. No. 753,235**

**Claims priority, application United Kingdom, Aug. 27, 1993, 9317813**

**Int. Cl.[6] B01J *13/00,* C08L *83/04***

**U.S. Cl. 252—312** **15 Claims**

1. A silicone emulsion composition comprising:

(a) an alkenylated silicone resin;

(b) an alkenyl polydiorganosiloxane;

(c) a silicone resin having SiH groups;

(d) water;

(e) a polyorganohydrogensiloxane selected from the group consisting of linear polyorganohydrogensiloxanes and cyclic polyorganohydrogensiloxanes;

(f) an unsaturated monomer selected from the group consisting of dibutylmaleate, decylvinyl ether, dodecylvinyl ether, camphene, meta-bis-isopropenyl benzene and $C_{16-18}$ α-olefins;

(g) a hydrosilylation catalyst; and

(h) an emulsifying agent selected from the group consisting of anionic emulsifying agents, nonionic emulsifying agents, and cationic emulsifying agents.

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5,741,440

## PRODUCTION OF HYDROGEN AND CARBON MONOXIDE

**James Lee Cooper, and Eugene Michael Ingram, both of Longview, Tex., assignors to Eastman Chemical Company, Kingsport, Tenn.**

**Continuation-in-part of Ser. No. 203,057, Feb. 28, 1994, abandoned. This application Sep. 25, 1995, Ser. No. 533,299**

**Int. Cl.[6] C01B *3/38***

**U.S. Cl. 252—373** **15 Claims**

1. A process for the preparation of a mixture of hydrogen and carbon monoxide comprising contacting a feed mixture of carbon dioxide, hydrogen, at least one hydrocarbon and, optionally, water with a catalyst containing an active metal at a temperature of about 650° to 1450° C., at a pressure of 1 kPa to 70,000 kPa wherein the mole ratio of water plus hydrogen to hydrocarbon and the mole ratio of hydrogen to hydrocarbon are both below 1.5:1 and wherein the resulting amount of carbon dioxide in the product stream is less than 20 mole percent.

VOL 1209 ISS 3 AP 21 1998 UMI

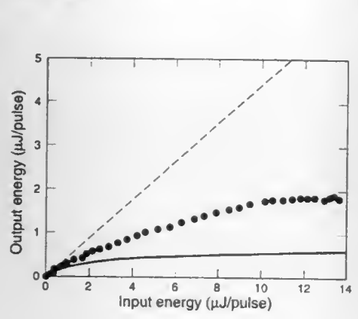


5,741,441
NON-LIQUID SCATTER STANDARD
Richard P. Watts, Diamond Bar, and Jack D. McNeal, Long Beach, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.
Filed Jul. 3, 1996, Ser. No. 675,587
Int. Cl.[6] G01N *21/00;* G01J *4/00;* G02B *5/00;* C08J *5/00;* C08K *13/00*
U.S. Cl. 252—408.1 8 Claims

1. A non-liquid scatter standard for use in nephelometry and turbidimetry systems which comprises a clear silicon rubber gel having an index of refraction of about 1.3 to about 1.5 in which an effective light scattering amount of inorganic particles are suspended, said inorganic particles having an index of refraction greater than that of said silicon rubber gel, and wherein the weight to volume ratio of the inorganic particles to the clear silicon rubber is about 0.0001 mg/ml to about 0.01 mg/ml.

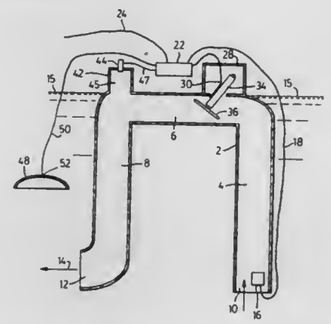
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5,741,442
OPTICAL LIMITING MATERIALS
Duncan W. McBranch; Benjamin R. Mattes, both of Santa Fe; Aaron C. Koskelo, Los Alamos, all of N. Mex.; Alan J. Heeger, Santa Barbara, Calif.; Jeanne M. Robinson, Los Alamos, N. Mex.; Laura B. Smilowitz, Los Alamos, N. Mex.; Victor I. Klimov, Los Alamos, N. Mex.; Myoungsik Cha, Goleta; N. Serdar Sariciftci, Santa Barbara, both of Calif., and Jan C. Hummelen, Groningen, Netherlands, assignors to The Regents of the University of California, Los Alamos, Minn.
Filed Jul. 11, 1995, Ser. No. 499,888
Int. Cl.[6] F21V *9/00;* G02B *5/22*
U.S. Cl. 252—582 7 Claims




1. An optical limiting material for wavelengths of pulsed electromagnetic radiation from a source thereof, which comprises an acceptor composition having a ground-state absorption cross section, $\sigma_0$, and an excited-state absorption cross section, $\sigma_1$, such that $\sigma_1/\sigma_0 \geq 1$ within a first wavelength interval, and a conjugated polymeric composition in which the acceptor composition is soluble such that said acceptor composition is not covalently bonded to said conjugated polymeric composition, said conjugated polymeric composition having an absorption within a second wavelength interval of pulsed electromagnetic radiation which includes the wavelengths of pulsed radiation, the relaxation time of said acceptor composition being long compared with the optical pulse width of the source of radiation, whereby said conjugated polymeric composition absorbs the wavelengths of pulsed radiation and transfer the energy thereof to said acceptor composition in the wavelength region where said acceptor composition does not absorb the pulsed radiation, and enhance the nonlinear absorption of the pulsed radiation where the first wavelength interval is included within the wavelengths of pulsed radiation such that said optical absorbing material limits the wavelengths of pulsed radiation directed therethrough.

5,741,443
OXYGENATION OF STRATIFIED WATER
Andy Gemza, c/o Ontario Ministry of Environment and Energy, 125 Resources Road, Etobicoke, Ontario, Canada, M9P 3V6
Filed Nov. 22, 1996, Ser. No. 755,100
Int. Cl.[6] B01F *3/04*
U.S. Cl. 261—77 22 Claims



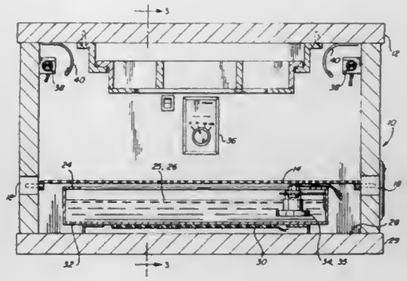

1. Apparatus for introducing oxygen into a selected subsurface stratum of a thermally stratified body of water, while maintaining the thermal stratification thereof substantially undisturbed, comprising:
(a) a conduit including an inflow aperture for receiving water, an upflow chamber, a horizontal chamber, a downflow chamber, and an outflow aperture for discharging water from said conduit in a discharge flow path, said conduit defining a closed flow path for water entering said inflow aperture, said flow path extending upwardly through said upflow chamber, through said horizontal chamber, downwardly through said downflow chamber, and through said outflow aperture, said inflow aperture and said outflow aperture adapted to be positioned within said selected subsurface stratum;
(a) aerator means for introducing oxygen within said conduit, said aerator means positioned in said upflow chamber or adjacent to said inflow aperture;
(b) impeller means for assisting flow of water through said conduit and for mixing water in said conduit with oxygen, said impeller means positioned in said conduit between said aerator means and said outflow aperture;
(c) collector means for collecting undissolved gas within said conduit, said collector means positioned on said horizontal chamber; and
(d) interceptor means for collecting undissolved gas from said discharge flow path, and for preventing vertical circulation of water discharged from said outflow aperture, said interceptor means positioned over and above said discharge-flow path and within said selected subsurface stratum.

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5,741,444
HUMIDOR AND METHOD
Richard A. Kasuli, Ridgefield, Conn., assignor to Humicon Corporation, Merrick, N.Y.
Filed Sep. 11, 1996, Ser. No. 712,330
Int. Cl.[6] B01F *3/04*
U.S. Cl. 261—128 23 Claims

1. A method for storing items at a high humidity level and at an ambient temperature comprising:
providing an enclosure around said items;
providing a water reservoir in said enclosure;
partially filling said water reservoir with water;
gradually heating said water reservoir to an elevated temperature of less than 5 degrees Fahrenheit above an ambient temperature to increase a rate of evaporation of said water;
maintaining said elevated temperature until a desired humidity level is reached;

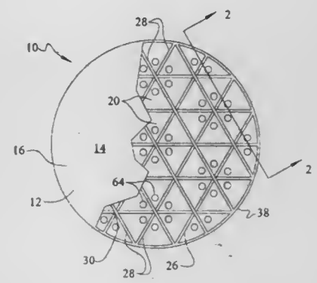





ceasing heating said reservoir when said desired humidity level is reached thereby allowing said water to return to said ambient temperature; and
repeating said heating and maintaining steps when said humidity level drops below said desired level.

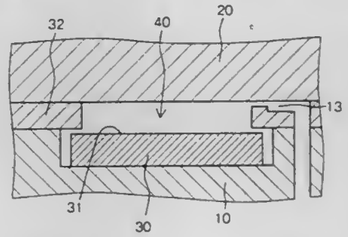
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5,741,445
METHOD OF MAKING LIGHTWEIGHT CLOSED-BACK MIRROR
Raymond L. Taylor, Swampscott; Michael A. Pickering, Dracut, and Lee E. Burns, Reading, all of Mass., assignors to CVD, Incorporated, Woburn, Mass.
Filed Feb. 6, 1996, Ser. No. 596,021
Int. Cl.[6] B29D *11/00*
U.S. Cl. 264—1.21 30 Claims




1. A process for forming a light weight, closed-back mirror, comprising the steps of:
providing a sacrificial mandrel having a base, a top face, and an edge wall, and a plurality of grooves extending into said top face in a cell structure pattern;
providing a plurality of legs in associated ones of said grooves to thus form said legs into said cell structure pattern, rear edges of said legs forming, with said top face, a substantially continuous surface;
chemical vapor depositing a coating of material upon said substantially continuous surface to form a back plate bonded to said rear edges of said legs;
removing mandrel material from said base to expose front edges of said legs and form, with said front edges, a substantially continuous formed surface, while leaving islands of mandrel material within said cell structure; and
chemical vapor depositing a coating of material upon said substantially continuous formed surface to form a front face bonded to said front edges of said legs.

5,741,446
METHOD OF PRODUCING A MOLDED ARTICLE USING A MOLD ASSEMBLY WITH AN INSERT BLOCK
Hisashi Tahara, and Toshiaki Izumida, both of Hiratsuka, Japan, assignors to Mitsubishi Engineering-Plastics Corp., Japan
Filed May 23, 1996, Ser. No. 652,356
Claims priority, applicatioo Japan, May 26, 1995, 7-152519; Oct. 3, 1995, 7-279761; Oct. 3, 1995, 7-279762; Oct. 5, 1995, 7-258609; Oct. 16, 1995, 7-266886; Oct. 27, 1995, 7-280724; Nov. 1, 1995, 7-285172; Nov. 21, 1995, 7-302517; Nov. 21, 1995, 7-403516; Dec. 22, 1995, 7-334817; Jan. 12, 1996, 8-021697; Feb. 1, 1996, 8-038687; Mar. 8, 1996, 8-080816
Int. Cl.[6] B29C *45/37*
U.S. Cl. 264—1.9 51 Claims




1. A method of the production of a molded article, using a mold assembly comprising
(A) a mold having a cavity, for producing a molded article from a thermoplastic resin,
(B) an insert block formed of ceramic or glass having a thermal conductivity of $2\times10^{-2}$ cal/cm.sec.°C. or less, said insert block being disposed inside the mold, constituting part of the cavity, and having a thickness of 0.5 mm to 10 mm, and
(C) a cover plate for covering a peripheral portion of the insert block, said cover plate being attached to the mold and constituting part of the cavity,
wherein a clearance between the insert block and the cover plate is 0.001 mm to 0.03 mm, and an amount of overlapping of the insert block and the cover plate is at least 0.1 mm,
said method comprising filling a molten thermoplastic resin in the cavity, and then cooling the thermoplastic resin to solidness.

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5,741,447
METHOD OF PRINTING ONTO PRESSURE-SENSITIVE RECORD MATERIALS
Michael Peter Bond, Barnrooden, United Kingdom, assignor to Carrs Paper Limited, West Midlands, United Kingdom
PCT No. PCT/GB94/01922, § 371 Date May 4, 1995, § 102(e) Date May 4, 1995, PCT Pub. No. WO95/07188, PCT Pub. Date Mar. 16, 1995
PCT Filed Sep. 5, 1994, Ser. No. 433,374
Claims priority, application United Kingdom, Sep. 4, 1993, 9318369
Int. Cl.[6] B41M *5/00*
U.S. Cl. 264—4 8 Claims

1. A method of preventing or reducing contamination of and damage to components of a toner-based printing apparatus made of natural or synthetic rubber, elastomers, and/or polymers when printing onto pressure-sensitive record material including a base sheet having a coating of a rupturable material confining droplets of a solution of colour-formers, the method comprising:
dissolving said colour-formers in a solvent of at least one of the group consisting of animal oils and vegetable oils, to produce said coating of a rupturable material confining droplets of a solution of colour-formers; and
using said base sheet having a coating in said toner-based printing apparatus in printing operations to reduce contamination of and damage to said components, wherein leakage of

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said droplets onto components does not deleteriously affect said natural or synthetic rubber, elastomer, and/or polymer components.

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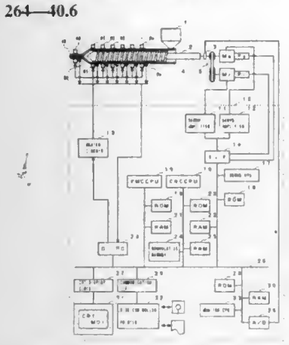
**5,741,448**
**SHRINK-CONTROLLED RESIN COMPOSITION**
**Dean H. Wiseman, Raleigh, N.C., assignor to Reichhold Chemicals, Inc., Research Triangle Park, N.C.**
**Filed Mar. 14, 1996, Ser. No. 615,456**
**Int. Cl.[6] B29C** *35/18*
**U.S. Cl. 264—28** **19 Claims**

**1**. A shrink resistant resin composition curable at room temperature comprising:
(a) a curable unsaturated polyester resin;
(b) an accelerator;
(c) a free radical peroxide initiator curable at a temperature of less than 50° C.; and
(d) a shrinkage controlling polyolefin powder.

**13**. A method of making a shrink-controlled molded article comprising:
(a) providing a shrink-controlled resin composition comprising a curable unsaturated polyester resin, an accelerator, a free radical peroxide initiator curable at a temperature of less than 50° C., and a shrinkage controlling polyolefin powder;
(b) forming a shaped article from the resin composition; and
(c) subjecting the shaped article to a temperature of from about 0° to 50° C. to cure the unsaturated polyester resin composition to provide a shrink-controlled molded article.

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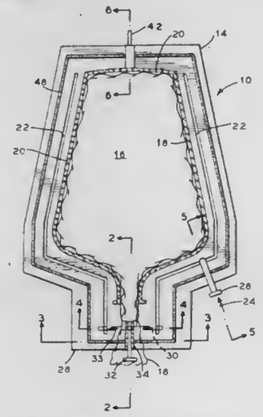
**5,741,449**
**CYLINDER TEMPERATURE SETTING METHOD FOR INJECTION MOLDING MACHINE**
**Masato Yamamura, Hachioji; Tokuhisa Miyauchi, Yamanashi; Noriaki Neko, Yamanashi, and Osamu Fujioka, Yamanashi, all of Japan, assignors to Fanuc Ltd, Yamanashi, Japan**
**Filed Mar. 23, 1995, Ser. No. 408,778**
**Claims priority, application Japan, Mar. 24, 1994, 6-076385**
**Int. Cl.[6] B29C** *45/74*
**U.S. Cl. 264—40.6** **12 Claims**



**1**. A cylinder temperature determination method for injection molding machines, each having an injection cylinder for injecting resin into a mold, a plurality of heat sources arranged axially of the injection cylinder, a plurality of temperature detectors for detecting temperatures of respective portions of the injection cylinder and a temperature controller connected to the heat sources and the temperature detectors, said method comprising the steps of:
(a) detecting the temperatures of the respective portions of the injection cylinder of a first injection molding machine by the temperature detectors when a conforming product is molded by the first injection molding machine;
(b) obtaining a representation of temperature distribution along the axis of the injection cylinder of the first injection molding machine, based on the temperatures detected in step (a);
(c) storing the representation obtained in said step (b); and
(d) obtaining target values for temperature control of the respective portions of the injection cylinder of a second injection molding machine based on the representation stored in step (c), where at least one of the heat sources arranged on the injection cylinder of the second injection molding machine does not have a corresponding heat source at an identical position along the axis of the injection cylinder of the first injection molding machine.

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**5,741,450**
**METHOD OF AND APPARATUS FOR MOLDING A HOLLOW FAN BLADE**
**Robert C. Monroe, Houston, Tex., assignor to Hudson Products Corporatinn, Houston, Tex.**
**Filed Jan. 16, 1996, Ser. No. 586,078**
**Int. Cl.[6] B29C** *45/14*
**U.S. Cl. 264—102** **16 Claims**



**1**. A method of molding an article comprising the steps of:
(a) constructing and arranging a first mold and a separable matching second mold, said first and second molds defining a recessed molding region therebetween corresponding to the article when said molds are secured together;
(b) installing a resin groove in at least one of said molds, said resin groove extending alongside but spaced from said molding region;
(c) forming a gap intermediate said first and second molds when said molds are secured together, said gap extending between said resin groove and said molding region;
(d) coupling a resin injection assembly to said resin groove for forcibly injecting resin into said groove, said resin travelling along said groove and being subsequently forced out of said groove, through said gap, and into said molding region of said first and second molds;
(e) coupling a vent assembly to said molding region for venting said molding region, said vent assembly being spaced from said resin groove; and,
(f) sealing or enclosing said molding region and said resin groove via a seal assembly.

**9**. A molding system for molding an article, comprising:
(a) a first mold and a separable matching second mold, said first and second molds defining a recessed molding region therebetween corresponding to the article to be molded when said molds are secured together;
(b) a resin groove in at least one of said molds extending alongside but spaced from said molding region;
c) a gap intermediate said first and second molds when said molds are secured together, said gap forming a passageway between said resin groove and said molding region;
(d) resin injection means coupled to said resin groove for forcibly injecting resin into said groove, said resin travelling along said groove and being subsequently forced out of said groove, through said gap, and into said molding region of said first and second molds;
(d) vent means coupled to said molding region for venting said molding region, said vent means being spaced from said resin groove; and
(f) seal means for sealing or enclosing said molding region and said resin groove.



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**5,741,451**
**METHOD OF MAKING A HIGH MOLECULAR WEIGHT POLYOLEFIN ARTICLE**
**James Jay Dunbar, Mechanicsville, Va.; Sheldon Kavesh, Whippany, N.J.; Dusan Ciril Prevorsek, Morristown, N.J.; Thomas Yiu-Tai Tam, Richmond, Va.; Gene Clyde Weedon, Richmond, Va., and Robert Charles Winckhofer, Richmond, Va., assignors to AlliedSignal Inc., Morristown, N.J.**
**Division of Ser. No. 385,238, Feb. 8, 1995, Pat. No. 5,578,374, which is a continuation of Ser. No. 32,774, Mar. 15, 1993, abandoned, which is a continuation of Ser. No. 758,913, Sep. 11, 1991, abandoned, which is a continuation of Ser. No. 358,471, May 30, 1989, abandoned, which is a continuation of Ser. No. 745,164, Jun. 17, 1985, abandoned. This application Aug. 17, 1995, Ser. No. 516,054**
**Int. Cl.[6] D01D** *5/12;* **D01F** *6/04;* **D02G** *3/00*
**U.S. Cl. 264—103** **42 Claims**

**1**. A method to prepare a low creep, high modulus, high strength, low shrink, high molecular weight polyethylene fiber having improved strength retention at high temperatures comprising
drawing a high molecular weight polyethylene fiber at a temperature within 10° C. of its melting temperature to form a drawn, highly oriented, polyethylene fiber, then
poststretching said fiber at a drawing rate of less than about 1 second$^{-1}$ at a temperature within 10° C. of its melting temperature, and
cooling said fiber under tension sufficient to retain its highly oriented state.

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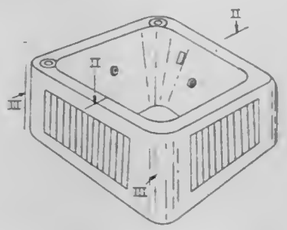
**5,741,452**
**ORIENTING EXTRUSION PROCESSES FOR MEDICAL TUBING APPLICATIONS**
**Patrick T. Ryan, Crystal Lake; Chuan Qin, Gurnee; Donna L. Rostron, Bartlett; Birendra K. Lal, Lake Zurich; Yuanpang S. Ding, Vernon Hills; Susan R. Mizener, Round Lake Heights; Lecon Woo, Libertyville; Michael T. K. Ling, Vernon Hills, and Martin F. Miller, Lake in the Hills, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.**
**Filed May 3, 1996, Ser. No. 642,657**
**Int. Cl.[6] B29C** *47/00;55/06;* **B29D** *23/00*
**U.S. Cl. 264—209.5** **14 Claims**



**1**. A method for fabricating flexible medical tubings comprising the steps of:
providing a polymeric material; forming a tubing from the polymeric material, the tubing having a longitudinal axis and an initial diameter;
orienting the tubing along the longitudinal axis of the tubing to reduce the diameter of the tubing to define an oriented diameter; and
heat setting the tubing in the oriented diameter.

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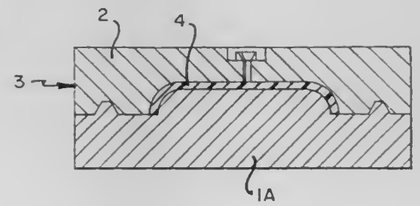
**5,741,453**
**METHOD FOR MAKING A ROTATIONALLY MOLDED SPA**
**John C. Kennedy, Grand Rapids, Mich., assignor to Emerald Spa Corporation, Kentwood, Mich.**
**Filed Nov. 7, 1995, Ser. No. 553,152**
**Int. Cl.[6] B29C** *71/00*
**U.S. Cl. 264—237** **2 Claims**



**1**. A method for manufacturing a one-piece, rotationally molded spa having integral reservoir, coping, exterior sidewalls and a floor beneath the reservoir and interconnecting the exterior sidewalls, comprising the steps of:
providing a mold having a cavity defining a reservoir of a spa including a plurality of walls and a footwell, a coping, exterior walls, and a floor beneath the footwell, and all interconnected to each other;
introducing a powdered polymeric material into the mold cavity;
rotationally molding the powdered polymeric material to the shape of the spa defined by the mold cavity;
removing the rotationally molded spa from the mold; and
placing the rotationally molded spa in a cooling fixture to produce a memory in the polymeric material

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**5,741,454**
**METHOD OF MAKING COMPOSITE TILES CONTAINING WASTE PLASTIC**
**Athos Polidori, Saludecio, Italy, assignor to Maloney Contractors Ltd., Dublin, Ireland**
**PCT No. PCT/IT93/00073, § 371 Date Aug. 12, 1994, § 102(e) Date Aug. 12, 1994. PCT Pub. No. WO94/01266, PCT Pub. Date Jan. 20, 1994**
**PCT Filed Jul. 8, 1993, Ser. No. 290,857**
**Claims priority, application Israel, Jul. 13, 1992, BO92A0275**
**Int. Cl.[6] B29C** *45/13*
**U.S. Cl. 264—45.1** **7 Claims**



**1**. A process for manufacturing a composite tile from waste thermoplastic material comprising the steps of:
(a) crushing the waste thermoplastic material;
(b) injecting a virgin plastic material into a mold between a cavity formed by a primary punch and a matrix associated with said mold to form the first layer of said tile;
(c) rotating said mold after said injecting step to reverse the position of said matrix and of said primary punch;

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(d) replacing said primary punch with a secondary punch to form a cavity between said first layer, supported by said matrix and said secondary punch; and

(e) injecting said waste thermoplastic material into said cavity to form a second layer of plastic material arranged upon said first layer of said tile.

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5,741,455

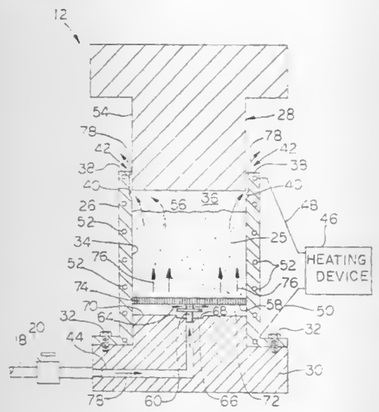
## INERT GAS HEATED COMPRESSION MOLDING PROCESS AND APPARATUS

**Thirumalai N. C. Devanathan, Warsaw, Ind., and Karthik Ramani, Purdue University, School of Mechanical Engineering, Advanced Material Design, and Processing, West Lafayette, Ind. 47907-1288, assignors to Purdue Research Foundation, Warsaw, and Karthik Ramani, W. Lafayette, both of Ind.**

**Filed Dec. 8, 1995, Ser. No. 569,537**

**Int. Cl.[6] B27N** *3/18;* **B29C** *41/46;43/52*

**U.S. Cl. 264—319** **2 Claims**




1. A method of compression molding a moldable material, comprising the steps of:

providing a compression mold having an inner cavity and a fluid inlet in communication with said inner cavity, said inner cavity having an initial volume and a compressed volume wherein said compressed volume is less than the initial volume;

providing compression means within said compression mold shiftable between first and second positions to decrease the volume of the inner cavity from said initial volume to said compressed volume;

providing a porous plate within said inner cavity of the compression mold in association with said fluid inlet, whereby a fluid may be introduced into said inner cavity of the compression mold through said fluid inlet and said porous plate;

introducing the moldable material into said inner cavity of the compression mold when said compression means is in its first position with said inner cavity having its initial volume;

heating and fluidizing said moldable material within said inner cavity of the compression mold by transporting a hot inert gas through said fluid inlet, porous plate and inner cavity of the compression mold; and

compressing the moldable material within said inner cavity of said compression mold by shifting said compression means from its first position toward its second position wherein the volume within said inner cavity is reduced from said initial volume to said compressed volume.

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5,741,456

## CARBON FIBRE PANELS WITH LASER FORMED HOLES

**Glen Donald Ayrton, North Yorks, England, assignor to Hurel DuBois UK Limited, Burnley, United Kingdom**

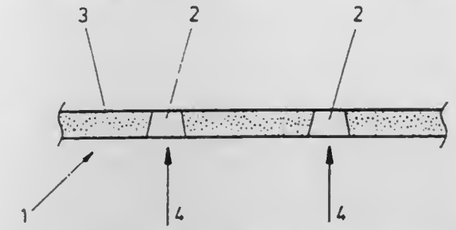
**PCT No. PCT/GB94/00077, § 371 Date Sep. 21, 1995, § 102(e) Date Sep. 21, 1995, PCT Pub. No. WO94/15746, PCT Pub. Date Jul. 21, 1994**

**PCT Filed Jan. 13, 1994, Ser. No. 491,859**

**Claims priority, application United Kingdom, Jan. 13, 1993, 9300545**

**Int. Cl.[6] B23K** *26/00*

**U.S. Cl. 264—400** **8 Claims**




1. A method of making an aircraft carbon fibre panel which includes permeable openings (2) therethrough comprising forming a layer (1) having a first and second side (3), the layer including a plurality of fibres and epoxy resin, with at least the region of the layer adjacent to the second side being formed with substantially unidirectionally extending fibres (3); subjecting the layer to heat and pressure; and burning the openings (2) through the panel from the first side to the second side (3) with a laser.

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5,741,457

## METHOD FOR INTRODUCING MOLD MATERIALS INTO A MOLD

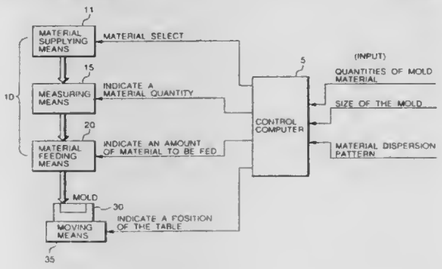
**Kennosuke Iida, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, and Akebono Research and Development Centre Ltd., Hanyu, both of Japan**

**Filed Feb. 16, 1996, Ser. No. 602,603**

**Claims priority, application Japan, Feb. 17, 1995, 7-029454**

**Int. Cl.[6] B29C** *43/58*

**U.S. Cl. 264—40.4** **3 Claims**




1. A method for introducing mold materials into a mold comprising the steps

A) preparing a plurality of mold materials;

B) inputting the desired material composition, size of the mold, and desired material dispersion pattern into a control unit;

C) dividing the inside of the mold into segments and assigning addresses to those segments;



D) generating a first control signal from said control unit to a material supply unit and selecting one mold material to be supplied to a material measuring unit in accordance with said first control signal;

E) generating a second control signal from said control unit to a material measuring unit and measuring said one mold material in accordance with said second control signal;

F) generating a third control signal from said control unit to a material feed unit and feeding said one mold material to said mold in accordance with said third control signal;

G) generating a fourth control signal from said control unit to cause said one mold material fed by said material feed unit to be fed to a specified address within the mold; and

H) repeating steps D) through G) using different mold materials.

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5,741,458

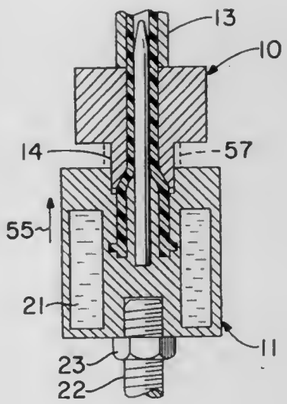
## METHOD OF FORMING A WATER HEATER TUBE

**William Rowley, 35 Wilding Chase, Chagrin Falls, Ohio 44022**

**Filed Jan. 19, 1996, Ser. No. 588,807**

**Int. Cl.[6] B29C** *71/04;57/02*

**U.S. Cl. 264—494** **26 Claims**




1. A process for forming a thermoset hollow cylindrical water heater tube having one belled proximal end without wall thinning from a constant thickness portion of the tube and an opposed distal end, comprising without regard to order of steps (a) through (e):

(a) belling the proximal tube end comprising the steps in the following order of:

(i) inserting the proximal tube end through a female die and having a portion of the tube projecting the female die, the female die surrounding a first outer diameter of the tube and having a projection adapted to cooperate with a recess of a male die;

(ii) heating at least a portion of the tube projecting from the female die sufficiently to make such projecting portion pliable enough to form; and

(iii) belling the proximal tube end by insertion of the projecting tube portion into an annular recess of the male die and the cooperating recess of the male die and the projection of the female die by closing the female and male dies;

(b) heating a portion of the tube at an inflection region between the proximal and distal ends of the tube and bending the tube;

(c) at least partially sealing the distal end of the tube;

(d) crosslinking the tube; and

(e) drilling at least one hole into a wall of the tube.

5,741,459

## PROCESS FOR PREPARING STAMP

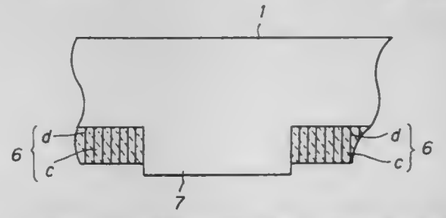
**Yoichi Ando, Sagamihara; Hajime Toda, Machida; Koichi Hirano, Yokohama, and Hisami Tamano, Machida, all of Japan, assignors to Mitsubishi Pencil Kabushiki Kaisha, Shinagawa-ku, Japan**

**Filed Dec. 28, 1994, Ser. No. 365,124**

**Claims priority, application Japan, Dec. 28, 1993, 5-350716; Dec. 28, 1993, 5-350717; Jan. 25, 1994, 6-006189**

**Int. Cl.[6] B29C** *59/02*

**U.S. Cl. 264—293** **20 Claims**




1. A process for preparing a stamp which comprises the step of passing a stamp ink-permeable sheet-like elastic stamp material between a platen and a thermal head of a thermal printer controlled by a processor for desired imprint data, while pressing the stamp material so that the thickness of the pressed stamp material is in the range of 95 to 30% of that of the stamp material, said stamp material being a sponge sheet made from at least one material selected from the group consisting of natural rubber, synthetic rubber and synthetic resin, and having open cells, whereby an imprint mirror image comprising a concave melted portion where the open cells are collapsed, and an melted portion in which the open cell state is maintained, are formed on the surface of the stamp material to form a stamp surface having the melted portion as an ink non-oozing portion and the melted portion as an ink oozing portion.

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5,741,460

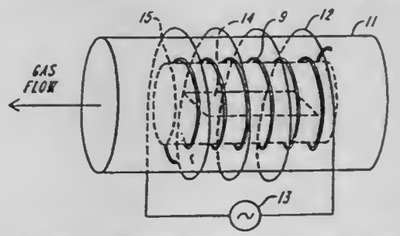
## PROCESS FOR DRY STERILIZATION OF MEDICAL DEVICES AND MATERIALS

**Adir Jacob, 23 Juniper La., Framingham, Mass. 01701, and Jnnathan Allen Wilder, Rochester, N.Y., assignors to Adir Jacob, Framingham, Mass.**

**Filed Jun. 7, 1995, Ser. No. 482,200**

**Int. Cl.[6] A61L** *2/14*

**U.S. Cl. 422—22** **20 Claims**




1. In a sterilization method wherein a load is exposed within a sterilization zone to active species of a plasma generated in a reaction zone operably associated with said sterilization zone; the improvement which comprises:

introducing a biocidal fluid in vapor or gas state into said sterilization zone;

exposing said load to said biocidal fluid during a preconditioning phase;

inducing a plasma in said biocidal fluid within said chamber by application of electrical energy; and

contacting said plasma with a textured metal surface while contacting said load with said active species.

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## 5,741,461
## AUTOMATIC ANALYZER HAVING CUVETTE CLEANING CONTROL DEVICE

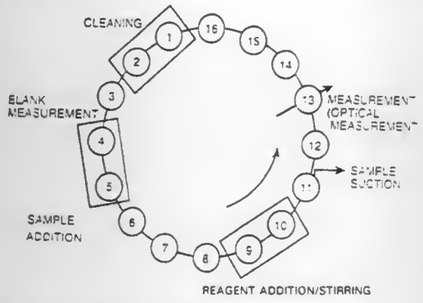
**Kenichi Takahashi, Hitachinaki; Tomonori Mimura, Tomobe-machi; Naoto Oki, Hitachinaka; Kyoko Imai, Hitachinaka; Isao Shindo, Hitachinaka, and Kahei Shiraishi, Hitachioota, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed May 13, 1996, Ser. No. 645,075**

**Claims priority, application Japan, May 19, 1995, 7-121665; Jul. 26, 1995, 7-190063**

**Int. Cl.[6] G01N** *35/02*

**U.S. Cl. 422—67** **2 Claims**




1. An automatic analyzer, comprising:

a turntable holding a plurality of reaction vessels;

means for driving the turntable so that cleaning, blank measurement, sample addition, reagent addition, and optical sample measurement are performed with respect to the plurality of reaction vessels when the plurality of reaction vessels are located at positions corresponding to the cleaning, the blank measurement, the sample addition, the reagent addition, and the optical sample measurement;

means for judging in advance of the sample addition whether any of said plurality of reaction vessels which are located between the cleaning position and the sample addition position should be cleaned when the analyzer starts to operate so as to perform the cleaning with respect to at least one of the reaction vessels located between the cleaning position and the sample addition position which should be cleaned, and so as to prevent the remainder thereof from being cleaned to start the blank measurement from the remainder prevented from being cleaned; and

means for storing correspondences between the plurality of reaction vessels and vessel positions at which the plurality of reaction vessels are held by the turntable, the correspondences being those after the turntable finishes operating;

wherein the judging means judges whether the reaction vessels which are located between the cleaning position and the sample addition position should be cleaned or not based on the stored correspondences.

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## 5,741,462
## REMOTELY PROGRAMMABLE MATRICES WITH MEMORIES

**Michael P. Nova, Rancho Sante Fe, and Andrew E. Senyei, San Juan Capistrano, both of Calif., assignors to Irori, San Diego, Calif.**

**Filed Apr. 25, 1995, Ser. No. 428,662**

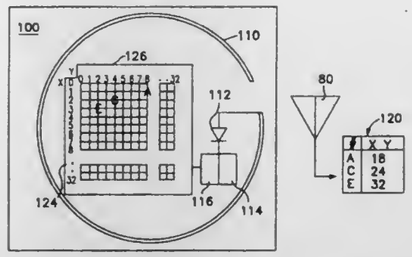
**Int. Cl.[6] G01N** *15/06;33/53;* **C12Q** *1/68;* **A61K** *38/00*

**U.S. Cl. 422—68.1** **13 Claims**

1. A system for programming and reading data from a combination of a matrix with memory, comprising:

(A) a host computer or decoder/encoder instrument having a memory for storing data:

(i) relating to one or a plurality of process steps for synthesizing, assaying or reacting molecules or biological particles in contact with the combination, relating to the identity of a molecule, or a biological particle, or to information categorizing the molecule or biological particle, wherein the biological particle is a virus, viral vector, viral capsid




with or without packaged nucleic acid, phage, a phage vector, phage capsid, a cell or fragments thereof;

(ii) for identifying one or a plurality of unique indicators representative of each of the process steps or the identity or category of molecule or biological particle; and

(iii) for generating a data signal representative of each unique indicator;

(B) a transmitter means for receiving a data signal and generating a transmitted signal for transmitting a data signal, and for providing a write signal;

(C) the combination of matrix with memory in contact with or in a solution containing a molecule or biological particle, wherein the combination of matrix with memory, comprises:

(i) a recording device, comprising an electromagnetically remotely programmable data storage unit; and

(ii) a matrix material, wherein:

the matrix material is either comprised of particles of a size such that at least one dimension is no more than 5 to 10 mm or the matrix material is in the form of a solid continuous surface that encases the recording device;

the matrix is derivatized for retaining products of each of the combination of process steps, the matrix being non-reactive with the plurality of process steps; and

the recording device is in contact with the matrix or in a solution that is in contact with the matrix, and comprises:

non-volatile memory means for storing a plurality data points and means for receiving the transmitted signal so that the write signal causes a stored data point corresponding to the data signal to be stored within the non-volatile memory means;

(D) means for reading from the non-volatile memory means to identify each of the stored data points, wherein the stored data points indicate exposure of the combination of matrix with memory to one of a combination of process steps or the identity or category of the molecule or biological particle.

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## 5,741,463
## APPARATUS FOR PREVENTING CROSS-CONTAMINATION OF MULTI-WELL TEST PLATES

**Ashok Ramesh Sanadi, 2704 Arlington Blvd., Apt. 2, Arlington, Va. 22204**

**Continuation of Ser. No. 195,125, Apr. 4, 1994, abandoned, which is a continuation-in-part of Ser. No. 49,171, Apr. 19, 1993, Pat. No. 5,342,581. This application Sep. 20, 1995, Ser. No. 530,967**

**Int. Cl.[6] B01L** *11/00*

**U.S. Cl. 422—101** **4 Claims**

1. A sealed multi-well plate having an array of wells depending from a planar principal plate surface, comprising:

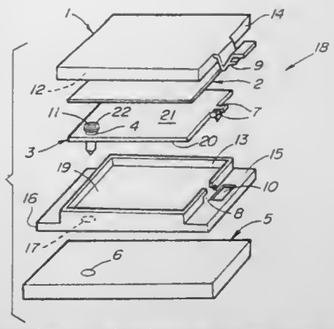
a base plate defining a plurality of wells in an array, said base plate having a continuous planar principal surface, said wells extending below said continuous planar principal surface;

said base plate further defining an array of well openings at said continuous planar surface of said base plate corresponding with said wells;

a unitary lid plate having an uninterrupted planar surface, wherein said uninterrupted planar surface of said lid plate has an area sufficient to extend over the majority of said well openings;

a gasket disposed between said base plate and said lid plate and overlying said well openings;






said contact between said uninterrupted planar surface of said lid plate and said continuous planar principal surface of said base plate defining with said wells closed well chambers for containing a sample;

a closure snap fitting along the perimeter of and integral with said base plate and said lid plate, wherein said closure snap fitting releasably and securely holds said lid plate to said base plate and compresses said gasket to close said well chambers.

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## 5,741,464
## SAMPLING VALVE

**Frank S. Giannone, North Bellmore, N.Y., assignor to MMC International Corp., Inwood, N.Y.**

**PCT No. PCT/US95/04770, § 371 Date Oct. 18, 1996, § 102(e) Date Oct. 18, 1996, PCT Pub. No. WO95/28627, PCT Pub. Date Oct. 26, 1995**

**PCT Filed Apr. 17, 1995, Ser. No. 727,516**

**Int. Cl.[6] G01N** *1/12*

**U.S. Cl. 422—103** **22 Claims**

1. A sampling valve for use with a sampling device having a sampler tube and a sampler ball to close off an end of the sampler tube which is adapted to enter a tank to obtain a sample of the contents of the tank, said valve comprising:

a housing and a rotatable ball in said housing, said rotatable ball having a central opening for receiving and having the sampler tube pass therethrough;

moving means including spring-biased means for engagement with said sampler ball associated with said rotatable ball for moving said sampler ball away from an end of said sampler tube to permit the liquid or fluid in said sampler tube to exit therefrom; and

means for withdrawing the fluid or liquid exiting from said sampler tube.

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## 5,741,465
## REACTIVE WASTE DEACTIVATION FACILITY AND METHOD

**Ronald E. Gregg, Dana Point, Calif., assignor to Advanced Environmental Technology, Inc., Dana Point, Calif.**

**Continuation-in-part of Ser. No. 567,757, Dec. 5, 1995. This application Aug. 20, 1996, Ser. No. 699,825**

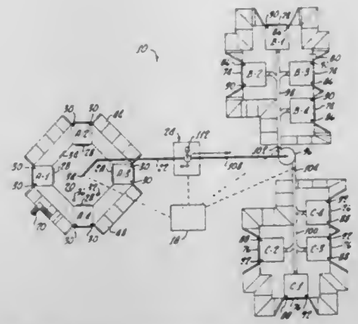
**Int. Cl.[6] G21F** *9/00;* **A45C** *13/06*

**U.S. Cl. 422—189** **6 Claims**

1. A reactive waste deactivation facility comprising:

a plurality of deactivation bays, each comprising means for deactivating wastes listed by the United States Enviromental Protective Agency under EPA Waste Code D003, the plurality of deactivation bays defining an outer perimeter of the facility;

an expansion chamber including interior wall means for controlling expansion of waste gasses generated during the deactivating of hazardous waste, said expansion chamber disposed generally central to the plurality of deactivation bays, said



interior wall means including means, defining openings therethrough, for dispersing waste gasses and promoting uniform pressure buildup of waste gasses throughout the expansion chamber;

expansion duct means, defined by a plurality of ducts connecting each deactivation chamber with the generally centrally disposed expansion chamber for exhausting the waste gasses from the deactivation bays into the expansion chamber;

air pollution control means, connected to said expansion chamber, for treating the waste gasses resulting from the deactivation of the hazardous waste;

means for venting waste gasses into the expansion chamber from one of the bays in which deactivation is being conducted;

means for selectively isolating each deactivation bay, in which deactivation is not being conducted, from the expansion chamber;

computer means for calculating a feed stream rate which will generate a selected output of waste gasses from the plurality of deactivation bays to the expansion chamber means and air pollution control means; and

control means for sequencing of operation of the deactivation means in the plurality of bays and for controlling said means in the plurality of bays and for controlling said means for selectively isolating and said means for venting, to effect continuous processing of hazardous wastes in order to provide the selected output of waste gasses to said expansion chamber means and air pollution control means.

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## 5,741,466
## MULTIPHASE STAGED PASSIVE REACTOR

**George Bodnaras, Hillarys, Australia, assignor to Atomaer Pty Ltd, Perth, Australia**

**PCT No. PCT/AU94/00299, § 371 Date Mar. 19, 1996, § 102(e) Date Mar. 19, 1996, PCT Pub. No. WO94/29017, PCT Pub. Date Dec. 22, 1994**

**PCT Filed Jun. 3, 1994, Ser. No. 553,623**

**Claims priority, application Australia, Jun. 3, 1993, PL9180**

**Int. Cl.[6] B01J** *19/24;* **B01F** *5/00*

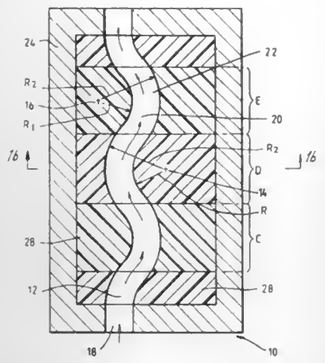
**U.S. Cl. 422—228** **14 Claims**

1. A method of promoting interphasic interaction of a first substance in a liquid phase with a second substance in a non-miscible liquid phase, a solid phase or a gaseous phase, and wherein the phases of said first and second substances respectively are characterized by different relative densities, the method comprising:

forcing the first and second substances along a substantially curved multistage flow path, each stage being shaped to define a curved flow path having a centre of curvature located to one side of the flow path, at least one stage having only two facing boundary surfaces defining the flow path, and wherein adjacent stages have a respective centre of curvature on opposite sides of the flow path whereby, in use, as the substances flow through the flow path they are subject to an inertial field of changing direction so that particles of the second substance

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are forced to migrate through the first substance, first in one direction and then in substantially the reverse direction to promote interphasic interaction due to relative movement and cross migration of the phases which causes the phases to be extruded and accelerated to form fine filaments and platelets thereby increasing interphasic contact surfaces and exposing the phases to high shear flow and intergranular friction.

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**5,741,467**

## PALLADIUM CATALYST WASHCOAT SUPPORTS FOR IMPROVED METHANE OXIDATION IN NATURAL GAS AUTOMOTIVE EMISSION CATALYSTS

**W. Burtoo Williamson, Broken Arrow, and Ronald G. Silver, Tulsa, both of Okla., assignors to ASEC Manufacturing, Tulsa, Okla.**

**Filed Jun. 7, 1995, Ser. No. 476,342**
**Int. Cl.[6] B01D** *53/94*
**U.S. Cl. 423—213.5** **4 Claims**

1. A process for treating the exhaust gas of a natural gas fueled automotive engine, said engine operating alternately in lean, stoichiometric, and rich air/fuel modes, comprising contacting the exhaust gas with a catalyst consisting of:

a substrate;

a first washcoat support, dispersed on said substrate, consisting of alumina;

a second washcoat support, dispersed on said first washcoat support, consisting of alumina and sufficient amounts of ceria and lanthana to promote treatment of the exhaust gas when the engine is operating in stoichiometric and rich air/fuel modes; and

an amount of palladium, sufficient to catalyze the oxidation of hydrocarbons and carbon monoxide and the reduction of nitrogen oxides contained in said exhaust gas, impregnated into the first and second washcoat supports.

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**5,741,468**

## EXHAUST GAS CLEANER AND METHOD FOR CLEANING EXHAUST GAS

**Mika Saito; Kiyohide Yoshida; Naoko Irite; Hong He; Akira Abe, and Akira Nishiya, all of Kumagaya, Japan, assignors to Kabushiki Kaisha Riken, Tokyo, Japan**

**Filed Jun. 6, 1995, Ser. No. 466,436**
**Claims priority, application Japan, Dec. 28, 1994, 6-339944; Feb. 23, 1995, 7-059812; Feb. 24, 1995, 7-061950; Feb. 28, 1995, 7-065173; Apr. 5, 1995, 7-104821**
**Int. Cl.[6] B01J** *8/00;* **C01B** *21/00*
**U.S. Cl. 423—239.1** **41 Claims**

38. A method for removing nitrogen oxides by reduction from an exhaust gas containing nitrogen oxides and oxygen in an amount larger than its stoichiometric amount relative to unburned components in said exhaust gas, which comprises:

disposing an exhaust gas cleaner in a flow path of said exhaust gas;

introducing into said exhaust gas at least one reducing agent selected from the group consisting of hydrocarbons and oxygen-containing organic compounds on an upstream side of said exhaust gas cleaner; and

bringing the resulting exhaust gas containing said reducing agent into contact with said exhaust gas cleaner at 150–600 C., thereby reducing said nitrogen oxides with said reducing agent to remove said nitrogen oxides by reduction; said exhaust gas cleaner consisting essentially of:

a first catalyst consisting essentially of a first inorganic oxide supporting 0.2–15 weight % of at least one Ag component selected from the group consisting of Ag and A compounds; and

a second catalyst consisting essentially of a second porous inorganic oxide supporting (a) 1–30 weight % of an Ni component or (b) 1–30 weight % of two or more of an Ag component, Cu component and Ni component in a weight ratio in terms of element basis of Ni:Ag=1:5 to 5:1, Ni:Cu=1:5 to 5:1 and Ag:Cu=1:5 to 5:1, said Ni component being at least one selected from the group consisting of Ni and Ni compounds, said Ag component being selected from the group consisting of Ag and Ag compounds, and said Cu component being selected from the group consisting of Cu and Cu compounds; the weight percentages being expressed by metal basis and being based on the amount of each porous inorganic oxide, and said first and second catalysts being disposed in this order from inlet side to outlet side of said exhaust gas cleaner for contact by said exhaust gas.

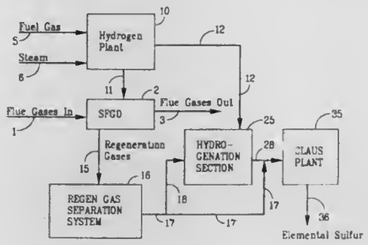
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**5,741,469**

## PROCESS SCHEME FOR $SO_x$ REMOVAL FROM FLUE GASES

**Nazeer A. Bhore, Wilmington, Del.; David L. Johnson, Glen Mills, Pa.; Khushrav E. Nariman, Lawrenceville, and David L. Stern, Princeton, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.**

**Continuation of Ser. No. 278,523, Jul. 20, 1994, abandoned. This application Oct. 4, 1996, Ser. No. 727,843**
**Int. Cl.[6] B01J** *8/00;* **C01B** *7/00*
**U.S. Cl. 423—244.01** **27 Claims**




1. A process for removing sulfur oxides from a flue gas stream, which comprises the steps of:

(a) directing the flue gas stream containing sulfur oxides along with a source of oxygen into an absorber, wherein the flue gas stream and the source of oxygen contact a bed of solid oxide operated under conditions effective to remove at least about 80 percent of the sulfur oxides from the flue gas stream, thereby producing a sulfated solid oxide having sulfur compounds thereon and a treated flue gas output stream;



(b) ceasing contact of the flue gas stream and the source of oxygen with the bed of sulfated solid oxide;

(c) regenerating the sulfated solid oxide by contacting the bed of sulfated solid oxide with a reducing gas capable of releasing at least a portion of the sulfur compounds contained thereon under conditions effective for regeneration of the solid oxide, the reducing gas being simultaneously injected through at least one injection point located on each of a plurality of different levels located longitudinally through the bed of solid oxide, thereby forming a regenerated solid oxide and an off-gas comprising elemental sulfur;

(d) directing said off-gas into a condenser operated at conditions effective for condensing elemental sulfur without condensing water, thereby forming (1) a product stream comprising elemental sulfur and (2) a tail-gas stream;

(e) recovering the elemental sulfur; and

(f) supplying said tail-gas stream from step (d) directly into said absorber in step (a) with the flue gas stream and said source of oxygen.

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**5,741,470**

## METHOD AND DEVICE FOR REMOVAL OF ETHYLENE OXIDE GAS

**Horst Wenzler, Freiburg-Tiengen, Germany, assignor to Benedikt-Kreutz-Rehabilitationszentrum Für Herz-und Kreizlaufkranke Bad Krozingen E.V., Krozingen, Germany**

**Filed Mar. 17, 1993, Ser. No. 31,430**
**Int. Cl.[6] B01D** *53/72*
**U.S. Cl. 423—245.2** **19 Claims**

19. A remediation method for a gas containing high concentrations of more than 1,000 ppm ethylene oxide, said method comprising the steps of:

a) wetting activated carbon with water containing a catalyst;

b) guiding the gas containing ethylene oxide over the activated carbon;

c) in the presence of water and said catalyst, simultaneously adsorbing and absorbing ethylene oxide as well as wet-catalytically converting ethylene oxide to ethylene glycol on said activated carbon that acts simultaneously as an absorbing medium, an adsorbing medium, and a catalyst carrier;

d) rinsing said activated carbon with water containing said catalyst and thereby converting remaining and incompletely converted ethylene oxide of step c) to ethylene glycol; and

e) repeating steps b), c) and d) when needed.

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**5,741,471**

## PROCESS FOR THE PREPARATION OF DISCRETE PARTICLES OF CALCIUM CARBONATE

**Donald Richard Deutsch, Walnutport, and Kenneth James Wise, Schnecksville, both of Pa., assignors to Minerals Technologies Inc., New York, N.Y.**

**Filed Dec. 5, 1995, Ser. No. 567,754**
**Int. Cl.[6] C01F** *11/18*
**U.S. Cl. 423—432** **8 Claims**

1. A process for the preparation of discrete particles of prismatic calcium carbonate comprising preparing a first calcium hydroxide slurry from calcium oxide and water, subsequently adding to said first slurry from about 0.1 weight percent to 5.0 weight percent of a saccharide or polysaccharide to form a second calcium hydroxide slurry, and while rapidly agitating, carbonating the thus prepared second calcium hydroxide slurry until the carbonation is substantially complete so as to obtain said discrete particles of prismatic calcium carbonate, said carbonation being started at a temperature of from about 8° C. to about 64 °C.

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**5,741,472**

## CARBONACEOUS ELECTRODE MATERIAL FOR SECONDARY BATTERY

**Naohiro Sonobe; Jiro Masuko, and Takao Iwasaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 23, 1995, Ser. No. 518,357**
**Claims priority, application Japan, Aug. 23, 1994, 6-219636**
**Int. Cl.[6] C09C** *1/56*
**U.S. Cl. 423—460** **11 Claims**

1. A carbonaceous electrode material for a non-aqueous solvent-type secondary battery, comprising a carbonaceous material having an average (002)-plane spacing of at least 0.365 nm according to X-ray diffraction method and characterized by a ratio $\rho_H/\rho_B$ of at least 1.15 wherein $\rho_H$ denotes a density measured by using helium gas as a substitution medium and $\rho_B$ denotes a density measured by using butanol as a substitution medium.

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**5,741,473**

**Patent Not Issued For This Number**

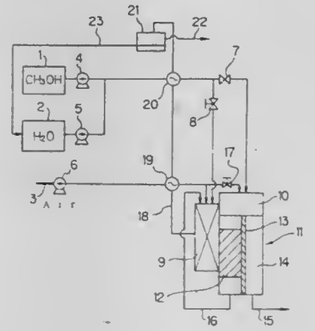
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**5,741,474**

## PROCESS FOR PRODUCTION OF HIGH-PURITY HYDROGEN

**Manabu Isomura, Tsushima; Takao Soma, Nishikamo-gun, and Tomonori Takahashi, Chita, all of Japan, assignors to NGK Insulators, Ltd., Japan**

**Filed May 18, 1995, Ser. No. 443,551**
**Claims priority, application Japan, May 23, 1994, 6-108625**
**Int. Cl.[6] C01B** *3/02;3/24;3/26*
**U.S. Cl. 423—648.1** **5 Claims**




1. A process for producing high-purity hydrogen by reforming a hydrocarbon and/or oxygen atom-containing hydrocarbon to form a reformed gas containing hydrogen and passing the reformed gas through a hydrogen-separating membrane to recover selectively hydrogen from the reformed gas, said process comprising the steps of:

heating a reforming chamber provided with a hydrogen-separating membrane;

feeding into the reforming chamber a hydrocarbon and/or an oxygen atom-containing hydrocarbon, steam, and oxygen or air;

causing both steam reforming and partial oxidation to take place in the reforming chamber; and

passing the reformed gas of the steam reforming operation through the hydrogen—separating membrane to recover high—purity hydrogen.

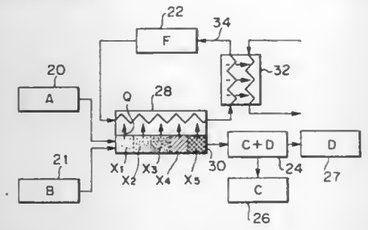
VOL 1209 ISS 3 AP 21 1998 UMI



### 5,741,475
### CATALYTIC REACTION METHOD

**Takumi Takashima; Tadayoshi Tanaka; Takahiro Fujii, and Takuya Doi, all of Tsukuba, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan**

**Continuation of Ser. No. 321,890, Oct. 14, 1994, abandoned. This application Sep. 30, 1996, Ser. No. 723,809**
**Claims priority, application Japan, Oct. 15, 1993, 5-281802**
**Int. Cl.[6] C07C** *29/141; C01B 17/24*
**U.S. Cl. 423—559** **18 Claims**




1. A catalytic reaction method for carrying out exothermic reactions using a catalyst, comprising:
   a. providing a reaction vessel for carrying out exothermic catalytic reactions therein and having first and second regions therein positioned sequentially to and in communication with one another and respectively containing first and second catalysts for the exothermic catalytic reactions;
   b. introducing a flow of at least one raw material into the reaction vessel and passing the flow through the first and second regions for exothermic reaction of the at least one raw material to produce at least one product with generation of heat so that each respective region has a temperature which increases as the flow is passed therethrough; and
   c. transferring the heat to a heat transfer medium which is arranged outside of and in contact with the reaction vessel and which flows co-currently with the flow through the reaction vessel,
   wherein the first and second catalysts have respective catalyst compositions comprising at least one catalytic material which is the same at least one catalytic material but which has a respective concentration per unit volume which is different so that respective activities of the first and second catalysts are different from each other, so that heat generation rate during exothermic reaction is controlled by controlling the difference in activity between the first and second catalysts, and so that the first and second regions have different catalytic performances from one another for at least one of (a) product production and (b) heat production.

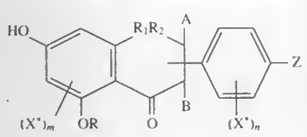
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### 5,741,476
### POLYHYDRIC PHENOL COMPOUNDS

**John Janine Rene Mertens, Vilvoorde, Belgium, assignor to Mallinckrodt Medical, Inc., St. Louis, Mo.**

**PCT No. PCT/US93/12272, § 371 Date Jun. 20, 1995, § 102(e) Date Jun. 20, 1995, PCT Pub. No. WO94/14477, PCT Pub. Date Jul. 7, 1994**
**PCT Filed Dec. 16, 1993, Ser. No. 491,841**
**Claims priority, application European Pat. Off., Dec. 21, 1992, 92204044**
**Int. Cl.[6] A61K** *51/04;* **C07H** *15/00;* **C07D** *311/04;* **C07C** *211/00*
**U.S. Cl. 424—1.73** **14 Claims**

1. A polyhydric phenol compound of the general formula




(I)

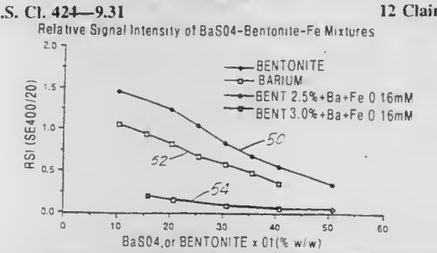
wherein
R is a hydrogen atom or a saccharide moiety;
A and B are hydrogen atoms or form together a C—C bond;
$R_1$ is a hydroxy group and $R_2$ is a hydrogen atom, or
$R_1$ is and $R_2$ form together an oxygen atom;
Z is a hydroxy group, an amino group, a carboxy group or a N-(carboxymethyl) carbamoyl group;
X* is a radioactive halogen isotope; and
m and n are 0 or 1, with the proviso, that m is 1 if n is 0, and that m is 0 if n is 1.

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### 5,741,477
### NEGATIVE CONTRAST AGENTS FOR MAGNETIC RESONANCE IMAGING COMPRISING BARIUM SULFATE AND A CLAY

**Michael A. Davis, Westwood, Mass., and Andrew A. Zwarun, Roslyn Heights, N.Y., assignors to E-Z-EM, Inc., Westbury, N.Y.**

**PCT No. PCT/US94/05604, § 371 Date Nov. 13, 1995, § 102(e) Date Nov. 13, 1995, PCT Pub. No. WO94/27499, PCT Pub. Date Dec. 8, 1994**
**Continuation-in-part of Ser. No. 65,192, May 20, 1993, Pat. No. 5,424,142. This PCT application May 19, 1994, Ser. No. 545,853**
**Int. Cl.[6] A61B** *5/055*
**U.S. Cl. 424—9.31** **12 Claims**




1. A negative contrast agent used in magnetic resonance imaging of the gastrointestinal tract comprising:
   a suspension having a substantial portion of a first constituent consisting of barium sulfate particles and a substantial portion of a second constituent comprising particles selected from at least one of the group of materials consisting of pharmaceutically acceptable clays, said second constituent constituting at least two percent by weight of said suspension, a substantial portion of said barium sulfate particles having a mean diameter sufficiently large to provide a relative signal intensity substantially less than 0.5 in at least one of the MRI pulse sequence modes.

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### 5,741,478
### PREPARATION OF HOLLOW MICROCAPSULES BY SPRAY-DRYING AN AQUEOUS SOLUTION OF A WALL-FORMING MATERIAL AND A WATER-MISCIBLE SOLVENT

**Nicholas Osborne, Colwick; Andrew Derek Sutton, Ruddington, and Richard Alan Johnson, West Bridgford, all of United Kingdom, assignors to Andaris Limited, Nottingham, United Kingdom**

**PCT No. PCT/GB95/02673, § 371 Date Jul. 19, 1996, § 102(e) Date Jul. 19, 1996, PCT Pub. No. WO96/15814, PCT Pub. Date May 30, 1996**
**PCT Filed Nov. 15, 1995, Ser. No. 676,344**
**Claims priority, application United Kingdom, Nov. 19, 1994, 9423419**
**Int. Cl.[6] A61K** *49/04;9/14;* **B01F** *3/00*
**U.S. Cl. 424—9.52** **14 Claims**

1. A process for forming microcapsules comprising (i) providing a solution of a material in an aqueous solvent and (ii) spraying said solution into a gas such that said aqueous solvent evaporates, thereby forming hollow microcapsules, characterised in that the aqueous solution contains a liquid of greater volatility than water, wherein said liquid of greater volatility than water is a solvent for said material and is miscible with water.

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### 5,741,479
### DESENSITIZING TEETH WITH DEGRADABLE PARTICLES

**Thomas Craig Masterman, and Jean L. Spencer, both of Boston, Mass., assignors to Gillette Canada Inc., Kirkland, Canada**

**Division of Ser. No. 336,486, Nov. 9, 1994. This application Jun. 6, 1995, Ser. No. 471,419**
**Int. Cl.[6] A61K** *7/16;9/14;* **A61C** *5/00;* **C09K** *3/12*
**U.S. Cl. 424—49** **9 Claims**

1. A method for desensitizing a hypersensitive tooth in a mouth of a patient, said hypersensitive tooth comprising exposed dentin tubules extending from a paupal surface to the peripheral surface located under the enamel and cementum of said tooth that is exposed in said mouth of said patient and whose exposure is responsible for hypersensitivity, said method comprising contacting said surface of said tooth and said exposed tubules with particles, comprising a degradable material, that are sufficiently small to block or clog said dentin tubules in an amount effective to thereby desensitize said tooth.

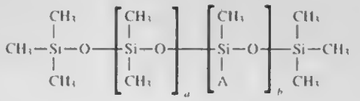
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### 5,741,480
### SELF-TANNING COSMETIC COMPOSITIONS

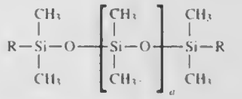
**Jean-Marc Ascione, Paris, France, assignor to Société L'Oréal S.A., Paris, France**

**Filed Apr. 8, 1996, Ser. No. 629,227**
**Claims priority, application France, Apr. 7, 1995, 95-04192**
**Int. Cl.[6] A61K** *7/42;7/00;31/695*
**U.S. Cl. 424—59** **24 Claims**

1. A topically applicable cosmetic composition adopted for the artificial tanning of the skin, comprising a cosmetically acceptable water-in-silicone emulsion which comprises:
   (i) an effective artificial tanning amount of dihydroxyacetone (DHA);
   (ii) at least one mono- or dihydric alcohol; and
   (iii) at least one silicone-containing emulsifying agent consisting of a polydimethylsiloxane of formula (I) or (II),



(I)



(II)

wherein in both formulae (I) and (II):
a is an integer≧1 and≦500;
b is an integer≧1 and≦100;
R is a radical: $—C_nH_{2n}—(—OC_2H_4)_x—(—OC_3H_6)_y—O—R'$,
wherein R' is H or a linear or branched $C_1$-$C_{12}$ alkyl radical, and:
x is an integer≧0 and≦50;
y is an integer≧0 and≦50;
x+y≧1 and
n is an integer≧2 and≦12.

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### 5,741,481
### COSMETICS CONTAINING CITRUS WATER DISTILLATE

**Henry M. Picken, Jr., 1500 Beaumont Dr., Kennesawa, Ga. 30144**

**Continuation of Ser. No. 282,513, Jul. 27, 1994, abandoned. This application Aug. 22, 1996, Ser. No. 702,769**
**Int. Cl.[6] A61K** *7/06*
**U.S. Cl. 424—74** **13 Claims**

1. A citrus scented cosmetic comprising
   5–90% by weight citrus water distillate as a component of the cosmetic, said distillate produced from the process of concentrating citrus juice.

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### 5,741,482
### AIR TREATMENT GEL COMPOSITIONS

**Jashawant J. Modi, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.**

**Filed Nov. 6, 1996, Ser. No. 743,687**
**Int. Cl.[6] A61L** *9/01*
**U.S. Cl. 424—76.3** **45 Claims**

1. An air treatment gel composition comprising in an aqueous medium, at least one volatile air treatment agent and a polymeric gelling agent consisting essentially of a) seaweed gum, b) guar or guar derivatives and c) additional non-sulfated water-soluble polymer selected from the group consisting of locust bean gum, hydroxyethyl cellulose (HEC), water-soluble ethylhydroxyethyl cellulose (EHEC), carboxymethyl cellulose (CMC), carboxymethylhydroxyethyl cellulose (CMHEC), hydroxypropylhydroxyethyl cellulose (HPHEC), methyl cellulose (MC), methylhydroxypropyl cellulose (MHPC), methylhydroxyethyl cellulose (MHEC), carboxymethylmethyl cellulose (CMMC), hydrophobically modified carboxymethyl cellulose (HMCMC), hydrophobically modified hydroxyethyl cellulose (HMHEC), hydrophobically modified hydroxypropyl cellulose (HMHPC), hydrophobically modified ethylhydroxyethyl cellulose (HMFEHEC), hydrophobically modified carboxymethylhydroxyethyl cellulose (HMCMHEC), hydrophobically modified hydroxypropylhydroxyethyl cellulose (HMHPHEC), hydrophobically modified methyl cellulose (HMMC), hydrophobically modified methylhydroxypropyl cellulose (HMMHPC), hydrophobically modified methylhydroxyethyl cellulose (HMMHEC), hydrophobically modified carboxymethylmethyl cellulose (HMCMMC), cationic hydroxyethyl cellulose (cationic HEC), cationic hydrophobically modified hydroxyethyl cellulose (cationic HMHEC), and mixtures thereof,
   wherein the bulk density of said composition is greater than about 0.9, the seaweed gum is from about 0.5% to about 25% of the total weight of the composition, the guar or guar derivatives is from about 0.1% to about 25% of the total weight of the composition, and the additional non-sulfated water-soluble polymer is from about 0.1% to about 20% of the total weight of the composition; and
   wherein the air freshener composition has freeze-thaw resistance greater than a composition that is the same except that it contains no guar or guar derivative.

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### 5,741,483
### INDUSTRIAL PRESERVATIVE ANTIFUNGAL COMPOSITION AND UNDERWATER ANTIFOULING COMPOSITION

**Shozo Okawa, Ibaraki, Japan, assignor to Rohm and Haas Company, Philadelphia, Pa.**

**Filed May 3, 1996, Ser. No. 642,064**
**Claims priority, application Japan, May 10, 1995, 7-111689**
**Int. Cl.[6] A01N** *43/80;43/30;* **A61K** *31/74*
**U.S. Cl. 424—78.09** **7 Claims**

1. Preservative composition comprising a synergistic mixture of antifungal industrial preservatives consisting essentially of:

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(A) one or more compounds selected from: 4,5-dichloro-2-n-octyl-4-isothiazolin-3-one, 2-n-octyl-4-isothiazolin-3-one, and salts thereof, and

(B) one or more compounds selected from: 5-[2-(2-butoxyethoxy) ethoxymethyl]-6-propyl- 1,3-benzodioxole and octachlorodipropyl ether, wherein the concentration of the mixture of antifungal industrial preservatives is at least 0.1 weight %, and the weight ratio of (A):(B) is from 1:0.1 to 1:5.

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**5,741,484**

**MACROPHAGE-DERIVED INFLAMMATORY MEDIATOR (MIP-1α AND MIP-1β)**

**Anthony Cerami, Shelter Island, N.Y.; Bruce Beutler, Dallas, Tex., and Stephen D. Wolpe, New York, N.Y., assignors to The Rockefeller University, New York, N.Y.**

**Division of Ser. No. 207,888, Mar. 7, 1994, Pat. No. 5,616,688, which is a continuation of Ser. No. 24,867, Mar. 1, 1993, abandoned, which is a continuation of Ser. No. 902,532, Jun. 22, 1992, abandoned, which is a continuation of Ser. No. 238,937, Sep. 2, 1988, abandoned, which is a continuation of Ser. No. 104,827, Oct. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 414,098, Sep. 7, 1982, Pat. No. 4,603,106, which is a continuation-in-part of Ser. No. 351,290, Feb. 22, 1982, abandoned, which is a continuation-in-part of Ser. No. 299,932, Sep. 8, 1981, abandoned. This application Jun. 7, 1995, Ser. No. 476,377**

**Int. Cl.[6] A61K** *38/19;45/05;* **C07K** *1/00*

**U.S. Cl. 424—85.1** **9 Claims**

1. A method of enhancing inflammatory response in a mammal suffering from an infectious or noninfectious disease, comprising administering to said mammal a therapeutically effective amount of an inflammatory cytokine, wherein said inflammatory cytokine is a protein that is capable of binding to heparin, inducing localized inflammation characterized by polymorphonuclear cell infiltration when administered subcutaneously and inducing in vitro polymorphonuclear cell chemokinesis, while lacking the ability to suppress the activity of the anabolic enzyme lipoprotein lipase, cause the cytotoxicity of cachetin/TNF-sensitive cells, stimulate the blastogenesis of endotoxin-resistant C3H/HeJ thymocytes, or induce the production of cachetin/TNF by primary thioglycollate-elicited mouse macrophage cells, which protein is anionic under physiological conditions and has an apparent molecular weight of approximately 8000 daltons as determined by SDS-PAGE.

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**5,741,485**

**METHOD FOR PREPARING ZINC INTERFERON ALPHA-2 CRYSTALS**

**Paul Reichert, Montville; Gerald S. Hammond, East Orange; Hung V. Le, Rockaway; Tattanahalli L. Nagabhushan, Parsippany, and Paul P. Trotta, Secaucus, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.**

**Continuation of Ser. No. 952,840, Dec. 1, 1992, Pat. No. 5,460,956, which is a continuation of Ser. No. 533,225, Jun. 4, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 469,332**

**Int. Cl.[6] A61K** *38/19;* **C07K** *14/52*

**U.S. Cl. 424—85.7** **2 Claims**

1. Crystalline zinc interferon alpha-2 which has a monoclinic morphology and diffracts x-rays to about 6 Angstroms upon x-ray diffraction analysis.

**5,741,486**

**SAFE VECTORS FOR GENE THERAPY**

**Vinay K. Pathak, and Wei-Shau Hu, both of Morgantown, W. Va., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.**

**Continuation of Ser. No. 248,132, May 24, 1994. This application Jun. 6, 1995, Ser. No. 466,516**

**Int. Cl.[6] A61K** *48/00*

**U.S. Cl. 424—93.21** **3 Claims**

1. In a method of gene therapy which comprises isolating target cells from a patient in need of said gene therapy, infecting said target cells with a virion produced by a helper cell transfected by a retroviral vector, and reintroducing said target cells into said patient, wherein the improvement is said retroviral vector comprises:

(i) cis-acting retroviral sequences required for reverse transcription and integration, and

(ii) direct repeats flanking a retroviral encapsidation sequence and at least one sequence which expresses a desired therapeutic product.

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**5,741,487**

**MUTANASE-CONTAINING ORAL COMPOSITIONS**

**Yoshio Asai; Motoyasu Ohdera; Hiromitsu Kigawa; Isao Shimotsuura; Yoshiko Yokobori; Masanori Hirano, and Koji Shibuya, all of Tokyo, Japan, assignors to Lion Corporation, Tokyo, Japan**

**Filed Feb. 26, 1997, Ser. No. 806,626**

**Claims priority, application Japan, May 16, 1996, 8-146613**

**Int. Cl.[6] A61K** *38/47*

**U.S. Cl. 424—94.61** **9 Claims**

1. An oral composition comprising mutanase having the following physicochemical properties (1) to (9):

(1) action: an ability to cleave α-1,3-glucosidic links of mutan,

(2) substrate specificity: an ability to effectively decompose mutan,

(3) optimum pH: pH 4 to 4.5 when reacting on a mutan substrate at 35° C. for 10 minutes,

(4) pH range for stability: pH 4 to 10 when kept at 25° C. for 24 hours,

(5) optimum temperature: 50° to 65° C. when reacted at pH 5 with mutan as a substrate,

(6) thermal stability: enzyme activity remains stable below 50° C. after incubation at pH 5 for 10 minutes,

(7) effect of metal ions: mercury and silver show inhibitory effect on a mutan substrate,

(8) effect of inhibitors: p-chloromercurybenzoic acid shows inhibitory effect on a mutan substrate, and

(9) molecular weight: about 140,000 to about 160,000 as determined by SDS-polyacrylamide gel electrophoresis.

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**5,741,488**

**TREATMENT OF RHEUMATOID ARTHRITIS WITH ANTI-CD4 ANTIBODIES IN CONJUNCTION WITH ANTI-TNF ANTIBODIES**

**Marc Feldman; Ravinder N. Maini, and Richard O. Williams, all of London, England, assignors to The Kennedy Institute for Rheumatology, London, England**

**PCT No. PCT/GB93/02070, § 371 Date May 3, 1995, § 102(e) Date May 3, 1995, PCT Pub. No. WO94/08619, PCT Pub. Date Apr. 28, 1994**

**PCT Filed Oct. 6, 1993, Ser. No. 403,785**

**Int. Cl.[6] A61K** *39/395*

**U.S. Cl. 424—154.1** **6 Claims**

1. A method of treating rheumatoid arthritis in a mammal comprising administering to said mammal a therapeutically effective amount of anti-CD4 antibody and anti-TNF antibody.



**5,741,489**

**PASSIVELY ADMINISTERED ANTIBODY THAT ENHANCES FEED CONVERSION EFFICIENCY**

**Julio Pimentel, Buford, Ga., assignor to Anitox Corporation, Buford, Ga.**

**Filed May 24, 1996, Ser. No. 653,604**

**Int. Cl.[6] A61K** *39/395*

**U.S. Cl. 424—157.1** **8 Claims**

1. A method for increasing feed conversion efficiency in swine comprising: feeding swine a diet containing an effective amount of an antibody which binds to urease wherein said diet is provided from starter period through market weight.

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**5,741,490**

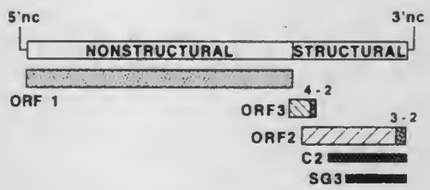
**HEPATITIS E VIRUS VACCINE AND METHOD**

**Gregory R. Reyes, Palo Alto, Calif.; Daniel W. Bradley, Lawrenceville, Ga.; Jr-Shin Twu, Daly City, Calif.; Michael A. Purdy, Atlanta, Ga.; Albert W. Tam, San Francisco, Calif.; Krzysztof Z. Krawczynski, Tucker, Ga., and Patrice D. Yarbough, San Antonio, Tex., assignors to Genelabs Technologies, Inc., Redwood City, Calif.**

**Continuation of Ser. No. 822,335, Jan. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 681,078, Apr. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 505,888, Apr. 5, 1990, abandoned, which is a continuation-in-part of Ser. No. 420,927, Oct. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 367,486, Jun. 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 336,672, Apr. 11, 1989, abandoned, which is a continuation-in-part of Ser. No. 208,997, Jun. 17, 1988, abandoned. This application Jun. 13, 1994, Ser. No. 259,148**

**Int. Cl.[6] A61K** *39/29*

**U.S. Cl. 424—189.1** **13 Claims**




1. An immunogenic composition comprising, in a pharmacologically acceptable carrier,

a peptide containing the C-terminal 48 amino acids of the capsid protein encoded by the second open reading frame of the HEV genome.

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**5,741,491**

**MEDICINAL COMPOSITION FOR DIABETES**

**Sherman Jones, Darewell, Canada, assignor to Isotechnika Incorporated, Edmonton, Canada**

**Filed Sep. 6, 1995, Ser. No. 524,432**

**Int. Cl.[6] A61K** *35/78*

**U.S. Cl. 424—195.1** **19 Claims**

1. A composition comprising plant material derived from *Heracleum lanatum* and plant material derived from a Populus species wherein ratio of *Heracleum lanatum* to Populus species is from about 3:1 to about 1:3.

**5,741,492**

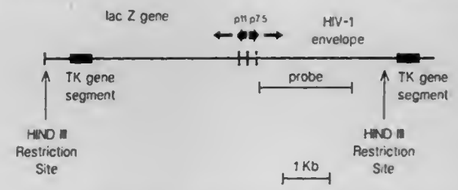
**PREPARATION AND USE OF VIRAL VECTORS FOR MIXED ENVELOPE PROTEIN VACCINES AGAINST HUMAN IMMUNODEFICIENCY VIRUSES**

**Julia L. Hurwitz, Germantown, and Randall J. Owens, Millington, both of Tenn., assignors to St. Jude Children's Research Hospital, Memphis, Tenn.**

**Filed Jan. 23, 1996, Ser. No. 590,288**

**Int. Cl.[6] A61K** *45/00;39/42;38/00;* **C12N** *15/00*

**U.S. Cl. 424—208.1** **18 Claims**




1. An immunogenic composition that can elicit an immune response to more than one but not necessarily all of the env variants contained in the composition, comprising at least 4 to about 10,000 recombinant vaccinia viruses, each comprising an env variant (EV) nucleotide encoding a different envelope protein variant of a human immunodeficiency virus (HIV), wherein

(i) said EV nucleotide encodes both variable and constant regions of said envelope protein variant; and

(ii) said immunogenic composition is capable of eliciting at least one of a cellular and a humoral immmune response in a mammal against an HIV strain.

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**5,741,493**

**VACCINE COMPOSITION AGAINST INFLUENZA, WITH SYNERGIC EFFECTS, CONTAINING INFLUENZA VIRUS CORE AS AN ADDITIVE**

**Catherine Moste-Deshairs, Ecully, and Bernard Meignier, Thurins, both of France, assignors to Pasteur Merieux Serums et Vaccins, Lyons, France**

**Continuation of Ser. No. 927,261, Nov. 22, 1992, abandoned. This application Jan. 19, 1995, Ser. No. 375,224**

**Claims priority, application France, Jan. 24, 1991, 91 00806**

**Int. Cl.[6] A61K** *39/00;39/145;38/00;* **C12N** *7/00*

**U.S. Cl. 424—209.1** **56 Claims**

1. In a vaccine composition which comprises an anti-influenza vaccine selected from the group consisting of a complete virion vaccine, a sub-unit vaccine, and a split vaccine, wherein the improvement comprises having an additive selected from the group consisting of: M protein from at least one influenza virus strain; an isolated influenza virus core particle including M protein from at least one influenza virus strain; and an isolated portion, including M protein, of an influenza virus core particle, from at least one influenza virus strain.

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**5,741,494**

**IMMUNOPOTENTIATIVE AND INFECTION-PROTECTIVE AGENT CONTAINING BACILLUS AND EGG WHITE**

**Seiichi Araki; Mamoru Suzuki, and Masatoshi Fujimoto, all of Ibaraki, Japan, assignors to Eisai Co., Ltd., Japan**

**PCT No. PCT/JP94/00521, § 371 Date Oct. 31, 1995, § 102(e) Date Oct. 31, 1995, PCT Pub. No. WO94/22459, PCT Pub. Date Oct. 13, 1994**

**PCT Filed Mar. 30, 1994, Ser. No. 530,385**

**Claims priority, application Japan, Apr. 7, 1993, 5-103701**

**Int. Cl.[6] A61K** *39/07;39/00;39/02;39/08*

**U.S. Cl. 424—246.1** **7 Claims**

1. A method of treating an *Escherichia coli* infection comprising orally administering to an animal a therapeutically effective

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amount of a synergistic combination of egg white, garlic and at least one microorganism selected from the group consisting of *Bacillus subtilis, Bacillus celleus, Lactobacillus lactis, Lactobacillus casei, Bifidobacterium bifidum* and Clostridium.

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**5,741,495**

**GLUCAN DRUG DELIVERY SYSTEM AND ADJUVANT**

**Spiros Jamas, Boston; Gary R. Ostroff, Worcester, and D. Davidson Easson, Jr., Shrewsbury, all of Mass., assignors to Alpha-Beta Technology, Inc., Worcester, Mass.**

**Continuation of Ser. No. 778,177, Dec. 13, 1991, Pat. No. 5,607,677, which is a continuation-in-part of Ser. No. 366,490, Jun. 15, 1989, Pat. No. 5,032,401. This application Feb. 27, 1997, Ser. No. 810,947**

**Int. Cl.[6] A61K** *47/36;31/75;* **C07H** *1/00*

**U.S. Cl. 424—278.1** **2 Claims**

1. A bioerodible composition for administration to a mammal comprising;

a) bioerodible whole β-glucan particles which are hollow spheres comprised of a semi-permeable glucan matrix; and

b) a drug which is capable of being incorporated within each of the whole β-glucan particles by natural diffusion;

said drug contained within or dispersed in the whole β-glucan particles, which composition, when placed in a physiological environment releases the drug over time into the physiological environment and wherein said whole β-glucan particles bioerode in the physiological environment.

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**5,741,496**

**PROCESS FOR THE TREATMENT OF SKINS HAVING DRY AREAS AND GREASY AREAS**

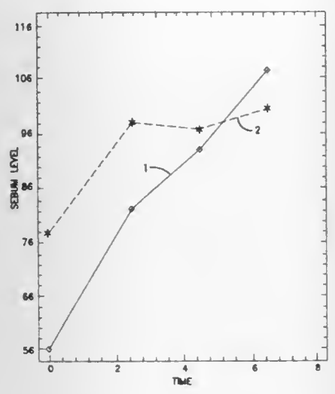
**Alain Khaiat, Paris, France, assignor to Laboratoires De Biologie Vegetale Yves Rocher, La Gacilly, France**

**Continuation of Ser. No. 305,929, Sep. 19, 1994, abandoned. This application Jan. 29, 1996, Ser. No. 593,480**

**Claims priority, application France, Sep. 21, 1993, 93 11240**

**Int. Cl.[6] A61K** *7/00;7/48*

**U.S. Cl. 424—401** **8 Claims**




1. Process for inhibiting the lipase activity on the skin in greasy areas while reestablishing the lipid coat of the dry areas of a person exhibiting a skin having both greasy and dry areas, comprising applying to a said skin an effective quantity of a substance selected from the group consisting of *Limnanthes alba* oil, and *Jessenia bataua* oil, said effective quantity being, by weight of the entire composition:

| | |
|---|---|
| *Limnanthes alba* oil | 0.5 to 15% |
| *Jessenia bataua* oil | 0.5 to 15%. |

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**5,741,497**

**SKIN TREATMENT WITH SALICYLIC ACID ESTERS**

**Angel Augusto Guerrero, Huntington; Peter Ladislaus Dorogi, Norwalk, and Thomas Charles Klepacky, Shelton, all of Conn., assignors to Elizabeth Arden Company, New York, N.Y.**

**Filed Jun. 25, 1996, Ser. No. 670,390**

**Int. Cl.[6] A61K** *7/48*

**U.S. Cl. 424—401** **1 Claim**

1. A method for treating wrinkling of skin comprising applying to the skin a safe and effective amount of tridecyl salicylate.

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**5,741,498**

**Patent Not Issued For This Number**

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**5,741,499**

**HOMOGENEOUS COMPOSITION COMPRISING FLUORINATED COMPOUNDS AND GLYCOLS, METHOD OF PREPARATION THEREOF AND USE IN COSMETICS**

**Pascal Arnauld, Creteil, and Myriam Mellul, L'Hay les Roses, both of France, assignors to L'Oreal, Paris, France**

**Continuation of Ser. No. 188,336, Jan. 25, 1994, abandoned. This application Oct. 21, 1996, Ser. No. 734,673**

**Claims priority, application France, Jan. 25, 1993, 93 00912**

**Int. Cl.[6] A61K** *7/00;7/021*

**U.S. Cl. 424—401** **11 Claims**

1. A homogeneous cosmetic composition consisting essentially of:

0.1 to 99% by weight with respect to the total composition weight of at least one organofluorinated hydrocarbon compound or a perfluorinated carbon compound having the following formula (I):

$$(R_F)_x—(A)_y—(R_H)_z \quad (I)$$

wherein:

x is 1, 2 or 3,

y is 0 or 1,

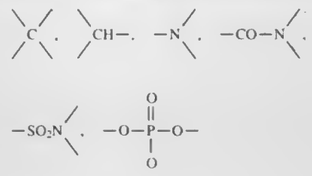
z is 0, 1, 2 or 3,

provided that y and z are not simultaneously 0 and that when z is 0, x is 2 or 3, the functional radicals OH, SH, $NH_2$ and NH may be on one or more of the radicals $R_F$, A and $R_H$ by insertion in the case of NH or terminal or pendent substitution in the case of OH, SH and/or $NH_2$; $R_F$ has at least two of said functional radicals when y and z are both 0, $R_F$ is an aliphatic or aromatic, saturated or unsaturated, fluorinated radical with a linear, branched or cyclic chain which may be functionalized and/or interrupted by oxygen or sulfur or nitrogen and/or substituted by hydrogen atoms or other halogen atoms provided that, for any two carbon atoms of the backbone, no more than one of these substituents other than fluorine is present,

$R_H$ is an aliphatic or aromatic, saturated or unsaturated, hydrocarbon radical with a linear, branched or cyclic chain which may be functionalized and/or interrupted by one or more oxygen or sulfur atoms or by one or more nitrogen atoms,



A is a di-, tri- or quadrivalent radical which is



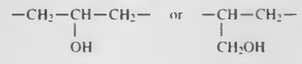
or unsaturated ethylene;

or A is

$$—(CH_2)_n—X—[C_3H_5(OH)]—(Y)'_{x'}—$$

wherein

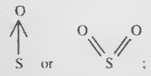
$C_3H_5(OH)$ is the structure:



(Ia) (Ib)

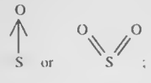
n is between 0 and 4;

X is O, S,



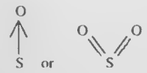
x is 0, or 1;

Y is O, S



provided that when X is

Y is not

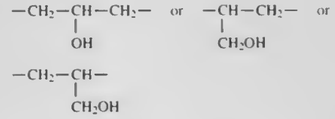


or A is

$$—(CH_2)_n—X—[C_3H_5(OH)]—Y—(CH_2)_m—$$

in which

$C_3H_5(OH)$ is the structure:

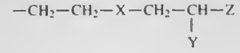


m and n, which are identical or different, are 0, 1, 2, 3 or 4;

X and Y are identical and are —O— or —S—;

or X is O and Y is S or X is S and Y is O,

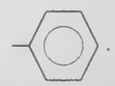
or A is



where

Y is OH, and

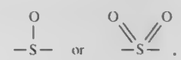
Z is



$—CH_3$, $—CH_2OH$, $—CH_2OCOCH_3$

or alternatively Y is $—CH_2OH$ and Z is $—O—COCH_3$

X is —O—, —S—,



or A is:

$$—CH=CH—CH_2—O—CH_2—[C_4H_4—OW]$$

where

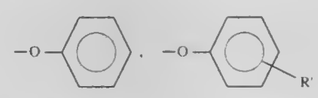
$C_2H_4OW$ is



(a) (b)

W is:

—OR, —SR, —COOR.



R is a linear or branched $C_1$–$C_{18}$ alkyl radical,

R' is $—CH_3$ or —OH, in the ortho or para position;

or A is a $C_nF_{2n+1}—C_2H_4OH$ compound

wherein

n is 6 or 8

or A is a R $CF_2—(OC_2F_4)_p—(OCF_2)_q—OCF_2R$ compound

wherein

p/q is from 0.5 to 1.5

and R is $CH_2OH$,

$CH_2(OCH_2CH_2)_tOH$ where t is 1 or 2, or

$CH_2OCH_2CHOHCH2OH$,

0.1 to 99% by weight with respect to the total composition weight of at least one hydrocarbon glycol having two hydroxyl radicals, wherein no surfactant is present in said composition.

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**5,741,500**

**GUM GROWTH PAD**

**Alayne Yates, 4176 Round Top Dr., Honolulu, Hi. 96822**

**Filed Jul. 15, 1996, Ser. No. 680,135**

**Int. Cl.[6] A61K** *9/70*

**U.S. Cl. 424—404** **18 Claims**

1. A gum growth pad comprising:

a) a nonporous first layer;

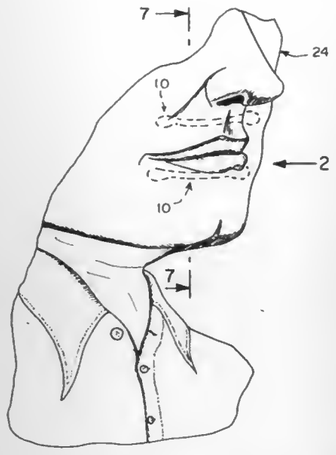
b) an absorbent second layer placed upon and in contact with said nonporous first layer;

c) a dried medication capable of being liquified by saliva impregnated within said absorbent second layer;

d) a semi-permeable third layer covering said absorbent second layer with said dried medication forming a pocket completely filled by said absorbent second layer; and

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e) means for sealing said nonporous first layer to said semi-permeable third layer about a periphery thereof.

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5,741,501

**PARA-HYDROXYPHENYLACETIC ACID FOR REDUCING THE REPELLENCY OF INSECTICIDES**

**Karl Justus, Köln; Jürgen Georg Lenz; Günther Nentwig, both of Leverkusen; Jürgen Scherkenbeck, Wermelskirchen; Martin Dambach, Burscheid, and Gernot Wendler, Erftstadt, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Jul. 26, 1996, Ser. No. 690,286**

**Claims priority, application Germany, Aug. 2, 1995, 195 28 306.6**

**Int. Cl.[6] A01N** *25/00;31/08*

**U.S. Cl. 424—405** **10 Claims**

1. A method of reducing the repellency of an insecticide applied to a surface which comprises applying to such surface a cockroach insecticide and a repellency-reducing effective amount of para-hydroxyphenylacetic acid or a salt thereof.

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5,741,502

**HOMOGENEOUS, ESSENTIALLY NONAQUEOUS ADJUVANT COMPOSITIONS WITH BUFFERING CAPABILITY**

**Johnnie R. Roberts, Memphis, Tenn., assignor to Helena Chemical Co.**

**Continuation-in-part of Ser. No. 394,839, Feb. 27, 1995, Pat. No. 5,580,567, and a continuation-in-part of Ser. No. 960,894, Oct. 14, 1992, Pat. No. 5,393,791, and a continuation-in-part of Ser. No. 554,359, Jul. 19, 1990, Pat. No. 5,178,795. This application Oct. 15, 1996, Ser. No. 731,415**

**Int. Cl.[6] A01N** *25/02;27/00;* **B01J** *13/00*

**U.S. Cl. 424—405** **22 Claims**

1. A homogeneous, essentially nonaqueous adjuvant composition comprising:

(1) at least one spray oil selected from the group consisting of:

(a) vegetable oils;

(b) esterified fatty acids or blends thereof;

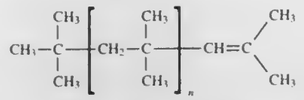
(c) saponified fatty acids or blends thereof;

(d) N,N-dimethylamide of the formula

$RCON(CH_3)_2$

wherein R is an alkyl chain derived from fatty acids having about 6 to about 18 carbon atoms;

(e) polybutenes of the following formula



where n is a number from about 1 to about 50;

(f) alpha or beta pinene,

(g) thymol and

(h) d-limonene,

(2) a surfactant in an effective amount to provide emulsification of said composition and

(3) a buffering agent wherein said buffering agent can also be the same ingredient as said oil or said surfactant and said buffering agent reduces the pH of said composition to about 7 or below.

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5,741,503

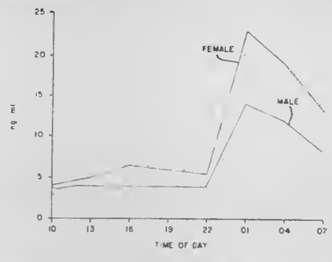
**METHOD FOR REGULATING METABOLISM WITH DOPAMINE BETA HYDROXYLASE INHIBITORS**

**Anthony H. Cincotta, Charlestown, Mass.; Albert H. Meier, Baton Rouge, La., and John M. Wilson, Charlestown, Mass., assignors to The Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La., and Ergo Research Corporation, Wakefield, R.I.**

**Division of Ser. No. 486,188, Jun. 7, 1995, Pat. No. 5,626,860. This application Nov. 8, 1996, Ser. No. 747,114**

**Int. Cl.[6] A61F** *2/02*

**U.S. Cl. 424—423** **16 Claims**




1. A method for modifying lipid metabolism in a vertebrate animal or human subject in need of such treatment which comprises administering to said animal or said human at a predetermined time an effective amount for inhibiting dopamine beta hydroxylase activity in said animal or human of a compound having the property of inhibiting dopamine beta hydroxylase.

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5,741,504

**Patent Not Issued For This Number**

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5,741,505

**EDIBLE PRODUCTS HAVING INORGANIC COATINGS**

**Daniel L. Beyer; Theodore E. Jach, both of Netcong, N.J.; Dennis L. Zak, Doylestown, Pa.; Ralph A. Jerome, Blairstown, N.J., and Frank P. DeBrincat, Tobyhanna, Pa., assignors to Mars, Incorporated, McLean, Va.**

**Filed Jan. 20, 1995, Ser. No. 376,029**

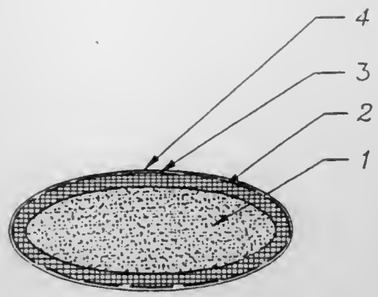
**Int. Cl.[6] A61K** *47/00*

**U.S. Cl. 424—439** **29 Claims**

1. A coated edible product comprising:

a. an edible material; and






b. a substantially continuous inorganic coating on a surface of the edible material, wherein said coating covers at least a portion of the edible material and said coating has a thickness ranging from 0.0001 to 0.5 microns.

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5,741,506

**USE OF ACTIVE INGREDIENTS PROTECTED AGAINST DEGRADATION IN THE RUMEN AS HEPATOPROTECTORS**

**Dominique Bauchart, Veyre-Monton; Yves Chilliard, Ceyrat; Denys Durand, Beaumont; Dominique Gruffat, Clermont-Ferrand; Alain Ollier, Saint Genes Champanelle; Jean-Claude Robert, Neris les Bains, and Peter Williams, Le Chesnay, all of France, assignors to Rhone-Poulenc Nutrition Animale, Antony, France**

**Filed May 8, 1995, Ser. No. 436,115**

**Claims priority, application France, May 6, 1994, 94 05617**

**Int. Cl.[6] A61K** *47/00;* **A23K** *1/18*

**U.S. Cl. 424—439** **12 Claims**

1. A method for the prevention or treatment of hepatic steatosis in ruminants, said method comprising administering to a ruminant in an amount effective to prevent or treat hepatic steatosis a composition containing at least one active ingredient, said at least one active ingredient being selected from amino acids, polyols, amino alcohols, and vitamins, and said at least one active ingredient being protected from degradation in the rumen by a composition comprising a pH-sensitive polymer and a fatty substance or a composition stable in the rumen and subject to enzymatic degradation in the abomasum or small intestine.

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5,741,507

**RANITIDINE TABLET HAVING A HYDROXYPROPYLMETHYLCELLULOSE CONTAINING COATING AND A METHOD FOR PRODUCING SAID COATING**

**Søren Bols Pedersen, Hvidovre; Knud Erik Gebhard-Hansen, Birkerød, and Helle Kann, Frederiksberg, all of Denmark, assignors to A/S GEA Farmaceutisk Fabrik, Frederiksberg, Denmark**

**PCT No. PCT/DK95/00163, § 371 Date Jan. 15, 1997, § 102(e) Date Jan. 15, 1997, PCT Pub. No. WO95/28918, PCT Pub. Date Nov. 2, 1995**

**PCT Filed Apr. 19, 1995, Ser. No. 732,383**

**Claims priority, application Denmark, Apr. 22, 1994, 0468/94**

**Int. Cl.[6] A61K** *47/00;9/68*

**U.S. Cl. 424—439** **6 Claims**

1. Ranitidine tablet having a contents of at least 30% ranitidine hydrochloride and having a coating containing hydroxypropylmethylcellulose, characterized in that the coating comprises hydroxyproplylmethylcellulose and ethylcellulose in a mutual ratio between 10:1 and 1:2.

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5,741,508

**FEED FOR LIVESTOCK AND POULTRY AND A METHOD FOR IMPROVING MEAT AND FAT OBTAINABLE FROM LIVESTOCK AND POULTRY USING THE SAME**

**Ikuo Katsumi, Kobe; Yoshihide Fuse, Himeji; Taizo Kawabe, Takasago; Naoko Yasuhara, Aioi, and Yoji Hisada, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 278,039, Jul. 20, 1994, abandoned. This application Dec. 6, 1995, Ser. No. 567,850**

**Claims priority, application Japan, Jul. 21, 1993, 5-179509; Jul. 21, 1993, 5-179510; Jul. 4, 1994, 6-152332**

**Int. Cl.[6] A23K** *1/16;1/18*

**U.S. Cl. 424—442** **6 Claims**

1. A method for improving freshness-keeping power of raw meat and fat from poultry consisting essentially of feeding poultry one or more spices from the families of plants selected from the group consisting of Myristicaceae, Cruciferae, Ruthaceae, Compositae, Pedaliaceae, Piperaceae, Leguminosae, Umbelliferae, Myrtaceae, Solanaceae, Labiatae, Lauraceae, Liliaceae and Zingiberaceae, and obtaining meat and fat from the poultry modified by said spices without transferring substantially smell and taste intrinsic to the spices to the raw meat and fat, wherein said meat and fat has a peroxide value (POV) of 50 or less, a thiobarbituric acid value (TBA) of 130 or less, and an acid value (AV) of 19 or less.

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5,741,509

**SILICONE WOUND DRESSING**

**Jack Kushner, Paso Robles, Calif., assignor to Alvin S. Berlat, Silverdale, Wash.**

**Filed Aug. 26, 1996, Ser. No. 703,324**

**Int. Cl.[6] A61F** *13/00*

**U.S. Cl. 424—443** **14 Claims**

1. A wound dressing comprising a mixture of:

a blend of silicone fluid and about 0.5% to about 12% fumed silica based on the weight of the silicone fluid, with the blend having a first consistency, with the first consistency being the consistency of a stiff cream, and

about 1% to about 99.9% of a volatile diluent based on the weight of the final mixture, with the mixture having a second consistency, and with the second consistency being the consistency of a spreadable cream,

so that the mixture can be easily applied to a wound, and a protective covering comprising the blend of silicone fluid and fumed silica having the first consistency, will remain on the wound upon evaporation of the volatile diluent.

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5,741,510

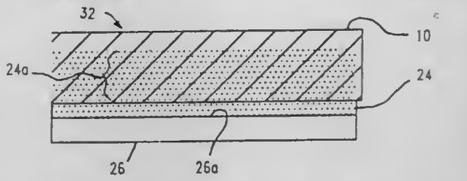
**ADHESIVE PATCH FOR APPLYING ANALGESIC MEDICATION TO THE SKIN**

**David Rolf, Minneapolis, Minn., and Elisabeth K. Sjoblom Urmann, Tomahawk, Wis., assignors to Lectec Corporation, Minnetonka, Minn.**

**Continuation of Ser. No. 219,982, Mar. 30, 1994, Pat. No. 5,536,263. This application Apr. 8, 1996, Ser. No. 629,191**

**Int. Cl.[6] A61F** *13/02*

**U.S. Cl. 424—448** **14 Claims**




1. A non-occlusive medication-containing analgesic adhesive patch for the transdermal delivery of medication into the body of a

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patient through the skin for the relief of pain including arthritis, backache, and muscular aches and strains comprising,

a flexible pressure-sensitive adhesive hydrocolloidal gel matrix as a layer including:

1) a natural or synthetic polymer,

2) a biomedically active pain relieving substance dispersed in the gel matrix layer for being absorbed through the skin into the body of the patient,

a flexible backing sheet for supporting the matrix, said backing sheet comprising a sheet of water insoluble material having an upper surface and a lower surface,

said patch including both the backing and the matrix layer is non-occlusive with a moisture vapor transmission rate that is greater than that of a person's skin,

said adhesive matrix layer is cured so as to solidify in contact with the backing,

said adhesive patch having the following portions proceeding from a lower surface of the adhesive patch to said upper surface of the backing:

a) a portion of said pressure-sensitive adhesive matrix layer located below the lower surface of the backing, said layer having an exposed pressure-sensitive adhesive surface for bonding the patch to the skin of the patient,

b) an upper portion of the matrix bonded to the backing,

c) the backing having a portion that is free of said matrix,

d) the backing has an upper surface that is spaced apart from the matrix and

said biomedically active substance is dispersed in the matrix such that the matrix releases the biomedically active substance into the body of the patient through said adhesive surface of the matrix that is bonded to the patient's skin.

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**5,741,511**

## TRANSDERMAL DRUG DELIVERY DEVICE FOR TREATING ERECTILE DYSFUNCTION

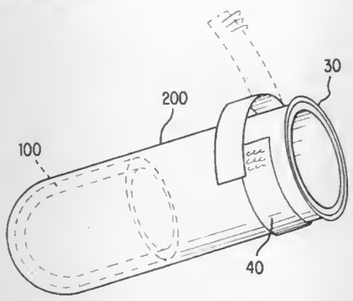
**Hun Han Lee; Joong Woong Cho; Choul Young Kim; Chaul Min Pai; Jin Deog Song; Chul Min Park; Hye Jeong Yoon; Yoon Yeo, all of Taejeon, and Jae Seung Paick, Seoul, all of Rep. of Korea, assignors to Sam Yang Co., Ltd., Seoul, Rep. of Korea**

**Filed Apr. 10, 1996, Ser. No. 627,805**

**Claims priority, application Rep. of Korea, Apr. 12, 1995, 95-8444; Nov. 24, 1995, 95-43422; Mar. 15, 1996, 96-6908**

**Int. Cl.[6] A61F** *13/00;6/02*

**U.S. Cl. 424—449** **9 Claims**




1. A transdermal drug delivery device for treating erectlie dysfunction which comprises:

a) a transdermal multi-reservoir patch containing a drug for treating erectlie dysfunction for application to the glans of a circumcised penis and two separated rings for placement at or near the base of the penis body, each of said rings having different constricting power; and

b) an adhesive band for attaching the patch to the glans of the circumcised penis;

wherein the separated rings constrict the base part of the penis body, thereby controlling venous outflow and drug loss.

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**5,741,512**

## PHARMACEUTICAL COMPOSITIONS COMPRISING CYCLOSPORINS

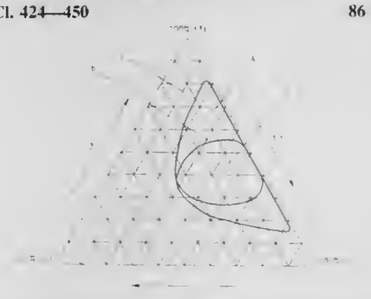
**Birgit Hauer, Lahr; Armin Meinzer, Freiburg/Munzingen; Ulrich Posanski, Freiburg, all of Germany, and Friedrich Richter, Schönbühl-Urtenen, Switzerland, assignors to Novartis Corporation, Summit, N.J.**

**Continuation of Ser. No. 259,951, Jun. 15, 1994, abandoned, which is a division of Ser. No. 990,734, Dec. 15, 1992, Pat. No. 5,342,625, which is a continuation of Ser. No. 680,211, Apr. 4, 1991, abandoned, which is a continuation of Ser. No. 406,656, Sep. 13, 1989, abandoned. This application Apr. 27, 1995, Ser. No. 430,770**

**Claims priority, application United Kingdom, Sep. 16, 1988, 8821754; Feb. 9, 1989, 8902900; Feb. 9, 1989, 8902903**

**Int. Cl.[6] A61K** *9/127;9/107;38/13*

**U.S. Cl. 424—450** **86 Claims**



1. An oral pharmaceutical composition comprising about 5 to about 25% by weight of cyclosporin A, about 0.5 to about 90% by weight of a hydrophilic component which is a lower alkanol having from one to five carbon atoms, about 0.5 to about 90% by weight of a lipophilic component and about 0.5 to about 90% by weight of a surfactant, all weights based on the total weight of the composition, the relative proportion of all cyclosporin A, hydrophilic components, lipophilic components and surfactants in said composition being such that upon dilution with water to a ratio of 1 part by weight of said composition to 5 parts by weight of water, an oil-in-water microemulsion having average particle size of less than about 1,500 Å is spontaneously formed.

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**5,741,513**

## ALCOHOLIC AQUEOUS GEL-LIKE PHOSPHOLIPID COMPOSITION, ITS USE AND TOPICAL PREPARATIONS CONTAINING IT

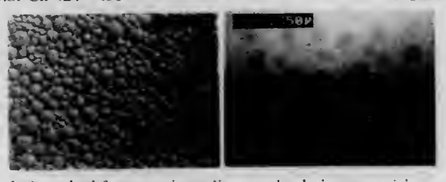
**Miklos Ghyczy, Köln; Joachim Roding, Wiesbaden; Hans Lautenschläger; Walter Hameister, both of Pulheim, and Jörg Hager, Köln, all of Germany, assignors to A. Natterman & Cie. GmbH, Köln, Germany**

**Division of Ser. No. 340,457, Nov. 14, 1994, abandoned, which is a continuation of Ser. No. 917,052, Aug. 7, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 478,884**

**Claims priority, application Germany, Feb. 8, 1990, 40 03 782.7; Feb. 8, 1990, 40 03 783.5**

**Int. Cl.[6] A61K** *9/127*

**U.S. Cl. 424—450** **8 Claims**



1. A method for preparing a liposomal solution comprising:

(a) dissolving in at least one alcohol a phospholipid concentrate comprising

(i) 70–80 parts by weight of phosphatidylcholine,



(ii) 15–5 parts by weight of at least one phospholipid selected from the group consisting of phosphatidylethanolamine, phosphatidic acid, N-acylphosphatidylethanolamine, and mixtures thereof,

(iii) 5–25 parts by weight of at least one other phospholipid selected from the group consisting of lysophosphatidylcholine, phosphatidylinositol and mixtures thereof, and

(iv) 1–15 parts by weight of at least one phosphorus-free lipid per 100 parts by weight of (i), (ii) and (iii);

(b) adding an aqueous solution to produce a liposomal gel comprising

(i) 15–30 parts by weight of said phospholipid concentrate,

(ii) 20–14 parts by weight of said one alcohol, and

(iii) 50–71 parts by weight of said aqueous solution, and

(c) adding a further amount of water to convert said liposomal gel to said liposomal solution.

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**5,741,514**

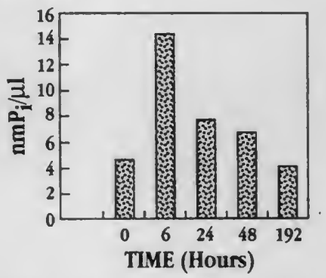
## METHOD FOR REDUCING SERUM LIPOPROTEIN(A) CONCENTRATION

**Yechezkel Barenholz, Jerusalem; Hilary Shmeeda, Givat Zev, and Tova Chajek, Jerusalem, all of Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel**

**Filed Aug. 31, 1995, Ser. No. 521,670**

**Int. Cl.[6] A61K** *9/127*

**U.S. Cl. 424—450** **14 Claims**




1. A method of inhibiting restenosis in a subject following percutaneous transluminal coronary angioplasty or surgical resection of vascular tissue, comprising

determining a pretreatment serum Lp(a) concentration of the subject,

intravenously administering to the subject a suspension of small unilammellar liposomes composed primarily of phosphatidylcholines having phase transition temperatures in the range between about −10° and 37° C., and

repeating said administering over a period of at least about two weeks, and in an amount effective to produce a reduction in serum Lp(a) concentration in the subject of at least 20% relative to the pretreatment serum Lp(a) concentration of the subject.

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**5,741,515**

## KETOPROFEN LIPOSOMES

**Silvana Ciceri, Como, Italy; Hans-Jürgen Hamann, Dormagen, Germany; Ingrid Hürner, Düsseldorf, Germany; Peter Kurka, Hilden, Germany, and Joachim Maasz, Granger, Ind., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Oct. 13, 1995, Ser. No. 542,752**

**Claims priority, application Italy, Oct. 20, 1994, MI94A2142**

**Int. Cl.[6] A61K** *9/127*

**U.S. Cl. 424—450** **7 Claims**

1. A process for the preparation of ketoprofen liposomes comprising adding a mixture of ketoprofen and phospholipids or non-ionic amphiphiles to a solution having a pH in the range of 6 to 8, decreasing the pH of the solution to a pH below 6 sufficient to effect spontaneous formation of liposomes, wherein the non-ionic amphiphiles are compounds of formulae (II) and (III)

$$R_4—O—(CH_2—CH_2—O)_nH \quad (II)$$

and

$$R_4—O—CH_2—\underset{\displaystyle R_5}{\underset{|}{CH}}—O—(CH_2—CH_2—O)_nH \quad (III)$$

where $R_4$ and $R_5$ are identical or different and in each case represent alkyl or alkenyl having 12 to 16 carbon atoms and n represents a number from 3 to 25.

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**5,741,516**

## SPHINGOSOMES FOR ENHANCED DRUG DELIVERY

**Murray S. Webb, Vancouver; Marcel B. Bally, Bowen Island; Lawrence D. Mayer, N. Vancouver; James J. Miller, Vancouver, and Paul G. Tardi, Richmond, all of Canada, assignors to Inex Pharmaceuticals Corporation, Vancouver, Canada**

**Continuation-in-part of Ser. No. 481,120, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 263,603, Jun. 20, 1994, Pat. No. 5,543,152. This application Dec. 14, 1995, Ser. No. 572,555**

**Int. Cl.[6] A61K** *9/127;* **A01N** *43/04*

**U.S. Cl. 424—450** **35 Claims**

1. A liposomal composition for delivery of a therapeutic compound to a mammalian host which comprises a liposome having one or more membranes which comprise sphingomyelin and cholesterol, a liposomal interior having a pH less than that of the liposomal exterior, and a therapeutic compound contained in said liposome for delivery to the host.

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**5,741,517**

## WATER-CONTAINING LIPOSOME SYSTEM

**Jörg Hager, Köln; Manfred Dürr, Pulheim-Dansweiler, and Ernst Lünebach, Erftstadt-Lechenich, all of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Germany**

**Continuation of Ser. No. 371,380, Jan. 11, 1995, Pat. No. 5,556,637, which is a continuation of Ser. No. 29,977, Mar. 12, 1993, abandoned, which is a continuation of Ser. No. 738,837, Aug. 1, 1991, abandoned. This application May 20, 1996, Ser. No. 650,736**

**Claims priority, application Germany, Aug. 6, 1990, 40 24 886.0; Mar. 19, 1991, 41 08 902.2; Jul. 10, 1991, 41 22 744.1**

**Int. Cl.[6] A61K** *9/127*

**U.S. Cl. 424—450** **26 Claims**

1. A liposome composition comprising at least one uncharged phospholipid, said uncharged phospholipid comprising at least 90% by weight of phosphatidylcholine, at least one negatively charged phospholipid, and water forming an aqueous phase for said liposome composition, wherein said negatively charged phospholipid is a salt of phosphatidylglycerol, wherein the mass ratio of the uncharged phospholipid to the charged phospholipid is in the range of about 50:1 to about 400:1, and the total phospholipid content of the liposome composition is between 0.50 and 20% by weight.

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5,741,518

## COMPOSITION COMPOSED OF AN AQUEOUS DISPERSION OF STABILIZED VESICLES OF NONIONIC AMPHIPHILIC LIPIDS

**Alain Ribier; Jean-Thierry Simonnet; Rose-Marie Handjani, all of Paris, and Nadia Terren, Chevilly-Larue, all of France, assignors to L'Oreal, Paris, France**

**Continuation of Ser. No. 473,360, Jun. 7, 1995, abandoned. This application Aug. 16, 1996, Ser. No. 698,658**

**Claims priority, application France, Aug. 3, 1992, 92 09603; Oct. 15, 1992, 92 12343**

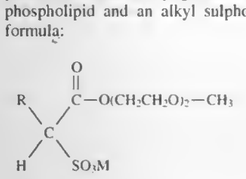
**Int. Cl.[6] A61K** *9/127*

**U.S. Cl. 424—450** **13 Claims**

1. A process for imparting hydrolysis stability to vesicles dispersed in an aqueous phase, said vesicles comprising a membrane of a lipid phase encapsulating an aqueous phase, said vesicles being prepared from a lipid phase, said process comprising combining a nonionic amphiphilic lipid mixture with at least one ionic amphiphilic lipid in an amount sufficient to impart to said aqueous phase a pH ranging from 5.5 to 7.5

said nonionic amphiphilic lipid mixture being a mixture of esters of at least one polyol and a fatty acid, said at least one polyol being selected from the group consisting of polyethylene glycol containing 1 to 60 ethylene oxide units, sorbitan, sorbitan containing 2 to 60 ethylene oxide units, glycerol containing 2 to 30 ethylene oxide units, a polyglycerol containing 2 to 15 glycerol units, sucrose, and glucose containing 2 to 30 ethylene oxide units, and said fatty acid being a fatty acid containing a saturated or unsaturated, linear or branched $C_5$–$C_{17}$ alkyl chain, the number of alkyl chains per polyol group ranging from 1 to 10; and

said ionic amphiphilic lipid being selected from the group consisting of an alkali metal salt of dicetyl phosphate, an alkali metal salt of dimyristyl phosphate, and alkali metal salt of cholesterol sulphate, an alkali metal salt of cholesterol phosphate, monosodium acyl glutamate, disodium acyglutamate, a phospholipid and an alkyl sulphonic compound having the formula:



wherein R represents $C_{16}H_{33}$ or $C_{18}H_{37}$ and M represents an alkali metal, or a mixture thereof;

the weight ratio of said nonionic amphiphilic lipid to said ionic amphiphilic lipid in said lipid phase being between 50:1 and 50:25.

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5,741,519

## THE PRODUCTION OF ACTIVE SUBSTANCE COMPOSITIONS IN THE FORM OF A SOLID SOLUTION OF THE ACTIVE SUBSTANCE IN A POLYMER MATRIX, AND ACTIVE SUBSTANCE COMPOSITIONS PRODUCED BY THIS PROCESS

**Joerg Rosenberg, Ellerstadt, and Jörg Breitenbach, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**PCT No. PCT/EP96/01047, § 371 Date Nov. 21, 1996, § 102(e) Date Nov. 21, 1996, PCT Pub. No. WO96/29061, PCT Pub. Date Sep. 26, 1996**

**PCT Filed Mar. 12, 1996, Ser. No. 737,745**

**Claims priority, application Germany, Mar. 21, 1995, 195 09 807.2**

**Int. Cl.[6] A61K** *9/20;9/14*

**U.S. Cl. 424—464** **6 Claims**

1. A process for producing biologically active substance compositions in the form of a solid solution of the active substance in a polymer matrix, where the biologically active substance is in salt form, which comprises melt extrusion of the biologically active substance, which is capable of forming a salt, in nonionic form together with a polymer and an effective amount of a salt which provides the counterion forming the salt of the biologically active substance.

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5,741,520

## DISINFECTANT EFFERVESCENT TABLET FORMULATION

**Richard DeSenna, Marietta, Ga., assignor to Southland, Ltd., Kennesaw, Ga.**

**Filed Oct. 6, 1995, Ser. No. 539,873**

**Int. Cl.[6] A61K** *9/46;9/16*

**U.S. Cl. 424—466** **3 Claims**

1. A disinfectant effervescent tablet formulation, comprising:

a first tablet comprising about 66% effervescing agent, about 10% sodium bromide, about 1% sodium lauryl sulfate, about 20% sodium carbonate, and about 3% PEG 8000; and

a second tablet comprising about 47% effervescing agent, about 24% sodium dichloroisocyanurate, about 25% sodium carbonate, about 1% sodium lauryl sulfate, and about 3% PEG 8000.

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5,741,521

## BIODEGRADABLE CONTROLLED RELEASE AMYLACEOUS MATERIAL MATRIX

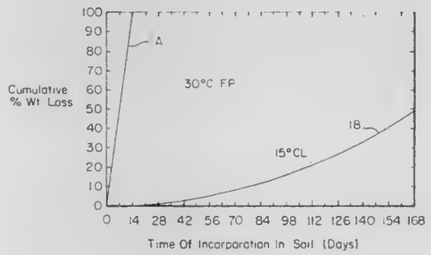
**Adrian Timothy Knight, Lane Cove; Thomas Peter Anderson, Manly West, and Mirsad Ahmet Ahmetagic, Albany Creek, all of Australia, assignors to Goodman Fielder Limited, and Incitec Limited, both of Australia**

**Continuation-in-part of Ser. No. 838,802, May 11, 1992, abandoned. This application May 30, 1995, Ser. No. 454,093**

**Claims priority, application Australia, Sep. 15, 1989, PJ 6411**

**Int. Cl.[6] A01N** *25/10;25/14;25/34;* **B29C** *47/00*

**U.S. Cl. 424—488** **49 Claims**




33. A controlled release biodegradable composition comprising a matrix of an amylaceous material in combination with an agriculturally active agent, said matrix formed by

(a) providing a composition comprising an amylaceous material having an amylose content of at least 50% w/w and water, said water being present in an amount of from about 2 to about 30% w/w, said amylaceous material selected from the group consisting of amylose, waxy maize starch, wheat starch, tapioca starch, pea starch and combinations thereof,

(b) heating said composition to a temperature of no more than about 150° C. at a pressure of no more than about 4000 psi to form a uniform hot melt from said composition without destructurising said amylaceous material, and

(c) forming said hot melt into said matrix,

and said agriculturally active agent subject to controlled release and selected from the group consisting of acaricides, insecticides, nematicides, herbicides, fungicides, plant growth regulants, fertilizers, trace nutrients, biological control agents and combinations thereof, said matrix optionally comprising up to about 90% by weight of a synthetic polymer, up to about 20% by weight of a plasticizer and up to about 95% by weight of a filler.



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5,741,522

## ULTRASMALL, NON-AGGREGATED POROUS PARTICLES OF UNIFORM SIZE FOR ENTRAPPING GAS BUBBLES WITHIN AND METHODS

**Michael R. Vinlante, Pittsford, and Kevin J. Parker, Rochester, both of N.Y., assignors to University of Rochester, Rochester, N.Y.**

**Division of Ser. No. 384,193, Feb. 6, 1995, which is a continuation of Ser. No. 106,966, Aug. 16, 1993, abandoned, which is a continuation of Ser. No. 725,983, Jul. 5, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 460,963**

**Int. Cl.[6] A61K** *9/14*

**U.S. Cl. 424—489** **33 Claims**

1. A porous particle preparation produced by the process comprising:

(a) preparing a solution which includes first and second solid compounds in a suitable solvent;

(b) infusing a precipitating liquid into the solution, the two solid compounds having low solubility in the precipitating liquid, so as to produce a suspension of co-precipitated substantially non-aggregated particles of a uniform size; and

(c) washing the particles in a suitable washing liquid, the first and second compounds having differential solubility in the washing liquid such that the first compound has a lower solubility than the second compound in said washing liquid, so that at least some of the second compound is selectively extracted from the first compound to produce porous particles having a porous matrix.

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5,741,523

## STABILIZED PROSTAGLANDIN E1

**Dirk L. Teagarden; William J. Petre, both of Kalamazoo, and Paul M. Gold, Vicksburg, all of Mich., assignors to Pharmacia & Upjohn Company, Kalamazoo, Mich.**

**PCT No. PCT/US94/09648, § 371 Date Mar. 28, 1996, § 102(e) Date Mar. 28, 1996, PCT Pub. No. WO95/11683, PCT Pub. Date May 4, 1995**

**Continuation-in-part of Ser. No. 143,695, Oct. 27, 1993, abandoned. This PCT application Sep. 6, 1994, Ser. No. 619,690**

**Int. Cl.[6] A61K** *31/557;9/14*

**U.S. Cl. 424—489** **3 Claims**

1. A lyophilized formulation of PGE-1 made by the process consisting of:

a) adding PGE-1 to lactose and tertiary butyl alcohol wherein said tertiary butyl alcohol is present in an amount of from about 15% to about 33% volume/volume and the ratio of said lactose to PGE-1 is from about 40,000 to 1 to about 10,000 to 1 weight/weight whereby a formulation of PGE-1 dispersed in lactose is formed;

b) adjusting the pH of said formulation from about 4 to about 5 with a citrate or acetate buffer;

c) freezing said formulation to about −50° C., warming to about −25° C. for about 2 hours then refreezing to about −50° C.; and

d) drying said formulation to obtain a moisture content of less than 1% by dry weight and a tertiary butyl alcohol content of less than 3% by dry weight.

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5,741,524

## SUSTAINED-RELEASE FORMULATIONS UTILIZING PHARMACEUTICAL EXCIPIENT HAVING IMPROVED COMPRESSIBILITY

**John N. Staniforth, Bath, England; Bob E. Sherwood, Amenia, and Edward A. Hunter, Glenham, both of N.Y., assignors to Edward Mendell Co., Inc., Patterson, N.Y.**

**Continuation-in-part of Ser. No. 486,183, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 370,576, Jan. 9, 1995, Pat. No. 5,585,115. This application Jul. 8, 1996, Ser. No. 676,654**

**Int. Cl.[6] A61K** *9/14*

**U.S. Cl. 424—489** **30 Claims**

1. A sustained-release formulation comprising:

an active agent;

an augmented microcrystalline cellulose comprising agglomerated particles of microcrystalline cellulose and a compressibility augmenting agent which

(i) physically restricts the proximity of the interface between adjacent cellulose surfaces, (ii) inhibits interactions between adjacent cellulose surfaces; or (iii) accomplishes both (i) and (ii) above; and a matrix comprising a sustained-release carrier to promote sustained-release of said active agent.

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5,741,525

## VAGINAL PHARMACEUTICAL HYDROGEN PEROXIDE COMPOSITION

**Bryan Larsen, Huntington, W. Va., assignor to Marshall University Research Corporation, Huntington, W. Va.**

**Filed Oct. 24, 1995, Ser. No. 547,518**

**Int. Cl.[6] A61K** *33/40*

**U.S. Cl. 424—616** **4 Claims**

1. A method for maintaining or enhancing the normal protective function of vaginal flora, which comprises:

administering a therapeutically effective amount of a gelled vaginal pharmaceutical composition consisting essentially of a pharmaceutically acceptable excipient for use in the vaginal cavity area, a water-soluble bioadhesive acrylic acid polymer which repels microorganisms that adhere to vaginal epithelial cells, an active therapeutic agent, hydrogen peroxide in an amount of about 0.1% to about 3.0% and a pH buffer, wherein the pH of the composition is between about 3.0 and about 6.0 to the vaginal cavity.

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5,741,526

## ANTIMICROBIAL AGENT

**Shigeo Miyata, Kitakyushu, Japan, assignor to Kabushiki Kaisha Kaisui Kagaku Kenkyujo, Kitakyushu, Japan**

**Continuation of Ser. No. 410,300, Mar. 24, 1995, abandoned. This application Oct. 2, 1996, Ser. No. 724,396**

**Claims priority, application Japan, Mar. 25, 1994, 6-079714**

**Int. Cl.[6] A61K** *33/34;* **C08K** *3/22*

**U.S. Cl. 424—635** **5 Claims**

1. An antimicrobial agent containing, as an active ingredient, at least one of an oxide solid solution of the formula (1),

$$[(M_1^{2+})_x(M_2^{2+})_{1-x}]_{1-y}M_y^{3+}{}_{1-a}O \quad (1)$$

wherein $M_1^{2+}$ is $Zn^{2+}$ and/or $Cu^{2+}$, $M_2^{2+}$ is $Mg^{2+}$ and/or $Ca^{2+}$, $M^{3+}$ is at least one trivalent metal selected from $Al^{3+}$, $Fe^{3+}$, $Co^{3+}$, $Cr^{3+}$, $In^{3+}$ and $Bi^{3+}$, x is a number in the range of $0.01 \leqq x < 0.5$, y is a number in the range of $0 < y \leqq 1$, and x−a shows that the number of $M^{3+}$ is decreased by a due to a lattice defect.

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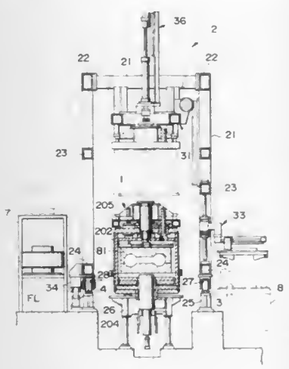


5,741,527
**VETERINARY TOPICAL COMPOSITIONS AND METHODS OF USE**
**Paul K. Brown, 1101 River Bend Rd., Haughton, La. 71037**
**Filed Feb. 18, 1997, Ser. No. 800,563**
**Int. Cl.[6] A61K** *33/28;35/78*
**U.S. Cl. 424—645** **3 Claims**

1. A topical composition for treatment of injuries in animals comprising isopropyl alcohol, mercuric chloride and DMSO, wherein said isopropyl alcohol comprises from about 65–95 wt. % of said composition, said mercuric chloride comprises from about 5–30 wt. % of said composition, and said DMSO comprises from about 0.1–5.0% wt. % of said composition.

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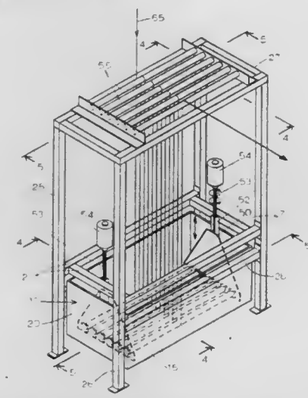
5,741,528
**TIRE VULCANIZING SYSTEM**
**Itaru Amano; Kashiro Ureshino; Katsumi Ichikawa, all of Takasago; Takumi Mizokawa, Toyohashi; Ko Takakura, Takasago; Masaki Naoi, Takasago, and Yasuo Morita, Takasago, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan**
**Filed Aug. 14, 1995, Ser. No. 515,060**
**Claims priority, application Japan, Aug. 25, 1994, 6-225582**
**Int. Cl.[6] B29C** *35/02*
**U.S. Cl. 425—29** **3 Claims**



SIDE ELEVATIONAL VIEW

1. A tire vulcanizing system comprising:
a group of tire vulcanizing presses comprising at least one row of said presses, each of said presses comprising an upper press member, a lower press member, and upper and lower molds which can be fastened to one another;
a plurality of green tire mounting tables;
a plurality of post-cure inflators; and
a plurality of manipulators movable in proximity to said presses for transferring green tires from said green tire mounting tables to said presses and for transferring vulcanized tires to said post-cure inflators, wherein each of said manipulators comprises:
a) a slide connectable to said upper press members,
b) a loader for transferring green tires from said green tire mounting tables to said presses,
c) an unloader for transferring vulcanized tires to said post-cure inflators,
d) means for setting a position of said manipulator with sufficient accuracy to permit said slide to connect to one of said upper press members, and
e) centering correction means on at least one of said loader and said unloader for correctly centering said green tire in the mold of the press having said one of said upper press members.

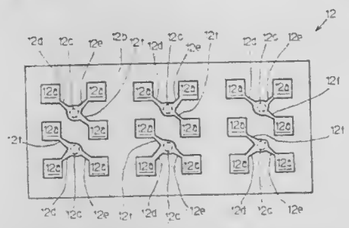
5,741,529
**ADJUSTABLE REACTION TUBS FOR CELLULOSE**
**Alan D. Stall, Naperville, Ill., assignor to Alfacel s.a., Madrid, Spain**
**Filed Jul. 31, 1996, Ser. No. 687,780**
**Int. Cl.[6] A22L** *13/00*
**U.S. Cl. 425—71** **5 Claims**



1. An adjustable reaction tub for use in making regenerated cellulosic casings, the tub comprising:
tub walls with a liquid level;
a frame extending outside the tub walls;
a set of upper rollers attached to the frame above the liquid level;
a roll support comprising lower rollers, and mounted to the frame for adjustable positioning of all the lower rollers with respect to the upper rollers at any of a range of depths from an upper position above the liquid level to a lower position within the tub walls below the liquid level; and
a casing path winding directly between the upper rollers and the lower rollers.

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5,741,530
**MOLDING DIE USED FOR SEALING SEMICONDUCTOR CHIPS WITH GOOD PRODUCTIVITY AND LEAD-FRAME USED FOR MOUNTING SEMICONDUCTOR CHIPS**
**Youichi Tsunoda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**
**Filed Jan. 25, 1996, Ser. No. 591,361**
**Claims priority, application Japan, Jan. 27, 1995, 7-31405**
**Int. Cl.[6] B29C** *45/02;45/14;45/26*
**U.S. Cl. 425—116** **1 Claim**

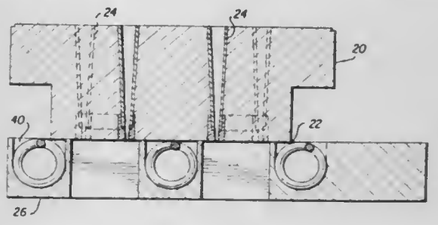



1. A molding die having a major surface, comprising:
a plurality of cavities open to said major surface for accommodating semiconductor chips mounted on a lead frame, respectively, and arranged in rows and columns, said plurality of cavities being divided into a plurality of cavity groups each having cavities in two of said rows, said rows of cavities being an odd number, and each of said cavity groups including two cavities selected from one of said two rows and one cavity selected from the next row;
a plurality of pots open to said major surface, and respectively associated with said plurality of cavity groups, each of said plurality of pots being equally spaced from said cavities of an associated one of said plurality of cavity groups; and
a plurality of runner groups open to said major surface, and respectively associated with said plurality of cavity groups and said plurality of pots, each of said plurality of runner groups having a plurality of straight runners connecting said cavities of an associated one of said plurality of cavity groups and an associated one of said plurality of pots so as to guide molten resin from said associated one of said plurality of pots to said cavities of said associated one of said plurality of cavity groups.



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5,741,531
**HEATING ELEMENT FOR A PASTA DIE AND A METHOD FOR EXTRUDING PASTA**
**Raymond Gregory Kowalski, Weedsport; Carl Michael Norman, Syracuse, and David Brian Bertollini, North Bay, all of N.Y., assignors to Borden, Inc., N.J.**
**Continuation of Ser. No. 380,996, Jan. 31, 1995, abandoned.**
**This application Oct. 18, 1996, Ser. No. 733,539**
**Int. Cl.[6] B29C** *47/86*
**U.S. Cl. 425—144** **7 Claims**

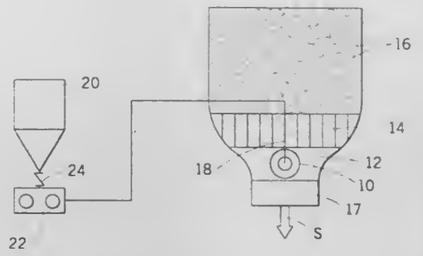



1. An apparatus for extruding uniform alimentary pasta lengths comprising a die having a front die face, said die having a plurality of lands formed therethrough and terminating in a plurality of orifices at said front die face, means for extruding alimentary paste through said lands and out of said orifices for producing shaped lengths of alimentary pasta, a heated plate having a front face and an opposite rear face, said heated plate being mounted on said die with its rear face disposed in abutting facing relationship to said front die face, said heated plate having a plurality of openings formed therethrough superposed over said orifices and being similar in number and shape to said orifices but larger in dimension, and heating means disposed adjacent the rear face of said heated plate and occupying significant area of the rear face of said heated plate to uniformly heat the entire front face of said die to ensure uniform flow of alimentary paste through said orifices.

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5,741,532
**APPARATUS FOR INTRODUCING ADDITIVES INTO A GRID SPINNING SYSTEM**
**Robert L. Lilly, Asheville; Charles H. Rogers, Candler; Zachary G. Shoaf, Canton, all of N.C.; Wayne L. Conard, Talbott, and Steve C. Parks, Newport, both of Tenn., assignors to BASF Corporation, Mt. Olive, N.J.**
**Filed Nov. 20, 1995, Ser. No. 557,802**
**Int. Cl.[6] B29C** *47/78*
**U.S. Cl. 425—197** **5 Claims**

1. In an apparatus for melting particulate polymeric material including a melting grid, a molten polymer reservoir beneath said grid and having a lateral cross-sectional contour defined by walls defining said reservoir, the improvement comprising:




a distribution device having substantially flat parallel upper and lower surfaces and adapted to the contour of said molten polymer reservoir and disposed in said molten polymer reservoir in proximity to said grid, said device comprising:
an internal reservoir formed between said upper and lower surfaces;
a perimetrical surface joining said upper and lower surfaces and providing said device with height;
at least two fluid distribution pores, each having one end in communication with said internal reservoir and another end disposed in said perimetrical surface; and
an injection tube providing fluid flow communication between said internal reservoir and an external supply of fluid.

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5,741,533
**METHOD OF COOKING A FOOD PRODUCT AND PRODUCT THEREOF**
**Tina V. Lorenzo Moore, and Donald Keith Moore, Jr., both of Spartanburg, S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.**
**Filed Dec. 22, 1995, Ser. No. 575,807**
**Int. Cl.[6] B65B** *29/08*
**U.S. Cl. 426—112** **23 Claims**

1. A method of cooking a food product, comprising the steps of:
a) enclosing said food product in a peelable laminate to provide a packaged food product, said peelable laminate comprising
(1) an edible film in contact with said food product, and
(2) a protective film providing protection to said edible film and food product against contamination and abuse, said protective film being peelably adhered to said edible film; and
b) heating said packaged food product so as to at least partially cook said food product,
said edible film adhering to the at least partially cooked food product with an adhesive strength greater than that required to peel said protective film from said edible film.

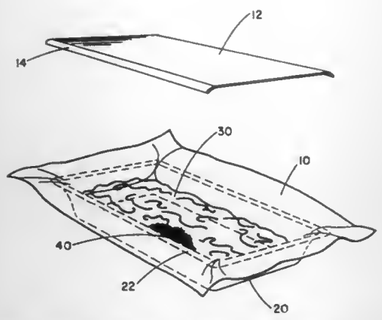
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5,741,534
**PACKAGED FOOD PRODUCT USING PARTITIONED RECEPTACLES WITH REMOVABLE THIN PARTITION WALLS AND METHOD OF MAKING IT**
**Jing-Yau Chung, Houston, Tex., assignor to Alice H. Chung, Houston, Tex., Trustee**
**Filed Aug. 26, 1994, Ser. No. 296,715**
**Int. Cl.[6] B65D** *85/00*
**U.S. Cl. 426—120** **9 Claims**

1. A food package separating a food component A and a food component B of an entree during manufacturing and during heating, comprising:
a food receptacle having an edge which defines an opening to said food receptacle;
said food component A comprising a solid placed on a bottom of said food receptacle;
a removable thin partition layer with an outer edge, said thin partition layer placed on said food component A with the

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outer edge of said thin partition layer extended over the opening and over said edge of said food receptacle;

said food component B comprising a gravy placed on said thin partition layer within said food receptacle;

said partition layer includes a means to facilitate cutting of said layer to allow the food component B to mix with the food component A when the food components are ready to be mixed; and

a cover placed over the opening, over said thin partition layer and over said edge of said food receptacle wherein said thin partition layer is firmly secured between said edge of said food receptacle and said cover such that said food component A and said food component B are completely separated by said thin partition layer.

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**5,741,535**

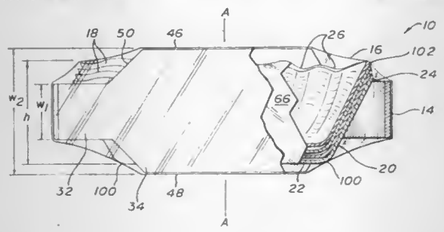
**FRAGILE FOOD PRODUCT PACKAGE**

**Jonathan C. Cope, and Donald G. Warnock, both of Madera, Calif., assignors to Warnock Food Products, Inc., Madera, Calif.**

**Filed Nov. 22, 1995, Ser. No. 561,843**

**Int. Cl.[6] B65D** *81/02;85/30*

**U.S. Cl. 426—124** **20 Claims**




1. A package containing a fragile food product, comprising:

a fragile food product unit, wherein the unit has a height measured along a first direction from a bottom of the unit to a top of the unit;

a protective band located around the unit and defining an opening receiving the fragile food product unit between a first open end and a second open end of the protective band such that the band opening is aligned in the first direction from the first open end to the second open end, wherein the band has a width, measured in the first direction, that is greater than the height of the fragile food product unit; and

a first wrap material tautly secured around the fragile food product unit and the first and second open ends of the protective band to form a package, wherein the first wrap material supports the fragile food product unit in the opening of the protective band such that the first wrap material engages the bottom of the fragile food product unit when the package is in an upright position and engages the top of the fragile food product unit when the package is in an inverted position.

**5,741,536**

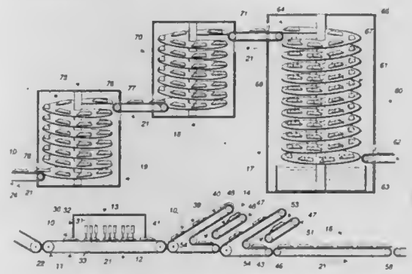
**METHOD OF PASTEURIZING MEAT PRODUCTS**

**James E. Mauer, 111 Sequoia Dr., SE., Rome, Ga. 30161; Harry Stuckey, Cartersville, Ga., and Benedict DiGerlando, Cedar Bluff, Ala., assignors to James E. Mauer, Rome, Ga.**

**Filed Jul. 9, 1996, Ser. No. 677,590**

**Int. Cl.[6] A23L** *3/16*

**U.S. Cl. 426—520** **20 Claims**



1. A process for pasteurizing meat parts for packaging and shipment of the parts, comprising the steps of:

marinating the parts with a marinade solution as the parts are moved along a processing path;

massaging the parts to distribute the marinade solution therethrough;

moving the parts through a heating means with the parts entering the heating means at a lower elevation and moving to higher elevations as the parts move through the heating means;

pasteurizing the parts at temperatures less than approximately 200° F. for an extended time sufficient to pasteurize the parts substantially uniformly throughout;

precooling the parts; and

after the parts have been precooled, freezing the parts.

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**5,741,537**

**BRAZZEIN SWEETENER**

**Bengt Göran Hellekant, and Ding Ming, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.**

**Continuation of Ser. No. 242,655, May 13, 1994, Pat. No. 5,527,555, which is a continuation-in-part of Ser. No. 84,846, Jun. 29, 1993, Pat. No. 5,346,998, which is a division of Ser. No. 21,540, Feb. 16, 1993, Pat. No. 5,326,580. This application Oct. 19, 1995, Ser. No. 545,472**

**Int. Cl.[6] A23L** *1/236;2/60*

**U.S. Cl. 426—548** **6 Claims**

1. A method of increasing the sweetness of a composition selected from the group consisting of foods and beverages comprising the step of adding a sufficient amount of Brazzein protein to the composition, so that the composition has an increased sweetness, wherein the Brazzein protein has been produced in a recombinant host cell and said protein has been isolated.

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**5,741,538**

**LOW DENSITY SOLUBLE COFFEE PRODUCTS HAVING INCREASED PARTICLE STRENGTH AND RAPID HOT WATER SOLUBILITY**

**Gordon Keith Stipp, and Robert Lee White, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Feb. 22, 1996, Ser. No. 605,603**

**Int. Cl.[6] A23F** *5/00*

**U.S. Cl. 426—594** **11 Claims**

1. Soluble coffee products having a particle size in the range of from about 6 mesh (3360 microns) to about 40 mesh (420 microns), which comprise:



a. a soluble amorphous porous open-celled coffee matrix having:

(1) a bulk density of from about0.10 to about 0.35 g/cc;

(2) a particle density of from about 1.0 to about 1.35 g/cc;

(3) a porosity of from about 15 to about 40%;

(4) a median pore size of from about 1 to about 30 microns;

(5) a sink time of about 45 seconds or less

(6) a compressive strength index of about 5 or less;

(7) a moisture content of about 7% or less; and

b. coffee aroma and flavor volatiles encapsulated within said soluble coffee matrix.

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**5,741,539**

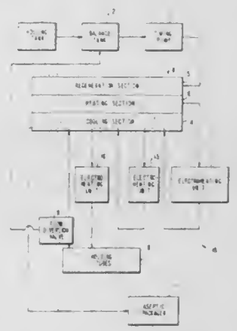
**SHELF-STABLE LIQUID EGG**

**Aloysius J. Knipper, 227 Cupsaw Dr., Ringwood, N.J. 07456, and Thaddeus J. Polny, Jr., 705 Suburban Rd., Union, N.J. 07083**

**Division of Ser. No. 460,692, Jun. 2, 1995, abandoned. This application Mar. 18, 1996, Ser. No. 617,140**

**Int. Cl.[6] A23L** *1/32*

**U.S. Cl. 426—614** **3 Claims**



1. A shelf-stable liquid egg product, produced in accordance with a method comprising the steps, in the sequence set forth, of:

providing liquid egg;

preheating said liquid egg to a temperature of at least about 110° F.;

heating said liquid egg a first time to a temperature of at least about 140° F. using a method selected from the group consisting of electroheating said liquid egg using high frequency alternating electric current, electroheating said liquid egg using mains frequency alternating electric current, and applying a plurality of high voltage electric pulses to said liquid egg;

cooling said liquid egg to a temperature below about 140° F.;

heating said liquid egg a second time to a temperature of at least about 140° F. using a method selected from the group consisting of electroheating said liquid egg using high frequency alternating electric current, electroheating said liquid egg using mains frequency alternating electric current, and applying a plurality of high voltage electric pulses to said liquid egg;

holding said liquid egg for a predetermined period of time at a temperature of least about 140° F. so that said liquid egg is at least pasteurized; and

aseptically packaging said liquid egg, wherein said liquid egg is shelf-stable for at least 5 days when stored at about 70° F., said liquid egg substantially retaining foaming ability, pourability, and emulsification properties of unpasteurized liquid egg without detrimental coagulation.

**5,741,540**

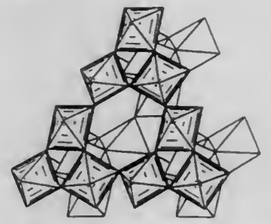
**METHOD OF FORMING SOLID STATE HUMIDITY SENSOR**

**Yingjeng James Li, Pingtung, and Ping Ping Tsai, Hsinchu, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan**

**Filed Jan. 16, 1996, Ser. No. 587,168**

**Int. Cl.[6] B05D** *5/12*

**U.S. Cl. 427—126.3** **15 Claims**



1. A method for growing pyrochlore-type crystalline tungsten trioxide film comprising the steps of:

(a) dissolving a tungstate salt into an aqueous solution;

(b) adjusting the pH of said aqueous tungstate salt solution to below 8.5; and

(c) placing a substrate into said pH-adjusted aqueous tungstate salt solution and heating said aqueous solution containing said substrate at temperatures above 70° C. to thereby form a pyrochlore-type crystalline tungsten trioxide film on said substrate;

(d) wherein said pyrochlore-type crystalline tungsten trioxide is represented by the general formula of $(M_2O)_xWO_3 \cdot zH_2O$, in which M is a cation, x is approximately equal to 0.5, and z is the amount of crystalline water contained in said crystal; and said pH-adjusted aqueous tungstate salt solution contains at least 0.43M of said tungstate salt.

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**5,741,541**

**METHOD FOR PRODUCING MAGNETO-OPTICAL RECORDING MEDIUM**

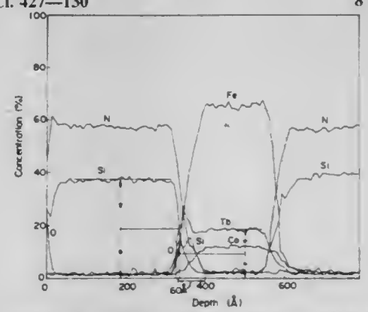
**Etsuro Ikeda; Masahiro Kikkawa, and Takashi Kishi, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 289,346, Aug. 11, 1994, Pat. No. 5,585,197, which is a continuation of Ser. No. 843,031, Feb. 28, 1992, abandoned. This application Nov. 15, 1996, Ser. No. 749,643**

**Claims priority, application Japan, Feb. 28, 1991, 3-058014; Mar. 19, 1991, 3-059567**

**Int. Cl.[6] G11B** *5/85;* **C23C** *14/00*

**U.S. Cl. 427—130** **8 Claims**




1. A process for forming a magneto-optical recording medium having a substrate, a recording layer having at least a rare earth-transition metal alloy film formed on said substrate and a dielectric layer formed on said recording layer with a blocking layer interposed therebetween to limit a depth of penetration of an element of the dielectric layer into said recording layer, said process compris-

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ing forming the rare earth-transition metal alloy film on the substrate, forming the blocking layer containing a rare earth element oxide on said rare earth-transition metal alloy film and subsequently forming the dielectric layer upon the blocking layer.

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**5,741,542**

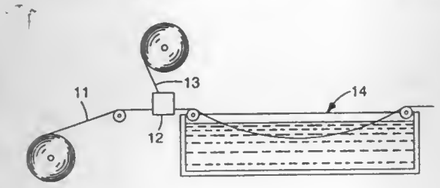
**PROCESS OF MAKING THERMAL FREE-RADICAL CURE ADHESIVES**

**Jerry W. Williams, Cottage Grove; Gary T. Boyd; Jeanne M. Goetzke, both of Woodbury; Gerald L. Uhl, St. Paul, and David A. Ylitalo, Stillwater, all of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.**

**Continuation of Ser. No. 234,468, Apr. 28, 1994, abandoned. This application May 18, 1995, Ser. No. 444,819**

**Int. Cl.[6] B05D** *5/10*

**U.S. Cl. 427—208.4** **24 Claims**




1. A process for making an adhesive comprising allowing a carrier web coated with a thermally, free-radically polymerizable mixture, comprising at least one thermally, free-radically polymerizable monomer and at least one thermal initiator in a catalytically effective amount to remain in contact with a thermal buffer having a heat transfer coefficient of at least 25 $W/(m^2.K)$ for a time sufficient to effect conversion of the coated mixture to an adhesive.

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**5,741,543**

**PROCESS FOR THE PRODUCTION OF AN ARTICLE COATED WITH A CROSSLINKED PRESSURE SENSITIVE ADHESIVE**

**Louis E. Winslow, Stillwater, Minn.; Greggory S. Bennett, Hudson, Wis.; Gaddam N. Babu, Woodbury, Minn.; Paul Hattam, Baldwin, Wis.; Michael L. Tumey, St. Paul, and Bhaskar V. Velamakanni, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**PCT No. PCT/US96/01827, § 371 Date Jul. 18, 1996, § 102(e) Date Jul. 18, 1997, PCT Pub. No. WO96/24644, PCT Pub. Date Aug. 15, 1996**

**Continuation-in-part of Ser. No. 386,890, Feb. 10, 1995, abandoned. This PCT application Feb. 9, 1996, Ser. No. 676,366**

**Int. Cl.[6] B05D** *5/10*

**U.S. Cl. 427—208.4** **28 Claims**

1. A process for making a substrate bearing a coating of a crosslinked pressure sensitive adhesive on at least one surface thereof, comprising the steps:

a) coating onto said substrate a mixture comprising

1) a pressure sensitive adhesive polymer comprising a plurality of mer units comprising pendent polymerizable unsaturation,

2) at least one free radically polymerizable unsaturated monomer,

3) an effective initiating amount of an energy activated initiator of polymerization; and

4) optionally, at least one of a tackifier, a plasticizer, a polymerization inhibitor, and a chain transfer agent; and

b) subjecting said coated mixture to energy that activates said initiator so as to crosslink said polymer and form said crosslinked pressure sensitive adhesive.

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**5,741,544**

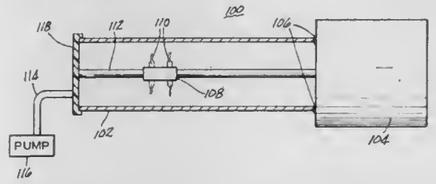
**ARTICLES USING SPECIALIZED VAPOR DEPOSITION PROCESSES**

**Deepak Mahulikar, Madison, Conn., assignor to Olin Corporation, New Haven, Conn.**

**Filed Aug. 31, 1995, Ser. No. 521,858**

**Int. Cl.[6] B05D** *7/22*

**U.S. Cl. 427—236** **18 Claims**




1. A method for producing a coated heat exchanger tube, comprising the steps of:

placing at least one gas jet nozzle inside the heat exchanger tube;

creating an air-tight seal on both ends of the heat exchanger tube;

evacuating the inside of the heat exchanger tube to a pressure no less than 5 millitorr;

directing a carrier gas containing a vaporized coating material to the gas jet nozzle after evacuating; and

impinging the carrier gas containing the vaporized coating material on the inside of the heat exchanger tube via the at least one gas jet nozzle creating a coating layer.

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**5,741,545**

**PROCESS FOR CONDITIONING ORGANIC SUBSTRATE SURFACES**

**Manfred Eschwey, Düsseldorf; Rolf van Bonn, Duisburg; Ludwig Böhm, Hattersheim; Rainer Kaps, Friedrichsdorf, and Eckard Raddatz, Biebesheim, all of Germany, assignors to Messer Griesheim GmbH, Germany**

**Filed Apr. 22, 1996, Ser. No. 635,471**

**Claims priority, application Germany, Apr. 22, 1995, 195 14 924.6**

**Int. Cl.[6] C23C** *16/02*

**U.S. Cl. 427—248.1** **4 Claims**

1. A process for conditioning organic substrate surfaces for improving a subsequent treatment process which comprises exposing the substrate surfaces, at temperatures between 25° and 300° C. to a hydrogen containing gas, wherein said organic substrate is a polyolefin and said subsequent treatment process is a fluorination step for producing fluorinated polyolefin surfaces not able to be wetted by water.

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**5,741,546**

**METHOD OF DEPOSITING TITANIUM NITRIDE FILMS ON SEMICONDUCTOR WAFERS**

**Gurtej S. Sandhu, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.**

**Continuation of Ser. No. 269,957, Jun. 30, 1994, Pat. No. 5,571,572, which is a continuation of Ser. No. 971,943, Nov. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 755,202, Sep. 5, 1991, Pat. No. 5,192,589. This application Sep. 19, 1996, Ser. No. 715,860**

**Int. Cl.[6] C23C** *8/00*

**U.S. Cl. 427—255.1** **36 Claims**

1. A chemical vapor deposition method of providing a layer comprising titanium and nitrogen atop a semiconductor wafer, the method comprising the following steps:

positioning a semiconductor wafer within a chemical vapor deposition reactor;



providing a source of an activated halogen species within the chemical vapor deposition reactor;

injecting quantities of a gaseous carbon containing titanium organometallic precursor and a carrier gas into the reactor having the semiconductor wafer positioned therein; and

maintaining the reactor at a pressure of less than or equal to about 100 Torr and the semiconductor wafer at a temperature which in combination cause a reaction of the precursor to bond carbon thereof with the activated halogen species and to deposit a film on the semiconductor wafer which comprises titanium and nitrogen.

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**5,741,547**

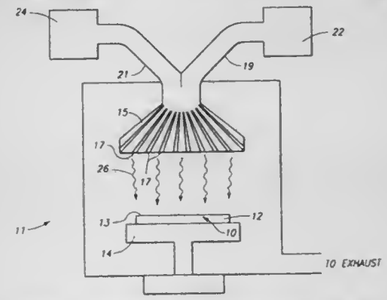
**METHOD FOR DEPOSITING A FILM OF TITANIUM NITRIDE**

**Salman Akram, and Daniel A. Koos, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**

**Filed Jan. 23, 1996, Ser. No. 589,924**

**Int. Cl.[6] C23C** *16/34*

**U.S. Cl. 427—255.2** **2 Claims**




1. A method of depositing and controlling relative surface roughness of a titanium nitride layer comprising:

selecting a relative titanium nitride layer surface roughness;

positioning a substrate having an outer surface within a chemical vapor deposition reactor;

providing a gas delivery shower head spaced from the outer surface at a selected distance greater than 1 cm and less than or equal to about 5 cm, said distance being determined at least in part by the selected titanium nitride layer surface roughness;

injecting a gaseous titanium organometallic compound and at least one of ammonia and phenylhydrazine through the shower head to chemical vapor deposit a titanium nitride layer having the selected surface roughness over the outer surface.

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**5,741,548**

**COATING COMPOSITION FOR REEMAY AND SATIN ACETATE FABRICS FOR LASER PRINTABILITY**

**Mohan L. Sanduja, 144-90 41 Ave., #516, Flushing, N.Y. 11355; Isabella Zilbert, 2078 Cropsey Ave., Apt. 5A, Brooklyn, N.Y. 11214; Joel A. Robinson, 226 W. 37th St., New York, N.Y. 10018, and Paul Thottathil, 17 Bryant Ave., New Hyde Park, N.Y. 11040**

**Filed Sep. 24, 1996, Ser. No. 718,724**

**Int. Cl.[6] B05D** *1/36;5/00*

**U.S. Cl. 427—261** **15 Claims**

9. A method of forming an image on a fabric, said method comprising the steps of:

(a) contacting a surface of said fabric with a graft initiator to produce a chemically activated fabric surface;

(b) contacting said activated fabric surface with a reagent comprising a polymerizable monomer or prepolymer to produce a polymer layer grafted onto said fabric surface; and

(c) printing an image onto said polymer layer.

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**5,741,549**

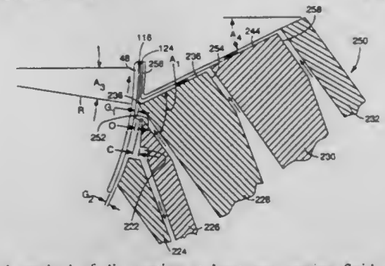
**SLIDE DIE COATING METHOD AND APPARATUS WITH IMPROVED DIE LIP**

**Gary W. Maier, and Omar D. Brown, both of P.O. Box 33427, St. Paul, Minn. 55133-3427**

**Continuation-in-part of Ser. No. 510,899, Aug. 3, 1995, abandoned, which is a continuation of Ser. No. 236,569, Apr. 29, 1994, abandoned. This application Oct. 3, 1996, Ser. No. 726,331**

**Int. Cl.[6] B05D** *1/26;* **B05C** *5/02*

**U.S. Cl. 427—294** **8 Claims**




1. A method of die coating at least one coating fluid onto a surface comprising:

sliding a first coating fluid along a slide surface that has a sharp edge, and an upstream land contacting the sharp edge and spaced further from the surface than the sharp edge to form a continuous coating bead between the sharp edge and the surface being coated; and

sliding the first coating fluid onto the surface without any coating fluid traveling between the sharp edge and the land, wherein the surface being coated has a shape, wherein the land has a shape which conforms to the shape of the surface being coated, and wherein the bead does not substantially move into a space between the land and the surface to be coated even when vacuum is applied and increased.

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**5,741,550**

**BLADE METERING UNIT AND METHOD FOR BLADE-COATING A MATERIAL WEB**

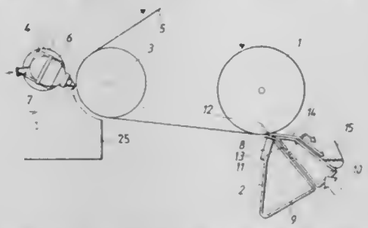
**Petri Paloviita, Vantaa, and Jukka Koskinen, Helsinki, both of Finland, assignors to Valmet Corporation, Helsinki, Finland**

**Continuation of Ser. No. 329,998, Oct. 27, 1994, abandoned. This application May 7, 1996, Ser. No. 644,676**

**Claims priority, application Finland, Oct. 27, 1993, 934767**

**Int. Cl.[6] B05D** *3/04;* **B05C** *11/06*

**U.S. Cl. 427—348** **8 Claims**




1. A method of coating an elongated web being advanced in a movement direction, comprising the steps of:

passing the web supportedly over a first backing roll;

applying a coating mix to a surface of the web supported on the first backing roll from a slot-orifice applicator apparatus located in proximal opposition to the first backing roll by ejecting a flow of the coating mix from the slot-orifice applicator onto the first backing roll supported web surface in a gap region defined between the slot-orifice applicator apparatus and the web so that at least a portion of the coating mix flows in a direction opposite the movement direction of the

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web and so that the amount of coating mix applied to the web surface is restricted, the slot-orifice applicator apparatus having a slot-orifice through which the coating mix flows, the slot-orifice being shaped so as to induce a Coanda effect so that the coating mix flowing from the slot-orifice flows in a jet directed in the direction opposite the movement direction of the web:

continuously controlling the flow of the coating mix ejected from slot-orifice applicator apparatus onto the first backing roll supported web surface along a direction transverse to the movement direction of the web; and

doctoring the applied coat on the web to a finished coat weight using an air knife disposed in confronting opposition to a second backing roll on which the web is supported and located downstream of said slot-orifice applicator apparatus.

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**5,741,551**

**PREPARATION OF POLYMERIC SURFACES**

**Patrick E. Guire; Shawn G. Dunkirk, both of Eden Prairie; Mark W. Josephson, Richfield, and Melvin J. Swanson, Carver, all of Minn., assignors to BSI Corporation, Eden Prairie, Minn.**

**Continuation of Ser. No. 173,914, Dec. 27, 1993, Pat. No. 5,512,329, which is a continuation of Ser. No. 816,771, Jan. 2, 1992, abandoned, which is a continuation of Ser. No. 675,604, Mar. 25, 1991, abandoned, which is a division of Ser. No. 447,802, Dec. 8, 1989, Pat. No. 5,002,582, which is a division of Ser. No. 223,149, Jul. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 138,226, Dec. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 920,567, Oct. 17, 1986, abandoned, and Ser. No. 108,765, Oct. 19, 1987, Pat. No. 4,973,493, which is a continuation-in-part of Ser. No. 428,074, Sep. 29, 1982, Pat. No. 4,722,906, and Ser. No. 108,765. This application Apr. 23, 1996, Ser. No. 636,245**

**Int. Cl.[6] C08F** *2/48;* **B05D** *3/06;1/38*

**U.S. Cl. 427—407.1** **8 Claims**

1. A method of providing a polymer to a substrate having a solid surface, the method comprising the steps of sequentially:

(a) contacting the substrate surface with a composition comprising a plurality of molecules of a reactive chemical unit, each having covalently bonded to it at least one latent reactive group selected from the group consisting of photoactivatable ketones, under conditions which enable the reactive chemical unit molecules to orient spatially so as to enable the latent reactive group to come into covalent bonding proximity with the substrate surface;

(b) activating the latent reactive groups by application of the external stimulus to covalently bond the reactive chemical unit molecules to the substrate surface;

(c) providing a different monomer, oligomer, or polymer capable of being covalently bound to the reactive chemical unit molecules covalently bound to the substrate surface;

(d) contacting and covalently bonding the different monomer, oligomer or polymer with the bound reactive chemical unit.

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**5,741,552**

**COATING COMPOSITION AND METHOD FOR FORMING MULTI-LAYER COATING**

**Hideki Takayama, and Eiichi Nishimura, both of Suita, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan**

**Filed Jun. 20, 1996, Ser. No. 666,738**

**Claims priority, application Japan, Jun. 27, 1995, 7-183487; Jun. 27, 1995, 7-183488**

**Int. Cl.[6] B05D** *7/16;1/36;3/02*

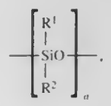
**U.S. Cl. 427—407.1** **20 Claims**

1. A method of forming a multi-layer coating comprising the steps of applying a base coat composition to an article to be coated, applying a topcoat to the resultant base coat, and separately or simultaneously baking the resultant coats, wherein

(A) said topcoat composition contains (a) a blend of at least one compound having a plurality of hydrosilyl groups and at least one compound having a plurality of alkenyl groups and (b) a catalytic amount of hydrosilylation catalyst,

there being a sufficient amount of said at least one compound having a plurality of hydrosilyl groups which contain phosphoric groups and/or said at least one compound having a plurality of alkenyl groups which contain phosphoric groups to provide an amount of phosphoric groups in said topcoat composition of from 0.001–5 mol/kg on a solid basis based on said compounds in said blend,

said at least one compound having a plurality of hydrosilyl groups being selected from the group consisting of (1) an organo-hydrogen polysiloxane having at least two hydrosilyl groups in one molecule represented by the following general formula:



wherein $R^1$ is an alkyl group having 1–6 carbon atoms, a phenyl group or a phenethyl group, $R^2$ is a hydrogen atom, an alkyl group having 1–6 carbon atoms, a phenyl group or a phenethyl group, and a is a number of 2–200, and (2) a homopolymer or a copolymer which does not contain alkenyl groups of a hydrogen polysiloxane macromonomer having a structural unit represented by the following general formula:



wherein $R^1$ is an alkyl group having 1–6 carbon atoms, a phenyl group or a phenethyl group, $R^2$ is a hydrogen atom, an alkyl group having 1–6 carbon atoms, a phenyl group or a phenethyl group and b is a number of 1–30, said structural unit further having at least one hydrosilyl group in one molecule and at least one (meth)acryloyloxyalkylene group in a siloxane skeleton or ends thereof, and

said at least one compound having a plurality of alkenyl groups being selected from the group consisting of alkenyl group-containing polyether resins, alkenyl group-containing acrylic resins, alkenyl group-containing polyester resins, alkenyl group-containing polycarbonate resins and alkenyl group-containing epoxy resins; and

(B) said base coat composition containing (d) a cross-linking agent which does not interfere with the hydrosilylation reaction of said topcoat composition and being selected from the group consisting of amino resins, blocked polyisocyanate compounds and curing agents for epoxy resins, and (e) a functional resin reactable with said cross-linking agent which is at least one resin selected from the group consisting of acrylic resins, polyester resins and epoxy resins, which functional resin is organic solvent-borne or aqueous-borne.

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**5,741,553**

**PET REPELLANTS**

**John A. Manolas, Lake Forest, and Brian D. Olms, Willow Springs, both of Ill., assignors to Venus Laboratories, Incorporated, Wood Dale, Ill.**

**Filed Jun. 7, 1995, Ser. No. 485,684**

**Int. Cl.[6] A01N** *25/02;31/00*

**U.S. Cl. 427—421** **25 Claims**

12. A method of repelling an animal comprising the steps of:

providing a pet repellant comprising:



a. from about 0.005% by weight to about 0.06% by weight denatonium benzoate bittering agent; and

b. a water carrier from about 99.94% by weight to about 99.995% by weight of the pet repellant;

applying the repellant to a surface to produce a treated surface; and,

exposing the animal to the treated surface.

20. The method of repelling an animal of claim 12 wherein the applying step comprises the step of spraying the repellant onto the surface.

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**5,741,554**

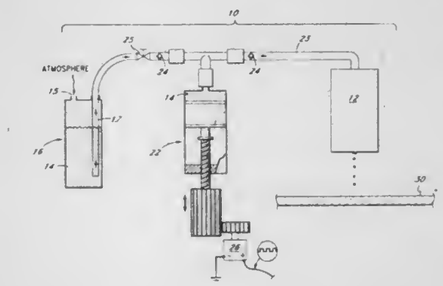
**METHOD OF DISPENSING A LIQUID REAGENT**

**Thomas C. Tisone, Orange, Calif., assignor to Bio Dot, Inc., Irvine, Calif.**

**Filed Jul. 26, 1996, Ser. No. 686,957**

**Int. Cl.[6] B05D** *1/26;1/40*

**U.S. Cl. 427—424** **8 Claims**




1. A method for forming a diagnostic test strip comprising the steps of:

movably transporting a receptive membrane;

metering a predetermined quantity or flow rate of liquid reagent using a positive displacement pump;

operating a dispenser to mix said metered quantity or flow rate of liquid reagent with air to form an aerosol mist which is deposited on said receptive membrane; and

regulating the metering of said predetermined quantity or flow rate of liquid reagent and the transporting of said receptive membrane such that the reagent density is controlled in terms of volume of reagent per unit length substantially independently of the particular flow characteristics of said liquid reagent.

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**5,741,555**

**SUCCINIC ACID DERIVATIVE DEGRADABLE CHELANTS, USES AND COMPOSITIONS THEREOF**

**David Alan Wilson, Richwood, and Druce Kirk Crump, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Division of Ser. No. 445,837, May 22, 1995, Pat. No. 5,569,443. This application Oct. 23, 1996, Ser. No. 735,857**

**Int. Cl.[6] B05D** *5/18*

**U.S. Cl. 427—437** **18 Claims**

1. A method of electroless deposition of copper upon a non-metallic surface receptive to the deposited copper including a step of contacting the non-metallic surface with an aqueous solution comprising a soluble copper salt and a polyamino disuccinic acid.

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**5,741,556**

**PROCESS FOR PRODUCING AN OXIDE DISPERSED MCRALY-BASED COATING**

**Thomas Alan Taylor, Indianapolis, and James Kent Knapp, Pittsboro, both of Ind., assignors to Praxair S.T. Technology, Inc., Danbury, Conn.**

**Continuation of Ser. No. 264,888, Jun. 24, 1994, abandoned. This application Apr. 5, 1996, Ser. No. 628,371**

**Int. Cl.[6] B05D** *1/08;* **B22F** *7/00*

**U.S. Cl. 427—453** **17 Claims**

1. A process for producing a McrAlY-based coating wherein M is selected from the group consisting of iron, cobalt, nickel and mixtures thereof, which comprises the thermal spraying by detonation gun means of a McrAlY-based powder composition onto the surface of a substrate using a gaseous fuel-oxidant mixture comprising an oxidant and at least one combustible gas selected from the group of saturated and unsaturated hydrocarbons in which the atomic ratio of oxygen to carbon is between 1.045 to 1 and 1.10 to 1, with at least an amount of oxygen present so that the coating comprises at least 2.5 weight percent oxygen and the aluminum content of the McrAlY-based powder is compensated by an amount to offset the amount of aluminum converted to aluminum oxide during the thermal spraying.

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**5,741,557**

**METHOD FOR DEPOSITING METAL FINE LINES ON A SUBSTRATE**

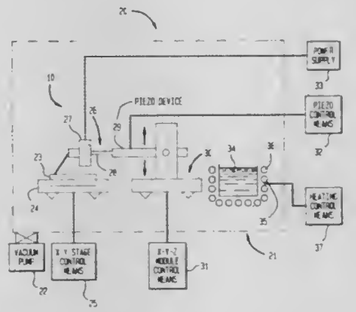
**Antoine Corbin, Paris; Philippe Demoncy, Evry; Jacques Foulu, Lesigny, and Pierre Sudraud, Dourdan, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 261,645, Jun. 17, 1994. This application May 24, 1995, Ser. No. 448,689**

**Claims priority, application European Pat. Off., Jul. 30, 1993, 93480106**

**Int. Cl.[6] B06B** *1/00;* **H05B** *3/00;7/00;* **B05D** *5/12*

**U.S. Cl. 427—469** **18 Claims**




1. A method for depositing a continuous line of material on a surface of a substrate comprising the steps of:

a) providing a tip having an apex at one end and a source of said material in a molten state at an opposite end of said tip, said material being brought to the molten state by a source of heating current;

b) providing a film of said molten material to an outside surface of said source, said molten material flowing towards said apex to provide a continuous flow of said molten material;

c) applying electrical discharges to said tip by providing a DC current which is superposed to said heating current; and

d) dragging said apex across said surface of said substrate, thereby forming said continuous line of material on said surface of said substrate.

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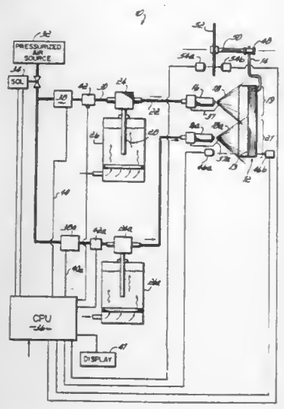


5,741,558

## METHOD AND APPARATUS FOR COATING THREE DIMENSIONAL ARTICLES

Tatsuo Otani, Tokyo; Hidetaka Tsukamoto, Suita, and Makoto Sekiguchi, Nagoya, all of Japan, assignors to Nordson Corporation, Westlake, Ohio

PCT No. PCT/US94/03828, § 371 Date Jun. 24, 1996, § 102(e) Date Jun. 24, 1996, PCT Pub. No. WO94/22589, PCT Pub. Date Oct. 13, 1994
PCT Filed Apr. 7, 1994, Ser. No. 530,142
Claims priority, application Japan, Apr. 7, 1993, 5-105168
Int. Cl.[6] B05D *1/02;1/06;* B05B *5/00;* B05C *19/00*
U.S. Cl. 427—469 21 Claims




1. An apparatus for powder coating a three-dimensional article having an external surface with a plurality of surface portions having a plurality of different topographies, comprising:
a first gun aimed in a discharge direction;
means for conveying, relative to the gun, the article along a conveying path to successively convey the surface portions past the gun;
a powder pump operatively connected to the gun;
means for supplying fluidized powder particles to the pump;
means for supplying pressurized air to the pump via a flow path, the pump adapted to combine the pressurized air and powder particles in a mixed stream and to convey the mixed stream along a transport path to the gun for discharge therefrom along a discharge path toward the surface portions;
flow control means located in the flow path and adapted to regulate the flow of pressurized air therethrough, thereby to regulate the flow rate of the mixed stream conveyed to the gun and discharged therefrom along a discharge path; and
a controller operatively connected to the flow control means, the controller adapted to control the flow control means to vary the discharge rate of the mixed stream from the gun according to a predetermined discharge sequence which corresponds to the topographies of the surface portions as said surface portions pass in front of the gun, so that a plurality of different discharge rates are used for the plurality of different topographies, thereby to promote uniform coating of the surface portions and reduced waste of powder particles during coating of the article.

17. A method of powder coating comprising the steps of:
moving a three-dimensional article to be powder coated along a conveying path relative to a spray gun, the gun aimed along a discharge path generally perpendicular to and intersecting the conveying path, the article having an external surface to be powder coated, the external surface having a plurality of surface portions of different surface topography and surface area;
mixing powder particles and pressurized air in the gun to form a mixed stream, the powder particles supplied by a powder source and the pressurized air supplied by a pressurized air source;
discharging the mixed stream from the gun along the discharge path to successively powder coat the surface portions as the article moves into the discharge path; and
controlling the rate of discharging of the mixed stream according to a predetermined coating sequence by varying the flow of pressurized air from the pressurized air source, to provide a corresponding plurality of different rates of discharging the mixed stream, the rate of discharging being dependent upon the surface topography and the surface area of the surface portion located in the discharge path, thereby to uniformly powder coat the surface potions with optimized efficiency in use of powder.

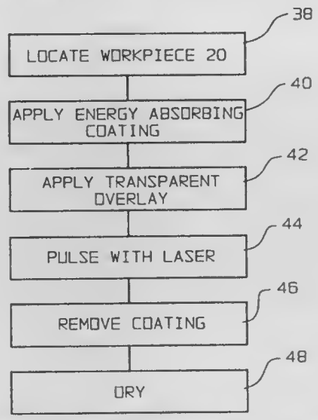
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5,741,559

## LASER PEENING PROCESS AND APPARATUS

Jeff L. Dulaney, Dublin, Ohio, assignor to LSP Technologies, Inc., Dublin, Ohio

Filed Oct. 23, 1995, Ser. No. 547,012
Int. Cl.[6] B05D *3/00*
U.S. Cl. 427—554 37 Claims




1. A method of improving properties of a solid material by providing shock waves therein, comprising:
applying an energy absorbing coating to a portion of the surface of the solid material;
applying a transparent overlay material to said coated portion of the solid material;
directing a pulse of coherent energy to said coated portion of the solid material to create a shock wave; and
directing a high-speed jet of a first fluid to the surface of the solid material to clean a portion of said surface of the solid material of possible energy absorbing coating and transparent overlay material to prepare said surface for another cycle.

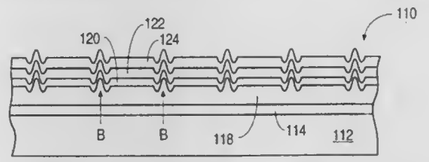
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5,741,560

## METHOD FOR PREPARING A SUBSTRATE FOR A MAGNETIC DISK

Caroline A. Ross, Mountain View, Calif., assignor to Komag, Incorporated, San Jose, Calif.

Continuation of Ser. No. 657,222, Jun. 3, 1996. This application Nov. 5, 1996, Ser. No. 740,945
Int. Cl.[6] B05D *3/00*
U.S. Cl. 427—555 18 Claims




1. A method of making a magnetic disk comprising the steps of:
depositing a metallic initiation layer on an unpolished glass substrate;
electroless plating a texture layer on said metallic initiation layer, said initiation layer initiating electroless plating of said texture layer onto said substrate;
polishing said texture layer;
laser texturing said texture layer; and depositing a magnetic layer on said texture layer.



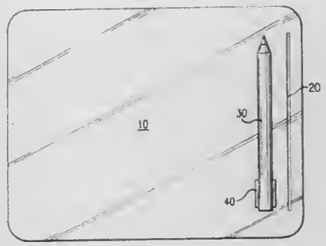
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5,741,561

## INTERCHANGEABLE EDUCATIONAL WRITING PAD

Alexa Lenkin, Bethesda, Md., assignor to Alexa L. Smith, Arlington, Va.

Filed Mar. 9, 1995, Ser. No. 401,279
Int. Cl.[6] G09B *1/00*
U.S. Cl. 428—13 8 Claims




1. An educational writing pad comprising:
a substantially rectangular bottom sheet;
a substantially rectangular clear top sheet attached to said bottom sheet on more than one side, said top sheet allowing dry erase marker markings to be wiped off;
attaching means for removably attaching at least one dry erase marker to one of said bottom sheet and said top sheet; and
a substantially rectangular printed sheet, which is independent of said top sheet and said bottom sheet, wherein said bottom sheet and said top sheet form a pocket structure for removably inserting said printed sheet therebetween;
wherein said printed material on one face provides a designated location for a user's response, and wherein an appropriate response is provided on a second face in a location corresponding to said designated location.

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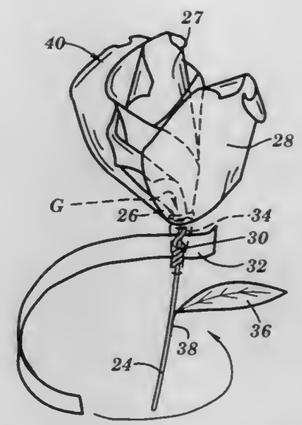
5,741,562

## ARTIFICIAL FLOWER

Mary L. Scatterday, 6443 N. 77th Pl., Scottsdale, Ariz. 95250

Filed Jan. 17, 1996, Ser. No. 587,555
Int. Cl.[6] A41G *1/00*
U.S. Cl. 428—24 8 Claims

1. An artificial flower constructed of at least one non-wetted, rectangular, foldable creasable sheet of material including at least a bud, a stem and a calyx form, comprising the combination of:
a single sheet of said at least one sheet having curled corners and centrally shaped to an integral calyx form defined by an unpleated, pinched and wire-secured portion of said single sheet, and further defined by said curled corners of the said single sheet effecting an essentially involuted tubular shape with outward curling edges; and
one or more of said at least one sheet each forming a petal pair having curled corners, a compression along a center portion of




said single sheet, securement means to secure said calyx form of the said flower and shaped curvately upward to emulate a rose.

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5,741,563

## SHRINK FILMS FROM PROPYLENE POLYMERS

Aspy Keki Mehta, Humble, and Michael Chia-Chao Chen, Houston, both of Tex., assignors to Exxon Chemical Patents Inc., Houston, Tex.

Filed Jul. 30, 1996, Ser. No. 688,699
Int. Cl.[6] B65B *53/00*
U.S. Cl. 428—35.1 15 Claims

1. A film comprising one or more layers of shrink film comprising metallocene catalyzed, propylene polymer having hexane extractables of less than 3 weight percent, wherein the polymer is either a propylene homopolymer or propylene copolymer.

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5,741,564

## STRETCH-ACTIVATED CONTAINER

Gunilla Elsa Gillberg-LaForce, Roswell, Ga., assignor to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Jun. 22, 1995, Ser. No. 493,766
Int. Cl.[6] B67D *3/00*
U.S. Cl. 428—35.2 12 Claims

1. A container adapted to contain therein a fluid, volatile solid, or absorbent for a fluid, wherein at least a portion of said container comprises a material which is initially in an unstretched condition so that the material is impervious to liquids or both gases and liquids, said material being constructed of a film that, when stretched by manual forces external to said material, forms a plurality of surface-connected pores to allow liquids and gases to penetrate said material so that liquids and gases will pass into or out of said container at a controlled rate depending on the amount of external stretching force applied to said material.

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5,741,565
**CAST FILM OF PROPYLENE POLYMERS**
**Pierre Coosemans, Hoeilaart, Belgium; Giuseppe Lesca, Milan, Italy; Daniele Romanini, Ferrara, Italy, and Roberto Tanganelli, Florence, Italy, assignors to Montell North America Inc., Wilmington, Del.**
**Continuation of Ser. No. 286,023, Aug. 4, 1994, abandoned. This application Jul. 25, 1995, Ser. No. 506,467**
**Claims priority, application Italy, Aug. 11, 1993, MI93A1815**
**Int. Cl.[6] B32B** *27/32*; **B65D** *85/60*
**U.S. Cl. 428—35.2** **5 Claims**

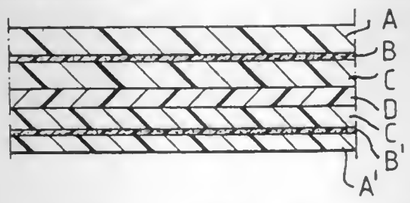
1. The combination of an article and a multilayered cast film, said article being twist-wrapped by said film, the elongation at break of said film being greater than 100%, and said film comprising:

A) at least one layer consisting essentially of a crystalline homopolymer of a $C_3$–$C_6$ α-olefin, or a crystalline, random copolymer of propylene with ethylene or a $C_4$–$C_{10}$ α-olefin, or a crystalline, random copolymers of propylene with ethylene and a $C_4$–$C_{10}$ α-olefin, or a composition of crystalline, random copolymers selected from the group consisting of crystalline, random copolymers of propylene with ethylene, of propylene with a $C_4$–$C_8$ α-olefin, and of propylene with ethylene and a $C_4$–$C_8$ α-olefin, the elongation at break of said layer being greater than 350%; and

B) at least one layer (Layer B) consisting essentially of a propylene homopolymer, or a propylene copolymer with ethylene or a $C_4$–$C_{10}$ α -olefin, or a propylene copolymer with ethylene and a $C_4$–$C_{10}$ α-olefin, the elongation at break of said homopolymer and copolymers being lower than 30%, the flexural modulus of said homopolymer and copolymers being higher than 1600 MPa, and the $M_w/M_n$ of said homopolymer and copolymers being 8–30.

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5,741,566
**AUTOCLAVABLE MULTILAYER FILMS**
**Peter Högström, Stockholm; Stefan Lundmark, Drottningholm; Curt Lindhe, Söderbärke, and Hannu Maasola, Vilähde, all of Sweden, assignors to Pharmacia & Upjohn Aktiebolag, Stockholm, Sweden**
**PCT No. PCT/SE94/00138, § 371 Date Nov. 20, 1995, § 102(e) Date Nov. 20, 1995, PCT Pub. No. WO94/19186, PCT Pub. Date Sep. 1, 1994**
**PCT Filed Feb. 18, 1994, Ser. No. 507,256**
**Claims priority, application Sweden, Feb. 19, 1993, 9300558**
**Int. Cl.[6] B32B** *27/28*
**U.S. Cl. 428—35.2** **18 Claims**




1. An autoclavable multi-layer film formed of thermoplastic materials capable of being processed into hollow shapes and useful for packaging oxygen sensitive materials, comprising:

sequential layers A—B—C—D—C—B'—A', wherein the film may optionally not include layer A or A' and the corresponding layer B or B', and wherein:

A and A' are layers substantially water and water vapor resistant, wherein at least one of the layers A and A' is made of polyolefins, polyethylene terephthalates, or co-polymers of polyethylene terephthalates;

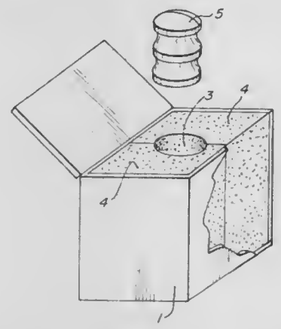
B and B' are layers adhesively bonding layers A and A' with layers C;

C is a layer of a moisture absorbing polymer substantially impermeable to oxygen, said polymer being selected from the group consisting of aromatic polyamides and co-polymers of aromatic polyamides; and

D is a layer of a polyethylene-vinyl alcohol with a molar ethylene concentration between 0% and 80%.

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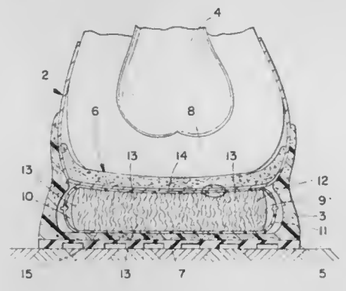
5,741,567
**METHOD FOR MAKING CELLULAR PACKAGING BOARD WITH INHIBITOR**
**Eugene R. Lewis, 25 Chatfield Rd., Prospect, Conn. 06712**
**Division of Ser. No. 449,832, May 24, 1995, Pat. No. 5,593,624. This application Jan. 10, 1997, Ser. No. 781,864**
**Int. Cl.[6] B29C** *44/02*
**U.S. Cl. 428—36.5** **3 Claims**




1. A beaded foam molded product comprising fused puffed beads of a resin coated with a vapor phase corrosion inhibitor, said inhibitor being dispersed throughout said product and migratable to the surface of said product to emanate therefrom.

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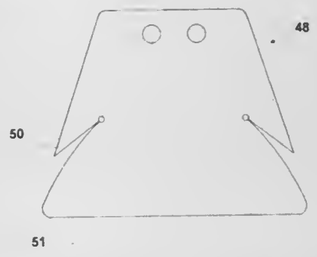
5,741,568
**SHOCK ABSORBING CUSHION**
**Marion Franklin Rudy, Northridge, Calif., assignor to Robert C. Bogert, Marina Del Rey, Calif., a part interest**
**Filed Aug. 18, 1995, Ser. No. 516,942**
**Int. Cl.[6] A43B** *13/20*
**U.S. Cl. 428—69** **17 Claims**




1. A cushion for an article of footwear comprised of a flexible foam core shaped to protect at least a portion of a footsole, said foam core surrounded by an envelope comprised of a material which is impervious to at least a selected fluid, a plurality of filaments having a first portion secured to said fluid impervious material and a second portion secured to said foam core, said selected fluid being contained within said envelope.



5,741,569
**SHOE AND SOCK DONNING DEVICE FOR PHYSICALLY HANDICAPPED**
**Anthony Votino, 16439 Glenhope Dr., Valinda, Calif. 91744, and Louis Votino, 1625 Alvarado St., Oceanside, Calif. 92054**
**Filed Sep. 16, 1996, Ser. No. 714,245**
**Int. Cl.[6] A47G** *25/80*; *25/82*
**U.S. Cl. 428—131** **9 Claims**




1. A sock and shoe donning device to facilitate a user inserting his foot in a sock and a shoe simultaneously, said shoe defining a shoe heel, sides and a tongue and said sock defining a top edge, a sock heel and a toe, said device comprising:

a C-shaped structure comprised of a generally rectangular shaped sheet of thin semirigid flexible material molded into a structure with approximately vertical sides and a C-shaped horizontal cross section defining an inside and an outside, and having:

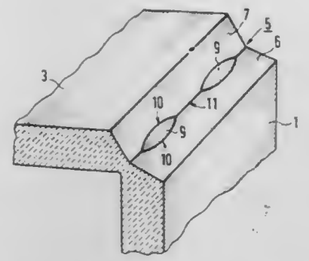
a lower portion comprising:

two lower support parts separated from each other by a distance of about 4 to 8 inches which when compressed toward each other to fit inside the shoe react by applying force against the inside of the shoe to hold the structure firmly in place and

two tongue parts separated from each other by a distance of about 3½ to 7½ inches which when compressed toward each other to fit inside the shoe react by forcing the tongue of the shoe forward out the way while the user inserts his foot in the shoe and

an upper portion extending upward form said lower portion, said upper portion defining a C-shaped top edge defining an arc length, said top edge providing a frame on which said sock can be draped with the top edge and sock heel on the outside of the C-shaped structure and the sock toe on the inside of the C-shaped structure:

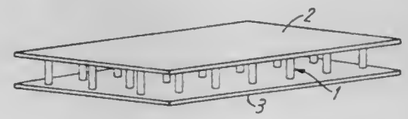
wherein notches are defined in said vertical sides between said lower support parts and said tongue parts.




center of curvature (M) which lies on the opposite side of a line (L) which joins the zones (8) of greater depth $T_2$.

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5,741,571
**DOUBLE SKIN COMPOSITE PANELS**
**Hugh Gordon Bowerman, Woking, and Bassam Adeeb Burgan, Bracknell, both of Great Britain, assignors to British Steel PLC, London, England**
**PCT No. PCT/GB95/00749, § 371 Date Nov. 25, 1996, § 102(e) Date Nov. 25, 1996, PCT Pub. No. WO95/27109, PCT Pub. Date Oct. 12, 1995**
**PCT Filed Mar. 31, 1995, Ser. No. 718,345**
**Claims priority, application United Kingdom, Mar. 31, 1994, 9406438; Mar. 31, 1994, 9406439; Mar. 31, 1994, 9406443; Mar. 31, 1994, 9406545**
**Int. Cl.[6] B32B** *9/00*
**U.S. Cl. 428—178** **19 Claims**




1. A pre-fabricated double skin panel comprising two steel facing plates which, in use of the panel, are positioned one on each side of a layer of cementitious material and are connected thereto by transverse cross-members which extend generally normal to the facing plates and are attached thereto to define a double skin composite panel of steel and cementitious material, the panel being characterised in that the thickness of each facing plate is between 2 mm and 32 mm; the spacing between neighbouring cross-members is between 15 and 50 times the thickness of the facing plates; and the separation between the facing plates is between 100 mm and 800 mm.

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5,741,570
**FILM BLANK FOR PACKAGES**
**Gerhard Seufert, Im Rehwinkel 11, D-63150 Heusenstamm, Germany**
**Filed Jul. 19, 1996, Ser. No. 684,467**
**Claims priority, application European Pat. Off., Aug. 4, 1995, 95112338**
**Int. Cl.[6] B32B** *3/28*; **B29B** *7/00*; **B65D** *25/00*
**U.S. Cl. 428—167** **11 Claims**

1. Film blank for packages, said blank comprising a first film face (3) and a second film face (4) with a film thickness D therebetween, said blank having impressed fold lines (BL) in the form of elongate depressions (5), which extend into said first film face (3) and are closed to the second film face (4), in which the depressions (5) each have a base which comprises alternately along its length zones (8) of greater depth $T_2$ and zones (9) of lesser depth $T_1$ wherein the zones (9) of lesser depth $T_1$ are bounded by circular ares (10) each having a radius R of at least 1.1 mm and a

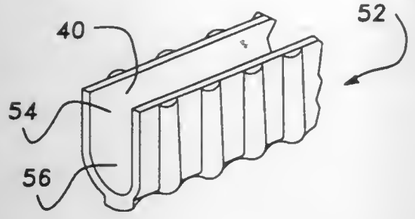
5,741,572
**HEAT FIXING PAPER OR SHEET**
**Jan Rose Heeg; Rolfe Frank Kruckas; Ashok Murthy; Stephen Todd Olson; Jeanne Marie Saldanha-Singh; Rita Sharma; Ajay Kanubhai Suthar, all of Lexington; Richard Barber Watkins, Frankfort, and Joe William Woods, Lexington, all of Ky., assignors to Lexmark International, Inc., Lexington, Ky.**
**Filed Feb. 17, 1995, Ser. No. 389,865**
**Int. Cl.[6] B32B** *3/00*
**U.S. Cl. 428—195** **16 Claims**

1. A flexible sheet for receiving printing consisting essentially of an outer layer firmly fixed to the body of said sheet for receiving printing; said outer layer being a resin comprising a blend of about one-half by weight of an ionomer resin and about one-half by weight of a non-ionomeric resin, said body of said sheet for receiving printing being a flexible paper or a transparent, non-ionomeric polyester resin.

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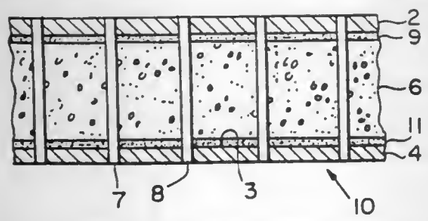
5,741,573
**RECYCLABLE PINCH FLANGE WELT AND METHOD OF MAKING SAME**
Douglas N. Malm, Northville, Mich., assignor to The Standard Products Company, Cleveland, Ohio
Filed Mar. 6, 1996, Ser. No. 611,726
Int. Cl.[6] B32B *3/02*; E06B *7/16*
U.S. Cl. 428—83 20 Claims




1. A molding member for a vehicle comprising:
an insert made of a first material, said insert having legs extending from a base portion in a manner that defines a U-shaped channel, said first material being a material that allows the legs to be flexible, said legs including a plurality of spaced-apart tines positioned on a common thin webbing made of the first material and extending from the base portion of the insert; and
an outer layer made of a second material completely formed around the insert such that the molding member is a U-shaped member, said first material being a more resilient material wherein than the second material, wherein the first material causes the insert to be resilient to such a degree that legs of the molding member return to an original position when forcibly separated apart, wherein the first and second materials are compatible materials so as to allow the molding member to be recycled as a single unit.

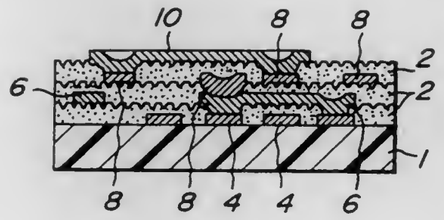
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5,741,574
**TRUSS REINFORCED FOAM CORE SANDWICH**
Joseph Santin Boyce, Hanover; Glenn Alexander Freitas, Foxboro, and Thomas Gerard Campbell, Concord, all of Mass., assignors to Foster-Miller, Inc., Waltham, Mass.
Continuation of Ser. No. 58,283, May 4, 1993, abandoned. This application May 3, 1995, Ser. No. 434,034
Int. Cl.[6] B32B *5/02*; *5/18*; *7/08*
U.S. Cl. 428—119 5 Claims




1. A reinforced foam core sandwich structure comprising:
opposing multi-layer laminate face sheets;
a foam core therebetween; and
a plurality of discrete supporting tow members encapsulated within said foam core forming a support structure therein, at least a number of said tow member extending into said face sheets to anchor the face sheets to the foam core to form a combined foam/tow member core wherein the compressive strength or shear strength of the combined foam/tow member core is greater than the compressive strength or shear strength, respectively, of the foam core alone or the tow members alone.

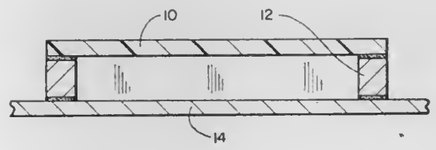
5,741,575
**ADHESIVE FOR PRINTED CIRCUIT BOARD**
Motoo Asai, and Chie Onishi, both of Gifu, Japan, assignors to Ibiden Co., Ltd., Gifu, Japan
Continuation of Ser. No. 469,881, Jun. 6, 1995, abandoned, which is a division of Ser. No. 248,209, May 24, 1994, Pat. No. 5,447,996, which is a division of Ser. No. 913,935, Jul. 17, 1992, Pat. No. 5,344,893. This application Dec. 17, 1996, Ser. No. 755,804
Claims priority, application Japan, Jul. 23, 1991, 3-205618
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—209 10 Claims




1. A printed circuit board comprising of a roughened adhesive layer formed on at least one surface of a substrate and a conductor circuit formed on the roughened adhesive layer, in which said adhesive layer is composed of an adhesive comprising an uncured heat-resistant resin matrix being insoluble in an acid or an oxidizing agent when being subjected to a curing treatment, and a cured fine powder of amino resin soluble in an acid or an oxidizing agent and dispersed thereinto.

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5,741,576
**OPTICAL PELLICLE WITH CONTROLLED TRANSMISSION PEAKS AND ANTI-REFLECTIVE COATINGS**
George Nein-Jai Kuo, Los Altos, Calif., assignor to Inko Industrial Corporation, Sunnyvale, Calif.
Filed Sep. 6, 1995, Ser. No. 524,724
Int. Cl.[6] B32B *7/02*; G02B *1/10*
U.S. Cl. 428—212 7 Claims




1. An optical pellicle comprising:
a membrane having an upper surface, a lower surface, and a thickness of about 0.61 μm±0.5 μm, said membrane having a wavelength transmission pattern with consecutive first and second maximum transmission peaks, said first maximum transmission peak corresponding to a wavelength of 365 nm and said second maximum transmission peak corresponding to a wavelength of 436 nm, and
an anti-reflective coating substantially coveting at least one of said upper and lower surfaces,
said pellicle transmitting at least 99 percent of light striking said pellicle having a wavelength of about 361 nm to 369 nm and at least 99 percent of light striking said pellicle having a wavelength of about 430 nm to 442 nm.



5,741,577
**MAGNETIC RECORDING MEDIUM HAVING A LUBRICANT LAYER WITH A SPECIFIED STRUCTURE OF A SPECIFIED PERFLUOROPOLYETHER LUBRICANT**
Yuzo Yamamoto; Yoshiyuki Nahata, and Shinji Yamada, all of Tochigi, Japan, assignors to Kao Corporation, Tokyo, Japan
Filed Nov. 9, 1995, Ser. No. 555,409
Claims priority, application Japan, Nov. 10, 1994, 6-276203; May 25, 1995, 7-126841
Int. Cl.[6] G11B *5/71*
U.S. Cl. 428—212 5 Claims

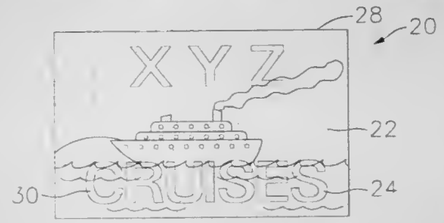
1. A magnetic recording medium comprising a substrate having thereon at least a magnetic layer and a lubricant layer, wherein said lubricant layer is an outermost layer and comprises a perfluoropolyether lubricant having a number average molecular weight of 800– 30,000 and represented by formula (1):

$$CF_3O-(CF_2O)_m-(CF_2CF_2O)_n-CF_3 \quad (1)$$

wherein m represents an integer of 2 or greater; n represents an integer of 1 or greater; and 7>m/n>2, and wherein said lubricant layer is composed of a layer comprising fixed lubricant molecules and a layer comprising free lubricant molecules, both synthesized by vapor phase polymerization, said fixed lubricant molecules being fixed to the surface of an underlying layer adjacent said lubricant layer, while said free lubricant molecules not being fixed to the surface of the underlaying layer, and wherein a carbon protective layer is present on said magnetic layer, and the lubricant layer is provided on said carbon protective layer.

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5,741,578
**ARTWORK COMPRISING OVERLYING IMAGES**
Sandra D. Sax, 7285 Rogers St., Las Vegas, Nev. 89118
Continuation-in-part of Ser. No. 259,781, Jun. 14, 1994, abandoned. This application Apr. 17, 1996, Ser. No. 633,923
Int. Cl.[6] B32B *7/02*
U.S. Cl. 428—212 26 Claims




1. A method for creating an artwork having overlaying images comprising:
providing a first image on a flexible, opaque substrate, said first image exhibiting a first reflective characteristic;
depositing a second image over the first image, said second image being transparent and exhibiting a second reflective characteristic, the artwork being viewed from an angle of reflection relative to the artwork revealing said second image.

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5,741,579
**HEAT-CONDUCTIVE SHEET**
Koji Nishizawa, Nagano-ken, Japan, assignor to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan
Filed Apr. 16, 1996, Ser. No. 633,495
Claims priority, application Japan, Apr. 28, 1995, 7-106271
Int. Cl.[6] B32B *7/02*; H01L *23/34*
U.S. Cl. 428—215 5 Claims

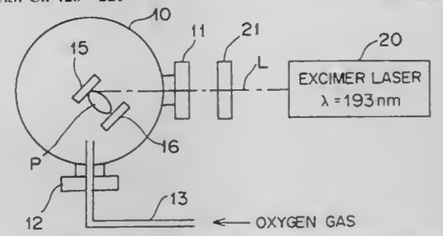
1. A heat-conductive sheet which is a composite laminar body comprising:




(A) a substrate sheet made from a material having a heat conductivity of at least 0.001 calorie/cm·second·°C.; and
(B) a deformable layer of a composite material having a thickness in the range from 0.005 to 1.0 mm formed on at least one surface of the substrate sheet, the composite material consisting of (a) a gelled organopolysioxane forming the matrix phase and (b) particles of a heat-conducting powder as the dispersed phase in the matrix phase and the composite material having a heat conductivity in the range from 0.001 to 0.005 calorie/cm·second·°C. and ¼-cone penetration in the range from 10 to 80 (×1/10 mm) at 25° C. according to JIS K 2220.

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5,741,580
**CRYSTALLINE THIN FILM AND PRODUCING METHOD THEREOF, AND ACOUSTOOPTIC DEFLECTION ELEMENT**
Shunichi Hayamizu, Amagasaki; Tomoji Kawai, Minoo, and Hitoshi Tabata, Takatsuki, all of Japan, assignors to Minolta Co, Ltd., Osaka, Japan
Filed Aug. 13, 1996, Ser. No. 696,149
Claims priority, application Japan, Aug. 25, 1995, 7-217099; Aug. 25, 1995, 7-217100; Aug. 25, 1995, 7-217101
Int. Cl.[6] B32B *7/00*; *7/02*
U.S. Cl. 428—221 43 Claims




1. A preparation method of a crystalline ZnO thin film formed on a glass member comprising:
irradiating a ZnO target with a laser beam in an atmospheric pressure of $O_2$ gas in the range between $7\times10^{-5}$ Torr and $1\times10^{-2}$ Torr; and
depositing a material generated by the irradiation on a glass member heated to a temperature in the range between 200° C. and 700° C.

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5,741,581
**ABSORBENT FOAM MATERIALS FOR AQUEOUS FLUIDS MADE FROM HIGH INTERNAL PHASE EMULSIONS HAVING VERY HIGH WATER-TO-OIL RATIOS**
Thomas Allen DesMarais, Cincinnati; Keith Joseph Stone, Fairfield; John Collins Dyer, Cincinnati; Bryn Hird, Cincinnati; Stephen Allen Goldman, Cincinnati, and Paul Seiden, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Division of Ser. No. 563,866, Nov. 29, 1995, Pat. No. 5,650,222, which is a continuation of Ser. No. 370,922, Jan. 10, 1995, abandoned. This application May 28, 1996, Ser. No. 655,041
Int. Cl.[6] C08J *9/28*
U.S. Cl. 428—284 14 Claims

1. A collapsible polymeric foam material which, upon contact with aqueous fluids, can expand and absorb said fluids, said poly-

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meric foam material comprising a hydrophilic, flexible, nonionic polymeric foam structure of interconnected open cells, which foam structure has:

A) a specific surface area per foam volume of at least about 0.025 $m^2$/cc;

B) at least about 0.1% by weight of a toxicologically acceptable hygroscopic, hydrated salt incorporated therein;

C) in its collapsed state, an expansion pressure of about 30 kPa or less;

D) a free absorbent capacity of from about 55 to about 100 mL/g;

E) a ratio of expanded to collapsed thickness of at least about 6:1; and

F) a resistance to compression deflection of about 40% or less when measured under a confining pressure of 0.74 psi.

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**5,741,582**

**BLACKOUT DRAPERY LINING WITH DUAL FABRIC SURFACES**

**Alexander J. Leaderman, Pikesville, and Stanley B. Fradin, Owings Mills, both of Md., assignors to Rockland Industries, Inc., Baltimore, Md.**

**Filed Sep. 8, 1995, Ser. No. 525,160**

**Int. Cl.[6] B32B** *7/12*

**U.S. Cl. 428—317.5** **23 Claims**

1. A blackout drapery lining comprising:

a first substrate of a textile material having an inner surface and an external surface, said external surface forming a first finished surface of said drapery lining;

a first adhesive layer having an opaque pigment adhered to said first substrate and coveting said inner surface of said first substrate to provide a substantially light impermeable barrier for said drapery lining; and

a second substrate of a textile material having an inner surface and an external surface, said inner surface of said second substrate being adhered to said first adhesive layer and said external surface of said second substrate forming a second finished surface of said drapery lining.

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**5,741,583**

**THERMAL TRANSFER RECORDING MATERIAL**

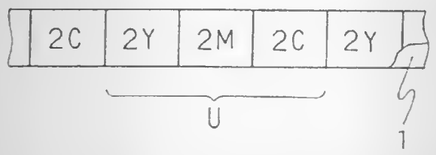
**Katsuhiro Yoshida, Osaka, Japan, assignor to Fujicopian Co., Ltd., Japan**

**Filed Oct. 8, 1996, Ser. No. 729,804**

**Claims priority, application Japan, Oct. 9, 1995, 7-261291**

**Int. Cl.[6] B41M** *5/38*

**U.S. Cl. 428—327** **9 Claims**




1. A thermal transfer recording material comprising a foundation and, provided thereon, a heat-meltable ink layer comprising at least an epoxy resin, a coloring agent and a particulate polytetrafluoroethylene,

the epoxy resin comprising not less than 50% by weight of at least one member selected from the group consisting of tetraphenolethane tetraglycidyl ether, cresol novolac polyglycidyl ether, bisphenol A diglycidyl ether and bisphenol F diglycidyl ether,

the content of the particulate polytetrafluoroethylene in the heat-meltable ink layer being from 1 to 60% by weight.

**5,741,584**

**CAST COATED PAPER FOR INK JET RECORDING, PROCESS FOR PRODUCING THE PAPER AND INK JET RECORDING METHOD USING THE PAPER**

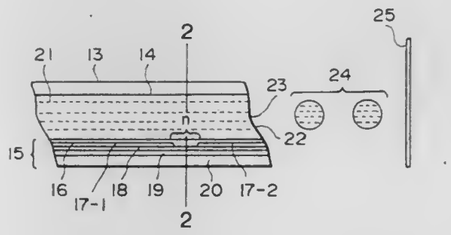
**Katsuyoshi Imabeppu, Itami; Shinichi Asano, Nishinomiya; Hiroyuki Ohashi, Neyagawa; Kazuhiro Nojima, Kobe; Eiichi Suzuki, Asaka, and Mamoru Sakaki, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, and Oji Paper Co., Ltd., both of Tokyo, Japan**

**Filed Oct. 19, 1995, Ser. No. 545,154**

**Claims priority, application Japan, Oct. 20, 1994, 6-255757**

**Int. Cl.[6] B41M** *5/00*

**U.S. Cl. 428—329** **45 Claims**




19. An ink jet recording method, comprising:

ejecting an aqueous ink through a minute orifice onto a cast coated paper, wherein said cast coated paper comprises in lamination, a base paper, an undercoating layer comprising alumina having a bulk density of 0.05 to 0.15 g/$cm^3$, and a cast coating layer comprising a resin.

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**5,741,585**

**POLYAMIC ACID PRECURSORS AND METHODS FOR PREPARING HIGHER MOLECULAR WEIGHT POLYAMIC ACIDS AND POLYIMIDEBENZOXAZOLE**

**William J. Harris, and Wen-Fang Hwang, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Apr. 24, 1995, Ser. No. 428,815**

**Int. Cl.[6] B29D** *22/00;* **C08G** *63/08*

**U.S. Cl. 428—357** **23 Claims**

1. A method for preparing a polyimidebenzoxazole polymer comprising:

(a) reacting an aromatic dianhydride, an aromatic diaminobenzoxazole and a bifunctional chain extender to form a polyimide precursor, one functional group of the chain extender being reactive with the amine of the aromatic diaminobenzoxazole or the anhydride of the aromatic dianhydride and the other functional group being an unsaturated group or a strained aromatic ring that do not form amic acid linkages, said reacting being performed in the presence of an aprotic polar solvent and at most about 5 mole percent water based on the total moles of dianhydride, aromatic diaminobenzoxazole and chain extender;

(b) curing the polyimide precursor to a conversion temperature of about 160° C. to about 280° C. for a time sufficient to convert at least a portion of the precursor to polyimidebenzoxazole and

(c) further heat treating at

(i) one temperature of at least about 350° C. to at most about 600° C. or

(ii) two or more successively higher temperatures that are higher than the conversion temperature to at most about 600° C. and at least one temperature is at least about 260° C.,



to form a polyimidebenzoxazole polymer having a tensile strength of at least about 35 Ksi.

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**5,741,586**

**MODIFIED POLYESTERS, PREPARATION THEREOF AND USE THEREOF**

**Dirk Zierer, Hofheim, and Peter Klein, Wiesbaden, both of Germany, assignors to Hoechst Trevira GmbH & Co. KG, Frankfurt am Main, Germany**

**Filed Apr. 1, 1997, Ser. No. 831,527**

**Claims priority, application Germany, Apr. 2, 1996, 196 13 187.1**

**Int. Cl.[6] D02G** *3/00;* **C08G** *63/18*

**U.S. Cl. 428—364** **12 Claims**

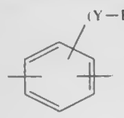
1. A polyester containing at least 0.1 mol % of the structural repeat units of the formula I and optionally up to 99.9 mol % of the structural repeat units of the formula II

$$-O-OC-Ar^1-CO-O-R^1- \quad (I),$$

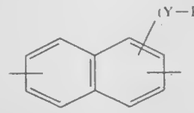
$$-O-OC-Ar^2-CO-O-R^2- \quad (II),$$

where

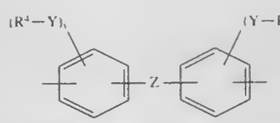
$Ar^1$ is a radical of the formula III and/or of the formula IV and/or of the formula V




(III)




(IV)




(V)

$Ar^2$ is a bivalent mono- or polycyclic aromatic radical which differs from the radicals of the formulae III, IV and V,

$R^1$ and $R^2$ are independently of each other a bivalent cycloaliphatic radical derived from cyclohexanedimethanol, a radical of the formula $-C_nH_{2n}-$ and/or a radical of the formula $-[C_mH_{2m}-O-]_x-C_mH_{2m}-$,

where

n is an integer between 2 and 10,

m is an integer between 2 and 10, and

x is an integer from 1 to 20,

Y is a direct C—C bond, —$NR^3$—, —S— or —O—,

Z is a direct C—C bond or a bridging group —O—, —$C_qH_{2q}$—, —S—, —CO— or —$SO_2$—,

q is an integer from 1 to 10,

$R^3$ is a univalent aliphatic, cycloaliphatic, aromatic or araliphatic radical,

$R^4$ is a radical of the formula —$C_pH_{2p+1}$ and/or a radical of the formula —$[C_pH_{2p}-O-]_y-R^5$,

$R^5$ is a univalent aliphatic, cycloaliphatic, aromatic or araliphatic radical,

o is an integer from 6 to 30,

p is an integer from 2 to 10,

y is an integer from 1 to 4, and

z is an integer from 1 to 10.

**5,741,587**

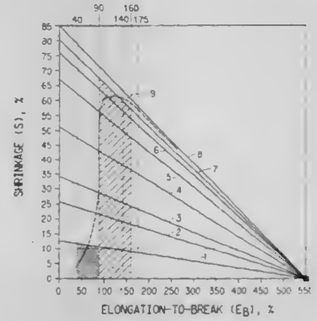
**HIGH FILAMENT COUNT FINE FILAMENT POLYESTER YARNS**

**David George Bennie, Rocky Point; Robert James Collins, Wilmington; Hans Rudolf Edward Frankfort, Kinston; Stephen Buckner Johnson; Benjamin Hughes Knox, both of Wilmington; Joe Forrest London, Jr., Greenville; Elmer Edwin Most, Jr., Durham, and Girish Anant Pai, Matthews, all of N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 221,306, Mar. 31, 1994, abandoned, which is a continuation-in-part of Ser. No. 93,156, Jul. 23, 1993, Pat. No. 5,417,902, Ser. No. 214,096, Mar. 16, 1994, abandoned, and Ser. No. 214,717, Mar. 16, 1994, Pat. No. 5,487,859, which is a continuation-in-part of Ser. No. 925,042, Aug. 5, 1992, abandoned, Ser. No. 5,672, Jan. 19, 1993, Pat. No. 5,288,553, and Ser. No. 15,733, Feb. 10, 1993, Pat. No. 5,250,245, said Ser. No. 93,156 is a continuation-in-part of Ser. No. 926,538, Aug. 5, 1992, abandoned, Ser. No. 5,672, and Ser. No. 15,733, said Ser. No. 214,096 is a continuation-in-part of Ser. No. 925,041, Aug. 5, 1992, abandoned, Ser. No. 5,672, and Ser. No. 15,733, each which is a continuation-in-part of Ser. No. 860,776, Mar. 27, 1992, abandoned, Ser. No. 647,381, Jan. 29, 1991, abandoned, and Ser. No. 647,371, Jan. 29, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 475,141**

**Int. Cl.[6] B32B** *5/22*

**U.S. Cl. 428—365** **4 Claims**




1. A unitary multi-filament polyester yarn, wherein the polyester polymer has a relative viscosity (LRV) of 13 to 23 and a zero-shear melting point ($T_m$°) of 240° to 265° C., wherein the filaments of said multi-filament yarn are at least 150 flat filaments of denier 0.5 to 2.2 that show unitary filament entanglement, and wherein said yarn has an elongation-to-break ($E_B$) of 40 to 160%, a normalized yarn tenacity-at-break-denier $(T_B)_n$ of at least 5 g/dd, and where $(T_B)_n$= Tenacity(g/d)(RDR), (20.8/LRV)$^{0.75}$, and where (RDR), is the residual spun draw ratio and is defined by (RDR),=[1+($E_B$)/100], and an along-end draw tension coefficient of variation (DTV, %) of less than 1%.

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**5,741,588**

**CARBON FIBERS FOR ENHANCING THE ELECTRICAL CONDUCTIVITY OF A PRODUCT**

**Joseph Thomas Ford, Chester; Dennis Walter Gallimore, and Stephen John Gallimore, both of Merseyside, all of United Kingdom, assignors to Solatrim Limited, Clwyd, Wales**

**Filed Aug. 10, 1995, Ser. No. 513,629**

**Claims priority, application United Kingdom, Mar. 31, 1995, 9506715**

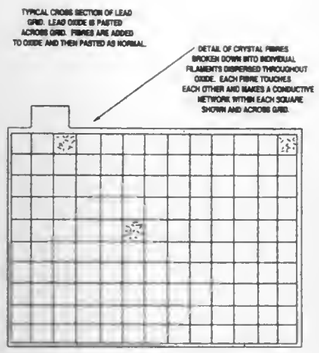
**Int. Cl.[6] B32B** *9/00;* **H01M** *4/86*

**U.S. Cl. 428—367** **19 Claims**

1. Crystal carbon fibers for enhancing electrical conductivity having a diameter of about 4 to 7 micrometers and chopped to a

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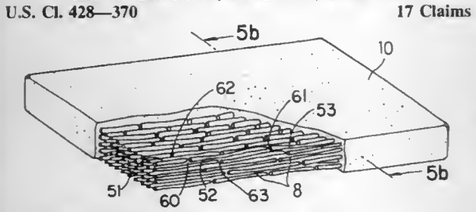

length of about 0.5 to 3.00 mm, said fibers being coated with a surfactant prior to chopping to said chopped length.

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**5,741,589**
**CONSTRUCTION MATERIAL MADE OF WOODY MATERIAL AND MORTAR**

**Tsuyoshi Fujii, and Atsushi Miyatake, both of Ibaragi-ken, Japan, assignors to The Forestry and Forest Products Research Institute, Ibaragi-ken, Japan**

**Filed Mar. 28, 1996, Ser. No. 623,213**
**Int. Cl.[6] D02G *3/00*; E04C *3/330*; B32B *3/00***
**U.S. Cl. 428—370** **17 Claims**




1. A woody structural member, comprising:
at least first and second layers each comprising a plurality of elongated split members obtained by splitting a woody material along a fiber direction, said plurality of elongated members in said first and second layers being arranged substantially parallel to one another in respective paths, each path in said first and second layers having at least two elongated members arranged substantially collinearly therein and being separated by a corresponding gap, with the gaps between the elongated members in the paths of said second layer being offset relative to the gaps between the elongated members in corresponding paths of said first layer; and
mortar for covering said elongated members;
said mortar being molded and solidified to a predetermined shape.

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**5,741,590**
**IRIDESCENT FABRICS**

**Henry Kobsa, Greenville, Del.; Barry Rubin, Glen Mills, Pa.; Stephen Marshall Shearer; James Edmond Van Trump, both of Wilmington, Del., and Walter P. Warren, Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Continuation of Ser. No. 128,491, Sep. 28, 1993, abandoned. This application Sep. 15, 1995, Ser. No. 528,962**
**Int. Cl.[6] D06P *1/00;3/82;3/854*; D01F *8/14***
**U.S. Cl. 428—373** **18 Claims**

1. A dyed fabric having predominantly straight and parallel yarn sections on the fabric surface and in which said yarn sections consist essentially of continuous, round concentric sheath-core polymeric filaments wherein the sheath and the cord are polyester and/or polyamide and the core of each of said filaments constitutes from 15 to 30 volume percent of the filament and is dyed a color different from that of the sheath so that said yarn sections exhibit a change in color which is dependent upon a change in the angle at which the fabric is viewed.

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**5,741,591**
**MICROCAPSULES, AND ENCAPSULATION METHOD THEREFOR**

**Nansei Tashiro, Sodegaura-machi, Japan, and Osamu Maruyama, Jakarta, Indonesia, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan**

**Continuation of Ser. No. 190,586, Feb. 2, 1994, Pat. No. 5,556,583, which is a continuation of Ser. No. 677,185, Mar. 29, 1991, abandoned. This application Oct. 17, 1995, Ser. No. 544,056**
**Int. Cl.[6] B01J *13/02;13/22***
**U.S. Cl. 428—402.24** **10 Claims**

1. An encapsulation method wherein one or more hydrophobic liquid and/or solid materials are encapsulated by a process including the steps of:
a) preparing an organic phase consisting of a mixture of:
i) self-dispersible resin which through the action of an aqueous phase, is self-dispersible into particles with a diameter up to about 0.1 μm;
ii) said one or more hydrophobic liquid and/or solid materials;
b) combining an aqueous phase with said organic phase in the absence of emulsifier, whereby said one or more hydrophobic liquid and/or solid materials become encapsulated by said self-dispersible resin.

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**5,741,592**
**MICROSENCAPSULATED SYSTEM FOR THERMAL PAPER**

**Maurice W. Lewis; John C. Rosenbaum, both of Dayton; Albert J. Herbert, Oxford, all of Ohio, and Pankaj Attri, Roorkee, India, assignors to NCR Corporation, Dayton, Ohio**

**Filed Dec. 20, 1995, Ser. No. 575,656**
**Int. Cl.[6] B41M *5/26;5/40***
**U.S. Cl. 428—402.24** **14 Claims**

1. A coating formulation which provides thermal sensitive coatings for thermal paper, said coating formulation comprising:
(a) microcapsules containing solid particles of a homogenous blend of a colorless dye and a sensitizer, said sensitizer which is free of color develops having a melting point below that of the colorless dye, wherein the homogenous blend melts at a temperature below the melting point of the colorless dye and below the operating temperature of a thermal print head of a thermal printer in the range of 50° C. to 250° C.;
(b) solid particles of a color developer; and
(c) a liquid vehicle for the microcapsules of (a), and particles of (b);
wherein the colorless dye develops color when exposed and reacted with the color developer; and
wherein the microcapsule is impermeable to said colorless dye at room temperature but ruptures to expose and react the colorless dye with the color developer at the operating temperature of a thermal print head of a thermal printer in the range of 50° C. to 250° C.

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**5,741,593**
**MAGNETIC RECORDING MEDIUM**

**Hirofumi Kondo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed May 17, 1991, Ser. No. 701,833**
**Int. Cl.[6] G11B *5/66***
**U.S. Cl. 428—422** **2 Claims**

1. A magnetic recording medium comprising:
a nonmagnetic substrate.



a magnetic thin film layer on said substrate, and
a lubricant layer on said magnetic layer,
wherein said lubricant layer is a single compound having the formula:

$$RN^+H_3O\ OCR_f^-COO\ H_3N^+R \quad (2)$$

wherein R is a straight chain hydrocarbon group which has at least eighteen carbon atoms, and $Rf_2$ is $-(OCR_2CF_2)_j-(OCR_2)_k-$, wherein j and k are each an integral number.

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**5,741,594**
**ADHESION PROMOTER FOR A LAMINATE COMPRISING A SUBSTANTIALLY LINEAR POLYOLEFIN**

**Gary L. Jialanella, 2005 Laurel La., Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Aug. 28, 1995, Ser. No. 520,149**
**Int. Cl.[6] B32B *27/32***
**U.S. Cl. 428—424.2** **16 Claims**

1. A laminate comprising:
a) a first substrate comprising a first substantially linear olefin copolymer;
b) an adhesion promoter superposing the first substrate, which adhesion promoter comprises a polar group functionalized second substantially linear olefin copolymer;
c) a tackifying resin admixed with the adhesion promoter, or an adhesive superposing the adhesion promoter or admixed therewith; and
d) a second substrate adhesively bonded to the first substrate through the adhesion promoter and the tackifying resin or adhesive;
wherein the first and the second substantially linear olefin polymers are characterized by having:
i) an $M_w/M_n$ of less than about 3.5;
ii) an $I_{10}/I_2$ of at least 5.63; and
iii) a critical shear rate at the onset of surface melt fracture of at least 50 percent greater than the critical shear rate at the onset of surface melt fracture of a linear olefin polymer having the same melt index and $M_w/M_n$; each olefin polymer being further characterized as a copolymer of ethylene and a $C_3$–$C_{20}$ α-olefin.

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**5,741,595**
**ULTRAVIOLET OPTICAL PART HAVING COAT OF ULTRAVIOLET OPTICAL THIN FILM, AND WAVELENGTH-CHANGING DEVICE AND ULTRAVIOLET LIGHT SOURCE UNIT HAVING COAT OF ULTRAVIOLET OPTICAL THIN FILM**

**Hiroyuki Wada, Kanagawa; Nobuhiko Umezu, Chiba; Minehiro Tonosaki, and Michio Oka, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Nov. 15, 1996, Ser. No. 749,632**
**Claims priority, application Japan, Nov. 17, 1995, 7-300060**
**Int. Cl.[6] B32B *17/06***
**U.S. Cl. 428—426** **9 Claims**

1. An ultraviolet optical part for use with ultraviolet rays continuously generated in a wavelength of 200 through 300 nm, comprising an optical component and an ultraviolet optical thin film formed on said optical component, wherein said ultraviolet optical thin film comprises a material having a thermal conductivity of 0.01 $J \cdot cm^{-1} \cdot sec^{-1} \cdot K^{-1}$ or greater.

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**5,741,596**
**COATING FOR OXIDATION PROTECTION OF METAL SURFACES**

**Raymund P. Skowronski, Woodland Hills, and David Kramer, Port Hueneme, both of Calif., assignors to Boeing North American, Inc., Seal Beach, Calif.**

**Filed Feb. 21, 1989, Ser. No. 313,002**
**Int. Cl.[6] B32B *15/04*; B22F *3/00*; B05D *5/12***
**U.S. Cl. 428—457** **30 Claims**

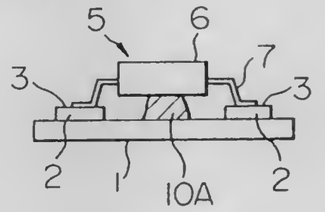
1. A coating on a metal substrate for oxidation protection of metal surfaces thereof which comprises:
a first layer of a glass-ceramic selected from the group consisting of (a) baria, silica, and alumina, (b) silica-alumina, and (c) baria-silica,
a second layer comprising alumina or silicon carbide, and
a third layer comprised of silica or a high silica material.

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**5,741,597**
**BOND FOR TACKING AN ELECTRONIC PART**

**Tadahiko Sakai, Fukuoka, and Shinichi Kuroki, Kagoshima, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Division of Ser. No. 190,605, Feb. 2, 1994, Pat. No. 5,447,267. This application May 30, 1995, Ser. No. 453,963**
**Claims priority, application Japan, Nov. 24, 1992, 4-313089; Feb. 8, 1993, 5-019805**
**Int. Cl.[6] B23K *35/36***
**U.S. Cl. 428—457** **2 Claims**




1. A combination of a tacking bond and solder, used in conjunction with said tacking bond, for fixing an electronic part to a circuit board, said combination comprising (a) synthetic resin mixed with a hardener for curing said synthetic resin and (b) a solder which is used for electrically connecting said electronic part to said circuit board, said hardener having a melting temperature higher than that of said solder.

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**5,741,598**
**POLYIMIDE/METAL COMPOSITE SHEET**

**Akinori Shiotani; Hiroaki Yamaguchi; Fumio Aoki, and Katsutoshi Washio, all of Chiba, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan**

**Filed Jul. 31, 1996, Ser. No. 690,107**
**Claims priority, application Japan, Aug. 1, 1995, 7-196537; Aug. 1, 1995, 7-196538; May 31, 1996, 8-138551**
**Int. Cl.[6] B32B *15/08***
**U.S. Cl. 428—458** **6 Claims**



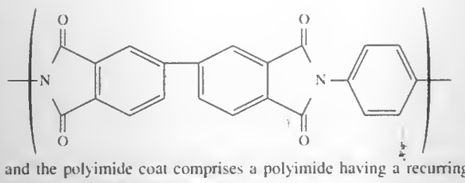

1. A composite sheet comprising, in this order, a polyimide substrate film, a polyimide coat, and a metal film, wherein the

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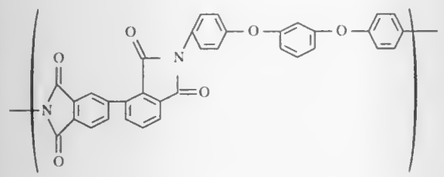
polyimide substrate film comprises a polyimide having a recurring unit of the following formula (1):

(1)



and the polyimide coat comprises a polyimide having a recurring unit of the following formula (2):

(2)



5,741,599

**POLYIMIDE COMPOSITIONS FOR ELECTRODEPOSITION AND COATINGS FORMED OF THE SAME**

**Yoshihiro Oie, Tokyo; Hiroshi Itatani, Chiba-ken; Shinichi Furusaki, Kanagawa-ken; Yuji Yamazaki, Tochigi-ken, and Sadakazu Hokamura, Kanagawa-ken, all of Japan, assignors to PI Materials Research Laboratory, Kanagawa-ken, Japan**

**Filed Oct. 10, 1996, Ser. No. 728,477**

**Claims priority, application Japan, Oct. 12, 1995, 7-264353**

**Int. Cl.[6] B32B** *15/08;* **C08G** *73/10;* **C09D** *179/08*

**U.S. Cl. 428—458** **7 Claims**

1. A polyimide composition for electrodeposition comprising a neutral salt of a polyimide which is the product of reaction between an aromatic tetracarboxylic dianhydride and an aromatic diamine, a polar solvent that dissolves said polyimide, water and a poor solvent for said polyimide, said polyimide being prepared using an aromatic diaminocarboxylic acid as part of said aromatic diamine.

6. A board comprising an electroconductive material and a electrodeposited coating containing the polyimide composition set forth in claim 1.

5,741,600

**ABSORBABLE COATING AND BLEND**

**James R. Olson, Norwich, Conn., assignor to Deknatel Technology Corporation, Inc., Fall River, Mass.**

**Division of Ser. No. 944,861, Sep. 14, 1992, Pat. No. 5,380,780, which is a continuation of Ser. No. 291,486, Dec. 29, 1988, abandoned. This application Nov. 18, 1994, Ser. No. 345,386**

**Int. Cl.[6] C08J** *5/10;* **B32B** *27/08*

**U.S. Cl. 428—474.4** **7 Claims**

1. An absorbable controlled release matrix for the release of a chemical or pharmaceutical agent comprising a chemical or pharmaceutical agent, a blend of about 95 to 5% by weight of a homopolymer of ∈-caprolactone and about 5 to about 95% by weight of a crystallization modifier selected from the group consisting of crystalline fatty acids and crystalline esters of fatty acids which are saturated $C_{12}$–$C_{18}$ fatty acid esters of polyhydric alcohols.

5,741,601

**POLYAMIDE FILM AND PROCESS FOR PRODUCING THE SAME**

**Minoru Kishida; Masanobu Hinki, and Junko Kobayashi, all of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan**

**Filed Jan. 31, 1996, Ser. No. 594,165**

**Int. Cl.[6] B32B** *27/06;* **C08J** *11/00;* **B29C** *55/00*

**U.S. Cl. 428—474.4** **8 Claims**

1. A polyamide film having been drawn at a draw ratio of 2 or more in at least one direction, which comprises a polyamide resin composition comprising from 90 to 99.99% by weight of a polyamide and from 10 to 0.01% by weight of a fluoromica-based mineral with swelling characteristics, said weight percentages being based on the total amount of the polyamide and the fluoromica-based mineral.

5,741,602

**HEAT-CURABLE COATING COMPOSITION COMPRISING PLURALITY OF BINDER RESINS**

**Manfred Hoppe; Andreas Kaplan, and René Gisler, all of Chur, Switzerland, assignors to EMS-Inventa AG, Zurich, Switzerland**

**Filed Aug. 23, 1995, Ser. No. 518,273**

**Claims priority, application Germany, Aug. 26, 1994, 44 30 400.5**

**Int. Cl.[6] B32B** *27/36;* **B05D** *1/06;1/24;* **C08G** *63/685*

**U.S. Cl. 428—482** **20 Claims**

1. A heat-curable, epoxy-free powder coating composition for preparing matt coatings, comprising

a dry blend of at least two different coating powders, each said coating powder comprising a binder resin comprised of

(a) a carboxyl-terminated polyester resin having an acid value from 20 to 200 mg KOH/g and a glass transition temperature of at least 40° C., and

(b) a β-hydroxyalkylamide component selected from the group consisting of

(i) a β-hydroxyalkylamide with at least two β-hydroxyalkylamide groups per molecule,

(ii) a mixture of at least two multifunctional β-hydroxyalkylamides, and

(iii) a mixture of (i) and (ii), and

wherein said binder resins of said at least two coating powders differ from one another in (1) the number of carboxyl groups per binder resin molecule, (2) the number of β-hydroxyalkylamide groups per binder resin molecule, or (3) both the number of carboxyl groups per binder resin molecule and the number of β-hydroxylalkylamide groups per binder resin molecule.

5,741,603

**OPTICAL DISC**

**Koichi Yasuda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 564,640, Nov. 29, 1995, Pat. No. 5,657,310. This application Apr. 3, 1997, Ser. No. 832,102**

**Claims priority, application Japan, Nov. 29, 1994, 6-294916**

**Int. Cl.[6] B32B** *3/00*

**U.S. Cl. 428—641** **1 Claim**

1. An optical disc comprising:

a transparent substrate;

a phase-changing material layer disposed of said transparent substrate and made of a material which is phase-changeable by radiation of a light beam, said phase-changing material selected from the group consisting of As-Te-Ge series films, Te-Ge-Sn series films, Te-Ge-Sn-O series films, Te-Se series films, Sn-Te-Se series films, Te-Ge-Sn-Au series films, Ge-Sb-Te series films, Sb-Te-Se series films, In-Se-Tl series films, In-Sb series films, In-Sb-Se series films, Ag-Zn alloy films, Cu-Al-Ni alloy films, In-Se-Tl-Co series films, Si-Te-Sn series films, a thin film layer of $TeO_x$ wherein x represents a number greater than 0 but less than 2, a portion of said phase-changing material layer being changeable to a liquid phase when the portion is radiated by the light beam and then the liquid phase portion is rapidly cooled to form an amorphous phase portion which has a different reflection coefficient from that of an inherent crystal phase of said phase-changing material layer;

a reflecting film layer disposed on said phase-changing material layer;

a cooling layer disposed between said phase-changing material layer and said reflecting layer; and

further comprising a protective layer which is interposed between said phase-changing material layer and said cooling layer;

wherein,

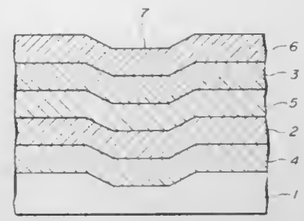
said cooling layer is formed of $Al_2O_3$, AlN, $Al_2S_3$, ZnS, $ZnO_2$, $SiO_2$, $Si_3N_4$, SiC or $SIS_2$,

said cooling layer has a heat conductivity ranging from 0.25 J/cmKs to 20.00 J/cmKs and an energy gap of 3 eV or greater;

a portion of said phase-changing material layer is changeable to a liquid phase when the portion is radiated by a write beam and then the liquid phase portion is rapidly cooled to form an amorphous phase portion which has a different reflection coefficient from that of an inherent crystal phase of said phase-changing material layer, and

said cooling layer functions as a protective layer.






5,741,604

**DIFFUSION BARRIER LAYERS**

**Martin J. Deakin, Olney, and John R. Nicholls, Great Horwood, both of Great Britain, assignors to The Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland of Defence & Evaluatinn Research Agency,DRA, United Kingdom**

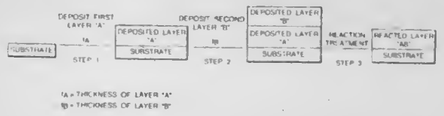
**PCT No. PCT/GB94/00301, § 371 Date Oct. 25, 1995, § 102(e) Date Oct. 25, 1995, PCT Pub. No. WO94/18359, PCT Pub. Date Aug. 18, 1994**

**PCT Filed Feb. 15, 1994, Ser. No. 505,198**

**Claims priority, application United Kingdom, Feb. 15, 1993, 9302978**

**Int. Cl.[6] B32B** *15/01*

**U.S. Cl. 428—660** **11 Claims**




1. A method of producing a metallic high temperature article comprising a metallic substrate, a protective coating and a continuous uniform intermetallic diffusion barrier layer positioned between said substrate and said protective coating, said diffusion barrier layer comprising a first metal, A, said first metal having a molecular weight $M_A$ and density $p_A$ and a second metal, B, said second metal having a molecular weight $M_B$ and density $p_B$ in proportion x moles A to y moles B, the method comprising the steps of:

(a) depositing at least a first layer of said first metal on the surface of the metallic substrate, said first layer being of thickness $t_A$;

(b) depositing at least a second layer of said second metal on the surface of said first metal, said second layer being of a thickness $t_B$, the ratio of said thickness $t_A$:$t_B$ being substantially equal to the ratio:

$$\frac{xM_A}{\rho_A} : \frac{yM_B}{\rho_B}$$

(c) reaction treating to a sufficiently high temperature to initiate an exothermic reaction thereby causing said first and second metals to combine to form a stable, continuous uniform intermetallic diffusion barrier layer formed of an intermetallic species; and

(d) depositing said protective coating on the surface of said intermetallic diffusion barrier layer.

5,741,605

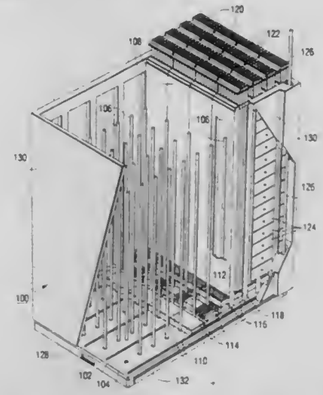
**SOLID OXIDE FUEL CELL GENERATOR WITH REMOVABLE MODULAR FUEL CELL STACK CONFIGURATIONS**

**James E. Gillett, Greensburg; Jeffrey T. Dederer, Valencia; Paolo R. Zafred, and Jeffrey C. Collie, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Mar. 8, 1996, Ser. No. 613,399**

**Int. Cl.[6] H01M** *8/10*

**U.S. Cl. 429—31** **23 Claims**




1. A fuel cell generator apparatus, comprising: a pre-assembled self-supporting removable modular fuel cell stack comprising:

a generally planar base;

a fuel cell stack mounted on said base; and

an outer fuel cellstack housing connected to said base and extending upwardly from the sides thereof defining a chamber generally enclosing the sides of said fuel cell stack, where the fuel cell stack comprises;

a plurality of electrically interconnected elongated tubular solid oxide fuel cells mounted to said base, each fuel cell having an air electrode, a fuel electrode, and an electrolyte disposed between the two electrodes;

an oxidant distribution channel connected to said fuel cells in fluid flow communication with said air electrodes of said fuel cells for transferring oxidant to said air electrodes; and,

a fuel distribution channel connected to said fuel cells in fluid flow communication with said fuel electrodes of said fuel cells for transferring fuel to said fuel electrodes; and,

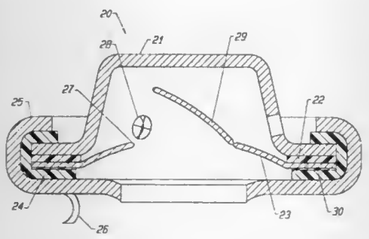
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a fuel cell generator container comprising an outer generator housing containing at least one fuel cell stack compartment within said outer generator housing for receiving said pre-assembled self-supporting removable modular fuel cell stack.

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**5,741,606**
**OVERCHARGE PROTECTION BATTERY VENT**
**Steven T. Mayer, San Leandro, and John C. Whitehead, Davis, both of Calif., assignors to Polystor Corporation, Dublin, Calif.**
**Filed Jul. 31, 1995, Ser. No. 509,531**
**Int. Cl.[6] H01M 2/12**
**U.S. Cl. 429—53** **27 Claims**

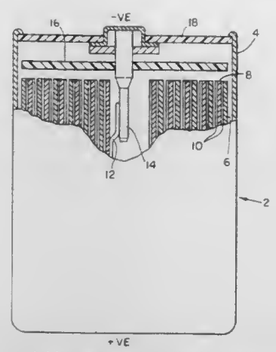



1. A cell cap subassembly for controlling pressure build-up in a cell, said cell cap subassembly comprising:
a terminal contact for making electrical contact with an external circuit;
a flip-burst disk having a substantially dome shaped flip portion and a rim portion connected to and located outside of said flip portion, said rim portion making electrical contact with said terminal contact, said flip portion protruding away from said terminal contact under a pressure that is below a first defined pressure, but at said first defined pressure inverting such that it protrudes toward said terminal contact, said flip-burst disk also having a pressure rupturable region that ruptures when the battery cell cap assembly is exposed to a second defined pressure which is greater than the first defined pressure; and
a conductive pathway making electrical contact with said flip portion of said flip-burst disk, said conductive pathway providing at least a portion of a pathway for electrons between an electrode and a pressure sensitive contact, wherein when said battery cell cap assembly is exposed to at least said first defined pressure, said flip portion inverts and opens electrical contact with said conductive pathway.

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**5,741,607**
**RECHARGEABLE ELECTROCHEMICAL CELL**
**Alexander Gilmour, Henley-on-Thames, United Kingdom, assignor to Lexcel Technology Limited, Oxon, United Kingdom**
**PCT No. PCT/GB95/01337, § 371 Date Dec. 11, 1996, § 102(e) Date Dec. 11, 1996, PCT Pub. No. WO95/34920, PCT Pub. Date Dec. 21, 1995**
**PCT Filed Jun. 8, 1995, Ser. No. 765,154**
**Claims priority, application United Kingdom, Jun. 16, 1994, 9412045**
**Int. Cl.[6] H01M 4/58;10/40**
**U.S. Cl. 429—94** **12 Claims**

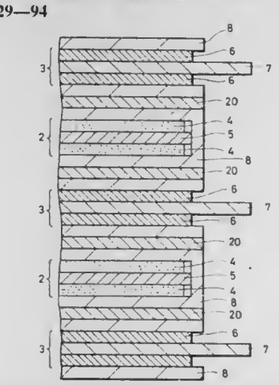
1. A rechargeable electrochemical cell comprising a positive electrode, a negative electrode and an electrolyte, the positive electrode being such that it is a composition of an alkali or alkaline earth salt of a sulphur oxy-acid and a transition metal oxide, and the electrolyte being such that it is a non-aqueous electrolyte




containing a soluble salt of the alkali or alkaline earth metal dissolved in the non-aqueous electrolyte.

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**5,741,608**
**MULTI-LAYER TYPE NONAQUEOUS ELECTROLYTE SECONDARY CELL**
**Kazuya Kojima; Yasuo Yukita; Nobuhiro Fujiwara, all of Kanagawa, and Yukio Noda, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan**
**Filed Dec. 12, 1996, Ser. No. 766,574**
**Claims priority, application Japan, Dec. 12, 1995, 7-323257**
**Int. Cl.[6] H01M 2/16:10/40**
**U.S. Cl. 429—94** **20 Claims**



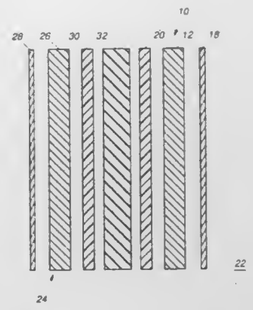

1. A multi-layer nonaqueous electrolyte secondary cell comprising:
a negative electrode, a thermally fusible resin micro-porous film, and a positive electrode disposed in stacked relation to form an electrode stack, said electrode stack further comprising a heat resistant porous film layer disposed in said electrode stack adjacent the thermally fusible resin microporous film, said heat resistant porous film layer comprising an inorganic or an organic temperature resistant sheet material exhibiting heat resistance to temperatures of at least about 600° C.

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**5,741,609**
**ELECTROCHEMICAL CELL AND METHOD OF MAKING SAME**
**Dong Chen, Duluth; Anaba A. Anani, Lawrenceville, and Zhenhua Mao, Duluth, all of Ga., assignors to Motorola, Inc., Schaumburg, Ill.**
**Filed Jul. 22, 1996, Ser. No. 684,758**
**Int. Cl.[6] H01M 10/40**
**U.S. Cl. 429—192** **16 Claims**

1. An electrochemical cell having electrode material capable of reversible intercalating and de-intercalating lithium ions, said cell






comprising a first and a second electrode assembly, each electrode assembly having a thickness of less than about 300 μm, an electrolyte layer disposed between said first and second electrode assemblies, and an ionically conducting adhesive layer operatively disposed between said electrolyte layer and at least one of said electrode assemblies.

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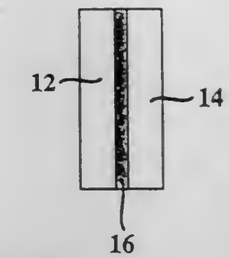
**5,741,610**
**ELECTROLYTIC MEMBRANE AND PROCESS FOR ITS PHOTO-CROSSLINKING ON A CATHODIC MEMBRANE**
**Maria Andrei, Berceto; Federico Capuano, Rieti, and Massimo Soprani, Borgosesia, all of Italy, assignors to Enitricerche S.p.A., Milan, and Olivetti Personal Computers S.p.A., Ivrea, both of Italy**
**Filed Oct. 30, 1996, Ser. No. 740,562**
**Claims priority, application Italy, Nov. 17, 1995, MI95A2369**
**Int. Cl.[6] H01M 6/16**
**U.S. Cl. 429—192** **6 Claims**

1. An electrolytic membrane for light rechargeable batteries essentially consisting of:
1) polymer deriving from the photopolymerization of a mixture essentially consisting of a vinyl ether having the general formula (I) $R—[—O—CH_2CH_2—]_n—O—CH=CH_2$, wherein R represents a methyl or an ethyl and n is an integer between 1 and 16; and a divinyl ether having the general formula (II) $CH_2=CH—[—O—CH_2—CH_2—]_m—O—CH=CH_2$, wherein m is an integer between 1 and 10; the molar ratio between (I) and (II) being from 98/2 to 40/60; in a quantity of between 15 and 60% by weight;
2) plasticizer in a quantity of between 35 and 75% by weight;
3) Lithium salt in a quantity of between 5 and 20% by weight;
4) photopolymerization initiator in such a quantity as to photopolymerize (I) and (II);
5) zeolite in a quantity of between 3 and 30% by weight; the percentage sum of components (1) to (5) being equal to 100.

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**5,741,611**
**METHOD OF PREPARING AN ELECTROCHEMICAL SYSTEM OPERATED AT AMBIENT TEMPERATURES**
**Niles A. Fleischer; Joost Manassen, both of Rehovot, and Steve Daren, Nes Ziona, all of Israel, assignors to E.C.R. - Electro-Chemical Research Ltd., Yavne, Israel**
**Division of Ser. No. 697,835, Aug. 28, 1996, Pat. No. 5,643,689. This application Feb. 26, 1997, Ser. No. 805,414**
**Int. Cl.[6] H01M 6/18**
**U.S. Cl. 429—192** **2 Claims**

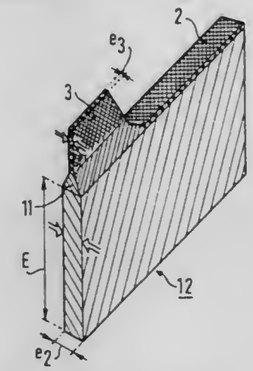
1. A method of preparing an electrochemical system selected from the group consisting of batteries, fuel cells, capacitors and electrolizers, operated at ambient temperatures, the method comprising the steps of:
(a) dissolving a matrix polymer and an acidic multimer in a first solvent to obtain a homogenous solution;
(b) pouring said homogenous solution onto a surface; and




(c) evaporating said first solvent and therefore obtaining a non-liquid proton conductor membrane; and
(d) interposing said non-liquid proton conductor membrane in an electrical contact between an anode plate and a cathode plate;
wherein, said matrix polymer is selected such that when said non-liquid proton conductor membrane is contacted with a second solvent, said non-liquid proton conductor membrane swells and as a result said electrical contact improves.

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**5,741,612**
**ELECTRODE PLATE FOR AN ELECTROCHEMICAL CELL AND HAVING A METAL FOAM TYPE SUPPORT, AND A METHOD OF MANUFACTURING SUCH AN ELECTRODE PLATE**
**Roelof Verhoog, and Donald Stewart, both of Bordeaux, France, assignors to SAFT, Romainville, France**
**Continuation of Ser. No. 665,504, Jun. 18, 1996, abandoned, which is a continuation of Ser. No. 267,236, Jun. 29, 1994, Pat. No. 5,578,397. This application May 12, 1997, Ser. No. 855,898**
**Claims priority, applicatinn France, Dec. 17, 1993, 93 15253**
**Int. Cl.[6] H01M 4/70;4/80**
**U.S. Cl. 429—235** **5 Claims**




1. An electrode plate for an electrochemical cell, said plate having a metal foam support and comprising: a first active portion pasted with active material; and a second portion forming a plate head comprising the same metal foam as said support, said plate head comprising
a transitional portion, the density of the metal foam in said transitional portion being at least about 2.5 times the density of the metal foam in the remainder of said plate.
a connection tab emerging from the middle of the thickness of said plate, said connection tab having a porosity that is substantially equal to 0%, and

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an outer portion of the plate head that lies outside of said connection tab, the density of the metal foam in said outer portion of the plate head being at least about 2.5 times the density of the metal foam in the remainder of said plate.

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5,741,613

## METHODS OF FORMING HALF-TONE PHASE-SHIFT MASKS WITH REDUCED SUSCEPTIBLITY TO PARASITIC SPUTTERING

**Seong-yong Moon, Kyungki-do; Jong-wook Kye; Sung-gi Kim, both of Seoul; Sung-chul Lim, Kyungki-do, and In-kyun Shin, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Sep. 13, 1996, Ser. No. 713,953**

**Claims priority, application Rep. of Korea, Sep. 13, 1995, 95-29842**

**Int. Cl.[6] G03F *9/00***

**U.S. Cl. 430—5** **14 Claims**




1. A method of forming a half-tone phase-shift mask, comprising the steps of:

forming a phase-shift layer on a face of a transparent substrate;

forming a layer of opaque material on the phase-shift layer, opposite the face of the transparent substrate;

forming a mask having openings therein on the layer of opaque material, opposite the phase-shift layer;

patterning the layer of opaque material to expose portions of the phase-shift layer defined by the openings in the mask; then

removing the mask from the patterned layer of opaque material; and then

forming a patterned phase-shift layer having openings therein which expose the face of the transparent substrate, by removing the exposed portions of the phase-shift layer using the patterned layer of opaque material as an etchant mask.

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5,741,614

## ATOMIC FORCE MICROSCOPE MEASUREMENT PROCESS FOR DENSE PHOTORESIST PATTERNS

**John H. McCoy, San Carlos, and Kyoichi Suwa, San Mateo, both of Calif., assignors to Nikon Corporation, Japan**

**Filed Oct. 16, 1995, Ser. No. 543,424**

**Int. Cl.[6] G03C *5/00***

**U.S. Cl. 430—30** **22 Claims**

1. A method of measuring a feature formed on a substrate, the feature being one of a number of such features on the substrate, comprising the steps of:

forming a photoresist layer on the substrate;

exposing the photoresist layer to radiation through a first mask pattern which defines a plurality of features;

exposing the photoresist layer to radiation through a second mask pattern, the second mask pattern allowing irradiation of portions of the photoresist layer also irradiated through the first mask pattern;

then developing the photoresist layer, wherein the developed photoresist layer defines at least one particular feature defined by the first exposing step, and the particular feature having no other features within a predetermined distance of one side thereof as defined by the second exposing step; and

contacting the one side of the particular feature with a scanning microscope probe.

5,741,615

## LIGHT RECEIVING MEMBER WITH NON-SINGLE-CRYSTAL SILICON LAYER CONTAINING CR, FE, NA, NI AND MG

**Keishi Saitoh; Kozo Arao, and Tatsuyuki Aoike, all of Nagahama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**PCT No. PCT/JP93/00525, § 371 Date Jun. 2, 1994, § 102(e) Date Jun. 2, 1994**

**PCT Filed Apr. 23, 1993, Ser. No. 170,247**

**Claims priority, application Japan, Apr. 24, 1992, 4-106529; Jun. 19, 1992, 4-184774; Jun. 19, 1992, 4-184775; Jun. 19, 1992, 4-184776**

**Int. Cl.[6] G03G *15/02;15/08***

**U.S. Cl. 430—57** **22 Claims**

1. A light receiving member comprising a substrate and a light receiving layer disposed on said substrate, said light receiving layer being composed of (A) a non-single crystal material containing silicon atoms as a matrix (B), at least one kind of atoms selected from the group consisting of hydrogen atoms and halogen atoms, and (C) chromium atoms, iron atoms, nickel atoms, sodium atoms and magnesium atoms, wherein said light receiving layer contains each of said chromium atoms, iron atoms, nickel atoms, sodium atoms and magnesium atoms in an amount of 0.9 atomic ppm or less.

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5,741,616

## METHOD OF DEVELOPING LATENT ELECTROSTATIC IMAGES AND DEVELOPER-BEARING MEMBER

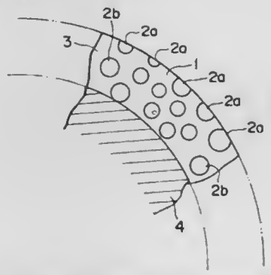
**Yasuo Hirano; Jun Aoto; Kazuo Nojima, all of Numazu; Koji Suzuki, Yokohama; Hiroshi Takashima, Yono; Shigekazu Enoki; Yuichi Ueno, both of Kawasaki, and Naoki Iwata, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 714,669, Jun. 13, 1991, abandoned. This application Nov. 14, 1994, Ser. No. 339,583**

**Claims priority, application Japan, Jun. 14, 1990, 2-156868; Aug. 1, 1990, 2-205683; Aug. 1, 1990, 2-205684; Aug. 1, 1990, 2-205685; Aug. 1, 1990, 2-205686**

**Int. Cl.[6] G03G *13/06;* B32B *5/16***

**U.S. Cl. 430—101** **12 Claims**




1. A method of developing latent electrostatic images comprising the steps of:

forming numerous micro closed electric fields near the surface of a rotatable developer-bearing member which comprises an electroconductive support and a surface layer formed thereon comprising an electroconductive organic polymeric matrix and numerous minute charge-retainable insulating segments distributed at least one the surface of said surface layer, by electrically charging the surface of said charge-retainable insulating segments, said insulating segments being insulating particles dispersed in said electroconductive organic polymeric matrix and exposed on the surface of said surface layer such that said surface layer is electrically chargeable to form said numerous micro closed electric fields for holding toner particles on said rotatable developer-bearing member,

supplying a one-component type developer comprising toner particles to said rotatable developer-bearing member to hold said developer on said rotatable developer-bearing member by said numerous micro closed electric fields; and

bringing said rotatable developer-bearing image member near or into contact with a latent-electrostatic-image bearing member which bears latent electrostatic images to develop said latent electrostatic images with said one component developer to visible toner images,

wherein the total surface area of said charge-retainable insulating segments is in the range of 20 to 80% of the entire surface area of said surface layer and wherein said charge-retainable insulating segments have a mean diameter of 30 to 500 μm.



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5,741,617

## TONER FOR DEVELOPING ELECTROSTATIC IMAGES

**Koji Inaba, Yokohama; Tatsuya Nakamura, Tokyo; Tatsuhiko Chiba, Kamakura, and Takao Ishiyama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 1, 1995, Ser. No. 457,779**

**Claims priority, application Japan, Jun. 2, 1994, 6-142228**

**Int. Cl.[6] G03G *9/08***

**U.S. Cl. 430—110** **28 Claims**




1. A toner for developing electrostatic images, comprising a binder resin, a colorant and a wax composition:

said wax composition having, in molecular weight distribution as measured by GPC, a maximal value in the region of molecular weight of from 350 to 850 and a maximal value in the region of molecular weight of from 900 to 4,000; and

said wax composition having ester wax with a weight average molecular weight (Mw) of from 350 to 4,000 and a number average molecular weight of from 200 to 4,000.

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5,741,618

## PROCESS FOR PRODUCING POLYMER TONER

**Kazunori Shigemori, and Tokudai Ogawa, both of Kanagawaken, Japan, assignors to Nippon Zeon Co. Ltd., Japan**

**Filed Oct. 10, 1996, Ser. No. 728,475**

**Claims priority, application Japan, Oct. 12, 1995, 7-290447**

**Int. Cl.[6] G03G *5/00***

**U.S. Cl. 430—137** **14 Claims**

1. A process for producing a polymer toner, which comprises the steps of:

pouring a polymerizable monomer composition (A) containing at least a polymerizable monomer and a colorant, but containing no oil-soluble polymerization initiator, into an aqueous dispersion medium containing a dispersing agent;

stirring the aqueous dispersion medium to form primary droplets of the polymerizable monomer composition (A) therein;

adding an oil-soluble polymerization initiator to the aqueous dispersion medium, at the time the volume average droplet size of the primary droplets comes to a droplet size within a range of 50–1,000 μm, while stirring the aqueous dispersion medium, thereby bringing the primary droplets into contact with droplets of the oil-soluble polymerization initiator to form droplets of the resulting polymerizable monomer composition (B) containing the oil-soluble polymerization initiator;

further stirring the aqueous dispersion medium to form secondary droplets of the polymerizable monomer composition (B) having a desired droplet size; and then

conducting suspension polymerization of the polymerizable monomer composition (B).

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5,741,619

## NEGATIVE IMAGE-RECORDING MATERIAL COMPRISING AN ACRYLIC RESIN, A DIAZO COMPOUND AND CARBON BLACK

**Keitaro Aoshima; Katsuji Kitatani; Hiroaki Yokoya, and Yuichi Shiraishi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 403,484, Mar. 14, 1995, abandoned. This application Jan. 27, 1997, Ser. No. 789,817**

**Claims priority, application Japan, Mar. 15, 1994, 6-44152; Apr. 15, 1994, 6-77542**

**Int. Cl.[6] G03F *7/021;7/30***

**U.S. Cl. 430—175** **7 Claims**

1. A negative-working image-recording material which is developed with an aqueous alkaline developing solution and which comprises carbon black, a diazonium compound having two or more diazonio groups, and an acrylic resin obtained by polymerizing at least one radical-polymerizable Group A monomer with at least one radical-polymerizable Group B monomer and at least one radical-polymerizable Group C monomer, where the Group A monomer is selected from the group consisting of monomers containing a radical-polymerizable ethylenic double bond and at least one acid group selected from the group consisting of —$SO_3H$, —$OP(O)(OH)_2$, —$P(O)(OH)_2$, —COOH, —CONHCO—, —$CONHSO_2$—, —$SO_2NH$—, and phenolic —OH; the Group B monomer is selected from the group consisting of monomers containing an ethylenic double bond which is radical-polymerizable with a hydroxyl group or a cyano group; and the Group C monomer is selected from the group consisting of (meth)acrylates and (meth)acrylamides which each has an optionally substituted hydrocarbon group having up to 12 carbon atoms and styrene which may be substituted.

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5,741,620

## REACTIVE POLYMERIC DYES

**Gary L. Holmes, Vadnais Heights; Terrance P. Smith, Woodbury; Mahfuza B. Ali, Mendota Heights, and David W. Macomber, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Division of Ser. No. 334,202, Nov. 4, 1994, Pat. No. 5,532,111, which is a division of Ser. No. 52,337, Apr. 23, 1993, Pat. No. 5,362,812. This application Jan. 16, 1996, Ser. No. 586,996**

**Int. Cl.[6] G03C *11/12***

**U.S. Cl. 430—253** **5 Claims**

3. A process for preparing an imaged article comprising the steps:

(a) coating a colorant layer formulation, wherein the colorant layer formulation comprises a polymeric dye which is reactive with acrylates when exposed to actinic radiation further including a photoinitiator, a multifunctional acrylate, a surfactant, a sensitizing dye, or a mixture thereof onto one major surface of a support base film;

(b) imagewise exposing the colorant layer to actinic radiation;

(c) laminating the exposed colorant layer, wherein the exposed colorant layer is adjacent and in contact with a dry peel receptor; and

(d) removing the support base film, wherein a positive image remains on the dry peel receptor and a negative image remains on the removed support base film.

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5,741,621

## PROCESS FOR USING PHOTOIMAGEABLE FILMS PREPARED FOR AQUEOUS PHOTOIMAGEABLE LIQUID EMULSIONS

**Richard Joseph Kempf, Towanda; John Haetak Choi, and Harvey Walter Taylor, Jr., both of Sayre, all of Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Continuation of Ser. No. 474,584, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 321,505, Oct. 12, 1994, abandoned, which is a continuation-in-part of Ser. No. 178,718, Jan. 10, 1994, abandoned. This application Dec. 23, 1996, Ser. No. 771,492**

**Int. Cl.**[6] **G03C** *11/12;1/805;11/20;1/73*

**U.S. Cl. 430—253** **18 Claims**

1. A process for preparing an image on a substrate comprising, in order:

(i) applying a photoimageable composition on a first polymeric film substrate, wherein the photoimageable composition, having a solids content from 25 to 60 weight percent, consists essentially of:

(a) a partially neutralized acid-containing polymer formed from a precursor polymer having an acid number from 90 to 160 prior to neutralization and wherein 1 to 15% of acid-containing groups of the precursor polymer are neutralized with base;

(b) an ethylenically unsaturated monomer;

(c) a photoinitiator or photoinitiating system;

(d) water; and

(e) 0–25% by weight of an organic solvent based on the total weight of the organic solvent and water; wherein the liquid composition is present as a stable emulsion, and wherein the photoimageable composition has a Brookfield viscosity, at 25° C., from about 10 to about 2000 centipoise;

(ii) drying the coated photoimageable composition to form a photoimageable layer on a first substrate;

(iii) imagewise exposing the layer to actinic radiation to form imaged and non-imaged areas; and

(iv) developing the exposed layer having imaged and non-imaged areas to form an image on the first film substrate, wherein the development is dry.

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5,741,622

## ONE-PACKAGE PHOTOSOLDER RESIST COMPOSITION DEVELOPABLE WITH AQUEOUS ALKALI SOLUTION AND METHOD FOR PRODUCTION OF PRINTED CIRCUIT BOARD BY USE THEREOF

**Masao Arima, Sakado, Japan, assignor to Taiyo Ink Manufacturing Co., Ltd., Japan**

**Filed Jun. 5, 1996, Ser. No. 658,626**

**Claims priority, application Japan, Jun. 6, 1995, 7-161548**

**Int. Cl.**[6] **G03C** *1/725;1/73;5/00*

**U.S. Cl. 430—270.1** **40 Claims**

1. A one-package photosolder resist composition developable with an aqueous alkali solution, comprising:

(A) a copolymeric macromolecular compound having at least one free carboxyl group in its molecule, the macromolecular compound being a copolymer of an unsaturated monobasic acid and at least one unsaturated compound having one unsaturated group in its molecule, said unsaturated monobasic acid being selected from the group consisting of acrylic acid, methacrylic acid, adducts of unsaturated dibasic acid anhydride with hydroxyl group-containing acrylates or methacrylates, and adducts of caprolactone with acrylic acid or methacrylic acid, and said unsaturated compound being selected from the group consisting of vinyl compounds, alkyl acrylates, alkyl methacrylates, acrylic esters, methacrylic esters, and maleimides,

(B) a diluent including a polyfunctional unsaturated compound which is in a liquid state at normal room temperature and an organic solvent,

(C) a photopolymerization initiator,

(D) a vinyltriazine compound or a derivative thereof selected from the group consisting of 2-vinyl-4,6-diamino-S-triazine, 2,4-diamino-6-methacryloyloxy-ethyl-S-triazine, adduct of 2-vinyl-4,6-diamino-S-triazine with isocyanuric acid, and adduct of 2,4-diamino-6-methacryloyloxy-ethyl-S-triazine with isocyanuric acid, and

(E) an inorganic filler, the filler being present in an amount of 150 to 600 parts by weight, based on 100 parts by weight of said copolymeric macromolecular compound (A).

11. In a method for the production of a printed circuit board, a process of forming a solder resist in a prescribed pattern on a printed circuit board having a circuit preparatorily formed thereon, which process comprises the steps of:

applying to a surface of said printed circuit board having a circuit already formed thereon a one-package photosolder resist composition set forth in claim 1,

drying the applied layer of said composition,

selectively irradiating the dried layer according to a prescribed pattern,

developing the unirradiated area of said layer with an aqueous alkali solution thereby forming a solder resist pattern, and

finally curing said resist pattern by irradiation.

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5,741,623

## OPTICAL RECORDING MEDIUM

**Kenryo Namba; Akihiko Kuroiwa, and Shiro Nakagawa, all of Tokyo, Japan, assignors to TDK Corporation, Japan**

**Continuation of Ser. No. 918,924, Jul. 22, 1992, abandoned, which is a continuation of Ser. No. 143,312, Jan. 6, 1988, abandoned, which is a continuation of Ser. No. 895,860, Aug. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 518,359, Jul. 29, 1983, abandoned. This application Dec. 9, 1992, Ser. No. 990,979**

**Claims priority, application Japan, Jul. 30, 1982, 67-134397; Jul. 31, 1982, 67-134170; Sep. 25, 1982, 67-166832; Sep. 27, 1982, 67-168048; Oct. 11, 1982, 67-177776; Oct. 18, 1982, 67-182589; Nov. 1, 1982, 67-192879; Nov. 2, 1982, 67-193685; Dec. 28, 1982, 67-234245; Dec. 29, 1982, 67-233157; Dec. 30, 1982, 67-232241; Dec. 31, 1982, 67-232198; Dec. 31, 1982, 67-232199**

**Int. Cl.**[6] **G03C** *1/72;* **G11B** *7/24*

**U.S. Cl. 430—270.19** **7 Claims**

1. An optical recording medium of the heat mode type comprising a substrate having deposited thereon a resin free recording layer and comprising at least one laser light absorbing dye mixed with at least one quencher, and having a thickness in the range of from 0.03 to 2 um, said dye being represented by the formula I:

$$\phi^{+}-L=\psi(x-)_m \qquad (I)$$

wherein $\phi$ and $\psi$ independently of each other denote an indole ring, thiazole ring, an oxazole ring; a selenazole ring, an imidazole ring or a pyridine ring which may have at least one aromatic ring condensed thereto, L denotes a methine chain for formation of a mono-, di-, tri- or tetra-cyanine dye, X- denotes an anion, and m denotes 0 or 1.

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5,741,624

## METHOD FOR REDUCING PHOTOLITHOGRAPHIC STEPS IN A SEMICONDUCTOR INTERCONNECT PROCESS

**Nanseng Jeng, and Christophe Pierrat, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**

**Filed Feb. 13, 1996, Ser. No. 600,587**

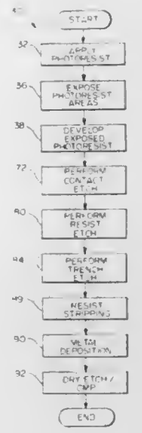
**Int. Cl.**[6] **G03F** *7/20;7/26*

**U.S. Cl. 430—312** **11 Claims**

1. A method for partially developing a layer of photoresist on a semiconductor wafer, comprising the steps of:

exposing a first area of the photoresist layer to light having a first dosage while concurrently exposing a second area to light having a second dosage differing from the first dosage; and






concurrently developing the first area and second area of the photoresist layer to remove photoresist within the first area to one depth and to remove photoresist within the second area to a second depth, the second depth differing from the first depth.

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5,741,625

## PROCESS FOR FORMING FINE PATTERNS IN A SEMICONDUCTOR DEVICE UTILIZING MULTIPLE PHOTOSENSITIVE FILM PATTERNS AND ORGANIC METAL-COUPLED MATERIAL

**Sang Man Bae, and Seung Chan Moon, both of Kyoungki-do, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungki-Do, Rep. of Korea**

**Division of Ser. No. 337,281, Nov. 10, 1994, abandoned. This application Jun. 6, 1996, Ser. No. 659,741**

**Claims priority, application Rep. of Korea, Nov. 10, 1993, 1993-23822; Nov. 15, 1993, 1993-24235; Nov. 17, 1993, 1993-24497**

**Int. Cl.**[6] **G03F** *7/38;7/40*

**U.S. Cl. 430—312** **4 Claims**

1. A process for forming fine patterns for a semiconductor device, comprising the steps of:

forming a first light-exposure mask and a second light-exposure mask with interlaced patterns selected from a plurality of fine patterns to be formed on a semiconductor substrate;

coating a first photosensitive film on an intermediate layer on a semiconductor substrate;

selectively exposing the first photosensitive film to a light by use of the first light-exposure mask having predetermined photo-interceptive patterns to create an exposed area and a non-exposed area;

contacting the first photosensitive film with an organic metal material such that the exposed area of the first photosensitive film is diffused with the organic metal material to form an organic metal-coupled material and such that the non-exposed area of the first photosensitive film is not diffused therewith to form first photosensitive film patterns, the first photosensitive film becoming a layer of the organic metal-coupled material and the first photosensitive film patterns;

coating a second photosensitive film over the layer of first photosensitive film patterns and the organic metal-coupled material;

selectively exposing the second photosensitive film by use of the second light-exposure mask to form second photosensitive film patterns over the organic metal-coupled material, the second light-exposure mask having photointerceptive patterns, each of which is interposed between adjacent photointerceptive patterns of the first light-exposure mask; and

taking off the selectively exposed areas of the organic metal-coupled material through the second photosensitive film patterns, to form organic metal-coupled layer patterns underneath the second photosensitive film patterns in addition to the first photosensitive film patterns in the layer of the organic metal-coupled material and the first photosensitive film patterns.

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5,741,626

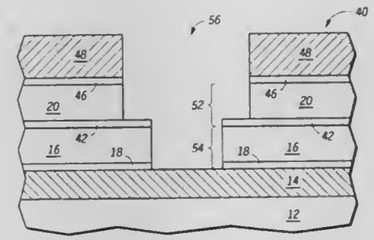
## METHOD FOR FORMING A DIELECTRIC TANTALUM NITRIDE LAYER AS AN ANTI-REFLECTIVE COATING (ARC)

**Ajay Jain, and Kevin Lucas, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Apr. 15, 1996, Ser. No. 632,209**

**Int. Cl.**[6] **G03F** *7/00;* **H01L** *21/314*

**U.S. Cl. 430—314** **27 Claims**




17. A method for forming a semiconductor structure, the method comprising the steps of:

forming a conductive region;

forming a first dielectric layer overlying the conductive region;

forming a tantalum nitride anti-reflective coating (ARC) layer of the formula $Ta_3N_5$ overlying the first dielectric layer;

forming a second dielectric layer overlying the ARC layer;

forming a first photoresist layer overlying the second dielectric layer;

exposing the first photoresist layer to light having a wavelength within the range of 440 nm to 245 nm to molecularly alter a portion of the first photoresist layer wherein the ARC layer attenuates light reflected from the conductive region so that the light reflected from the conductive region has a reduced effect on the portion of the first photoresist layer which is molecularly altered;

etching a first portion of an opening through the second dielectric layer wherein the first portion has a first width and wherein the ARC layer is used as an etch stop layer when forming the first portion of the opening;

depositing a second photoresist layer overlying the ARC layer;

exposing the second photoresist layer to light having a wavelength within the range of 440 nm to 245 nm to molecularly alter a portion of the second photoresist layer wherein the ARC layer attenuates light reflected from the conductive region so that the light reflected from the conductive region has a reduced effect on the portion of the second photoresist layer which is molecularly altered;

etching a second portion of the opening through the first dielectric layer and the ARC layer wherein the second portion has a second width which is less than the first width;

depositing a metal layer so that the metal layer fills the first and second portions of the opening; and

planarizing the metal layer so that the metal layer forms an electrical interconnect which is electrically coupled to the conductive region.

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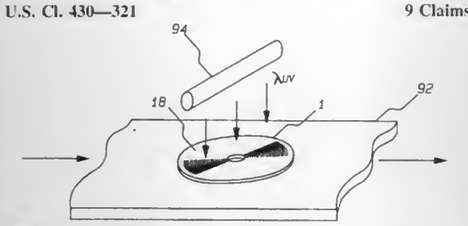


5,741,627

## OPTICAL RECORDING MEDIUM AND METHOD FOR ELIMINATING BERM BUILDUP

Robert L. Cubit, Westminster, and Bruce E. Del Mar, Laguna Beach, both of Calif., assignors to Del Mar Avionics, Irvine, Calif.

Filed May 15, 1996, Ser. No. 648,532
Int. Cl.[6] G11B 7/26
U.S. Cl. 430—321 9 Claims




9. In an optical disc mastering process:

a—forming a transparent disc substrate;

b—applying a lamina of semi transparent, semi absorptive, and semi reflective substance to said disc substrate;

c—applying a lamina of an optically active substance to said transparent, absorptive, reflective lamina;

d—recording data by modulated laser means passing through said transparent substrate and through said transparent, absorptive, reflective lamina to said active lamina; and

e—applying a conductive lamina to said recorded, active lamina to complete a disc master,

wherein, the improvement comprises the addition of a new step (dd) between steps d and e above as follows:

dd—illuminating, radiating, softening, and reflowing said recorded, active lamina to flatten and eliminate berm buildup prior to application of a conductive lamina.

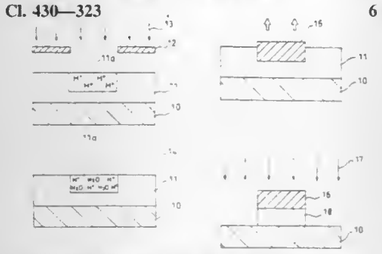
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5,741,628

## METHOD OF FORMING MICROPATTERNS BY HAVING A RESIST FILM ABSORB WATER

Takahiro Matsuo, Kyoto; Kazuhiro Yamashita, Hyogo; Masayuki Endo, and Masaru Sasago, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 497,471, Jun. 30, 1995, abandoned.
This application Oct. 7, 1996, Ser. No. 725,949
Claims priority, application Japan, Jul. 5, 1994, 6-153538
Int. Cl.[6] G03F 7/004
U.S. Cl. 430—323 6 Claims



1. A method of forming a micropattern comprising:

a first step of forming a resist film by applying, onto a semiconductor substrate, a resist containing an acid generator which generates an acid in response to the radiation of an energy beam;

a second step of causing the acid generator contained in an exposed portion of the resist film to generate the acid by patternwise irradiating said resist film with the energy beam;

a third step of causing the exposed portion of said resist film, in which the acid has been generated, to absorb water;

a fourth step of forming a metal oxide film in the exposed portion of said resist film by supplying water and a metal alkoxide to a surface of the exposed portion of said resist film having absorbed the water;

a fifth step of removing alcohol generated in said metal oxide film formed by said fourth step so as to retain a film of metal oxide having a thickness of about 100 nm or more; and a sixth step of forming a resist pattern by performing dry etching with respect to said resist film by using said film of metal oxide as a mask.

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5,741,629

## RESIST MATERIALS AND RELATED PROCESSES

Edwin Arthur Chandross, Murray Hill; Janet Mihoko Kometani, Warren; Omkaram Nalamasu, Basking Ridge; Elsa Reichmanis, Westfield, all of N.J., and Kathryn Elizabeth Uhrich, Boston, Mass., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 148,706, Nov. 8, 1993, abandoned.
This application Oct. 15, 1996, Ser. No. 730,560
Int. Cl.[6] G03C 5/00
U.S. Cl. 430—326 8 Claims

1. A process for fabricating a device comprising the steps of 1) providing on a device substrate a region of a polymer, a) said polymer having a multiplicity of first substituents with chemical protection where said protection comprises a first protective group bound to said first substituent, and b) having a multiplicity of unprotected second substituents such that said unprotected second substituents are left by the removal of second protective groups, 2) patternwise exposing said polymer to radiation to induce removal of a multiplicity of said first protective groups exposed to said radiation thereby forming a latent image, 3) developing said latent image to form a pattern, and 4) employing said pattern as a mask, for subsequent device processing, wherein a multiplicity of said second protective groups are removed to leave said multiplicity of unprotected second substituents before said exposure and wherein said second protective groups have a different chemical substituent which has a chemical property different from said first protective groups allowing said removal of said second protective groups without substantially affecting said first protective groups.

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5,741,630

## PROCESS FOR FIXING AN IMAGE, AND MEDIUM FOR USE THEREIN

John L. Marshall, Somerville; Rita S. Shon Baker, Brookline; Larry C. Takiff; Stephen J. Telfer, both of Arlington, and John C. Warner, Norwood, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 25, 1994, Ser. No. 232,757
Int. Cl.[6] G03C 1/73
U.S. Cl. 430—337 35 Claims

1. A process for producing and fixing ant image, which process comprises:

providing an imaging medium comprising an acid-generating layer or phase comprising a mixture of a superacid precursor, a sensitizer and a secondary acid generator, and a color-change layer or phase comprising an image dye;

the sensitizer being capable of absorbing actinic radiation of a sensitizer wavelength which does not, in the absence of the sensitizer, cause decomposition of the superacid precursor to form a first acid;

the secondary acid generator being capable of acid-catalyzed thermal decomposition by the first acid acid to form a second acid; and

the image dye undergoing a change in its absorption of radiation upon contact with the second acid;

imagewise exposing the medium to actinic radiation of the sensitizer wavelength, thereby causing, in the exposed areas of the acid-generating layer or phase, the sensitizer to decompose at least part of the superacid precursor, the imagewise exposure leading to imagewise formation of the first acid in the acid-generating layer;



thereafter, heating the medium to cause, in the exposed areas of the acid-generating layer or phase, acid-catalyzed thermal decomposition of the secondary acid generator and formation of the second acid;

admixing the components of the acid-generating and color-change layers or phases, thereby causing, in the exposed areas of the medium, the second acid to bring about the change in absorption of the image dye and thereby form the image;

in at least the non-exposed areas of the medium reacting, with the superacid precursor, a copper compound and a reactive material more reactive than the image dye to the products resulting from decomposition of the superacid precursor in the presence of the copper compound, thereby causing the copper compound and the reactive material to bring about decomposition of the superacid precursor remaining in the non-exposed areas, and thereby fix the image.

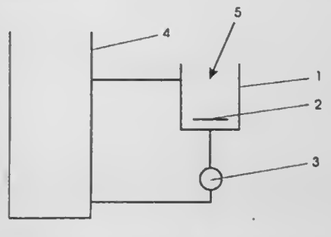
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5,741,631

## PHOTOGRAPHIC DYE IMAGE-FORMING PROCESS

Peter Jeffery Twist, Gr. Missenden, United Kingdom, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 9, 1997, Ser. No. 781,144
Claims priority, application United Kingdom, Jan. 10, 1996, 9600409
Int. Cl.[6] G03C 7/44
U.S. Cl. 430—399 20 Claims




1. A process for the formation of a dye image by a redox amplification process in an imagewise exposed photographic color material having at least one silver halide layer and associated therewith a dye image-forming color coupler,

the process comprising treating said material in a processing tank containing a color developer solution containing a color developing agent and hydroxylamine as developing agent preservative, and wherein said color developer solution is replenished with a color developer replenisher,

said process being carried out in a tank in which the ratio of the tank volume to maximum area of material accommodatable therein is less than 11 $dm^3/m^2$, and

said color developer replenisher is added as solids or liquid concentrates directly to said color developer solution with or without additional water.

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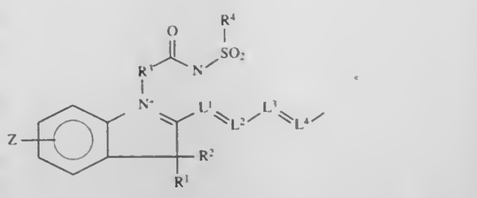
5,741,632

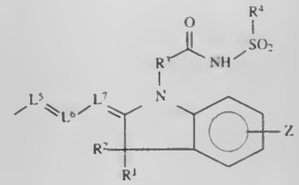
## CLASS OF NON-SENSITIZING INFRA-RED DYES FOR USE IN PHOTOSENSITIVE ELEMENTS

Eric Kiekens, Zele, Belgium, assignor to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Dec. 9, 1996, Ser. No. 762,442
Claims priority, application European Pat. Off., Dec. 14, 1995, 95203492
Int. Cl.[6] G03C 1/83; 1/20
U.S. Cl. 430—522 7 Claims

1. Photosensitive material comprising at least one photosensitive layer and optionally one or more other non-photosensitive layer(s), characterized in that at least one of said layers contains an infra-red absorbing compound represented by following general formula:





or an external salt thereof, wherein

Z represents hydrogen, or one or more substituent(s), or the necessary atoms to complete a fused-on aromatic ring,

$R^1$ and $R^2$ each independently represent hydrogen or lower ($C_1$–$C_3$) alkyl which may be substituted,

$R^3$ represents lower ($C_1$–$C_3$) alkylene which may be substituted,

$R^4$ represents an alkyl or aryl group which may be substituted,

each of $L^1$–$L^7$ represents a methine group which may be substituted, and the substituents of which may link together to form a supplementary ring which may be substituted itself.

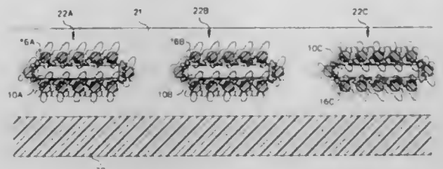
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5,741,633

## ATTACHMENT OF GELATIN-GRAFTED POLYMER PARTICLES TO PRE-PRECIPITATED SILVER HALIDE GRAINS

Mark Anthony Whitson; John Derek Lewis, both of Webster; Tienteh Chen, Penfield; Thomas Joseph Dannhauser, Pittsford, and Pranab Bagchi, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 346,727, Nov. 30, 1994, abandoned, which is a division of Ser. No. 122,191, Sep. 14, 1993, Pat. No. 5,399,480. This application Jun. 7, 1995, Ser. No. 478,631
Int. Cl.[6] G03C 1/91
U.S. Cl. 430—531 10 Claims




1. A mixed-packet photosensitive photographic element comprising at least one of the following packet emulsion elements:

(a) silver halide particles sensitive to red light and comprising silver halide grains each surrounded with a layer of peptizing gelatin wherein the peptizing gelatin has an isoelectric pH of $P_{1a}$ and attached thereto gelatin-grafted-polymer particles comprising a cyan dye-forming coupler wherein the grafted gelatin has an isoelectric pH of $P_{2a}$, which is different than $P_{1a}$.

(b) silver halide particles sensitive to green light and comprising silver halide grains each surrounded with a layer of peptizing gelatin wherein the peptizing gelatin has an isoelectric pH of $P_{1b}$ and attached thereto gelatin-grafted-polymer particles comprising a magenta dye-forming coupler wherein the grafted gelatin has an isoelectric pH of $P_{2b}$, which is different than $P_{1b}$, or

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(c) silver halide particles sensitive to blue light and comprising silver halide grains each surrounded with a layer of peptizing gelatin wherein the peptizing gelatin has an isoelectric pH of $P_{1c}$ and attached thereto gelatin-grafted-polymer particles comprising a yellow dye-forming coupler wherein the grafted gelatin has an isoelectric pH of $P_{2c}$ which is different than $P_{1c}$.

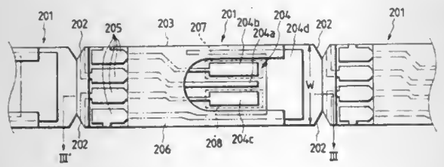
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5,741,634

## THROWAWAY TYPE CHEMICAL SENSOR

Yoshiteru Nozoe, and Kazuharu Murata, both of Kitamoto, Japan, assignors to A & D Company Limited, Tokyo, Japan

Division of Ser. No. 284,116, Aug. 2, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 471,781
Claims priority, application Japan, Aug. 3, 1993, P.HEI. 5-192452; Nov. 30, 1993, U.M. HEI5-068640
Int. Cl.[6] C12Q *1/00;* G01N *27/26*
U.S. Cl. 435—4 4 Claims




1. An enzyme electrode of a chemical sensor comprising:
an electrode portion including a pair of working electrodes, a reference electrode and a counter electrode;
a first film formed on one of said working electrodes, said first film comprising polyvinyl alcohol and surface-active agent which accelerates diffusion of a test sample solution through said first film;
a second film formed on the other working electrode, said second film comprising polyvinyl alcohol, enzyme and a surface-active agent which accelerates diffusion of a test sample solution through said second film; and
an overcoat film formed on said first and second film, said overcoat film comprising a high polymer electrolyte including pH buffer wherein said high polymer electrolyte is selected from the group consisting of polyacrylic acid and water soluble polysaccharide containing carboxyl groups; and wherein said pH buffer reduces variation of the concentration of hydrogen ions in said test sample.

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5,741,635

## METHOD OF QUANTITATING GTP AND GDP BOUND TO A G PROTEIN AND USES THEREOF

Gerry R. Boss, La Jolla, Calif.; Abhijit Guha, Etobicoke, Canada; Jurgen S. Scheele, Del Mar, Calif., and Anthony J. Pawson, Toronto, Canada, assignors to Mount Sinai Hospital Corporation, Toronto, Canada, and The Regents of the University of California, Oakland, Calif.

Filed Jan. 30, 1996, Ser. No. 593,614
Int. Cl.[6] C07K *1/00;* C12Q *1/00*
U.S. Cl. 435—4 13 Claims

1. An assay method for determining the amount of a G protein having bound guanosine 5'-triphosphate (GTP) in a cell of a mammal, wherein the G protein is a G protein of a Ras G protein family, comprising:
a) obtaining a sample of test cells which have not been exposed to radiolabelled orthophosphate;
b) isolating a G protein of the Ras G protein family from a lysate of said test cells to provide a G protein sample;
c) eluting G protein-bound GTP from said isolated Ras protein to provide eluted GTP;
d) converting said eluted GTP to adenosine 5'-triphosphate (ATP); and
e) determining the amount of said ATP of said G protein sample as a measure of the amount of G protein-bound GTP.

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5,741,636

Patent Not Issued For This Number

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5,741,637

## PROCESS FOR THE PRODUCTION OF MODIFIED NUCLEIC ACIDS

Rüdiger Rueger, Seeshaupt, and Christoph Kessler, Dorfen, both of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Continuation of Ser. No. 126,133, Sep. 24, 1993, abandoned, which is a continuation of Ser. No. 642,331, Jan. 17, 1991, abandoned. This application Jun. 6, 1994, Ser. No. 254,422
Claims priority, application Germany, Jan. 17, 1990, 40 01 154.2
Int. Cl.[6] C12Q *1/68;* C12P *19/34*
U.S. Cl. 435—6 13 Claims

1. A process for the production of labelled nucleic acids comprising the steps of
a) hybridizing at least one primer to a template nucleic acid, and
b) enzymatically elongating the primer by reaction with a set of nucleoside triphosphates to produce a newly formed complementary nucleic acid strand having at least two immobilizable biospecific labels and at least one detectable biospecific label,
wherein said set of nucleoside triphosphates comprises at least one type of nucleoside triphosphate with a detectable, biospecific label, the same or at least one other type of nucleoside triphosphate with an immobilizable, biospecific label and unmodified nucleoside triphosphates, and wherein said immobilizable biospecific label is different from said detectable biospecific label.

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5,741,638

## MICROTITER WELL FOR DETECTING NUCLEIC ACID

Akio Yamane, Kouda-Cho, Japan, assignor to Wakunaga Seiyaku Kabushiki Kaisha, Osaka-Fu, Japan

Continuation of Ser. No. 4,572, Jan. 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 722,673, Jun. 28, 1991, abandoned. This application Dec. 19, 1994, Ser. No. 358,995
Claims priority, application Japan, Jun. 28, 1990, 2-170684
Int. Cl.[6] C12Q *1/68;* A61L *3/00*
U.S. Cl. 435—6 4 Claims

1. A process for immobilizing an HLA-DRB oligonucleotide sequence in a microtiter well, comprising the steps of:
preparing a base sequence in which HLA-DRB oligonucleotide sequences specifically hybridizable with a target nucleic acid are repeated in tandem 5 to 200 times,
inserting the base sequence into a vector which is capable of producing a single stranded nucleic acid to prepare a recombinant vector,
transforming a microorganism with the recombinant vector, and culturing the microorganism to amplify the number of the base sequence,
isolating the amplified base sequence in which the HLA-DRB oligonucleotide sequences specifically hybridizable with the target nucleic acid are repeated in tandem 5 to 200 times, and
immobilizing the amplified base sequence in the microtiter well by irradiating the microtiter well in the presence of the amplified base sequence with ultraviolet light.

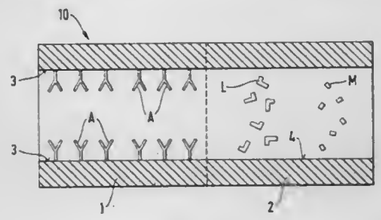


5,741,639

## DEVICE AND METHOD FOR COMBINED BIOAFFINITY ASSAY AND ELECTROPHORETIC SEPARATION OF MULTIPLE ANALYTES

Kees Ensing, Roodeschool, Netherlands; Peter Oroszlan, Basel, Switzerland; Aran Paulus, Heitersheim, and Carlo S. Effenhauser, Weil am Rhein, both of Germany, assignors to Ciba-Geigy Corp., Summit, N.J.

Filed Feb. 28, 1995, Ser. No. 396,310
Claims priority, application Germany, Mar. 8, 1994, 94 810 146.4
Int. Cl.[6] C12Q *1/68*
U.S. Cl. 435—6 16 Claims




1. A device for combined bioaffinity assay and electrophoretic separation of analyte molecules, which comprises a capillary system having a first capillary channel for performing a bioaffinity interaction between the analyte molecules and molecular recognition elements which am attached to and immobilized on a wall of the first capillary channel and a second capillary channel which is a means for separating the analyte molecules by capillary electrophoresis; and a means for detecting the separated analyte molecules.

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## DNA CYCLE SEQUENCING

Carl W. Fuller, Cleveland Heights, Ohio, assignor to Amersham Life Science, Inc., Cleveland, Ohio

Division of Ser. No. 227,702, Apr. 14, 1994, and a continuation-in-part of Ser. No. 767,137, Sep. 27, 1991. This application May 18, 1995, Ser. No. 443,468
Int. Cl.[6] C12Q *1/68;1/70;* C12P *19/34;* A61K *38/54*
U.S. Cl. 435—6 18 Claims




1. A method for sequencing DNA, comprising the steps of:
a) contacting a polynucleotide primer complementary to a region of said DNA to be sequenced, and said DNA to be sequenced, together in the presence of a DNA polymerase, and between one and three dNTPs at least one dNTP being labeled to allow extension of said primer by addition of one or more said dNTPs to said primer, to form an extended primer,
b) dissociating said extended primer from said DNA,
c) repeating steps a) and b) a plurality of times, and
d) contacting said extended primer with said DNA to be sequenced in the presence of a DNA polymerase, four dNTPs and a chain terminating agent.

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## MORPHOGENIC PROTEIN SCREENING METHOD

John E. Smart, Weston; Hermann Oppermann, Medway; Engin Ozkaynak, Milford; Thangavel Kuberasampath, Medway; David C. Rueger, Hopkinton, all of Mass.; Roy H. L. Pang, Etna, N.H., and Charles M. Cohen, Medway, Mass., assignors to Creative BioMolecules, Inc., Hopkinton, Mass.

Continuation of Ser. No. 278,729, Jul. 20, 1994, which is a continuation of Ser. No. 938,021, Aug. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 752,861, Aug. 30, 1991, abandoned, and Ser. No. 752,764, Aug. 30, 1991, which is a continuation-in-part of Ser. No. 667,274, Mar. 11, 1991, abandoned, said Ser. No. 752,861 is a continuation-in-part of Ser. No. 667,274. This application May 26, 1995, Ser. No. 451,953
Int. Cl.[6] C12Q *1/68;* G01N *33/53*
U.S. Cl. 435—6 8 Claims

1. A method for identifying a tissue source of epithelial cells in which expression of a cellular gene can be modulated by a compound, said cellular gene encoding a protein comprising a naturally-occurring polypeptide, the amino acid sequence of said polypeptide comprising
(I) a sequence having at least 70% amino acid sequence homology with the C-terminal seven-cysteine domain of human OP-1, residues 38–139 of SEQ ID No:5, or
(II) a sequence defined by generic sequence 6, SEQ ID No:31
said protein having the property when dimerized of inducing a developmental cascade of tissue-specific morphogenesis culminating in the formation of a mammalian body tissue, said method comprising the steps of:
(a) incubating at least two preparations comprising epithelial cells derived from at least two different tissues of an organism with said compound for a time sufficient to allow said compound to modulate expression of said cellular gene, wherein one of said at least two preparations is derived from brain or renal tissue, and wherein said compound has been shown to modulate expression of said cellular gene in epithelial cells which express said cellular gene; and
(b) assaying said at least two preparations of epithelial cells for the presence of or the amount of said protein expressed by said cellular gene, wherein a change in the level of said protein relative to the level thereof in said at least two preparations of epithelial cells in the absence of said compound identifies a tissue source of epithelial cells in which expression of said cellular gene can be modulated by said compound.

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5,741,642

## ASSAY FOR DETECTING THE EXPRESSION OF A GENE ENCODING HUMAN KERATINOCYTE GROWTH FACTOR (KGF)

Jeffrey S. Rubin, Rockville; Paul W. Finch, Bethesda, both of Md., and Stuart A. Aaronson, Great Falls, Va., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 106,775, Aug. 16, 1993, abandoned, which is a continuation of Ser. No. 780,847, Oct. 23, 1991, abandoned, which is a continuation of Ser. No. 304,281, Jan. 31, 1989, abandoned. This application May 31, 1995, Ser. No. 455,672
Int. Cl.[6] C12Q *1/68;* C12P *19/34;* C07H *21/02;21/04*
U.S. Cl. 435—6 1 Claim

1. An assay for detecting expression of a gene encoding human Keratinocyte Growth Factor (KGF), the assay comprising the steps of:
(i) isolating mRNA from human tissues or cells
(ii) annealing the mRNA to a nucleic acid probe comprising a sequence according to FIG. 7 or a fragment thereof wherein said sequence or fragment thereof specifically hybridizes to

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nucleic acids encoding human KGF to form a mRNA: nucleic acid probe hybrid; and

(iii) detecting the mRNA:nucleic acid probe hybrid.

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**5,741,643**

## OLIGONUCLEOTIDE CLAMPS

**Sergei M. Gryaznov, San Mateo, and David H. Lloyd, Daly City, both of Calif., assignors to Lynx Therapeutics, Inc., Hayward, Calif.**

**Division of Ser. No. 87,387, Jul. 2, 1993, Pat. No. 5,473,060. This application Jun. 5, 1995, Ser. No. 461,271**

**Int. Cl.[6] C12Q** *1/68;* **C12P** *19/34;* **C07H** *21/02*

**U.S. Cl. 435—6** **24 Claims**

1. The oligonucleotide clamp for specifically binding to a target polynucleotide, the oligonucleotide clamp comprising:

(a) at least one oligonucleotide moiety containing a polynucleotide sequence capable of specifically binding to a target polynucleotide; and

(b) one or more pairs of binding moieties attached covalently to said oligonucleotide, each pair of binding moieties comprising a first binding moiety and a second binding moiety,

whereby specific binding of said oligonucleotide moiety to the target polynucleotide is effective to place said first and second bonding moieties in proximity to each other, such that a stable covalent or non-covalent linkage is formed between the first binding moiety and the second binding moiety, producing a macrocyclic oligonucleotide clamp structure bound to said target polynucleotide, further comprising two oligonucleotide moieties defined by the formulas:

X—oligo1—W

and

Y—oligo2—Z

wherein:

X—oligo1—W and Y—oligo2—Z are oligonucleotides which are each specific for either a first polynucleotide sequence in said target polynucleotide or a complementary sequence thereof;

X and Y are a first pair of binding moieties such that X and Y form a stable covalent or non-covalent linkage whenever X and Y are brought in proximity with each other as a result of specific binding of said oligonucleotide moieties to the target polynucleotide; and

W and Z are a second pair of binding moieties such that W and Z form a stable covalent or non-covalent linkage whenever W and Z are brought in proximity with each other as a result of specific binding of said oligonucleotide moieties to the target polynucleotide,

whereby a macrocyclic oligonucleotide clamp structure is formed between X—oligo1—W and Y—oligo2—Z.

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**5,741,644**

## DNA SEQUENCING BY EXTENSION OF PROBE CHIP IMMOBILIZED OLIGONUCLEOTIDES

**Hideki Kambara, Hachiouji; Kazunori Okano, Shiki, and Hisanori Nasu, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 86,892, Jul. 7, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 465,181**

**Claims priority, application Japan, Jul. 7, 1992, 4-180095**

**Int. Cl.[6] C12Q** *1/68;* **C12P** *19/34;* **C07H** *21/04*

**U.S. Cl. 435—6** **14 Claims**

1. A method of base sequence determination comprising steps of:

i) preparing a probe chip having a plurality of cells formed on said probe chip by immobilizing each of a predetermined number of DNA oligomers, each with a known base sequence at a different cell, wherein each of the DNA oligomers has a first sequence part having an identical sequence in all of the DNA oligomers and a second sequence part connecting to the first sequence part and having a sequence selected from sequences which constitute all possible sequences of a plurality of bases selected from the group consisting of A, T, G, and C, one terminal portion of the first sequence part is immobilized on the cells, and the length of the first sequence part is equal to or longer than 4 mers, the length of the second sequence part is 2 mers to 6 mers, and the length of each of the DNA oligomers is equal to or longer than 10 mers, and preparing a set of fluorophore-labelled primers each of which has an identical sequence to that of each of said DNA oligomers;

ii) digesting a double stranded DNA to be sequenced at specific sequence portions with type II restriction enzymes;

iii) introducing a labelling material into the DNA digested in step ii);

iv) making into a single strand at least at a terminal portion of the DNA labelled by said labeling material in step iii), by denaturing the double stranded DNA digested in step ii) or decomposing the DNA digested in step ii) with exonuclease;

v) hybridizing single stranded DNA formed in step iv) with the DNA oligomers immobilized on the cells, under hybridization conditions sufficiently stringent for specific binding of the DNA oligomers immobilized on the cells to single stranded DNA labelled by labeling material;

vi) detecting fluorescence from the cell on which said DNA oligomer hybridizes with said DNA having the single strand at least at a terminal portion, and determining a primer which can be hybridized with said DNA having the single strand at least at a terminal portion;

vii) selecting a first sequence primer from said set of fluorophore-labelled primers, wherein said first sequence primer has a same base sequence as the primer determined in step vi), and hybridizing said first sequence primer with the single stranded DNA labelled by labelling material;

viii) extending the first sequence primer hybridized with the single stranded DNA in step vii), using a DNA polymerase; and

ix) determining the base sequence by a gel electrophoresis of the DNA obtained by extension of the first sequence primer in step viii).

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**5,741,645**

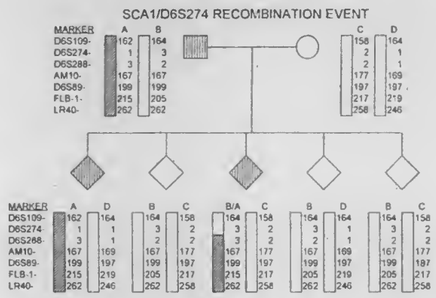
## GENE SEQUENCE FOR SPINOCEREBELLAR ATAXIA TYPE 1 AND METHOD FOR DIAGNOSIS

**Harry T. Orr, Minneapolis; Laura P. W. Ranum, St. Paul; Ming-Yi Chung, Minneapolis, all of Minn., and Huda Y. Zoghbi, Houston, Tex., assignors to Regents of the University of Minnesota, Minneapolis, Minn.**

**Continuation of Ser. No. 84,365, Jun. 29, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 469,802**

**Int. Cl.[6] C12Q** *1/68;* **C12P** *19/34;* **C07H** *21/04*

**U.S. Cl. 435—6** **13 Claims**




1. A method for identifying individuals at risk for developing spinocerebellar ataxia type 1 comprising the step of:



analyzing the CAG repeat region of a spinocerebellar ataxia type 1 gene wherein individuals at risk for developing spinocerebellar ataxia type 1 have greater than or equal to 43 CAG repeats.

9. An isolated DNA fragment having a sequence comprising bases 1716–1749 of SEQ ID NO:1 of a spinocerebellar ataxia type 1 gene and a CAG repeat region.

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**5,741,646**

## CELL LINES AND METHODS FOR SCREENING GROWTH REGULATORY COMPOUNDS

**James L. Sherley, Philadelphia, and Lee B. Riley, Landsdale, both of Pa., assignors to Fox Chase Cancer Center, Philadelphia, Pa.**

**Filed Dec. 29, 1995, Ser. No. 578,207**

**Int. Cl.[6] C12Q** *1/68*

**U.S. Cl. 435—6** **27 Claims**

1. A murine cell line devoid of functional endogenous genes encoding p53, the cell line being stably transformed with an exogenous DNA molecule comprising a p53 coding sequence operably linked to an inducible promoter that activates expression of the p53 coding sequence upon exposure to an inducing agent, the cell line exhibiting exponential growth kinetics in the absence of the inducing agent and renewal growth kinetics upon exposure to the inducing agent.

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**5,741,647**

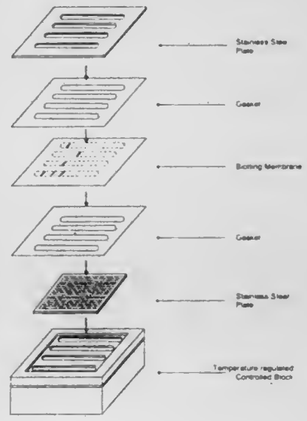
## FLOW THROUGH NUCLEIC ACID HYBRIDISATION USES THEREOF AND A DEVICE THEREOF

**Joseph Wing On Tam, 25A Fu Chak Yuen, Block 18 Chi Fu Fa Yuen, 18 Chi Fu Road, Hong Kong, Hong Kong**

**Filed Feb. 16, 1996, Ser. No. 602,903**

**Int. Cl.[6] C12Q** *1/68*

**U.S. Cl. 435—6** **14 Claims**




1. A method for determining whether a target nucleic acid sequence is present in a sample comprising steps of:

(a) immobilizing probe capable of hybridizing to the target nucleic acid sequence on a matrix;

(b) passing the sample through the said matrix in a flow-through device permitting formation of a complex of the target nucleic acid sequence and the probe, wherein this step is finished in one to five minutes; and

(c) detecting the complexes formed, wherein a positive detection indicates the sample containing the target sequence.

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## CELL ANALYSIS METHOD USING QUANTITATIVE FLUORESCENCE IMAGE ANALYSIS

**George P. Hemstreet, III; Robert E. Hurst; Rebecca B. Bonner, all of Oklahoma City, and Jian Yu Rao, Edmond, all of Okla., assignors to The Board of Regents of the University of Oklahoma, Norman, Okla.**

**Continuation of Ser. No. 984,191, Dec. 20, 1992. This application Feb. 9, 1996, Ser. No. 605,342**

**Int. Cl.[6] G01N** *33/574;33/53*

**U.S. Cl. 435—6** **39 Claims**

1. A method of assessing an individual's risk for bladder cancer, comprising:

providing a prepared slide having a population of cells affixed thereto, the prepared slide having been prepared by applying a portion of a cell sample provided by the individual to a slide then treating the slide with a first fluorescent label for labeling cellular DNA and at least a second fluorescent label for labeling a second cytological marker;

irradiating the prepared slide with an amount of a first excitation wavelength of light effective in causing the first fluorescent label in the cells to emit fluorescent light having a first emission wavelength;

obtaining a first population parameter related to the number of cells in the population of cells having quantities of cellular DNA which exceed a predetermined threshold quantity of cellular DNA;

irradiating the prepared slide with a second excitation wavelength of light effective in causing the second fluorescent label to emit fluorescent light having a second emission wavelength;

obtaining a second population parameter related to the number of cells in the population of cells having quantities of the second cytological marker which exceed a predetermined threshold quantity of the second cytological marker;

comparing the first population parameter to a set of predetermined first parameter thresholds;

comparing the second population parameter to a set of predetermined second parameter thresholds; and

assigning a predetermined risk for bladder cancer to the individual based on which first parameter thresholds and second parameter thresholds are exceeded.

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**5,741,649**

## METHOD AND KIT FOR DETECTING BREAST CANCER CELLS

**Johji Inazawa, Kyoto, Japan, assignor to Daikin Co., Ltd., Osaka, Japan**

**Filed Apr. 1, 1996, Ser. No. 625,213**

**Claims priority, application Japan, Apr. 2, 1995, 7-112217; Sep. 8, 1995, 7-231556**

**Int. Cl.[6] C12Q** *1/68;* **C12P** *19/34;* **C07H** *21/02;21/04*

**U.S. Cl. 435—6** **17 Claims**

1. A method for detecting breast cancer cells, consisting essentially of hybridizing a sample from human breast tissue with probes which specifically hybridize with two chromosomes, said two chromosomes being chromosomes 1 and 11 or chromosomes 1 and 17, and identifying the sample to contain breast cancer cells when aneusomy is observed on either chromosome 1 or chromosome 11 or both, or either chromosome 1 or chromosome 17 or both of the sample.

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## METHODS FOR DETECTING COLON CANCER FROM STOOL SAMPLES

Stanley N. Lapidus, Bedford, N.H.; Anthony P. Shuber, Milford, and Kevin M. Ulmer, Cohasset, both of Mass., assignors to Exact Laboratories, Inc., Maynard, Mass.

Filed Aug. 14, 1996, Ser. No. 699,678
Int. Cl.[6] C12Q *1/68*
U.S. Cl. 435—6 14 Claims

1. A method of screening for indicia of colorectal cancer in a stool sample that comprises cells and cellular debris sloughed from the circumference of the colonic epithelium, the method comprising the steps of:

(a) obtaining a sample comprising a cross-sectional portion of a stool voided by a patient; and

(b) performing an assay to detect the presence of cells or cellular debris shed from a cancerous or precancerous lesion into a voided stool sample.

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## ASSAYS FOR IDENTIFIYING COMPOUNDS THAT BIND TO THE GASTRIN RELEASING PEPTIDE RECEPTOR

Richard I. Feldman, El Cerritto, and James C. Jenson, Moraga, both of Calif., assignors to Berlex Biosciences, Richmond, Calif.

Continuation of Ser. No. 879,825, May 7, 1992, abandoned, which is a division of Ser. No. 426,150, Oct. 24, 1989, Pat. No. 5,215,963. This application Jan. 26, 1994, Ser. No. 187,773
Int. Cl.[6] G01N *33/50;* C07K *14/705*
U.S. Cl. 435—7.1 26 Claims

1. A method of measuring the amount of binding of a test compound to the gastrin releasing peptide receptor comprising the steps of:

(1) providing a source of gastrin releasing peptide receptor, wherein said source of gastrin releasing peptide receptor is solubilized from cell membranes and wherein said gastrin releasing peptide receptor has the following characteristics:

(a) binds gastrin releasing peptide with an affinity of at least $K_D$=10 nM;

(b) binds selectively with peptides of the bombesin type;

(c) contains N-linked carbohydrates; and

(d) when deglycosylated has an apparent molecular weight of 36 kilodaltons plus or minus 5 kilodaltons on SDS-PAGE under reducing conditions;

(2) contacting and incubating said source of gastrin releasing peptide receptor with a labeled compound known to bind to the gastrin releasing peptide receptor, and a test compound whose binding to the gastrin releasing peptide receptor is being evaluated, wherein said test compound is not gastrin releasing peptide; and

(3) measuring the amount of labeled compound bound to the receptor, said amount of labeled compound bound to the receptor being inversely proportional to the amount of test compound binding.

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5,741,652

## ANTI-HUMAN TYPE IV COLLAGEN ANTIBODIES AND USE THEREOF

Akitaka Shibuya, Sagamihara; Shunji Saitoh, Machida; Toshio Takahashi, Yokohama; Masanori Kamei, Yokohama, and Naoko Maruo, Yokohama, all of Japan, assignors to Tosoh Corporation, Shinnanyo, and Morinaga & Co., Ltd., Tokyo, both of Japan

Filed Sep. 29, 1995, Ser. No. 536,740
Claims priority, application Japan, Sep. 30, 1994, 6-237962
Int. Cl.[6] G01N *33/53*
U.S. Cl. 435—7.1 22 Claims

1. A method for immunoassay of human type IV collagen in a sample, comprising contacting a sample with a carrier immobilized monoclonal antibody against human type IV collagen and a labelled polyclonal antibody against human type IV collagen, wherein said monoclonal antibody is produced by a mouse X mouse hybridoma COL IV-67 (FERM BP-5240) and wherein said monoclonal antibody:

(1) is raised against pepsin-solubilized human type IV collagen, said type IV collagen having been purified at least with DEAE agarose;

(2) binds to the 7S domain of human type IV collagen but not to other domains;

(3) does not bind to human type I, type III and type V collagen;

(4) when analyzed by SDS-polyacrylamide gel electrophoresis under reduced condition, comprises a heavy (H) chain of about 51,000 daltons and a light (L) chain of about 28,000 daltons; and

(5) is of the IgG1κ subtype; and

detecting said human type IV collagen in said sample.

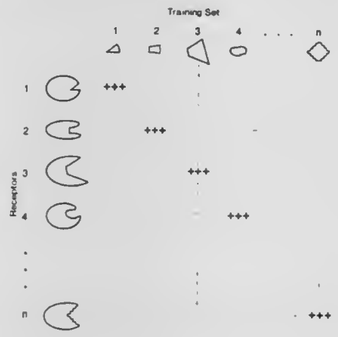
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5,741,653

## PROFILING REFERENCE PANEL ENRICHED BY NON-IG PROTEINS

Lawrence M. Kauvar, San Francisco, and Hugo O. Villar, Newark, both of Calif., assignors to Terrapin Technologies, Inc., South San Francisco, Calif.

Division of Ser. No. 308,813, Sep. 19, 1994, which is a continuation-in-part of Ser. No. 177,673, Jan. 6, 1994, Pat. No. 5,587,293. This application Mar. 26, 1996, Ser. No. 622,693
Int. Cl.[6] G01N *33/53*
U.S. Cl. 435—7.1 10 Claims




1. A method to characterize a single non-peptide small molecule compound, which method comprises:

contacting said compound with each member of a reference panel of members comprising proteins, wherein at least one of the members of the panel is a protein other than an immunoglobulin (Ig) or fragment thereof which non-Ig protein is selected from the group consisting of an enzyme, a lectin and a receptor; and

wherein said panel provides members reacting in a multiplicity of differing degrees wherein zero is considered a degree of reactivity with respect to a population of compounds; and wherein the presence of said non-Ig protein enriches the panel;

detecting the degree of reactivity of said compound to each of said members;

recording said degree of reactivity of said compound to each of said members; and



arranging said recorded degrees of reactivity so as to provide a characteristic profile of said compound.

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## IMMUNOASSAY FOR THE DETECTION OF HUMAN AUTOANTIBODIES

Gerd Michel, Heidelberg; Hans-Bertram Braun, Weisbaden; Kay Röhrig, Wiesbadem, and Birgit Thome-Kromer, Oberursel, all of Germany, assignors to Abbott Laboratories, Abbott Park, Ill.

PCT No. PCT/EP94/03550, § 371 Date May 2, 1996, § 102(e) Date May 2, 1996, PCT Pub. No. WO95/12816, PCT Pub. Date May 11, 1995
PCT Filed Oct. 28, 1994, Ser. No. 637,801
Claims priority, application European Pat. Off., Nov. 2, 1993, 93117725
Int. Cl.[6] G01N *33/53;33/544;33/536;* C12Q *1/42*
U.S. Cl. 435—7.9 9 Claims

1. A method for determining anti-LKM (anti-liver-kidney microsomal) autoantibody which may be present in a test sample, said method comprising:

(a) incubating the test sample with an LKM specific binding member attached to a solid phase for a time and under conditions sufficient for LKM antigen/anti-LKM antibody specific binding pairs to form;

(b) incubating the so-formed specific binding pairs with an indicator reagent comprising a species-specific antibody attached to a signal generating compound capable of generating a measurable signal;

(c) measuring the signal detected,

wherein the amount of signal detected is correlated to the amount of anti-LKM antibody present in the test sample, and wherein said LKM specific binding member is an LKM-1 antigen selected from the group consisting of LKM microsome fraction and recombinant LKM-1 (cytochrome P450 db 1) amino acids 125–497.

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**Patent Not Issued For This Number**

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## EPSTEIN-BARR VIRUS SEQUENCES ENCODING A DIAGNOSTICALLY RELEVANT VIRUS CAPSID ANTIGEN, EXPRESSION CLONES DERIVED THROUGH POLYMERASE CHAIN REACTION AND THE USE OF THIS RECOMBINANT ANTIGEN IN DIAGNOSTIC TESTS

Hans Joachim Wolf, Josef-Jagerhuber-Strasse 9, 82319 Starnberg, Germany; Udo Reischl, Grafenau, and Manfred Motz, Munich, both of Germany, assignors to Hans Joachim Wolf, Starnberg, Germany

PCT No. PCT/EP94/02436, § 371 Date Apr. 29, 1996, § 102(e) Date Apr. 29, 1996, PCT Pub. No. WO94/03415, PCT Pub. Date Feb. 2, 1995
PCT Filed Jul. 22, 1994, Ser. No. 586,640
Claims priority, application European Pat. Off., Jul. 23, 1993, 93111883
Int. Cl.[6] G01N *33/53;33/48;* C12P *21/00;19/34*
U.S. Cl. 435—7.1 6 Claims

1. A method for the detection of EBV infections comprising obtaining a sample from serum of a patient, and determining the content of sera against the p23kDA antigen of EBV, the determined presence and amount of sera being indicative of the presence of an EBV infection.

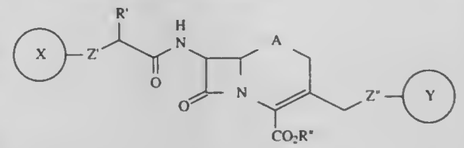
5,741,657

## FLUOROGENIC SUBSTRATES FOR β-LACTAMASE AND METHODS OF USE

Roger Y. Tsien, La Jolla, and Gregor Zlokarnik, Sao Diego, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Mar. 20, 1995, Ser. No. 407,544
Int. Cl.[6] C12Q *1/34;* C07D *501/00;501/14*
U.S. Cl. 435—18 18 Claims

1. A compound having the formula I:




wherein:

one of X and Y is a fluorescent donor moiety or an ester derivative of said fluorescent donor moiety, and the other is a quencher or an ester derivative of said quencher; wherein said quencher quenches fluorescence of said fluorescent donor moiety;

R' is selected from the group consisting of H, lower alkyl and $(CH_2)_nOH$, in which n is 0 or an integer from 1 to 5;

R" is selected from the group consisting of H, physiologically acceptable metal and ammonium cations, $—CHR^2OCO(CH_2)_nCH_3$, $—CHR^2OCOC(CH_3)_3$, -acylthiomethyl, -acyloxy-alpha-benzyl, -delta-butyrolactonyl, -methoxycarbonyloxymethyl, -phenyl, -methylsulphinylmethyl, -beta-morpholinoethyl, -dialkylaminoethyl, -acyloxyalkyl, -dialkylaminocarbonyloxymethyl and -alkyl, in which $R^2$ is selected from the group consisting of H and lower alkyl and in which n is 0 or an integer from 1 to 5; A is selected from the group consisting of S, O, SO, $SO_2$ and $CH_2$; and Z' and Z" are linkers for the fluorescent donor and quencher moieties.

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5,741,658

## QUANTITATIVE CLOTTING ASSAY FOR ACTIVATED FACTOR VII

James H. Morrissey, Oklahoma City, Okla., assignor to Oklahoma Medical Research Foundation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 683,682, Apr. 10, 1991, Pat. No. 5,472,850. This application Jun. 5, 1995, Ser. No. 463,931
Int. Cl.[6] C12Q *1/37*
U.S. Cl. 435—23 28 Claims

1. A kit for use in measuring factor VIIa in an anticoagulated plasma sample, comprising:

(a) a truncated tissue factor reagent comprising truncated tissue factor and a phospholipid agent solubilized in an aqueous medium, said truncated tissue factor characterized by inability to bind to a phospholipid membrane surface and inability to support conversion of factor VII to factor VIIa while maintaining some cofactor activity, provided in a first container;

(b) a factor VII-deficient plasma provided in a second container;

(c) a factor VIIa standard provided in a third container; and

(d) an instruction protocol for mixing said reagent with a plasma sample in an assay to measure an unknown amount of factor VIIa which may be present in said plasma sample, for mixing said reagent with said factor VIIa standard in said assay to measure a known amount of factor VIIa present in said standard, and for using said factor VII-deficient plasma as a diluent in said assay so that different concentrations of said plasma sample and of said standard can be measured.

5,741,659

## RAPID MICROBIAL PROTEASE ASSAY

Stephen Alden Ralls, Great Lakes; Lloyd Grant Simonson, Deerfield, and Sylvia Zottu Schade, Riverside, all of Ill., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 4, 1996, Ser. No. 583,170
Int. Cl.[6] C12Q *1/37;1/04;1/52;* A01N *37/18*
U.S. Cl. 435—23 8 Claims



1. An assay means for rapidly detecting microbial protease activity in clinical and laboratory samples comprising:

a sample suspected of containing microorganisms having the desired protease activity and selected from the group consisting of dental plaque, saliva, oral rinse expectorant, urine, sweat, tears, blood, serum, stool, gastric fluid, synovial fluid, phlegm, culture media and other clinical and laboratory specimens and samples;

a flow-through solid phase substrate capable of immobilizing the desired microorganisms in the sample and allowing other fluids and materials which may contain host proteases to drain through;

an enzymatic substrate for application to the desired microorganisms immobilized on the solid phase substrate said enzymatic substrate capable of producing an enzymatic substrate end-product by interaction with said microorganism; and

a chemical enhancing reagent capable of reacting with the enzymatic substrate end-product to produce a detectable chromogenic reaction.

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5,741,660

## METHOD OF MEASURING ENZYME REACTION BY RAMAN SCATTERING

Xiaoming Don; Yutaka Yamasaki; Harumi Uenoyama, and Yoshinori Yamaguchi, all of Kyoto, Japan, assignors to Kyoto Dai-ichi Kagaku Co., Ltd., Minami-ku, Japan

Filed Jan. 30, 1996, Ser. No. 594,205
Claims priority, application Japan, Feb. 1, 1995, 7-037564
Int. Cl.[6] C12Q *1/26*
U.S. Cl. 435—25 9 Claims

1. A qualitative measuring method comprising the steps of:

adding an enzyme to a sample solution to which ferricyanic ions are added;

irradiating said sample solution with an excitation beam of a single wavelength before and after said addition of said enzyme for receiving scattered light from said sample solution and separating said scattered light into its spectral components; and

measuring presence or absence of a target substrate of said enzyme depending on whether or not a Raman scattering spectrum from said sample solution after said addition of said enzyme includes a reinforced peak of that of a Raman scattering spectrum from said sample solution before said addition of said enzyme.

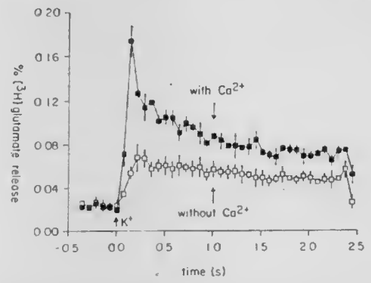
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5,741,661

## SUBSTITUTED GUANIDINES AND DERIVATIVES THEREOF AS MODULATORS OF NEUROTRANSMITTER RELEASE AND NOVEL METHODOLOGY FOR IDENTIFYING NEUROTRANSMITTER RELEASE BLOCKERS

Stanley M. Goldin, Lexington; Subbarao Katragadda, Belmont; Lain-Yen Hu, Bedford; N. Laxma Reddy, Malden; James B. Fischer, Cambridge; Andrew Gannett Knapp, Salem, and Lee David Margolin, Belmont, all of Mass., assignors to Cambridge NeuroScience, Inc., Cambridge, Mass.

Continuation of Ser. No. 343,829, Nov. 22, 1994, which is a division of Ser. No. 833,421, Feb. 10, 1992, Pat. No. 5,403,861, which is a continuation of Ser. No. 652,861, Feb. 8, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 463,686
Int. Cl.[6] C12Q *1/02;* A23J *3/00;* A01N *37/52*
U.S. Cl. 435—29 58 Claims




1. A screening assay for compounds which inhibit the release of a neurotransmitter from neuronal cells, which comprises:

(a) contacting immobilized synaptosomes containing radiolabelled neurotransmitter with a compound suspected of inhibiting the neurotransmitter release;

(b) inducing the release of radiolabelled neurotransmitter from the immobilized radiolabelled synaptosomes obtained in step (a);

(c) washing the immobilized radiolabelled synaptosomes obtained in step (b) with a buffer comprising said compound and fractionating the effluent every 15 to 500 msec; and

(d) detecting the relative amount of radiolabelled neurotransmitter in each fraction compared to control synaptosomes which have not been exposed to the compound;

wherein a reduced amount of released radiolabelled neurotransmitter in the fractions from synaptosomes treated with the compound relative to control synaptosomes indicates that the compound inhibits neurotransmitter release.

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5,741,662

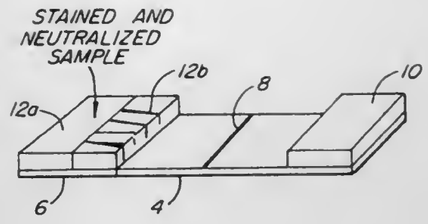
## DIRECT STAIN SPECIFIC BINDING ASSAYS FOR MICROORGANISMS

Randall D. Madsen; Lorraine S. Bautista, both of San Diego; Jan W. Pawlak, Encinitas, and Allan D. Pronovost, San Diego, all of Calif., assignors to Quidel Corporation, San Diego, Calif.

Filed Dec. 18, 1995, Ser. No. 573,706
Int. Cl.[6] C12Q *1/04;1/06;* G01N *33/53;* C12N *1/00*
U.S. Cl. 435—34 38 Claims

1. An assay for determining the presence or absence of a microorganism in a fluid sample suspected of containing a microorganism, said assay comprising:






a) combining the sample with a labeling reagent to form a labeled microorganism, said labeling reagent comprising a dye which directly stains the microorganism to provide a stained sample comprising a stained microorganism,

b) contacting the stained sample with a matrix defining a flow path from a sample receiving zone to a capture zone located downstream from the sample receiving zone wherein said capture zone comprises an immobilized specific binding pair member for the microorganism, and

c) observing the accumulation of the stained microorganism within the capture zone as a result of the stained microorganism flowing into and being immobilized within the capture zone by the specific binding pair member.

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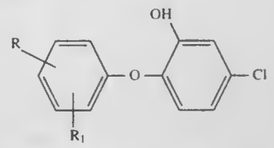
5,741,663

## SELECTIVE ADDITIVE AND MEDIA FOR *PSEUDOMONAS FLUORESCENS*

Scott Marshall Russell, Athens, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed Apr. 16, 1996, Ser. No. 632,929
Int. Cl.[6] C12Q *1/04*
U.S. Cl. 435—34 13 Claims

1. A bacteriological growth medium selective for *Pseudomonas fluorescens*, said selective medium comprising a nutrient component capable of supporting growth of *P. fluorescens* and a compound of the formula




where R is a halogen and $R_1$ is H or Cl, at a concentration of between about 1 and 50 μg/mL, carbenicillin at a concentration of between 5 and 800 μg/ml and nitrofurantoin at a concentration of between about 1 and about 200 μg/mL.

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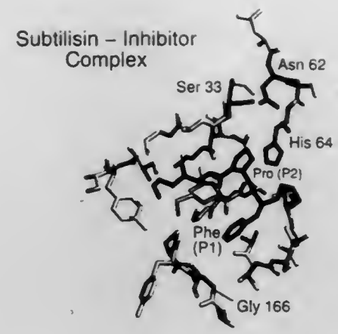
5,741,664

## SUBTILISIN VARIANTS CAPABLE OF CLEAVING SUBSTRATES CONTAINING DIBASIC RESIDUES

Marcus D. Ballinger, and James A. Wells, both of Burlingame, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 398,028, Mar. 3, 1995. This application Jun. 1, 1995, Ser. No. 460,343
Int. Cl.[6] C12P *21/00;* C12N *9/54;9/56;15/57*
U.S. Cl. 435—68.1 11 Claims

1. A subtilisin modified to have substrate specificity for peptide substrates having basic amino acids at the $P_2$ and $P_1$ positions of the substrate, said subtilisin having an Asp or Glu at an amino acid residue equivalent to Asn 62 and Gly 166 of the subtilisin having




the amino acid sequence of SEQ ID NO: 74 naturally produced by *Bacillus amyloliquefaciens*.

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5,741,665

## LIGHT-REGULATED PROMOTERS FOR PRODUCTION OF HETEROLOGOUS PROTEINS IN FILAMENTOUS FUNGI

Elie K. Kato, Honolulu, and W. Dorsey Stuart, Kaneohe, both of Hi., assignors to University of Hawaii, Honolulu, Hi.

Filed May 10, 1994, Ser. No. 240,372
Int. Cl.[6] C12N *1/15;15/09;15/11;* C07H *21/04*
U.S. Cl. 435—69.1 9 Claims

1. A nucleic acid molecule for expression of a first nucleotide sequence encoding a heterologous protein in a filamentous fungus, which nucleic acid molecule comprises said first nucleotide sequence operably linked to the al-1, al-2 or al-3 promoter and optionally further comprises a second nucleotide sequence that provides for a selectable marker in said fungus.

8. A Neurospora fungus modified to contain the nucleic acid molecule of claim 1.

9. A method to produce proteins heterologous to a Neurospora fungus, which method comprises culturing the Neurospora fungus of claim 8 under conditions wherein said heterologous protein is produced; and

recovering the heterologous protein from the culture.

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5,741,666

## COMPOSITIONS AND METHODS, FOR THE TREATMENT OF BODY WEIGHT DISORDERS, INCLUDING OBESITY

Louis Anthony Tartaglia, Waterstown, Mass., assignor to Millennium Pharmaceuticals, Inc., Cambridge, Mass.

Filed Aug. 23, 1994, Ser. No. 294,522
Int. Cl.[6] C12N *15/12;15/10;15/63*
U.S. Cl. 435—69.1 16 Claims

1. An isolated nucleic acid containing:

(a) the C5 nucleotide sequence (SEQ ID NO.:37) from nucleotide residue number 1 to 909;

(b) a nucleotide sequence encoding the C5 polypeptide. (SEQ ID NO.:36);

(c) the C5 human homolog (SEQ ID NO.:38);

(d) the nucleotide sequence contained in the cDNA insert within the fahs005a clone as deposited with the NRRL having Accession No. B-21320; or

(e) a nucleotide sequence encoding the C5 polypeptide encoded by the cDNA insert within the fash005a clone as deposited with the NRLL having Accession No. B-21320.

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7. A genetically engineered host cell containing the nucleic acid of claim 1, 2 or 3 in operative association with a nucleotide regulatory element that controls expression of the nucleotide sequence in the host cell.

8. A method for producing a C5 polypeptide, comprising: culturing the genetically engineered host cell of claim 7 so that the C5 polypeptide is expressed in the cell culture, and recovering the C5 polypeptide from the cell culture.

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5,741,667

## TUMOR NECROSIS FACTOR RECEPTOR-ASSOCIATED FACTORS

David V. Goeddel, Hillsborough, and Mike Rothe, San Mateo, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 331,394, Oct. 28, 1994, Pat. No. 5,670,319, which is a continuation-in-part of Ser. No. 250,858, May 27, 1994. This application May 22, 1995, Ser. No. 446,915

Int. Cl.[6] C12N *5/10;15/12*

U.S. Cl. 435—69.1 6 Claims

1. An isolated nucleic acid molecule comprising a nucleotide sequence encoding a native mammalian TRAF1 or TRAF2 protein or a TRAF protein, comprising at least amino acids 180 to 409 of SEQ. ID. NO: 2, or at least amino acids 272 to 501 of SEQ. ID. NO: 4.

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5,741,668

## EXPRESSION OF A GENE FOR A MODIFIED GREEN-FLUORESCENT PROTEIN

William W. Ward, Metuchen, N.J., and Martin Chalfie, New York, N.Y., assignors to Rutgers, the State University of New Jersey, Piscataway, N.J., and The Trustees of Columbia University in the City of NY, New York, N.Y.

Division of Ser. No. 192,158, Feb. 4, 1994, abandoned. This application May 26, 1995, Ser. No. 452,295

Int. Cl.[6] C12P *21/00;* C12N *15/63;* C07H *21/04*

U.S. Cl. 435—69.1 7 Claims




1. A method of synthesizing coelenterazine comprising:

a) synthesizing a pre-coelenterazine peptide comprising a modified amino acid sequence of a green-fluorescent protein of *A. victoria* in which $R^{65}$ is Tyr, said method comprising

incubating a polynucleotide in the presence of means for effecting expression of said polynucleotide under conditions favorable to expression of said polynucleotide,

said polynucleotide comprising one or more sequences of nucleotide bases collectively encoding said pre-coelenterazine peptide, wherein said one or more sequences of bases collectively encoding said amino acid sequence of said pre-coelenterazine peptide are uninterrupted by non-coding sequences; and

b) isolating coelenterazine from said means.

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5,741,669

## INSECTICIDALLY EFFECTIVE PEPTIDES

Karen Joanne Krapcho; John Randolph Hunter Jackson; Janice Helen Johnson; Eric George DelMar, and Robert Marden Kral, Jr., all of Salt Lake City, Utah, assignors to FMC Corporation, Philadelphia, Pa., and NPS Pharmaceuticals, Inc., Salt Lake City, Utah

Division of Ser. No. 171,383, Dec. 20, 1993, Pat. No. 5,441,934, which is a continuation-in-part of Ser. No. 826,925, Jan. 24, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 461,041

Int. Cl.[6] C12N *15/12;15/63;* A61K *38/00;* C12P *21/00*

U.S. Cl. 435—69.1 31 Claims

20. A method for producing an insecticidally effective peptide comprising the amino acid sequence defined in SEQ ID NO:3, comprising the steps of:

a) culturing recombinant host cells wherein a recombinant expression vector transformed or transfected in said host cells has a nucleotide coding sequence encoding said peptide, wherein the vector is capable of effecting the expression of said coding sequence in transformed cells; and

b) recovering said insecticidally effective peptide from the recombinant host cell culture or host organism.

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5,741,670

## CARTILAGE MATRIX PROTEIN AND METHODS FOR USE

Paul F. Goetinck, Boston, and Mehrdad Tondravi, Marshfield, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Division of Ser. No. 6,096, Jan. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 866,403, Apr. 10, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 463,180

Int. Cl.[6] C12P *21/06;* C12N *1/20;* C07N *21/04*

U.S. Cl. 435—69.1 7 Claims

1. Substantially purified DNA encoding a chimeric polypeptide which includes a fragment of cartilage matrix protein domain CMP-1 or CMP-2, said fragment including a collagen binding site and said fragment being at least 99% homologous with the corresponding residues of cartilage matrix protein domain CMP-1 or CMP-2.

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5,741,671

## ISOLATION CLONING AND EXPRESSION OF TRANSMEMBRANE WATER CHANNEL AQUAPORIN 1(AQP1)

Peter C. Agre, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 393,996, Feb. 24, 1995, which is a continuation-in-part of Ser. No. 930,168, Aug. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 806,723, Dec. 12, 1991, Pat. No. 5,191,330. This application Jun. 6, 1995, Ser. No. 468,763

Int. Cl.[6] C12N *15/12;15/64;* C07K *14/705*

U.S. Cl. 435—69.1 5 Claims

1. An isolated DNA molecule which encodes a water channel protein corresponding to the amino acid sequence of Aquaporin-1 (AQP1) as shown in SEQ ID NO: 17.



5,741,672

## EXPRESSION AND PRODUCTION OF POLYPEPTIDES USING THE PROMOTERS OF THE *HANSENULA POLYMORPHA* MOX AND DAS GENES

Adrianus M. Ledeboer, Rotterdam; Jan Maat, Monster; Cornelis T. Verrips, Maassluis; Christiaan Visser, Capelle a/d IJssel, all of Netherlands; Zbigniew A. Janowicz, Erkrath-Unterfeldhaus, and Cornelis P. Hollenberg, Düsseldorf, both of Germany, assignors to Unilever Patent Holdings B.V., Netherlands

Continuation of Ser. No. 45,081, Apr. 12, 1993, abandoned, which is a continuation of Ser. No. 587,555, Sep. 24, 1990, Pat. No. 5,240,838, which is a continuation of Ser. No. 300,211, Jan. 23, 1989, abandoned, which is a continuation of Ser. No. 759,315, Jul. 26, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 473,295

Claims priority, application European Pat. Off., Jul. 27, 1984, 84201114; United Kingdom, Feb. 7, 1985, 8503160

Int. Cl.[6] C12P *21/00;* C12N *1/19;15/00;* C07H *21/04*

U.S. Cl. 435—69.1 8 Claims

2. Process for preparing a polypeptide comprising culturing a fungus of a genera selected from the group consisting of Hansenula and Saccharomyces transformed with a structural gene coding for the polypeptide under conditions such that said structural gene is expressed and said polypeptide is thereby produced, wherein said structural gene is operably linked to a region comprising a promoter selected from the group consisting of at least the −1 to about −1500 region of the *Hansenula polymorpha* MOX gene and the −1 to −2125 region of the *Hansenula polymorpha* DAS gene, said structural gene being other than a native MOX or DAS gene.

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5,741,673

## NUCLEIC ACID ENCODING A NOVEL HOMEOBOX FACTOR WHICH STIMULATES INSULIN EXPRESSION IN PANCREATIC ISLET CELLS

Marc R. Montminy, Encinitas, and James N. Leonard, San Diego, both of Calif., assignors to Research Development Foundation, Carson City, Nev.

Continuation of Ser. No. 106,936, Aug. 16, 1993, abandoned. This application Jan. 5, 1996, Ser. No. 583,672

Int. Cl.[6] C12N *15/12*

U.S. Cl. 435—69.1 9 Claims

1. An isolated nucleic acid encoding a mammalian insulin transcription factor protein, wherein said nucleic acid is selected from the group consisting of:

a) nucleic acid encoding the amino acid sequence as set forth in SEQ ID NO:2;

b) nucleic acid hybridizing under high stringency conditions to the complement of the nucleic acid as set forth in SEQ ID NO:1; and

c) nucleic acid that is degenerate with the nucleic acid of a) or b).

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5,741,674

## RECOMBINANT PRODUCTION OF PROTEINS IN YEAST

Jürgen Schweden, Neustadt; Claus Bollschweiler, Heidelberg; Michael Piontek, Essen; Ulrike Weydemann, Köln; Zbigniew A. Janowicz, Erkrath, and Alexander W.M. Strasser, Düsseldorf, all of Germany, assignors to Rhein Biotech Gesellschaft fur neue biotechnologische Prozesse und Produkte, mbH, Duesseldorf, Germany

PCT No. PCT/EP94/02897, § 371 Date Mar. 1, 1996, § 102(e) Date Mar. 1, 1996, PCT Pub. No. WO95/07356, PCT Pub. Date Mar. 16, 1995

PCT Filed Sep. 1, 1994, Ser. No. 605,053

Claims priority, application Germany, Sep. 4, 1993, 43 29 969.5

Int. Cl.[6] C12P *21/00*

U.S. Cl. 435—69.1 3 Claims

1. A process for the recombinant production of proteins which are heterologous in the yeast Hansenula, which comprises transforming Hansenula with an expression cassette which comprises the following structural elements encoded:

L-A-P-GEN

where

L is a leader sequence,

A is an adaptor with the sequence SEQ ID NO:1,

P is a processing signal and

GEN is a structural gene for the required protein;

growing Hansenula in a suitable growth medium;

and recovering said protein; wherein said protein is correctly processed.

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5,741,675

## REGULATORY NUCLEIC ACID SEQUENCES AND USES IN ACTINOMYCETES

Annick Friedmann, Villiers-le-Bacle; Michel Guerineau, Paris; Juliette Hagege, Orsay; Jean-Luc Pernodet, Cachan, and Guënnady Sezonov, Paris, all of France, assignors to Rhone-Poulenc Rorer S.A., Antony, France

PCT No. PCT/FR94/01413, § 371 Date Jun. 7, 1996, § 102(e) Date Jun. 7, 1996, PCT Pub. No. WO95/16046, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 5, 1994, Ser. No. 656,253

Claims priority, application France, Dec. 8, 1993, 93 14701

Int. Cl.[6] C12N *1/21;15/31;15/76;* C12P *21/00*

U.S. Cl. 435—69.1 16 Claims

1. An isolated nucleic acid comprising all or part of the sequence SEQ ID NO. 1 or a variant of the latter, which sequence or variant of said sequence is capable of inducing the appearance of replicative free copies of pSAM2 or its derivatives and wherein said sequence or variant of said sequence is under the control of a promoter functional in actinomycetes wherein the promoter is a heterologous constitutive promoter or a heterologous regulated promoter.

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5,741,676

## DNA CYCLE SEQUENCING

Carl W. Fuller, Cleveland Heights, Ohio, assignor to Amersham Life Science, Inc., Cleveland, Ohio

Division of Ser. No. 767,137, Sep. 27, 1991. This application May 9, 1995, Ser. No. 437,318

Int. Cl.[6] C12P *19/34*

U.S. Cl. 435—91.1 4 Claims

1. A method for preparing DNA for sequencing of the DNA, comprising the steps of amplifying said DNA, under conditions in which the amplifying reaction products may still contain undesirable NTPs excess primer, and nonspecifically amplified single-stranded DNA, and reacting said amplification reaction products with exonuclease I and alkaline phosphatase under conditions in which any said undesirable single-stranded DNA and primer are degraded by said exonuclease I, and said excess dNTPs are dephospholylated by said alkaline phosphatase.

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5,741,677

## METHODS FOR MEASURING TELOMERE LENGTH

Michael R. Kozlowski; Karen R. Prowse, both of Palo Alto; Sy-shi Wang, Burlingame; Sharon Wong, San Jose; Nam Woo Kim, Sunnyvale, and Richard Allsop, Menlo Park, all of Calif., assignors to Geron Corporation, Menlo Park, Calif.

Filed Jun. 7, 1995, Ser. No. 479,916

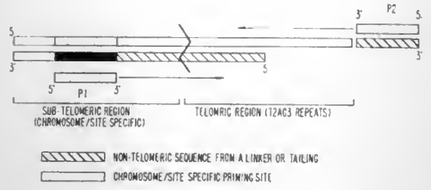
Int. Cl.[6] C12P *19/34;* C12Q *1/68;* C07H *21/02;21/04*

U.S. Cl. 435—91.2 8 Claims

1. A method for measuring an average length of telomeres in a sample comprising a cell or tissue, said method comprising steps of:

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(a) contacting said telomeres with an oligonucleotide linker under conditions such that said linker is covalently linked to a 3' end of said telomeres;

(b) amplifying with a first primer complementary to said oligonucleotide linker and a second primer complementary to a subtelomeric region of a chromosome under conditions in a reaction mixture such that said first and second primers hybridize specifically to said linker and subtelomeric region, respectively, and are extended by a polymerase, thereby forming first and second primer extension products; and

(c) measuring an amount by which said first and/or second primer has been extended to form said extension products or duplex nucleic acids comprising said first and second primer extension products to determine an average telomere length.

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**5,741,678**

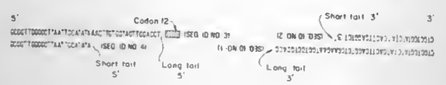
**QUANTITATIVE METHOD FOR EARLY DETECTION OF MUTANT ALLELES AND DIAGNOSTIC KITS FOR CARRYING OUT THE METHOD**

**Zeev A. Ronai, Montebello, N.Y., assignor to American Health Foundation, Valhalla, N.Y.**

**Continuation of Ser. No. 441,227, May 15, 1995, abandoned, which is a division of Ser. No. 339,786, Nov. 15, 1994, Pat. No. 5,512,441. This application Jul. 23, 1996, Ser. No. 684,009**

**Int. Cl.[6] C12P** *19/34;* **C12Q** *1/68;* **C07H** *21/04*

**U.S. Cl. 435—91.2** **6 Claims**




1. A diagnostic kit for use in an assay for detecting the presence or absence on a first genomic nucleic acid strand of a genomic region containing a mutant nucleotide sequence, wherein said genomic region can contain the mutant nucleotide sequence or a wild-type sequence, wherein said first genomic nucleic acid strand is present in a test sample in the form of a first genomic duplex consisting of the first genomic nucleic acid strand and a first complementary nucleic acid strand, and wherein the assay comprises at least a first and a second amplification step, said kit comprising:

a) a first reagent mixture for use in the first amplification step wherein the first nucleic acid duplexes are synthesized in a polymerase chain reaction with synthesis of a first synthesized duplex, said first mixture comprising upstream and downstream long tail primers, each of said upstream and downstream long tail primers comprising a complementary primer portion and a non-complementary primer portion, the complementary primer portion of the upstream long tail primers being sufficiently complementary to a first end portion of the first complementary nucleic acid strand to enable the upstream long tail primers to anneal thereto and thereby to initiate synthesis of a nucleic acid extension product using the first complementary strand as a template, the complementary primer portion of the downstream long tail primers being sufficiently complementary to a first end portion of the first genomic strand to enable the downstream primers to anneal thereto and thereby to initiate synthesis of a nucleic acid extension product using the first genomic strand as a template, the non-complementary primer portions of said upstream and downstream long tail primers not being sufficiently complementary to either the first genomic strand or the first complementary strand to anneal with either, the non-complementary primer portions of the respective upstream and downstream long tail primers being positioned on the upstream and downstream long tail primers such that a first end portion of the first synthesized strand of synthesized duplexes formed using the upstream and downstream primers has nucleotide sequences that are identical to the nucleotide sequences of the non-complementary primer portion of the upstream long tail primers and such that a first end portion of the first complementary synthesized strand of synthesized duplexes formed using the upstream and downstream primers has nucleotide sequences that are identical to the nucleotide sequences of the non-complementary primer portion of the downstream primers, and

b) a second reagent mixture for use in the second amplification step comprising upstream and downstream short tail primers, each of said upstream short tail primers comprising nucleotide sequences which are sufficiently complementary to the nucleotide sequences in the non-complementary primer portion of the upstream long tail primers to anneal thereto but which are not sufficiently complementary to nucleotide sequences in either the first genomic strand or the first complementary genomic strand to anneal thereto, each of said downstream short tail primers comprising nucleotide sequences which are sufficiently complementary to the nucleotide sequences in the non-complementary primer portion of the downstream long tail primers to anneal thereto but which are not sufficiently complementary to nucleotide sequences in either the first genomic strand or the first complementary genomic strand to anneal thereto, whereby the upstream and downstream short tail primers can be used in the second amplification step selectively to amplify synthesized duplexes synthesized in the first amplification step and none of the first genomic duplexes.

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**5,741,679**

**REGULATABLE NUCLEIC ACID THERAPEUTIC AND METHODS OF USE THEREOF**

**Shaji T. George; Andy Shih, and Jeffrey Michael Bockman, all of New York, N.Y., assignors to Innovir Laboratories, Inc., New York, N.Y.**

**Continuation of Ser. No. 987,465, Dec. 4, 1992, abandoned. This application Sep. 16, 1994, Ser. No. 307,401**

**Int. Cl.[6] C12P** *19/34;* **C07H** *21/04*

**U.S. Cl. 435—91.31** **28 Claims**

15. A method of making a regulatable ribozyme molecule comprising a ribozyme sequence which cleaves a separate targeted RNA molecule and a RNA sequence which binds to a ligand, wherein binding of the ligand alters the activity of the ribozyme against the targeted RNA, comprising the steps of

providing a random nucleotide sequence of between 20 and 100 nucleotides in length which is to be linked to a sequence with ribozyme activity which cleaves a targeted RNA molecule,

amplifying the random sequence under conditions promoting mutation of the random sequence, wherein mutation of the random sequence results in mutated sequences,

exposing the mutated sequences to a ligand which is to be used to modify the activity of the ribozyme under conditions favorable to binding of the ribozyme to the ligand,

removing mutated sequences not binding to the ligand,

repeating the amplification and binding steps until mutated sequences are obtained which bind to the ligand,

linking each of the mutated sequences which bind to the ligand to the ribozyme sequence to form ribozyme-ligand binding sequences,

exposing the ribozyme-ligand binding sequences to ligand, and



screening for alteration of the ribozyme activity when ligand is bound and when ligand is not bound to the ligand binding sequence, wherein alteration of ribozyme activity identifies a ribozyme-ligand binding sequence as a regulatable ribozyme molecule.

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**5,741,680**

**BUFFER COMPOSITION BASE AND METHOD OF FORMULATION FOR ORAL VACCINE DELIVERY**

**David A. Sack, Fallston, Md., assignor to Cera Products, Inc., Columbia, Md.**

**Filed Sep. 3, 1996, Ser. No. 706,447**

**Int. Cl.[6] C12P** *14/14;* **A61K** *39/106;* **A01N** *59/00;* **C12N** *7/06*

**U.S. Cl. 435—99** **15 Claims**

1. A buffer composition base suitable for mixing with an oral vaccine comprising:

(a) a carbohydrate composition having a weight percentage of said buffer composition within the approximate weight range of 40.0%–87.5%, said carbohydrate composition formed from a starch containing food product and having a dextrose equivalency value approximating 41; and,

(b) an electrolyte composition blended with said carbohydrate composition and forming a weight percentage of said buffer composition within the approximate range of 12.5%–50.0%, said blended carbohydrate and electrolyte compositions being mixed with said vaccine for oral ingestion by a user, said electrolyte composition including a first electrolyte composition chosen from the group consisting of trisodium citrate, citric acid and mixtures thereof, and said electrolyte composition further including a second neutralizing salt composition chosen from the group consisting of sodium bicarbonate, calcium carbonate and mixtures thereof.

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**5,741,681**

**METHOD FOR PRODUCING L-ASPARTIC ACID**

**Naoki Kato; Yoshiaki Mori; Norioki Mine; Seishi Fujii, and Naoyuki Watanabe, all of Yokkaichi, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan**

**PCT No. PCT/JP95/02526, § 371 Date Aug. 8, 1996, § 102(e) Date Aug. 8, 1996, PCT Pub. No. WO96/17950, PCT Pub. Date Jun. 13, 1996**

**PCT Filed Dec. 8, 1995, Ser. No. 687,618**

**Claims priority, application Japan, Dec. 9, 1994, 6-306217**

**Int. Cl.[6] C12P** *13/20;13/04*

**U.S. Cl. 435—109** **24 Claims**

1. A method for producing L-aspartic acid by using maleic acid, maleic anhydride or both as a raw material, comprising steps of:

(a) subjecting monoammonium maleate in an aqueous solution in the presence of ammonia to an isomerization reaction and an enzyme reaction caused by aspartase to produce ammonium L-aspartate in a reaction solution;

(b) converting substantially all produced ammonium L-aspartate into monoammonium salt by distilling or stripping the reaction solution obtained in the step (a);

(c) adding maleic acid, maleic anhydride or both as an acidic precipitating agent to the solution obtained in the step (b) to precipitate L-aspartic acid crystals and produce monoammonium maleate in a mother liquor;

(d) separating L-aspartic acid crystals precipitated in the step (c) from the mother liquor containing monoammonium maleate; and

(e) supplying the separated mother liquor containing monoammonium maleate obtained in the step (d) to the step (a) to be used as a raw material for the reaction.

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**5,741,682**

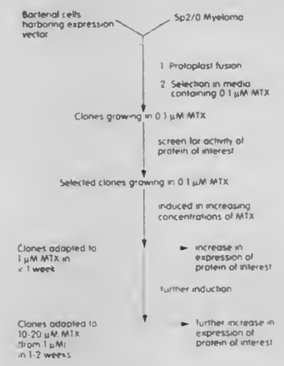
**EXPRESSION INDUCTION METHOD**

**Kin-Ming Lo, Wellesley, and Stephen D. Gillies, Hingham, both of Mass., assignors to Abbott Biotech, Inc., Abbott Park, Ill.**

**Continuation of Ser. No. 926,143, Aug. 5, 1992, abandoned, which is a continuation of Ser. No. 660,925, Feb. 27, 1991, abandoned, which is a continuation of Ser. No. 511,998, Apr. 13, 1990, abandoned, which is a continuation of Ser. No. 281,833, Dec. 8, 1988, abandoned. This application Jan. 20, 1995, Ser. No. 376,073**

**Int. Cl.[6] C12N** *5/18;15/63*

**U.S. Cl. 435—172.3** **20 Claims**




1. A method of inducing transcription of a gene encoding a protein of interest in a host cell, said gene being present in a DHFR-selectable expression vector, comprising the steps of:

(a) contacting a mammalian cell with an expression vector comprising a first transcription unit comprising an expressible gene encoding an enzymatically functional dihydrofolate reductase (DHFR) and a second transcription unit comprising an expressible gene encoding a protein of interest, under conditions suitable for transfection of said cell with at least about 100 copies of said vector, such that a transfectant of said mammalian cell is produced;

(b) subjecting said transfectant to selective culture in the presence of at least about 100 nM methotrexate as a selecting agent to produce a clone of isolated transfectants essentially free of nontransfected mammalian cells;

(c) culturing said clone in the absence of methotrexate; and

(d) treating said cultured clone with methotrexate at a concentration sufficient to induce, in less than the cell doubling time of said cultured clone, an increase in transcription coordinately of the genes carried on said vector and encoding DHFR and said protein of interest.

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**5,741,683**

**IN VITRO PACKAGING OF ADENO-ASSOCIATED VIRUS DNA**

**Xiaohuai Zhou; Nicholas Muzyczka; Sergei Zolotukhin, all of Gainesville, Fla., and Tichua Ni, Malden, Mass., assignors to The Research Foundation of State University of New York, Stony Brook, N.Y.**

**Filed Jun. 7, 1995, Ser. No. 477,538**

**Int. Cl.[6] C12Q** *1/70;15/00;7/00;15/85;* **C12N** *15/00;7/00;15/85*

**U.S. Cl. 435—172.3** **11 Claims**

1. A method for in vitro packaging of a DNA substrate comprising the steps of:

(a) transfecting a mammalian host cell culture permissive for AAV replication with a dAAV vector containing AAV capsid and Rep gene coding sequences;

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(b) infecting said host cell culture with a helper virus;
(c) after said transfecting and said infecting, preparing an extract from the transfected cell culture;
(d) combining said extract with said DNA substrate, said DNA substrate comprising AAV terminal repeat sequences or a double-D sequence;
(e) incubating said extract under conditions to promote packaging of said DNA substrate; and,
(f) extracting said extract with chloroform.

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5,741,684

## MOLECULAR METHODS OF HYBRID SEED PRODUCTION

**Steven F. Fabijanski, and Paul G. Arnison, both of Ontario, Canada, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa**

**Division of Ser. No. 276,510, Jul. 14, 1994, which is a continuation of Ser. No. 556,917, Jul. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 306,438, Feb. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 151,906, Feb. 3, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 487,051**

**Int. Cl.[6] C12N *15/82*; A01H *1/02;1/04***

**U.S. Cl. 435—172.3** **10 Claims**

1. A method of producing a plant comprising the steps of:
(a) transforming a plant cell of said plant with a sense gene which confers on said plant resistance to an herbicide or antibiotic;
(b) regenerating from said transformed plant cell a genetically transformed plant which is resistant to said herbicide or antibiotic;
(c) inserting into the genome of a plant cell of said plant a recombinant DNA molecule comprising:
(i) a DNA sequence that codes for RNA that is complementary to the RNA sequence encoded by the sense gene;
(ii) a promoter which functions in said plant cell to cause transcription of said DNA sequence into RNA, preferentially in cells critical to pollen development or function;
(d) obtaining a plant cell of said resistant plant which has been transformed with the DNA molecule described in step (c) above; and
(e) regenerating from said transformed plant cell a plant which has been genetically transformed with the gene and the DNA molecule described in step (a) and step (c) above and can be rendered male sterile by said herbicide or antibiotic.

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5,741,685

## PARENCHYMAL CELLS PACKAGED IN IMMUNOPROTECTIVE TISSUE FOR IMPLANTATION

**Joseph P. Vacanti, Winchester, Mass., assignor to Children's Medical Center Corporation, Boston, Mass.**

**Filed Jun. 7, 1995, Ser. No. 473,255**

**Int. Cl.[6] C12N *11/04;5/00***

**U.S. Cl. 435—182** **10 Claims**

6. Cells for implantation comprising
parenchymal cells to be implanted completely packaged within a barrier of immunoprotective tissue selected from the group consisting of cartilage, interior of the eye containing the vitreous humor, vascular endothelium of the brain, and maternal-fetal interface in the placenta, wherein the barrier is effective to immunoprotect the cells packaged therein and allows sufficient exchange of nutrients and gases to the packaged cells to maintain the viability of the cells.

5,741,686

## EXOPEPTIDASE CATALYZED SITE-SPECIFIC BONDING OF SUPPORTS, LABELS AND BIOACTIVE AGENTS TO PROTEINS

**Fred W. Wagner, Walton, Nebr.; Thomas R. Coolidge, Falls Village, Conn.; Dwane E. Wylie, Lincoln, Nebr.; Sheldon M. Schuster, Gainesville, Fla.; William Lewis, and Jay Stout, both of Lincoln, Nebr., assignors to Board of Regents of the University of Nebraska, Lincoln, Nebr.**

**Continuation of Ser. No. 61,913, May 14, 1993, abandoned, which is a continuation of Ser. No. 375,138, Jun. 30, 1989, Pat. No. 5,279,954. This application Oct. 3, 1994, Ser. No. 316,810**

**Int. Cl.[6] C12N *9/96*; C07K *1/13*; C08H *1/00***

**U.S. Cl. 435—188** **19 Claims**

17. A method for forming a protein-nucleophile adduct for use in preparation of a modified protein, comprising:
coupling a nucleophile to a carboxy terminus of a protein by catalysis with a carboxypeptidase at a basic or acidic pH to form an adduct;
wherein the protein is a functional protein having one or more active sites; the nucleophile is spectroscopically active and photoreactive and is an amine or alcohol; the amine is a $C_2$–$C_{20}$ aliphatic, aromatic, arylaliphatic primary amine having a photoreactive group along its backbone or at its other terminus; and the alcohol is a $C_1$–$C_{20}$ aliphatic, aromatic, arylaliphatic primary alcohol having a photoreactive group along its backbone or at its terminus.

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5,741,687

## SORBITOL OXIDASE REAGENT FROM XANTHOMONAS

**Shizuo Hattori, Tsuruga; Yukihiro Sogabe, and Shigenori Emi, both of Turuga, all of Japan, assignors to Toyo Boseki Kaubshiki Kaisha, Osaka, Japan**

**Division of Ser. No. 162,628, Dec. 7, 1993, Pat. No. 5,472,862. This application Jun. 6, 1995, Ser. No. 471,388**

**Claims priority, application Japan, Dec. 7, 1992, 4-326871**

**Int. Cl.[6] C12N *9/04***

**U.S. Cl. 435—189** **6 Claims**

1. A reagent for determining sorbitol, which comprises sorbitol oxidase that catalyzes the following reaction: sorbitol+$O_2$→glucose+and hydrogen peroxide, wherein the sorbitol oxidase is isolated from *Xanthomonas maltophilia* and wherein said sorbitol oxidase further has the following properties:
(1) substrate specificity: specific activity for D-sorbitol, D-mannitol, D-xylitol, and D-arabitol;
(2) optimum pH: 6.5 to 7.5; and
(3) molecular weight: about 54,000 as determined by gel filtration or about 43,000 as determined by SDS-PAGE.

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5,741,688

## ALKALINE GLUCOSE OXIDASE OBTAINED FROM CLADOSPORIUM OXYSPORUM

**Karen M. Oxenbøll; Joan Qi Si, and Jesper Aagaard, all of Bagsvaerd, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark**

**PCT No. PCT/DK95/00178, § 371 Date May 25, 1995, § 102(e) Date May 25, 1995, PCT Pub. No. WO95/29996, PCT Pub. Date Nov. 9, 1995**

**PCT Filed May 3, 1995, Ser. No. 446,645**

**Claims priority, application Denmark, May 3, 1994, 504/94**

**Int. Cl.[6] C12N *9/04*; A23B *5/00***

**U.S. Cl. 435—190** **4 Claims**

1. An isolated glucose oxidase having a pH optimum in the range pH 6–7, determined at 30° C. with D-glucose as substrate, having more than 75% of maximum activity at pH 8, determined at 30° C. with D-glucose as substrate, and is obtained from a strain of *Cladosporium oxysporum*, designated as CBS 163.94.



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5,741,689

## METHODS TO INHIBIT SERINE KINASE ACTIVITY AND TO ALTER INTERSUBUNIT BINDING ACTIVITY OF PHOSPHATIDYLINOSITOL 3-KINASE, AND SERINE KINASE ACTIVE SEQUENCE OF THE SAME

**Ritu Bala Dhand, London; Michael Derek Waterfield, Berks; Ian Donald Hiles, Kent; Ivan Tarasovich Gout, London, all of England; Masato Kasuga; Kazuyoshi Yonezawa, both of Kobe, Japan; Peter End, London, England; Michael Fry, London, England, and George Panayotou, London, England, assignors to Ludwig Institute for Cancer Research, New York, N.Y.**

**Filed Jan. 21, 1994, Ser. No. 185,424**

**Int. Cl.[6] C12N *9/12***

**U.S. Cl. 435—194** **28 Claims**

1. Method for inhibiting the serine kinase ability of phosphatidyl-inositol 3 kinase (Pi3-kinase) which comprises disabling the sequence DRHNSN in the p110 subunit of phosphatidyl-inositol 3 kinase (PI3-kinase).

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5,741,690

Patent Not Issued For This Number

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5,741,691

## PARA-NITROBENZYL ESTERASES WITH ENHANCED ACTIVITY IN AQUEOUS AND NONAQUEOUS MEDIA

**Frances H. Arnold, and Jeffrey C. Moore, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.**

**Filed Jan. 23, 1996, Ser. No. 589,893**

**Int. Cl.[6] C12N *15/55;9/18;1/21;15/63***

**U.S. Cl. 435—197** **12 Claims**

1. A modified para-nitrobenzyl esterase having improved hydrolysis activity in aqueous and aqueous/organic media relative to unmodified para-nitrobenzyl esterase of SEQ. ID. NO: 2 from *Bacillus subtilis*, wherein said modified para-nitrobenzyl esterase consists of unmodified para-nitrobenzyl esterase which has been modified by an amino acid substitution at one or more amino acid positions selected from the group consisting of amino acid position numbers 60, 94, 96, 144, 267, 271, 322, 334, 343, 358 and 370.

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5,741,692

## PROTEIN VULGARIS CHONDROITINASE II

**Kiran M. Khandke, Nanuet; John Gotto, Suffern, both of N.Y., and Ursula Eul, Kahl, Germany, assignors to American Cyanamid Company, Wayne, N.J.**

**Continuation-in-part of Ser. No. 231,534, Apr. 22, 1994, Pat. No. 5,525,500, and a continuation-in-part of Ser. No. 232,540, Apr. 22, 1994, Pat. No. 5,498,536. This application Apr. 24, 1995, Ser. No. 428,948**

**Int. Cl.[6] C12N *9/24;9/26;9/28;1/00;1/12***

**U.S. Cl. 435—200** **4 Claims**

1. An isolated, purified protein consisting of the sequence of SEQ ID NO:2, wherein said protein having an amino acid sequence has chondroitinase II activity.

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5,741,693

## ALKALOPHILIC BACILLUS SP. AC13 AND PROTEASE, XYLANASE, CELLULASE OBTAINABLE THEREFROM

**Helle Outtrup, Ballerup; Claus Dambmann, Søborg; Arne Agerlin Olsen, Virum; Henrik Bisgård-Frantzen, Lynghy, and Martin Schülein, Copenhagen, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark**

**PCT No. PCT/DK93/00218, § 371 Date Nov. 30, 1994, § 102(e) Date Nov. 30, 1994, PCT Pub. No. WO94/01532, PCT Pub. Date Jan. 20, 1994**

**PCT Filed Jul. 2, 1993, Ser. No. 343,600**

**Claims priority, application Denmark, Jul. 2, 1992, 870/92**

**Int. Cl.[6] C12N *9/50;9/54***

**U.S. Cl. 435—221** **8 Claims**

1. An isolated protease obtained from a strain of Bacillus sp. AC13, and having
(a) an apparent molecular weight of approximately 30 kD as determined by SDS-PAGE;
(b) an isoelectric point of approximately 9.3 as determined by isoelectric focusing on LKB Ampholine PAG plates;
(c) a pH optimum above 10 determined at 25° C. with casein as substrate;
(d) a temperature optimum in the range of 45°–55° C. determined at pH 9.5 with casein as substrate; and
(e) immunochemical properties identical or partially identical to those of a protease derived from Bacillus sp. AC13, NCIMB No. 40482.

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5,741,694

## USEFUL MUTATIONS OF BACTERIAL ALKALINE PROTEASE

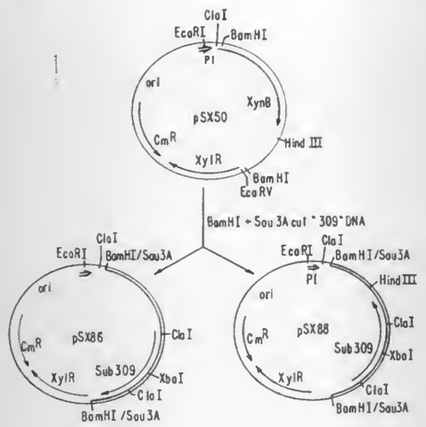
Sven Hastrup, København NV; Sven Branner, Lyngby; Fanny Norris, Hellerup; Steffen Bjørn Petersen, Ballerup; Leif Nørskov-Lauridsen, Køge; Villy Johannes Jensen, Bagsvaerd, and Dorrit Aaslyng, Roskilde, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Division of Ser. No. 294,241, Jan. 6, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 486,415

Claims priority, application Denmark, Jan. 7, 1988, 00064/88

Int. Cl.[6] C12N *9/56;9/50;9/54;* C11D *3/386*

U.S. Cl. 435—227 125 Claims




1. A substantially pure subtilisin modified by a substitution of an amino acid residue with another naturally occurring amino acid residue at one or more positions selected from the group consisting of:

6, 9, 11–12, 19, 25, 37–38, 54–59 68, 71, 89, 111, 115, 120, 121–122, 140, 175, 180, 182, 186, 187, 191, 194, 195, 226 234–238, 241, 260–262, 265, 268, and 275, wherein each position corresponds to a position of the amino acid sequence of the mature subtilisin BPN' as depicted in FIG. 6.

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5,741,695

## STRAINS OF BREAD-MAKING YEAST, A PROCESS FOR OBTAINING SAME, AND THE CORRESPONDING FRESH AND DRY NEW YEAST

Annie Loiez nee Hennette, Lille; Philippe Clement, Roubaix, and Didier Colavizza, Conde sur l'Escaut, all of France, assignors to Lesaffre et Cie, Paris, France

Continuation of Ser. No. 80,131, Jun. 23, 1993, which is a continuation of Ser. No. 872,395, Apr. 23, 1992. This application Aug. 3, 1994, Ser. No. 285,768

Claims priority, application France, Apr. 23, 1991, 91 05008

Int. Cl.[6] C12N *1/18;* A23L *1/28*

U.S. Cl. 435—255.2 58 Claims

1. Isolated man-made bread-making yeast strain having simultaneous enzymatic activity comprising the following:

maltose-permease activity after growth of the yeast on glucose medium in the absence of maltose (Test $T_1$) of at least 9 units;

maltase activity after growth of the yeast on glucose medium in the absence of maltose (Test $T_2$) of at least 80 units; and

invertase activity (Test $T_3$) of less than 10 units.

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5,741,696

## RECOMBINANT EQUINE HERPESVIRUSES

Mark D. Cochran, Carlsbad, and Christina H. Chiang, San Diego, both of Calif., assignors to Syntro Corporation, Lenexa, Kans.

Continuation-in-part of Ser. No. 926,784, Aug. 7, 1992, abandoned. This application Feb. 17, 1994, Ser. No. 198,094

Int. Cl.[6] C12N *7/01;7/04;15/86*

U.S. Cl. 435—235.1 11 Claims

1. A live recombinant equine herpesvirus 4 (EHV-4) comprising a foreign DNA sequence inserted into an equine herpesvirus 4 viral genome, wherein the foreign DNA sequence is inserted within the unique short region of the equine herpesvirus 4 viral genome.

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5,741,697

## BACTERIOPHAGE OF CHLAMYDIA PSITTACI

Patrik M. Bavoil, and Ru-Ching Hsia, both of Pittsford, N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Nov. 30, 1995, Ser. No. 565,386

Int. Cl.[6] C12N *7/00;* C07H *21/04*

U.S. Cl. 435—235.1 13 Claims

1. An isolated DNA molecule comprising the genomic sequence of bacteriophage ϕCPG1, said genomic sequence as shown in SEQ ID NO:1.

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5,741,698

## DNA ENCODING THE HUMAN ROTAVIRUS MAJOR OUTER CAPSID GLYCOPROTEIN

Ian Hamilton Holmes, Canterbury, and Michael Leigh Dyall-Smith, Kew, both of Australia, assignors to The University of Melbourne, Victoria, Australia

Continuation of Ser. No. 474,642, Feb. 1, 1990, Pat. No. 5,395,759, which is a continuation of Ser. No. 824,704. This application Feb. 28, 1994, Ser. No. 202,380

Claims priority, application WIPO, Apr. 29, 1985, PCT/AU85/00096; Australia, Apr. 27, 1994, PG 4733

Int. Cl.[6] C12N *1/21;15/63;* C07H *21/02;21/04*

U.S. Cl. 435—252.3 10 Claims

1. An isolated nucleic acid encoding a major outer capsid glycoprotein of a human rotavirus.

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5,741,699

## BIOLOGICAL CONTROL OF DISEASES OF HARVESTED AGRICULTURAL COMMODITIES USING STRAINS OF THE YEAST CANDIDA OLEOPHILA

Charles L. Wilson, Frederick, Md.; Michael E. Wisniewski, Shepherdstown, W. Va., and Edo Chalutz, Rishon le 'Zion, Israel, assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 136,182, Oct. 15, 1993, Pat. No. 5,425,941, which is a continuation-in-part of Ser. No. 745,796, Aug. 16, 1991, abandoned. This application Mar. 16, 1995, Ser. No. 405,109

Int. Cl.[6] C12N *1/16;* A01N *63/00*

U.S. Cl. 435—255.4 11 Claims

1. A biologically pure culture of *Candida oleophila* effective for the inhibition of fruit-rot pathogens, where *Candida oleophila* is NRRL Y-18844, NRRL Y- 18845 or NRRL Y-18846.



5,741,700

## METHOD OF IMMOBILIZING WATER-SOLUBLE BIOORGANIC COMPOUNDS ON A CAPILLARY-POROUS CARRIER

Gennady Moiseevich Ershov; Eduard Nikolaevich Timofeev; Igor Borisovich Ivanov; Vladimir Leonidovich Florentiev, and Andrei Darievich Mirzabekov, all of Moscow, Russian Federation, assignors to University of Chicago, Chicago, Ill.

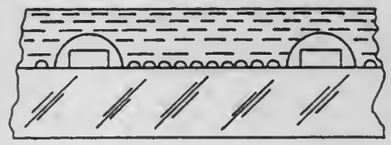
PCT No. PCT/RU94/00178, § 371 Date Jun. 2, 1995, § 102(e) Date Jun. 2, 1995, PCT Pub. No. WO95/04833, PCT Pub. Date Feb. 16, 1995

PCT Filed Aug. 5, 1994, Ser. No. 411,711

Claims priority, application Russian Federation, Aug. 11, 1993, 93040901

Int. Cl.[6] C12M *1/00;* C12Q *1/68;* A61K *38/00;* C07H *19/00*

U.S. Cl. 435—287.1 4 Claims



1. A method for immobilizing water-soluble bioorganic compounds on to a carrier bondable with the compounds, comprising applying water-soluble bioorganic compounds onto a bondable carrier having a matrix of cells and kept thereon until completion of the chemical bonding between said bioorganic compounds and said carrier matrix, application of water-soluble bioorganic solutions being followed by setting the temperature of the carrier equal to or below the dew point of the ambient air and the carrier is allowed to stand until water condensate swells said matrix cells, whereupon the carrier surface is coated with a layer of water-immiscible nonluminescent inert oil and allowed to stand until the reaction of bonding the bioorganic compounds with the carrier is completed.

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5,741,701

## CELL CULTURE SUBSTRATES AND METHODS OF USE

Mark S. Swiderek, Gloucester, and Frank J. Mannuzza, Burlington, both of Mass., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 233,028, Apr. 25, 1994, abandoned. This application Jan. 25, 1995, Ser. No. 377,887

Int. Cl.[6] C12M *3/06*

U.S. Cl. 435—297.1 5 Claims

1. A kit for promoting development of differentiated function in cultured epithelial cells comprising:

a) a cell culture medium for growth of epithelial cells;

b) a dried collagen film on a porous surface having an upper side and an underside, the dried collagen film produced by a process comprising the steps of

i) preparing solubilized collagen in liquid solution;

ii) polymerizing the collagen on the upper side of the porous surface in the presence of about 0.15–1.0M salt, to form a collagen gel;

iii) collapsing the collagen gel by removing entrapped liquid therefrom through the underside of the porous surface, and;

iv) drying the collapsed gel to form a film on the porous surface, and;

a differentiation inducing agent comprising about 4–20 mM butyric acid.

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5,741,702

## SYSTEM FOR PROCESSING GASES CONTAINING CARBON DIOXIDE

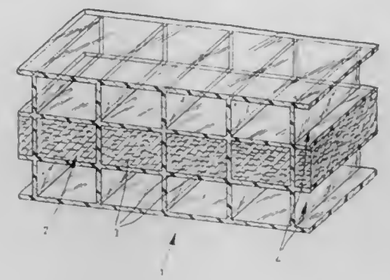
Thomas Lorenz, Hansastr. 75, 49134, Wallenhorst-Hollage, Germany

Filed Jun. 21, 1996, Ser. No. 667,434

Claims priority, application Germany, Jun. 21, 1995, 195 22 429.9

Int. Cl.[6] C12M *3/00*

U.S. Cl. 435—292.1 10 Claims



1. A reactor vessel for processing gases containing carbon dioxide by means of a fluid containing algae comprising:

a first elongated duct having a rectangular cross section with a top surface and a bottom surface for containing said gases and said fluid containing algae;

a second elongated duct, abutting said first elongated duct, having a rectangular cross section with a top surface and a bottom surface, said duct having ribs extending from said bottom surface to said top surface to form a plurality of elongated channels for insulating said first elongated duct;

wherein the channels of said second elongated duct are constructed so as to be evacuated to create a vacuum therein.

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5,741,703

Patent Not Issued For This Number

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5,741,704

## HEXOKINASE PROMOTER AND ASSAY METHOD

Stephen R. Jaspers, Edmonds, and Sherri L. Mudri, Seattle, both of Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 483,212, Jun. 7, 1995, abandoned. This application Dec. 28, 1995, Ser. No. 580,401

Int. Cl.[6] C12N *5/00;9/12;15/09;* C07H *21/04*

U.S. Cl. 435—325 16 Claims

1. An isolated DNA molecule selected from the group consisting of:

(a) molecules having a coding strand consisting of from 2140 to 2180 nucleotides and comprising nucleotide 17 to nucleotide 2156 of SEQ ID NO:1;

(b) molecules having a coding strand consisting of from 1774 to 2014 nucleotides and comprising nucleotide 17 to nucleotide 1790 of SEQ ID NO:1; and

(c) allelic variants of (a) and (b), wherein said molecule comprises promoter and insulin-sensitive transcription regulatory elements.

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**5,741,705**
**METHOD FOR IN VITRO CELL GROWTH OF EUCARYOTIC CELLS USING LOW MOLECULAR WEIGHT PEPTIDES**

**Wim R. Blom, Houten; Anthonie Kunst; Bart J. van Schle, both of Huizen, all of Netherlands, and Gregory W. Luli, Sarasota, Fla., assignors to Quest International Flavors & Food Ingredients Company, division of Indopco, Inc., Bridgewater, N.J.**

**Filed Feb. 23, 1995, Ser. No. 393,338**
**Int. Cl.[6] C12N *5/00***
**U.S. Cl. 435—348** **19 Claims**

1. In a method for maintaining or growing eucaryotic cells in vitro requiring L-glutamine by use of a culture medium wherein the method includes culturing the cells in the culture medium, the improvement which comprises: providing a hydrolyzed protein material containing peptides as a mixture in the culture medium in an effective amount which provides a main source of the L-glutamine for the cells alone and as the peptides of at least 20% by weight of the hydrolyzed protein material, wherein the hydrolyzed protein material is obtained by enzymatic hydrolysis with an enzyme and any insoluble materials are separated from a hydrolysate and then the hydrolysate is subjected to membrane filtration, wherein the hydrolyzed protein material has a free amino acid level of less than about 15 percent of a total weight of the hydrolyzed protein material, has an average length of the peptides which is less than about 15 amino acids and contains greater than 90 percent by weight of the hydrolyzed protein material of the peptides and amino acids with a molecular weight of less than 1000 Daltons, as determined by gel permeation chromatography.

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**5,741,706**
**ANTI-HIV RIBOZYMES**

**Markley C. Leavitt; Richard Tritz; Elizabeth Duarte; Jack Barber, and Mang Yu, all of San Diego, Calif., assignors to Immusol, Incorporated, San Diego, Calif.**

**Filed Sep. 25, 1996, Ser. No. 719,593**
**Int. Cl.[6] C12N *15/85*; C12Q *1/68***
**U.S. Cl. 435—372** **20 Claims**

1. A endo-ribonuclease nucleic acid encoding a ribozyme which cleaves an RNA comprising a target subsequence selected from the group of target subsequences consisting essentially of SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:23, SEQ ID NO:24, SEQ ID NO:25, SEQ ID NO:26, SEQ ID NO:27, SEQ ID NO:28, and SEQ ID NO:29, wherein the endo-ribonuclease nucleic acid comprises a nucleic acid subsequence complementary to the selected target subsequence.

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**5,741,707**
**METHOD FOR QUANTITATIVE ANALYSIS OF EARTH SAMPLES**

**Michael M. Herron; Abigail Matteson, both of Ridgefield, and Michael Supp, Waterbury, all of Conn., assignors to Schlumberger Technology Corporation, Ridgefield, Conn.**

**Continuation-in-part of Ser. No. 999,077, Dec. 31, 1992, abandoned. This application Jun. 24, 1994, Ser. No. 265,175**
**Int. Cl.[6] G01N *33/24***
**U.S. Cl. 436—25** **16 Claims**

1. A method of analyzing the composition of an earth sample to determine the presence of particular minerals in the earth sample, comprising the steps of:

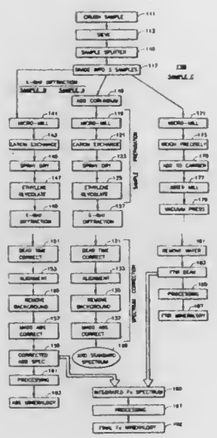
(a) obtaining an FTIR spectrum of the earth sample and creating a dataset therefrom;

(b) obtaining an XRD spectrum of the earth sample and creating a dataset therefrom;

(c) combining data from the datasets created from the FTIR spectrum and the XRD spectrum to define an integrated spectrum dataset for the earth sample;

(d) analysing the integrated spectrum dataset by performing regression analysis against a library of data obtained from standard spectra using a constrained spectral processing technique; and

(e) determining a quantitative mineralogical composition of the sample from results obtained by the regression analysis; and



wherein step (b) includes the steps of:

(i) reducing the earth sample into a fine powder of particles no more than substantially 2.5 microns in diameter;

(ii) disposing a first portion of the earth sample in a divalent cation solution causing a cation exchange reaction to replace a bond-forming element between sample particles with a chosen bond-forming element at each bond to minimize variability of adsorbed cation of clay minerals within the first portion of the earth sample;

(iii) spray drying the first portion of the earth sample to randomly orient the particles of the sample;

(iv) exposing the spray-dried portion of the earth sample to a water-replacement environment causing replacement of interlayer water in clay layers to minimize variability of interlayer spacing of clay minerals within the exposed portion of the earth sample;

(v) performing an XRD scan on the exposed portion of the earth sample to obtain an XRD spectrum for the sample including spectral peaks, representing various minerals;

(vi) adding an additive to a second portion of the earth sample to be used as an internal standard for comparison purposes;

(vii) repeating steps (ii)–(v) for the second portion; and

(viii) determining the position of the additive peaks in the XRD spectrum of the second portion and determining an error between the determined position and height and the known position and height of XRD peaks and removing said error from the position and height of the peaks in the XRD spectrum of the first portion.

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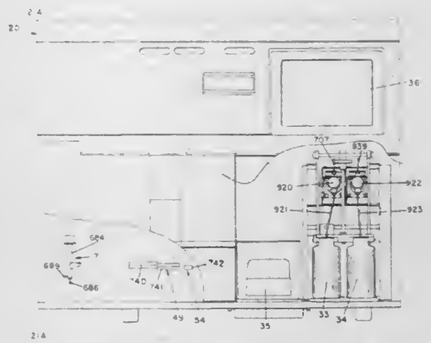
**5,741,708**
**AUTOMATED ANALYZER HAVING MAGNETIC ISOLATION DEVICE AND METHOD USING THE SAME**

**Glen A. Carey, Grafton; Scott C. Lewis, Amherst; Mary Beth Whitesel, Grafton, and Frank C. Klingshirn, Medina, all of Ohio, assignors to Chiron Diagnostics Corporation, E. Walpole, Mass.**

**Division of Ser. No. 222,559, Apr. 1, 1994, abandoned, which is a continuation of Ser. No. 665,196, Mar. 4, 1991. This application Jun. 2, 1995, Ser. No. 460,091**
**Int. Cl.[6] G01N *35/10***
**U.S. Cl. 436—49** **13 Claims**

1. An automated analyzer having a cuvette conveyed along an event path, said analyzer comprising a means for isolating a detectable product, wherein said detectable product is present in said cuvette having a bottom wall, a side wall and an open top and said detectable product is formed by a reaction between a test sample, a labeled reagent and a solid-phase reagent which has paramagnetic particles, said means for isolating said detectable product comprising:





(a) first magnetic means along said event path for attracting said paramagnetic particles against the side wall of said cuvette, said magnetic means comprising a first upstream magnet for creating a first magnetic field at a first level along the side wall of the cuvette, and a second downstream magnet for creating a second magnetic field at a second level along the side of the cuvette which is below said first level for positioning said paramagnetic particles below an upper level of a re-suspend liquid;

(b) liquid evacuating means for aspirating a liquid from said cuvette while said paramagnetic particles are held against the side wall of said cuvette;

(c) liquid dispensing means which are located downstream of said magnetic means for dispensing the re-suspend liquid into said cuvette for re-suspending said paramagnetic particles in said re-suspend liquid,

(d) second magnetic means disposed proximate said liquid dispensing means for assisting migration of said paramagnetic particles into said re-suspend liquid, and

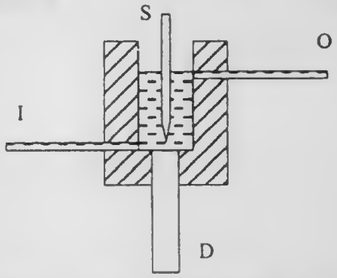
(e) control means including a central processing unit for coordinating said liquid evacuating means, said liquid dispensing means and means for conveying said cuvette along said event path.

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**5,741,709**
**MULTIPLE INJECTION ANALYSIS**

**Tien-Tsai Hsu, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan**

**Continuation-in-part of Ser. No. 220,292, Mar. 30, 1994, abandoned. This application Dec. 18, 1995, Ser. No. 573,856**
**Int. Cl.[6] G01N *35/08***
**U.S. Cl. 436—52** **13 Claims**




7. A method to perform liquid sample analysis comprising the steps of:

(a) obtaining an open-flow analysis apparatus comprising:

(i) an open flow cell containing an upper cell body, a lower cell body contiguously affixed to said upper cell body, and a cell chamber provided in said upper cell body, said cell chamber having a bottom and a top wherein said top is open to an atmosphere;

(ii) a carrier fluid inlet provided in a lower portion of said upper cell body of and in communication with said cell chamber;

(iii) flow means for introducing a carrier fluid into said cell chamber through said carrier fluid inlet;

(iv) over-flow outlet means in an upper portion of said upper cell body to allow exit of said carrier fluid and thus maintaining a constant fluid volume in said cell chamber;

(v) a detector disposed in said lower cell body in such a manner that its detecting surface is level with said bottom of said cell chamber and and facing upward; and

(vi) sample injecting means, separated from said carrier fluid inlet and said flow means for injecting a sample to be analyzed directly onto said detector without requiting said carrier fluid to carry said sample to said cell chamber;

wherein said cell chamber has a inside-diameter of about 3 mm, and said detecting surface of said detector has a diameter of about 2 mm;

(b) continuously flowing said carrier fluid into said cell chamber through said carrier fluid inlet by said flow means, wherein said volume of said carrier fluid in said open flow cell being kept constant by said over-flow outlet means;

(c) injecting a sample to be tested directly into said cell chamber and above said detector via said sample injecting means;

(d) sending output signals transmitted from said detector to a display device or a recording device to as to display or record analysis result;

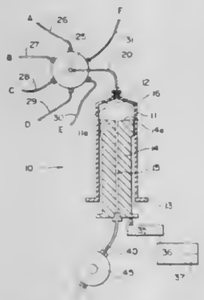
(e) allowing said sample along with said carrier fluid to exit from said over-flow outlet means; wherein said sample is directly injected into said cell chamber by said sample injecting means without being carried and thus diluted by said carrier fluid to thereby obtain maximum resolution from said detector.

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**5,741,710**
**REACTION CHAMBER AND A METHOD FOR GENERATING A GASEOUS SAMPLE BASED ON THE USE THEREOF**

**Paul Ek, Helastentie 168, FIN-21330 Paattinen, Finland**

**PCT No. PCT/FI94/00565, § 371 Date Jun. 11, 1996, § 102(e) Date Jun. 11, 1996, PCT Pub. No. WO95/17964, PCT Pub. Date Jul. 6, 1995**
**PCT Filed Dec. 15, 1994, Ser. No. 663,046**
**Claims priority, application Finland, Dec. 31, 1993, 935952**
**Int. Cl.[6] G01N *33/20,21/71*; B01L *3/00***
**U.S. Cl. 436—73** **10 Claims**

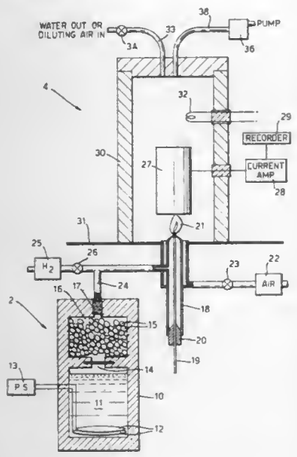


1. A reaction chamber comprising a cylindrical vessel having at a first end, at least one inlet or outlet tube or lead-through fitted with a valve for a liquid or gaseous component, said cylindrical vessel having a second, open end, the reaction chamber further comprising a plunger in sealing relationship with an inner wall of said cylindrical vessel and adapted to perform a reciprocating movement within the cylindrical vessel in axial direction through the open end, said plunger having at least one channel, in substantially axial direction, and fitted with a valve or connected to a tube fitted with a valve.

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**5,741,711**
**FLAME-BASED METHOD AND APPARATUS FOR ANALYZING A SAMPLE**
**Aviv Amirav, 58 Bialik Avenue, Ramat Hasharon, Israel, and Nitzan Tzanani, Tel-Aviv, Israel, assignors to Aviv Amirav, Ramat Hasharon, Israel**
**Filed Dec. 4, 1995, Ser. No. 566,555**
**Claims priority, application Israel, Sep. 13, 1995, 115287**
**Int. Cl.[6] G01N** *21/72;21/71*
**U.S. Cl. 436—154** **21 Claims**

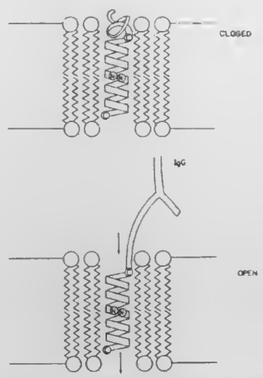



1. A flame based method for analyzing a sample by introducing the sample into an enclosure including a combustible gas mixture, comprising the steps of:
generating by means of a water electrolyser a premixed hydrogen and oxygen gas mixture, said water electrolyser being capable of providing the gas mixture require for solely sustaining a flame;
stabilizing the output flow rate of said premixed gas mixture for reducing the flame background noise;
heating said enclosure to a temperature sufficient for preventing water condensation in said enclosure;
feeding said mixture via a flame source having an opening sufficiently small for preventing a flame flashback towards said electrolyser;
igniting said gas mixture to produce a flame, and
detecting a characteristic of the resulting flame to determine the identity and/or concentration of one or more chemical substances in the sample.

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**5,741,712**
**RECEPTOR MEMBRANES**
**Bruce Andrew Cornell, and Vijoleta Lucija Bronislava Braach-Maksvytis, both of New South Wales, Australia, assignors to Australian Membrane and Biotechnology Research Institute, New South Wales, Australia**
**Division of Ser. No. 473,932, Jan. 25, 1990, Pat. No. 5,436,170. This application May 23, 1995, Ser. No. 448,178**
**Claims priority, application Australia, Jul. 27, 1987, PI3346; Jul. 27, 1987, PI3348; Jul. 31, 1987, PI3453; Sep. 21, 1987, PI4478**
**Int. Cl.[6] G01N** *33/53;33/543;33/563;33/566*
**U.S. Cl. 436—501** **33 Claims**

1. A biosensor for use in detecting the presence or absence of an analyte in a sample, the biosensor comprising a membrane comprising a closely packed array of selfassembling amphiphilic molecules, the membrane including a plurality of ion channels selected from the group consisting of peptides capable of forming helices and aggregates thereof, podands, cryptands and coronands, a first receptor moiety being attached to the ion channel at an end thereof, the first receptor moiety being such that it normally exists in a first




state, said change of state of the first receptor moiety causing a change in the ability of ion flow across the membrane.

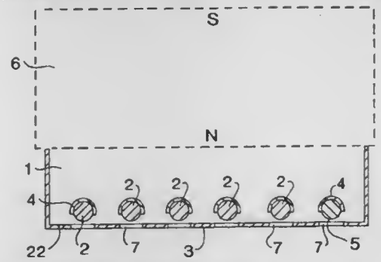
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**5,741,713**
**COMBINATORIAL LIBRARIES OF LABELED BIOCHEMICAL COMPOUNDS AND METHODS FOR PRODUCING SAME**
**Jonathan M. Brown, Baltimore; F.C. Thomas Allnutt, Port Deposit; Hao Chen, Adelphi, and Richard Radmer, Clarksville, all of Md., assignors to Martek Biosciences Corporation, Columbia, Md.**
**Division of Ser. No. 493,300, Jun. 21, 1995. This application Jun. 21, 1996, Ser. No. 667,723**
**Int. Cl.[6] G01N** *33/543;* **C12N** *1/12;* **C07K** *1/00*
**U.S. Cl. 436—518** **9 Claims**

1. A method of producing a combinatorial library of labeled compounds comprising the steps of:
(a) producing individual units selected from the group consisting of amino acids, nucleic acids, fatty acids, and carbohydrates, said individual units being labeled with NMR active isotopes;
(b) combining at least two of the individual units so as to produce a compound in labeled form, wherein the compound is labeled with NMR active isotopes;
(c) repeating step (b) at least once so as to produce a combinatorial library of labeled compounds.

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**5,741,714**
**DETECTION OF BOUND ANALYTE BY MAGNETIC PARTITIONING AND MASKING**
**Paul A. Liberti, Huntingdon Valley, Pa., assignor to Immunivest Corporation, Wilmington, Del.**
**Filed Jul. 16, 1996, Ser. No. 683,812**
**Int. Cl.[6] G01N** *33/553*
**U.S. Cl. 436—526** **14 Claims**




8. An assay method for determining the presence of an analyte in a sample comprising the steps of:
combining the sample with a first and second specific binding substance in a a chamber of an assay apparatus to form a body of fluid to be assayed,

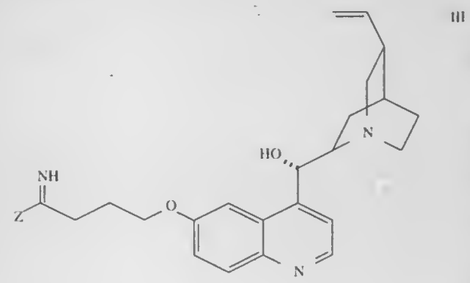


wherein said first specific binding substance is coupled to a mobile solid phase component and binds to said analyte, and said second specific binding substance is labeled with a detectable label and binds either to said analyte or to said first specific binding substance, and
wherein said assay apparatus comprises
a chamber having a plurality of walls opaque to radiant energy, except for at least one assay aperture and a control aperture which are transparent to radiant energy,
at least one collection element within said chamber, said collection element having a collection area of predetermined dimensions exposed to said body of fluid, said at least one collection area disposed immediately adjacent to wall of the chamber having said at least one assay aperture to define therebetween a limited assay region, and
at least one control element within said chamber, said control element having the same overall dimensions as said at least one collection element and having a control area exposed to said body of fluid and disposed immediately adjacent to said control aperture on a wall of the chamber to define therebetween a limited control region for comparison with said assay region,
said collection area being capable of capturing said mobile solid phase component, and said control area being incapable of capturing said mobile phase component, and
said limited assay region and said control region constituting a small fraction of said body of fluid;
incubating said body of fluid to produce free label and label bound to said mobile solid phase component in proportion to the amount of analyte in said sample;
producing movement of said mobile solid phase component through said assay region and said control region to provide for capture of said mobile solid phase component onto said collection area, but not onto said control area; and
determining the presence of said analyte by detecting, through said assay aperture, a first signal generated by free label in said assay region and said label bound to mobile solid phase component captured onto said collection area, and comparing said first signal with a second signal generated by free label in said control region and detected through said control aperture.

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**5,741,715**
**QUINIDINE IMMUNOASSAY AND REAGENTS**
**Mitali Ghoshal, Neshanic Station, N.J.; Kathryn Sarah Schwenzer, Yardley, Pa., and Robert Sundoro Wu, West Orange, N.J., assignors to Roche Diagnostic Systems, Inc., Branchburg, N.J.**
**Filed May 30, 1995, Ser. No. 452,742**
**Int. Cl.[6] G01N** *33/542;33/577;33/533;* **C07K** *16/44*
**U.S. Cl. 436—537** **2 Claims**

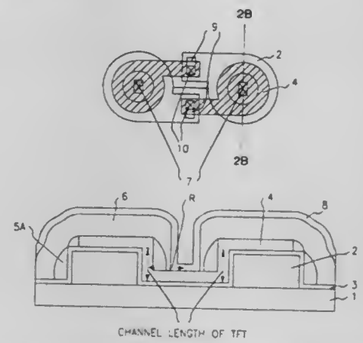
1. A kit for performing a fluorescence polarization immunoassay to determine the concentration of quinidine in body fluid samples, said kit comprising the tracer (9S)-N-[3',6'-dihydroxy-3-oxospiro[isobenzofuran-1(3H),9'-[9H]xanthen]5-yl)methyl]-4-[(9-hydroxycinchonan-6'yl)oxy]butamide and antibody MoAb Q6-6C5 prepared by inoculating a host animal with an immunogen of formula




wherein Z is bovine thyroglobulin (BTG), said antibody having a dynamic curve span of at least 150 mP and having a cross reactivity not exceeding the given percentages to the following quinidine metabolite compounds: quinidine-N-oxide 13.5%; 3-S-hydroxyquinidine 11%; 2-oxoquinidine 3%; and O-desmethylquinidine 43.5%.

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**5,741,716**
**METHOD FOR FABRICATING THIN FILM TRANSISTOR**
**Jin Ho Choi, and Sung Wook Yin, both of Ichonshi, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Rep. of Korea**
**Filed Oct. 29, 1996, Ser. No. 740,423**
**Claims priority, application Rep. of Korea, Nov. 3, 1995, 1995-39629**
**Int. Cl.[6] H01L** *21/84;21/265*
**U.S. Cl. 437—21** **2 Claims**




1. A method for fabricating a TFT comprising the steps of:
forming a conductive layer on an interlayer insulating layer;
forming a cylindrical gate electrode by pattering said conductive layer;
forming a gate electrode insulating layer on the gate electrode;
forming a polysilicon layer on said gate electrode insulating layer;
forming a round polysilicon channel layer by patterning said polysilicon layer;
forming a first insulating layer on the channel layer;
forming a spacer on a sidewall of said gate electrode and said polysilicon channel layer, by applying a blanket etching process to said first insulating layer; and
implanting impurities into said polysilicon channel layer so that source and drain regions are formed in said polysilicon channel layer.

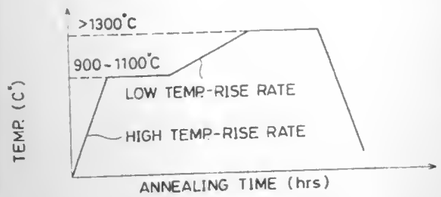
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**5,741,717**
**METHOD OF MANUFACTURING A SOI SUBSTRATE HAVING A MONOCRYSTALLINE SILICON LAYER ON INSULATING FILM**
**Tetsuya Nakai; Hiroshi Shinyashiki, both of Saitama-ken; Yasuo Yamaguchi, and Tadashi Nishimura, both of Hyogo-ken, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Mitsubishi Material Corporation, both of Tokyo, Japan**
**Continuation of Ser. No. 857,425, Mar. 26, 1992, abandoned. This application Feb. 21, 1995, Ser. No. 391,283**
**Claims priority, application Japan, Mar. 27, 1991, 3-062973**
**Int. Cl.[6] H01L** *21/76*
**U.S. Cl. 437—24** **10 Claims**

1. A method of manufacturing an SOI substrate having a monocrystalline silicon layer on an insulating film comprising the following sequential steps:

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implanting oxygen ion into a monocrystalline silicon substrate to form a silicon dioxide layer under a silicon surface layer while retaining said silicon surface layer on a main surface of said silicon substrate to form an oxygen ion implanted silicon substrate;

heating said oxygen ion implanted silicon substrate to a temperature greater than or equal to about 1300° C. wherein the temperature of the substrate is raised less than 1° C./min. from 1050° C. to 1300° C.; and

holding said silicon substrate at said temperature for a period of time to restore crystallinity of said silicon surface layer.

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**5,741,718**

**METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE**

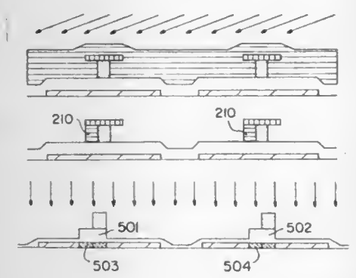
**Mitsufumi Codama; Ichiro Takayama, both of Kanagawa, and Michio Arai, Tokyo, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, and TDK Corporation, Tokyo, both of Japan**

**Division of Ser. No. 385,822, Feb. 9, 1995, Pat. No. 5,604,139. This application Jul. 16, 1996, Ser. No. 683,096**

**Claims priority, application Japan, Feb. 10, 1995, 6-37959; Feb. 10, 1995, 6-37960**

**Int. Cl.[6] H01L *21/86***

**U.S. Cl. 437—41** **7 Claims**




1. A method for forming a semiconductor device comprising:

forming on a gate electrode a blocking material which has a lower etching rate than that of the gate electrode, and which has a light blocking characteristic or is a smaller refractive index than that of a positive resist;

side-etching the gate electrode;

forming the positive resist and performing oblique exposure from a source region side, to remain the positive resist in only drain region side in a side of the gate electrode; and

performing an impurity implantation using the positive resist and the gate electrode as masks, to form an offset region between a drain region and a channel forming region.

**5,741,719**

**NONVOLATILE MEMORY DEVICE AND METHOD OF MANUFACTURING THE SAME**

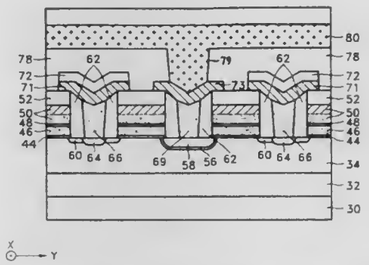
**Keon-soo Kim, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Division of Ser. No. 615,064, Mar. 13, 1996. This application Jan. 27, 1997, Ser. No. 789,533**

**Claims priority, application Rep. of Korea, Mar. 13, 1995, 95-5146**

**Int. Cl.[6] H01L *21/8247***

**U.S. Cl. 437—43** **11 Claims**




1. A nonvolatile memory device manufacturing method comprising the steps of:

forming cell transistors having sources and drains shared by cell transistors adjacent to one another in a first direction, a floating gate confined to each cell transistor, and a control gate shared by cell transistors adjacent in a second direction;

forming a first conductive layer so as to fill grooves between said cell transistors, on the resultant structure after said cell transistors forming step;

plugging only said grooves with said first conductive layer by etching back said layer;

forming a second conductive layer on the resultant structure after said plugging step;

forming a first insulating layer on said second conductive layer;

forming a first insulating layer pattern in a rod shape lengthwise in a second direction by patterning said insulating layer so as to contain said sources of cell transistors adjacent in said second direction;

forming a first photosensitive pattern in a shape on said drains of alternating said cell transistors in said first direction; and

forming a first plugged conductive layer formed of said first conductive layer for connecting said sources of said cell transistors adjacent in said second direction, a common source line formed of said second conductive layer, being in parallel with said first plugged conductive layer, a second plugged conductive layer formed of said first conductive layer for connecting said drains of said cell transistors, and a pad layer formed of said second conductive layer for being connected with said second plugged conductive layer, by etching said first and second conductive layers using said first insulating layer pattern and first photosensitive pattern as an etching mask.

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**5,741,720**

**METHOD OF PROGRAMMING AN IMPROVED METAL-TO-METAL VIA-TYPE ANTIFUSE**

**Frank W. Hawley, Campbell; Abdelshafy A. Eltoukhy, San Jose, and John L. McCollum, Saratoga, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.**

**Filed Oct. 4, 1995, Ser. No. 538,962**

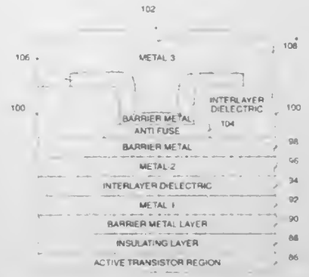
**Int. Cl.[6] H01L *21/70***

**U.S. Cl. 437—60** **12 Claims**

1. A method for forming a programmed antifuse disposed in an integrated circuit, said method comprising the steps of:

forming a lower conductive layer formed of a film of material including aluminum;






forming a lower barrier metal layer disposed over and in electrical contact with said lower conductive layer, said lower barrier metal layer having a first minimum thickness of at least 2000 Å;

forming an antifuse material layer disposed over and in contact with said lower barrier metal layer;

forming an upper barrier metal layer disposed over and in contact with said antifuse material layer, said upper barrier metal layer having a second minimum thickness, said second minimum thickness being in the range of about 1000 Å to about 2000 Å;

forming an upper conductive layer formed of a film of material including aluminum, said film disposed over and in electrical contact with said upper barrier metal layer;

programming the antifuse by forming a substantially aluminum-free conductive link shorting said antifuse material layer by applying a programming signal between said lower conductive layer and said upper conductive layer, a voltage induced on said upper conductive layer referenced to said lower conductive layer being positive.

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**5,741,721**

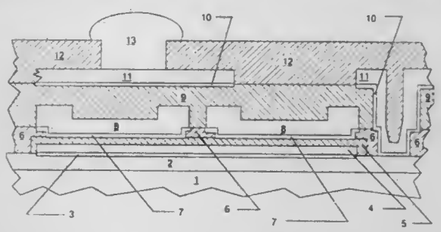
**METHOD OF FORMING CAPACITORS AND INTERCONNECT LINES**

**E. Henry Stevens, Colorado Springs, Colo., assignor to Quality Microcircuits Corporation, Colorado Springs, Colo.**

**Division of Ser. No. 189,921, Feb. 1, 1994, Pat. No. 5,508,881. This application Apr. 12, 1996, Ser. No. 630,061**

**Int. Cl.[6] H01L *21/70***

**U.S. Cl. 437—60** **23 Claims**




1. A process for forming a capacitor and interconnect line structure, the process comprising:

providing a substrate upon which material regions are to be formed;

providing a first conductive region comprising nitrogen compounded with a transition metal, said first conductive region being (a) unpatterned and overlying all of said substrate or (b) patterned to provide one or more features overlying said substrate, said first conductive region forming capacitor first electrodes;

providing a first dielectric region comprising oxygen compounded with said transition metal, said first dielectric region being formed over a surface of said first conductive region by reaction of an oxidant with said compound of nitrogen and a transition metal comprising said first conductive region, said reaction comprising the steps of:

(a) establishing an atmosphere comprising argon or helium;

(b) increasing a temperature of said substrate and said overlying first conductive region to a temperature within the range of 400 to 700 degrees C.;

(c) adding an oxidant to said atmosphere while holding a partial pressure of said oxidant at a value in the range of 0.1 to 100 torr;

(d) removing said oxidant from said atmosphere when said first dielectric region has grown to a layer thickness in the range of 10 to 500 nanometers; and

(e) annealing in said atmosphere for a time interval in the range of 10 seconds to 10 minutes;

providing a second dielectric region overlying said first dielectric region and directly overlying said substrate where neither said first conductive region nor said first dielectric region is interposed between said second dielectric region and said substrate;

providing one or more openings in said second dielectric region to provide access to an upper surface of said first dielectric region;

providing a selected number of additional openings in said second dielectric region to provide access to said substrate at sites where said second dielectric region directly overlies said substrate; and

providing a second conductive region overlying said first dielectric region at selected openings in said second dielectric region, said second conductive region overlying said substrate at selected other openings in said second dielectric region, said second conductive region further overlying a portion of said second dielectric region, said second conductive region forming capacitor second electrodes, said second conductive region also forming interconnections between said capacitor second electrodes and external devices, forming interconnections between said substrate and an external circuit power supply or a circuit ground, and forming interconnections between various external devices.

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**5,741,722**

**METHOD FOR MANUFACTURING DRAM DEVICE USING HIGH DIELECTRIC CONSTANT**

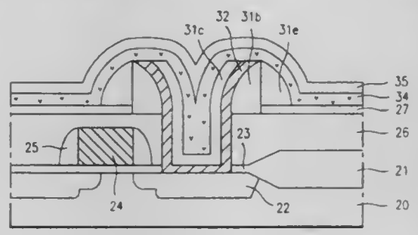
**Chang Jae Lee, Chungcheongbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea**

**Filed Aug. 15, 1996, Ser. No. 698,520**

**Claims priority, application Rep. of Korea, Apr. 12, 1996, 11066/1996**

**Int. Cl.[6] H01L *21/8242***

**U.S. Cl. 437—60** **32 Claims**




1. A method of manufacturing a capacitor structure of a semiconductor device, the method comprising the steps of

forming a gate electrode and a gate sidewall on a semiconductor substrate in which a field oxide film is formed on a device isolating region;

forming impurity diffusion regions having an LDD structure in the semiconductor substrate on different sides of the gate electrode;

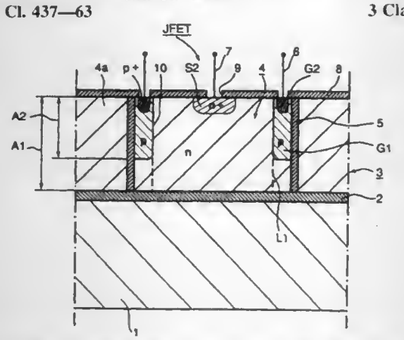
VOL 1209 ISS 3 AP 21 1998 UMI



forming first, second, third, and fourth insulating layers over the semiconductor substrate, coating and patterning a photoresist over the insulating layers, and sequentially etching the fourth insulating layer, the third insulating layer, and the second insulating layer to thereby form a contact hole in the fourth, third, and second insulating layers;
forming a first electrode material layer over the semiconductor substrate and anisotropically etching the first electrode material layer so as leave only a portion of the first electrode material on a wall of the contact hole, the portion of the first electrode material on the wall of the contact hole forming a first conductive sidewall;
removing a portion of the first insulating layer located below the contact hole by using the first conductive sidewall as a mask, and forming a second electrode material layer over the semiconductor substrate, a plurality of the insulating layers, and the first conductive sidewall;
forming a planarizing layer over a surface of the semiconductor substrate over which the second electrode material layer is formed, and etching back the planarizing layer until the second electrode material layer is exposed;
removing an exposed portion of the second electrode material layer and at least a portion of the third insulating layer, and forming a third electrode material layer to a predetermined thickness over the semiconductor substrate;
anisotropically etching the third electrode material layer to thereby form a second conductive sidewall on a side of the first conductive sidewall;
removing a portion of the planarizing layer remaining in the contact hole and forming a dielectric layer over the semiconductor substrate; and
forming an upper electrode of a capacitor on the dielectric layer.

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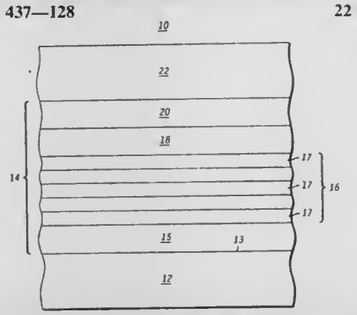
**5,741,723**
**DIELECTRICALLY ISOLATED SEMICONDUCTOR DEVICE AND A METHOD FOR ITS MANUFACTURE**
**Andrej Litwin, Danderyd, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**
**Division of Ser. No. 185,146, Jan. 24, 1994, Pat. No. 5,432,377. This application May 19, 1995, Ser. No. 444,512**
**Claims priority, application Sweden, Jan. 25, 1993, 9300211**
**Int. Cl.[6] H01L** *21/76*
**U.S. Cl. 437—63** **3 Claims**




1. A method of producing a dielectrically isolated semiconductor device comprising the steps of:
oxidizing a surface of a semiconductor substrate to form an electrically isolating oxide layer;
applying to the oxide layer a monocrystalline semiconductor wafer doped with a first type of doping material;
defining a component region in the monocrystalline wafer by forming dielectrically isolating layers which surround the component region and extend from a surface of the monocrystalline wafer down to the isolating oxide layer;
applying over the component region a first mask having recesses which include two elongated openings extending along the dielectrically isolating layer and along two mutually opposing sides of the component region;
applying through the recesses a second type of doping material that is opposite to the first type of doping material to produce in the component region a sunken region which includes two subregions on opposing sides of the component region;
applying over the component region at least one second mask provided with second mask openings; and
supplying a third type of doping material through the second mask openings to produce electrical connection regions of a semiconductor component in the component region.

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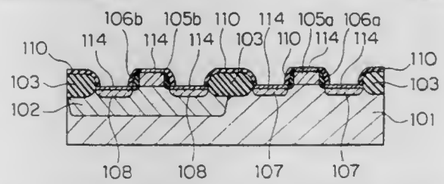
**5,741,724**
**METHOD OF GROWING GALLIUM NITRIDE ON A SPINEL SUBSTRATE**
**Jamal Ramdani, Gilbert; Michael S. Lebby, Apache Junction, and Paige M. Holm, Phoenix, all of Ariz., assignors to Motorola, Schaumburg, Ill.**
**Filed Dec. 27, 1996, Ser. No. 774,819**
**Int. Cl.[6] H01L** *21/20;21/203;21/205*
**U.S. Cl. 437—128** **22 Claims**




1. A method of growing gallium nitride on a substrate comprising the steps of:
providing a supporting substrate having a surface;
disposing a plurality of buffer layers on the surface of the supporting substrate, the plurality of buffer layers including an aluminum oxynitride material, graded aluminum oxynitride, aluminum nitride and gallium nitride; and
fabricating one of a photonic device structure, an electronic device structure and an optical waveguide structure on a surface of the plurality of buffer layers.

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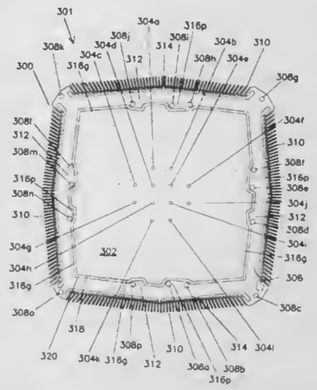
**5,741,725**
**FABRICATION PROCESS FOR SEMICONDUCTOR DEVICE HAVING MOS TYPE FIELD EFFECT TRANSISTOR**
**Ken Inoue, and Kunihiro Fujii, both of Tokyo, Japan, assignors to NEC Corporation, Japan**
**Filed Feb. 26, 1996, Ser. No. 607,301**
**Claims priority, application Japan, Feb. 27, 1995, 7-038397**
**Int. Cl.[6] H01L** *21/44*
**U.S. Cl. 437—200** **11 Claims**




1. A fabrication process for a semiconductor device having a MOS type field effect transistor comprising the steps of:
selectively forming an insulation layer on a semiconductor layer, whereby a surface of said semiconductor layer is selectively exposed;
forming a refractory metal silicide layer on the exposed surface of said semiconductor layer and said insulation layer; and
oxidizing said refractory metal silicide layer formed on said insulation layer.



**5,741,726**
**SEMICONDUCTOR DEVICE ASSEMBLY WITH MINIMIZED BOND FINGER CONNECTIONS**
**Ivor Barber, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.**
**Continuation of Ser. No. 466,810, Jun. 6, 1995, Pat. No. 5,604,161, which is a continuation of Ser. No. 396,084, Feb. 28, 1995, Pat. No. 5,545,923, which is a continuation of Ser. No. 142,251, Oct. 22, 1993, abandoned. This application Dec. 6, 1996, Ser. No. 761,534**
**Int. Cl.[6] H01L** *21/60*
**U.S. Cl. 437—216** **19 Claims**

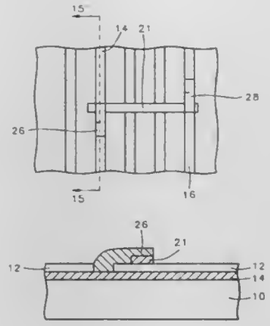



1. A method of making a semiconductor device assembly, comprising:
(a) providing a printed wiring board substrate;
(b) centrally locating a planar conductive layer on a surface of the substrate, the planar conductive layer including one or more conductive segments electrically insulated from one another, each conductive segment adapted for connection thereto, and each conductive segment having portions surrounding a perimeter of an area adapted to receive a semiconductor die;
(c) disposing a plurality of bond fingers around the periphery of the planar conductive layer, each of the plurality of bond fingers adapted for connection thereto;
(d) disposing a semiconductor die above the planar conductive layer and within the perimeter of the area adapted to receive the semiconductor die, the semiconductor die having a first and second plurality of bond pads thereon; and
(e) connecting the portions of the one or more conductive segments to the first plurality of bond pads, and connecting the plurality of bond fingers to the second plurality of bond pads.

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**5,741,727**
**CIRCUIT MODIFICATION AND REPAIR USING A LOW RESISTANCE CONDUCTING METAL BRIDGE AND A FOCUSED ION BEAM**
**Tai-Ho Wang, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsin-Chu, Taiwan**
**Filed May 23, 1997, Ser. No. 862,795**
**Int. Cl.[6] H01L** *21/00*
**U.S. Cl. 438—4** **26 Claims**

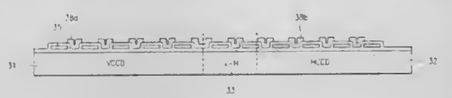
1. A method of forming a bridge, comprising the steps of:
providing a wiring pattern formed on a substrate having a dielectric material covering said wiring pattern;
providing selectively shaped pieces of transparent mask material;
assembling said selectively shaped pieces of transparent mask material to form a bridge mask having a bridge opening;




selectively placing said bridge mask over said dielectric material covering said wiring pattern;
filling said bridge opening with conducting bridge material thereby forming a conducting bridge having a first end and a second end;
removing said bridge mask leaving said conducting bridge having a first end and a second end on said dielectric material;
forming a first hole in said dielectric material thereby exposing a first contact region of said wiring pattern;
forming a second hole in said dielectric material thereby exposing a second contact region of said wiring pattern;
connecting said first contact region of said wiring pattern to said first end of said conducting bridge; and
connecting said second contact region of said wiring pattern to said second end of said conducting bridge.

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**5,741,728**
**METHOD FOR MANUFACTURING CHARGE-COUPLED DEVICE WITH POLYGATES HAVING THE SAME RESISTANCES**
**Yong Kwan Kim, Chungcheongbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea**
**Filed Aug. 13, 1996, Ser. No. 696,150**
**Claims priority, application Rep. of Korea, May 16, 1996, 16466/1996**
**Int. Cl.[6] H01L** *21/339*
**U.S. Cl. 438—75** **12 Claims**




1. A method for manufacturing a charge-coupled device, comprising the steps of:
forming a first semiconductor layer on a substrate;
implanting an impurity ion having a first concentration on said first semiconductor layer;
patterning said first semiconductor layer to form a plurality of first gate electrode lines having a first width and spaced apart by a constant distance;
forming a second semiconductor layer on said first gate electrode line and the exposed entire surface of said substrate;
implanting an impurity ion having a second concentration on said second semiconductor layer; and
patterning said second semiconductor layer to form second gate electrode lines having a second width between said first gate electrode lines.

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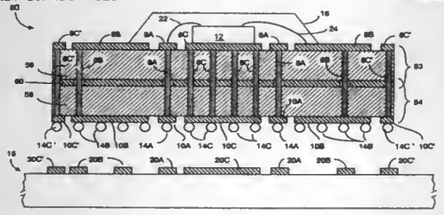


5,741,729

## BALL GRID ARRAY PACKAGE FOR AN INTEGRATED CIRCUIT

Erich Selna, Mountain View, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Division of Ser. No. 273,331, Jul. 11, 1994. This application Jun. 5, 1995, Ser. No. 461,299
Int. Cl.[6] H01L 21/60
U.S. Cl. 438—125 18 Claims



1. A method of packaging an integrated circuit (IC) in a ball grid array (BGA) package that has improved BGA package thermal and electrical characteristics, comprising:

forming upper layer BGA package traces including a Vss trace, a Vdd trace, and a signal trace;

forming lower layer BGA package traces at least a portion of which traces are in vertical alignment with a corresponding one of said upper layer BGA package traces;

wherein solder balls may be attached to regions of said lower layer BGA package traces to solder said BGA package to an underlying system printed circuit board;

disposing a BGA core material between said upper and lower layer BGA package traces;

forming vias that include:

a unitarily-constructed Vss via coupling said upper layer BGA Vss trace to a corresponding lower layer BGA Vss trace;

a unitarily-constructed Vdd via coupling said upper layer BGA Vdd trace to a corresponding lower layer BGA Vdd trace;

a unitarily-constructed signal via coupling a said upper layer BGA signal trace to a corresponding lower layer BGA signal trace; and

disposing a BGA Vss plane intermediate said upper and lower layer BGA package traces and making electrical contact with said Vss vial;

wherein said BGA Vss plane so disposed improves thermal dissipation and electrical characteristics of said BGA package.

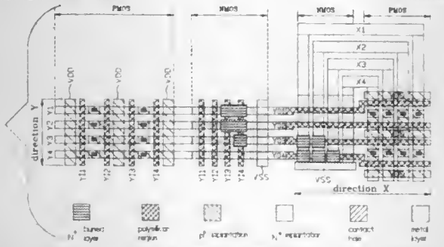
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5,741,730

## FLEXIBLE IC LAYOUT METHOD

Hsin-Min Tseng, and David Wang, both of Hsinchu, Taiwan, assignors to Holtek Microelectronics Inc., Hsinchu, Taiwan

Filed Jun. 12, 1995, Ser. No. 489,595
Int. Cl.[6] H01L 21/82;21/44
U.S. Cl. 438—130 6 Claims



1. A flexible IC layout method utilized for an IC having a plurality of logic gates in a first direction connected with a plurality of logic gates in a second direction wherein each of said logic gates has at least one polysilicon region and each of said logic gates in said first direction has an output serving as an input of a corresponding one of said logic gates in said second direction, comprising a step of forming input terminals for said logic gates by ion implanting said polysilicon region, wherein each of said logic gates includes a plurality of PMOS transistors and a plurality of NMOS transistors and each of said transistors has one said polysilicon region, wherein said polysilicon region of said PMOS transistor processed by $p^+$ implantation serves as a valid input terminal, said polysilicon region of said NMOS transistor provided with an $n^+$ buried layer serves as said invalid input terminal, and wherein the remaining polysilicon region of said NMOS transistor is a valid input terminal, and a number of said valid input terminals formed on said at least one PMOS transistor is equal to a number of said valid input terminals formed on said at least one NMOS transistor.

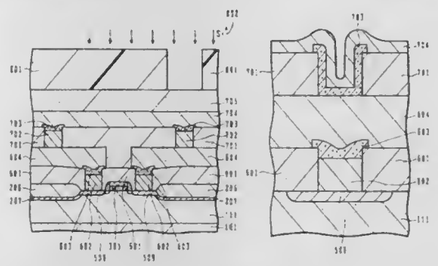
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5,741,731

## SEMICONDUCTOR DEVICE WIRED WITH FUSE

Tomohiro Yuuki, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Dec. 11, 1995, Ser. No. 570,105
Claims priority, application Japan, Dec. 19, 1994, 6-315108
Int. Cl.[6] H04L 21/82
U.S. Cl. 438—132 28 Claims



11. A method of manufacturing a semiconductor device comprising the steps of:

(a) providing a substrate having a lower conductive layer and an insulating layer thereover, the insulating layer having a hole therethrough on said lower conductive layer;

(b) forming a laminated conductive film comprising a first conductive film and a second conductive film formed on the first conductive film in the hole;

(c) forming an upper conductive layer on the laminated conductive film;

the laminated conductive film electrically connecting a lower conductive layer provided under the laminated conductive film and an upper conductive layer provided on the laminated conductive film; and

(d) selectively implanting ions into the second conductive film to disconnect electrical connection made through the laminated conductive film between the lower conductive layer and the upper conductive layer.

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5,741,732

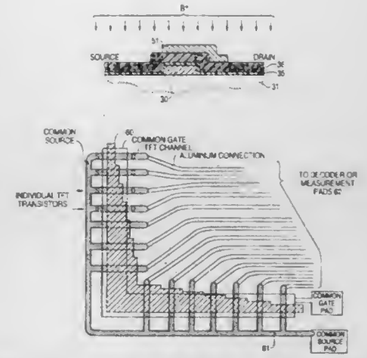
## METHOD FOR DETECTING IMPLANTATION MASK MISALIGNMENT

Victor Tikhonov, San Antonio, Tex., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., Park Ridge, N.J.

Filed May 3, 1995, Ser. No. 434,192
Int. Cl.[6] H01L 21/77
U.S. Cl. 438—149 18 Claims

1. A method for determining alignment of an implantation mask employed in the construction of thin film transistors (TFTs), comprising:





forming a plurality of adjacent TFTs on a semiconductor substrate, said forming comprising employing a test implantation mask, wherein said test implantation mask has a profile in which a masked area of each TFT being formed increases as the test implantation mask extends from one TFT to an adjacent TFT;

selecting a portion of the test implantation mask corresponding to one of said TFTs;

testing said TFT corresponding to said selected portion of the test implantation mask; and

determining alignment of said test implantation mask based on said testing.

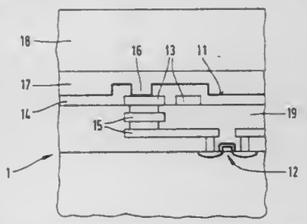
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5,741,733

## METHOD FOR THE PRODUCTION OF A THREE-DIMENSIONAL CIRCUIT ARRANGEMENT

Emmerich Bertagnolli, and Helmut Klose, both of München, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/DE95/00031, § 371 Date Jul. 15, 1996, § 102(e) Date Jul. 15, 1996, PCT Pub. No. WO95/19642, PCT Pub. Date Jul. 20, 1995
PCT Filed Jan. 12, 1995, Ser. No. 676,164
Claims priority, application Germany, Jan. 14, 1994, 44 00 985.2
Int. Cl.[6] H01L 21/84;21/00
U.S. Cl. 438—152 26 Claims



1. A method for producing a three-dimensional circuit arrangement, comprising the steps of:

connecting a first substrate, which comprises, in a region of a first main area, at least one first circuit structure, a first metallization plane and a first passivation layer which covers said first metallization plane, to an auxiliary substrate via a first adhesion layer which is applied to said first main area.

thinning said first substrate at a second main area opposite to said first main area,

providing a second substrate, which comprises, in a region of a third main area, at least one second circuit structure, a second metallization plane and a second passivation layer which covers said second metallization plane, with a second adhesion layer on said third main area,

joining said first substrate and said second substrate together in such a way that said second main area of said first substrate adjoins said second adhesion layer on said second substrate, and that said first substrate and said second substrate are fixedly connected via said second adhesion layer,

opening a first contact hole from said first main area to said first metallization plane,

opening, after removal of said auxiliary substrate and of said first adhesion layer, at least one second contact hole to said second metallization plane starting from said first main area, said opening step of said at least one second contact hole including etching said at least one second contact hole through material of said first substrate, said opening step of said at least one second contact hole being performed after said joining step,

producing a conductive layer on said first main area and electrically connecting said first metallization plane and said second metallization plane to one another.

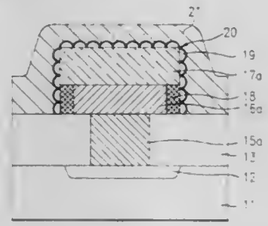
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5,741,734

## CAPACITOR STRUCTURE FOR SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Young Jong Lee, Daejeon, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheonghuk-do, Rep. of Korea

Filed Jan. 26, 1996, Ser. No. 592,233
Claims priority, application Rep. of Korea, Sep. 25, 1995, 31653/1995
Int. Cl.[6] H01L 21/8242
U.S. Cl. 438—235 9 Claims



1. A method of manufacturing a capacitor of a semiconductor device, comprising the steps of:

preparing a semiconductor substrate;

forming first and second metal layers on said semiconductor substrate, sequentially;

forming a nitridation-treated film on the outer side of said first metal layer;

forming a tungsten film having a rugged surface on the outer surface of said first and second metal layers;

forming a dielectric film on said rugged surface of said tungsten film; and

forming a third metal layer on said dielectric film.

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5,741,735

## LOCAL GROUND AND $V_{CC}$ CONNECTION IN AN SRAM CELL

Michael P. Violette, and Fernando Gonzalez, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 508,117, Jul. 27, 1995. This application May 20, 1996, Ser. No. 650,286
Int. Cl.[6] H01L 21/336
U.S. Cl. 438—279 14 Claims

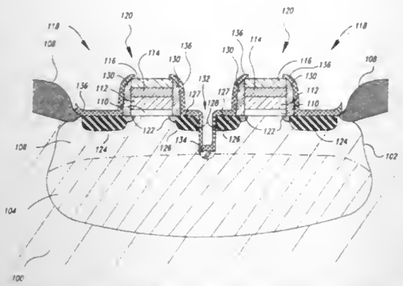
10. A method of forming an integrated circuit in a semiconductor substrate, comprising the steps of:

forming a retrograde well region in the semiconductor substrate, the retrograde well region including an upper region of low conductivity and a lower region of high conductivity;

forming an active region in the upper region;

forming first and second switching devices having a common input/output terminal region in the active region;

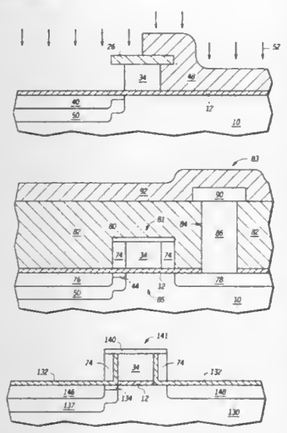
removing a portion of the common input/output terminal region and an underlying portion of the upper region to form a trench structure; and



forming a conducting layer in the trench structure to electrically connect the common input/output terminal region with the lower region.

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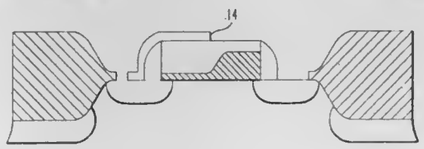
**5,741,736**
**PROCESS FOR FORMING A TRANSISTOR WITH A NONUNIFORMLY DOPED CHANNEL**
**Marius K. Orlowski, and Frank Kelsey Baker, Jr., both of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.**
**Continuation of Ser. No. 434,210, May 4, 1995, abandoned. This application May 13, 1996, Ser. No. 645,939**
**Int. Cl.[6] H01L** *21/336*
**U.S. Cl. 438—286** **27 Claims**



1. A process for forming a semiconductor device comprising the steps of:
forming a gate dielectric layer over a substrate, wherein the substrate has a first conductivity type;
forming a first layer over the gate dielectric layer;
forming a masking member over the first layer;
etching the first layer to form a first member that is narrower than the masking member such that an extension portion of the masking member does not overlie the first member, wherein a portion of the gate dielectric layer is exposed during this step;
selectively doping the substrate with a dopant having the first conductivity type such that a first portion of the substrate is doped and underlies the extension portion but a second portion of the substrate underlies the first member and is not doped during this step, wherein the second portion is different from the first portion, and wherein this step is performed using implantation that is not at a tilt angle;
forming a second layer over the substrate and adjacent the first member and the masking member;
etching the second layer to remove a portion of the second layer, wherein:
a gate electrode includes the first member and a remaining portion of the second layer; and
the gate electrode is at least as wide at the masking member; and
doping a third portion of the substrate not covered by the first member and the remaining portion of the second layer, wherein:
this step is performed using a dopant having a second conductivity type that is opposite the first conductivity type; and
the third portion is adjacent to the first portion.

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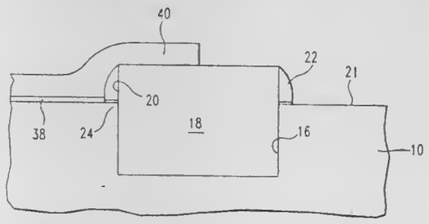
**5,741,737**
**MOS TRANSISTOR WITH RAMPED GATE OXIDE THICKNESS AND METHOD FOR MAKING SAME**
**Mark T. Kachelmeier, Austin, Tex., assignor to Cypress Semiconductor Corporation, San Jose, Calif.**
**Division of Ser. No. 671,480, Jun. 27, 1996. This application Dec. 17, 1996, Ser. No. 768,883**
**Int. Cl.[6] H01L** *21/336*
**U.S. Cl. 438—286** **5 Claims**



1. A method of forming of semiconductor transistor comprising
i) applying a gate mask to a source region edge of a patterned gate material, leaving a drain region edge of said patterned gate material exposed; and
ii) oxidizing said gate material such that a gate oxide is formed having a thickness at a drain region edge which is greater than a thickness at a source region edge.

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**5,741,738**
**METHOD OF MAKING CORNER PROTECTED SHALLOW TRENCH FIELD EFFECT TRANSISTOR**
**Jack A. Mandelman, Stormville, N.Y.; Brian J. Machesney, Burlington, Vt.; Hing Wong, Norwalk, Conn.; Michael M. Armacost, Wallkill, N.Y., and Pai-Hung Pan, Boise, Id., assignors to International Business Machines Corporation, Armonk, N.Y.**
**Division of Ser. No. 348,709, Dec. 2, 1994, Pat. No. 5,521,422. This application Feb. 21, 1996, Ser. No. 604,283**
**Int. Cl.[6] H01L** *21/76*
**U.S. Cl. 438—296** **14 Claims**



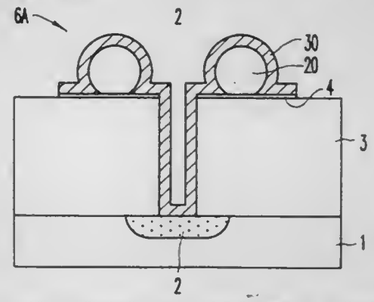
1. A method of fabricating a semiconductor structure comprising the steps of:
(a) providing a semiconductor substrate having a substantially planar surface;
(b) forming a coating on said surface;
(c) forming a window in said coating, said window having an edge;
(d) forming a trench in said substrate, said trench having a sidewall co-aligned to said edge, an intersection of said trench and said surface forming a corner;
(f) forming a corner material co-aligned with said corner and extending over said surface; and



(g) forming a field effect transistor having a channel having a current path extending parallel to said corner, said corner, said channel being spaced from said corner by said corner dielectric.

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**5,741,739**
**MANUFACTURING METHOD OF A CHARGE STORAGE ELECTRODE BY USING CYLINDRICAL OXIDE PATTERNS**
**Sung Chun Cho, Suwon, and Kyung Dong Yoo, Seoul, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyungki-Do, Rep. of Korea**
**Division of Ser. No. 363,902, Dec. 27, 1994, Pat. No. 5,561,309. This application Oct. 1, 1996, Ser. No. 723,582**
**Claims priority, application Rep. of Korea, Dec. 27, 1993, 93 29781**
**Int. Cl.[6] H01L** *21/8242*
**U.S. Cl. 438—387** **17 Claims**

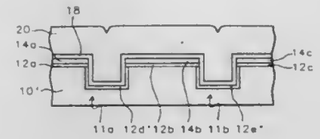


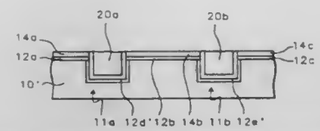
1. A method for manufacturing a charge storage electrode for a capacitor, comprising the steps of:
forming an insulating layer on a silicon substrate on which a junction region is formed;
forming an etching barrier layer on said insulating layer;
forming at least one initial oxide pattern(s) on said etching barrier layer;
transforming said initial oxide pattern(s) by a heat treatment process, thereby forming a transformed oxide pattern(s);
forming a contact hole on said junction region by etching said etching barrier layer and said insulating layer using a charge storage electrode contact mask;
forming a polysilicon layer on the surfaces of said contact hole, said etching barrier layer and said transformed oxide pattern(s);
etching the exposed portions of said polysilicon layer by an etching process using a charge storage electrode mask, thereby exposing a portion at both ends of said transformed oxide pattern(s);
removing said transformed oxide pattern(s) by a wet etching process, thereby forming a through hole(s); and
etching exposed portions of said etching barrier layer to form a charge storage electrode having at least one conduit(s).

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**5,741,740**
**SHALLOW TRENCH ISOLATION (STI) METHOD EMPLOYING GAP FILLING SILICON OXIDE DIELECTRIC LAYER**
**Syun-Ming Jang, Hsin-Chu; Ying-Ho Chen, Taipei, and Chen-Hua Yu, Hsin-Chu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan**
**Filed Jun. 12, 1997, Ser. No. 873,836**
**Int. Cl.[6] H01L** *21/76*
**U.S. Cl. 438—435** **11 Claims**

1. A method for filling a trench within a silicon substrate comprising:

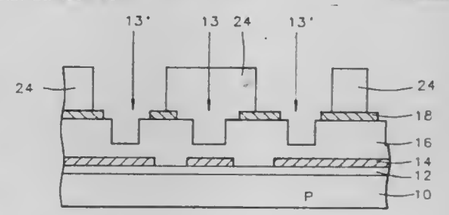




providing a silicon substrate, the silicon substrate having a trench formed therein;
oxidizing thermally the silicon substrate to form within the trench a thermal silicon oxide trench liner layer;
forming upon the thermal silicon oxide trench liner layer a conformal silicon oxide intermediate layer formed through a plasma enhanced chemical vapor deposition (PECVD) method employing a silane silicon source material; and
forming upon the conformal silicon oxide intermediate layer a gap filling silicon oxide trench fill layer formed through an ozone assisted sub-atmospheric pressure thermal chemical vapor deposition (SACVD) method employing an ozone oxidant and a tetra-ethyl-ortho-silicate (TEOS) silicon source material.

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**5,741,741**
**METHOD FOR MAKING PLANAR METAL INTERCONNECTIONS AND METAL PLUGS ON SEMICONDUCTOR SUBSTRATES**
**Horng-Huei Tseng, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan**
**Filed May 23, 1996, Ser. No. 652,175**
**Int. Cl.[6] H01L** *21/44*
**U.S. Cl. 438—637** **24 Claims**



1. A method for fabricating concurrently planar metal interconnections and metal plugs on a substrate comprising the steps of:
depositing a first insulating layer on said substrate;
depositing a first conducting layer on said first insulating layer;
patterning said first conducting layer forming a first level of interconnections;
depositing a second insulating layer on said patterned first conducting layer;
planarizing said second insulating layer;
depositing a hard-mask film as an etch stop layer;
coating a first photoresist layer on said hard-mask film;
patterning said first photoresist layer to form open regions having vertical sidewalls where said metal interconnections are desired;
anisotropic plasma etching in said openings removing said hard-mask film and partially etching into said second insulating layer forming trenches with vertical sidewalls;
isotropically plasma etching said first photoresist layer and thereby laterally and controllably removing portions of said sidewalls of said patterned first photoresist layer and exposing regions of said hard-mask film adjacent to said trenches, said regions being self-aligned to said trenches;

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selectively removing portions of said exposed hard-mask film adjacent to said trenches in said second insulating layer;
removing said first photoresist layer;
depositing a second photoresist layer;
patterning said second photoresist layer forming openings for plug contact openings over said trench areas where metal plug contacts are desired to said patterned first conducting layer and said openings extending over and exposing the edge of said hard-mask film self-aligned to said trenches;
anisotropically and selectively plasma etching in said plug contact openings further recessing said trenches in said second insulating layer having vertical sidewalls aligned to said edge of said hard-mask film and said plug contact openings extending to said first conducting layer, thereby forming T-shaped plug contact openings;
removing said second photoresist layer;
removing remaining portions of said hard mask film;
depositing a conformal second conducting layer filling said T-shaped plug contact openings and said trenches elsewhere in said second insulating layer;
chemical/mechanical polishing said second conducting layer to the surface of said second insulating layer, thereby completing said planar metal interconnections and metal plugs on said substrate.

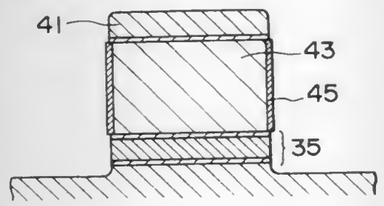
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**5,741,742**

**FORMATION OF ALUMINUM-ALLOY PATTERN**

**Yukihiro Kamide, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 300,222, Sep. 6, 1994, abandoned. This application Aug. 12, 1996, Ser. No. 695,526**
**Claims priority, application Japan, Sep. 10, 1993, 5-249809**
**Int. Cl.[6] H01L** *21/283;21/31*
**U.S. Cl. 438—653** **5 Claims**




3. A method of manufacturing an integrated semiconductor device comprising-the steps of:
forming a barrier metal layer over a substrate;
forming a conductive layer of aluminum-alloy over said barrier metal layer;
providing a double-layered mask on the conductive layer, the double-layered mask comprising a lower mask having a resistance against an etching gas used for etching the conductive layer and an upper layer comprising a silicon nitride based film for supplying a component forming a film for protecting a sidewall of the conductive layer upon etching the conductive layer;
patterning the conductive layer by dry-etching by using the double-layered mask at or about room temperature wherein said upper layer deposits a protection film on the sidewall of the conductive layer;
oxygen plasma processing for removing said upper mask layer and forming aluminum oxide on the side wall of the conductive layer;
patterning the barrier metal layer by dry-etching; and
over-etching for perfectly removing the remaining part of the barrier metal layer on the substrate.

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**5,741,743**

**Patent Not Issued For This Number**

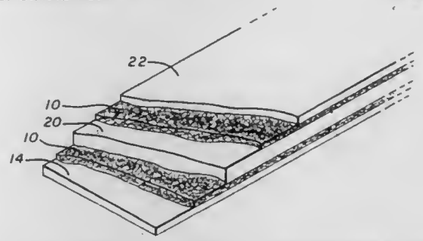
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**5,741,744**

**THERMOPLASTIC THERMOFORMABLE COMPOSITE MATERIAL AND METHOD OF FORMING SUCH MATERIAL**

**Douglas R. Fitchmun, Woodland Hills, Calif., assignor to Thermocomp Corporation, Woodland Hills, Calif.**

**Division of Ser. No. 390,533, Feb. 16, 1995, Pat. No. 5,604,020. This application Nov. 15, 1996, Ser. No. 749,989**
**Int. Cl.[6] B32B** *5/18;5/28*
**U.S. Cl. 442—16** **9 Claims**




1. A thermoplastic thermoformable composite material for shaping and stretching into a desired form without voids and holes, including
a core including at least one layer of chopped fibers enveloped and impregnated by thermoplastic material to form a fiber layer core,
layers of thermoplastic material respectively positioned on opposite sides of the fiber layer core,
the layers of thermoplastic material being provided with a sufficient thickness to flow into and fill any voids or holes formed in the core as the composite material is shaped and stretched into a desired form, and
two fiber layers are provided to form two cores and three layers of thermoplastic material are provided to form a central layer of thermoplastic material with fiber layer cores positioned on opposite sides of the central layer and with two further thermoplastic layers positioned on the outside surfaces of the fiber layer cores and with the central layer of thermoplastic material thicker than either of the thermoplastic layers.

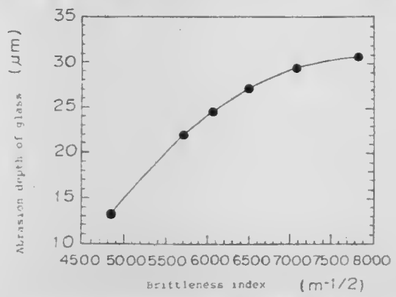
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**5,741,745**

**ABRASION RESISTANT GLASS**

**Jeetendra Sehgal; Junichiro Kase; Akira Takada; Hideo Takahashi; Yasumasa Nakao, and Seturo Ito, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan**

**PCT No. PCT/JP96/00300, § 371 Date Oct. 8, 1996, § 102(e) Date Oct. 8, 1996, PCT Pub. No. WO96/24559, PCT Pub. Date Aug. 15, 1996**
**PCT Filed Feb. 13, 1996, Ser. No. 718,441**
**Claims priority, application Japan, Feb. 10, 1995, 7-023126; Jun. 6, 1995, 7-139692; Aug. 28, 1995, 7-219070**
**Int. Cl.[6] C03C** *00/85;00/87*
**U.S. Cl. 501—69** **7 Claims**




1. An abrasion resistant glass, which consists essentially of the following components:



| | | |
|---|---|---|
| $SiO_2$ | 75.5 to 85.5 | (wt %), |
| MgO | 1 to 7.8 | (wt %), |
| CaO | 0.5 to 6.8 | (wt %), |
| RO | 1.5 to 7.8 | (wt %), |
| $Na_2O$ | 10 to 22 | (wt %), |
| $K_2O$ | 0 to 10 | (wt %), |
| $Li_2O$ | 0 to 10 | (wt %), |
| $R'_2O$ | 10 to 22 | (wt %), |
| $Al_2O_3$ | 1 to 5 | (wt %), |
| $RO + R'_2O$ | 11.5 to 23.5 | (wt %), |

$RO/R'_2O$ (weight ratio) at most 0.5,

said glass having a density of at most 2.41 g/cc measured at room temperature.

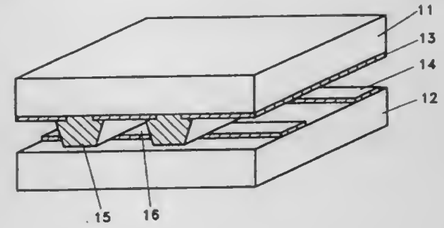
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**5,741,746**

**GLASSES FOR DISPLAY PANELS**

**Jeffrey T. Kohli, 25 Spencer Hill Rd., and Dawne M. Moffatt, 1 Evergreen Dr., both of Corning, N.Y. 14830**

**Continuation-in-part of Ser. No. 397,606, Mar. 2, 1995, abandoned. This application Feb. 14, 1996, Ser. No. 593,097**
**Int. Cl.[6] C03C** *3/087*
**U.S. Cl. 501—70** **23 Claims**




1. A substrate for a flat panel display device wherein said substrate is comprised of a flat, transparent glass exhibiting a linear coefficient of thermal expansion (CTE) over the temperature range 0°–300° C. between $60–90\times10^{-7}$/° C. and a strain point over 630° C., said glass consisting essentially of an aluminosilicate having a composition as calculated in weight percent on an oxide basis, of 41–52% $SiO_2$, 2–12% $Al_2O_3$, 4–16% CaO, 8–19% SrO, 16–29% BaO, 0–3% MgO, and 0–4% $B_2O_3$.

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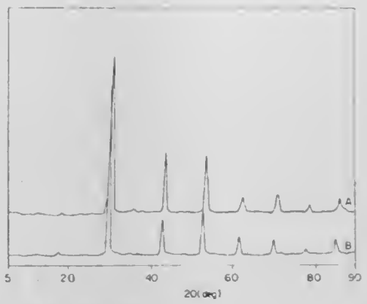
**5,741,747**

**CERAMIC SUBSTRATE FOR BI-CUPRATE SUPERCONDUCTORS AND A PROCESS FOR PREPARING THE SAME**

**Jacob Koshy; Jose Kurian; Poo Kodan Sajith; Krishnan Sudersan Kumar; Rajan Jose; Asha Mary John, and Alathur Damodaran Damodaran, all of Trivandrum, India, assignors to Council of Scientific & Industrial Research, New Delhi, India**

**Filed Nov. 27, 1996, Ser. No. 758,243**
**Claims priority, application India, May 16, 1996, 1028/DEL/96**
**Int. Cl.[6] C04B** *35/48*
**U.S. Cl. 501—135** **1 Claim**

1. A novel ceramic substrate useful for the preparation of superconductors, said substrate having the formula $Ba_2DyMO_{x<}$ where




M represents Zr and/or Hf.

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**5,741,748**

**CATALYST PRODUCTION FOR USE IN A PROCESS FOR FLUORINATION OF HYDROCARBONS**

**John Graham Allen, Warrington, and Daniel Howard Legg, Wirral, both of United Kingdom, assignors to Imperial Chemical Industries PLC, Great Britain**

**PCT No. PCT/GB93/01889, § 371 Date Mar. 17, 1995, § 102(e) Date Mar. 17, 1995, PCT Pub. No. WO94/06558, PCT Pub. Date Mar. 31, 1994**
**PCT Filed Sep. 7, 1993, Ser. No. 403,801**
**Claims priority, application United Kingdom, Sep. 17, 1992, 9219720**
**Int. Cl.[6] B01J** *20/34;23/00*
**U.S. Cl. 502—25** **18 Claims**

1. A process for the treatment of a spent chromium-based fluorination catalyst which comprises the step (a) of contacting the spent catalyst with aqueous potassium hydroxide to form a product comprising an aqueous potassium fluoride solution and solid hydrated chromium oxide.

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**5,741,749**

**REGENERATION OF A TITANIUM-CONTAINING MOLECULAR SIEVE**

**Guy L. Crocco, Senlis, France, and John G. Zajacek, Devon, Pa., assignors to Arco Chemical Technology, L.P., Greenville, Del.**

**Filed Feb. 13, 1996, Ser. No. 600,661**
**Int. Cl.[6] B01J** *20/34;38/02;38/06;38/10*
**U.S. Cl. 502—56** **13 Claims**

1. A method for regenerating a spent titanium-containing molecular sieve which has framework titanium atoms and has been employed in an olefin epoxidation process wherein propylene is converted to propylene oxide using hydrogen peroxide comprising heating the spent titanium-containing molecular sieve at a temperature of from 150° C. to 700° C. in the presence of a gas stream which is free of molecular oxygen for a time effective to enhance the activity of the spent titanium-containing molecular sieve.

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**5,741,750**

**CONDITIONING COMPOSITION AND CATALYST FOR USE THEREWITH**

**David Alan Hall, Arundel, Australia, assignor to Plantagenet Holdings Pty Ltd., Australia**

**Division of Ser. No. 388,464, Feb. 14, 1995, Pat. No. 5,605,557. This application Dec. 23, 1996, Ser. No. 772,317**
**Claims priority, application Australia, Feb. 14, 1994, PMS3870; Feb. 14, 1994, PMS3871; Sep. 26, 1994, PMS8410**
**Int. Cl.[6] B01J** *27/24;27/16*
**U.S. Cl. 502—200** **5 Claims**

1. A catalyst for use with a conditioning composition, the catalyst comprising water, calcium nitrate, urea, molasses, phosphoric

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acid and at least one non-ionic surfactant, each being provided in the following amounts (w/w):

| | |
|---|---|
| water | 30 to 60% |
| calcium nitrate | 2 to 40% |
| urea | 30 to 70% |
| molasses | 3 to 35% |
| phosphoric acid | 3 to 35% |
| non-ionic surfactant | 1 to 10%. |

**2**. A catalyst according to claim **1** wherein the catalyst comprises (w/w):

| | |
|---|---|
| water | 31% |
| calcium nitrate | 12% |
| urea | 40% |
| molasses | 8% |
| phosphoric acid | 7% |
| non-ionic surfactant | 2%. |

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**5,741,751**

**ALUMINA SOURCE FOR NON-ZEOLITIC MOLECULAR SIEVES**

**Stephen J. Miller, San Francisco, Calif., assignor to Chevron U.S.A. Inc., San Francisco, Calif.**

**Continuation-in-part of Ser. No. 553,211, Nov. 7, 1995, abandoned. This application Aug. 28, 1996, Ser. No. 704,055**

**Int. Cl.**[6] **B01J** *27/18;27/182;27/188;27/198*

**U.S. Cl. 502—208** **29 Claims**

**1**. A process for preparing a molecular sieve comprising maintaining a reaction mixture containing an active source of phosphorous and a particulate hydrated alumina under crystallization conditions until crystals of a non-zeolitic molecular sieve form, the particulate hydrated alumina having an average particle size of less than about 40μ, a particle density of less than about 1.0 g/cm$^3$ and an alkali content of less than 0.12 wt %.

**26**. A molecular sieve prepared by the process of claim **1** which contains from about 75 to about 500 ppm alkali.

**28**. A molecular sieve having a unit empirical formula on an anhydrous basis of:

$$(M_xAl_yP_z)O_2$$

wherein "x", "y", and "z" represent the mole fractions, respectively, of an element "M", aluminum, and phosphorus, wherein "x" has a value equal to or greater than zero (0), and "y" and "z" each have a value of at least 0.01 and wherein "M" is an element which is capable of forming oxides in tetrahedral coordination with $AlO_2$ and $PO_2$, wherein the molecular sieve contains from about 75 to about 500 ppm alkali.

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**5,741,752**

**TRANSPARENT THERMAL RECORDING MEDIUM**

**Hiroshi Goto, Fuji; Hideaki Ema, Shimizumachi, and Kiyoshi Sakai, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

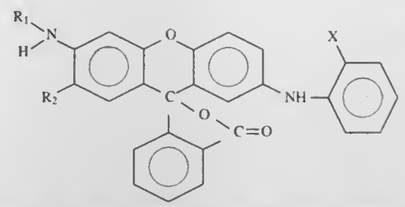
**Continuation-in-part of Ser. No. 355,903, Dec. 14, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 479,354**

**Claims priority, application Japan, Dec. 15, 1993, 5-343113; Jun. 9, 1994, 6-151481; Sep. 2, 1994, 6-234326; Dec. 9, 1994, 6-331855**

**Int. Cl.**[6] **B41M** *5/30;5/40*

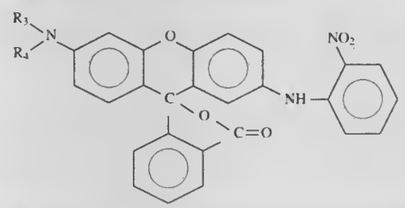
**U.S. Cl. 503—221** **7 Claims**

**1**. A transparent thermal recording medium comprising: a thermal recording layer, which is provided on a transparent layer, consisting essentially of an electron-donating chromophoric compound selected from the group of fluoran compounds consisting of formulas (III), (IV), (V), (VI), (VII) and (VIII):



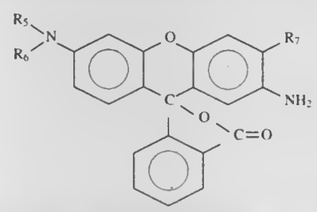
(III)

wherein $R_1$ is selected from alkyl group≦8 carbon atoms, $R_2$ is selected from a hydrogen atom and an alkyl group having≦4 carbon atoms, and X is a halogen atom selected from the group consisting of fluorine, chlorine and bromine;



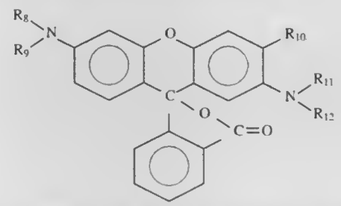
(IV)

where $R_3$ is hydrogen or an alkyl group having≦8 carbon atoms, and $R_4$ is an alkyl group having≦8 carbon atoms;



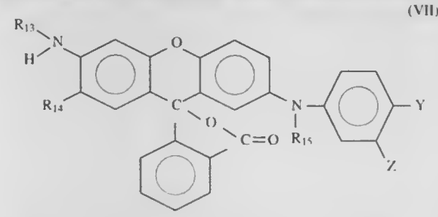
(V)

where $R_5$ and $R_6$ are each an alkyl group having≦8 carbon atoms, and $R_7$ is hydrogen, lower alkyl, or lower alkoxy;



(VI)

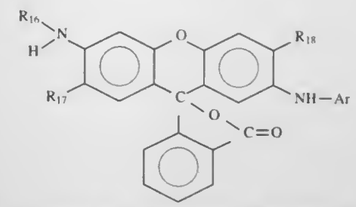
where $R_8$ is hydrogen, $R_9$ is an alkyl group having≦8 carbon atoms, $R_{10}$ is hydrogen, lower alkyl or lower alkoxy, $R_{11}$ is hydrogen or an alkyl group having≦8 carbon atoms, and $R_{12}$ is an alkyl group having≦8 carbon atoms, phenyl or substituted phenyl;



(VII)

where $R_{13}$ is an alkyl group having≦8 carbon atoms, $R_{14}$ is methyl or ethyl, $R_{15}$ is hydrogen or an alkyl group having≦4 carbon atoms, and Y and Z are each a halogen atom selected from the group consisting of fluorine, chlorine and bromine;





(VIII)

where $R_{16}$ is an alkyl group having≦8 carbon atoms, $R_{17}$ is methyl or ethyl, $R_{18}$ is an alkyl group having≦4 carbon atoms or a halogen atom selected from the group consisting of chlorine and bromine, and Ar is phenyl or benzyl; an electron-accepting compound and binder resin; and

a further-provided protective layer having an approximately equal refractive index to the refractive index of said thermal recording layer,

wherein said binder resin is a compound having a hydroxyl group and/or a carboxyl group.

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**5,741,753**

**NITRATE-FREE CATALYST FOR THE WASH-AND-WEAR FINISHING OF TEXTILES**

**Pia Hois, Birkenau, and Toni Simenc, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**PCT No. PCT/EP94/04003, § 371 Date Jun. 6, 1996, § 102(e) Date Jun. 6, 1996, PCT Pub. No. WO95/16068, PCT Pub. Date Jun. 15, 1995**

**PCT Filed Dec. 1, 1994, Ser. No. 647,901**

**Claims priority, application Germany, Dec. 10, 1993, 43 42 126.1**

**Int. Cl.**[6] **B01J** *27/138;21/02;* **D06M** *13/00;9/00*

**U.S. Cl. 502—226** **4 Claims**

**1**. A nitrate-free catalyst for the wash-and-wear finishing of textiles with formaldehyde-free crosslinkers, comprising magnesium, tetrafluoroborate, chloride and sulfate ions in the molar weight ratios of

(a) $Mg^{2+}$: $BF_4^-$=1:0.1 to 1:4,

(b) $Mg^{2+}$: $Cl^-$=1:1.7 to 1:15 and

(c) $SO_4^{2-}$: $Cl^-$=1:0.2 to 1:4.

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**5,741,754**

**METHOD FOR FORMING IMAGE ON OBJECT AND THERMAL TRANSFER SHEET AND THERMAL TRANSFER IMAGE-RECEIVING SHEET FOR USE IN SAID METHOD**

**Kazunobu Imoto; Katsuyuki Oshima, and Hideki Nishikawa, all of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan**

**Filed Mar. 20, 1995, Ser. No. 406,138**

**Claims priority, application Japan, Mar. 18, 1994, 6-072962; Mar. 18, 1994, 6-072963**

**Int. Cl.**[6] **B41M** *5/035;5/38*

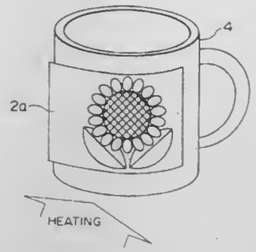
**U.S. Cl. 503—227** **3 Claims**

**1**. A method for forming an image on an object, comprising the steps of:

thermally transferring a dye from a thermal transfer sheet to the dye-receptive layer of a thermal transfer image-receiving sheet thereby to form a dye image on the sheet, said thermal transfer image-receiving sheet comprising a substrate sheet, said dye-receptive layer, and, provided between said substrate sheet and said dye-receptive layer, a dye release layer comprising a hydrophilic material;

contacting the dye-receptive layer side of the thermal transfer image-receiving sheet with an object;

thermally transferring the dye image on the thermal transfer image-receiving sheet to the object by heating the sheet; and




peeling the thermal transfer image-receiving sheet from the object.

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**5,741,755**

**HERBICIDAL COMPOSITION AND A METHOD TO CONTROL UNDESIRED VEGETATION**

**Vladimir Iosifovich Sorokin, Moscow, Russian Federation, assignor to Kare Ltd., Riga, Latvia**

**PCT No. PCT/RU93/00211, § 371 Date Jun. 22, 1995, § 102(e) Date Jun. 22, 1995, PCT Pub. No. WO95/05155, PCT Pub. Date Mar. 17, 1994**

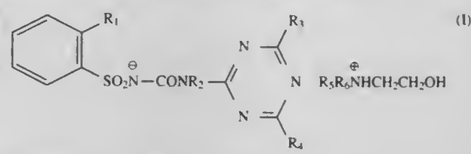
**PCT Filed Sep. 2, 1993, Ser. No. 392,869**

**Claims priority, application U.S.S.R., Sep. 4, 1992, 5061695**

**Int. Cl.**[6] **A01N** *43/64;47/10*

**U.S. Cl. 504—135** **5 Claims**

**1**. A herbicidal composition for use in cereals, comprising at least one benzenesulfonylurea derivative and at least one dichlorobenzoic acid derivative in synergistic herbicidally effective amounts, a surfactant, an organic solvent, and water, wherein the benzenesulfonylurea derivative is of the formula (I)



(I)

wherein:

$R_1$ is Cl;

$R_2$ is H;

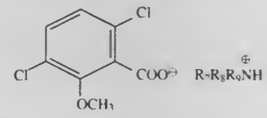
$R_3$ is $CH_3$;

$R_4$ is $OCH_3$;

$R_5$ is $C_2H_5$; and

$R_6$ is $C_2H_5$;

and the derivative of dichlorobenzoic acid is a 2-methoxy-3,6-dichlorobenzoic acid of the formula (II)



(II)

wherein:

$R_7$ is $CH_3$;

$R_8$ is $CH_3$; and

$R_9$ is H;

with the following weight percentages of compounds:

| | |
|---|---|
| ammonium salt of benzenesulfonylurea derivative | 2.0–50 |
| ammonium salt of 2-methoxy-3,6-dichlorobenzoic acid | 5.0–50 |
| surfactant | 1.0–5.0 |
| organic solvent | 10–40 |
| water | up to 100. |

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5,741,756

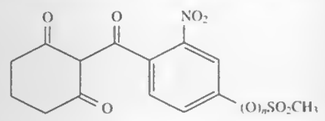
## SYNERGISTIC HERBICIDAL COMPOSITION COMPRISING TRIKETONES AND CHLOROACETANILIDES, AND METHOD OF USE THEREOF

John Martin Shribbs, Petaluma, Calif., assignor to Zeneca Limited, London, England

Filed Jul. 19, 1995, Ser. No. 504,267
Int. Cl.[6] A01N *35/06:37/22*
U.S. Cl. 504—149 15 Claims

1. An herbicidal composition comprising an herbicidally effective amount of a mixture of:

(A) a cyclohexanedione compound of formula (I):



(I)

wherein n is 0 or 1; and

(B) a chloroacetanilide compound selected from the group consisting of acetochlor, alachlor and metolachlor.

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5,741,757

## BIOCIDAL MIXTURE OF TETRAKIS (HYDROXYMETHYL) PHOSPHONIUM SALT AND A SURFACTANT

Kenneth G. Cooper, Hagley; Robert E. Talbot, Cannock, and Malcolm J. Turvey, Kidderminster, all of England, assignors to Albright & Wilson Limited, Oldbury, England

Continuation of Ser. No. 264,419, Jun. 23, 1994, abandoned, which is a continuation of Ser. No. 146,457, Nov. 1, 1993, abandoned, which is a continuation of Ser. No. 42,444, Apr. 2, 1993, abandoned, which is a continuation of Ser. No. 897,608, Jun. 10, 1992, abandoned, which is a continuation of Ser. No. 663,191, Feb. 28, 1991, abandoned, which is a continuation of Ser. No. 501,374, Mar. 29, 1990, abandoned, which is a continuation of Ser. No. 893,334, Aug. 5, 1986, abandoned. This application Mar. 17, 1995, Ser. No. 407,494
Claims priority, application United Kingdom, Aug. 6, 1985, 8519677; Dec. 20, 1985, 8531372
Int. Cl.[6] A01N *25/30;57/10*
U.S. Cl. 504—153 25 Claims

1. A biocidally active composition for use in water treatment consisting essentially of a synergistic mixture of:

(A) a water soluble tetrakis (hydroxymethyl) phosphonium salt and;

(B) at least one surfactant selected from the group consisting of anionic, nonionic and amphoteric surfactants, which are effective to lower surface tension between water and hydrophobic solid surface.

in a proportion of A:B of from 1:50 to 1,000:1.

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5,741,758

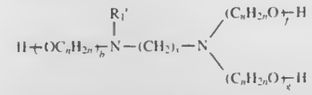
## METHOD FOR CONTROLLING GAS HYDRATES IN FLUID MIXTURES

Marek K. Pakulski, The Woodlands, Tex., assignor to BJ Services Company, U.S.A., Houston, Tex.

Filed Oct. 13, 1995, Ser. No. 543,014
Int. Cl.[6] E21B *43/12;37/06*
U.S. Cl. 507—90 7 Claims

1. A method for controlling the formation of gas hydrate crystals in a gaseous fluid mixture susceptible to gas hydrate formation, comprising:

admixing with said fluid mixture an effective for controlling the formation of gas hydrates of at least one additive having the general formula:



(II)

wherein x=1–4. $R_1$ is an alkyl group having from 1 to 20 carbon atoms and wherein b+f+g is 3 to 30 and n is 2 to 3.

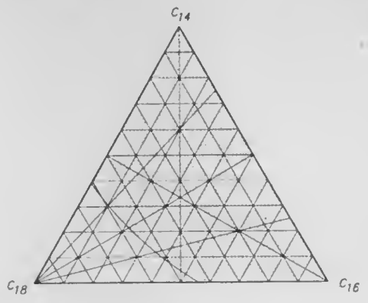
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5,741,759

## SKELETALLY ISOMERIZED LINEAR OLEFINS

Jeffrey C. Gee, Kingwood, Tex.; Roger C. Williamson, Dewey Beach, Del.; Christope J. Lawrie, Kingwood, Tex., and Stephen J. Miller, San Francisco, Calif., assignors to Chevron Chemical Company, San Ramon, Calif.

Division of Ser. No. 381,039, Jan. 31, 1995, abandoned, which is a continuation-in-part of Ser. No. 190,404, Feb. 2, 1994, abandoned. This application Sep. 19, 1996, Ser. No. 716,119
Int. Cl.[6] C09K *7/06;7/02*
U.S. Cl. 507—103 30 Claims




1. A drilling fluid comprising:

(a) a continuous phase comprising an olefin mixture comprising olefins containing at least 12 carbon atoms, wherein the olefin mixture contains less than 20 weight percent alpha olefins and 15 to 90 weight percent methyl branched olefins;

(b) a weight material; and

(c) water.

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5,741,760

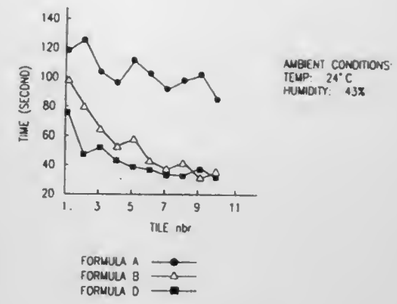
## AQUEOUS CLEANING COMPOSITION WHICH MAY BE IN MICROEMULSION FORM COMPRISING POLYALKYLENE OXIDE-POLYDIMETHYL SILOXANE

Myriam Mondin, Seraing; Nicole Andries, Voroux-Lez-Liers, and Jean Massaux, Olne, all of Belgium, assignors to Colgate-Palmolive Company, Piscataway, N.J.

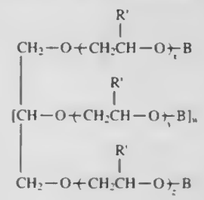
Continuation-in-part of Ser. No. 336,936, Nov. 15, 1994, Pat. No. 5,549,840, which is a continuation-in-part of Ser. No. 192,118, Feb. 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 155,317, Nov. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 102,314, Aug. 4, 1993, abandoned. This application Aug. 16, 1996, Ser. No. 698,605
Int. Cl.[6] C11D *3/37;3/60;17/00*
U.S. Cl. 510—365 16 Claims

1. A cleaning composition comprising:



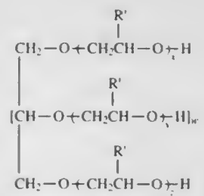



(a) 0.1 wt. % to 10 wt. % of a mixture of



(I)

and



(II)

wherein w equals one to four, and B is selected from the group consisting of hydrogen and a group represented by:



wherein R is selected front the group consisting of alkyl group having 6 to 22 carbon atoms, and alkenyl groups having 6 to 22 carbon atoms, wherein at least one of the B groups is represented by said



R' is selected from the group consisting of hydrogen and methyl groups; x, y and z have a value between 0 and 60, provided that (x+y+z) equals 2 to 100, wherein in Formula (I) the weight ratio of monoester/diester/triester is 40 to 90/5 to 35/1 to 20, wherein the weight ratio of Formula (I) and Formula (II) is a value between 3 and 0.02;

(b) 0.1 to 10 wt. % of a block copolymer of a polyalkylene oxide-modified polydimethyl siloxane;

(c) 0.1 wt. % to 20 wt. % of an anionic surfactant;

(d) 0.1 wt. % to 15 wt % of a cosurfactant, said cosurfactant being selected from the group consisting of a water soluble glycol ether, a $C_3$–$C_6$ aliphatic carboxylic acid and polypropylene glycol having an average molecular weight of from 200 to 1,000;

(e) 0.1 wt. % to 10 wt. % of a water insoluble hydrocarbon, essential oil or a perfume; and

(f) the balance being water.

**10**. A microemulsion composition comprising:

(a) 0.1 to 10 wt. % of a block copolymer of a polyalkylene oxide-modified polydimethyl siloxane;

(b) 0.1 wt. % to 20 wt. % of an anionic surfactant;

(c) 0.1 wt. % to 15 wt. % of a cosurfactant, wherein said cosurfactant is selected from the group consisting of polypropylene glycol having an average molecular weight of from 200 to 1,000, a water soluble glycol ether and a $C_3$–$C_6$ aliphatic carboxylic acid;

(d) 0.4 wt. % to 10 wt. % of a water insoluble hydrocarbon, essential oil or a perfume;

(e) a salt of a multivalent metal cation in an amount sufficient to provide from 0.5 to 1.5 equivalents of said cation per equivalent of said anionic surfactant; and

(f) the balance being water.

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5,741,761

## POLYMER-SURFACTANT FLUIDS FOR DECONTAMINATION OF EARTH FORMATIONS (LAW181)

Ramesh Varadaraj, Flemington, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 324,546, Oct. 18, 1994, Pat. No. 5,614,474. This application Nov. 19, 1996, Ser. No. 751,343
Int. Cl.[6] C09K *7/02;* B01F *17/02;17/00*
U.S. Cl. 507—225 1 Claim

1. In the decontamination of a hydrocarbon contaminated earth formation wherein a surfactant solution is injected into the formation the improvement comprising: determining the viscosity of the hydrocarbon contaminant, and injecting into the formation a composition that has a viscosity substantially equal to or greater than that of the contaminant and selected from compositions having the following range of ingredients:

(a) from about 1,000 to about 25,000 parts by weight of a hydrophobically associating polymer per million parts by weight of water the polymer being selected from the group consisting of copolymers of mono or dialkylacrylamides with acrylamide, partially hydrolyzed derivatives thereof, and terpolymers of mono and dialkyl acrylamides, acrylamides and one of an ethenically unsaturated sulfonic acid salt of an alkali metal or ammonia, or N-vinyl pyrrolidone;

(b) from about 25 to about 7,500 parts by weight per million parts by weight of water of one or more anionic or non-ionic surfactants; and,

(c) from about 0.5 wt % to about 4 wt %, based on the weight of water, of salts selected from the group consisting of alkali and alkaline earth metal halides and mixtures thereof.

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5,741,762

## LUBRICATED ROLLING CONTACT DEVICES, A METHOD FOR LUBRICATING ROLLING CONTACT DEVICES, AND A COMPOSITION FOR LUBRICATING ROLLING CONTACT DEVICES

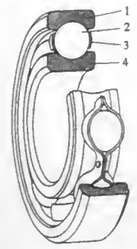
Lars Kahlman, Göteborg, Sweden, assignor to SKF Nova AB, Göteborg, Sweden

Filed Mar. 6, 1997, Ser. No. 810,817
Claims priority, application Sweden, Mar. 7, 1996, 9600881
Int. Cl.[6] C10M *103/06;* F16C *33/56*
U.S. Cl. 508—108 17 Claims

1. A lubricated rolling contact device, comprising at least one rolling element provided with a ceramic contact surface, the ceramic contact surface of the device being coated with a thin

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lubricating, wear and friction reducing film formed from titanium dioxide in the anatase phase.

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**5,741,763**
**LUBRICANT OIL COMPOSITION**
**Shouzou Matsushita, Saitama-ken, Japan, assignor to Exxon Research and Engineering Company, Florham Park, N.J.**
**Filed Dec. 22, 1995, Ser. No. 577,021**
**Int. Cl.[6] C10M *141/08***
**U.S. Cl. 508—413** **8 Claims**

1. A lubricant oil composition for use as a slide way oil which easily separates from water soluble cutting fluids, said composition comprising a base oil of mineral oil series and/or synthetic oil series, said base oil having a kinematic viscosity of 10 to 500 $mm^2/s$ at 40° C. and 0.001 to 5.0 parts by weight per 100 parts by weight of the base oil of calcium sulfonate(s), barium sulfonate(s) or mixtures thereof being neutral or having the total base number of 100 mg KOH/g or less, and 0.01 to 5.0 parts by weight per 100 parts by weight of the base oil of straight chain univalent saturated fatty acid(s) having 8 to 14 carbon atoms.

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**5,741,764**
**TWO-CYCLE LUBRICANT CONTAINING SOLVENT AND HIGH MOLECULAR WEIGHT POLYMER**
**Jayram D. Patel, Eastlake, and William K. S. Cleveland, Mentor-on-the-Lake, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio**
**Filed Oct. 15, 1996, Ser. No. 731,631**
**Int. Cl.[6] C10M *145/00***
**U.S. Cl. 508—459** **52 Claims**

1. A lubricant composition suitable for lubricating a two-stroke cycle engine, comprising:
(a) an oil of lubricating viscosity;
(b) about 0.2 to about 10 percent by weight of a polymer, soluble in said lubricant composition, having a number average molecular weight of greater than 50,000;
(c) 0 to about 10 percent by weight of an olefin polymer having a number average molecular weight of up to 500; and
(d) about 10 to about 95 percent by weight of a combustible solvent other than oil of lubricating viscosity, having a flash point of less than about 105° C., in which the remaining components of the lubricant are soluble.

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**5,741,765**
**CLEANING COMPOSITION COMPRISING QUATERNISED POLY-DIMETHYLSILOXANE AND NONIONIC SURFACTANT**
**Matthew James Leach, Wirral, United Kingdom, assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.**
**Filed Feb. 22, 1996, Ser. No. 605,410**
**Claims priority, application United Kingdom, Feb. 23, 1995, 9503596**
**Int. Cl.[6] C11D *1/12;1/755***
**U.S. Cl. 510—123** **9 Claims**

1. Aqueous, hard-surface cleaning composition comprising surfactant, wherein said surfactant consists essentially of:
a) at least 65% wt of total surfactant of nonionic surfactant,
b) less than 1% wt of total surfactant of anionic surfactant,
c) 0.1–35% wt of total surfactant of a quaternised polydimethylsiloxan, and
d) water.

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**5,741,766**
**OIL-IN-WATER CLEANSING EMULSION HAVING THE APPEARANCE OF MILK**
**Catherine Marion, Sceaux; Nathalie Louvet-Plaisant, and Liliane Lukassen, both of Chevilly-Larue, all of France, assignors to L'Oreal, Paris, France**
**Filed Jun. 14, 1995, Ser. No. 490,192**
**Claims priority, application France, Jun. 14, 1994, 94 07252**
**Int. Cl.[6] C11D *3/22;3/37;* A61K *7/02;7/48***
**U.S. Cl. 510—130** **5 Claims**



1. An oil-in-water cleansing emulsion comprising from 0.5 to 5% by weight of a self-emulsifiable composition and 0.02 to 0.5% by weight relative to the total weight of the emulsion, of a copolymer of a $C_{10}$–$C_{30}$ alkyl acrylate and of acrylic or methacrylic acid, crosslinked with an allyl ether of sucrose or of pentaerythritol, wherein said self-emulsifiable composition comprises from 60 to 90% by weight of at least one alcohol having from 12 to 22 carbon atoms, from 10 to 40% by weight of an alkylpolyoside whose alkyl chain has from 12 to 22 carbon atoms, and from 0 to 5% by weight of polyoside, and
wherein said emulsion has a viscosity equal to or less than 1 Pa•s.

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**5,741,767**
**PERACID BASED DISHWASHING DETERGENT COMPOSITION**
**John Richard Nicholson, Ramsey; Isaac Israel Secemski, Teaneck; Deborah Sue Rick, New Milford, and Duane Anthony Raible, Park Ridge, all of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.**
**Filed Nov. 16, 1995, Ser. No. 558,994**
**Int. Cl.[6] C11D *7/38;7/42***
**U.S. Cl. 510—220** **29 Claims**

1. A warewashing composition for a mechanical dishwashing machine comprising:
(a) an organic monoperoxy or diperoxy acid which exhibits maximum tannin stain removal efficacy at a wash pH of about 8.5 which is at or near the pKa of the peroxy acid the organic peroxy acid being present in an amount of 1 ppm to 100 ppm available $O_2$ in the solution;
(b) an amylase enzyme which, when incubated at 55° C. in a solution of 2 mM sodium citrate, 1 mM epsilon phthalimidoperoxyhexanoic acid in 36 ppm water at pH 8.0, has a half-life of 10 minutes or greater based on an activity vs. time plot obtained via monitoring color development at 405 nm of solution samples incubated with p-nitrophenyl-α-D-maltoheptaoside as substrate and gluco amylase and α-glucosidase as coupled enzymes; and
(c) 1% by weight to 75% by weight of a builder.
provided that a 1% aqueous solution of the warewashing composition has a pH of 6 to 9.5.

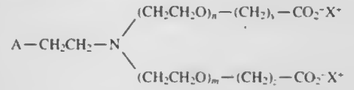


16. A method of cleaning dishware in a machine dishwashing machine comprising:
(a) applying an effective amount of a detergent composition comprising:
(i) an amylase enzyme which, when incubated at 55° C. in a solution of 2 mM sodium citrate, 1 mM epsilon phthalimidoperoxyhexanoic acid in 36 ppm water at pH 8.0, has a half-life of 10 minutes or greater based on an activity vs. time plot obtained via monitoring color development at 405 nm of solution samples incubated with p-nitrophenyl α-D-maltoheptaoside as substrate and gluco amylase and α-glucosidase as coupled enzymes;
(ii) an organic monoperoxy or diperoxy acid which exhibits maximum tannin stain removal efficacy at a wash pH of about 8.5,which is at or near the pKa of the peroxy acid, the organic peroxy acid being present in an amount of 1 ppm to 100 ppm available $O_2$ in the solution; and
(iii) 1% by weight to 75% by weight of a builder,
provided that a 1% aqueous solution of the warewashing composition has a pH of 6 to 9.5, and
(b) rising the detergent composition from the cleaned dishware to substantially provided clean dishes.

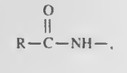
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**5,741,768**
**COMPOSITION AND IMPROVED PH DRIVEN METHOD FOR WASTEWATER SEPARATION USING AN AMPHOTERIC DICARBOXYLATE AND A CATIONIC DESTABILIZER COMPOSITION**
**David J. Falbaum, St. Paul; Robert D. Hei, Cottage Grove; Helmut K. Maier, Golden Valley, and Paul J. Mattia, Prior Lake, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.**
**Division of Ser. No. 267,664, Jun. 29, 1994, Pat. No. 5,523,000. This application May 15, 1996, Ser. No. 647,697**
**Int. Cl.[6] C11D *17/00;17/08***
**U.S. Cl. 510—339** **31 Claims**

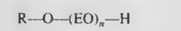
1. An alkaline cleaning concentrate composition comprising:
(a) an effective detergent amount comprising 5 to 95 wt-% of a source of alkalinity;
(b) an effective detergent and pH phase separation amount of an amphoteric dicarboxylate surfactant of the formula:



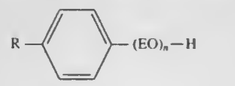
wherein A is



R is a $C_{9-17}$ alkyl, $X^+$ is ammonium or an alkali metal cation, y an z are independently 1–6 and m and n are independently 0–6, m+ n≧1; and
(c) an effective detergent amount comprising about 1 to 25 wt-% of a nonionic surfactant composition comprising a $C_{8-18}$ alcohol ethoxylate of the formula:



or a $C_{8-9}$ alkyl phenol ethoxylate surfactant of the formula:

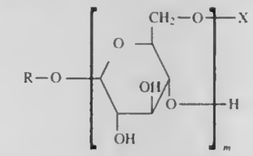


each having from 3–15 moles of ethylene oxide per mole of surfactant;
wherein fabric soiled with greasy or oily soils can be cleaned in an aqueous cleaning composition containing an effective cleaning amount of the concentrate resulting in an alkaline effluent containing substantial quantities of organic hydrophobic soil which can be readily separated from the aqueous effluent by contacting the effluent, at a pH less than 7, with an effective amount of a cationic emulsion destabilizing composition.

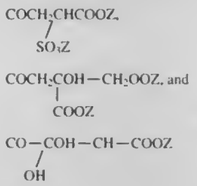
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**5,741,769**
**MICROEMULSION LIGHT DUTY LIQUID CLEANING COMPOSITIONS**
**Rita Erilli, Liege, Belgium, assignor to Colgate Palmolive Company, Piscataway, N.J.**
**Continuation-in-part of Ser. No. 344,059, Nov. 23, 1994, Pat. No. 5,531,938. This application Jul. 1, 1996, Ser. No. 678,353**
**Int. Cl.[6] C11D *1/83;1/84***
**U.S. Cl. 510—417** **10 Claims**

1. A light duty liquid microemulsion composition comprises approximately by weight: 10% to 34% of a mixture of a sulfonate surfactant and an alkyl ether polyethenoxy sulfate surfactant; 1 to 10% of a zwitterionic surfactant, 1% to 10% of a biodegradable anionic surfactant selected from the group consisting of an alkyl ethoxy citrate and an alkyl polyglucoside; 0.4% to 8.0% of a water insoluble hydrocarbon, essential oil or perfume; 2% to 15% of a cosurfactant said cosurfactant being selected from the group consisting of dipropylene glycol, polypropylene glycol, mono $C_1$–$C_6$ alkyl ethers and esters of ethylene glycol and propylene glycol, glycerol, ethylene glycol and polyethylene glycol, and the balance being water, wherein said alkyl polyglycoside is depicted by the formula:



wherein R is a $C_{10}$ to $C_{16}$ alkyl group, m is a number average which is less than 4 and is of such a value to provide a number molecular weight of about 500 to 1000, and X is selected from the group consisting of



wherein Z is selected from the group consisting of sodium, potassium, ammonium, triethanol amine, diethanol amine and monoethanol amine, and said light duty liquid microemulsion composition has a light transmission of at least 95%.

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**5,741,770**
**LIQUID CRYSTAL COMPOSITION**
**Georges Yianakopoulos, Liege; Genevieve Blandiaux, Trooz, and Myriam Mondin, Seraing, all of Belgium, assignors to Colgate-Palmolive Co., Piscataway, N.J.**
**Continuation-in-part of Ser. No. 611,924, Mar. 6, 1996, abandoned, which is a continuation-in-part of Ser. No. 334,107, Nov. 4, 1994, Pat. No. 5,523,013, which is a continuation-in-part of Ser. No. 96,501, Sep. 3, 1993, abandoned, which is a continuation of Ser. No. 726,597, Jul. 8, 1991, abandoned, which is a continuation of Ser. No. 411,280, Sep. 22, 1989, Pat. No. 5,035,826. This application Jul. 8, 1996, Ser. No. 676,612**
**Int. Cl.[6] C11D *9/32;17/08***
**U.S. Cl. 510—426** **8 Claims**

1. A clear liquid crystal detergent composition which consisting essentially of by weight:

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(a) about 1% to about 36% of a nonionic surfactant containing ethylene oxide groups;
(b) about 1% to about 20% of a water soluble salt of an ethoxylated $C_{8-18}$ alkyl ether sulfate surfactant or;
(c) about 0.1% to about 2.5% of an amorphous silica abrasive having a particle size of 300 mm;
(d) about 1% to about 30% of a water soluble glycol ether cosurfactant;
(e) about 0.6% to about 10% of a water insoluble organic compound selected from the group consisting of perfumes, essential oils and water insoluble hydrocarbons having about 8 to about 18 carbon atoms; and
(f) the balance being water, said liquid crystal detergent composition has a storage modulus measured at a temperature between 20° C. to 40° C., at a strain of 0.1% to 5% and a frequency of 10 radians/second of at least about one Pascal and is one phase at a temperature of 8° C. to 43° C., wherein the composition does not contain sulfonate surfactant.

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**5,741,771**

**THROMBOLYTIC COMPOSITION**

**Keith Martyn Dawson; Lars Michael Wood, and Michael Berisford Comer, all of Oxford, United Kingdom, assignors to British Biotech Pharmaceuticals Ltd., England**

**PCT No. PCT/GB95/01388, § 371 Date Mar. 18, 1997, § 102(e) Date Mar. 18, 1997, PCT Pub. No. WO95/35117, PCT Pub. Date Dec. 28, 1995**

**PCT Filed Jun. 14, 1995, Ser. No. 750,711**

**Claims priority, application United Kingdom, Jun. 17, 1994, 9412131**

**Int. Cl.[6] A61K** *38/49;38/48*

**U.S. Cl. 514—2** **5 Claims**

**1**. A product containing a plasminogen activator and a thrombin-activatable plasminogen analogue, for simultaneous or sequential use in thrombolytic therapy.

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**5,741,772**

**NEUROTROPHIC FACTOR NNT-1**

**Ming-shi Chang, Newbury Park, Calif., assignor to Amgen Inc., Thousand Oaks, Calif.**

**Filed Feb. 3, 1997, Ser. No. 792,019**

**Int. Cl.[6] A01N** *37/18;* **A61K** *38/00*

**U.S. Cl. 514—2** **6 Claims**

1 ATTAAAGCTT CGCCGGAGCC GCGGCTCGCC CTCCCACTCC GCCAGCCTCC
51 GGGAGAGGAG CCGCACCCGG CCGCCCAGC CCCAGCCCCA TGGACCTCCG
101 AGCAGGGGAC TCGTGGGGGA TGTTAGCGTG CCTGTGCACG GTGCTCTGGC
151 ACCTCCCTGC AGTGCCAGCT CTCAATCGCA CAGGGACCC AGGGCCTGGC
201 CCCTCCATCC AGAAAACCTA TGACCTCACC CGCTACCTGG AGCACCAACT
251 CCGCAGCTTG GCTGGGACCT ATCTGAACTA CCTGGGCCCC CCTTTCAACG
301 AGCCAGACTT CAACCCTCCC CGCCTGGGGG CAGAGACTCT GCCCAGGGCC
351 ACTGTTGACT TGGAGGTGTG GCGAAGCCTC AATGACAAAC TGCGGCTGAC
401 CCAGAACTAC GAGGCCTACA GCCACCTTCT GTGTTACTTG CGTGGCCTCA
451 ACCGTCAGGC TGCCACTGCT GAGCTGCGCC GCAGCCTGGC CCACTTCTGC
501 ACCAGCCTCC AGGGCCTGCT GGGCAGCATT GCGGGCGTCA TGGCAGCTCT
551 GGGCTACCCA CTGCCCCAGC CGCTGCCTGG GACTGAACCC ACTTGGACTC
601 CTGGCCCTGC CCACAGTGAC TTCCTCCAGA AGATGGAGGA CTTCTGGCTG
651 CTGAAGGAGC TGCAGACCTG GCTGTGGCGC TCGGCCAAGG ACTTCAACCG
701 GCTCAAGAAG AAGATGCAGC CTCCAGCAGC TGCAGTCACC CTGCACCTGG
751 GGGCTCATGG CTTCTGACTT CTGACCTTCT CCTCTTCGCT CCCCCCC

**1**. An NNT-1 polypeptide, which has a biological activity of stimulating growth of motor or sympathetic neurons, selected from the group consisting of:
(a) the polypeptide of SEQ ID NO:2;
(b) the polypeptide that is amino acids 1–198 of SEQ ID NO:2;
(c) the polypeptide that is at least 70 percent identical to the polypeptide of (a) or (b); and
(d) a fragment of any of (a)–(c), which has said biological activity.

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**5,741,773**

**STORAGE STABLE DENTIFRICE COMPOSITION CONTAINING AN ANTIBACTERIAL CASEIN GLYCOMACROPEPTIDE ADJUVANT**

**Yun Po Zhang, Hillsborough, and Abdul Gaffar, Princeton, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.**

**Filed Apr. 26, 1996, Ser. No. 639,871**

**Int. Cl.[6] A61K** *38/16*

**U.S. Cl. 514—8** **26 Claims**

**1**. An oral composition comprising in a dental vehicle a casein glycomacropeptide in an amount effective for antibacterial activity, an anionic surfactant and a hydrolyzed protein compound stabilizer in an amount effective to stabilize the antibacterial activity of the casein glycomacropeptide antibacterial activity against inactivation due to the presence of the anionic surfactant.

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**5,741,774**

**USE OF A CYTOKINE REGULATORY AGENT TO TREAT RHEUMATOID ARTHRITIS**

**Beverly E. Girten, San Diego, and Ronald R. Tuttle, Escondido, both of Calif., assignors to Trega Biosciences, Inc., San Diego, Calif.**

**Continuation-in-part of Ser. No. 336,473, Nov. 19, 1994, which is a continuation-in-part of Ser. No. 151,534, Nov. 12, 1993, Pat. No. 5,420,109. This application Sep. 27, 1996, Ser. No. 722,279**

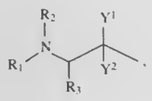
**Int. Cl.[6] A61K** *38/00;* **C07K** *5/00;7/00;17/00*

**U.S. Cl. 514—8** **15 Claims**

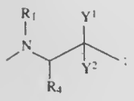
**1**. A method for reducing the severity of rheumatoid arthritis in an individual susceptible to developing rheumatoid arthritis, comprising administering to the individual an effective dose of a cytokine regulatory agent (CRA) having the structure

$X_1—X_2—His—(D)Phe—Arg—(D)Trp—X_3$, wherein

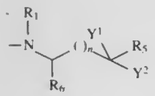
$X_1$ is



H or $COCH_3$;
$H_2$ is

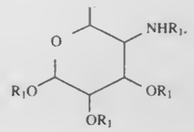


and
$H_3$ is





or $NH_2$;
wherein $Y^1$ and $Y^2$ are independently a hydrogen atom, or are taken together to form a carbonyl or thiocarbonyl;
$R_1$ is H, $COCH_3$, $C_2H_5$, $CH_2Ph$, COPh, $COOCH_2Ph$, COO-t-butyl, $CH_2CO$-(polyethylene glycol) or A;
$R_2$ is H or $COCH_3$;
$R_3$ is a linear or branched alkyl group having 1 to 6 carbon atoms;
$R_4$ is $(CH_2)_m—CONH_2$, $(CH_2)_m—CONHR_1$ or $(CH_2)_m—CONHA$;
$R_5$ is OH, $OR_3$, $NH_2$, SH, $NHCH_3$, $NHCH_2Ph$ or A; and
$R_6$ is H or $R_3$;
and wherein "Ph" is $C_6H_5$, "m" is **1**, **2** or **3**, "n" is **0**, **1**, **2** or **3**, and "A" is a carbohydrate having the general formula



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**5,741,775**

**CYCLOHEXAPEPTIDYL AMINOALKYL ETHERS**

**James M. Balkovec, N. Plainfield; James F. Dropinski, Piscataway, and Frances Aileen Bouffard, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

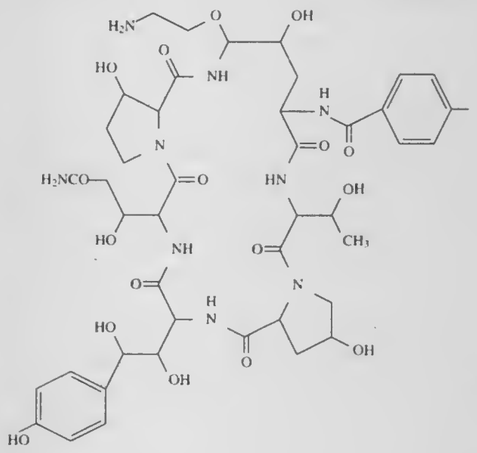
**Continuation-in-part of Ser. No. 58,656, May 4, 1993, abandoned. This application Jun. 13, 1995, Ser. No. 489,976**

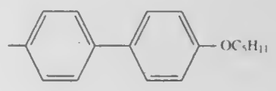
**Int. Cl.[6] A61K** *38/12;* **C07K** *7/64*

**U.S. Cl. 514—11** **8 Claims**

**1**. A compound having the formula selected from the group consisting of

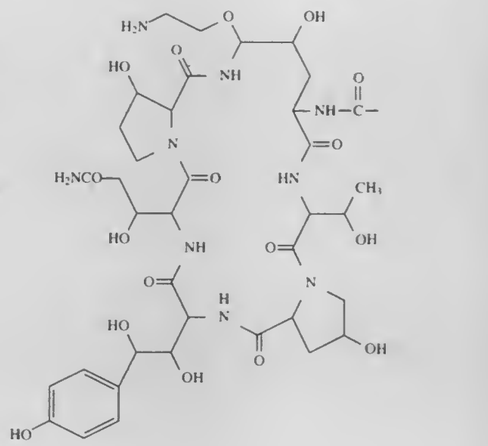
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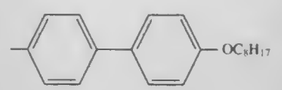




which has a water solubility of greater than 20 mg/ml;

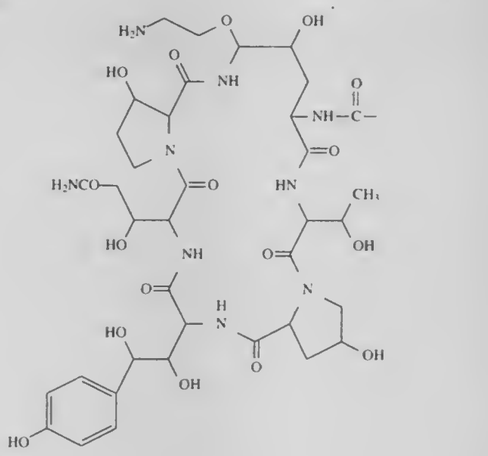
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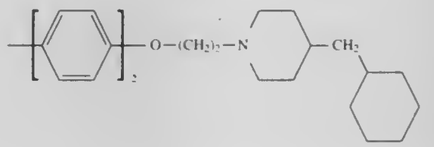




which has a water solubility of greater than 5 mg/ml;

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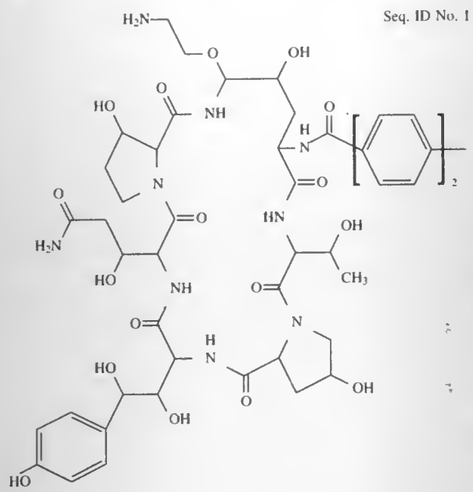
VOL 1209 ISS 3 AP 21 1998 UMI

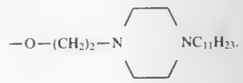


-continued

and

Seq. ID No. 1





5,741,776

**METHOD OF ADMINISTRATION OF IGF-I**

**Ross G. Clark, Pacifica; Neil Gesundheit, Palo Alto, both of Calif.; Marc R. Hammerman, and Steven B. Miller, both of St. Louis, Mo., assignors to Genentech, Inc., South San Francisco, Calif., and Washington University, St. Louis, Mo.**

**Filed May 22, 1995, Ser. No. 445,805**

**Int. Cl.[6] A61K** *38/00;38/27*

**U.S. Cl. 514—12** **17 Claims**

1. A method for administering insulin-like growth factor-I (IGF-I) to a mammal so as to sustain its biological response in the treatment of a chronic disorder in the mammal comprising administering a therapeutically effective amount of IGF-I to the mammal to provide an exposure to IGF-I for a period of time that provides the maximum biological response in the mammal, then discontinuing said administration for a period of time equal to or less than the time period during which the IGF-I was previously administered, then administering a therapeutically effective amount of IGF-I to the mammal to provide an exposure to IGF-I for a period of time that provides the maximum biological response in the mammal, then discontinuing said administration for a period of time equal to or less than the time period during which the IGF-I was just previously administered, and repeating this pattern of administration and discontinuance of administration for as long as necessary to achieve or maintain sustained biological response in the mammal.

5,741,777

**MODULATION OF WOUND CONTRACTION BY BLOCKING PROTEIN TYROSINE PHOSPHATASE**

**Frederick L. Grinnell, and Ying-Chun Lin, both of Dallas, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.**

**Filed Oct. 31, 1995, Ser. No. 570,615**

**Int. Cl.[6] A61K** *38/00;31/41;* **C07K** *14/00*

**U.S. Cl. 514—12** **10 Claims**

1. A method of inhibiting fibroblast contraction in a collagen matrix comprising exposing said matrix to an effective amount of a tyrosine phosphatase inhibitor in the presence of serum and platelet-derived growth factor.

5,741,778

**METHOD FOR TREATING HUNTINGTON'S DISEASE USING GLIAL CELL LINE-DERIVED NEUROTROPHIC FACTOR (GDNF) PROTEIN PRODUCT**

**David Martin, Boulder, and Gerald D. Miller, Nederland, both of Colo., assignors to Amgen Inc., Thousand Oaks, Calif.**

**Filed Mar. 19, 1996, Ser. No. 618,543**

**Int. Cl.[6] A61K** *47/00;31/685;* **A61F** *2/00*

**U.S. Cl. 514—12** **11 Claims**

1. A method for treating injury or degeneration of glutamatergic neurons comprising administering to a subject suffering from such disease an effective amount of a glial cell line-derived neurotrophic factor (GDNF) protein product.

5,741,779

**ANTITHROMBOTIC MATERIALS AND METHODS**

**Mark L. White, Sonoma, and William Steve Ammons, Pinole, both of Calif., assignors to XOMA Corporation, Berkeley, Calif.**

**Filed May 10, 1996, Ser. No. 644,290**

**Int. Cl.[6] A61K** *38/16;38/17;38/36;* **C07K** *14/435*

**U.S. Cl. 514—12** **7 Claims**

1. A method for slowing clot formation in blood comprising administering to a subject a BPI protein product in an amount effective to delay or prevent clot formation in the blood.

5,741,780

**Patent Not Issued For This Number**

5,741,781

**MERCAPTOALKANOYLDIPEPTIDE COMPOUNDS**

**Bernard Pierre Roques, Saint-Maurice, and Marie-Claude Fournie-Zaluski, Paris, both of France, assignors to Adir et Compagnie, Courbevoie, and Inserm, Paris, both of France**

**Filed Jan. 22, 1996, Ser. No. 589,797**

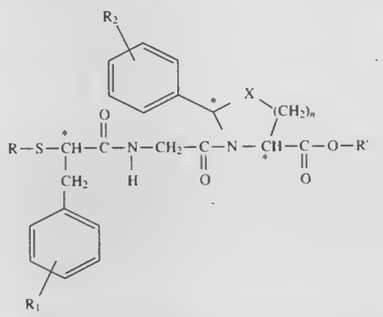
**Claims priority, application France, Jan. 23, 1995, 95 00694**

**Int. Cl.[6] A61K** *38/05*

**U.S. Cl. 514—19** **14 Claims**

1. A compound selected from those of formula (I):

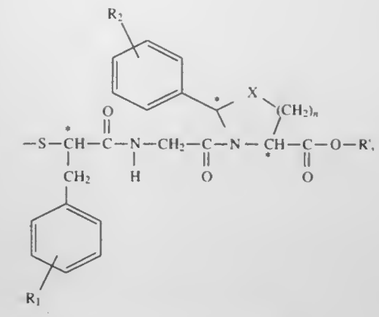
(I)



wherein:

R is selected from hydrogen, acyl having 1 to 6 carbon atoms inclusive in straight or branched chain, benzoyl, naphthoyl, and adamantoyl and





wherein $R_1$, $R_2$, R', X and n are as defined below,

$R_1$ and $R_2$, which are identical or different, are each selected, independently of the other, from hydrogen, hydroxy, alkyl having 1 to 6 carbon atoms inclusive in straight or branched chain, alkoxy having 1 to 6 carbon atoms inclusive in straight or branched chain, halogen selected from fluorine, chlorine, bromine and iodine, nitro, amino, carboxy, alkoxycarbonyl having 1 to 6 carbon atoms inclusive in straight or branched chain, benzyloxycarbonyloxy, phosphonate, sulphonate, $SO_2$—$NH_2$ and $SO_2$—NH-alkyl wherein the term alkyl denotes a saturated hydrocarbon group having 1 to 6 carbon atoms in straight or branched chain,

R' is selected from hydrogen, alkyl having 1 to 20 carbon atoms inclusive in straight or branched chain, aralkyl, and cycloalkylalkyl,

X is selected from oxygen, sulphur, $CH_2$, and NH,

n is selected from the integers 1 and 2,

wherein:

"aralkyl" denotes a radical formed by an aryl group selected from phenyl and naphthyl that is bonded to an alkyl radical having 1 to 6 carbon atoms inclusive in straight or branched chain,

"cycloalkylalkyl" denotes a radical formed by a cycloalkyl group having 3 to 8 carbon atoms inclusive that is bonded to an alkyl radical having 1 to 6 carbon atoms inclusive in straight or branched chain,

a stereoisomeric form thereof, or a pharmaceutically-acceptable addition salt thereof.

13. A method for treating hypertension comprising administering to a mammal in need thereof an effective amount of a compound of claim 1.

5,741,782

**ANTIBIOTIC COCKTAIL AND METHOD OF USE**

**Kelvin G.M. Brockbank, Marietta; Steven Goldstein, Atlanta, both of Ga.; Chigoke Adoma, Katy, Tex.; Judith K. Sheldon, Smyrna, and Patti E. Dawson, Marietta, both of Ga., assignors to Cryolife, Inc., Kennesaw, Ga.**

**Filed Mar. 29, 1996, Ser. No. 626,167**

**Int. Cl.[6] A61K** *31/70;* **A61F** *2/02*

**U.S. Cl. 514—31** **13 Claims**

1. An antibiotic cocktail for decontaminating tissue for transplantation comprising:

amphotericin B and fluconazole as antifungal agents; and

a plurality of antibacterial agents;

the agents being present in amounts effective to substantially inhibit yeast and bacterial growth while substantially maintaining the viability of the tissue.

5,741,783

**N-CYANOMETHYLATED CHITOSANS AND HYDROLYSATES THEREOF**

**Jürg Haase, Bettingen, and Martin Kuhn, Dornach, both of Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.**

**Filed Dec. 21, 1995, Ser. No. 576,628**

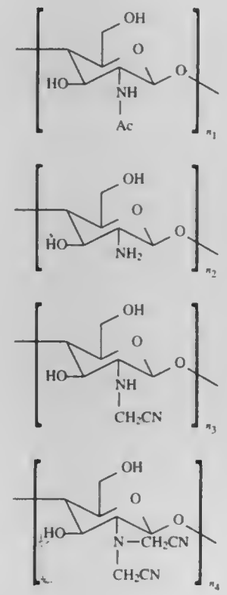
**Claims priority, application Switzerland, Dec. 22, 1994, 03 899/94**

**Int. Cl.[6] A61K** *31/73;* **C08B** *37/08*

**U.S. Cl. 514—55** **6 Claims**

1. A N-cyanomethylated chitosan containing repeating units of formula

(1)



wherein

$n_1$ is 0 to 0.6

$n_2$ is 0 to 0.20

$(n_3+n_4)$ is 0.4 to 1.0.

5,741,784

**BENZOPYRAN DERIVATIVES AND THEIR USE**

**Takashi Sohda, Takatsuki; Shigehisa Taketomi, Ikeda, and Tsuneo Oda, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Division of Ser. No. 242,638, May 13, 1994, Pat. No. 5,580,863. This application Aug. 30, 1996, Ser. No. 697,862**

**Claims priority, application Japan, May 18, 1993, 5-115950; Mar. 3, 1994, 6-33911**

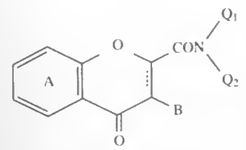
**Int. Cl.[6] A61K** *31/665;31/675*

**U.S. Cl. 514—80** **8 Claims**

1. A method for the prophylaxis or treatment of metabolic bone diseases in a mammal comprising the step of administering a pharmaceutically effective amount of a compound represented by the formula:

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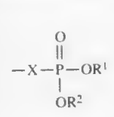




wherein B represents a hydrogen atom or a lower alkyl group; ring A represents a benzene ring which may have one or more substituents; fheight..... represents a single or double bond; $Q_1$ represents the group represented by the formula,



,or a hydrocarbon residue substituted with the group represented by the formula,



wherein X represents a bond or a spacer having a chain length of 1 to 4 atoms as the linear moiety which may have one or more side chains; $R^1$ and $R^2$, whether identical or not, independently represent a hydrogen atom or a lower alkyl, or may bind together to form a ring; $Q_2$ represents a hydrogen atom, a hydrocarbon residue which may be substituted or a heterocyclic ring residue which may be substituted; or a salt thereof, to a mammal in need thereof.

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**5,741,785**

## HETEROCYCLIC COMPOUNDS, THEIR PREPARATION AND USE

**Lone Jeppesen, Virum, Denmark, assignor to Novo Nordisk A/S, Bagsvaerd, Denmark**

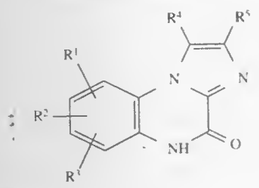
**Filed Feb. 8, 1995, Ser. No. 385,250**

**Claims priority, application Denmark, Feb. 11, 1994, 0183/94; Nov. 25, 1994, 1351/94**

**Int. Cl.**[6] **A61K** *31/675;31/495;* **C07F** *9/576;* **C07D** *487/04*

**U.S. Cl. 514—81** **38 Claims**

**1**. A compound of formula I,

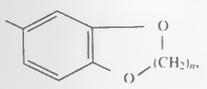


(I)

wherein

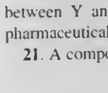
$R^1$, $R^2$, $R^3$ independently are hydrogen, $C_{1-6}$-alkyl, $C_{1-6}$-alkoxy, halogen, $NO_2$, $NH_2$, $CF_3$ or CN;

$R^4$ is $CH_2$-$R^6$ wherein $R^6$ is halogen or $NR^7R^8$, wherein $R^7$ and $R^8$ independently are hydrogen,

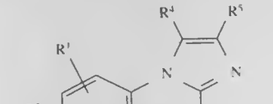


or $C_{1-6}$-alkyl optionally substituted with hydroxy or phenyl; wherein n is 1, 2 or 3; and

$R^5$ is

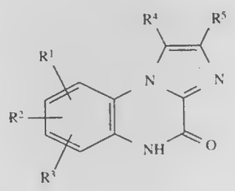


, $CH_2OH$, CHNOH, CN,



wherein $R^9$ is hydroxy, $C_{1-6}$-alkoxy, hydrogen or $NR^{10}$ $R^{11}$; $R^{10}$ and $R^{11}$ independently are hydrogen, $NH_2$ or OH; X is O or S; and Y is O or S when there is a double bond between Y and the carbon atom to which Y is attached and Y is $NH_2$ when there is a single bond between Y and the carbon atom to which Y is attached; or a pharmaceutically acceptable salt thereof.

**12**. A compound of formula I



(I)

wherein

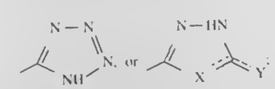
$R^1$, $R^2$, $R^3$ independently are hydrogen, $C_{1-6}$-alkyl, $C_{1-6}$-alkoxy, halogen, $NO_2$, $NH_2$, $CF_3$, CN, $SO_2CH_3$, $SO_2CF_3$, $SO_2NR'R''$ or imidazolyl which is optionally substituted with phenyl or $C_{1-6}$-alkyl; wherein R' and R" independently are hydrogen or $C_{1-6}$-alkyl;

$R^4$ is $CH_2$-$R^6$ wherein $R^6$ is $POR'''R''''$, wherein R''' and R'''' independently are hydroxy or $C_{1-6}$-alkoxy; and

$R^5$ is



, $CH_2OH$, CHNOH, CN,



wherein $R^9$ is hydroxy, $C_{1-6}$-alkoxy, hydrogen or $NR^{10}R^{11}$; $R^{10}$ and $R^{11}$ independently are hydrogen, $NH_2$ or OH; X is O or S; and Y is O or S when there is a double bond between Y and the carbon atom to which Y is attached and Y is $NH_2$ when there is a single bond between Y and the carbon atom to which Y is attached; or a pharmaceutically acceptable salt thereof.

**21**. A compound of formula I



(I)

wherein

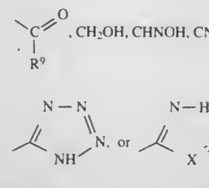
$R^1$, $R^2$, $R^3$ independently are hydrogen, $C_{1-6}$-alkyl, $C_{1-6}$-alkoxy, halogen, $NO_2$, $NH_2$, $CF_3$, CN, $SO_2CH_3$, $SO_2CF_3$, $SO_2NR''R''$



or imidazolyl which is optionally substituted with phenyl or $C_{1-6}$-alkyl; wherein R' and R" independently are hydrogen or $C_{1-6}$-alkyl;

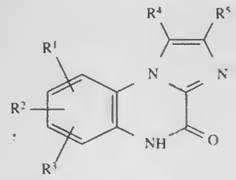
$R^4$ is $CH_2$-$R^6$ wherein $R^6$ is a piperazinyl or imidazolyl group which is optionally substituted with one or two of phenyl, $C_{1-6}$-alkyl or halogen;

$R^5$ is



wherein $R^9$ is hydroxy, $C_{1-6}$-alkoxy, hydrogen or $NR^{10}R^{11}$; $R^{10}$ and $R^{11}$ independently are hydrogen, $NH_2$ or OH; X is O or S; and Y is O or S when there is a double bond between Y and the carbon atom to which Y is attached and Y is $NH_2$ when there is a single bond between Y and the carbon atom to which Y is attached; or a pharmaceutically acceptable salt thereof.

**30**. A compound of formula I

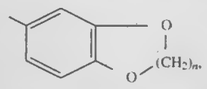


(I)

wherein

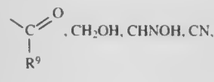
at least one of $R^1$, $R^2$ and $R^3$ is $SO_2CH_3$, $SO_2CF_3$, or imidazolyl which is optionally substituted with phenyl or $C_{1-6}$-alkyl; and the other of $R^1$, $R^2$ and $R^3$ are independently one of these groups or hydrogen, $C_{1-6}$-alkyl, $C_{1-6}$-alkoxy, halogen, $NO_2$, $NH_2$, $CF_3$ or CN;

$R^4$ is hydrogen or $CH_2$-$R^6$ wherein $R^6$ is hydrogen, halogen or $NR^7R^8$, wherein $R^7$ and $R^8$ independently are hydrogen,

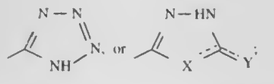


or $C_{1-6}$-alkyl optionally substituted with hydroxy or phenyl; wherein n is 1, 2 or 3; and

$R^5$ is



, $CH_2OH$, CHNOH, CN,



wherein $R^9$ is hydroxy, $C_{1-6}$-alkoxy, hydrogen or $NR^{10}R^{11}$; $R^{10}$ and $R^{11}$ independently are hydrogen, $NH_2$ or OH; X is O or S; and Y is O or S when there is a double bond between Y and the carbon atom to which Y is attached and Y is $NH_2$ when there is a single bond between Y and the carbon atom to which Y is attached; or a pharmaceutically acceptable salt thereof.

**5,741,786**

## STEROIDS WITH A 17-SPIROMETHYLENE LACTONE OR LACTOL GROUP

**Johannes Antonius Maria Hamersma, and Jaap van der Louw, both of Oss, Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands**

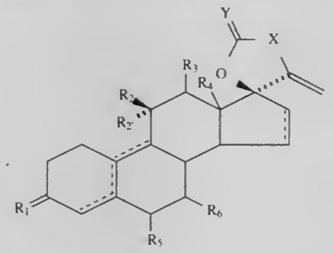
**Filed Oct. 24, 1995, Ser. No. 547,176**

**Claims priority, application European Pat. Off., Oct. 27, 1994, 94203117**

**Int. Cl.**[6] **A61K** *31/58;31/585;* **C07J** *43/00;21/00*

**U.S. Cl. 514—173** **11 Claims**

**1**. A steroid with a 17-spiro[methylene lactone] or 17-spiro[methylene lactol] group having formula I



wherein

$R_1$ is O, (H,H), (H,OR), or NOR, R being selected from H, (1–6C) alkyl and (1–6C) acyl;

$R_2$ is H, (1–6C) alkyl optionally substituted by a halogen, (2–6C) alkenyl optionally substituted by a halogen, (2–6C) alkynyl optionally substituted by a halogen, or halogen;

$R_2'$ is H; or $R_2'$ together with $R_2$ is a (1–6C) alkylidene group or a (2–6C) alkenylidene group; or

$R_2'$ together with $R_3$ is a bond;

$R_3$ is H if not together with $R_2'$ a bond;

$R_4$ is (1–6C) alkyl; one of $R_5$ and $R_6$ is hydrogen and the other is hydrogen or (1–6C) alkyl;

X is $(CH_2)_n$ or $(C_nH_{2n-2})$ wherein n is 2 or 3, wherein $(CH_2)_n$ is optionally substituted with hydroxy, halogen, (1–6C) alkyl, (1–6C) aliphatic hydrocarbon acyl, (7–9C) phenylalkyl, the phenyl group of which may be substituted with (1–6C) alkyl, (1–6C) alkoxy, hydroxy or halogen;

Y is O or (H,OH); and

the dotted lines indicate optional bonds, at least one of bonds 4–5, 5–10, and 9–10 being a double bond.

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**5,741,787**

## ANTIGLUCOCORTICOID STEROIDS FOR THE TREATMENT OF ANXIETY DISORDERS

**Bernardus Wynand Mathijs Marie Peeters, Herpen, Netherlands, assignor to Akzo Nobel N.V., Arnhem, Netherlands**

**PCT No. PCT/EP94/02513, § 371 Date Jan. 18, 1996, § 102(e) Date Jan. 18, 1996, PCT Pub. No. WO95/04536, PCT Pub. Date Feb. 16, 1995**

**PCT Filed Jul. 28, 1994, Ser. No. 581,631**

**Claims priority, application European Pat. Off., Aug. 4, 1993, 93202304**

**Int. Cl.**[6] **A61K** *31/56*

**U.S. Cl. 514—177** **3 Claims**

**1**. A method for the treatment of anxiety disorders, comprising administering an anxiolytically effective amount of at least one antiglucocorticoid steroid.

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5,741,788

## HETEROCYCLIC COMPOUNDS AND THEIR PREPARATION AND USE

**Preben H. Olesen, København NV, and Per Sauerberg, Farum, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark**

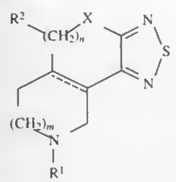
**Filed Nov. 17, 1995, Ser. No. 559,961**

**Claims priority, application Denmark, Nov. 21, 1994, 1324/94**

**Int. Cl.[6] C07D** *513/14;513/04;* **A61K** *31/425;31/44*

**U.S. Cl. 514—183** **26 Claims**

1. A compound of formula I



(I)

wherein

X is —S—;

m is 1;

n is 0 or 1 provided that when n is 0, $R^2$ is not present;

$R^1$ is H, straight or branched $C_{1-5}$-alkyl, straight or branched $C_{2-5}$-alkenyl, straight or branched $C_{2-5}$-alkynyl, $C_{3-6}$-cycloalkyl or $C_{3-6}$-cycloalkyl-$C_{1-3}$-alkyl; and

$R^2$ is H; straight or branched $C_{1-10}$-alkyl; straight or branched $C_{2-10}$-alkenyl; straight or branched $C_{2-10}$-alkynyl; phenyl optionally substituted with halogen, $CF_3$, CN, $NO_2$, OH, $C_{1-4}$-alkyl, $C_{1-4}$-alkoxy or $SO_2R^4$ wherein $R^4$ is $C_{1-4}$-alkyl; or $C_{1-5}$-alkyl, $C_{2-5}$-alkenyl or $C_{2-5}$-alkynyl each of which is substituted with halogen, $CF_3$, $OCF_3$, CN, $C_{3-6}$-cycloalkyl or phenyl which phenyl is optionally substituted with halogen, $CF_3$, $OCF_3$, CN, $NO_2$, OH, $C_{1-4}$-alkyl, $C_{1-4}$-alkoxy or $SO_2R^4$; and ..... is a single or double bond; or a pharmaceutically acceptable salt thereof.

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5,741,789

## COMPOUNDS HAVING EFFECTS ON SEROTONIN-RELATED SYSTEMS

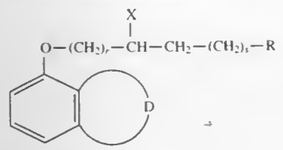
**David J. Hibschman, Bargersville; Joseph H. Krushinski, Jr., Indianapolis; Kurt Rasmussen, Fishers; Vincent P. Rocco, Indianapolis; John M. Schaus, Zionsville, and Dennis C. Thompson, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation-in-part of Ser. No. 373,823, Jan. 17, 1995, abandoned. This application Jun. 6, 1995, Ser. No. 467,434**

**Int. Cl.[6] C07D** *227/00;401/12;* **A61K** *31/395;31/445*

**U.S. Cl. 514—210** **20 Claims**

1. A compound of the formula



I

wherein r is 0–4;

s is 0–1;

D is a residue which combines with the carbon atoms to which it is attached to complete a pyridinyl group;

wherein X is hydrogen, phenyl, hydroxy or methoxy;

provided that X is hydrogen or phenyl when r is 0;

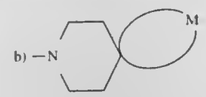
R is



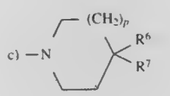
V

A is a residue which combines with the nitrogen atom to which it is attached to complete

a) an azabicyclo(octyl nonyl or decyl) group;

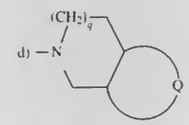


VIII



IX

or



X

M is a residue which combines with the carbon atom to which it is attached to complete an indanyl, indenyl, pyrrolidinyl, tetralinyl, benzopyranyl, dihydroindolyl, naphthodihydrofuranyl, benzodihydrothienyl, benzodihydrofuranyl, benzodihydropyranyl, naphthodihydrothienyl, or naphthodihydropyrrolyl group wherein the spiro junction is not to an aromatic ring wherein M is, substituted with 0–2 $C_1$–$C_3$ alkyl, oxo, $C_1$–$C_3$ alkoxy, pyrrolidinyl- or piperidinyl-$C_1$–$C_3$ alkoxy, $C_1$–$C_2$ alkylenedioxy, phenoxy, benzyloxy, phenyl or halo groups;

p represents 0–2;

$R^6$ and $R^7$ independently represent phenyl groups, substituted with 0–2 $C_1$–$C_3$ alkyl, $C_1$–$C_3$ alkoxy or halo groups;

or $R^6$ and $R^7$ combine with the atom to which they are attached to complete a fluorenyl or dihydroanthracenyl group;

q represents 0–2;

Q represents a residue which combines with the atoms to which it is attached to complete a phenyl or naphthyl group, substituted with 0–2 $C_1$–$C_3$ alkyl, $C_1$–$C_3$ alkoxy or halo groups;

or a pharmaceutically acceptable salt thereof.

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5,741,790

## AZETIDINES

**Alexander Roderick Mackenzie; Allan Patrick Marchington; Donald Stuart Middleton, and Sandra Dora Meadows, all of Sandwich, United Kingdom, assignors to Pfizer Inc., New York, N.Y.**

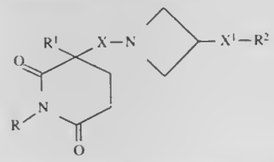
**Filed Jan. 27, 1997, Ser. No. 789,698**

**Claims priority, application United Kingdom, Jan. 27, 1996, 9601697**

**Int. Cl.[6] A61K** *31/495;31/535;* **C07D** *401/14;413/14*

**U.S. Cl. 514—210** **20 Claims**

1. A compound of the formula (I):



(I)

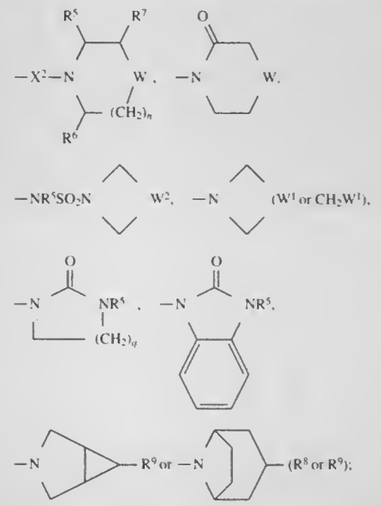
or a pharmaceutically acceptable salt thereof, wherein



R is $C_3$–$C_7$ cycloalkyl, aryl or $C_1$–$C_6$ alkyl, said $C_1$–$C_6$ alkyl being optionally substituted by fluoro, —COOH, —COO($C_1$–$C_4$) alkyl, $C_3$–$C_7$ cycloalkyl, adamantyl, aryl or het[1], and said $C_3$–$C_7$ cycloalkyl being optionally substituted by 1 or 2 substituents each independently selected from $C_1$–$C_3$ alkyl, $C_3$–$C_7$ cycloalkyl, $C_1$–$C_4$ alkoxy, hydroxy, fluoro, fluoro($C_1$–$C_4$) alkyl and fluoro($C_1$–$C_4$)alkoxy;

$R^1$ is phenyl, benzyl, naphthyl, thienyl, benzothienyl or indolyl, each optionally substituted by 1 or 2 substituents each independently selected from $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, halo and trifluoromethyl;

$R^2$ is —$CO_2H$, —$CONR^3R^4$, —$CONR^5(C_3$–$C_7$ cycloalkyl), —$NR^5$ ($C_2$–$C_5$ alkanoyl), —$NR^3R^4$, —$NR^5CONR^5R^6$, ($C_3$–$C_7$ cycloalkyl-$C_1$–$C_4$ alkyl)$R^5N$—, ($C_3$–$C_7$ cycloalkyl-$C_1$–$C_4$ alkyl)$_2$N, —$NR^5COCF_3$, —$NR^5SO_2CF_3$, —$NR^5(SO_2C_1$–$C_4$ alkyl), —$NR^5SO_2NR^5R^6$, —$NR^5(SO_2$ aryl), —N(aryl)($SO_2C_1$–$C_4$ alkyl), —$OR^5$, —O($C_3$–$C_7$ cycloalkyl), —$SO_2NR^5R^6$, het[3] or a group of the formula:



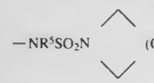
$R^3$ and $R^4$ are each independently selected from H and $C_1$–$C_4$ alkyl optionally substituted by hydroxy, $C_1$–$C_4$ alkoxy, —$S(O)_p(C_1$–$C_4$ alkyl), amino, —$NH(C_1$–$C_4$ alkyl), —$N(C_1$–$C_4$ alkyl)$_2$ or het[2];

$R^5$ and $R^6$ are each independently selected from H, $C_1$–$C_4$ alkyl and $C_3$–$C_7$ cycloalkyl-$C_1$–$C_4$ alkyl, said $C_1$–$C_4$ alkyl and $C_3$–$C_7$ cycloalkyl-$C_1$–$C_4$ alkyl being optionally substituted by fluoro;

$R^7$ is H, $C_1$–$C_4$ alkyl, hydroxy, fluoro($C_1$–$C_4$)alkyl or phenyl, said phenyl being optionally substituted by 1 or 2 substituents each independently selected from $C_1$–$C_4$ alkyl, fluoro($C_1$–$C_4$)alkyl, halo, $C_1$–$C_4$ alkoxy and fluoro($C_1$–$C_4$)alkoxy;

$R^8$ is H, fluoro, hydroxy, $C_1$–$C_4$ alkoxy, $C_2$–$C_5$ alkanoyl or $C_2$–$C_5$ alkanoyloxy;

$R^9$ is —$NR^5R^6$, —$NR^5COR^5$, —$NR^5SO_2CF_3$, —$NR^5(SO_2C_1$–$C_4$ alkyl), —$NR^5SO_2NR^5R^6$, —$NR^5COO(C_1$–$C_4$ alkyl), —$NR^5CONR^5R^6$, —$NR^5(SO_2$morpholino), —$NR^5(SO_2$ aryl), —N(aryl)($SO_2C_1$–$C_4$ alkyl) or a group of the formula:

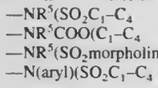


X is $C_1$–$C_4$ alkylene;

$X^1$ is a direct link or $C_1$–$C_6$ alkylene;

$X^2$ is a direct link, CO, $SO_2$ or $NR^5CO$ where the carbonyl is attached to the ring nitrogen atom;

W is methylene, CO, CH(OH), $C(OH)_2$, CH($C_1$–$C_4$ alkoxy), $CHCO_2H$, $CHCO_2(C_1$–$C_4$ alkyl), $CHCONR^5R^6$, CHF, $CF_2$, CH(azetidin-1-yl), CH(pyrrolidin-1-yl), CH(piperidin-1-yl), CH(morpholino), CH(benzoxazol-2-yl), $CHR^9$, O, $S(O)_p$, $NR^5$, N($C_3$–$C_7$ cycloalkyl), $NSO_2(C_1$–$C_4$ alkyl), $NSO_2NR^5R^6$, $NSO_2CF_3$, $NSO_2$(morpholino), $NSO_2$(aryl),



NCONR[5]R[6], $NCOR^5$, NCO(aryl) or $NCO_2(C_1$–$C_4$ alkyl);

$W^1$ is methylene, CO, CH(OH), $C(OH)_2$, CH($C_1$–$C_4$ alkoxy), $CHCO_2H$, $CHCO_2(C_1$–$C_4$ alkyl), $CHCONR^5R^6$, CHF, $CF_2$, CH(azetidin-1-yl), CH(pyrrolidin-1-yl), CH(piperidin-1-yl), CH(morpholino) or $CHR^9$;

$W^2$ is $W^1$, —$CH_2W^1$—, —$CH_2WCH_2$— or —$CH_2CH_2WCH_2$—;

n is 1 or 2 when W is other than methylene and is 0, 1 or 2 when W is methylene;

p is 0, 1 or 2;

q is 1 or 2;

r is 1, 2, 3 or 4;

"aryl", used in the definition of R, $R^2$, $R^9$ and W, means naphthyl or phenyl, each optionally substituted by $C_1$–$C_4$ alkyl, halo, —$OR^5$, fluoro($C_1$–$C_4$)alkyl, $C_2$–$C_5$ alkanoyl, —$CONR^5R^6$, —$SO_2NR^5R^6$ or phenyl;

"het[1]", used in the definition of R, means thienyl or a 5- or 6-membered ring heteroaryl group containing either 1 or 2 nitrogen heteroatoms or one nitrogen heteroatom and one oxygen or sulphur heteroatom, each optionally substituted by 1 or 2 substituents each independently selected from $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, halo, fluoro($C_1$–$C_4$ alkyl) and fluoro($C_1$–$C_4$ alkoxy);

"het[2]", used in the definitions of $R^3$ and $R^4$, means a 4- to 7-membered ring, non-aromatic, heterocyclic group containing 1 or 2 heteroatoms each independently selected from nitrogen, oxygen and $S(O)_p$, said group being optionally C-substituted by 1 or 2 substituents each independently selected from $C_1$–$C_3$ alkyl, $C_1$–$C_3$ alkoxy and fluoro($C_1$–$C_4$)alkyl, and said ring nitrogen heteroatom optionally bearing a H, $C_1$–$C_4$ alkyl, $C_2$–$C_5$ alkanoyl, —$CONR^5R^6$ or —$SO_2NR^5R^6$ substituent;

and "het[3]", used in the definition of $R^2$, means an optionally benzo-fused, N-linked, 5-membered ring heteroaryl group containing from 1 to 4 nitrogen heteroatoms, which het[3] is optionally substituted, including in the benzo-fused portion, by 1 or 2 substituents each independently selected from $C_1$–$C_4$ alkyl, fluoro and fluoro($C_1$–$C_4$)alkyl.

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5,741,791

## METHOD OF REDUCING BLOOD GLUCOSE

**Uffe Bang Olsen, Vallensbaek, Denmark, assignor to Novo Nordisk A/S, Bagsvaerd, Denmark**

**Filed Dec. 13, 1996, Ser. No. 766,839**

**Claims priority, application Denmark, Dec. 15, 1995, 1426/95**

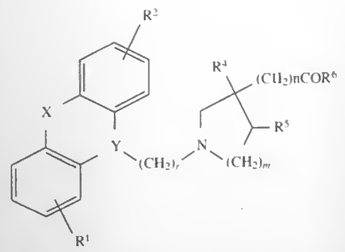
**Int. Cl.[6] A01N** *43/46;* **A61K** *31/55*

**U.S. Cl. 514—212** **20 Claims**

1. A method for reducing blood glucose and/or inhibiting the activity of CGRP comprising administering to a patient a clinically effective amount of a compound of formula I

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(I)

wherein

$R^1$ and $R^2$ independently are hydrogen, halogen, trifluoromethyl, $C_{1-6}$-alkyl or $C_{1-6}$-alkoxy;

Y is >N—$CH_2$—, >CH—$CH_2$— or >C=CH— wherein only the underscored atom participates in the ring system;

X is —O—, —S—, $CR^7R^8$, $—CH_2CH_2—$, —CH=CH—$CH_2$—, —$CH_2$—CH=CH—, —$CH_2CH_2CH_2$—, —CH=CH—, $NR^9$(C=O)—, —O—$CH_2$—, —(C=O)— or —(S=O)— wherein $R^7$, $R^8$ and $R^9$ independently are hydrogen or $C_{1-6}$-alkyl;

r is 1, 2, or 3;

m is 1 or 2;

n is 1 when m is 1 and n is 0 when m is 2;

$R^4$ and $R^5$ represents hydrogen or may—when m is 2—together represent a bond; and

$R^6$ is OH or $C_{1-8}$-alkoxy; or

a pharmaceutically acceptable salt thereof.

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**5,741,792**

**HETEROCYCLIC THROMBIN INHIBITORS**

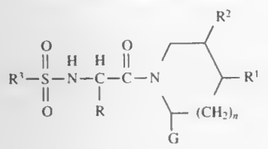
**Spencer D. Kimball, East Windsor; Jagabandhu Das, Mercerville; Wan Fang Lau, Lawrenceville, all of N.J.; Steven E. Hall, Chapel Hill, N.C., and Wen-Ching Han, Newtown, Pa., assignors to Bristol-Myers Squibb Company, Princeton, N.J.**

**Division of Ser. No. 373,334, Jan. 17, 1995, Pat. No. 5,583,146, which is a continuation-in-part of Ser. No. 207,725, Mar. 14, 1994, abandoned, Ser. No. 207,726, Mar. 14, 1994, abandoned, Ser. No. 112,155, Aug. 26, 1993, abandoned, Ser. No. 213,964, Mar. 16, 1994, and Ser. No. 146,714, Nov. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 112,153, Aug. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 984,640, Dec. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 207,725, which is a continuation-in-part of Ser. No. 56,279, May 3, 1993, abandoned, said Ser. No. 207,726 is a continuation-in-part of Ser. No. 56,017, May 3, 1993, abandoned. This application Nov. 8, 1995, Ser. No. 555,560**

**Int. Cl.**[6] **A61K** *31/535;31/495;31/54;* **C07D** *413/12;403/12;401/12;417/12*

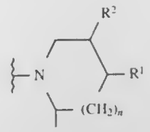
**U.S. Cl. 514—237.2** **8 Claims**

1. A compound having the structure



or a stereoisomer thereof, wherein n is 0, 1 or 2;

G is an amido moiety which has a cyclic member which is an azaheteroalkyl ring of 4 to 6 carbons in the ring, G also includes a carbonyl linked to the available carbon bond of



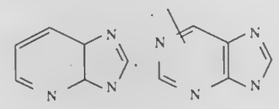
(I)

of structure I and said azaheteroalkyl ring being linked to an amidino moiety, with the proviso that the azaheteroalkyl ring in G does not include an oxo substituent;

R is hydrogen, hydroxyalkyl, aminoalkyl, alkyl, cycloalkyl, aryl, arylalkyl, alkenyl, alkynyl, amidoalkyl, arylalkoxyalkyl or an amino acid side chain, either protected or unprotected;

$R^1$ and $R^2$ are independently hydrogen, lower alkyl, cycloalkyl, aryl, hydroxy, alkoxy, oxo, thioxo, thioalkyl, thioaryl, amino and alkylamino;

$R^3$ is alkyl, arylalkyl, aryl, monocyclic heteroaryl containing 5 or 6 members in the aromatic ring which includes 1 or 2 heteroatoms which are N, O or S, said monocyclic heteroaryl being optionally fused to a phenyl ring,



or tetrahydroquinolinyl;

or a pharmaceutically acceptable salt thereof.

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**5,741,793**

**COMPOSITIONS HAVING SYNERGISTIC FUNGITOXIC EFFECTS**

**David Hamilton Young, Ambler; Ronald Ross, Jr., Jamison, and Richard Andrew Slawecki, Warminster, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Filed Aug. 13, 1996, Ser. No. 696,284**

**Int. Cl.**[6] **A01N** *37/00;37/02;43/58*

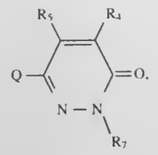
**U.S. Cl. 514—247** **19 Claims**

1. A fungicidal composition comprising synergistic fungicidally effective amounts of:

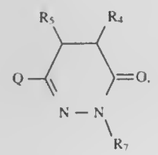
(1) at least one fatty acid having the formula $CH_3(CH_2)_nCO_2Z$, wherein n is an integer selected from the integers 11 through 17.; Z is independently selected from the group consisting of: H, alkaline metals, ammonium, $(C_1–C_3)$ alkyl ammonium and $(C_1–C_3)$ alkyl; and

(2) at least one pyridazinone having a formula selected from the formulas I, II, and III:

I



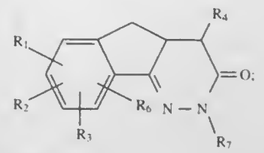
II



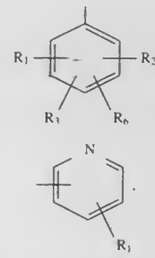


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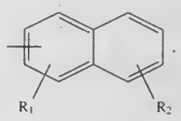
and



wherein Q is selected from:



and



and wherein:

$R_1$, $R_2$, $R_3$, $R_4$, $R_5$, and $R_6$ are each independently selected from the group consisting of hydrogen and halogen; and

$R_7$ is selected from alkynylalkenyl, alkynyl, haloalkynyl, alkenylalkynyl, and alkoxyalkynyl.

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**5,741,794**

**HETEROCYCLIC SULFONAMIDE DERIVATIVES AS ANTAGONISTS OF PAF AND ANGIOTENSIN II**

**Stephen Arthur Bowles; Christopher David Floyd; Andrew Miller; Mark Whittaker, and Lars Michael Wood, all of Oxford, United Kingdom, assignors to British Biotech Pharmaceuticals Limited, Cowley, England**

**PCT No. PCT/GB93/00010, § 371 Date Sep. 1, 1994, § 102(e) Date Sep. 1, 1994, PCT Pub. No. WO93/14069, PCT Pub. Date Jul. 22, 1993**

**PCT Filed Jan. 6, 1993, Ser. No. 256,139**

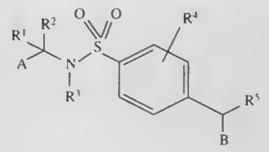
**Claims priority, application United Kingdom, Jan. 7, 1992, 9200209**

**Int. Cl.**[6] **A61K** *31/435;31/505;* **C07D** *471/04;403/02*

**U.S. Cl. 514—261** **15 Claims**

1. A compound of general formula I:

I

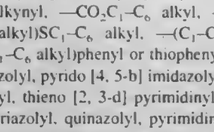


wherein:

A represents:

a) a —$VR^6$ group wherein V is —C(=O)—, —C(=O)O—, —$CH_2$O—, —$CH_2$OC(=O)—, —C(=S)—, —$CH_2$OC(=O)NH—, —C(=S)O—, —$CH_2$S—, —C(=O)$NHSO_2$—, —$SO_2$NHC(=O)— or —$CH_2OSiPh_2$—; and

$R^6$ is hydrogen, —$C_1–C_{18}$ alkyl, —$C_2–C_{18}$ alkenyl, —$C_2–C_{18}$ alkynyl, —$(C_1–C_6$ alkyl)$OC_1–C_6$ alkyl, —$(C_1–C_6$ alkyl)$SC_1–C_6$ alkyl, —$(C_1–C_6$ alkyl)O$(C_1–C_6$ alkyl)$OC_1–C_6$ alkyl, —$C_3–C_8$ cycloalkyl, —$C_4–C_8$ cycloalkenyl or pyridyl, (any of which may optionally be substituted with one or more substituents selected from halogen, hydroxyl, nitro, nitrile or carboxyl), $C_1–C_4$ perfluoroalkyl, a group —D or a —$(C_1–C_6$ alkyl)OD group wherein D represents a group



wherein n is an integer from 0 to 3, and each of $R^7$ and $R^8$ is independently hydrogen, —$C_1–C_6$ alkyl, —$C_2–C_6$ alkenyl, —$C_2–C_6$ alkynyl, halogen, —CN, —$CO_2$H, —$CO_2C_1–C_6$ alkyl, —$CONH_2$, —$CONHC_1–C_6$ alkyl, —$CON(C_1–C_6$ alkyl$)_2$, —CHO, —$CH_2$OH, —$CF_3$, —$OC_1–C_6$ alkyl, —$SC_1–C_6$ alkyl, —$SOC_1–C_6$ alkyl, —$SO_2C_1–C_6$ alkyl, —$NH_2$ or —NHCOMe;

b) a group —$CH_2OSi(R^6)_3$ wherein $R^6$ is as defined above; or

c) tetrazolyl;

$R^1$ and $R^2$ each independently represent hydrogen, halogen, —$C_1–C_6$ alkyl optionally substituted by one or more halogen atoms, —$C_2–C_6$ alkenyl, —$C_2–C_6$ alkynyl, —$(C_1–C_6$ alkyl$)CO_2C_1–C_6$ alkyl, —$(C_1–C_6$ alkyl$)SC_1–C_6$ alkyl, —$(C_1–C_6$ alkyl$)OC_1–C_6$ alkyl, —$(C_1–C_6$ alkyl$)N(C_1–C_6$ alkyl$)_2$, —$C_3–C_8$ cycloalkyl, —$C_4–C_8$ cycloalkenyl, —$(C_1–C_6$ alkyl$)C_3–C_8$ cycloalkyl, —$(C_1–C_6$ alkyl$)C_4–C_8$ cycloalkenyl, —$(C_1–C_6$ alkyl$)OC_3–C_8$ cycloalkyl, —$(C_1–C_6$ alkyl$)OC_4–C_8$ cycloalkenyl, —$(C_1–C_6$ alkyl$)SC_3–C_8$ cycloalkyl, —$(C_1–C_6$ alkyl$)SC_4–C_8$ cycloalkenyl, a side chain of a naturally occurring amino acid, a group —D, or a —$(C_1–C_6$ alkyl)OD group wherein D is as defined above;

or $R^1$ and $R^2$ together with the carbon atom to which they are attached form a $C_3–C_8$ cycloalkyl ring;

$R^3$ represents hydrogen, —$C_1–C_6$ alkyl, —$C_2–C_6$ alkenyl, —$C_2–C_6$ alkynyl, —$COC_1–C_6$ alkyl, —$CO_2C_1–C_6$ alkyl, —$(COC_1–C_6$ alkyl)phenyl, —$(CO_2C_1–C_6$ alkyl)phenyl, —$(C_1–C_6$ alkyl$)OC_1–C_6$ alkyl, —$(C_1–C_6$ alkyl$)SC_1–C_6$ alkyl, —$(C_1–C_6$ alkyl$)CO_2C_1–C_6$ alkyl, —$C_3–C_8$ cycloalkyl, —$C_4–C_8$ cycloalkenyl or a group —D wherein D is as defined above;

or $R^3$ together with $R^3$ and the atoms to which they are attached form a 5 to 8 membered nitrogen-containing heterocyclic ring;

$R^4$ represents hydrogen, —$C_1–C_6$ alkyl, —$C_2–C_6$ alkenyl, halogen, —$OC_1–C_6$ alkyl, —$C_1–C_4$ perfluoroalkyl or —$C_3–C_8$ cycloalkyl;

$R^5$ represents hydrogen, —$C_1–C_6$ alkyl, —$C_2–C_6$ alkenyl, —$C_2–C_6$ alkynyl, —$CO_2C_1–C_6$ alkyl, —$SC_1–C_6$ alkyl, —$(C_1–C_6$ alkyl$)SC_1–C_6$ alkyl, —$(C_1–C_6$ alkyl$)OC_1–C_6$ alkyl, —$(C_1–C_6$ alkyl)phenyl or thiophenyl;

B represents imidazolyl, pyrido [4, 5-b] imidazolyl, pyrido [2, 3-b] pyrrolyl, isoquinolyl, thieno [2, 3-d] pyrimidinyl, pyrido [3, 2-c] pyrrolyl, purinyl, triazolyl, quinazolyl, pyrimidino [2, 3-d] dihydropyrrolyl, benzodioxothiadiazinyl, imidazo [1, 2-b] triazolyl, pyrimidinyl, pyrrolyl, pyrido [2, 3-d] pyrimidinyl or quinolinyl group, any of the rings of which groups may be optionally substituted with one or more substituents selected from hydrogen, halogen, —$C_1–C_4$ perfluoroalkyl, hydroxyl, carbonyl, thiocarbonyl, formyl, carboxyl, —$CONH_2$, —$NO_2$, a group —D wherein D is as defined above, —$R^{11}$, —$OR^{11}$, —$SR^{11}$, —$SOR^{11}$, —$SO_2R^{11}$, —$NHR^{11}$, —$NR^{11}R^{11}$, —$CO_2R^{11}$ or $CONHR^{11}$ wherein $R^{11}$ is —$C_1–C_6$ alkyl, —$C_2–C_6$ alkenyl, —$C_2–C_6$ alkynl, —$C_3–C_8$

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cycloalkyl or $C_4$–$C_8$ cycloalkenyl, each of which is optionally substituted with one or more substituents selected from halogen, hydroxyl, amino, carboxyl, —$C_1$–$C_4$ perfluoroalkyl, —$C_1$–$C_6$ alkyl, —$C_2$–$C_6$ alkenyl, —$C_2$–$C_6$ alkynl, —$C_3$–$C_8$ cycloalkyl, $C_4$–$C_8$ cycloalkenyl, —$OC_1$–$C_6$ alkyl, —$SC_1$–$C_6$ alkyl, tetrazol-5-yl, a group —D wherein D is as defined above or a heteroaryl or heteroarylmethyl group;
or a pharmaceutically or veterinarily acceptable acid addition salt or hydrate thereof.

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**5,741,795**

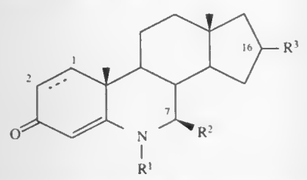
## 16-SUBSTITUTED-6-AZA-ANDROSTEN-4-ENE-3-ONES AS 5-α-REDUCTASE INHIBITORS

**Susan D. Aster, Teaneck; Donald W. Graham, Mountainside, and Derek J. Von Langen, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

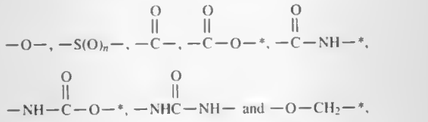
**Filed Oct. 17, 1996, Ser. No. 732,953**
**Int. Cl.[6] A61K *31/715***
**U.S. Cl. 514—284** **13 Claims**

**1**. A compound of the formula I

I



or a pharmaceutically acceptable salt or ester thereof wherein:
the C1–C2 carbon-carbon bond may be a single or a double bond;
$R^1$ is selected from the group consisting of hydrogen and $C_{1-10}$ alkyl;
$R^2$ is selected from the group consisting of hydrogen and $C_{1-10}$ alkyl;
$R^3$ is selected from the group consisting of:
(a) hydrogen
(b) $C_{1-3}$ alkyl
(c) cyano,
(d) fluoro,
(e) hydroxy,
(f) $C_{1-10}$ alkyl—X—,
(g) $C_{2-10}$ alkenyl—X—, wherein the $C_{1-10}$ alkyl and $C_{2-10}$ alkenyl groups are unsubstituted or substituted with one to three substituents selected from halo, hydroxy, cyano, $C_{1-6}$ alkyloxy, $C_{1-6}$ alkylthio, carboxy, $C_{1-6}$ alkylcarbonyl, $C_{1-6}$ alkyloxycarbonyl, amino, $C_{1-6}$ alkylamino, and di ($C_{1-6}$ alkyl)amino,
(h) aryl—X—,
(i) heteroaryl—X—, and
(j) $C_{1-3}$ alkyl—X—, wherein the $C_{1-3}$ alkyl group is substituted with one or two substituents selected from aryl and heteroaryl;
X is selected from the group consisting of:



wherein the asterisk (*) denotes the bond which is attached to the 16-position in structure I;
n is zero, 1 or 2, and heteroaryl is attached by a carbon atom and is unsubstituted or mono- or di-substituted pyridyl, furyl, pyrryl, thienyl, isothiazolyl, imidazolyl, benzimidazolyl, tetrazolyl, quinolyl, isoquinolyl, benzofuryl, isobenzofuryl, benzothienyl, pyrazolyl, indolyl, isoindolyl, carbazolyl, isoxazolyl, thiazolyl, oxazolyl, benzthiazolyl, and benzoxazolyl, wherein the substituents are independently selected from $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl, phenyl, halo, trifluoromethyl, cyano, carboxy, $C_{1-6}$ alkyloxycarbonyl, hydroxy, $C_{1-6}$ alkoxy, $C_{1-6}$ alkylcarbonyloxy, $C_{1-6}$ alkylthio, $C_{1-6}$ alkylsulfinyl, $C_{1-6}$ alkylsulfonyl, $C_{1-6}$ alkylcarbonyl, amino, $C_{1-6}$ alkylamino, di($C_{1-6}$ alkyl)amino, $C_{1-6}$ alkylcarbonylamino, $C_{1-6}$ alkyloxycarbonylamino, $C_{1-6}$ alkylsulfonyl-amino and $C_{1-6}$ alkylaminosulfonyl.

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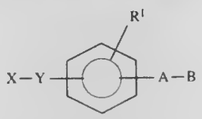
**5,741,796**

## PYRIDYL AND NAPHTHYRIDYL COMPOUNDS FOR INHIBITING OSTEOCLAST-MEDIATED BONE RESORPTION

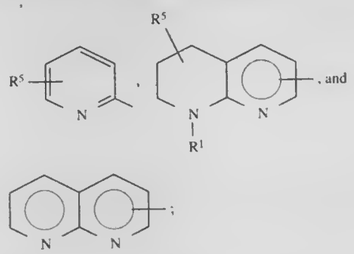
**George D. Hartman, Lansdale; Mark E. Duggan, Schwenksville; William F. Hoffman, Lansdale, all of Pa., and Nathan C. Ihle, Mercer Island, Wash., assignors to Merck & Co., Inc., Rahway, N.J.**

**PCT No. PCT/US95/05938, § 371 Date Sep. 26, 1996, § 102(e) Date Sep. 26, 1996, PCT Pub. No. WO95/32710, PCT Pub. Date Dec. 7, 1995**
**Continuation-in-part of Ser. No. 250,218, May 27, 1994, abandoned. This PCT application May 12, 1995, Ser. No. 714,097**
**Int. Cl.[6] A61K *31/435*; C07D *487/04*;*213/02***
**U.S. Cl. 514—300** **8 Claims**

**1**. A compound of the formula



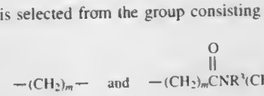
and pharmaceutically acceptable salts thereof, wherein
X is selected from the group consisting of



Y is selected from the group consisting of
$C_{1-8}$ alkylene,
$(CH_2)m—C{\equiv}C(CH_2)n$,
$(CH_2)mCR^1{=}CR^2(CH_2)n$,
$(CH_2)mCR^1{=}CR^2(CH_2)n'$,
$C_{0-8}$ alkylene—$NR^3$—CO—$C_{0-8}$ alkylene,
$C_{0-8}$ alkylene—O—$C_{0-8}$ alkylene,
$C_{0-8}$ alkylene-$NR^3$—$C_{0-8}$ alkylene and
$C_{0-8}$ alkYlene-$NR^3$—$C_{0-8}$ alkylene—O—;



A is selected from the group consisting of



B is



$R^1$, $R^2$, $R^3$ and $R^4$ are each independently selected from the group consisting of
hydrogen,
$C_{1-4}$ alkoxy $C_{0-6}$ alkylene,
$C_{1-4}$ alkoxycarbonyl $C_{0-6}$ alkylene,
$C_{1-6}$ alkylamino $C_{0-8}$ alkylene,
$C_{1-6}$ dialkylamino $C_{0-8}$ alkylene,
amino $C_{0-8}$ alkylene and
aryl $C_{0-8}$ alkylene;
$R^5$ is selected from the group consisting of
hydrogen,
$C_{1-4}$ alkoxy $C_{0-6}$ alkylene,
$C_{1-4}$ alkoxycarbonyl $C_{0-6}$ alkylene,
$C_{1-6}$ alkylamino $C_{0-8}$ alkylene,
$C_{1-6}$ dialkylamino $C_{0-8}$ alkylene,
amino $C_{0-8}$ alkylene,
oxo and
aryl $C_{0-8}$ alkylene;
$R^6$ and $R^7$ are each independently selected from the group consisting of:
hydrogen,
$C_{0-6}$ alkylamino $C_{0-6}$ alkylene,
$C_{0-6}$ dialkylamino $C_{0-6}$ alkylene,
aryl $C_{0-6}$ alkyloxycarbonylamino $C_{0-6}$ alkylene,
aryl $C_{0-6}$ alkylsulfonylamino $C_{0-6}$ alkylene,
camphorsulfonylamino, and
aryl $C_{0-6}$ alkylcarbonylamino $C_{0-6}$ alkylene;
$R^{12}$ is selected from the group consisting of
hydroxy,
$C_{1-8}$ alkyloxy,
$C_{1-6}$ dialkylaminocarbonylmethoxy and
aryl $C_{1-6}$ dialkylaminocarbonylmethoxy; and
m and n are integers independently chosen from 0–6;
and the pharmaceutically acceptable salts thereof.

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**5,741,797**

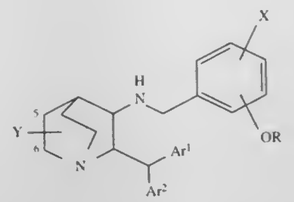
## HETEROATOM SUBSTITUTED ALKYL BENZYLAMINOQUINUCLIDINES

**Kunio Satake, Handa, Japan, assignor to PFizer Inc., New York, N.Y.**

**PCT No. PCT/JP94/00781, § 371 Date Nov. 20, 1995, § 102(e) Date Nov. 20, 1995, PCT Pub. No. WO94/26740, PCT Pub. Date Nov. 24, 1994**
**PCT Filed May 13, 1994, Ser. No. 556,916**
**Claims priority, application Japan, May 19, 1993, 5/117102**
**Int. Cl.[6] C07D *403/02*;*453/02*; A61K *31/435***
**U.S. Cl. 514—305** **7 Claims**

**1**. A compound of the chemical formula (I) and its pharmaceutically acceptable salt:

(I)



wherein
R is methyl and the OR group is at the 2-position;
X is ($C_2$–$C_6$)alkyl having one or two substituents selected from hydroxy, ($C_1$–$C_6$)alkoxy and ($C_1$–$C_6$)alkylthio;
$Ar^1$ and $Ar^2$ are each phenyl, monochlorophenyl or monofluorophenyl; and
Y is hydrogen or carboxy; and Y is at the 5- or 6-position.

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**5,741,798**

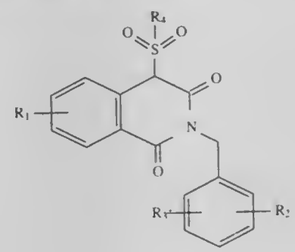
## 2-BENZYL-4-SULFONYL-4H-ISOQUINOLIN-1,3-DIONES AND THEIR USE AS ANTIINFLAMMATORY AGENTS

**Edward S. Lazer, Trumbull; Charles Cywin, and Ronald J. Sorcek, both of Bethel, all of Conn., assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.**

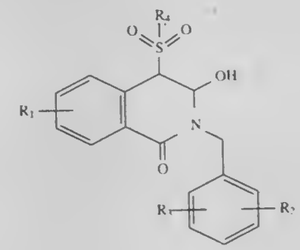
**Filed May 13, 1997, Ser. No. 855,554**
**Int. Cl.[6] C07D *217/22*; A61K *31/47***
**U.S. Cl. 514—309** **6 Claims**

**1**. A compound of the formula I or IA

(I)



(IA)



wherein,
$R_1$ is hydrogen, halogen, $C_{1-4}$ alkyl, or $C_{1-4}$ alkoxy;
$R_2$ and $R_3$ are the same or different and each is hydrogen, halogen, trifluoromethyl, $C_{1-4}$ alkyl, or $C_{1-4}$ alkoxy; and,
$R_4$ is $C_{1-4}$ alkyl, 1,1,1-trifluoroethyl, 2-thienyl, 2-naphthyl, phenyl or phenyl mono- or disubstituted with $C_{1-4}$ alkyl, $C_{1-4}$ alkoxy, halogen, trifluoromethyl, or nitro.

VOL 1209 ISS 3 AP 21 1998 UMI



5,741,799

## HETEROCYCLIC THROMBIN INHIBITORS

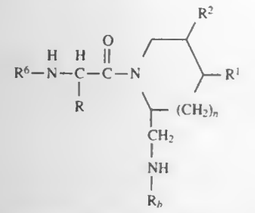
Spencer D. Kimball, East Windsor; Jagabandhu Das, Mercerville; Wan Fang Lau, Lawrenceville, all of N.J.; Steven E. Hall, Chapel Hill, N.C., and Wen-Ching Han, Newtown, Pa., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Division of Ser. No. 373,334, Jan. 17, 1995, Pat. No. 5,583,146, which is a continuation-in-part of Ser. No. 146,714, Nov. 10, 1993, abandoned, Ser. No. 207,725, Mar. 14, 1994, abandoned, Ser. No. 207,726, Mar. 14, 1994, abandoned, Ser. No. 112,155, Aug. 26, 1993, abandoned, and Ser. No. 213,964, Mar. 16, 1994, said Ser. No. 146,714 is a continuation-in-part of Ser. No. 112,153, Aug. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 984,640, Dec. 2, 1992, abandoned, said Ser. No. 207,725 is a continuation-in-part of Ser. No. 056,279, May 3, 1993, abandoned, said Ser. No. 207,726 is a continuation-in-part of Ser. No. 056,017, May 3, 1993, abandoned. This application Nov. 8, 1995, Ser. No. 555,561

Int. Cl.[6] A61K *31/445;31/40;* C07D *401/12;207/09;211/28*

U.S. Cl. 514—316 14 Claims

1. A compound having the structure Ia,



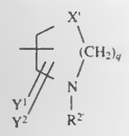
Ia.

or a stereoisomer thereof, wherein n is 0, 1 or 2;

$R_b$ is $—A^1—R^{3a}$, $—CO—A^1—R^{3a}$ or $—SO_2—A^1—R^{3a}$;

wherein $R^{3a}$ is guanidine, amidine or amino, and $A^1$ is an alkyl, alkenyl or alkynyl chain of 2 to 6 carbons, provided that where $R_b$ is $—A^1—R^{3a}$, $A^1$ is an alkenyl or alkynyl chain of 2 to 6 carbons; or

$R_b$ is $—(CH_2)_p—A^2—R^{2'}$ or $—(C_2)_p—CO—A^2R^{2'}$ where p is 0, 1 or 2, $R^{2'}$ is amidine and $A^2$ is an azacycloalkyl, azaheteroalkyl or azaheteroalkenyl ring of 4 to 8 atoms, optionally substituted by alkyl, CO or halo as given by the structure:



where

X' is $CH_2$, O, S or NH; p is 0, 1 or 2;

q=0, 1, 2, 3 or 4 if X'=$CH_2$;

q=2,3 or 4 if X'=O, S, NH; and

$y^1$, $y^2$ are independently H, alkyl or halo; or

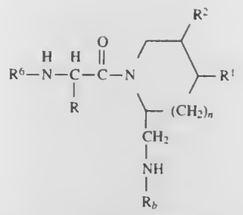
$R_b$ is $—(CH_2)_p—A^3—R^4$, $—(CH_2)_p—CO—A^3—R^4$, or $—(CH_2)_p—SO_2—A^3—R^4$,

wherein $R^4$ is guanidine, amidine or aminomethyl, and $A^3$ is aryl or cycloalkyl;

R is hydrogen, hydroxyalkyl, aminoalkyl, alkyl, cycloalkyl, aryl, arylalkyl, alkenyl, alkynyl, amidoalkyl, arylalkoxyalkyl or an amino acid side chain, either protected or unprotected;

$R^1$ and $R^2$ are independently hydrogen, lower alkyl, cycloalkyl, aryl, hydroxy, alkoxy, oxo, thioxo, thioalkyl, thioaryl, amino or alkylamino;

$R^6$ is hydrogen,



Ia.

$—SO_2R^{7'}$ or $—CO_2R^{7'}$ (wherein $R^{7'}$ is lower alkyl, aryl or cyclohetero-alkyl);

or a pharmaceutically acceptable salt thereof.

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5,741,800

## AZOLYL-CYCLIC AMINE DERIVATES WITH IMMUNOMODULATORY ACTIVITY

David George Webber; Gerald Bernard Tometzki; Michael Henry Hockley; Roger Bernard Titman; Roy Victor Davies, and Paul Anthony Bradley, all of Nottingham, United Kingdom, assignors to Knoll Aktiengesellschaft, Ludwigshafen, Germany

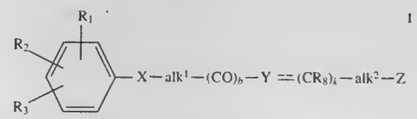
Filed Dec. 21, 1995, Ser. No. 564,155

Claims priority, application United Kingdom, Jun. 22, 1993, 9312806

Int. Cl.[6] C07D *401/06;403/06;* A61K *31/445*

U.S. Cl. 514—322 11 Claims

1. A compound of formula I

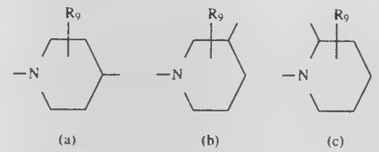


I

or a pharmaceutically acceptable salt thereof, in which $R_1$ and $R_3$ are both hydrogen and $R_2$ is hydrogen, halo, trifluoromethyl, $C_{1-6}$ alkyl, $C_{1-6}$ alkoxy or $C_{1-6}$ alkylthio, or $R_2$ and $R_3$ are both hydrogen and $R_1$ together with X and the phenyl group to which they are attached form a tetrahydronaphthyl group;

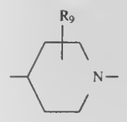
X is a bond, b is 0 or 1 and $alk^1$ is $C_{1-4}$ alkylene;

Y is a member selected from the group consisting of III(a), III(b), III(c), and III(e):



III

(a) (b) (c)



(e)

in which $R_9$ is hydrogen, $C_{1-6}$ alkyl, hydroxy-(C1-6)alkyl or $(C_{1-6})$alkoxy$(C_{1-6})$alkyl;

$R_8$ is hydrogen or $C_{1-4}$ alkyl;

k is 0 or 1 provided that when k is 1, $CR_8$ is linked to a carbon atom in the group Y;

the dotted line in ——.

(a) represents a bond when k is 1;

(b) does not represent a bond when k is 0;



$alk^2$ is a $C_{1-6}$ alkylene chain optionally substituted by one or more $C_{1-4}$ alkyl groups;

Z is imidazol-1-yl, 1,2,4-triazol-1-yl, 1,2,3-triazol-1-yl, 1,2,3-triazol-2-yl, tetrazol-2-yl or benzimidazol-1-yl, each of which is optionally substituted by one to three groups selected from halo, trifluoromethyl, $C_{1-12}$alkyl, phenyl and benzoyl, said phenyl or benzoyl groups being optionally substituted by halo;

provided that;

when k is 0 and Y is connected to $alk^2$ through a nitrogen atom, then $alk^2$ is not methylene.

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5,741,801

## 5-HT4 RECEPTOR ANTAGONIST

Francis David King; Laramie Mary Gaster, both of Bishop's Stortford, and Keith Raymond Mulholland, Essex, all of England, assignors to SmithKline Beecham plc, Brentford, England

PCT No. PCT/EP94/01583, § 371 Date Nov. 22, 1995, § 102(e) Date Nov. 22, 1995, PCT Pub. No. WO94/27987, PCT Pub. Date Dec. 8, 1994

PCT Filed May 16, 1994, Ser. No. 553,390

Claims priority, application United Kingdom, May 22, 1993, 9310582

Int. Cl.[6] A61K *31/445;* C07D *401/06*

U.S. Cl. 514—323 8 Claims

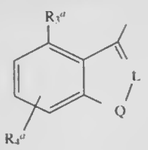
1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein

X is of formula (a):



(a)

wherein

L is N or $CR_5$ wherein $R_5$ is hydrogen, $C_{1-6}$ alkoxy, halogen, $C_{1-4}$ alkyl or cyano;

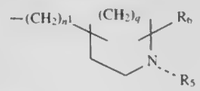
Q is $NR_4''$, $CH_2$, O or S;

$R_1''$ is hydrogen, $C_{1-10}$ alkyl, $C_{2-6}$ alkenyl, aralkyl, $C_{2-6}$ alkanoyl or $C_{2-6}$ alkanoyl $C_{1-3}$ alkyl;

$R_3''$ is hydrogen, halo, $C_{1-6}$ alkyl, amino, nitro or $C_{1-6}$ alkoxy;

$R_4''$ is hydrogen, halo, $C_{1-6}$ alkyl or $C_{1-6}$ alkoxy;

Z is of sub-formula (h):



(h)

wherein

$n^1$ is 1, 2, 3 or 4;

q is 0, 1, 2 or 3;

$R_5$ is $C_{2-12}$ alkyl, aralkyl or $R_5$ is $(CH_2)_z—R_{10}$ wherein z is 2 or 3 and $R_{10}$ is selected from cyano, hydroxyl, $C_{1-6}$ alkoxy, phenoxy, $C(O)C_{1-6}$ alkyl, $COC_6H_5$, $—CONR_{11}R_{12}$, $NR_{11}COR_{12}$, $SO_2NR_{11}R_{12}$ or $NR_{11}SO_2R_{12}$ wherein $R_{11}$ and $R_{12}$ are hydrogen or $C_{1-6}$ alkyl; or $R_5$ is straight or branched chain alkylene of chain length 1–6 carbon atoms terminally substituted by aryl, 3 to 8 membered cycloalkyl, 3 to 8 membered heterocyclyl, 5 or 6 membered monocyclic heteroaryl or 9 or 10 membered fused bicyclic heteroaryl linked through carbon, $C_{2-7}$ alkoxycarbonyl, or secondary or tertiary hydroxy substituted $C_{1-6}$ alkyl; or $R_5$ is straight or branched chain alkylene of chain length 1–6 carbon atoms terminally substituted by $C_{2-7}$ alkoxycarbonyl, secondary or tertiary hydroxy substituted $C_{1-6}$ alkyl, or a cyclic moiety which is selected from aryl, 3–8 membered cycloalkyl, 3 to 8 membered heterocyclyl, 5 or 6 membered monocyclic heteroaryl and 9 or 10 membered fused bicyclic heteroaryl, wherein the cyclic moiety is linked through carbon; and

$R_6$ is hydrogen or $C_{1-6}$ alkyl;

provided that the present compound is not β-(1-carbobenzoxy-4-piperidyl)ethyl-3-indolyl ketone or β-(1-carbobenzoxy-4-piperidyl-α-bromoethyl) 3 indolyl ketone.

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5,741,802

## ANABASEINE DERIVATIVES USEFUL IN THE TREATMENT OF DEGENERATIVE DISEASES OF THE NERVOUS SYSTEM

William R. Kem; John A. Zoltewicz; Edwin M. Meyer, and Katalin Prokai-Tatrai, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

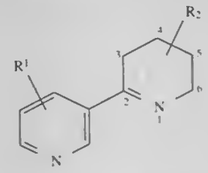
PCT No. PCT/US93/08192, § 371 Date Jan. 5, 1996, § 102(e) Date Jan. 5, 1996, PCT Pub. No. WO94/05288, PCT Pub. Date Mar. 17, 1994

Continuation-in-part of Ser. No. 938,427, Aug. 31, 1992, abandoned. This PCT application Aug. 31, 1993, Ser. No. 392,763

Int. Cl.[6] A61K *31/44;* C07D *211/68*

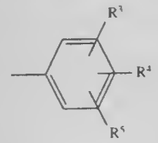
U.S. Cl. 514—334 15 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof;

wherein $R^1$ is hydrogen or $C_1$–$C_4$ alkyl; $R^2$ is =CH—X, wherein X is napthyl optionally substituted by N,N-dialkylamino having 1 to 4 carbons in each of the alkyls, styryl optionally substituted by N,N-dialkylamino having 1 to 4 carbons in each of the alkyls, furyl, furylacrolyl or



wherein $R^3$, $R^4$, and $R^5$ are each selected from hydrogen, $C_1$–$C_4$ alkyl, $C_1$–$C_6$ alkoxy optionally substituted by N,N-dialkylamino having 1 to 4 carbons in each of the alkyls, amino, cyano, N,N-dialkylamino having 1 to 4 carbons in each of the alkyls, halo, hydroxyl, and nitro, provided that $R^3$, $R^4$ and $R^5$ are not all hydrogen and when two of $R^3$, $R^4$ and $R^5$ are methyl, chloro or methoxy, they are not para to each other and further provided that when $R^1$ is hydrogen or methyl, $R^2$ is not 1-methyl benzylidene or (4-dimethylamine)benzylidene.

VOL 1209 ISS 3 AP 21 1998 UMI



5,741,803

## SUBSTITUTED THIAZOLIDINEDIONLE DERIVATIVES

Colin Ripley Pool, Surrey; Alan William Tremper, Kent; Malcolm David Brightwell, and Robin Sherwood Roman, both of Surrey, all of England, assignors to SmithKline Beecham plc, Brentford, England

Continuation of Ser. No. 392,878, Mar. 3, 1995, abandoned. This application Jun. 5, 1995, Ser. No. 465,509

Claims priority, application United Kingdom, Sep. 5, 1992, 9218830

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—342 5 Claims

1. A compound which is 5-[4-[2-(N-methyl-N-(2-pyridyl)amino)ethoxy]benzyl]thiazolidine- 2,4-dione, maleic acid salt.

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5,741,804

## SUBSTITUTED BENZIMAZOLES WHICH INHIBIT PLATELET AGGRECATION

Richard McCulloch Keenan, Malvern, and William Henry Miller, Schwenksville, both of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

PCT No. PCT/US93/11779, § 371 Date May 30, 1995, § 102(e) Date May 30, 1995, PCT Pub. No. WO94/12478, PCT Pub. Date Jun. 9, 1995

PCT Filed Dec. 1, 1993, Ser. No. 446,791

Claims priority, application United Kingdom, Dec. 1, 1992, 9225141

Int. Cl.[6] C07D *235/12;* A61K *31/415*

U.S. Cl. 514—394 8 Claims

1. A compound of the formula (I):

(I)



wherein:

R is $R^7$, $—CH_2R^7$, $—CH_2CH_2R^7$, $—CH_2CH_2CH_2R^7$, $—NHCH_2R^7$, or $—NHCH_2CH_2R^7$;

R* is H or $—(CH_2)_{1-2}$phenyl;

$R^6$ is $W—(CR'_2)_q—Z—(CR'R^{10})_r—U—(CR'_2)_s—$; $(CR'R^{10})_r—U—(CR'_2)_s$ is $CH_2NHCO$, $CH(NR'R'')CONH$, $CONH$ or $NHCO$;

$R^7$ is $—CO_2H$;



or

$R''HNCO—$;

each R' independently is H, C1–4alkyl, $C_{3-7}$cycloalkyl-$C_{0-4}$alkyl, or Ar—$C_{0-4}$alkyl;

each R" independently is R' or —C(O)R';

Z is phenyl; and

q is0to 3;

or a pharmaceutically acceptable salt thereof.

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5,741,805

## CONTROLLED RELEASE PILOCARPINE DELIVERY SYSTEM

Ramesh N. Acharya, Lake Forest, Ill., assignor to OraMed, Inc., Lake Forest, Ill.

Continuation of Ser. No. 907,852, Jul. 2, 1992, abandoned. This application May 5, 1995, Ser. No. 435,285

Int. Cl.[6] A61K *31/415*

U.S. Cl. 514—397 8 Claims

1. A method for treating a patient suffering from xerostomia, comprising orally administering to said patient an extended release formulation comprising a therapeutically effective amount of pilocarpine, or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable extended release carries in an amount sufficient to maintain a blood serum level of pilocarpine in said patient of from about 5 to about 40 ng/ml, for a period of at least 6 hours.

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5,741,806

## SUPPOSITORY COMPOSITIONS CONTAINING ONDASETRON DIHYDRATE

Isabelle Thielemans, and Isabelle Richard, both of Evreux, France, assignors to Laboratoire Glaxo Wellcome S.A., Paris, France

PCT No. PCT/EP94/01652, § 371 Date Dec. 4, 1995, § 102(e) Date Dec. 4, 1995, PCT Pub. No. WO94/27599, PCT Pub. Date Dec. 8, 1994

PCT Filed May 24, 1994, Ser. No. 537,950

Claims priority, application United Kingdom, May 25, 1993, 9310756

Int. Cl.[6] A61K *31/415*

U.S. Cl. 514—397 6 Claims

1. A pharmaceutical composition for rectal administration which comprises: 1,2,3,9-tetrahydro-9-methyl-3-[(2-methyl-1 H-imidazol-1-yl)-methyl]-4H-carbazol-4-one in the form of its free base or a pharmaceutically acceptable solvate thereof as active ingredient, together with a carrier; said carrier being a hard fat base having a hydroxy value range of 60–70; and said composition being in the form of a suppository.

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5,741,807

## HISTIDINE COMPOSITIONS AND METHODS FOR TREATING OR PREVENTING INFECTIOUS AND NON-INFECTIOUS DIARRHEAS

Peter G. Thomas, Charlottesville, Va., assignor to Cytos Pharmaceuticals, L.P., Durham, N.C.

Filed Sep. 27, 1996, Ser. No. 718,705

Int. Cl.[6] A61K *31/415*

U.S. Cl. 514—399 34 Claims

1. A method of preventing or reducing at least one of intestinal tract fluid secretions, fluid loss, or electrolyte loss in a mammal, wherein said at least one of extracellular fluid secretion, fluid loss, or electrolyte loss is a result of an adverse stimulus on said mammal, by administering to said mammal a therapeutically effective amount of at least one of D-histidine, L-histidine, a racemic mixture thereof, a non-racemic mixture thereof, or pharmaceutically acceptable salts thereof.



5,741,808

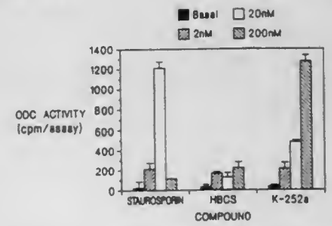
## PROTEIN KINASE INHIBITORS FOR TREATMEN OF NEUROLOGICAL DISORDERS

Michael E. Lewis, West Chester; James C. Kauer, Kennett Sq.; Nicola Neff, Wallingford; Jill Roberts-Lewis, West Chester, all of Pa.; Chikara Murakata, Hachioji, Japan; Hiromitsu Saito, Mishima, Japan; Yuzuru Matsuda, Koganei, Japan; Marcie A. Glicksman, Swarthmore, Pa.; Fumihiko Kanai, Machida, Japan, and Masami Kaneko, Sagamihara, Japan, assignors to Cephalon, Inc., West Chester, Pa., and Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 456,642, Jun. 2, 1995, which is a continuation-in-part of Ser. No. 329,540, Oct. 26, 1994, Pat. No. 5,621,100, which is a continuation-in-part of Ser. No. 96,561, Jul. 22, 1993, Pat. No. 5,461,146, which is a continuation-in-part of Ser. No. 920,102, Jul. 24, 1992, abandoned. This application Feb. 14, 1997, Ser. No. 800,383

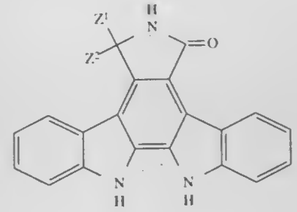
Int. Cl.[6] A61K *31/55*

U.S. Cl. 514—410 8 Claims



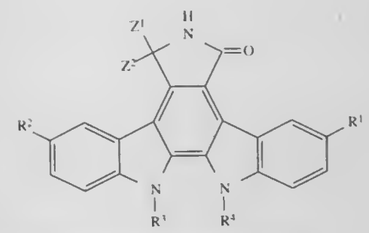

1. A method for enhancing the function of a neuron in a mammal, wherein said neuron is selected from the group consisting of sensory, cholinergic, basal forebrain, and striatal neurons, said method comprising administering to said mammal a therapeutic amount of a functional derivative of K-252a, said functional derivative represented by the formulae:

(III)



or

(IV)



wherein the following substitutions are made:

| Compound | $R^1$ | $R^2$ | X | R | $Z^{1(1)}$ $Z^2$ |
|---|---|---|---|---|---|
| III-1 | — | — | — | | H |
| III-2 | — | — | — | | O |
| IV-1[2,7] | H | H | — | | H |
| IV-2[3] | Br | H | — | | H |
| IV-3[4] | H | H | — | — | H |
| IV-4[6,7] | H | H | — | — | H |
| IV-5[8] | H | H | — | — | H |
| IV-6[5,9] | H | H | — | — | H |

[1] $Z^1$ and $Z^2$ are both hydrogen, or both are combined together to represent oxygen, where indicated.

[2] $R^3$ is $CH_2CH=CH_2$; $R^4$ is H.

[3] $R^3$ and $R^4$ are each H.

[4] $R^3$ and $R^4$ are each $CH_2CH=CH_2$.

[5] Compound is in the form of the hydrochloride.

[6] $R^3$ is H and $R^4$ is $CH_2CH=CH_2$.

[7] IV-1 and IV-4 are a 1.5 to 1.0 mixture of the two components.

[8] $R^3 = R^4 = CH_2CH_2CH_2OH$

[9] $R^3 = CH_2CH_2CH_2—N$ O, $R^4$ = H

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5,741,809

## COMPOUNDS AND METHODS FOR THE TREATMENT OF CARDIOVASCULAR INFLAMMATORY AND IMMUNE DISORDERS

Tesfaye Biftu, Belmont; Xiong Cai, Framingham; Sajjat Hussoin, Lexington; Gurmit Grewal, Waltham, all of Mass., and T. Y. Shen, Charlottesville, Va., assignors to Cytomed, Inc., Cambridge, Mass.

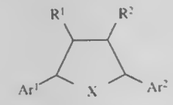
Division of Ser. No. 178,222, Jan. 6, 1994, Pat. No. 5,463,083, which is a continuation-in-part of Ser. No. 062,391, May 12, 1993, Pat. No. 5,648,486, which is a continuation-in-part of Ser. No. 933,911, Aug. 24, 1992, Pat. No. 5,434,151, which is a continuation-in-part of Ser. No. 912,788, Jul. 13, 1993, Pat. No. 5,368,938. This application Jun. 6, 1995, Ser. No. 466,332

Int. Cl.[6] A61K *31/38;31/34*

U.S. Cl. 514—438 7 Claims

1. A method for the treatment of disorders mediated by platelet activating factor or products of 5-lipoxygenanse in an animal, comprising administering to an animal in need of such treatment, an amount effective to reduce formation of oxygen radicals in vivo, of a compound of the formula:

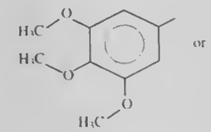
Formula I



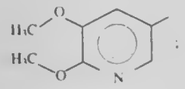
or pharmaceutically acceptable salts.

wherein:

$Ar^1$ is either



or

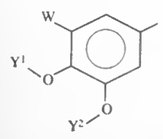


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-continued

$Ar^2$ is



and wherein:

W is independently selected from the group consisting of:

$—S(O)_nR^3$,

$—S(O)_nCH_2CH(OH)A$,

and

—C(O)NHA,

X is O, S, S(O), $CR^5$;

$Y^1$, $Y^2$ are independently selected from the group consisting of:

(a) hydrogen

(b) lower alkyl, lower alkoxy, lower alkenyl, lower alkynl, alkylarlyl;

(c) $—AN(OM)C(O)N(R^3)R^4$, $—AN(R^3)C(O)N(OM)R^4$, $—AN(OM)C(O)R^4$, $—AC(O)N(OM)R^4$, and $—C(O)N(OM)R^4$, and

(d) $—C(O)NHR^3$;

wherein at least one of $Y^1$ and $Y^2$ is (c); and

wherein each n is independently 0, 1 or 2;

A is selected from the group consisting of substituted or unsubstituted lower alkyl, lower alkyl-alkoxy, lower alkenyl, lower alkynl, alkaryl or aralkyl;

M is selected from hydrogen, a pharmaceutically acceptable cation, and a metabolically cleavable leaving group;

$R^1$ and $R^2$ are independently selected from the group consisting of hydrogen, lower alkyl, $C_{3-8}$-cycloalkyl, haloloweralkyl, halo-COOH;

$R^3$ and $R^4$ are independently selected from the group consisting of hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkyl where one or more carbon atoms are replaced by S,N, or O, substituted or unsubstituted cycloalkyl of from 3 to 8 atoms, where one or more carbons are replaced by S,N, or O, alkenyl, alkynyl, aryl, aralkyl, alkaryl, $C_{1-6}$ alkoxy $C_{1-10}$ alkyl, $C_{1-6}$ alkylthio-$C_{1-10}$ alkyl, $C_{1-6}$ hydroxy-$C_{1-6}$ alkyl, $C_{1-6}$ carbonyl-$C_{1-6}$ alkyl, $C_{1-6}$ -amino-$C_{1-6}$ alkyl;

$R^5$ is selected from the group consisting of:

(a) hydrogen;

(b) lower alkyl, lower alkenyl, lower alkynyl, alkaryl;

(c) $—AN(OM)C(O)N(R^3)R^4$, $—AN(R^3)C(O)N(OM)R^4$, $—AC(O)N(OM)R^4$, $—AS(O)_nR^3$, $—AS(O)_nCH_2C(O)R^3$, $—AS(O)_nCH_2CH(OH)R^3$, $—AC(O)NHR^3$;

wherein each n is independently 0, 1 or 2; A is selected from the group consisting of substituted or unsubstituted lower alkyl, lower alkyl-alkoxy, lower alkenyl, lower alkynyl, alkaryl or aralkyl; M is selected from hydrogen, a pharmaceutically acceptable cation, or a metabolically cleavable leaving group in a pharmaceutically acceptable carrier.

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**5,741,810**

**CYCLOPENTANE HEPTAN(ENE)OIC ACID, 2-HETEROARYLALKENYL DERIVATIVES AS THERAPEUTIC AGENTS**

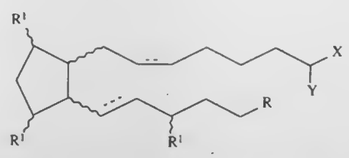
**Robert M. Burk, Laguna Beach, Calif., assignor to Allergan, Waco, Tex.**

**Filed Feb. 29, 1996, Ser. No. 608,794**

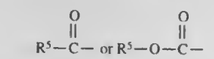
**Int. Cl.[6] A61K** *31/38;31/34;* **C07D** *333/06;317/04*

**U.S. Cl. 514—438** **13 Claims**

1. A method of treating ocular hypertension or glaucoma which comprises topically administering to a mammal having ocular hypertension a therapeuticaliy effective amount of a compound represented by formula I:



wherein wavy line attachments indicate either the alpha (α) or beta (β) configuration; dashed bonds represent a double bond or a single bond, R is a heteroaryl or a substituted heteroaryl radical, $R^1$ is hydroxyl or hydrocarbyloxy or hetero atom substituted hydrocarbyloxy comprising up to 20 carbon atoms, X is selected from the group consisting of $—OR^6$ and $—N(R^6)_2$ wherein $R^6$ is selected from the group consisting of hydrogen, a lower alkyl radical having from 1 to 6 carbon atoms,



wherein $R^5$ is a lower alkyl radical having from 1 to 6 carbon atoms and Y is =O or represents 2 hydrogen radicals and further provided at least one of $R^1$ is a hydrocarbyloxy or an heteroatom substituted hydrocarbyloxy or a pharmaceutically-acceptable salt thereof.

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**5,741,811**

**POLYTHIOPHENE ANTI-TUMOR AGENTS**

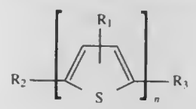
**Ching Te Chang, Taipei, Taiwan; Ching-Jer Chang, West Lafayette, Ind.; Chen-Tao Lee, Hsinchu, Taiwan; Fen-Lan Lin, Hsinchu, Taiwan; Jih-Dar Tsai, Hsinchu, Taiwan; Curtis L. Ashendel, West Lafayette, Ind.; Thomas C. K. Chan, Hopkinton, Mass.; Robert L. Geahlen, and David J. Waters, both of West Lafayette, Ind., assignors to Purdue Research Foundation, W. Lafayette, Ind., and Industrial Technology Research Institute, Hsinchu, Taiwan**

**Continuation of Ser. No. 224,828, Apr. 8, 1994, Pat. No. 5,578,636. This application Sep. 12, 1996, Ser. No. 712,854**

**Int. Cl.[6] A61K** *31/38;* **C07D** *409/02*

**U.S. Cl. 514—444** **19 Claims**

1. A compound of the formula:



wherein n is 0 or 1,

$R_1$ is H, $CH_2OH$, CHO, $CH_2NH_2$,

$R_2$ and $R_3$ are independently selected from the group consisting of mono- or di-substituted 2-thienyl, and mono- or di-substituted 3-thienyl, wherein the thienyl substituents are selected from the group consisting of cyano, $C_1$–$C_7$ haloalkyl, $C_1$–$C_7$ haloalkenyl, $C_1$–$C_4$ alkanoyloxy methyl, $CH_2OR_4$, $COR_5$, $CH_2NR_6R_7$, $CH=CR_9R_{10}$, $CH=NR_{11}$, $CH_2SC(NH)NH_2$ and $C\equiv CR_{12}$ wherein

$R_4$ is H, $CO(CH_2)_2CO_2H$, $(CH_2)_2OCH_3$, $C_1$–$C_4$ alkyl or $COC_1$–$C_{17}$ alkyl;

$R_5$ is H or $C_1$–$C_7$ alkyl;

$R_6$ and $R_7$ are independently H, mono- or di-hydroxy$C_2$–$C_4$ alkyl;

$R_8$ is $C_1$–$C_7$ alkyl, or $C_1$–$C_7$ alkenyl;

$R_9$ and $R_{10}$ are independently H, $C_1$–$C_7$ alkyl, $COOR_5$, $CH(OR_4)$ $COOR_5$, Br, CO-thienyl, or $COC_6H_4OH$ (p);

$R_{11}$ is $NHR_4$ or $OR_5$;

$R_{12}$ is $COOR_5$, CH $(OR_5)$ $CH_2OR_5$ or CH $(OCOC_1$–$C_4$ alkyl) $CH_2OR_5$; cyclodextrin complexes of such compound; and when $R_2$ or $R_3$ is thienyl substituted with $CH_2NR_6R_7$, the pharmaceutically acceptable salt of the compound represented thereby; with the proviso, that

when $R_1$ is H, $R_2$ is selected from the group consisting of di-substituted 2-thienyl, hydroxymethyl- or aminomethyl-substituted 2-thienyl, 3-formyl- 2-thienyl and mono- or di-substituted 3-thienyl, and $R_3$ is selected from the group consisting of di-substituted 2-thienyl, hydroxymethyl- or aminomethyl-substituted 2-thienyl, mono- or di-substituted 3-thienyl and formyl substituted 2-thienyl.



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**5,741,812**

**THROMBOXANE LIGANDS WITHOUT BLOOD CLOTTING SIDE EFFECTS**

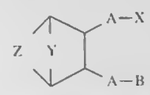
**Robert M. Burk, Laguna Beach; Achim H. Krauss, Foothill Ranch, and David F. Woodward, El Toro, all of Calif., assignors to Allergan, Waco, Tex.**

**Continuation-in-part of Ser. No. 645,467, May 13, 1996, Pat. No. 5,650,431, which is a continuation-in-part of Ser. No. 378,414, Jan. 26, 1995, Pat. No. 5,516,791, which is a division of Ser. No. 174,534, Dec. 28, 1993, Pat. No. 5,416,106. This application Apr. 2, 1997, Ser. No. 832,431**

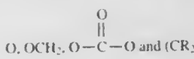
**Int. Cl.[6] A61K** *31/335;31/35;31/045;31/215*

**U.S. Cl. 514—450** **4 Claims**

1. A method of treating hemorrhage which comprises administering to a mammal suffering therefrom a therapeutically effective amount of a thromboxane agonist which is a compound of formula I,



wherein Y is $(CH_2)_x$; Z is selected from the group consisting of



O, $OCH_2$, O—C—O and $(CR_2)_x$

x is an integer of 1 or 2; $R_2$ is hydrogen or an alkyl radical of from 1 to 4 carbons, A is an alkylene or alkenylene radical having from two to seven carbon atoms, which radical may be substituted with one or more hydroxy, oxo, alkyloxy or alkylcarboxy groups or said alkylene or alkenylene may have one or more enchained oxo or imino radicals; B is a methyl radical or a cycloalkyl radical having from three to seven carbon atoms, or an aryl radical, selected from the group consisting of hydrocarbyl aryl and heteroaryl radicals wherein the heteroatom is selected from the group consisting of nitrogen, oxygen and sulfur atoms, or substituted derivatives of said methyl, cycloalkyl or aryl radicals wherein said substituent is selected from the group consisting of halo, nitro, amino, thiol, hydroxy, alkyloxy and alkylcarboxy; and X is selected from the group consisting of nitro, cyano, —COOR, $—CH_2OR_1$, $—C(O)N(R_1)_2$, $—CH_2N(R_1)_2$ —CH=N— OH and $—CH_2SR_1$ radicals, wherein R is a $C_1$ to $C_{10}$ alkyl, phenyl or benzyl, and $R_1$ is R or hydrogen; or a pharmaceutically acceptable salt thereof.

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**5,741,813**

**COMPOUNDS FOR THE TREATMENT OF HEPATOMA**

**Chun-Nan Lin, Kaohsiung; Shen-Jeu Won; Hsiao-Sheng Liou, both of Tainan, and Shorong-Shii Liou, Nantou Hsien, all of Taiwan, assignors to National Science Council, Taipei, Taiwan**

**Continuation-in-part of Ser. No. 134,834, Oct. 12, 1993, abandoned. This application Sep. 29, 1995, Ser. No. 537,089**

**Claims priority, application Japan, Sep. 14, 1993, 5-229248**

**Int. Cl.[6] A61K** *31/35*

**U.S. Cl. 514—455** **2 Claims**

1. The method of treatment of a living subject affected by hepatoma which consists of administering to said subject by the oral route up to three times daily a pharmaceutical composition in unit dosage form containing 50–300 mgs. per dose of a compound which is a member selected from the group consisting of 3-(2,3-Epoxypropoxy)xanthone, 6-(2,3-Epoxy-propoxy)-1-hydroxyxanthone, 2,6-di(2,3-epoxypropoxy)xanthone, 3,5-di(2,3-epoxypropoxyl)-1-hydroxyxanthone and 3,4-Dihydroxy-xanthone.

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**5,741,814**

**CYCLOOCTADIENE DERIVATIVES**

**Yasuyuki Nakajima; Hisayuki Watanabe; Michiaki Adachi, all of Funahashi; Michito Tagawa, Minamisaitama-gun; Mitsugu Futagawa, Minamisaitama-gun; Takashi Furusato, Minamisaitama-gun; Hiroshi Ohya, Minamisaitama-gun, and Masanori Nishioka, Minamisaitama-gun, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan**

**PCT No. PCT/JP95/00128, § 371 Date Sep. 3, 1996, § 102(e) Date Sep. 3, 1996, PCT Pub. No. WO95/21149, PCT Pub. Date Aug. 10, 1995**

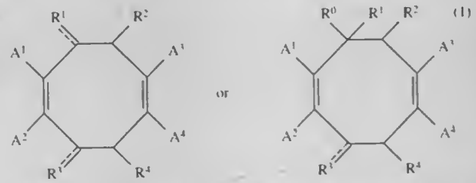
**PCT Filed Feb. 1, 1995, Ser. No. 682,782**

**Claims priority, application Japan, Feb. 1, 1994, 6-010440**

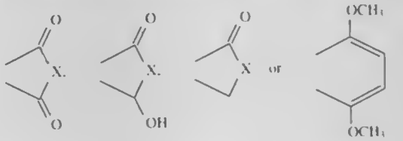
**Int. Cl.[6] A61K** *31/34;* **C07D** *307/93*

**U.S. Cl. 514—468** **11 Claims**

1. A cyclooctadiene derivative of the formula (1):



wherein $A^1$, $A^2$, $A^3$ and $A^4$ each independently represent $COOR^5$ (where $R^5$ represents a hydrogen atom, a $C_1$–$C_{10}$ alkyl group, a $C_2$–$C_{10}$ alkenyl group, a $C_2$–$C_{10}$ alkynyl group, a phenyl group (the phenyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group), or a $C_7$–$C_{12}$ aralkyl group (the aralkyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group)), or $CONR^6R^7$ (where $R^6$ and $R^7$ each independently represent a hydrogen atom, a $C_1$–$C_{10}$ alkyl group or a phenyl group (the phenyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group)), or $A^1$ and $A^2$, and/or $A^3$ and $A^4$ may be combined together to represent group(s) of:



in which X represents an oxygen atom or $NR^8$ {where $R^8$ represents a hydrogen atom, a $C_1$–$C_{10}$ alkyl group, a phenyl group (the phenyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group), or a $C_7$–$C_{12}$ aralkyl group (the aralkyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group)};

$R^0$, $R^1$, $R^2$, $R^3$ and $R^4$ each independently represent a hydrogen atom, a halogen atom, a hydroxyl group, an optionally-substituted $C_1$–$C_{10}$ alkyl group, an optionally-substituted $C_2$–$C_{10}$ alkenyl group, or an optionally-substituted $C_2$–$C_{10}$ alkynyl group;

the substituent for the optionally-substituted groups can be any one or more selected from the group consisting of a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_2$–$C_6$ alkenyl group, a $C_2$–$C_6$ alkynyl group, a $C_1$–$C_6$ haloalkyl group, $OR^9$ {where $R^9$ represents a hydrogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$

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alkenyl group, a $C_2$–$C_6$ alkynyl group, a $C_1$–$C_6$ haloalkyl group, a silyl group, a $C_1$–$C_4$ alkylsulfonyl group, a $C_7$–$C_{12}$ aralkyl group (the aralkyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group), a phosphoryl group, a $C_2$–$C_{10}$ alkoxyalkyl group, or $COR^{14}$ where $R^{14}$ represents a $C_1$–$C_6$ alkyl group, a phenyl group (the phenyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group), a $C_1$–$C_6$ alkoxy group, or $NR^{15}R^{16}$ (where $R^{15}$ and $R^{16}$ each independently represent a hydrogen atom, a $C_1$–$C_6$ alkyl group or a phenyl group (the phenyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group))))}, $SR^{10}$ (where $R^{10}$ represents a hydrogen atom, a $C_1$–$C_6$ alkyl group, a $C_2$–$C_6$ alkenyl group, a $C_2$–$C_6$ alkynyl group, a $C_7$–$C_{12}$ aralkyl group (the aralkyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group), $NR^{11}R^{12}$ {where $R^{11}$ and $R^{12}$ each independently represent a hydrogen atom, a $C_1$–$C_6$ alkyl group, a phenyl group (the phenyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group) or $COR^{17}$ (where $R^{17}$ represents a $C_1$–$C_6$ alkyl group, a phenyl group (the phenyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group) or $C_1$–$C_6$ alkoxy group)}, =O, $=NR^{13}$ {where $R^{13}$ represents a $C_1$–$C_6$ alkyl group, a phenyl group (the phenyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group) or $OR^{18}$ (where $R^{18}$ represents a hydrogen atom, a $C_1$–$C_6$ alkyl group or $COR^{19}$ (where $R^{19}$ represents a $C_1$–$C_6$ alkyl group, a phenyl group (the phenyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group) or $NR^{20}R^{21}$ (where $R^{20}$ and $R^{21}$ each independently represent a hydrogen atom, a $C_1$–$C_6$ alkyl group, a phenyl group (the phenyl group may be optionally substituted by a halogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a cyano group and/or a nitro group))))}, and



(where m is an integer of from 2 to 4);

the symbol ——— represents a single or double bond, and when it is a double bond, then $R^1$ and $R^3$ each independently may represent an oxygen atom;

provided that the case where all of $R^0$, $R^1$, $R^2$, $R^3$ and $R^4$ represent hydrogen atoms at the same time is excluded.

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**5,741,815**

**METHODS FOR IN VIVO REDUCTION OF NITRIC OXIDE LEVELS AND COMPOSITIONS USEFUL THEREFOR**

**Chiog-San Lai, 17765 Bolter La., Brookfield, Wis. 53045**

**Continuation-in-part of Ser. No. 459,518, Jun. 2, 1995. This application Nov. 6, 1995, Ser. No. 554,196**

**Int. Cl.[6] A61K** *31/325*

**U.S. Cl. 514—492** **41 Claims**

1. A method for the in vivo reduction of nitric oxide levels in a subject, said method comprising:

administering to said subject an effective amount of at least one dithiocarbamate-containing nitric oxide scavenger, wherein said dithiocarbamate-containing nitric oxide scavenger comprises a dithiocarbamate moiety and, optionally a physiologically compatible di- or tri-valent transition metal ion, wherein said dithiocarbamate has the structure:

$$R_1R_2N—C(S)—S$$

wherein:

each of $R_1$ and $R_2$ is independently selected from a $C_1$ up to $C_{18}$ alkyl substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclic, substituted heterocyclic, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkylaryl, substituted alkylaryl, arylalkyl, substituted arylalkyl or $R_1$ and $R_2$ can cooperate to form 5-, 6- or 7-membered ring including N, $R_1$ and $R_2$.

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**5,741,816**

**HAIR-GROWTH AGENT**

**Kenji Tsujihara; Kunio Saito, both of Saitama-ken, and Satoshi Furuuchi, Tokyo-to, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan**

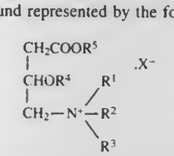
**Filed Jun. 6, 1995, Ser. No. 466,968**

**Claims priority, application Japan, Jun. 20, 1994, 6-136853; Mar. 2, 1995, 7-042713**

**Int. Cl.[6] A01N** *37/02;37/06*

**U.S. Cl. 514—547** **20 Claims**

1. A method for promotion of hair growth in a human or an animal in need thereof, which comprises applying to the skin of said human or animal an agent which comprises a carnitine compound represented by the formula (I):



(I)

wherein $R^1$ to $R^3$ each represent a methyl group; $R^4$ represents an aliphatic acyl group having 3 to 18 carbon atoms which may be substituted; $R^5$ represents an alkyl group having 3 to 21 carbon atoms which may be substituted, or an alkenyl group having 3 to 21 carbon atoms which may be substituted; and $X^-$ represents an anion of a pharmaceutically acceptable acid, and wherein said carnitine compound is an active ingredient of said agent which is present in an amount sufficient to promote hair growth in a human or an animal.

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**5,741,817**

**USE OF LOW MOLECULAR WEIGHT AMINO ACIDS IN OPHTHALMIC COMPOSITIONS**

**Masood Chowhan, 2305 Busch Dr., Arlington, Tex. 76014; Bahram Asgharian, 6628 Townlake Cir., Arlington, Tex. 76016, and Paul Stach, 2786 Woodstock Rd., Upper Arlington, Ohio 43221**

**Continuation of Ser. No. 279,324, Jul. 22, 1994, abandoned. This application Dec. 18, 1995, Ser. No. 575,740**

**Int. Cl.[6] A61K** *31/195*

**U.S. Cl. 514—561** **7 Claims**

1. A method of enhancing the antimicrobial activity of an ophthalmic composition which comprises adding to the composition an effective amount of a low molecular weight amino acid, said amino acid including an alpha carboxylic acid group and having a molecular weight of 75 to 250, wherein the ophthalmic composition does not contain EDTA.



**5,741,818**

**SEMICARBAZONES HAVING CNS ACTIVITY AND PHARMACEUTICAL PREPARATIONS CONTAINING SAME**

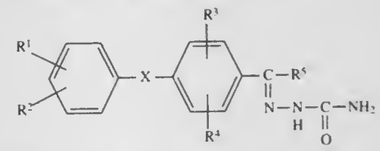
**Jonathan Richard Dimmock, Saskatoon, Canada, assignor to University of Saskatchewan, Saskatoon, Canada**

**Filed Jun. 7, 1995, Ser. No. 475,313**

**Int. Cl.[6] A61K** *31/175;* **C07C** *281/14*

**U.S. Cl. 514—590** **15 Claims**

1. A compound of the general formula I:



(I)

wherein $R^1$, $R^2$, $R^3$ and $R^4$ may be the same or different and each represents hydrogen, halo, $C_{1-9}$alkyl, $C_{3-9}$cycloalkyl, cyano, $C_{1-9}$alkoxy or $C_{6-10}$aryloxy; $R^5$ represents hydrogen, $C_{1-9}$alkyl, $C_{3-9}$cycloalkyl or $C_{6-10}$aryl; and X is oxygen or sulfur; with the proviso that:

a) if X is sulfur, then at least one of $R^1$ and $R^2$ is other than hydrogen or at least one of $R^3$ and $R^4$ is fluoro, $C_{1-9}$alkyl, $C_{3-9}$cycloalkyl, cyano, $C_{1-9}$alkoxy or $C_{6-10}$aryloxy; and

b) if X is oxygen, $R^5$ is hydrogen, methyl, or ethyl, and if one of $R^1$ and $R^2$ is chloro or methoxy or if one of $R^3$ and $R^4$ is methyl, then the other of $R^1$ and $R^2$ or the other of $R^3$ and $R^4$ is other than hydrogen; and

c) if X is oxygen, $R^5$ is hydrogen, methyl or ethyl, and if $R^1$ and $R^2$ are both hydrogen, then at least one of $R^3$ and $R^4$ is other than hydrogen and methyl;

or a pharmaceutically acceptable salt thereof.

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**5,741,819**

**ARYLSULFONYLAMINOBENZENE DERIVATIVES AND THE USE THEREOF AS FACTOR XA INHIBITORS**

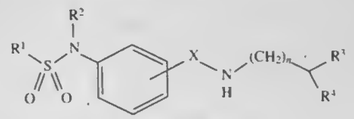
**Carl R. Illig, Phoenixville, Pa.; Richard M. Soll, Lawrenceville, N.J.; Joseph M. Salvino, Schwenksville, Pa.; Bruce E. Tomczuk, Collegeville, Pa.; Tianbao Lu, Exton, Pa., and Nalin L. Subasinghe, West Chester, Pa., assignors to 3-Dimensional Pharmaceuticals, Inc., Exton, Pa.**

**Filed Jun. 7, 1995, Ser. No. 488,196**

**Int. Cl.[6] A61K** *31/18;31/24;31/44*

**U.S. Cl. 514—602** **27 Claims**

1. A compound having the Formula I:



I

or a pharmaceutically acceptable salt thereof;

wherein

$R^1$ is alkyl, substituted alkyl, cycloalkyl, aryl, or substituted aryl;

$R^2$ is one of hydrogen, alkyl, cycloalkyl, aryl or aralkyl;

$R^3$ is one of hydrogen, hydroxy or alkoxy;

$R^4$ is one of $—NH_2$, substituted phenyl, or a $C_{3-10}$ heterocycle selected from the group consisting of quinuclidinyl, piperidinyl, morpholinyl, pyrrolidinyl, pyridinyl, pyrimidinyl and imidazole, wherein said phenyl is substituted and said $C_{3-10}$ heterocycle is optionally substituted with one or two of halogen, hydroxy, hydroxyalkyl, alkoxy, amino, monoalkylamino, dialkylamino, aminoalkyl, monoalkylaminoalkyl, or dialkylaminoalkyl;

X is one of $—CH_2—$ or —C(O)—;

n is from zero to eleven; and

wherein X is attached to the benzene ring in a position ortho-, meta- or para- to the sulfonylamino group;

provided that when $R^4$ is $—NH_2$, then $R^3$ is hydrogen and n is other than zero; further provided that when $R^3$ is hydroxy or alkoxy, then $R^4$ is other than $—NH_2$, and n is other than zero; further provided that when $R^2$ is hydrogen or methyl, while $R^3$ is hydrogen, $R^4$ is pyridyl, X is —C(O)—, and n is zero or one, then $R^1$ is other than unsubstituted phenyl.

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**5,741,820**

**Patent Not Issued For This Number**

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**5,741,821**

**USE OF NATURAL PRODUCTS AND RELATED SYNTHETIC COMPOUNDS FOR THE TREATMENT OF CARDIOVASCULAR DISEASE**

**Basil Don Roufogalis, Pymble; Colin Charles Duke, Randwick, and Qian Li, Lewisham, all of Australia, assignors to The University of Sydney, Australia**

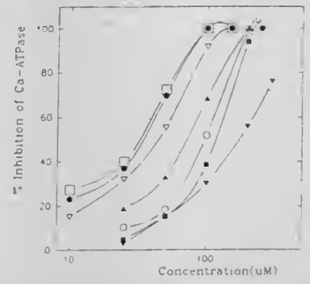
**PCT No. PCT/AU94/00297, § 371 Date Nov. 30, 1995, § 102(e) Date Nov. 30, 1995, PCT Pub. No. WO94/28886, PCT Pub. Date Dec. 22, 1994**

**PCT Filed Jun. 3, 1994, Ser. No. 553,714**

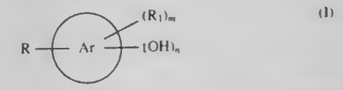
**Claims priority, application Australia, Jun. 3, 1993, PL9181**

**Int. Cl.[6] A61K** *31/05;* **C07C** *39/04*

**U.S. Cl. 514—734** **7 Claims**




1. A method for inhibiting the action of plasma membrane $Ca^{2+}$-ATPase enzymes in a subject which comprises administering to the subject a compound of formula (I)



(I)

wherein Ar is a ring system comprising one or more optionally substituted phenyl rings optionally linked to and/or fused with one or more other optionally substituted phenyl rings or one or more 5 or 6-membered, optionally substituted heterocyclic rings wherein the heteroatom is oxygen;

wherein the ring system comprises 1–4 phenyl rings and wherein the Ar is independently selected;

wherein Ar can be linked to another Ar via a group X or directly linked to another Ar; when Ar is linked to another Ar via a group X, the two Ar groups can also be directly linked to each other;

where X is optionally substituted $C_{1-20}$alkylene, $C_{2-20}$alkenylene or $C_{2-20}$alkynylene;

when Ar is linked to another Ar via a group X, R is hydrogen; $C_{1-20}$alkyl, $C_{2-20}$alkenyl, $C_{2-20}$alkynyl, $C_{2-20}$alkanoyl, $C_{2-20}$alkenoyl, $C_{2-20}$alkynoyl, each of which can be optionally substituted;

when Ar is not linked to another Ar via a group X, R is $C_{5-20}$alkyl, $C_{5-20}$alkenyl, $C_{5-20}$alkynyl, $C_{5-20}$alkanoyl, $C_{5-20}$alkenoyl, $C_{5-20}$alkynoyl, each of which can be optionally substituted;

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$R_1$ is independently selected and is hydrogen; optionally substituted $C_{1-12}$alkyl, $C_{2-12}$alkenyl, $C_{2-12}$alkynyl; —COOR'—NR'R', halogen, —OR', —COR', —CONR'R', =O, —SR', —$SO_3$R', —$SO_2$NR'R', —SOR', $SO_2$R', —$NO_2$, —CN, glycoside, silyl;

where R' is independently hydrogen; alkyl, alkenyl or alkynyl each optionally substituted; and

where two groups $R_1$ can be joined;

wherein the optional substituents are one or more independently selected from $C_{1-10}$alkyl, $C_{2-10}$alkenyl, $C_{2-10}$ alkynyl; —COOR"—NR"R", halogen, —OR", —COR", —CONR"R", —SR", =O, —$SO_3$R", —$SO_2$NR"R", —SOR", —$SO_2$R", —$NO_2$, —CN;

wherein R" is independently hydrogen, alkyl, alkenyl; or alkynyl;

n=1, 2 or 3

m=1, 2, 3 or 4

or a pharmaceutically acceptable derivative thereof in the manufacture of a medicament for inhibiting the action of plasma membrane $Ca^{2+}$-ATPase enzyme.

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**5,741,822**

**MIXED LIPID-BICARBONATE COLLOIDAL PARTICLES FOR DELIVERING DRUGS**

**David W. Yesair, 136 Main St., Byfield, Mass. 01922**

**Division of Ser. No. 908,442, Jun. 30, 1992, Pat. No. 5,314,921, which is a continuation of Ser. No. 567,243, Aug. 13, 1990, abandoned. This application May 5, 1994, Ser. No. 238,592**

**Int. Cl.[6] A61K** *47/00*

**U.S. Cl. 514—784** **16 Claims**

1. A composition for oral administration to an individual, to enhance absorption of a drug incorporated therein, comprising:

a. at least one non-esterified fatty acid having 14–18 carbon atoms;

b. at least one monoglyceride which is a monoester of glycerol and a fatty acid having 14–18 carbon atoms;

c. lysophosphatidylcholine in which the fatty acid moiety has 14–18 carbon atoms;

d. bicarbonate; and

e. a drug;

wherein said fatty acids and monoglyceride together comprise from about 70.0 mole percent to about 99.0 mole percent of the lipid composition and the molar ratio of said fatty acids to said monoglycerides is from about 2:1 to about 1:2, and said lysophosphatidylcholine comprises from about 30.0 mole percent to about 1.0 mole percent of said lipid composition; and

wherein the composition is in the form of colloidal particles in an aqueous environment.

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**5,741,823**

**POLYMERIZED LATEX EMULSION SUITABLE FOR PRODUCING COATING ON RECONSTITUTED WOOD SUBSTRATE**

**Oscar Hsien-Hsiang Hsu, Lansdale, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.**

**Division of Ser. No. 474,034, Jun. 7, 1995, Pat. No. 5,635,248. This application Aug. 27, 1996, Ser. No. 697,390**

**Int. Cl.[6] C08J** *9/28;9/30*

**U.S. Cl. 521—70** **9 Claims**

1. A polymerized latex emulsion used for producing a smooth hard coating on the surface or edge of a reconstituted wood substrate comprising from 10 percent to 60 percent based on the total weight of emulsion of polymer particles of a polymer of an ethylenically unsaturated monomer, said polymer having $T_g$ in the range of 10° C. to 100° C., a foaming agent, and from 0.1 percent to 15 percent by weight of said emulsion of a foam stabilizer selected from the group consisting of disodium N-octadecylsulfosuccinate, tetrasodium N-(1,2-dicarboxyethyl)-N-octadecylsulfosuccinate, sulfosuccinimate surfactant, diamyl ester of sodium sulfosuccinic acid, dihexyl ester of sodium sulfosuccinic acid, dioctyl ester of sodium sulfosuccinic acid, distearyl pyridinium chloride, N-coco-betaaminopropionic acid and the sodium salts thereof.

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**5,741,824**

**ACOUSTICALLY ACTIVE PLASTISOLS**

**Günter Butschbacher, Meckenheim; Manfred Rein, Hirschberg; Klaus Ruch, Wiesloch, and Karl Wesch, Waldbrunn, all of Germany, assignors to Teroson GmbH, Heidelberg, Germany**

**PCT No. PCT/EP94/01767, § 371 Date Dec. 7, 1995, § 102(e) Date Dec. 7, 1995, PCT Pub. No. WO94/29394, PCT Pub. Date Dec. 22, 1994**

**PCT Filed May 31, 1994, Ser. No. 557,038**

**Claims priority, application Germany, Jun. 7, 1993, 43 18 712.9**

**Int. Cl.[6] C08J** *9/30*

**U.S. Cl. 521—73** **22 Claims**

1. In a method of reducing sound emission and mechanical vibration in a metal plate, the improvement comprising; applying to the metal plate a sprayable plastisol composition comprising a powder-form organic polymer and a plasticizer for the organic polymer and gelling the pastisol composition, wherein said plastisol composition comprises:

a) 5 to 60% by weight of at least one powder-form polymer selected from the group consisting of i) copolymers consisting essentially of styrene residues and 2 to 20% by weight of the polymer of residues of an olenfinically unsaturated carboxylic acid coupling monomer, ii) copolymers consisting essentially of styrene, 2 to 20% by weight of residues of an olefinically unsaturated carboxylic acid coupling monomer, and 0.2 to 5% by weight of residues of an olefinically unsaturated crosslinking comonomer having a functional group which is not a carboxyl group and which does not react during the radical polymerization, iii) alkyl methacrylate homopolymers, iv) copolymers consisting essentially of alkyl methacrylate residues and from 0.5% to 4% by weight of residues of an olefinically unsaturated coupling or crosslinking comonomer having a functional group which does not react during the radical polymerization, v) copolymers of alkyl methacrylate and methyl methacrylate, vi) copolymers consisting essentially of alkyl methacrylate residues, methyl methacrylate residues, and from 0.5% to 4% by weight of residues of an olefinically unsaturated coupling or crosslinking comonomer having a functional group which does not react during the radical polymerization, and vii) mixtures of at least two of said homopolymers and copolymers of groups i) to vi);

b) 5 to 65% by weight of plasticizers;

c) 0 to 40% by weight of fillers; and

d) 2 to 40% by weight of reactive additives.

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**5,741,825**

**THERMAL INSULATING FOAMED MATERIAL AND METHOD FOR MANFACTURING THE SAME**

**Fumihiro Inagaki; Takashi Hashida; Masa-aki Suzuki, all of Osaka; Yoshio Kishimoto, Hirakata, and Takayoshi Ueno, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-Fu, Japan**

**Filed Sep. 6, 1995, Ser. No. 524,194**

**Claims priority, application Japan, Sep. 7, 1994, 6-213940; Oct. 21, 1994, 6-256746**

**Int. Cl.[6] C08J** *9/14*

**U.S. Cl. 521—88** **14 Claims**

1. A thermal insulating foamed material comprising a foamed resin composition which has a multiplicity of closed cells, wherein said closed cells confine a gas of a blowing agent of at least one compound selected from the group consisting of iodofluorohydrocarbons, and hydrogen-containing fluoromorpholine derivatives.



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**5,741,826**

**Patent Not Issued For This Number**

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**5,741,827**

**PRODUCTION OF FLAME-RESISTANT FLEXIBLE POLYURETHANE FOAMS**

**Sarbananda Chakrabarti, Mannheim; Stefan Fox, Mettlach; Jürgen Schneider, Freinsheim, and Klaus Schmutzer, Odelzhausen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Aug. 28, 1996, Ser. No. 705,100**

**Claims priority, application Germany, Sep. 2, 1995, 195 32 508.7**

**Int. Cl.[6] C08J** *9/00;* **C08K** *5/3492;5/41;5/42*

**U.S. Cl. 521—121** **32 Claims**

1. A process for producing flame-resistant flexible polyurethane foams comprising reacting

a) organic and/or modified organic polyisocyanates.

b) compounds containing at least two reactive hydrogen atoms and having a number average molecular weight of from 2200 to 8000.

c) optionally, chain extenders having a number average molecular weight of from 17 to 400.

in the presence of

d) a catalyst.

e) a blowing agent

f) a flame retardant, and optionally

g) auxiliaries,

wherein the flame retardant f) comprises melamine and an anionic dispersant selected from the group consisting of (diphenyl oxide)-disulfonates containing a $C_6$–$C_{16}$ alkyl group and mixtures thereof.

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**5,741,828**

**FLEXIBLE HYDROPHILIC COMPOSITE COATINGS**

**Vladimir A. Stoy, Princeton, and Gerald A. Gontarz, Jr., Helmetta, both of N.J., assignors to S.K.Y. Polymers, Inc., Rocky Hill, N.J.**

**Continuation-in-part of Ser. No. 434,573, May 1, 1995, Pat. No. 5,688,855. This application Apr. 19, 1996, Ser. No. 634,788**

**Int. Cl.[6] C08J** *3/02;* **C08L** *33/20*

**U.S. Cl. 524—501** **16 Claims**

1. A coating composition comprising:

(a) Component A, being a composition selected from the group consisting of aqueous emulsions and dispersions, said composition containing an essentially hydrophobic constituent stabilized with at least one emulsifier; and

(b) Component B, being a composition selected from the group consisting of solutions and dispersions, said composition containing hydrophilic polyacrylonitrile of the following properties:

i) insoluble in water under ambient conditions;

ii) soluble in one or more water-miscible solvents; and,

iii) swellable in water under ambient conditions, said swelling in water being greater than 33% by weight of water when measured in its swelled state in water under ambient conditions.

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**5,741,829**

**RADIATION-CURABLE ACRYLATES WITH BUILT-IN PHOTOINITIATORS**

**Wolfgang Reich, Maxdorf; Erich Beck, Ladenburg; Ulrich Jäger, Harthausen, and Reinhold Schwalm, Wachenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

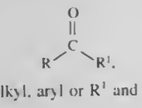
**Filed Jul. 3, 1996, Ser. No. 674,832**

**Claims priority, application Germany, Jul. 7, 1995, 195 24 812.0**

**Int. Cl.[6] C08G** *00/00;* **C07C** *69/96;* **C08F** *18/24*

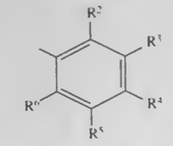
**U.S. Cl. 522—35** **11 Claims**

1. A radiation-curable (meth)acrylate which is the reaction product of a compound of the formula



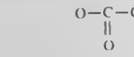
I

where R is $C_1$–$C_4$-alkyl, aryl or $R^1$ and $R^1$ is



II

wherein $R^2$ to $R^6$ independently of one another are H, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, OH, phenyl, SH, $SCH_3$, $SC_2H_5$, F, Cl, Br, CN, COOH, COO—($C_1$–$C_{17}$-alkyl), COO—$C_6$–$C_{10}$-aryl), $CF_3$, N(alkyl)$_2$, N(alkyl)(aryl), N(aryl)$_2$, $N^{\oplus}$(alkyl)$_3A^{\ominus}$, $N^{\oplus}H$(alkyl)$_2A^{\ominus}$, $A^{\ominus}$ is the anion of an acid, and alkyl or aryl is $C_1$–$C_{10}$-alkyl or $C_6$–$C_{10}$-aryl, respectively, and at least one but not more than three of $R^2$ to $R^6$ are



with a hydroxy(meth)acrylate which contains at least 1 free hydroxyl group and at least two (meth)acrylic groups in the molecule.

5. A process for the preparation of a radiation-curable (meth) acrylate, wherein a compound of the formula I is reacted with hydroxy(meth)acrylates which contain at least one free hydroxyl group and at least two (meth)acrylic groups.

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**5,741,830**

**WATER-ABSORPTIVE SOFT CONTACT LENS**

**Miyuki Kamiya; Naotaka Kamiya; Noriko Iwata, all of Kasugai; Yasushi Yamamoto, and Yasuo Tarumi, both of Gunma-ken, all of Japan, assignors to Menicon Co., Ltd., Nagoya, Japan**

**Filed Feb. 13, 1996, Ser. No. 600,877**

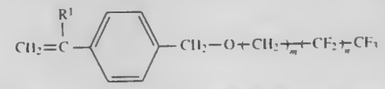
**Claims priority, application Japan, Feb. 15, 1995, 7-026981**

**Int. Cl.[6] G02C** *7/04*

**U.S. Cl. 523—106** **5 Claims**

1. A water-absorptive soft contact lens comprising a polymer prepared by polymerizing a monomer mixture consisting of:

(A) a fluorine-containing styrene derivative of the formula (I):



(I)

wherein $R^1$ is hydrogen atom or methyl group, m is an integer of 1 to 3 and n is 0 or an integer of 1 to 7,

(B) N,N-dimethyl(meth)acrylamide, and

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(C) 1 to 50% by weight of other monomer copolymerizable with said fluorine-containing styrene derivative (I) and N,N-dimethyl(meth)acrylamide,

with or without a crosslinking monomer, wherein the ratio of the component (A) to the component (B) is from 10/90 to 80/20 by weight, and said other monomer (C) is a silicon-containing monomer and optionally at least one member selected from the group consisting of hydroxyethyl (meth)acrylate, hydroxypropyl (meth)acrylate, hydroxybutyl (meth)acrylate, dihydroxybutyl (meth)acrylate, diethyleneglycol mono(meth)acrylate, triethyleneglycol mono(meth)acrylate, propyleneglycol mono(meth)acrylate, dipropyleneglycol mono(meth)acrylate, (meth)acrylic acid, an aminoalkyl (meth)acrylate, an alkoxy group-containing (meth)acrylate, maleic arthydride, maleic acid, a maleic acid derivative, fumaric acid, a fumaric acid derivative, aminostyrene, hydroxystyrene, an alkyl (meth-)acrylate, an alkoxyalkyl (meth)acrylate, an alkylthioalkyl (meth)acrylate, styrene, α-methylstyrene, an alkylstyrene, an alkyl-α-methylstyrene, a fluoroalkyl (meth)acrylate, and a fluoroalkylstyrene.

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**5,741,831**

**POLYMERIZABLE COMPOSITIONS BASED ON THIO (METH) ACRYLATE MONOMERS, POLYMERS WITH A LOW YELLOW INDEX OBTAINED FROM SUCH COMPOSITIONS, AND CORRESPONDING OPHTHALMIC LENSES**

**Gabriel Keita, Courbevoie, France, and Peiqi Jiang, Tokyo, Japan, assignors to Essilor International - Compagnie Generale d'Optique, Charenton, France**

**Filed May 23, 1996, Ser. No. 652,244**

**Claims priority, application France, May 31, 1995, 95 06442**

**Int. Cl.[6] C08F** *228/02;228/04*

**U.S. Cl. 523—106** **16 Claims**

1. Transparent polymer obtained by polymerization of a composition comprising:

a component A comprising:

at least 10% by weight of a monomer or a mixture of monomers (I), containing at least one thioacrylate or thiomethacrylate function of formula: 9



wherein $R_1$ is H or $CH_3$;

0 to 90% by weight of one or more monomers (II) which are copolymerizable by a radical route, wherein said monomers are selected from the group consisting of mono- or polyfunctional vinyl, acrylic and methacrylic monomers; and

a component B comprising, relative to the weight of the component A:

0.1 to 15% by weight of one or more monomers (III) containing an ethylenic unsaturation which does not contribute to an aromatic system and having a carbon bearing a free hydroxyl group in an α position relative to the ethylenic unsaturation.

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**5,741,832**

**MECHANICALLY BONDED FIBER MULCH AND PROCESS FOR PRODUCING SAME**

**Kevin Scott Spittle, 7934 Ravenwood La., Stanley, N.C. 28164**

**Division of Ser. No. 663,033, Jun. 7, 1996. This application Nov. 5, 1996, Ser. No. 740,919**

**Int. Cl.[6] C09K** *17/52;* **C08L** *1/02;33/26*

**U.S. Cl. 523—132** **4 Claims**

1. A process for producing a mechanically-bonded, water-absorbent fiber mulch, comprising:

entraining natural fibers in an airstream;

introducing into said air stream synthetic fibers in a ratio of about 0.05–0.25 parts synthetic to natural fibers to create an intimately mixed, mechanically-bonded fiber mulch; and

dispersing into said fiber mulch a polymeric water absorbent to increase the mulch water absorption capacity.

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**5,741,833**

**RAW MATERIAL FOR INJECTION MOLDING**

**Yoshihiko Seyama; Yutaka Shimizu, and Shinya Iijima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 67,081, May 26, 1993, abandoned. This application Feb. 9, 1995, Ser. No. 386,184**

**Claims priority, application Japan, May 28, 1992, 4-137070**

**Int. Cl.[6] C08K** *9/10*

**U.S. Cl. 523—205** **8 Claims**

1. A raw material for injection molding, the raw material comprising:

powder particles selected from the group consisting of at least one of metal powder particles and ceramic powder particles; and

a binder comprising:

a first water soluble resin selected from the group consisting of at least one of polyethylene glycol and methyl cellulose, and

a second water insoluble resin selected from the group consisting of at least one of polymethyl methacrylate, polystyrene and polyethylene, said second water insoluble resin having a softening temperature higher than a softening temperature of said first water soluble resin,

the raw material being obtained by coating or encapsulating the powder particles with said second water insoluble resin and subsequently kneading the coated or encapsulated powder particles and said first water soluble resin.

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**5,741,834**

**LOW COMPRESSION SET SILICONE ELASTOMERS**

**Brian John Ward, Valley Falls; Edward Matthew Jeram, Burnt Hills, and Richard Albert Striker, Troy, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.**

**Continuation of Ser. No. 450,293, May 25, 1995, abandoned, which is a continuation of Ser. No. 824,849, Jan. 23, 1992, abandoned. This application Oct. 10, 1996, Ser. No. 728,415**

**Int. Cl.[6] C08K** *9/06;3/26*

**U.S. Cl. 523—213** **10 Claims**

1. A fast curing silicone polymer resin composition having low compression set consisting essentially of:

(a) a silicone component of the general formula:

$$MM^{Vi}QD$$

wherein

M is $R_3SiO_{1/2}$,

$M^{Vi}$ is $CH_2{=}CH_2R_2SiO_{1/2}$,

Q is $SiO_{4/2}$,

and D is $R_2SiO_{2/2}$ where each R is independently selected and R is alkyl of from 1 to about 8 carbon atoms, cycloalkyl or cycloalkenyl of from 5 to about 10 carbon atoms or aryl of from 6 to about 12 carbon atoms wherein the ratio of M and $M^{Vi}$ units to Q units ranges from 1.1 to about 2.0 and the ratio of D units to Q units is from about 0.5 to about 8;

(b) a dimethyl vinyl chainstopped diorganopolysiloxane polymer of the formula:

$$M^{Vi}D_tM^{Vi}$$

where $M^{Vi}$ is as previously defined, D is $R_2SiO_{2/2}$ units where R is as defined above wherein the subscript t defines a polymer having a viscosity ranging from 100 to 200,000 centipoise at 25° C.;



(c) a platinum catalyst; and

(d) a crosslinking or curing agent selected from the group consisting of hydrogen containing silanes, hydrogen containing polysiloxanes and mixtures thereof.

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**5,741,835**

**AQUEOUS DISPERSIONS OF EPOXY RESINS**

**Charles John Stark, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Continuation of Ser. No. 551,205, Oct. 31, 1995, abandoned. This application Jul. 17, 1997, Ser. No. 896,118**

**Int. Cl.[6] C08K** *3/20;* **C08L** *63/00*

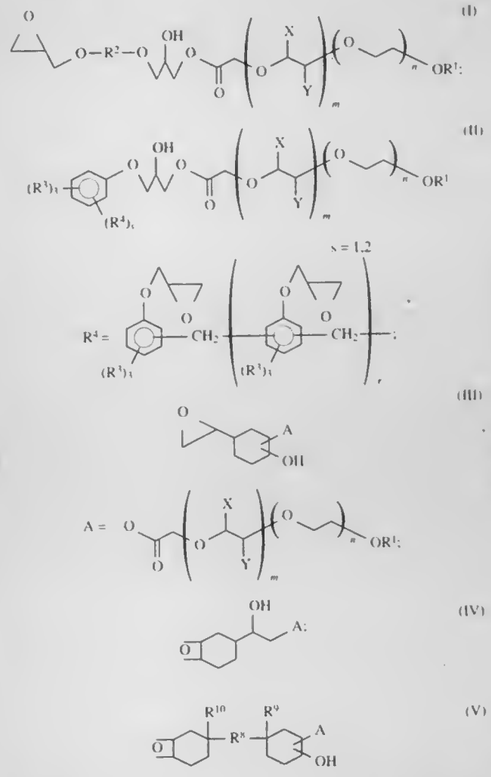
**U.S. Cl. 523—403** **12 Claims**

1. An aqueous dispersion comprising:

a) water;

b) at least one epoxy resin having a functionality of greater than about 1.0 epoxide group per molecule;

c) from about 1 to about 20 weight percent, based on the epoxy resin of at least one epoxy-functional polyether as having the formula:



wherein $R^1$ is a $C_1$–$C_{15}$ alkyl, aryl or alkylaryl group. $R^2$ is a divalent aliphatic group, a divalent cycloaliphatic group, a divalent aryl group, or a divalent arylaliphatic group. $R^3$ is independently a hydrogen or a $C_1$–$C_{10}$ alkyl group. $R^8$ is a divalent aliphatic group optionally containing ether or ester group(s) or together with $R^9$ or $R^{10}$ form a spiro ring optionally containing heteroatoms, and $R^9$ and $R^{10}$ are independently hydrogen or $R^9$ or $R^{10}$ together with $R^8$ form a spiro ring optionally containing heteroatoms such as oxygen, r is a real number from about 0 to about 6, X and Y are independently a hydrogen, methyl or ethyl group with the provision that if X is methyl or ethyl, Y is hydrogen or if Y is methyl or ethyl, X is hydrogen and n+m is a real number from about 15 to about 450 and n is a real number in an amount effective to provide emulsifying property.

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**5,741,836**

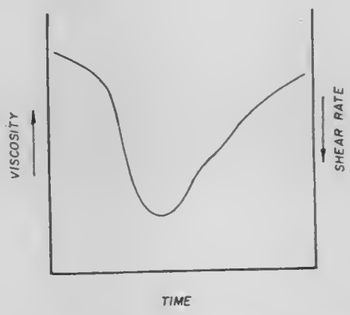
**SCREEN-PRINTABLE INK-RECEPTIVE COMPOSITIONS**

**Mary A. Krenceski, Delmar; Kevin J. Swallow, Avon; Douglas Eugene Bugner, and Alfred John Amell, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 22, 1994, Ser. No. 362,364**

**Int. Cl.[6] C08L** *1/26;* **C09D** *11/00;11/14*

**U.S. Cl. 524—44** **9 Claims**




1. A screen-printable ink-receptive composition containing a hydrophilic polymer composition and a thickener; wherein the composition:

(a) has a viscosity of 10 to 1,000 poise at shear rates less than $10^0$ $s^{-1}$;

(b) exhibits a shear thinning behavior defined by the following relationship:

(III) $$\log(\text{viscosity}) = A\,[\log(\text{shear rate})]$$

in which A represents the slope of the line obtained by plotting log(viscosity) against log(shear rate) and A has a value of up to –0.1 when calculated over shear rates ranging from $10^0$ to $10^2$ $s^{-1}$; and

(c) the hydrophilic composition contains:

(i) a poly(vinyl pyrrolidone);

(ii) particles of poly(cyclohexylenedimethylene-co-xylylene terephthalate-co-malonate-co-sodioiminobis(sulfonylbenzoate)polyester ionomer; and

(IV) (iii) a polyvinyl alcohol.

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**5,741,837**

**SYNDIOTACTIC POLYSTYRENE COMPOSITION WITH IMPROVED CRYSTALLIZATION RATE**

**Chung-Jen Wu, Tainan; Chien-Ming Chen, Taoyuang Hsien; Hsien-Ming Chen, and Hurng-Rern Lee, both of Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan**

**Filed Mar. 27, 1997, Ser. No. 825,235**

**Int. Cl.[6] C08K** *5/34*

**U.S. Cl. 524—87** **10 Claims**

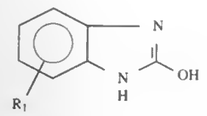
1. A syndiotactic polystyrene composition with improved crystallization rate, comprising:

(a) a syndiotactic polystyrene; and

(b) a nucleating agent which is selected from the group consisting of Compounds I and II, which are respectively represented by the following formulas:

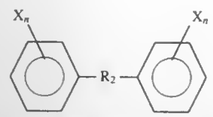
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(Compound I)

and



(Compound II)

wherein $R_1$ and $R_2$ are, independently, $C_1$ to $C_5$ alkyl groups, X is a halogen group, and n is an integer from 1 to 5;

(c) further wherein said nucleating agent is provided at 0.01 to 5 part, by weight, per 100 parts, by weight, of said syndiotactic polystyrene.

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**5,741,838**

**FLAME RETARDENT THERMOPLASTIC POLYCARBONATE MOULDING COMPOUNDS**

**Karl Fuhr, Krefeld; Thomas Eckel, Dormagen; Dieter Wittmann, Leverkusen, and Heinrich Alberts, Odenthal, all of Germany, assignors to Bayer AG, Leverkusen, Germany**

**Filed Aug. 9, 1995, Ser. No. 513,052**

**Claims priority, application Germany, Aug. 18, 1994, 44 29 319.4**

**Int. Cl.[6] C08J** *5/10;* **C08K** *5/52;* **C08L** *69/00*

**U.S. Cl. 524—127** **6 Claims**

1. Thermoplastic halogen-free moulding compounds consisting of

A) 50 to 95 wt. % of thermoplastic aromatic polycarbonate,

B) 0 to 20wt. % of copolymer or polycondensation product prepared form

B.1) thermoplastic copolymer prepared form

B.1.1) 50 to 95 wt. % of styrone, a-methylstyrene, ring-alkylated styrone, $C_1$–$C_8$ alkyl acrylate, $C_1$–$C_8$ alkyl methacrylate or mixtures thereof and

B.1.2) 5 to 50 wt. % of acrylonitrile, methacrylonitrile, $C_1$–$C_8$ alkyl acrylate, $C_1$–$C_8$ alkyl methacrylate, maleic anhydride, N-substituted maleimide, vinyl acetate or mixtures thereof and/or

B.2) thermoplastic polyalkylene terephthalate,

C) 3 to 18 wt. % of graft polymer produced from

C.1) 5 to 90 wt. % of a mixture prepared from

C.1.1) 50 to 95 wt. % of styrene, a-methylstyrene, ring-alkylated styrene, methyl methacrylate or mixtures thereof and

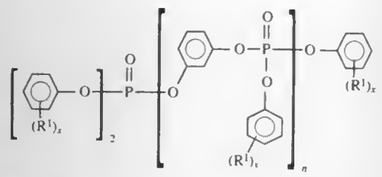
C.1.2) 5 to 50 wt. % of acrylonitrile, methacrylonitrile, $C_1$–$C_8$ alkyl acrylate, $C_1$–$C_8$ alkyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures thereof on

C.2) 10 to 95 wt. % of rubber with a glass transition temperature $T_g$ of ≦10°,

D) 3 to 6 wt. % of thermoplastic polyphenylene ether,

E) 3 to 18 wt. % of phosphoric acid ester prepared form

E.1) phosphorus compounds of the formula (I),



(I)

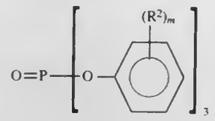
in which

n is a number from 1 to 6

$R^1$ is methyl and

X is a number 0 from to 5;

E.2) a mixture of phosphorus compounds of the formula (I) and phosphorus compounds of the formula (II),



(II)

in which

$R_2$ is methyl and

m is a number from 1 to 5,

where the quantity of phosphorus compounds of formula (II) in the phosphate mixture prepared from E.1) and E.2) is at most 35 wt. %,

wherein all percentages by weight are based on weight of molding compounds.

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**5,741,839**

**STORAGE-STABLE ALKOXY-CROSSLINKING RTV1 SYSTEMS**

**Uwe Scheim, Coswig, Germany, assignor to Huels Silicone GmbH, Nuenchritz, Germany**

**Filed May 2, 1996, Ser. No. 642,173**

**Claims priority, application Germany, May 2, 1995, 195 15 947.0**

**Int. Cl.[6] C08K** *5/54*

**U.S. Cl. 524—188** **14 Claims**

1. A composition comprising at least one dialkoxyalkylsiloxy- and/or trialkoxysiloxy-terminated polydiorganosiloxane, a crosslinking agent therefor in an amount sufficient to crosslink by condensation, a catalyst in catalytic effective amounts, and a stabilizer in stabilizing effective amounts, wherein the stabilizer comprises at least one carbodiimide of the following general formula:

$$R—N=C=N—R \qquad (1)$$

wherein each R is the same or different and is a silyl-substituted alkyl radical of the following general formula:

$$—(CH_2)_xSiR^1_y(OR^2)_{3-y}$$

wherein x and y are independently 0 to 3, and $R^1$ and $R^2$ are the same or different alkyl radicals.

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**5,741,840**

**COHESIVELY FAILING HOT MELT PRESSURE SENSITIVE ADHESIVE**

**Jeffrey S. Lindquist, Cottage Grove, and Lisa L. Ryan, Dayton, both of Minn., assignors to H.B. Fuller Licensing & Financing, Inc., St. Paul, Minn.**

**Filed Jul. 3, 1996, Ser. No. 676,864**

**Int. Cl.[6] C08L** *93/04;53/00;* **C08K** *5/01*

**U.S. Cl. 524—271** **11 Claims**

1. A hot melt pressure sensitive adhesive comprising:

a) from about 15% to about 30% by weight of the adhesive of a linear styrene-ethylene/butylene-styrene block copolymer having a styrene content from about 15% to about 35% by weight of the block copolymer and a coupling efficiency of less than about 75%;

b) from about 20% to about 50% by weight of the adhesive of a tackifying resin selected from the group consisting of those tackifying resins having a softening point of less than about 100° C.;

c) from about 30% to about 50% by weight of the adhesive of a plasticizing oil; and

d) from about 0% to about 15% by weight of the adhesive of a second compatible polymer wherein the total polymer content does not exceed 30% by weight of the adhesive; wherein the hot melt pressure sensitive adhesive fails cohesively during use.



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**5,741,841**

**COATING COMPOSITION WITH STABLE VISCOSITY**

**Santokh S. Badesha, Pittsford; George J. Heeks, Rochester; Arnold W. Henry, Pittsford, all of N.Y.; Biritawit Asfaw, Oakville, Canada; Marko D. Saban, Etobicoke, Canada; John Abate, Mississauga, Canada; Richard L. Carlston, Rochester, N.Y., and Nam S. Ro, Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 25, 1996, Ser. No. 637,912**

**Int. Cl.[6] C08C** *53/04*

**U.S. Cl. 524—379** **12 Claims**

1. A coating composition comprising water, a solvent, a grafted elastomer composed of a polyorganosiloxane bonded to a fluoroelastomer, and a liquid which forms an azeotropic mixture with the water, wherein the azeotropic mixture of the water and the liquid restrains a viscosity increase in the coating composition over time, wherein the liquid is present in an amount ranging from about 2 to about 10% by weight based on the weight of the coating composition, wherein the grafted elastomer is prepared by a process including adding unsaturated polyorganosiloxane in an excess molar amount relative to the fluoroelastomer.

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**5,741,842**

**THERMOPLASTIC MOULDING COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND A PROCESS FOR THE PRODUCTION OF CERAMIC OR METAL MOULDED PARTS BY SINTERING**

**John Huggins, Leverkusen; Gebhard Wagner, Odenthal, and Ottfried Schlak, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Continuation of Ser. No. 179,402, Jan. 10, 1994, abandoned. This application Feb. 16, 1996, Ser. No. 604,258**

**Claims priority, application Germany, Jul. 10, 1991, 41 22 764.6; Oct. 21, 1991, 41 34 694.7; Apr. 15, 1992, 42 12 593.6**

**Int. Cl.[6] C08L** *83/06*

**U.S. Cl. 524—500** **10 Claims**

1. Thermoplastic moulding composition containing at least one sinterable ceramic or metal powder and a mixture of thermoplastic binders consisting of at least one thermoplastic silicone resin and at least one thermoplastic organic binder, wherein the silicone resin has a softening point of 40° to 150° C. and corresponds to the average formula

$$R_a^1Si(OH)_b(OR^2)_cO_{\frac{4-a-b-c}{2}} \qquad (I)$$

wherein

a is in the range of 0.95 to 1.2,

c is in the range of 0 to 0.2

the sum a+b+c is 1.05 to 1.5

the sum b+c is at most 0.3

$R^1$ denotes methyl and

$R^2$ denotes one or more of the $C_1$–$C_{18}$-alkyl radicals,

wherein the following units are present

from 80 to 98 mol-% of $CH_3SiO_{3/2}$ units,

from 0 to 20 mol-% of $(CH_3)_2SiO$ units, and

from 0 to 10 mol-% of $(CH_3)_3SiO_{1/2}$ units,

and wherein the moulding composition consists of 50 to 70 volume % of sinterable powder.

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**5,741,843**

**SEALANT COMPOSITIONS AND SEALED ELECTRICAL CONNECTORS**

**Francis Frederick Koblitz, York; Thomas John Lynch, Mechanicsburg, and Ricky Charles Mellinger, Seven Valleys, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.**

**Division of Ser. No. 297,574, Aug. 29, 1994, Pat. No. 5,580,265, which is a continuation of Ser. No. 878,807, May 5, 1992, Pat. No. 5,360,350, which is a continuation-in-part of Ser. No. 749,373, Aug. 23, 1991, Pat. No. 5,354,210. This application May 31, 1995, Ser. No. 455,228**

**Int. Cl.[6] C08L** *83/00;83/04*

**U.S. Cl. 524—505** **19 Claims**

1. A sealant composition comprising an elastomeric thermoplastic polymer and an extender for said polymer, said elastomeric thermoplastic polymer being elastomeric at temperatures of from about −40° C. to at least about +150° C. and flowable yet thermally stable at temperatures of at least about +200° C. in its neat uncompounded state, said elastomeric thermoplastic polymer comprising at least one elastomeric block and one non-elastomeric block, and said elastomeric thermoplastic polymer comprising a first elastomeric thermoplastic polymer and a second elastomeric thermoplastic polymer, the melt viscosity of said second elastomeric thermoplastic polymer being at least about 50 times greater than the melt viscosity of said first elastomeric thermoplastic polymer, said extender comprising a major proportion by weight of said composition and said polymer comprising a minor proportion by weight of said composition, wherein said composition has a slump resistance of less than about 0.8 in. at about 80° C., and an elastic memory of at least about 200% at temperatures of from about- 40° C. to about +80° C.

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**5,741,844**

**COATING COMPOSITION, PLASTER MATERIAL, METHOD FOR MAKING FRESCO-LIKE PLASTER WALL FINISH AND PLASTER WALL, CEILING, OR SURFACE FORMED THEREBY**

**Warren John Nass, North Barrington; Kurt Gutfreund, Park Forest, and Eli S. Freeman, Buffalo Grove, all of Ill., assignors to Warren J. Nass, North Barrington, Ill.**

**Continuation of Ser. No. 153,430, Nov. 16, 1993, abandoned. This application May 2, 1997, Ser. No. 850,649**

**Int. Cl.[6] C08J** *5/10;* **C08L** *1/02*

**U.S. Cl. 524—523** **10 Claims**

1. A fresco coating composition which, when admixed, with a cement-based plaster produces a material for application by troweling to obtain a fresco finish, said composition being made by combining:

a) 10 to 30% by weight of at least one binder selected from the group consisting of an acrylic emulsion polymer binder, an acrylic polymer binder and an acrylic polymer cross-linking binder;

b) 20 to 45% by weight of water;

c) 5 to 20% by weight of a filler selected from the group consisting of cellulose, paper pulp, mixtures thereof and fine silica sand;

d) 10 to 30% by weight of at least one water-insoluble particulate extender; and

e) optionally, at least one non-reacting chemical agent selected from the group consisting of solvents, coalescence promoters,

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5–15 wt.% thickening agents, surfactants, foam inhibitors, pH adjusters, biocides, mildewcides, colorants and mixtures thereof.

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**5,741,845**

## PROCESS FOR PRODUCTION OF AZO MACROINITIATORS FOR THE SYNTHESIS OF BLOCK COPOLYMERS AND OF AQUEOUS BLOCK COPOLYMER DISPERSIONS AND EMULSIONS AND THE USE THEREOF

**Rainer B. Frings, Berlin, Germany; Shigeru Komazaki, Izumi-ootsu, Japan, and Gerwald F. Grahe, Berlin, Germany, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan**

**Division of Ser. No. 191,357, Feb. 3, 1994, abandoned, which is a continuation of Ser. No. 911,728, Jul. 10, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 488,414**

**Claims priority, application Germany, Jul. 11, 1991, 41 23 223.2**

**Int. Cl.[6] C08L** *31/00*

**U.S. Cl. 524—533** **2 Claims**

1. An aqueous block copolymer emulsion having a solids content between 10 and 90 weight percent and having been prepared by heating an emulsified mixture of at least one vinyl monomer and an azo-macro-initiator in water,

said azo-macro-initiator having a number average molecular weight between 1,500 and 60,000, being insoluble in water and soluble in said at least one vinyl monomer, and having been prepared by reaction of at least one prepolymer having isocyanate-reactive end groups, said prepolymer being selected from the group consisting of polyurethanes, polyacrylates, polymethacrylates, polyesters, polybutadienes, aminopropyldimethylpolysiloxanes, polydimethylsiloxanecarbinols, polyethers, polyepoxides, polylactones, polycarbonates and polyamides, with an azodiisocyanate prepared by reaction of a diisocyanate and a thermally decomposable azo-initiator containing at least 2 hydroxy groups.

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**5,741,846**

## THERMOPLASTIC COMPOSITION COMPRISING A COMPATIBILIZER POLYPHENYLENE ETHER POLYAMIDE BASE RESIN AND ELECTROCONDUCTIVE CARBON BLACK

**Johannes Hubertus Gabriél Marie Lohmeijer, Hoogerheide; Johannes Everardus Fortuijn, and Jan Wagenaar, both of Bergen op Zoom, all of Netherlands, assignors to General Electric Company, Pittsfield, Mass.**

**Continuation of Ser. No. 349,850, Dec. 6, 1994, abandoned. This application Mar. 15, 1996, Ser. No. 617,535**

**Claims priority, application European Pat. Off., Jun. 1, 1994, 94108412**

**Int. Cl.[6] C07K** *3/16*

**U.S. Cl. 524—538** **15 Claims**

1. A thermoplastic composition comprising (a) a compatibilized polyphenylene ether-polyamide base resin, and (b) 1–7 parts by weight per 100 parts by weight of (a) an electroconductive carbon black, wherein the composition has a notched Izod impact strength of more than 15 kJ/m$^2$ (measured in accordance with ISO 180/1A) and a volume resistivity of less than $10^6$ Ohm-cm (measured on the narrow parallel portion of a multipurpose test specimen type A according to ISO 3167 with a length of about 70 mm obtained by breaking off both ends of the test specimen, molded as described in ISO 294 for dumb-bell bars, the fracture surface of both ends being coated with a silver paint and the resistivity being measured between the silver painted surfaces with an electrical multimeter) and wherein said electroconductive carbon black is added into said compatibilized polyphenylene ether-polyamide base resin.

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**5,741,847**

## POLYMER POLYOLS CONTAINING HALOGENATED AROMATIC MONOMERS AND POLYURETHANE FOAM MADE THEREFROM

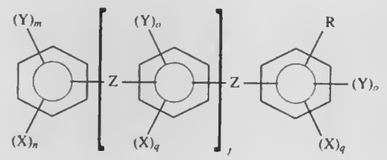
**Wayne R. Willkomm, Lake Jackson; Ruben Solis, Richwood, and Kenneth J. Hinze, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed May 23, 1996, Ser. No. 652,179**

**Int. Cl.[6] C08L** *27/00;27/24;* **C08G** *65/32*

**U.S. Cl. 524—551** **22 Claims**

1. A dispersion of particles of a polymer of an addition polymerizable monomer having the structure:



wherein

j is a whole number from 0 to 4,

Z is selected from the group consisting of:

a single bond;

a substituted or unsubstituted divalent hydrocarbon radical that is $OCH_2CH(OH)CH_2O$, methylene or a methylene substituted with a radical selected from the group consisting of: $CH_3$, $C_2H_5$, $C_3H_7$, n-$C_3H_7$, i-$C_3H_7$, cyclohexyl, bicyclo[2.2.1]heptyi, phenyl, $CF_2$, $CF_3$, $CCL_3$, $CF_2CL$, CN, $(CH_2)_2COOCH_3$ and $PO(OCH_3)_2$ and

a divalent radical selected from the group consisting of: S, $S_2$, SO, $SO_2$, O and CO,

X is a halogen wherein "n" is an integer from 1 to 5 and "q" is an integer from 1 to 4,

R is an ethylenically unsaturated hydrocarbon monovalent radical having:

(a) up to about 12 carbons wherein R is a substituted or unsubstituted hydrocarbon monovalent radical that is linear or branched, provided that when R is substituted, said substituted radical is substituted with a substituent selected from the group consisting of: an ether; ester; hydroxyl and carbonyl and

(b) at least one free radical polymerizable carbon—carbon double bond, and

Y is a monovalent radical selected from the group consisting of: hydrogen;

mercaptan;

hydroxyl and

a substituted or unsubstituted hydrocarbon monovalent radical that (i) has at most about 12 carbons and (ii) is linear or branched, provided that when Y is the substituted hydrocarbon radical, said substituted radical is substituted with a substituent selected from the group consisting of: an other; ester; hydroxyl and carbonyl,

wherein "o" is an integer equal to 4 minus "q" and " " is an integer equal to 5 minus "n" in a polyol.



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**5,741,848**

## METHOD OF MANUFACTURING POLYOLEFIN SOLUTIONS

**Tetsuro Nogata; Kotaro Takita; Kenji Miyasaka, and Koichi Kono, all of Kawasaki, Japan, assignors to Tonen Chemical Corporation, Tokyo, Japan**

**PCT No. PCT/JP96/00564, § 371 Date Nov. 7, 1996, § 102(e) Date Nov. 7, 1996, PCT Pub. No. WO96/27631, PCT Pub. Date Dec. 12, 1996**

**PCT Filed Mar. 7, 1996, Ser. No. 737,205**

**Claims priority, application Japan, Mar. 8, 1995, 7-077230**

**Int. Cl.[6] C08J** *3/11*

**U.S. Cl. 524—587** **19 Claims**

1. A method of manufacturing a polyolefin solution, comprising the steps of:

providing a continous kneader having a self-cleaning action, and having a plurality of internal sections including a polyolefin resin feed section, at least one solvent liquid feed section, and a section in which a kneading of a polyolefin resin and a solvent liquid is initially performed;

kneading the polyolefin resin with the solvent liquid using the kneader, and

maintaining the polyolefin resin feed section, the solvent liquid feed section and the section in which kneading of the polyolefin resin and the solvent liquid is initially performed, in a starved condition.

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**5,741,849**

## AQUEOUS BINDER COMPOSITIONS HAVING A LONG PROCESSING TIME AND THEIR USE IN COATING COMPOSITIONS

**Harald Blum, Wachtendonk; Eberhard Arning, Kaarst; Rolf Roschu, Willich, and Josef Pedain, Köln, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Jun. 19, 1996, Ser. No. 666,166**

**Claims priority, application Germany, Jun. 26, 1995, 195 23 103.1**

**Int. Cl.[6] C08J** *3/00;* **C08K** *3/20;* **C08L** *75/00;* **B32B** *27/00*

**U.S. Cl. 524—591** **13 Claims**

1. An aqueous binder composition which contains, prior to any reaction between components A1) and B),

A) 65 to 97 wt % of an aqueous polyol component having a viscosity at 23° C. of 25 to 15,000 mPa.s and containing a mixture of

A1) at least one dispersion or solution of a hydroxyl group-containing polyester containing carboxylate and/or sulphonate groups, having a weight average molecular weight of 1,000 to 40,000, an OH number of 15 to 100 mg KOH/g dispersion or solution and an acid number, based on all of the carboxylate, carboxyl and sulphonate groups of 2 to 40 mg KOH/g dispersion or solution, wherein the polyester is based on the reaction product of

a1) 65 to 100 wt % of one or more polyester precursors prepared from

a1.1) 0 to 40 wt % of one or more monocarboxylic acids,

a1.2) 20 to 65 wt % of one or more di-, tri-, and/or tetrafunctional alcohols,

a1.3) 20 to 60 wt % of one or more di- and/or trifunctional carboxylic acids or their anhydrides and

a1.4) 0 to 10 wt % of one or more compounds containing sulphonate and carboxyl groups and optionally hydroxyl groups,

a2) 0 to 15 wt % of one or more carboxylic acid anhydrides or hydroxycarboxylic acids,

a3) 0 to 22 wt % of one or more di- or polyisocyanates and

a4) 0 to 8 wt % of one or more mono-, di- and/or trifunctional compounds containing hydroxyl and/or amino groups and

A2) at least one physically drying, aqueous polyurethane dispersion, which is substantially free from unreacted hydroxyl and amino groups and contains carboxylate and/or sulphonate groups, and

B) 3 to 35 wt % of a polyisocyanate component having a viscosity at 23° C. of 50 to 10,000 mPa.s and containing one or more organic polyisocyanates,

wherein components A) and B) are present at an NCO/OH equivalent ratio, based on the isocyanate groups of component B) and the hydroxyl groups of the polyol component A1) of component A), of 0.3:1 to 2:1.

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**5,741,850**

## METHOD FOR THE CONTINUOUS PREPARATION OF ORGANOPOLYSILOXANE EMULSIONS

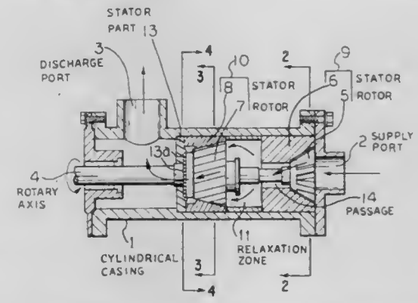
**Hidchiko Hosokawa, Crestview Hills, Ky.; Junichi Maeshima, and Fumitaka Suto, both of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan**

**Filed Aug. 27, 1996, Ser. No. 704,478**

**Claims priority, application Japan, Aug. 30, 1995, 7-245574; Aug. 30, 1995, 7-245575**

**Int. Cl.[6] C08L** *83/00*

**U.S. Cl. 524—837** **12 Claims**




1. A method for preparing organopolysiloxane emulsions comprising

(A) as a first procedure:

continuously feeding and supplying an organopolysiloxane liquid or gum, water, and an emulsifying agent as materials into the supply port of a first mixer having a cylindrical casing, the cylindrical casing having mounted therein between its supply port and its discharge port a first-stage shearing and stirring mechanism and a second-stage shearing and stirring mechanism, the first-stage shearing and stirring mechanism comprising a turbine rotor having blades slanted obliquely from the radial direction when viewed in the axial direction and a stator about the circumference of the rotor, the second-stage shearing and stirring mechanism comprising a turbine rotor having blades describing spiral curves with respect to the axial direction and a stator about the circumference of its rotor, the first and second stage mechanisms being arranged serially along the direction of flow of fed materials and being separated one from the other by a relaxation zone; subjecting the fed materials in the first-stage shearing and stirring mechanism to an intake and shearing action at a shear rate of at least 100 reciprocal seconds; and after passage through the relaxation zone, subjecting the materials in the second-stage shearing and stirring mechanism to phase reversal rotational effects, and shearing action, at a shear rate of at least 100 reciprocal seconds; and discharging from the discharge port of the cylindrical casing an organopolysiloxane-in-water emulsion having a content of organopolysiloxane in the emulsion of 10–99 weight percent based on the total weight of the emulsion; and

(B) as a second procedure:

continuously feeding and supplying dilution water and the organopolysiloxane-in-water emulsion produced in the first mixer by the first procedure to a second mixer, and repeating in the second mixer the steps carried out in the first procedure in the first mixer, and discharging from the

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discharge port of the cylindrical casing of the second mixer a water-diluted organopolysiloxane-in-water emulsion.

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5,741,851

## GRAFT POLYMER DISPERSION HAVING A THIRD MONOMER AND POLYURETHANE FOAMS HAVING A REDUCED TENDENCY TO SHRINK PREPARED THEREBY

**Duane A. Heyman, Monroe, and James A. Gallagher, Grosse Ile, both of Mich., assignors to BASF Corporation, Mt. Olive, N.J.**

**Continuation of Ser. No. 184,730, Jan. 21, 1994, abandoned. This application Aug. 30, 1995, Ser. No. 520,911**

**Int. Cl.[6] C08F** *290/06;290/14*

**U.S. Cl. 525—28** **3 Claims**

1. A process for preparing a graft polymer dispersion comprising polymerizing in situ from 25 to 60 weight percent, based on the total weight of the polymer dispersion of a mixture of at least three ethylenically unsaturated monomers in a polyol mixture containing less than 0.1 moles of induced unsaturation per mole of polyol mixture in the presence of a reaction moderator and a free radical initiator, wherein said mixture of ethylenically unsaturated monomers comprises acrylonitrile, styrene or 4-methylstyrene, and from 10 weight percent to 20 weight percent, based on the weight of the monomer mixture of 2-hydroxyethyl methacrylate.

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5,741,852

## NONTHROMBOGENIC IMPLANT SURFACES

**Roger E. Marchant, Cleveland Heights; Shengmei Yuan, Cleveland, and Gyongyi Szakalas-Gratzl, Chagrin Falls, all of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio**

**Continuation of Ser. No. 979,157, Nov. 19, 1992, abandoned. This application Jun. 6, 1994, Ser. No. 254,492**

**Int. Cl.[6] C08G** *81/00*

**U.S. Cl. 525—54.3** **35 Claims**

1. A method for reducing the thrombogenicity of a hydrophobic substrate, comprising the steps of:

a. providing a water soluble block polymer comprising at least one hydrophobic block comprising a hydrocarbon chain having from at least 5 carbons to 18 carbons, and at least two polysaccharide blocks having a weight average molecular weight of at least 4,000, said hydrophobic block being attached to the polysaccharide blocks; and

b. applying the block polymer to the surface of the substrate wherein the hydrophobic block attaches to the surface of the substrate by hydrophobic interaction.

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5,741,853

## ABS MOULDING COMPOSITIONS WITH IMPROVED PROPERTIES

**Herbert Eichenauer; Ulrich Jansen, both of Dormagen; Karl-Erwin Piejko, Bergisch Gladbach, and Edgar Leitz, Dormagen, all of Germany, assignors to Bayer AG, Leverkusen, Germany**

**Filed May 22, 1996, Ser. No. 651,454**

**Claims priority, application Germany, Jun. 2, 1995, 195 20 286.4**

**Int. Cl.[6] C08L** *55/02;25/12*

**U.S. Cl. 525—71** **13 Claims**

1. Thermoplastic moulding compositions of the ABS type comprising:

I) at least one graft copolymer which is obtained by emulsion polymerization of styrene and acrylonitrile in the weight ratio 90:10 to 50:50, wherein styrene and/or acrylonitrile can be completely or partly replaced by α-methylstyrene, methyl methacrylate or N-phenylmaleimide, in the presence of at least two butadiene polymer latices of types (A) and (B), which each contain, copolymerized, 0 to 50 wt. % of a further vinyl monomer, and wherein the weight ratio of monomers used to butadiene polymers used is 25:75 to 70:30, and

(II) at least one copolymer of styrene and acrylonitrile in the weight ratio 90:10 to 50:50, wherein the styrene and/or acrylonitrile can be completely or partly replaced by α-methylstyrene, methyl methacrylate or N-phenylmaleimide, characterized in that the butadiene polymer latex (A) has a particle diameter $d_{50}$≦320 nm, a width of the particle size distribution (measured as $d_{90}$–$d_{10}$ from the integral particle size distribution) of 30 to 100 nm, and a gel content of 40 to 70 wt. % and the butadiene polymer latex (B) has a particle diameter $d_{50}$≧370 nm, a width of the particle size distribution (measured as $d_{90}$–$d_{10}$ from the integral particle size distribution) of 50 to 500 nm and a gel content≧70 wt. %.

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5,741,854

## VINYL AROMATIC RESIN COMPOSITIONS CONTAINING A FLUORO OLEFIN POLYMER AND A METAL SALT OR ESTER OR A FATTY ACID

**Jianing Huang, Parkersburg, W. Va., assignor to General Electric Company, Pittsfield, Mass.**

**Continuation of Ser. No. 342,545, Nov. 21, 1994, abandoned. This application Jul. 31, 1996, Ser. No. 690,058**

**Int. Cl.[6] C08G** *63/48*

**U.S. Cl. 525—72** **16 Claims**

1. A thermoplastic resin composition, comprising:

(a) a graft copolymer selected from the group consisting of acrylonitrile-butadiene-styrene graft copolymers, acrylonitrile-styrene-butyl acrylate graft copolymers, methyl methacrylate-butadiene-styrene graft copolymers and acrylonitrile-ethylene-propylene-nonconjugated diene-styrene graft copolymers present at a level of from 60 to 99.8 percent by weight based on the total weight of said composition;

(b) a metal salt of a fatty acid or an ester of a fatty acid present at a level of from 0.1 to 0.9 percent by weight based on the total weight of the composition, and

(c) a tetrafluoroethylene polymer having a fluorine content of from 65 to 75 percent percent by weight, based on the weight of the a terafluoroethylene polymer, present at a level of from 0.03 to 0.8 percent by weight based on the total weight of the composition, said tetrafluoroethylene polymer being introduced into said composition in the form of a preblend comprising from 0.5 to 50 percent by weight, based on the total weight of the preblend, of said tetrafluoroethylene polymer and from 50 to 95.5 percent by weight based on the total weight of the preblend, of a vinyl aromatic polymer.

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5,741,855

## COMPATIBILIZED FLUOROPLASTIC BLENDS

**Bruce Kaduk, Mountain View; Keith Dawes, San Mateo; Awtar Singh, Milpitas, and Jing Tian, San Mateo, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.**

**Filed Jun. 10, 1996, Ser. No. 660,998**

**Int. Cl.[6] C08L** *27/12;27/16;27/18*

**U.S. Cl. 525—88** **6 Claims**

1. A composition comprising a blend of:

(a) a first crystalline fluoroplastic which is an ethylene-tetrafluoroethylene copolymer, in an amount between 30 and 70 weight %;

(b) a second crystalline fluoroplastic which is a terpolymer of tetrafluoroethylene, hexafluoropropylene, and vinylidene fluoride, in an amount between 30 and 65 weight %; and

(c) a thermoplastic fluoroelastomer which is a block copolymer comprising at least one elastomeric segment comprising tetrafluoroethylene, vinylidene fluoride, and hexafluoropropylene repeat units in a mole ration 45–90:5–50:0–35 and at least one nonelastomeric segment comprising tetrafluoroethylene and ethylene repeat units, in an amount between 5 and 25 weight %;

the weight %'s being based on the combined weights of the first and second crystalline fluoroplastics and the thermoplastic fluoroelastomer.



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5,741,856

## CHEMICAL CURING OF EXPOXIDIZED DIENE POLYMERS USING AROMATIC ANHYDRIDE CURING AGENTS

**Michael Alan Masse, Richmond, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Filed Feb. 10, 1997, Ser. No. 797,155**

**Int. Cl.[6] C08L** *53/00*

**U.S. Cl. 525—92 B** **6 Claims**

1. A process for curing epoxidized diene polymers for use in adhesives, sealants, and coatings which consists of contacting the polymer with an aromatic anhydride curing agent selected from the group consisting of phthalic anhydride and methylphthalic anhydride at an epoxy/anhydride molar ratio from 0.5/1 to 2.0/1.0, and optionally, from 0.1 to 10 phr of an accelerator at a temperature of from 100° to 200° C. for a period of 10 minutes to six hours.

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5,741,857

## BLENDS OF ELASTOMER BLOCK COPOLYMER AND ALIPHATIC α-OLEFIN/MONOVINYLIDENE AROMATIC MONOMER AND/OR HINDERED ALIPHATIC VINYLIDENE MONOMER INTERPOLYMER

**Calvin P. Esneault, Baton Rouge, La., and Morris S. Edmondson, Brazoria, Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Oct. 15, 1996, Ser. No. 732,108**

**Int. Cl.[6] C08L** *53/02;25/04*

**U.S. Cl. 525—97** **14 Claims**

1. A thermoplastic elastomeric blend composition comprising:

(A) from 99 to 1 weight percent of a styrenic block copolymer; and

(B) from 1 to 99 weight percent of an interpolymer containing polymer units derived from (1) at least one aliphatic α-olefin and (2) at least one vinylidene aromatic monomer or an interpolymer containing polymer units derived from (1) and (3) a combination of at least one vinylidene aromatic monomer and at least one hindered aliphatic vinylidene monomer.

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5,741,858

## SILANE-CROSSLINKABLE ELASTOMER-POLYOLEFIN POLYMER BLENDS THEIR PREPARATION AND USE

**Jeffery E. Brann, Lake Jackson; Morgan M. Hughes, Angleton, both of Tex.; Stephen H. Cree, Geneva, and John Penfold, Uetliburg, both of Switzerland, assignors to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of Ser. No. 230,364, Apr. 20, 1994, abandoned. This application May 31, 1996, Ser. No. 657,926**

**Int. Cl.[6] C08L** *23/26*

**U.S. Cl. 525—101** **19 Claims**

1. A silane-crosslinked blend comprising (a) a polyolefin elastomer with a density of less than 0.885 g/cc, (b) a crystalline polyolefin polymer with a percent crystallinity of at least about 40%, and (c) a silane crosslinker, the polyolefin elastomer comprising at least about 70 weight percent of the total weight of the blend.

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5,741,859

## BLOCK COPOLYMERS OF POLYISOBUTYLENE AND POLYDIMETHYLSILOXANE

**Anil Kumar Saxena, and Toshio Suzuki, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Feb. 3, 1997, Ser. No. 794,695**

**Int. Cl.[6] C08F** *8/00*

**U.S. Cl. 525—106** **21 Claims**

1. A method for preparing a polyisobutylene-siloxane block copolymer, said method comprising:

(I) lithiating

(A) a polyisobutylene having one terminal silanol group with

(B) an organolithium compound to provide a silanolate-functional polyisobutylene;

(II) reacting the silanolate-functional polyisobutylene with

(C) a hexaorganocyclotrisiloxane of the formula $(R_2SiO)_3$ in which R is a monovalent group independently selected from the group consisting of alkyl radicals having 1 to 6 carbon atoms, aryl radicals having 6 to 10 carbon atoms, and halogenated alkyl radicals having 2 to 6 carbon atoms to form a siloxanolate-functional block copolymer; and

(III) capping the siloxanolate-functional block copolymer with a compound selected from the group consisting of

(D) a silane of the formula $R'_{(4-a)}SiX_a$ wherein R' is a monovalent group independently selected from the group consisting of alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, aryl having 6 to 10 carbon atoms, halogenated alkyl having 2 to 6 carbon atoms, acryloxyalkyl radicals having 4 to 10 carbon atoms, methacryloxyalkyl radicals having 4 to 10 carbon atoms and alkenylaryl radicals having 8 to 14 carbon atoms, X is a hydrolyzable group and a is an integer having a value of 1 to 4, and

(E) an acid.

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5,741,860

## THERMOPLASTIC RESIN COMPOSITION AND TRIM PARTS FOR INTERIOR DECORATION OF AUTOMOBILE

**Shigemi Matsumoto, Akashi, and Akinaga Goda, Fukuoka, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka-Fu, Japan**

**PCT No. PCT/JP95/02237, § 371 Date Jun. 18, 1996, § 102(e) Date Jun. 18, 1996, PCT Pub. No. WO96/15190, PCT Pub. Date May 23, 1996**

**PCT Filed Nov. 1, 1995, Ser. No. 652,476**

**Claims priority, application Japan, Nov. 11, 1994, 6-303064**

**Int. Cl.[6] C08L** *33/06*

**U.S. Cl. 525—230** **5 Claims**

1. A thermoplastic resin composition consisting essentially of 5–55 weight % of a copolymer (A) whose glass transition temperature is not more than 0° C., and 95–45 weight % of a high α-methylstyrene-content ABS resin (B) and/or a maleimide ABS resin (C), both (B) and (C) being not less than 100° C. in thermal deformation temperature (load 18.6 kg/cm$^2$), wherein

said copolymer (A) is an acrylic ester copolymer comprising 40–85 weight % of alkyl (meth)acrylates, not more than 25 weight % of aromatic vinyl compounds and 15–35 weight % of vinyl cyanide compounds, having 0.2–1.5 dl/g in reduction viscosity (30° C., in N, N-dimethylformamide solution),

said high α-methylstyrene-content ABS resin (B) is comprised of

30–85 weight % of a copolymer (Bc) comprising 60–80 weight % of α-methylstyrene, not more than 25 weight % of aromatic vinyl compounds and 20–35 weight % of vinyl cyanide compounds and having 0.3–1.5 dl/g in reduction viscosity (30° C., in N, N-dimethylformamide solution), and

70–15 weight % of a graft copolymer (Bg) comprising 30–90 weight % of at least one rubber polymer selected from the group consisting of diene rubbers, olefin rubbers and acryl rubbers grafted with 70–10 weight % of a monomer mix-

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ture of 20–90 weight % of aromatic vinyl compounds, not more than 40 weight % of vinyl cyanide, not more than 85 weight % of alkyl methacrylates and 0–20 weight % of other copolymerizable monomers,

said maleimide ABS resin (C) is comprised of

30–85 weight % of a copolymer (Cc) comprising 10–50 weight % of maleimide compounds, 80–15 weight % of aromatic vinyl compounds, 10–35 weight % of vinyl cyanide compounds and 0–20 weight % of other copolymerizable monomers and having 0.3–1.5 dl/g in reduction viscosity (30° C., in N, N-dimethylformamide solution), and

70–15 weight % of a graft copolymer (Cg) comprising 30–90 weight % of at least one rubber polymer selected from the group consisting of diene rubbers, olefin rubbers and acryl rubbers grafted with 70–10 weight % of a monomer mixture of 20–90 weight % of aromatic vinyl compounds, not more than 40 weight % of vinyl cyanide compounds, not more than 85 weight % of alkyl methacrylates and 0–20 weight % of other polymerizable monomers, and

said resin composition is not less than 10 kg cm/cm in Izod impact strength (23° C.).

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**5,741,861**

**RESIN COMPOSITION FOR LAMINATES**

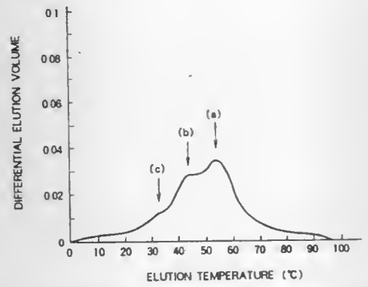
**Koji Yamamoto; Hajime Ikeno, and Keiko Shichijo, all of Yokkaichi, Japan, assignors to Mitsuhishi Chemical Corporation, Tokyo, Japan**

**Continuation of Ser. No. 153,966, Nov. 18, 1993, abandoned. This application Mar. 23, 1995, Ser. No. 409,957**

**Claims priority, application Japan, Dec. 3, 1992, 4-323529; Dec. 25, 1992, 4-345750**

**Int. Cl.[6] C08L** *23/04*

**U.S. Cl. 525—240** **23 Claims**




1. A resin composition for laminates, said resin composition containing 50 to 99% by weight of component A and 1 to 50% by weight of component B,

said component A comprising a copolymer of ethylene and α-olefin having a carbon number of 3 to 18, said component A having the following properties (a) to (d):

(a) a melt flow rate (MFR) of 2 to 30 g/10 min.;

(b) a density of not more than 0.935 g/cm$^3$; and

(c) an integral elution volume indicated by an elution curve obtained by temperature rising elution fractionation (TREF) whereby not more than 10% by wt. of the eluted polymer is obtained when the elution temperature reaches 10° C., and not less than 90% by wt. of the eluted polymer is obtained when the elution temperature reaches 90° C.,

(d) a Q value of not more than 4,

said component B comprising a free radical polymerized, high-pressure low-density polyethylene (LDPE), said component B having the following properties (a') to (e'):

(a') a melt flow rate of 0.1 to 20 g/10 min.;

(b') a density of 0.915 to 0.93 g/cm$^3$;

(c') a memory effect (ME) of not less than 1.6;

(d') a melt tension (MT) of not less than 1.5 g; and

(e') a Q value of 5 to 30.

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**5,741,862**

**HIGH FLEXIBLE PROPYLENE/ETHYLENE COPOLYMERS AND PROCESS FOR PREPARING SAME**

**Patrik Müller, Kaiserslautern, and Meinolf Kersting, Neustadt, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Division of Ser. No. 527,681, Sep. 13, 1995, abandoned. This application Jan. 13, 1997, Ser. No. 782,085**

**Int. Cl.[6] C08F** *297/08;8/50*

**U.S. Cl. 525—323** **3 Claims**

1. A propylene/ethylene copolymer having a high rubber content obtained from a two-stage polymerization process from the gas phase in an agitated solid bed by means of a Ziegler-Natta catalyst system containing a titanium-containing solid component and an aluminum compound cocatalyst, which process comprises,

polymerizing propylene in a first polymerization stage at a pressure of from 15 to 24 bar and at a temperature of from 50° to 60° C. and for an average residence time of from 0.5 to 5 hours and subsequently

in a second polymerization stage adding a mixture of propylene and ethylene by polymerization to the polymer removed from the first polymerization stage at a pressure of from 5 to 30 bar, this pressure being at least 2 bar below the pressure in the first polymerization stage, at a temperature of from 60° to 100° C., and for an average residence time of from 0.5 to 5 hours; while the ratio of the partial pressure of propylene to that of ethylene is adjusted to from 0.5:1 to 5:1; the weight ratio of the monomers reacted in the first polymerization stage to those reacted in the second polymerization stage is adjusted to from 0.9:1 to 0.4:1; the polymerization in the second polymerization stage is carried out in the presence of a $C_1$–$C_8$-alkanol and no additional aluminum compound cocatalyst and no additional titanium-containing solid catalyst component is introduced to the polymerization in the second polymerization stage and then subjecting the copolymer removed from the second polymerization stage to molecular weight reduction by means of a peroxide.

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**5,741,863**

**Patent Not Issued For This Number**

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**5,741,864**

**FUNCTIONALIZED STYRENE POLYMERS AND COPOLYMERS**

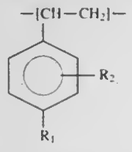
**Abhimanyu Onkar Patil, Westfield, N.J., assignor to Exxon Research & Engineering Company, Florham Park, N.J.**

**Filed Jul. 28, 1995, Ser. No. 508,640**

**Int. Cl.[6] C08F** *8/34*

**U.S. Cl. 525—333.3** **6 Claims**

1. A functionalized styrene polymer or copolymer which contains in the polymeric chain monomeric units of the formula:




wherein $R_1$ is of alkyl or primary or secondary halo alkyl; $R_2$ is






wherein is an integer of from 2 to 10, $R_3$ is hydrogen or an alkyl group, and X is NH, O or S.

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**5,741,865**

**FATTY ALKLY DIETHANOLAMINES TO STABILIZE THE OPTICAL CLARITY OF POLYOLS CONTAINING ZINC FATTY ACID SALTS**

**Charles R. Bunting, Country Club Hills, and Donald G. Zelhart, Palos Park, both of Ill., assignors to Witco Corporation, Greenwich, Conn.**

**Filed Jul. 18, 1995, Ser. No. 503,886**

**Int. Cl.[6] C08L** *67/02;71/02*

**U.S. Cl. 525—394** **11 Claims**

1. A process for retarding the tendency to opacify of a liquid composition of matter comprising polyol as the major component, comprising admixing said polyol with one or more zinc salts of fatty acids containing 8 to 24 carbon atoms, and one or more fatty alkyl amine diethoxylates in a small amount effective to retard said tendency to opacify, wherein said fatty alkyl amine diethoxylates have the formula $R—N((—CH_2CH_2O)_nH)_2$ in which R is alkyl or alkenyl containing 12 to 22 carbon atoms, and n is 1 to 5.

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**5,741,866**

**METHOD FOR PRODUCING AN ACETAL COPOLYMER**

**Shyuzi Yahiro, Yamamoto, and Minoru Yamamoto, Kurashiki, both of Japan, assignors to Asahi Kasei Kogo Kabushiki Kaisha, Osaka, Japan**

**PCT No. PCT/JP95/00306, § 371 Date May 6, 1996, § 102(e) Date May 6, 1996, PCT Pub. No. WO95/23171, PCT Pub. Date Aug. 31, 1995**

**PCT Filed Feb. 28, 1995, Ser. No. 646,238**

**Claims priority, application Japan, Feb. 28, 1994, 6-052576**

**Int. Cl.[6] C08G** *63/91*

**U.S. Cl. 525—414** **5 Claims**

1. A method for producing an acetal copolymer, which comprises copolymerizing trioxane with 1,3-dioxolane or 1,4-butanediol formal in the presence of a cation-active catalyst, wherein said 1,3-dioxolane or 1,4-butanediol formal is obtained by adding to fresh 1,3-dioxolane or 1,4-butanediol formal containing a peroxide derived therefrom in an amount of 15 ppm by weight or less in terms of hydrogen peroxide at least one sterically hindered phenol in an amount of from 10 to 500 ppm by weight, based on the weight of said fresh 1,3-dioxolane or 1,4-butanediol formal.

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**5,741,867**

**PROCESS FOR ADJUSTING THE VISCOSITY OF HIGHLY CONCENTRATED ELASTANE SOLUTIONS FOR THE DRY SPINNING OR WET SPINNING OF ELASTANE FIBRES**

**Ulrich Reinehr; Günter Türck, both of Dormagen; Tilo Sehm, Düsseldorf; Wolfgang Anderheggen; Toni Herbertz, both of Dormagen, all of Germany, and Gino Antolini, Bergamo, Italy, assignors to Bayer Faser GmbH, Dormagen, Germany**

**Continuation of Ser. No. 573,704, Dec. 18, 1995, abandoned. This application Jan. 10, 1996, Ser. No. 677,995**

**Claims priority, application Germany, Dec. 23, 1994, 44 46 339.1**

**Int. Cl.[6] C08F** *283/04*

**U.S. Cl. 525—453** **7 Claims**

1. A process for adjusting the viscosity of highly concentrated elastane solutions for the dry or wet spinning of elastane fibres from elastane solutions, characterised in that 0.2 to 1 wt. % of a secondary aliphatic amine, based on a 100 wt. % polyurethane content, are added to an elastane solution of polyester- or polyetherurethanes (urethane ureas) with a polyurethane content of at least 30 wt. % in order to reduce their viscosity, allowed to react at a temperature of at least 20° C. for a period of 1 to 60 minutes and subsequently brought to a process temperature of 20° to 80° C. for the spinning process.

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**5,741,868**

**OLEFIN POLYMERIZATION PROCESS BY USING A SUBSTITUTED INDENYL CONTAINING METALLOCENE CATALYST**

**Andreas Winter, Glashütten; Frank Küber, Oberursel; Michael Aulbach, Hofheim; Bernd Bachmann, Eppstein; Robert Klein, Frankfurt am Main; Klaus Kühlein, Kelkheim; Walter Spaleck, Liederbach, and Christian Kohlpaintner, Kelkheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany**

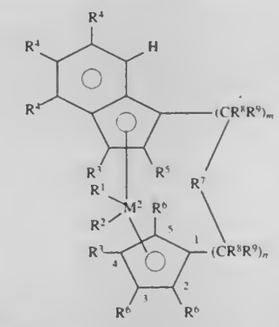
**Division of Ser. No. 360,608, Dec. 21, 1994, Pat. No. 5,543,373. This application Jun. 7, 1995, Ser. No. 477,412**

**Claims priority, application Germany, Dec. 27, 1993, 43 44 688.4**

**Int. Cl.[6] C08F** *4/64*

**U.S. Cl. 526—127** **12 Claims**

1. A process for preparing an olefin polymer comprising the step of polymerizing at least one olefin in the presence of a catalyst which contains at least one metallocene as transition metal compound and at least one cocatalyst, wherein the metallocene is a compound of the formula I



(I)

where

$M^2$ is a metal of the group IVb, Vb or VIb of the Periodic Table,

$R^1$ and $R^2$ are identical or different and are a hydrogen atom, a $C_1$–$C_{10}$-alkyl group, a $C_1$–$C_{10}$-alkoxy group, a $C_6$–$C_{10}$-aryl group, a $C_6$–$C_{10}$-aryloxy group, a $C_2$–$C_{10}$-alkenyl group, a $C_7$–$C_{40}$-arylalkyl group, a $C_7$–$C_{40}$-alkylaryl group, a $C_8$–$C_{40}$-arylalkenyl group or a halogen atom,

$R^3$ are identical or different and are a hydrogen atom, a halogen atom, a $C_1$–$C_{10}$-alkyl group which can be halogenated, a $C_6$–$C_{10}$-aryl group, a $C_2$–$C_{10}$-alkenyl group, a $C_7$–$C_{40}$-arylalkyl group, a $C_7$–$C_{40}$-alkyloxy group, a $C_8$–$C_{40}$-arylalkenyl group, a $—NR_2^{10}$, $—OR^{10}$, $—SR^{10}$, $—OSiR_3^{10}$, $—SiR_3^{10}$ or $—PR_2^{10}$ radical, where $R^{10}$ is a halogen atom, a $C_1$–$C_{10}$-alkyl group or a $C_6$–$C_{10}$-aryl group,

$R^4$ are identical or different and are a hydrogen atom, a halogen atom, a $C_1$–$C_{20}$-alkyl group, a $C_1$–$C_{20}$-fluoroalkyl group, a $C_6$–$C_{30}$-aryl group, a $C_6$–$C_{40}$-fluoroaryl group, a $C_1$–$C_{20}$-alkoxy group, a $C_2$–$C_{20}$-alkenyl group, a $C_7$–$C_{40}$-arylalkyl group, a $C_8$–$C_{40}$-arylalkenyl group, a $C_7$–$C_{40}$-alkylaryl group, a $—NR_2^{10}$, $—OR^{10}$, $—SR^{10}$, $—OSiR_3^{10}$, $—SiR_3^{10}$ or $—PR_2^{10}$ radical, where $R^{10}$ is a halogen atom, a $C_1$–$C_{10}$-alkyl group or a $C_6$–$C_{10}$-aryl group, or two or more radicals $R^4$ together with the atoms connecting them form a ring system,

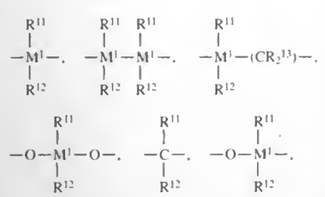
$R^5$ is a hydrogen atom, a halogen atom, a $C_1$–$C_{10}$-alkyl group which can be halogenated, a $C_6$–$C_{10}$-aryl group, a $C_2$–$C_{10}$-alkenyl group, a $C_7$–$C_{40}$-arylalkyl group, a $C_7$–$C_{40}$-alkyloxy group, a $C_8$–$C_{40}$-arylalkenyl group, a $—NR_2^{10}$, $—OR^{10}$, $—SR^{10}$, $—OSiR_3^{10}$, $—SiR_3^{10}$ or $—PR_2^{10}$ radical, where $R^{10}$ is a halogen atom, a $C_1$–$C_{10}$-alkyl group or a $C_6$–$C_{10}$-aryl group,

$R^6$ are identical or different and are a hydrogen atom, a halogen atom, a $C_1$–$C_{20}$-alkyl group which can be halogenated, a $C_6$–$C_{30}$-aryl group, a $C_2$–$C_{10}$-alkenyl group, a $C_7$–$C_{40}$-arylalkyl group, a $C_7$–$C_{40}$-alkyloxy group, a $C_8$–$C_{40}$-arylalkenyl group, a $—NR_2^{10}$, $—OR^{10}$, $—SR^{10}$, $—OSiR_3^{10}$, $—SiR_3^{10}$ or $—PR_2^{10}$ radical, where $R^{10}$ is a halogen atom, a $C_1$–$C_{10}$-alkyl group or a $C_6$–$C_{10}$-aryl group,

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$R^7$ is



$=BR^{11}$, $=AlR^{11}$, —Ge—, —Sn—, —O—, —S—, =SO, $=SO_2$, $=NR^{11}$, =CO, $=PR^{11}$ or $=P(O)R^{11}$,

where $R^{11}$, $R^{12}$ and $R^{13}$ are identical or different and are a hydrogen atom, a halogen atom, a $C_1$–$C_{20}$-alkyl group, a $C_1$–$C_{20}$-fluoroalkyl group, a $C_6$–$C_{30}$-aryl group, a $C_6$–$C_{30}$-fluoroaryl group, a $C_1$–$C_{20}$-alkoxy group, a $C_2$–$C_{20}$-alkenyl group, a $C_7$–$C_{40}$-arylalkyl group, a $C_8$–$C_{40}$-arylalkenyl group, a $C_7$–$C_{40}$-alkylaryl group, or $R^{11}$ and $R^{12}$ or $R^{11}$ and $R^{13}$ in each case together with the atoms connecting them form a ring,

$M^1$ is silicon, germanium or tin,

$R^8$ and $R^9$ are identical or different and are a hydrogen atom, a halogen atom, a $C_1$–$C_{20}$-alkyl group, a $C_1$–$C_{20}$-fluoroalkyl group, a $C_6$–$C_{30}$-aryl group, a $C_6$–$C_{30}$-fluoroaryl group, a $C_1$–$C_{20}$-alkoxy group, a $C_2$–$C_{20}$-alkenyl group, a $C_7$–$C_{40}$-arylalkyl group, a $C_8$–$C_{40}$-arylalkenyl group, a $C_7$–$C_{40}$-alkylaryl group, or $R^8$ and $R^9$ together with the atoms connecting them form a ring,

m and n are identical or different and are zero, 1 or 2, where m plus n is zero, 1 or 2, wherein at least one of the radicals $R^4$ and $R^5$ is not hydrogen.

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**5,741,869**

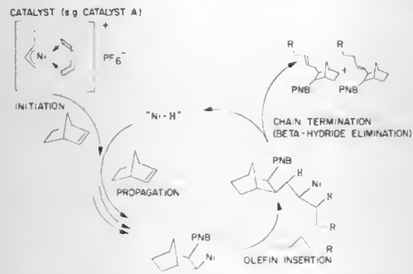
**ADDITION POLYMERS DERIVED FROM NORBORNENE-FUNCTIONAL MONOMERS AND PROCESS THEREFOR**

**Brian Leslie Goodall, Akron; George Martin Benedikt, Solon; Lester Howard McIntosh, III, Cuyahoga Falls; Dennis Allen Barnes, Medina, and Larry Funderburk Rhodes, Silver Lake, all of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio**

**Division of Ser. No. 339,863, Nov. 15, 1994, Pat. No. 5,569,730, and a continuation-in-part of Ser. No. 153,250, Nov. 16, 1993, Pat. No. 5,468,819. This application Jun. 7, 1995, Ser. No. 481,027**

**Int. Cl.[6] C08F** *4/80;4/76;4/78;10/00*

**U.S. Cl. 526—171** **86 Claims**




**14**. An essentially anhydrous reaction mixture in which a processable addition polymer is formed, said reaction mixture comprising,

(a) one or more norbornene-functional monomers, and optionally one or more monocyclomonoolefins;

(b) a pre-formed single component complex metal catalyst of a Group VIII metal which initiates and maintains chain growth of a polymer by an insertion reaction in combination with;

(c) a predetermined amount of a terminal olefinic chain transfer agent, in the absence of an organometal cocatalyst;

said pre-formed single component catalyst consisting essentially of

(i) a cation of said organo Group VIII metal complex, and

(ii) a weakly coordinating counteranion;

said cation having a hydrocarbyl group directly bound to said Group VIII metal by a single metal-C σ-bond, and by not more than three π-bonds, to a weakly coordinating neutral donating ligand, and

(d) a hydrocarbon or halohydrocarbon solvent in which said cycloolefin monomer, said catalyst and said chain transfer agent are soluble.

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**5,741,870**

**RESIN COMPOSITION**

**Kaoru Ikeda; Toshiaki Sato, both of Kurashiki, and Kazushige Ishiura, Kashima-gun, all of Japan, assignors to Kuraray Co., Ltd., Japan**

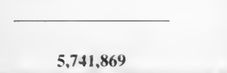
**Continuation of Ser. No. 514,864, Aug. 14, 1995, Pat. No. 5,571,871, which is a division of Ser. No. 208,025, Mar. 8, 1994, Pat. No. 5,466,748. This application Aug. 2, 1996, Ser. No. 691,464**

**Claims priority, application Japan, Mar. 15, 1993, 5-54124; Jul. 14, 1993, 5-174335; Jul. 19, 1993, 5-178360**

**Int. Cl.[6] C08F** *4/52*

**U.S. Cl. 526—198** **15 Claims**

**1**. A polyolefin comprising a cyclic boronic acid ester group and repeating units represented by the following formula:



wherein $R^1$ represents a hydrogen atom or an alkyl group having 1 to 20 carbon atoms, said cyclic boronic acid ester group being bonded to an $sp^3$ carbon atom of said polyolefin.

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**5,741,871**

**ACRYLIC EMULSIONS PREPARED IN THE PRESENCE OF FULLY HYDROLYZED POLY (VINYL ALCOHOL)**

**Richard Henry Bott, and Frank Vito DiStefano, both of Macungie, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**Filed Jun. 14, 1996, Ser. No. 663,496**

**Int. Cl.[6] C08F** *2/22;2/38;20/18*

**U.S. Cl. 526—202** **18 Claims**

**1**. In a process for the emulsion polymerization of a monomer mixture consisting essentially of water insoluble, ethylenically unsaturated monomers having acrylic unsaturation comprising polymerizing said water insoluble, ethylenically unsaturated monomers having acrylic unsaturation in the presence of water and a stabilizer for producing an emulsion containing polyacrylic polymer, the improvement for producing an acrylic emulsion having a solids content of greater than 45% by weight without microfluidization which comprises:

a) effecting the polymerization in a polymerization zone utilizing a stabilizer consisting essentially of poly(vinyl alcohol) derived by the hydrolysis of polyvinyl acetate and selected from the group consisting of poly(vinyl alcohol) having a hydrolysis value of greater than 96.5% and a number average molecular weight of 5,000 to 45,000 and a poly(vinyl alcohol) having a hydrolysis value of at least 86% where the number average molecular weight is within a range of from about 5,000 to 13,000 and in the substantial absence of surfactants and solvents, said poly(vinyl alcohol) being present in an amount of from 2 to about 12% by weight of the monomers to be polymerized; and,



b) effecting the polymerization in the presence of a chain transfer agent, said chain transfer agent incorporated in an amount of from 0.2 to 3% by weight of the monomers to be polymerized;

c) effecting polymerization of a monomer mixture of $C_{1-8}$ alkyl esters of acrylic or methacrylic acid monomers, the majority of the $C_{1-8}$ alkyl esters of acrylic or methacrylic acid monomers having a carbon content greater than methyl acrylate and less than 10% of ethylenically unsaturated monomers which are not $C_{1-8}$ alkyl esters of acrylic or methacrylic acid monomers, and,

d) effecting polymerization such that the polyacrylic polymer in said emulsion has a particle size range from 0.3 to 2 microns.

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**5,741,872**

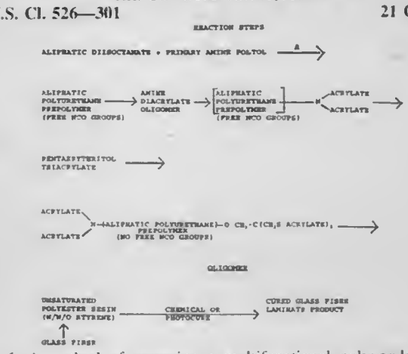
**MULTIFUNCTIONAL POLYACRYLATE-POLYURETHANE OLIGOMER AND METHOD**

**Stuart B. Smith, Conyers, Ga., assignor to Hehr International Inc., Decatur, Ga.**

**Continuation-in-part of Ser. No. 629,894, Apr. 10, 1996. This application Nov. 12, 1996, Ser. No. 745,445**

**Int. Cl.[6] C08F** *126/02;120/36*

**U.S. Cl. 526—301** **21 Claims**




**1**. A method of preparing a multifunctional polyacrylate aliphatic polyurethane oligomer adapted to react with a monomer in a polymer curing system, which method comprises:

a) reacting an aliphatic polyisocyanate with an amine polyol to form a polyurethane prepolymer with free isocyanate groups;

b) reacting the aliphatic polyurethane prepolymer with an amine polyacrylate monomer in an amount sufficient to provide an acrylate-aliphatic polyurethane prepolymer with free isocyanate groups; and

c) reacting a polyacrylate aliphatic hydroxy monomer with the acrylate-aliphatic polyurethane prepolymer in about a stoichiometric amount to react the hydroxy group with the free isocyanate groups to provide a multifunctional polyacrylate aliphatic polyurethane oligomer having substantially no free reactive isocyanate or hydroxyl groups.

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**5,741,873**

**LOW ORGANIC EMISSION RESINS**

**Ronald A. Andrekanic; Joseph Pugach, both of Allegheny County, and Thomas W. Smeal, Westmoreland County, all of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.**

**Filed Jun. 27, 1997, Ser. No. 883,992**

**Int. Cl.[6] C08F** *12/24*

**U.S. Cl. 526—313** **10 Claims**

**1**. A composition consisting essentially of:

(a) about 60 to about 90 wt % of at least one alkoxylated bisphenol-A diacrylate or dimethacrylate;

(b) about 5 to about 30 wt % ethylene glycol dimethacrylate; and

(c) about 5 to about 25 wt % of a vinyl monomer selected from the group consisting of vinyl toluene, styrene, t-butyl styrene and divinyl benzene.

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**5,741,874**

**METHOD FOR PRODUCING POLY(VINYL CHLORIDE)**

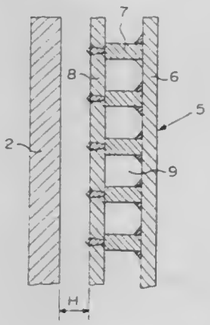
**Hideto Iizawa; Susumu Kato, and Shuichi Sakakibara, all of Okayama, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan**

**Filed Sep. 7, 1995, Ser. No. 525,295**

**Claims priority, application Japan, Sep. 12, 1994, 6-217291; Sep. 29, 1994, 6-235356; Sep. 30, 1994, 6-237874**

**Int. Cl.[6] C08F** *2/10;14/06*

**U.S. Cl. 526—344.2** **20 Claims**




**1**. A method for producing a poly(vinyl chloride) which comprises polymerizing vinyl chloride or a mixture of copolymerizable monomers containing vinyl chloride as the main component, in an aqueous medium, wherein said polymerization is carried out in a reaction vessel comprising a temperature control element, said temperature control element being formed by arranging partition plates at intervals at right angles to the outer surface of an inner barrel and overlaying outer strips on and between the ends of the partition plates opposite to the surface of the inner barrel to thereby form a flow passage unit having a flow passage for a heating medium defined by the partition plates, the inner barrel and the outer strips, attaching said temperature control element in a reaction vessel so as to provide a continuous gap between the outer side of the outer strips and the inner surface of said reaction vessel, and sealing the upper and lower portions of the gap formed between the outer strip side of the temperature control element and the inner surface of the reaction vessel to form a gap chamber.

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**5,741,875**

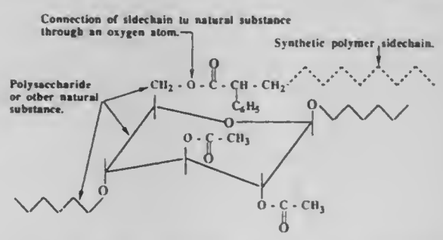
**BIODEGRADABLE PLASTICS AND COMPOSITES FROM WOOD**

**John J. Meister, 31675 Westlady Rd., Beverly Hills, Mich. 48025-3744, and Meng-Jiu Chen, 901 St. Louis, Apt. #25, Ferndale, Mich. 48220**

**Continuation-in-part of Ser. No. 80,006, Jun. 21, 1993, Pat. No. 5,424,382, which is a continuation-in-part of Ser. No. 789,360, Nov. 8, 1991, abandoned. This application Mar. 8, 1995, Ser. No. 400,891**

**Int. Cl.[6] C08H** *5/02*

**U.S. Cl. 527—400** **14 Claims**




**1**. A biodegradable composition comprising first component, A, and second component, B, in which both of said components A and B are biodegradable wherein

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a) component A is a grafted, lignin-containing material, having a lignin-containing part with an aromatic ring and a graft part, the graft part being connected by carbon-carbon bond to the lignin aromatic ring or to a carbon bonded by one or more carbon bonds to the aromatic ring and

i) the lignin-containing part is a piece of a vascular plant or derived from such plant and

ii) the grafted part

$$|-(R_u)_m-|_n$$

is at least one polymerized, substituted ethene or ethyne chain, $-(R_u)_m-$, containing "m" of from 1 to 500,000 repeat units, $R_u$, in "n" grafted polymeric chains where "n" is n=1 to n=500 where

$$R_u = \begin{array}{l} R_2\ R_3 \\ | \quad | \\ -C-C- \\ | \quad | \\ R_1\ R_4 \end{array} \quad \text{or} \quad R_u = \begin{array}{l} R_1 \\ | \\ -C=C- \\ \quad | \\ \quad R_2 \end{array}$$

and $R_i$, with i=1, 2, 3, or 4 is an organic or inorganic functional group which does not interfere with free radical polymerization and selected from the group consisting of:

(1) hydrogen;

(2) a halogen;

(3) the group consisting of an organic acid, an organic alcohol, an aldehyde, an alkane, an alkene, an alkyne, an amide, an aromatic, a cycloalkane, an ester, an ether, an organic halogen, a ketone, an organic nitrile, a phenol, an organophosphate, and an organic sulfonic acid;

(4) the group specified at (3) substituted in at least one carbon atom by a heteroatom with the atomic symbol S, Se, Te, N, P, As, Sb, Bi, Si, Ge, Sn, Pb, or B;

(5) the group specified at (3) further substituted on at least one carbon atom by members of the group specified at (3); and

(6) the group specified at (4) further substituted on the heteroatom by members of the group specified at (3),

b) component B is a synthetic polymeric phase consisting of at least one polymer molecule, $R'_q$, where R' designates a monomer, q designates the number of repeat units, q is between 25 and 500,000, and the total molecular weight of the average polymer molecule is between 500 and 50,000,000, and

c) said component A having said grafted part, $[-(R_u)_m-]_n$ being reactive with lignolytic organisms to provide charged radical organic moieties and said component B being reactive in the presence of said radical moieties by radical reaction propagated from said component A to said component B facilitated by or at least uninhibited by the carbon-carbon bond to decompose both of said A and B components.

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**5,741,876**

**METHOD OF PREPARING POWDERED SILICONE RESINS**

**Leslie Earl Carpenter, II, Tokyo, Japan; Jason Richard Cassiday, Midland, Mich.; Leon Neal Cook, Midland, Mich.; Linda Moy Madore, Midland, Mich.; Theodore Arnold Oberhellman, III, Midland, Mich.; Randall Gene Schmidt, Midland, Mich., and Hongxi Zhang, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Continuation-in-part of Ser. No. 497,736, Jul. 3, 1995. This application Dec. 23, 1996, Ser. No. 774,864**

**Int. Cl.[6] C08G** *77/00*

**U.S. Cl. 528—10** **13 Claims**

1. A method of preparing silicone resin powder, comprising the steps of:

(1) preparing a solution of an MQ silicone resin in a volatile liquid organosilicon solvent;

said solution including no more than 5 weight percent of an aromatic organic solvent, based on the weight of said volatile liquid organosilicon solvent;

said MQ silicone resin including M units of the general formula $R_3SiO_{1/2}$ and Q units of the general formula $SiO_{4/2}$ wherein R is a functional or nonfunctional, substituted or unsubstituted monovalent organic radical;

said silicone resin having a ratio of M groups to Q groups between about 0.4 and about 1.1;

said silicone resin having a number average molecular weight between about 2,000 and 15,000 and a polydispersity ranging from 1.0 to about 6.0;

said solution having a resin solids content between about 5% and about 70% by weight; and

(2) spray-drying the solution obtained in step (1) to remove the volatile liquid organosilicon solvent therefrom to produce a silicone resin powder;

said spray-drying step (2) being carried out at a temperature between about 80° C. and about 350° C.

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**5,741,877**

**SILICONE PSEUDOGEL**

**John S. Tiffany, 9490 El Cajon St., Ventura, Calif. 93004**

**Continuation of Ser. No. 570,804, Dec. 12, 1995, abandoned, which is a continuation-in-part of Ser. No. 391,641, Feb. 21, 1995, abandoned. This application Jun. 6, 1997, Ser. No. 870,888**

**Int. Cl.[6] C08G** *77/06*

**U.S. Cl. 528—15** **7 Claims**

1. A pseudogel consisting of a viscoelastic material having a gel-like consistency, said material comprising a network of polydisperse terminally cross-linked polyorganosiloxane polymer chains and containing less than about a 15 percent fluid portion which is capable of being extracted by organic solvents at 20° C. to 40° C., said viscoelastic material having a polydispersity of at least 5.

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**5,741,878**

**METAL-NITROGEN POLYMER COMPOSITIONS COMPRISING ORGANIC ELECTROPHILES**

**Kurt Joseph Becker, Newark; James Allen Jensen, Hockessin, and Alexander Lukacs, III, Wilmington, all of Del., assignors to Lanxide Technology Company, LP, Newark, Del.**

**Continuation of Ser. No. 223,294, Apr. 5, 1994, Pat. No. 5,616,650, which is a continuation-in-part of Ser. No. 148,044, Nov. 5, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 481,672**

**Int. Cl.[6] C08G** *77/06*

**U.S. Cl. 528—25** **40 Claims**

1. A composition comprising the reaction mixture of (1) at least one organic electrophile comprising at least one organic oligomer comprising a multiplicity of organic electrophilic substituents, wherein said electrophilic substituents comprise at least one electrophilic reactive group selected from the group consisting of epoxides and carbonyl-containing groups other than a multifunctional isocyanate and a multifunctional amide, and (2) at least one metal-containing polymer comprising the repeat unit

$$+Si-N+$$

where R, R' and R"=hydrogen, alkyl, alkenyl, alkynyl or aryl.



**5,741,879**

**ENERGY-POLYMERIZABLE COMPOSITIONS COMPRISING A CYANATE ESTER MONOMER OR OLIGOMER AND A POLYOL**

**Fred B. McCormick, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Mar. 3, 1995, Ser. No. 400,053**

**Int. Cl.[6] C08G** *18/08;18/16;* **B37B** *5/16*

**U.S. Cl. 528—48** **16 Claims**

1. A homogeneous, cured composition derived from ingredients comprising:

a cyanate ester monomer or oligomer comprising an organic radical bonded through aromatic carbon atoms to at least two —OCN groups;

a low molecular weight polyalkylene glycol; and

an organometallic compound of the general formula:

$$|L^1L^2L^3M|^{+e}X_f$$

wherein:

$L^1$ represents none or 1 to 12 ligands contributing pi-electrons that can be the same or different selected cyclic aromatic, acyclic aromatic, cyclic heteroaromatic, acyclic heteroaromatic, cyclic unsaturated, and acyclic unsaturated compounds and groups, each capable of contributing 2 to 24 pi-electrons to the valence shell of M;

$L^2$ represents none or 1 to 24 ligands that can be the same or different, each contributing 2, 4, or 6 electrons selected from mono-, di-, and tridentate ligands to the valence shell of M;

$L^3$ represents none or 1 to 12 ligands that can be the same or different, each contributing no more than one electron to the valence shell of each M;

M represents from 1 to 6 of the same or different metal atoms selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Tc, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, and Pt;

e is an integer from 0 to 2 such that the organometallic portion of the molecule is neutral, cationic, or dicationic;

X is an anion selected from the group consisting of organic sulfonate, halogenated metal, alkylated metal, arylated metal, halogenated metalloid, alkylated metalloid, and arylated metalloid groups;

f is an integer from 0 to 2 and is the number of anions required to balance the charge e on the organometallic portion of the molecule;

with the proviso that the organometallic compound contains at least one transition metal to carbon bond and that $L^1$, $L^2$, $L^3$, M, e, X, and f are chosen so as to achieve stable configuration.

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**5,741,880**

**CLEARCOATING COMPOSITIONS**

**Richard S. Valpey, III, Frankfort, Ill., and Eugene I. Bzowej, Chicago, Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio**

**Filed Apr. 28, 1997, Ser. No. 845,841**

**Int. Cl.[6] C08G** *18/62;18/42;* **C08F** *12/08;20/18;20/20;20/28;* **C07C** *69/54;69/52*

**U.S. Cl. 528—74** **13 Claims**

1. A hydroxy-functional polymer having a number average molecular weight, as determined by gel permeation chromatography, of from about 1800 to about 2700 and which consists essentially of polymerized monomers of 10–40% by weight, based on the total weight of the polymer, styrene; 20–55% by weight isobornyl methacrylate; and 20–55% by weight hydroxypropyl methacrylate; where the total of the monomers equals 100%.

**5,741,881**

**PROCESS FOR PREPARING COVALENTLY BOUND-HEPARIN CONTAINING POLYURETHANE-PEO-HEPARIN COATING COMPOSITIONS**

**Birendra K. Patnaik, Chester, N.J., assignor to Meadox Medicals, Inc., Oakland, N.J.**

**Filed Nov. 25, 1996, Ser. No. 755,190**

**Int. Cl.[6] C08G** *18/62*

**U.S. Cl. 528—75** **44 Claims**

1. A bio-active coating comprising the reaction product of:

a) a first reaction that includes reacting a bio-compatible polymer backbone having α,β-unsaturated carbonyl functionality with a hydrophilic spacer having at least one reactive functional group at its first and second ends, wherein one of said reactive functional groups reacts with a β-carbon of said unsaturated carbonyl functionality to bond said spacer to said polymer backbone; and

b) a second reaction that includes reacting a bio-active agent with a remaining unreacted reactive functional group of said spacer to covalently hind said bio-active agent to said spacer.

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**5,741,882**

**ALIPHATIC POLYESTER AND A PROCESS FOR THE PREPARATION THEREOF**

**Takeaki Fujii; Kenji Kobayashi, both of Iruma-gun; Sadakatsu Suzuki, Kawaguchi, and Hiroshi Ueno, Hiki-gun, all of Japan, assignors to Tonen Corporation, Tokyo, Japan**

**Filed Sep. 21, 1995, Ser. No. 531,694**

**Claims priority, application Japan, Sep. 21, 1994, 6-253003; Oct. 11, 1994, 6-270197; Feb. 7, 1995, 7-041383**

**Int. Cl.[6] C08G** *63/78;* **C08K** *3/10*

**U.S. Cl. 528—279** **19 Claims**

1. A process for the preparation of an aliphatic polyester of the formula:

$$R^1O+R^2-O-\overset{O}{\overset{\|}{C}}-R^1-\overset{O}{\overset{\|}{C}}-O+_nR^2-OR^1 \quad (1)$$

wherein $R^1$ is a hydrogen atom or a $C_1$ to $C_8$ alkyl group; $R^2$ and $R^1$ may be independent form each other and may each represent a $C_2$ to $C_{12}$ alkylene group; and n represents a polymerization degree, and which has a number average molecular weight of larger than 70,000 by reaction of a diester of a dibasic aliphatic carboxylic acid with an aliphatic glycol, characterized in that a catalyst is portionwise added to a reaction system at least twice at an interval of at least ten minutes in a period of time of the reaction including a starting point of the reaction.

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**5,741,883**

**TOUGH, SOLUBLE, AROMATIC, THERMOPLASTIC COPOLYIMIDES**

**Robert G. Bryant, Poquoson, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Dec. 16, 1994, Ser. No. 359,752**

**Int. Cl.[6] C08G** *73/10;69/26*

**U.S. Cl. 528—353** **42 Claims**

1. A tough, soluble, aromatic, thermoplastic copolyimide prepared by reacting 4,4'-oxydiphthalic anhydride with 3,4,3',4'-biphenyltetracarboxylic dianhydride and 3,4'-oxydianiline.

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5,741,884

**PROCESS FOR MAKING POLY(THIOETHER ETHER)S FROM DIALLYL ETHER AND DITHIOLS**

**Gangfeng Cai, and Robert G. Gastinger, both of West Chester, Pa., assignors to Arco Chemical Technology, L.P., Greenville, Del.**

**Division of Ser. No. 179,793, Jan. 11, 1994. This application Jun. 2, 1995, Ser. No. 460,321**

**Int. Cl.[6] C08G** *75/04*

**U.S. Cl. 528—375** **9 Claims**

1. A liquid poly(thioether ether) prepared by reacting, under free-radical conditions, diallyl ether with at least two different dithiols selected from the group consisting of 1,2-ethanedithiol, 1,3-propanedithiol, 1,4-butanedithiol, and 1,6-hexanedithiol.

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5,741,885

**METHODS FOR REDUCING ALLERGENICITY OF NATURAL RUBBER LATEX ARTICLES**

**Jeffrey S. Dove, Santa Ana, Calif., assignor to Baxter International Inc., Deerfield, Ill.**

**Continuation-in-part of Ser. No. 519,371, Aug. 25, 1995, Pat. No. 5,691,446. This application Aug. 16, 1996, Ser. No. 689,975**

**Int. Cl.[6] A61F** *6/00;* **A61L** *2/00;27/00;31/00*

**U.S. Cl. 528—935** **26 Claims**

1. A method for the production of an enhanced hypoallergenic natural rubber latex article having normal physical, mechanical, and chemical properties and having opposed inside and outside surfaces with at least a portion of both surfaces exhibiting reduced allergenicity, said method comprising the steps of:

dipping an article forming mandrel coated with a latex coagulant composition incorporating a screening reagent into a natural rubber latex emulsion including antigenic components to directly sequester those antigenic components coming into contact with said screening reagent as said latex emulsion coagulates on said mandrel; and

inducing the remaining antigenic components of said coagulating latex emulsion to bloom onto and adjacent to the surface of said coagulating latex emulsion opposite to the surface of said coagulating latex emulsion in contact with said mandrel.

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5,741,886

**END-CAPPED POLYMERIC BIGUANIDES**

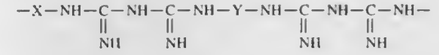
**Richard F. Stockel, 475 Rolling Hills Rd., Bridgewater, N.J. 08807, and Murray Jelling, 21 Spring Hill Rd., Roslyn Heights, N.Y. 11577**

**Filed Sep. 19, 1995, Ser. No. 530,704**

**Int. Cl.[6] C08G** *73/00*

**U.S. Cl. 528—422** **17 Claims**

1. A linear polymeric biguanide or a salt thereof wherein the polymeric chain is wholly or substantially wholly terminated at its cyanoguanidine end group by a primary or secondary monoamine containing 2–90 carbon atoms, said monoamine being optionally substituted with a functionality selected from the group consisting of fluoride, chloride, bromide, iodide, nitro, hydroxyl, ether, sulfide, disulfide, sulfoxide and sulfone, said polymeric biguanide, in the form of its free base, comprising recurring units of the general formula:



wherein X and Y are the same or different organic radical bridging groups.

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5,741,887

**AGENTS AND METHODS FOR GENERATION OF ACTIVE OXYGEN**

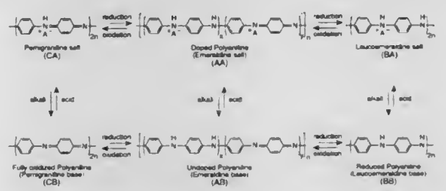
**Ken-ichi Morita, 3-12-5 Kataseyama, Fujisawa, Kanagawa; Shigeru Otsuka, Saitama, and Kiyoshi Saito, Chiba, all of Japan, assignors to Ken-ichi Morita, Kanagawa, Japan**

**Filed Aug. 14, 1996, Ser. No. 700,592**

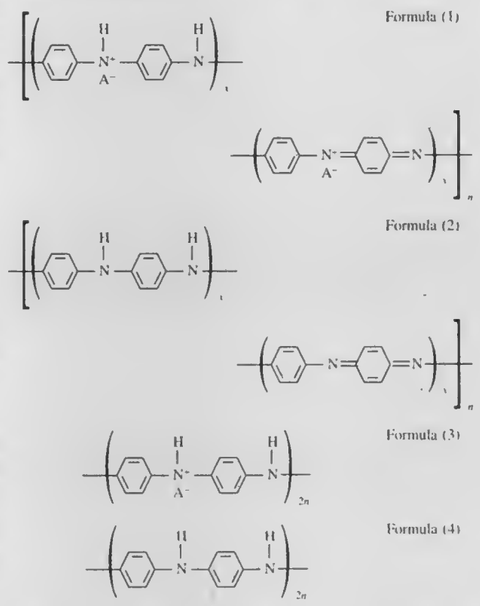
**Claims priority, application Japan, Dec. 26, 1995, 7-338347**

**Int. Cl.[6] C08G** *73/00*

**U.S. Cl. 528—422** **12 Claims**




1. A method of generating active oxygen, said method comprising the step of causing a liquid having oxygen dissolved therein to contact an agent comprising polyaniline which is one or more selected from the group consisting of compounds shown by Formulas (1)–(4) given below:




where A is a negative ion, n is an integer between 2 and 5000, and x and y are numbers such that $x+y=1$ and $0 \leqq y \leqq 0.5$.



5,741,888

**REMOVAL OF HETEROPOLY COMPOUNDS FROM POLYETHERS, POLYESTERS AND POLYETHER ESTERS**

**Hans-Jürgen Weyer, Bobenheim-Roxheim, and Rolf Fischer, Heidelberg, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**PCT No. PCT/EP95/03956, § 371 Date Mar. 27, 1997, § 102(e) Date Mar. 27, 1997, PCT Pub. No. WO96/11222, PCT Pub. Date Apr. 18, 1996**

**PCT Filed Oct. 6, 1995, Ser. No. 809,689**

**Claims priority, application Germany, Oct. 7, 1994, 44 35 934.9**

**Int. Cl.[6] C08F** *6/00;* **C08J** *3/00*

**U.S. Cl. 528—494** **14 Claims**

1. A method of removing heteropoly compounds from polymers, polyesters and/or polyether esters, which are contaminated with heteropoly compounds, which comprises adding, to the polymers or a solution thereof, an ether whose polarity is so low that its addition leads to the deposition of the heteropoly compound in a separate phase, and separating off the precipitated heteropoly compound phase.

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5,741,889

**MODIFIED ROSIN EMULSION**

**Yan C. Huang, Campbell Hall; M. Bruce Lyne, Warwick, and John H. Stark, Campbell Hall, all of N.Y., assignors to International Paper Company, Purchase, N.Y.**

**Filed Apr. 29, 1996, Ser. No. 639,399**

**Int. Cl.[6] C09F** *1/00;1/04*

**U.S. Cl. 530—210** **8 Claims**

1. A method for making a sizing agent for paper which comprises mixing water, a cationic rosin emulsion containing from about 30 to about 35 wt. % cationic rosin solids and from about 1 to about 6% by weight relative to the rosin solids in the modified rosin emulsion of a water soluble salt of a poly(alkylene-acrylic acid) copolymer under high shear mixing conditions to provide a modified cationic rosin emulsion containing from about 20 to about 25 percent by weight cationic rosin solids and mixing the modified cationic emulsion with a starch solution to provide a surface size agent.

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5,741,890

**PROTEIN BINDING FRAGMENTS OF GRAVIN**

**John D. Scott; J. Brian Nauert, and Theresa M. Klauck, all of Portland, Oreg., assignors to Oregon Health Sciences University, Portland, Oreg.**

**Filed Dec. 19, 1996, Ser. No. 769,309**

**Int. Cl.[6] C07K** *14/00*

**U.S. Cl. 530—300** **3 Claims**

1. A polypeptide fragment that binds to a type II regulatory subunit of cAMP-dependent protein kinase, said fragment consisting of the amino acid sequence set out in SEQ ID NO.: 1.

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5,741,891

**PULMONARY SURFACTANT PEPTIDE SOLUBILIZATION PROCESS**

**James V. Weber, Newton, Pa.; Charles F. Kasulanis, High Bridge, and Keith Sampino, Parsippany, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.**

**Filed Oct. 22, 1996, Ser. No. 735,171**

**Int. Cl.[6] A61K** *38/00;* **C07K** *5/00;7/00*

**U.S. Cl. 530—326** **7 Claims**

1. An improvement in the process of preparing liposomal pulmonary surfactant composition by ethanolic injection, wherein the liposomal pulmonary surfactant composition is comprised of a polypeptide and a pharmaceutically acceptable phospholipid, the improvement comprising preparing a form of the polypeptide, or salt or ester thereof, which exhibits enhanced solubility in ethanol, comprising the steps of:

(a) preparing a solution of the polypeptide or salt or ester thereof in a fluorinated alcohol at a concentration of about 5 to 40 mg/ml;

(b) incubating for a period of time sufficient to achieve an optical density at 450 nanometers of less than 0.06;

(c) filtering; and

(d) removing the fluorinated alcohol to recover solid, soluble polypeptide.

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5,741,892

**PENTAPEPTIDES AS ANTITUMOR AGENTS**

**Teresa Barlozzari, Wellesley; Andreas Haupt, Westborough; Bernd Janssen, Marlborough, all of Mass.; Christian Griesinger, Oberursel; Daniel Belik, Frankfurt, both of Germany; Michael Boretzky, Offenbach, Germany, and George R. Pettit, Paradise Valley, Ariz., assignors to Basf Aktiengesellschaft, Rheinland-Pfalz, Germany**

**Filed Jul. 30, 1996, Ser. No. 688,334**

**Int. Cl.[6] C07K** *7/00*

**U.S. Cl. 530—330** **8 Claims**

1. A compound of Formula I,

A-B-N($CH_3$)-CHD-CH($OCH_3$)-$CH_2$CO-Pro-Pro-K (I),

wherein A is an amino acid residue of the formula $(CH_3)_2N$—CHX—CO, wherein X is a normal or branched $C_3$–$C_4$-alkyl group; B is an amino acid residue selected from the group consisting of valyl, isoleucyl, leucyl, and 2-butylglycyl; D is a normal or branched $C_2$–$C_5$-alkyl group; and K is a t-butoxy group or a substituted amino group; or a salt thereof with a pharmaceutically acceptable acid.

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5,741,893

**COMPOSITIONS AND METHODS UTILIZING NITROXIDES IN COMBINATION WITH BIOCOMPATIBLE MACROMOLECULES**

**Jen-Chang Hsia, 35 Starcrest, Irvine, Calif. 92715**

**Continuation-in-part of Ser. No. 417,132, Mar. 31, 1995, which is a continuation-in-part of Ser. No. 291,590, Aug. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 107,543, Aug. 16, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 487,496**

**Int. Cl.[6] A61K** *38/38;38/42;* **C07K** *14/805*

**U.S. Cl. 530—385** **8 Claims**

1. A composition comprising:

a hemoglobin-based oxygen carrier,

a membrane permeable first nitroxide, and

a nitroxide-labelled membrane impermeable macromolecule selected from the group consisting of albumin, hydroxylethyl starch, dextran, liposome, and immunoglobulin.

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5,741,894

**PREPARATION OF PHARMACEUTICAL GRADE HEMOGLOBINS BY HEAT TREATMENT IN PARTIALLY OXYGENATED FORM**

**Mahmood Rezazadeh Azari, Gurnee; August A. Ebeling, Palatine; John E. Picken, Village of Lakewood, and Timothy N. Estep, Grayslake, all of Ill., assignors to Baxter International, Inc., Deerfield, Ill.**

**Filed Sep. 22, 1995, Ser. No. 532,293**

**Int. Cl.[6] C07K** *14/805*

**U.S. Cl. 530—385** **21 Claims**

1. A method for preparing pharmaceutical grade hemoglobin comprising:

adding oxygen to a hemoglobin mixture comprising crosslinked hemoglobin and uncrosslinked hemoglobin to form a reaction

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mixture, the reaction mixture containing from about 11 to about 28% oxyhemoglobin or having a dissolved oxygen content of about 0.7 to about 1.7 ppm;

heating the reaction mixture to form a precipitate containing the uncrosslinked hemoglobin; and

removing the precipitate.

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**5,741,895**

**IDENTIFICATION OF CELL DENSITY SIGNAL MOLECULE**

**Richard I. Schwarz, Oakland, Calif., assignor to The Regents of the University of California, Oakland, Calif.**

**Continuation of Ser. No. 49,481, Apr. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 570,422, Aug. 21, 1990, abandoned. This application May 19, 1995, Ser. No. 445,367**

**Int. Cl.**[6] **C07K** *1/14;1/34;14/465;14/50*

**U.S. Cl. 530—399** **3 Claims**

1. A method of producing substantially purified proteinaceous CDS capable of initially stimulating the proliferation of embryonic tendon cells in culture and thereafter promoting differentiated procollagen gene expression, comprising:

A. providing primary tendon cells in confluent cell cultures,

B. providing conditions, including an unsupplemented medium, in which the cells secrete polypeptides which include CDS,

C. agitating the culture to increase the amount of CDS in the medium,

D. collecting CDS-containing unsupplemented medium, and

E. recovering and purifying the CDS from the collected CDS-containing unsupplemented medium.

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**5,741,896**

**O- OR S- SUBSTITUTED TETRAHYDRONAPHTHALENE DERIVATIVES HAVING RETINOID AND/OR RETINOID ANTAGONIST-LIKE BIOLOGICAL ACTIVITY**

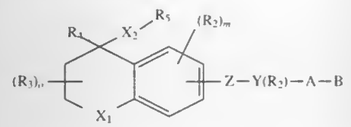
**Vidyasagar Vuligonda, Irvine; Min Teng, Aliso Viejo; Richard L. Beard, Newport Beach; Alan T. Johnson, Rancho Santa Margarita; Yuan Lin, Walnut, and Roshantha A. Chandraratna, Mission Viejo, all of Calif., assignors to ALLERGAN, Irvine, Calif.**

**Filed Jun. 21, 1996, Ser. No. 667,664**

**Int. Cl.**[6] **C07C** *245/10;* **A61K** *31/655*

**U.S. Cl. 534—860** **31 Claims**

1. A compound of the formula



wherein $X_1$ is $[C(R_1)_2]_n$ where $R_1$ is independently H or alkyl of 1 to 6 carbons, and n is an integer between 0 and 2;

$X_2$ is S or O;

Z is —N=N—, —N(O)=N—, —N=N(O)—, —N=$CR_1$—, —$CR_1$=N, —CO—$NR_1$—, —CS—$NR_1$—, —$NR_1$—CO, —$NR_1$—CS,

$R_2$ is hydrogen, lower alkyl of 1 to 6 carbons, F, Cl, Br, I, $CF_3$, flouro substituted alkyl of 1 to 6 carbons, OH, SH, alkoxy of 1 to 6 carbons, or alkylthio of 1 to 6 carbons;

$R_3$ is hydrogen, lower alkyl of 1 to 6 carbons or F;

m is an integer having the value of 0–3;

o is an integer having the value of 0–4;

$R_4$ is hydrogen, alkyl of 1 to 10 carbons, alkenyl of 2 to 10 carbons and having 1 to 3 double bonds, alkynyl having 2 to 10 carbons and 1 to 3 triple bonds, carbocyclic aryl selected from the group consisting of phenyl, $C_1$–$C_{10}$-alkylphenyl, naphthyl, $C_1$–$C_{10}$-alkylnaphthyl, phenyl-$C_1$–$C_{10}$alkyl, napthyl-$C_1$–$C_{10}$alkyl; CN, $(CH_2)_pCO_2H$ or $(CH_2)_pCO_2R_8$ where p is an integer between 0 to 10;

$R_5$ is hydrogen, alkyl of 1 to 10 carbons, fluoro-substituted alkyl of 1 to 10 carbons, alkenyl of 2 to 10 carbons and having 1 to 3 double bonds, alkynyl having 2 to 10 carbons and 1 to 3 triple bonds, carbocyclic aryl selected from the group consisting of phenyl, $C_1$–$C_{10}$-alkylphenyl, naphthyl, $C_1$–$C_{10}$-alkylnaphthyl, phenyl-$C_1$–$C_{10}$alkyl, napthyl-$C_1$–$C_{10}$alkyl; $Si(C_{1-6}alkyl)_3$, $COR_4$, camphanoyl, $C(R_{15})(R_{16})X_2R_{17}$;

Y is a phenyl or naphthyl group optionally substituted with one or two $R_2$ groups;

A is $(CH_2)_q$ where q is 0–5, lower branched chain alkyl having 3–6 carbons, cycloalkyl having 3–6 carbons, alkenyl having 2–6 carbons and 1 or 2 double bonds, alkynyl having 2–6 carbons and 1 or 2 triple bonds;

B is COOH or a pharmaceutically acceptable salt thereof, $COOR_8$, $CONR_9R_{10}$, —$CH_2OH$, $CH_2OR_{11}$, $CH_2OCOR_{11}$, CHO, $CH(OR_{12})_2$, $CHOR_{13}O$, —$COR_7$, $CR_7(OR_{12})_2$, $CR_7OR_{13}O$, or $Si(C_{1-6}alkyl)_3$, where $R_7$ is an alkyl, cycloalkyl or alkenyl group containing 1 to 5 carbons, $R_8$ is an alkyl group of 1 to 10 carbons or (trimethylsilyl)alkyl where the alkyl group has 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or $R_8$ is phenyl or lower alkylphenyl, $R_9$ and $R_{10}$ independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5–10 carbons, or phenyl or lower alkylphenyl, $R_{11}$ is lower alkyl, phenyl or lower alkylphenyl, $R_{12}$ is lower alkyl, and $R_{13}$ is divalent alkyl radical of 2–5 carbons;

$R_4$ is hydrogen, alkyl of 1 to 10 carbons, alkenyl of 2 to 10 carbons and having 1 to 3 double bonds, alkynyl having 2 to 10 carbons and 1 to 3 triple bonds, carbocyclic aryl selected from the group consisting of phenyl, $C_1$–$C_{10}$-alkylphenyl, naphthyl, $C_1$–$C_{10}$-alkylnaphthyl, phenyl-$C_1$–$C_{16}$alkyl, napthyl-$C_1$–$C_{10}$alkyl, and

$R_{15}$ and $R_{16}$ are hydrogen or lower alkyl of 1 to 6 carbons, $R_{17}$ is lower alkyl of 1 to 6 carbons, or $R_{16}$ and $R_{17}$ jointly form a ring having a total of 4 to 5 carbons and the $X_2$ heteroatom.

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**5,741,897**

**PROCESS FOR PREPARING AN N-SUBSTITUED ALDONAMIDE**

**Burkhard Weuste, Gummersbach, and Andrea Katharina Jansen, Eschweiler, both of Germany, assignors to Akzo Nobel nv, Arnhem, Netherlands**

**Filed Jun. 3, 1996, Ser. No. 656,735**

**Claims priority, application European Pat. Off., Jun. 15, 1995, 95201587**

**Int. Cl.**[6] **C07H** *1/00;13/12*

**U.S. Cl. 536—18.5** **16 Claims**

1. A process for preparing an N-substituted aldonamide by reacting an aldonic acid in a polar organic solvent with an amine of the formula $HNR^1(X—NR^1)nR^2$, wherein $R^1$ and $R^2$ may be the same or different and represent a hydrogen atom, a (cyclo)aliphatic or aromatic hydrocarbon separated by a hetero-atom or not, an amino acid ester, an amino acid amide, an ether amine or an N-alkanoyl alkylene diamine according to the formula $R^3$—C(O)N(H)—$R^4$—, wherein $R^3$=$C_1$–$C_{24}$ alkyl or alkenyl and $R^4$=$C_2$–$C_{22}$ branched or linear alkylene group, which may contain heteroatoms, X is a difunctional (cyclo)aliphatic or aromatic hydrocarbon separated or not by a hetero-atom or a hydrocarbon substituted hetero-atom, and n=0 or 1, with the proviso that when n=0, $R^1$ and $R^2$ do not stand for a hydrogen atom simultaneously, wherein an aqueous syrup of the aldonic acid is reacted, optionally after esterification with an alcohol with simultaneous distilling off of the water which is present, at a temperature in the range of 30° to 120° C., with the amine in the organic solvent, which is distilled off wholly or in part simultaneously with any water still present and/or formed.



**5,741,898**

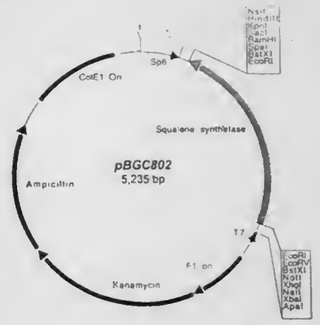
**DNA SEQUENCE ENCODING NICOTIANA SQUALENE SYNTHETASE**

**Kathleen Marie Hanley, 309 Saddlebrook Cir., Lewisville, N.C. 27023; Gary Mark Hellmann, 3516 Donegal Dr., Clemmons, N.C. 27012, and Olivier Nicolas, 2700 Reynolda Rd., Apartment 1215, Winston-Salem, N.C. 27106**

**Filed Sep. 22, 1994, Ser. No. 310,693**

**Int. Cl.**[6] **C12N** *15/54;15/29;9/10;15/70*

**U.S. Cl. 536—23.2** **11 Claims**




1. An isolated nucleotide molecule encoding squalene synthetase having an amino acid sequence specified by SEQ ID NO:2, which nucleotide molecule is isolated from a Nicotiana species.

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**5,741,899**

**CHIMERIC RECEPTORS COMPRISING JANUS KINASE FOR REGULATING CELLULAR PRO LIFERATION**

**Daniel J. Capon, Hillsborough; Huan Tian, Cupertino; Douglas H. Smith, Foster City; Genine A. Winslow, Hayward, all of Calif., and Miriam Siekevitz, New York, N.Y., assignors to Cell Genesys, Inc., Foster City, Calif.**

**Continuation of Ser. No. 382,846, Feb. 2, 1995. This application Jun. 7, 1995, Ser. No. 481,003**

**Int. Cl.**[6] **C12N** *15/62;5/10;* **C07K** *19/00;14/705*

**U.S. Cl. 536—23.4** **12 Claims**

1. A chimeric DNA sequence encoding a membrane bound protein, said DNA sequence comprising in reading frame:

a DNA sequence encoding a signal sequence;

a DNA sequence encoding an extracellular inducer-responsive clustering domain that binds specifically to at least one inducer molecule which results in the dimerization or oligomerization of said extracellular domain;

a DNA sequence encoding a transmembrane domain; and

a DNA sequence encoding a proliferation signaling domain comprising a Janus tyrosine kinase,

wherein when said chimeric DNA sequence is expressed as a membrane bound protein in a selected host cell under conditions suitable for expression, said membrane bound protein initiates a signal for proliferation in said host cell on binding to an inducer molecule.

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**5,741,900**

**METHOD FOR PREPARING POLY (FDU)$_x$**

**William H. Gmeiner, and Patrick L. Iversen, both of Omaha, Nebr., assignors to The Board of Regents of The University of Nebraska, Lincoln, Nebr.**

**Division of Ser. No. 164,089, Dec. 8, 1993, Pat. No. 5,457,187. This application Sep. 11, 1995, Ser. No. 526,296**

**Int. Cl.**[6] **C07H** *1/02;21/04*

**U.S. Cl. 536—25.31** **4 Claims**

1. A process for preparing a solid phase matrix with a single FdU covalently attached for synthesis of $FdU_n$ comprising:

(a) reacting 5'-O-[4,4'-dimethoxytrityl]-5-fluorodeoxy-uridine with succinic anhydride to form 3'-O-succinate; and

(b) reacting 3'-O-succinate with long-chain alkylamine controlled pore glass in the presence of catalytic amounts of dimethylaminopyridine and stoichiometric amounts of 1-(3-dimethylaminopropyl)-ethylcarbodiimide in anhydrous pyridine.

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**5,741,901**

**UV CURABLE CELLULOSE ESTERS**

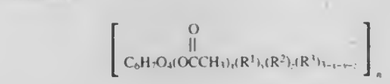
**Phillip Michael Cook, Kingsport, and Robert Andrew Simm, Mt. Carmel, both of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.**

**Filed Nov. 16, 1995, Ser. No. 558,995**

**Int. Cl.**[6] **C08B** *3/22;* **C08G** *63/00*

**U.S. Cl. 536—76** **4 Claims**

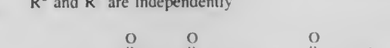
1. An ethylenically unsaturated cellulose acetate ester of the formula



wherein:

$R^1$ is independently maleate, fumarate, or a mixture thereof;

$R^2$ and $R^3$ are independently



or a mixture thereof;

x is 0.1 to 2.5,

y is 0.1 to 2.0,

z is 0.1 to 2.5, and

n is 30–250, provided that the sum of x, y, and z is in the range of 0.3 to 3.0.

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**5,741,902**

**7-ACYL-3-(SUBSTITUTED CARBAMOYLOXY) CEPHEM COMPOUNDS AND PROCESS FOR THEIR PREPARATION**

**Shigeto Negi, Ibaraki Prefecture; Motosuke Yamanaka, Chiba Prefecture; Kanemasa Katsu, Ibaraki Prefecture; Isao Sugiyama, Ibaraki Prefecture; Yuuki Komatu, Ibaraki Prefecture; Atsushi Kamata, Ibaraki Prefecture; Akihiko Tsuruoka, Ibaraki Prefecture, and Yoshimasa Machida, Ibaraki Prefecture, all of Japan, assignors to Eisai Co., Ltd., Japan**

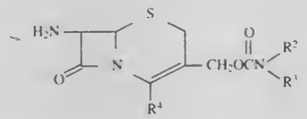
**Division of Ser. No. 393,074, Feb. 23, 1995, Pat. No. 5,563,265, which is a continuation of Ser. No. 209,484, Mar. 14, 1994, Pat. No. 5,559,225, which is a continuation of Ser. No. 789,669, Nov. 8, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 464,341**

**Claims priority, application Japan, Nov. 9, 1990, 2-302783; Feb. 14, 1991, 3-40747; Mar. 8, 1991, 3-67709; Apr. 12, 1991, 3-169512**

**Int. Cl.**[6] **C07D** *501/18;501/40*

**U.S. Cl. 540—222** **4 Claims**

1. A compound of the formula



wherein $R^2$ and $R^3$ are the same or different and individually represent a lower alkyl group, a hydroxyl-substituted lower alkyl

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group, a carbamoyl-substituted lower alkyl group, a cyanosubstituted lower alkyl group, or alternatively $R^2$ and $R^3$ together with nitrogen form a ring selected from the group consisting of azetidinyl, pyrrolidinyl, piperidinyl and morpholinyl groups optionally substituted by one or more lower alkyl, hydroxy and/or hydroxyl-substituted lower alkyl groups; $R^4$ is a carboxyl group or a carboxyl group protected by one or more member selected from the group consisting of 1-(isopropyloxycarbonyloxy)ethyl group, 1-(ethoxycarbonyloxy)ethyl group, 1-(cyclohexyloxycarbonyloxy)ethyl group, pivaloyloxymethyl group and isopropyloxycarbonyloxymethyl group; or a salt thereof.

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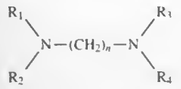
**5,741,903**

## DIAMINE SALTS FOR PURIFICATION OF CLAVULANIC ACID

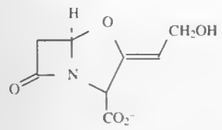
**P. G. Weber, Ridderkerk, Netherlands, assignor to Gist-Brocades N.V., Germany**

**Filed Mar. 26, 1993, Ser. No. 38,130**
**Int. Cl.[6] C07B** *63/02;* **C07D** *498/047*
**U.S. Cl. 540—349** **3 Claims**

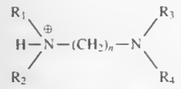
**1**. A process for the purification of clavulanic acid and subsequent conversion to a salt thereof comprising reacting in an organic solvent impure clavulanic acid with a diamine of the formula



wherein $R_1$, $R_2$, $R_3$ and $R_4$ are individually selected from the group consisting of alkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 8 carbon atoms and cycloalkyl alkyl of 3 to 8 cycloalkyl carbon atoms and alkyl of 1 to 8 carbon atoms, all optionally substituted with 1 to 3 members of the group consisting of halogen, —OH, lower alkoxy and carboxy esterified with lower alkyl or $R_1$ and $R_2$ or $R_3$ and $R_4$ taken with the nitrogen to which they are attached form piperidino and n is an integer from 1 to 10 to form a mono amine salt of the formula



(IIa)



recovering the amine salt and reacting the amine salt with a non-toxic pharmaceutically acceptable salt to form the corresponding purified salt of clavulanic acid.

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**5,741,904**

## METHOD OF PRODUCING E-CAPROLACTAM, MFI ZEOLITE CATALYSTS ON WHOSE SURFACE SYMMETRICALLY ARRANGED OH GROUPS ARE PRESENT AND TO A METHOD OF PRODUCING THEM

**Wolfgang Hoelderich, Frankenthal; Joerg Roeseller, Aachen, and Dietrich Arntz, Oberursel, all of Germany, assignors to Degussa Aktiengesellschaft, Franfurt, Germany**

**Filed May 6, 1996, Ser. No. 647,438**
**Claims priority, application Germany, May 4, 1995, 195 16 284.6; Mar. 6, 1996, 196 08 660.4**
**Int. Cl.[6] C07D** *201/04*
**U.S. Cl. 540—536** **12 Claims**

**1**. A method of producing ϵ-caprolactam comprising the Beckmann rearrangement of cyclohexanone oxime in the gaseous phase in a temperature range of 250° to 450° C. on MFI zeolite catalysts, wherein said MFI zeolite catalysts have OH groups symmetrically arranged in relation to each other on the surface of said MFI zeolite catalysts due to the lack of central metal atoms.

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**5,741,905**

## TRIAZINE ULTRAVIOLET ABSORBERS USEFUL FOR IMPROVING THE SUN PROTECTION FACTOR OF TEXTILES

**Jean-Pierre Bacher, Buschwiller, France; Werner Kaufmann, Rheinfelden, Switzerland, and Dieter Reinehr, Kandern, Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.**

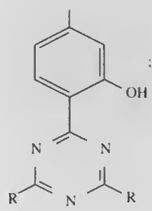
**Filed Jun. 6, 1995, Ser. No. 471,816**
**Claims priority, application United Kingdom, Jul. 23, 1994, 9414881; Sep. 1, 1994, 9417562**
**Int. Cl.[6] C07D** *251/38;251/30;251/42;251/48*
**U.S. Cl. 544—194** **14 Claims**

**1**. A compound of the formula:



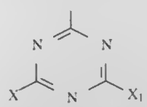
(1)

in which m is 1 or 2;
when m is 1, A is a residue selected from those of the formulae:



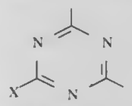
(2)

; and



(6)

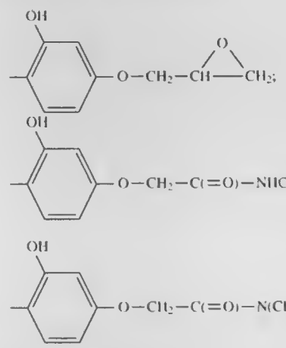
and, when m is 2, A is a residue of the formula:



(5)

;

in which R is phenyl, optionally substituted by 1 or 2 $C_1$–$C_4$alkyl groups, or by 1 or 2 $C_1$–$C_{18}$ alkoxy groups, or R is a group selected from those having one of the formulae:



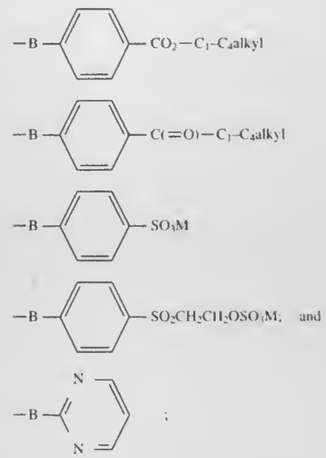
and



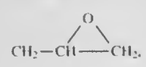
X is F, Cl or $NHCH_2OH$;



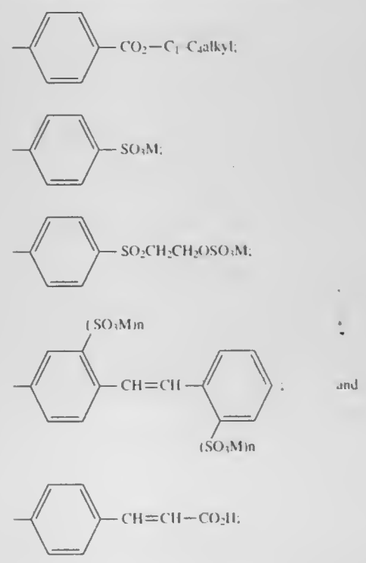
$X_1$ is F, Cl, $NHCH_2OH$ or a group selected from those of the formulae:



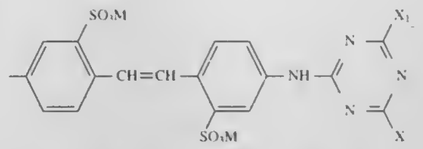
B is —O—, —NH— or —$SO_2$—; and
D is a group selected from those of the formulae:



$CH_2$—C(=O)—$NH(CH_2OH)$, $CH_2$—C(=O)—$N(CH_2OH)_2$ and $CH_2CH_2$ —$OSO_3M$ in which is hydrogen, sodium, potassium, calcium, magnesium, ammonium, mono-, di-, tri- or tetra-$C_1$–$C_4$alkyl-ammonium, or ammonium that is di- or tri-substituted by a mixture of $C_1$–$C_4$alkyl and $C_1$–$C_4$hydroxyalkyl groups or, when A is a residue of formula (5) or (6), D may also be a group selected from those having one of the formulae:



in which M has its previous significance and n is 0 or 1, provided that at least one $SO_3M$ group is present, or D has the formula:



in which X, $X_1$ and M have their previous significance; provided that those compounds of formula (1) are excluded in which A is a residue of formula (2) wherein R has its previous significance, m is 1, B is —NH— or —$SO_2$—; and D is a group of formula $CH_2CH_2$—$OSO_3M$ in which M has its previous significance and provided that the compounds 4,4'-bis-(4",6"-dichlorotriazin-2"-ylamino)stilbene-2,2'-disulfonic acid and its sodium salt, 2-(2-hydroxy-4-glycidyloxy)-4,6-(2,4-dimethylphenyl)-1,3,5-triazine and 2-(2-hydroxy-4-glycidyloxy)-4,6-(4-methylphenyl)-1,3,5-triazine are excluded.

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**5,741,906**

## PRODUCTION OF TRIETHYLENEDIAMINE USING SURFACE ACIDITY DEACTIVATED ZEOLITE CATALYSTS

**Jose Guadalupe Santiesteban; Hong-Xin Li, both of Allentown, and John Nelson Armor, Orefield, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**Filed Nov. 15, 1996, Ser. No. 751,143**
**Int. Cl.[6] C07D** *487/08*
**U.S. Cl. 544—352** **18 Claims**

**1**. In a process for preparing triethylenediamine by passing an amine compound which is monoethanolamine, diethanolamine, triethanolamine, ethylenediamine, diethylenetriamine, triethylenetetramine, piperazine, N-hydroxyethylpiperazine, bis(hydroxyethyl)-piperazine, N-aminoethylpiperazine, morpholine or a mixture thereof over a pentasil-type zeolite at elevated temperature, the improvement which comprises employing a pentasil-type zeolite in the hydrogen or ammonium form which has been treated with a dealuminating agent.

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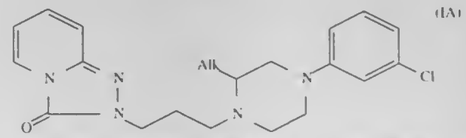
**5,741,907**

## PHARMACOLOGICALLY ACTIVE ENANTIOMERS

**Leandro Baiocchi, and Valerio Cioli, both of Rome, Italy, assignors to Angelini Ricerche S.p.A. Societa' Consortile, Rome, Italy**

**PCT No. PCT/EP94/02061, § 371 Date Apr. 29, 1996, § 102(e) Date Apr. 29, 1996, PCT Pub. No. WO95/01354, PCT Pub. Date Jan. 12, 1995**
**PCT Filed Jun. 21, 1994, Ser. No. 564,276**
**Claims priority, application Italy, Jul. 1, 1993, MI93A1418**
**Int. Cl.[6] C07D** *241/08;401/06*
**U.S. Cl. 544—366** **4 Claims**

**1**. A method for preparing an enantiomer of formula (IA)



(IA)

where Alk is an alkyl having from 1 to 3 carbon atoms, or an acid addition salt thereof with a physiologically acceptable acid,
characterized in that
(a) a racemic mixture of formula (IA) is salified with (R,R or S,S) tartaric acid,
(b) the pair of the thus obtained diastereoisomeric salts is separated by fractional crystallization from a suitable solvent, and, when desired,

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(c) the thus obtained enantiomer is salified with a physiologically acceptable acid.

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5,741,908

## PROCESS FOR REPARING IMIDAZOQUINOLINAMINES

John F. Gerster, Woodbury, Minn., and Kyle J. Lindstrom, Houlton, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 21, 1996, Ser. No. 673,712
Int. Cl.[6] C07D *471/02;471/04;487/14;9/60*
U.S. Cl. 546—81 15 Claims

1. A process for preparing a chemical compound comprising the steps of:
(i) providing a tetrazolo[1.5-a]quinolin-5-ol;
(ii) nitrating the compound from step (i) to provide a 4-nitrotetrazolo[1.5-a]quinolin-5-ol; and
(iii) sulfonylating the compound from step (ii) to provide a 4-nitrotetrazolo[1,5-a]quinolin-5-sulfonate.

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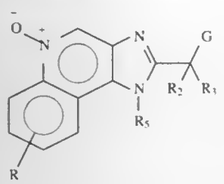
5,741,909

## 1-SUBSTITUTED, 2-SUBSTITUTED 1H-IMIDAZO[4,5-C]QUINOLIN-4-AMINES

John F. Gerster, Woodbury; Stephen L. Crooks, Mahtomedi, both of Minn., and Kyle J. Lindstrom, Houlton, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 353,802, Dec. 12, 1994, Pat. No. 5,605,899, which is a division of Ser. No. 938,295, Aug. 28, 1992, Pat. No. 5,389,640, which is a continuation-in-part of Ser. No. 838,475, Feb. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 687,326, Apr. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 662,926, Mar. 1, 1991, abandoned. This application Jan. 28, 1997, Ser. No. 789,264
Int. Cl.[6] C07D *471/04;413/04*
U.S. Cl. 546—82 2 Claims

1. A compound of the formula



wherein $R_5$ is selected from the group consisting of: straight chain or branched chain alkyl containing one to ten carbon atoms and substituted straight chain or branched chain alkyl containing one to ten carbon atoms, wherein the substituent is selected from the group consisting of cycloalkyl containing three to six carbon atoms and cycloalkyl containing three to six carbon atoms substituted by straight chain or branched chain alkyl containing one to four carbon atoms; straight chain or branched chain alkenyl containing two to ten carbon atoms and substituted straight chain or branched chain alkenyl containing two to ten carbon atoms, wherein the substituent is selected from the group consisting of cycloalkyl containing three to six carbon atoms and cycloalkyl containing three to six carbon atoms substituted by straight chain or branched chain alkyl containing one to four carbon atoms; alkoxyalkyl wherein the alkoxy moiety contains one to four carbon atoms and the alkyl moiety contains one to six carbon atoms; acyloxyalkyl wherein the acyloxy moiety is alkanoyloxy of two to four carbon atoms or benzoyloxy, and the alkyl moiety contains one to six carbon atoms; benzyl; (phenyl)ethyl; and phenyl; said benzyl, (phenyl)ethyl, or phenyl substituent being optionally substituted on the benzene ring by one or two moieties independently selected from the group consisting of alkyl of one to four carbon atoms, alkoxy of one to four carbon atoms, and halogen, with the proviso that when said benzene ring is substituted by two of said moieties, then the moieties together contain no more than six carbon atoms;
$R_2$ and $R_3$ are independently selected from the group consisting of hydrogen, alkyl of one to four carbon atoms;
G is selected from the group consisting of alkoxy containing one to four carbon atoms, alkoxyalkyl wherein the alkoxy moiety contains one to four carbon atoms and the alkyl moiety contains one to four carbon atoms, alkylamido wherein the alkyl group contains one to about four carbon atoms; and
R is selected from the group consisting of hydrogen, straight chain or branched chain alkoxy containing one to four carbon atoms, halogen, and straight chain or branched chain alkyl containing one to four carbon atoms.

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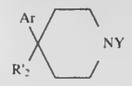
5,741,910

## COMPOUNDS WHICH ARE SELECTIVE ANTAGONISTS OF THE HUMAN $NK_3$ RECEPTOR AND THEIR USE AS MEDICINAL PRODUCTS AND DIAGNOSTIC TOOLS

Daniel Bichon, Montpellier; Patrick Gueule, Teyran; Didier Van Broeck, Murviel les Montpellier; Xavier Emonds-Alt, Combaillaux, and Vincenzo Proietto, Saint Georges D'Orques, all of France, assignors to Sanofi, Paris, France

Division of Ser. No. 405,833, Mar. 17, 1995. This application Feb. 29, 1996, Ser. No. 607,976
Claims priority, application France, Mar. 18, 1994, 94 03193; Jul. 29, 1994, 94 09478; Jan. 19, 1995, 95 00571
Int. Cl.[6] C07D *211/34;401/04*
U.S. Cl. 546—193 2 Claims

1. A piperidine derivative of formula:



in which
Ar is a pyrid-2-yl or a phenyl which is unsubstituted or substituted by a halogen, a methyl or a ($C_1$–$C_4$) alkoxy;
$R'_3$ represents an —$NR_3COR_4$ group in which $R_3$ is hydrogen or a ($C_1$–$C_4$) alkyl and $R_4$ is a phenyl, a benzyl or a pyridyl;
Y represents hydrogen or a protecting group;
and its salts.

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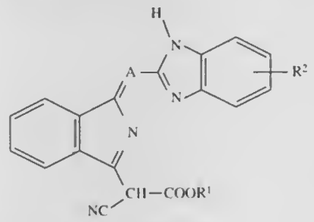
5,741,911

## BENZIMIDAZOLE-ISOINDOLENINE DYESTUFFS

Manfred Lorenz, Köln, and Klaus-Wilfried Wanken, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 26, 1996, Ser. No. 753,548
Claims priority, application Germany, Dec. 6, 1995, 195 45 464.2
Int. Cl.[6] C07D *235/04;* C09B *57/00*
U.S. Cl. 548—305.1 14 Claims

1. A compound of the formula (1)



(1)

or a tautomeric form thereof, wherein
A represents N, and



$R^1$ represents a saturated or unsaturated, substituted or unsubstituted aliphatic radical having 5 to 20 C atoms.

or

A represents a cyanomethylene radical, and
$R^1$ represents a saturated or unsaturated, substituted or unsubstituted aliphatic radical having 5 to 20 C atoms which is uninterrupted or interrupted by one or more oxygen atoms and
$R^2$ denotes hydrogen, halogen, $C_1$-$C_4$-alkyl, a saturated or unsaturated aliphatic oxyradical having 1 to 4 C atoms, which is unsubstituted or substituted by $C_1$-$C_4$-alkoxy, CN or $NO_2$.

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5,741,912

## METHODS FOR PREPARING HETEROATOM-BEARING LIGANDS AND METAL COMPLEXES THEREOF

Kondareddiar Ramalingam, Dayton, and Natarajan Raju, Kendall Park, both of N.J., assignors to Bracco International B.V., Amsterdam

Division of Ser. No. 242,093, May 18, 1994, Pat. No. 5,608,110, which is a continuation-in-part of Ser. No. 77,981, Jun. 15, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 479,076
Int. Cl.[6] C07C *249/00;* C07F *5/00;* C07D *233/54;* A61K *51/04*
U.S. Cl. 548—341.1 6 Claims

1. A method for the stereoselective preparation of (R)-3,3,9,9-tetramethyl-6-((2-nitro-1H-imidazol-1-yl)methyl)-5-oxa-4,8-diazaundecane-2, 10-dione dioxime; comprising the steps of:
(i) reacting (S)-(+)-epichlorohydrin with phthalimide to form a stereoisomer of 1-chloro-3-phthalimido-2-propanol;
(ii) contacting the product of (i) with an epoxide ring-forming agent to obtain a stereoisomer of N-(2,3-epoxypropyl) phthalimide;
(iii) contacting the product of (ii) with a base and 2-nitroimidazole to obtain a stereoisomer of 2-(2-hydroxy-2-(nitro-1H-imidazol-1-yl)ethyl)-1H-isoindole-1,3(2H) -dione;
(iv) contacting the product of (iii) with hydrazine, followed by a base and ditertiarybutyl dicarbonate, to obtain a stereoisomer of α-((t-Boc-amino)methyl)-2-nitro-1H-imidazole-1-ethanol;
(v) contacting the product of (iv) with N-hydroxyphthalimide, triphenylphosphine and diethylazodicarboxylate to obtain a stereoisomer of 2-(1-(t-Boc-amino)methyl)-2-(2-nitro-1H-imidazol-1-yl)ethoxy)1H-isoindole-1,3 (2H) - dione;
(vi) contacting the product of (v) with hydrazine to obtain a stereoisomer of 1-(2-(aminooxy)-3-(t-Boc-amino)propyl)-2-nitro4H-imidazole;
(vii) deprotecting the product of (vi) to obtain a stereoisomer of 1-(3-amino-2-(aminooxy)propyl)-2-nitro-1H-imidazole; and
(viii) contacting the product of (vii) with 3-chloro-3-methyl-2-nitrosobutane in the presence of a tertiary amine.

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5,741,913

## PROCESS FOR PREPARING N-SUBSTITUTED MALEIMIDES

Masasuke Oda, Hyogo, and Toshimitsu Noda, Osaka, both of Japan, assignors to Daihachi Chemical Industry Co., Ltd., Osaka, Japan

Filed Jan. 28, 1997, Ser. No. 790,312
Claims priority, application Japan, Jun. 10, 1996, 8-147266
Int. Cl.[6] C07D *207/448;207/452*
U.S. Cl. 548—548 15 Claims

1. A process for preparing a N-substituted maleimide comprising reacting maleic anhydride with a primary amine using both a non-polar solvent and a protic polar solvent in the presence of an acid catalyst and a polymerization inhibitor.

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5,741,914

## RESINOUS BINDER COMPOSITONS

George S. Everett, Claredon Hills, Ill.; George R. MacLennan, West Lafayette, and Michael C. Chen, Lafayette, both of Ind., assignors to QO Chemicals, Inc., West Lafayette, Ind.

Continuation-in-part of Ser. No. 176,341, Dec. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 12,359, Feb. 9, 1987, Pat. No. 4,873,597. This application May 8, 1995, Ser. No. 437,169
Int. Cl.[6] C07D *307/12*
U.S. Cl. 549—497 10 Claims

1. A liquid resinous composition heat curable to a rigid set condition comprising the reaction product of furfuryl alcohol with formaldehyde in a molar ratio of at least 1:2, the composition containing not more than 10% by weight of water insoluble material and not more than about 10% by weight of furfuryl alcohol.

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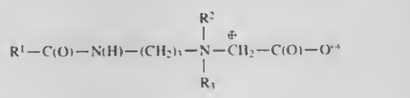
5,741,915

## MEADOWFOAM BETAINES

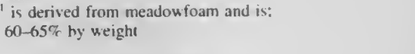
Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Fan Tech Ltd., Chicago, Ill.

Continuation-in-part of Ser. No. 516,138, Aug. 17, 1995, Pat. No. 5,646,321. This application Jan. 13, 1997, Ser. No. 782,217
Int. Cl.[6] C07C *233/00*
U.S. Cl. 554—52 3 Claims

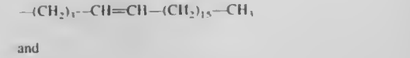
1. A meadowfoam betaine which conforms to the following structure:



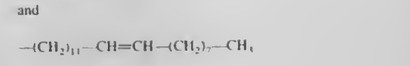
wherein:
$R^1$ is derived from meadowfoam and is:
60–65% by weight



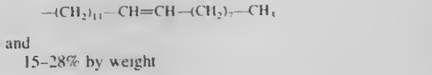
12–20% by weight a mixture of



and



and
15–28% by weight



$R^2$ and $R^3$ are methyl or ethyl.

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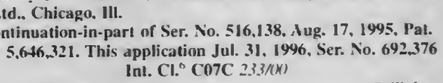
5,741,916

## MEADOWFOAM ALKANOLAMIDES

Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Fan Tech Ltd., Chicago, Ill.

Continuation-in-part of Ser. No. 516,138, Aug. 17, 1995, Pat. No. 5,646,321. This application Jul. 31, 1996, Ser. No. 692,376
Int. Cl.[6] C07C *233/00*
U.S. Cl. 554—66 7 Claims

1. An alkanolamide conforming to the following structure:



wherein:
$R^1$ is derived from meadowfoam and is:
60–65% by weight —$(CH_2)_3$—CH=CH—$(CH_2)_{13}$—$CH_3$;

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12–20% by weight a mixture of
$-(CH_2)_2-CH=CH-(CH_2)_{15}-CH_3$ and
$-(CH_2)_{11}-CH=CH-(CH_2)_7-CH_3$; and
15–28% by weight
$-(CH_2)_3-CH=CH-(CH_2)_6-CH=CH-(CH_2)_6-CH_3$;

$R^2$ is:
$-(CH_2CH_2-O)_x-(CH_2CH(CH_3)O)_y-H$;
x, and y are independently 0 or 1 with the proviso that x+ y is greater than 0;
$R^3$ is H or
$-(CH_2CH_2-O)_a-(CH_2CH(CH_3)O)_b-H$
a, and b are independently 0 or 1 with the proviso that a+ b is greater than 0.

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**5,741,917**

**PROCESS FOR THE PREPARATION OF ACYLOXYALKANESULFONATES HAVING IMPROVED PROPERTIES**

**Dirk Bühring, Suzano, Brazil, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany**

**Filed Mar. 27, 1996, Ser. No. 624,905**

**Claims priority, application Germany, Mar. 29, 1995, 195 11 460.4**

**Int. Cl.[6] C11D *1/28***

**U.S. Cl. 554—92** **9 Claims**

1. A process for the preparation of acyloxyalkane-sulfonates having improved properties by esterification of fatty acids with hydroxyalkanesulfonates, which comprises esterifying at least one fatty acid of the formula 1 RCOOH (1), in which R is a branched hydrocarbon radical having 5 to 31 carbon atoms, or a mixture of branched and unbranched hydrocarbon radicals each having 5 to 31 carbon atoms, the amount of unbranched radicals being at most 50% by weight, with at least one hydroxyalkanesulfonate of the formula 2 HO—$R^1$—$SO_3X$ (2), in which $R^1$ is a $C_2$ to $C_4$-alkylene or a divalent di-$C_2$ to $C_4$-alkyl ether radical and X is an alkali metal or ammonium, in the presence of an esterification catalyst and essentially in the absence of a consistency regulator at a temperature of 180° to 250° C. with removal of the water present, a product having a high content of acyloxyalkane-sulfonate being obtained.

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**5,741,918**

**Patent Not Issued For This Number**

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**5,741,919**

**COMPLEX MEADOWFOAM ESTERS**

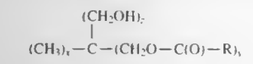
**Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Fan Tech Ltd., Chicago, Ill.**

**Continuation-in-part of Ser. No. 516,138, Aug. 17, 1995, Pat. No. 5,646,321. This application Dec. 26, 1996, Ser. No. 773,735**

**Int. Cl.[6] C07C *57/00***

**U.S. Cl. 554—224** **5 Claims**

1. A compound which conforms to the following structure:



wherein:
R is:
60–65% by weight $-(CH_2)_3-CH=CH-(CH_2)_{13}-CH_3$
12–20% by weight a mixture of
$-(CH_2)_3-CH=CH-(CH_2)_{15}-CH_3$ and
$-(CH_2)_{11}-CH=CH-(CH_2)_7-CH_3$ and
15–28% by weight
$-(CH_2)_3-CH=CH-(CH_2)_6-CH=CH-(CH_2)_6-CH_3$;
x is and integer ranging from 0 to 1;
z is an integer ranging from 0 to 3;
y is and integer ranging from 1 to 4, with the proviso that x+y+z=4.

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**5,741,920**

**INHIBITION OF RE-ABSORPTION OF MIGRATING DYES IN THE WASH LIQUOR**

**Claude Eckhardt, Riedisheim, France, and Dieter Reinehr, Kandern, Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.**

**Division of Ser. No. 259,651, Jun. 14, 1994, Pat. No. 5,462,564. This application Jun. 6, 1995, Ser. No. 469,596**

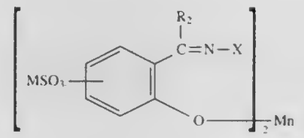
**Claims priority, application United Kingdom, Jun. 19, 1993, 9312693; Dec. 8, 1993, 9325117**

**Int. Cl.[6] C07F *13/00***

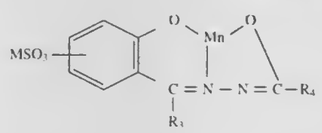
**U.S. Cl. 556—45** **13 Claims**

1. A compound having the formula (2), (3), (4), (5), (6) or (7):

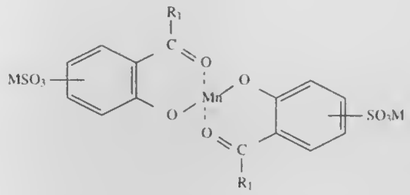
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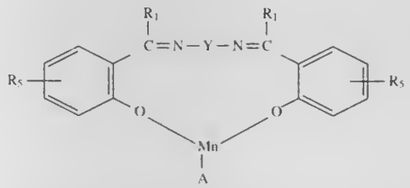
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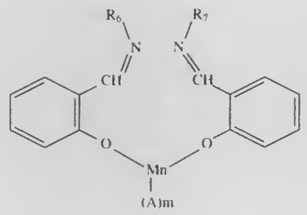
(4)



(5)



(6)



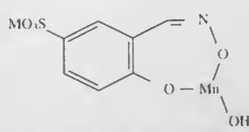
(A)m



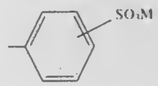
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or

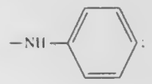
(7)



in which $R_1$, $R_2$, $R_3$ and $R_4$ are the same or different and each is hydrogen or optionally substituted alkyl, cycloalkyl or aryl; $R_5$ is hydrogen, alkyl or $SO_3M$; $R_6$ and $R_7$ are the same or different and each is NH—CO—$NH_2$, a group of formula



or a group of formula



Y is optionally substituted alkylene or cyclohexylene; X is OH, $NH_2$, optionally substituted aryl or optionally substituted alkyl; M is hydrogen, an alkali metal atom, ammonium or a cation formed from an amine; m is 0 or 1; and A is an anion, provided that, in the compounds of formula (5), those compounds are excluded in which A is Cl, each $R_1$ is H and each $R_5$ is H; or A is Cl, each $R_1$ is H and each $R_5$ is 4-$CH_3$; or A is Cl, each $R_1$ is H and each $R_5$ is 4-sec.-$C_4H_9$; or A is Cl, each $R_1$ is $CH_3$ and each $R_5$ is H; or A is $PF_6$ one $R_1$ is H and the other is phenyl and each $R_5$ is H; or A is $PF_6$ one $R_1$ is H and the other is phenyl and each $R_5$ is 2-butyl.

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**5,741,921**

**CONJUGATED POLYMERS CONTAINING HETERO-SPIRO ATOMS AND THEIR USE AS ELECTROLUMINESCENCE MATERIALS**

**Willi Kreuder, Mainz; Donald Lupo, Frankfurt; Josef Salbeck, Kelkheim; Hermann Schenk, Hofheim, and Thomas Stehlin, Kriftel, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany**

**PCT No. PCT/EP95/04594, § 371 Date Apr. 17, 1997, § 102(e) Date Apr. 17, 1997, PCT Pub. No. WO96/17036, PCT Pub. Date Jun. 6, 1996**

**PCT Filed Nov. 22, 1995, Ser. No. 817,376**

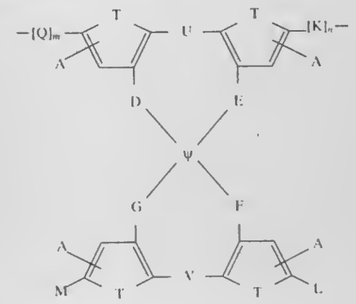
**Claims priority, application Germany, Nov. 25, 1994, 44 42 052.8**

**Int. Cl.[6] C09K *11/06*; C08G *61/00***

**U.S. Cl. 556—406** **11 Claims**

1. A conjugated polymer comprising recurring units of the formula (I).

(I)



where the symbols and indices have the following meanings:
Ψ is an element of the 4th main group of the Periodic Table with the exception of carbon;
D, E, F, G are identical or different and are each $-CR^1R^2-$, —O—, —S—, $-NR^3-$ or a chemical bond; where $R^1$, $R^2$, $R^3$ are identical or different and are each a $C_1$-$C_{20}$-hydrocarbon radical or H or where $R^1$ and $R^2$ together can form an unsubstituted or substituted ring;
U is $-CR^4=CR^5-$ or a chemical bond;
V is as defined for U or is $-CR^1R^2-$, —O—, —S—, $-NR^3-$, $-SiR^1R^2-$, $-SO_2-$, —SO—, —CO—, where $R^1$, $R^2$, $R^3$ are as defined above and $R^4$, $R^5$ are identical or different and can be as defined for $R^1$, $R^2$, $R^3$ or are fluorine or $CF_3$;
A are identical or different and are H, a $C_1$-$C_{20}$-hydrocarbon radical which can also contain heteroatoms;
T is —O—, —S—, $-NR^3-$, $-CR^1R^2-$, —CH=N—, —CA=CA—, —CH=CA—, —CH=CF— or —CF=CF—, where $R^1$, $R^2$, $R^3$ and A are as defined above;
K, L, M, Q are identical or different and are hydrocarbon radicals which can contain heteroatoms and have conjugated electron systems; where K, L, M, Q can also be joined to the groups A in the respective ortho positions to form a ring which is saturated, partially unsaturated or has maximum unsaturation;
m, n are identical or different and are 0, 1, 2, 3 or 4.

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**5,741,922**

**FLUORINE-CONTAINING AROMATIC COMPOUNDS**

**Norio Yoshino, Mitaka, Japan, assignor to Daikin Industries, Ltd., Osaka, Japan**

**PCT No. PCT/JP94/00374, § 371 Date Sep. 12, 1995, § 102(e) Date Sep. 12, 1995, PCT Pub. No. WO94/20442, PCT Pub. Date Sep. 15, 1994**

**PCT Filed Mar. 9, 1994, Ser. No. 525,702**

**Claims priority, application Japan, Mar. 12, 1993, 5-078704**

**Int. Cl.[6] C07F *7/08***

**U.S. Cl. 556—445** **6 Claims**

1. A fluorine-containing aromatic silane coupling agent comprising a compound of the formula (1) wherein Y is $-CAB(CH_2)_mSi(CH_3)_nZ'_{3-n}$, wherein A, B, m and n are each as defined above, Z' is $OCH_3$ or $OC_2H_5$.

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**5,741,923**

**ETHYLENICALLY UNSATURATED COMPOUNDS**

**Michael John Driver, and Deborah Jane Jackson, both of Surrey, United Kingdom, assignors to Biocompatibles Limited, Farnham, United Kingdom**

**PCT No. PCT/GB94/02571, § 371 Date May 23, 1996, § 102(e) Date May 23, 1996, PCT Pub. No. WO95/14702, PCT Pub. Date Jun. 1, 1995**

**PCT Filed Nov. 23, 1994, Ser. No. 704,519**

**Claims priority, application United Kingdom, Nov. 23, 1993, 9324033**

**Int. Cl.[6] C07F *9/09***

**U.S. Cl. 558—131** **18 Claims**

1. A process comprising the following stages:
(1) a first stage in which an ethylenically unsaturated compound of the formula I

Y—B—OH I

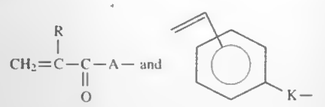
wherein B is selected from the group consisting of alkylene groups of formula $-(CR^1_2)_a-$, wherein the groups $-(CR^1_2)-$ are the same or different, and in each group $-(CR^1_2)-$ the groups $R^1$ are the same or different and each group $R^1$ is hydrogen or $C_{1-4}$ alkyl and a is from 1 to 12;
alkoxyalkyl groups having 1 to 6 carbon atoms in each alkyl moiety; and

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oligo-oxaalkylene groups of formula $—[(CR^4_2)_bO]_c(CR^4_2)_b—$ where the groups $—(CR^4_2)—$ are the same or different and in each group $—(CR^4_2)—$ the groups $R^4$ are the same or different and each group $R^4$ is hydrogen or $C_{1-4}$ alkyl, b is 2 or 3 and c is from 2 to 11;

Y is an ethylenically unsaturated polymerisable group selected from



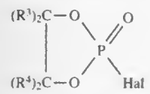
wherein:

R is hydrogen or a $C_1$–$C_4$ alkyl group;

A is —O— or $—NR^1—$ wherein $R^1$ is selected from the group consisting of hydrogen, $C_1$–$C_4$ alkyl groups and groups —B—OH;

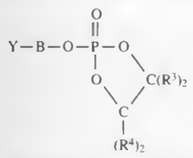
K is selected from the group consisting of a valence bond and groups $—(CH_2)_pOC(O)C—$, $—(CH_2)_pC(O)O—$, $—(CH_2)_pOC(O)O—$, $—(CH_2)_pNR^2—$, $—(CH_2)_pNR^2C(O)—$, $—(CH_2)_pC(O)NR^2—$, $(CH_2)_pNR^2C(O))—$, $—(CH_2)_pOC(O)NR^2—$, $—(CH_2)_pNR^2C(O)NR^2—$ (in which the groups $R^2$ are the same or different), $—(CH_2)_pO—$, and $—(CH_2)_pSO_3—$, in which p is from 1 to 12 and $R^2$ is selected from the group consisting of hydrogen and $C_1$–$C_4$ alkyl groups

is reacted with a phospholane reagent II



II

in which each $R^3$ is the same or different and is H or $C_{1-4}$ alkyl, each $R^4$ is the same or different and is H or $C_{1-4}$ alkyl, Hal is halogen atom, to form a diester product compound of the formula III and hydrogen halide by-product

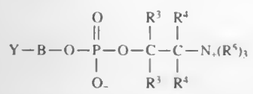


III

in which Y, B $R^3$ and $R^4$ are as defined previously,

the reaction being carried out in the presence of a first solvent which is a nitrile derivative of a $C_{1-6}$-carboxylic acid, in which the ethylenically unsaturated reagent and the phospholane reagent are soluble, the hydrogen halide by-product is removed from the product mixture, and

ii) a second stage in which the product mixture from the first stage comprising the compound III and the said first solvent is used directly in the second stage substantially without removal of any of said first solvent, which second stage is a ring opening amination reaction in which the compound of the formula III is reacted with a trialkylamine reagent $(N(R^5)_3)$ in the presence of a second solvent which includes substantially all the first solvent to form a zwitterionic compound of the formula IV



IV

in which each group $R^5$ is the same or different and is a $C_{1-24}$ alkyl group and Y, B, $R^3$ and $R^4$ are each as defined previously.

## 5,741,924
## SUNBLOCKING POLYMERS AND THEIR FORMULATION

**Milos Sovak, La Jolla; Ronald Calvin Terry; James Gordon Douglass, III, both of San Diego, and Farid Bakir, Del Mar, all of Calif., assignors to Biophysica Inc., La Jolla, Calif.**

**Continuation-in-part of Ser. No. 164,881, Dec. 9, 1993, Pat. No. 5,487,885, which is a continuation-in-part of Ser. No. 994,426, Dec. 21, 1992, abandoned. This application Jun. 14, 1995, Ser. No. 490,316**

**Int. Cl.[6] C07C** *229/00;49/36;* **A61K** *7/42*

**U.S. Cl. 560—43** **3 Claims**

1. A dibenzoylmethane having an acryloxy or methacryloxy substituent at a para position.

2. Anisoate ester of acryloxyethanol, methacryloxyethanol, p-acrylamidophenol or p-methacrylamidophenol.

3. p-Dimethylaminobenzoate ester of 1-acrylamido- or 1-methacrylamido-2-propanol.

## 5,741,925
## TRANSVINYLATION OF NAPHTHENIC ACIDS

**Chung-Ling Mao, Emmaus; Francis Joseph Waller, Allentown, and Kenneth Merle Kem, Emmaus, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**Filed Jan. 13, 1997, Ser. No. 782,132**

**Int. Cl.[6] C07C** *69/74*

**U.S. Cl. 560—116** **11 Claims**

1. A process for producing a vinyl naphthenate monomer mixture from naphthenic acid of the following formula: RCOOH, wherein R is predominantly $C_2$ to $C_{20}$ substituted and unsubstituted cycloalkyl groups, comprising:

(a) reacting the naphthenic acid with a vinyl ester under appropriate reaction conditions in the presence of a catalyst comprising a palladium carboxylate complex having one or more aryl N-containing ligands to form the vinyl naphthenate monomer mixture; and

(b) distilling the vinyl naphthenate monomer mixture in the presence of the catalyst at pot temperatures exceeding 80° C.

## 5,741,926
## ANILINE DERIVATIVES HAVING ANTIHYPERGLYCEMIC ACTIVITY

**Donald E. Bierer, Daly City, and Larisa G. Dubenko, San Francisco, both of Calif., assignors to Shaman Pharmaceuticals, Inc., South San Francisco, Calif.**

**Filed Feb. 12, 1997, Ser. No. 799,745**

**Int. Cl.[6] C27C** *229/00*

**U.S. Cl. 562—457** **4 Claims**

1. A compound selected from the group consisting of:
2-(2-(((2-fluorophenyl)amino)acetyl)amine)benzoic Acid;
2-(2-(((4-(Phenyl)phenyl)amine)acetyl)amine)benzoic Acid;
2-(2-(((4-(Trifluoromethyl)phenyl)amino)acetyl)amine)benzoic Acid;
2-(2-(((2-Fluorophenyl)amino)acetyl)amino)-5-methoxybenzoic Acid;
4-(2-(((2-Fluorophenyl)amino)acetyl)amino)benzoic Acid;
2-(2-(((2-Fluorophenyl)amino)acetyl)amino)-5-fluorobenzoic Acid;
2-(2-(((2-Fluorophenyl)amino)acetyl)amine)-6-fluorobenzoic Acid;
2-(2-(((2-(Trifluoromethyl)phenyl)amino)acetyl)amino)benzoic Acid;
2-(2-(((2-Fluorophenyl)amino)acetyl)amino)-5-chlorobenzoic Acid;
2-(2-((4-(Trifluoromethyl)phenyl)thio)acetyl)amino)benzoic Acid;
Methyl 2-(2-(((2-Fluorophenyl)amino)acetyl)amino)benzoate;
2-(2-((Phenylamino)acetyl)amino)-5-methoxybenzoic Acid;
2-(2-((phenylamino)acetyl)amino)-5-chlorobenzoic Acid;



2-(2-(((3-fluorophenyl)amino)acetyl)amino)benzoic Acid;
2-(2-((Phenylamino)acetyl)amino)-5-bromobenzoic Acid;
2-(2-((Phenylamino)acetyl)amino)-6-fluorobenzoic Acid;
2-(2-((2,3-Dimethylphenyl)amino)acetyl)amino)benzoic Acid;
2-(2-(((2,3-Dichlorophenyl)amino)acetyl)amino)benzoic Acid;
2-(2-(((2-Methoxyphenyl)amino)acetyl)amino)benzoic Acid;
2-(2-(((2-Fluorophenyl)amino)acetyl)amino)-4-chlorobenzoic Acid;
2-(2-(((2-Fluorophenyl)amino)acetyl)amino)-5-bromobenzoic Acid;
2-((2-Carboxyphenyl)amino)-2-((2-fluorophenyl)amino) ethane;
2-(2-(((2-fluorophenyl)thio)acetyl)amino)benzoic Acid;
2-(2-(((4-Fluorophenyl)amino)acetyl)amino)-5-fluorobenzoic Acid; 2-((Fluorophenyl)amino)acetyl)amine benzene; and 4-((2-((Fluorophenyl)amino)acetyl)amino)phenol; and pharmaceutically acceptable salts thereof.

## 5,741,927
## SEPARATION PROCESS

**David Parker, Great Ayton; John Arthur Turner, Normanby, and Ian Peter Milne, Stockton-on-Tees, all of United Kingdom, assignors to Imperial Chemical Industries PLC, Great Britain**

**PCT No. PCT/GB94/00248, § 371 Date Jul. 21, 1995, § 102(e) Date Jul. 21, 1995, PCT Pub. No. WO94/19082, PCT Pub. Date Sep. 1, 1994**

**PCT Filed Feb. 9, 1994, Ser. No. 492,064**

**Claims priority, application United Kingdom, Feb. 17, 1993, 9303191**

**Int. Cl.[6] C07C** *51/42*

**U.S. Cl. 562—486** **11 Claims**

1. A process for the purification of terephthalic acid comprising producing an aqueous solution of crude terephthalic acid, treating the same with hydrogen under reducing conditions at elevated pressure and temperature, subjecting the treated solution to a controlled crystallization process and separating the purified terephthalic acid from the aqueous mother liquor while under elevated temperature and pressure, wherein the separation comprises the following steps:

(a) in an elevated pressure and temperature zone subjecting the slurry to a primary separation process to produce a mass containing said crystals and residual mother liquor;

(b) in said elevated pressure and temperature zone washing said mass with a wash liquor to reduce the residual mother liquor content of said mass;

(c) under said elevated pressure and temperature conditions slurrying the washed mass in an aqueous medium and transferring the slurry to a lower pressure zone;

(d) in said lower pressure zone, subjecting the slurry of step (c) to a secondary separation process to recover the crystals and also the aqueous medium employed in step (c); and

(e) establishing a recirculating flow of said recovered aqueous medium between step (d) and step (c) whereby said recovered aqueous medium is repeatedly used in step (c).

## 5,741,928
## PROCESS FOR PRODUCING BIS (AMINOMETHYL) CYCLOHEXANE

**Shoichi Kobayashi, and Susumu Naito, both of Niigata-ken, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan**

**Filed Sep. 19, 1995, Ser. No. 540,026**

**Claims priority, application Japan, Sep. 21, 1994, 6-226740**

**Int. Cl.[6] C07C** *219/72;211/18*

**U.S. Cl. 564—449** **8 Claims**

1. A process for producing bis(aminomethyl)cyclohexane, which comprises hydrogenating a xylylenediamine in the presence of a catalyst and at least one solvent selected from the group consisting of alkylamines having 1 to 18 carbon atoms and alkylenediamines having 1 to 18 carbon atoms, and wherein said hydrogenating is carried out at a pressure of from 5 to 150 kg/cm$^2$G.

## 5,741,929
## PROCESS FOR PREPARING A MIXTURE OF AMINO-METHIYL-CYCLOHEXANES AND DIAMINO-METHYL-CYCLOHEXANES

**Gerhard Darsow, Krefeld, and Gerd-Michael Petruck, Erkrath, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Mar. 10, 1997, Ser. No. 814,184**

**Claims priority, application Germany, Mar. 18, 1996, 196 10 545.5**

**Int. Cl.[6] C07C** *209/72*

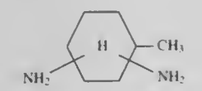
**U.S. Cl. 564—450** **20 Claims**

1. A continuous process for preparing a mixture of an amino-methyl-cyclohexane and a diamino-methyl-cyclohexane of the formulae



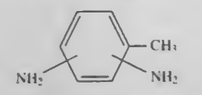
(I)

and



(II)

by catalytic hydrogenation of a diamino-toluene of the formula



(III)

with hydrogen at reaction temperatures of from 150° to 260° C. and an $H_2$ pressure of from 20 to 500 bar, wherein the catalyst used comprises ruthenium on an $Al_2O_3$ support treated with compounds of rare earth metals, of manganese and alkali metal hydroxides and/or alkaline earth metal hydroxides.

## 5,741,930
## REDUCTION OF NITRITE CONTAMINANTS BY SELECTIVE HYDROGENATION

**Dennis Hearn, and Kyte H. Terhune, both of Houston, Tex., assignors to Chemical Research & Licensing Company, Pasadena, Tex.**

**Division of Ser. No. 268,811, Jun. 30, 1994, Pat. No. 5,629,451. This application Apr. 28, 1997, Ser. No. 796,517**

**Int. Cl.[6] C07C** *209/48*

**U.S. Cl. 564—490** **12 Claims**

1. A process for the reduction of minor contaminant amounts of nitriles comprising treating a fluid material consisting essentially of methanol and containing said contaminant with hydrogen in the presence of a cobalt catalyst at a pressure in the range of 50 to 5000 psig at a temperature in the range of 30° to 200° C.

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5,741,931

## PHOSPHEPINIUM SALTS

Christoph Naumann, and Dieter Regnat, both of Frankfurt am Main, Germany, assignors to Hoechst AG, Frankfurt, Germany

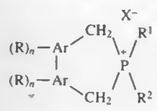
Filed Jun. 7, 1995, Ser. No. 482,825

Claims priority, application Germany, Jun. 8, 1994, 44 19 990.2

Int. Cl.[6] C07F *9/02*

U.S. Cl. 568—9 8 Claims

1. A phosphonium salt of the formula (I)



(I)

in which

Ar—Ar is a biphenyl radical, a 1-phenyl-naphthyl radical or a 1,1'-binaphthyl radical,

each $CH_2$ group is arranged in the ortho position to the Ar—Ar bond,

R is F, an alkyl radical having 1 to 8 carbon atoms or an alkoxy radical having 1 to 8 carbon atoms,

n is an integer from 0 to 4,

$R^1$ and $R^2$ are identical or different and, independently of each other, are an alkyl radical having 1 to 10 carbon atoms, a cycloaliphatic radical having 5 to 10 carbon atoms, or are a radical $Ar^1—(R^3)_m$,

where

$Ar^1$ is a phenyl or naphthyl radical,

$R^3$ is F, Cl, $CF_3$, $SO_3H$, a dialkylamino radical having 2 to 8 carbon atoms, an alkyl radical having 1 to 8 carbon atoms, an alkoxy radical having 1 to 8 carbon atoms or $SO_3Me$ wherein Me is Li, Na or K, and

m is an integer from 0 to 5,

or $R^1$ and $R^2$ together with the P atom form a ring having 4 to 8 members to which may be fused one or two aromatic rings or ring systems including 6 to 10 carbon atoms and

$X^-$ is a monovalent anion or the equivalent of a polyvalent anion of a mineral acid, carboxylic acid, sulfonic acid or an alcohol.

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5,741,932

## PROCESS FOR PREPARATION OF AJOENE

Guenter Dressnandt, München; Heinz Rockinger, Gilching; Helmut Prigge, Wolfratshausen, and Arno Treiber, München, all of Germany, assignors to Consortium für elektrochemische Industrie GmbH, München, Germany

Filed Nov. 13, 1995, Ser. No. 555,981

Claims priority, application Germany, Jan. 13, 1995, 195 00 863.4

Int. Cl.[6] C07C *321/00;315/00;7/00;7/10*

U.S. Cl. 568—21 6 Claims

1. A process for obtaining ajoene, which comprises the steps of mixing allicin or allicin dissolved in a solvent selected from the group consisting of water, a water-miscible solvent, and the mixtures thereof; with a cyclodextrin selected from the group consisting of α-cyclodextrin, β-cyclodextrin, γ-cyclodextrin and the mixtures thereof;

processing to a water-containing composition;

drying said composition; and

obtaining the resulting ajoene by decomplexation and extraction from the dried composition.

5,741,933

## PROCESS FOR PREPARING AROMATIC OR HETEROAROMATIC SULFUR COMPOUND

Hiroshi Goda; Mikio Yamamoto; Jun-ichi Sakamoto, and Hitoshi Karino, all of Hyogo-ken, Japan, assignors to Sumitomo Seika Chemicals Co., Ltd., Hyogo, Japan

PCT No. PCT/JP95/02315, § 371 Date Jul. 24, 1996, § 102(e) Date Jul. 24, 1996, PCT Pub. No. WO96/16034, PCT Pub. Date May 30, 1996

PCT Filed Nov. 13, 1995, Ser. No. 687,556

Claims priority, application Japan, Nov. 24, 1994, 6-289763

Int. Cl.[6] C07C *319/06*

U.S. Cl. 568—65 25 Claims

1. A process for preparing an aromatic thiol represented by formula (2), said process comprising the step of hydrolyzing an aromatic halogenated methyl sulfide represented by formula (1):

$$Ar—(SCH_{3-m}X_m)_n \quad (1)$$

$$Ar—(SH)_n \quad (2)$$

wherein Ar is an aromatic ring X is a halogen atom, m is an integer of 1 to 3, and n is 1 or 2.

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5,741,934

## PREPARATION OF PRIMARY MERCAPTANS

Stanley R. Sandler, 221 Hemlock La., Springifeld, Del. 19064; Pamela J. Peerce-Landers, 550 Sanatoga Rd., Sanatoga, Pa. 19464, and Christian Forquy, 7 rue Jean Sarrailh, 64360 Monein, France

Filed Apr. 10, 1996, Ser. No. 629,823

Int. Cl.[6] C07C *319/00*

U.S. Cl. 568—73 10 Claims

1. A process for the manufacture of mercaptan products containing a high proportion of primary mercaptans comprising reacting hydrogen sulfide with a $C_2$–$C_{20}$ alpha olefin in the presence of a reaction initiating amount of a borane represented by the formulas $R_2BH$ or $R_3B$ where R is a linear, or cyclic aliphatic, or aryl group, and recovering a mercaptan product.

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5,741,935

## PREPARATION OF ORGANIC PENTAFLUOROSULPHUR COMPOUNDS

Roy D. Bowden; Martin P. Greenhall; John S. Moilliet, and Julie Thomson, all of Preston, Great Britain, assignors to British Nuclear Fuels plc, Cheshire, Great Britain

PCT No. PCT/GB96/01829, § 371 Date Apr. 9, 1997, § 102(e) Date Apr. 9, 1997, PCT Pub. No. WO97/05106, PCT Pub. Date Feb. 13, 1997

PCT Filed Jul. 26, 1996, Ser. No. 809,771

Claims priority, application United Kingdom, Jul. 29, 1995, 9515599

Int. Cl.[6] C07C *381/00*

U.S. Cl. 568—74 10 Claims

1. A method for the preparation of a pentafluoride having a formula (1) as follows:

$$R^1SF_5 \quad (1)$$

wherein $R^1$ is selected from the group consisting of aryl, heteroaryl, aliphatic, and alicyclic groups, which comprises the step of reacting a disulphide of formula (2) as follows:

$$R^1—S—S—R^2 \quad (2)$$

wherein $R^2$ is selected from the group consisting of aryl, heteroaryl, aliphatic, and alicyclic groups, in a substantially inert solvent with elemental fluorine.



5,741,936

## PROCESS FOR THE PREPARATION OF 3-CHLORO-3'-NITRO-4'-METHOXYBENZOPHENONE

Klaus-Christian Paetz, Burscheid-Hilgen; Helmut Fiege, Leverkusen, and Wolfram Kissener, Neunkirchen-Seelscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 18, 1996, Ser. No. 710,474

Claims priority, application Germany, Sep. 25, 1995, 195 35 500.8

Int. Cl.[6] C07C *45/61*

U.S. Cl. 568—306 8 Claims

1. A process for the preparation of 3-chloro- 3'-nitro-4'-methoxybenzophenone by nitrating 3-chloro-4'-methoxybenzophenone, which comprises carrying out the nitration in from 65 to 85% strength by weight sulfuric acid as reaction medium, without organic solvents, with 50–100% wt. concentration nitric acid at temperatures in the range from −20° to +60° C.

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5,741,937

## PROCESS FOR THE PREPARATION OF ARYLIDENE-SUBSTITUTED ALKYLCYCLOALKANONES

Nikolaus Müller, Monheim, and Thomas Essert, Overath, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

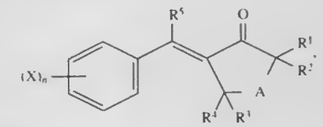
Filed Jun. 21, 1996, Ser. No. 668,402

Claims priority, application Germany, Jun. 28, 1995, 195 23 450.2

Int. Cl.[6] C07C *45/45*

U.S. Cl. 568—312 9 Claims

1. A process for the preparation of an arylidene-substituted alkylcycloalkanone of the formula



(I)

in which

A represents —$(CH_2)$—, where x=1, 2 or 3, which is unsubstituted or substituted with one or more identical or different substituents from the group consisting of $C_1$–$C_4$-alkyl and $C_1$–$C_7$-cycloalkyl, where $C_1$–$C_4$-alkyl can in turn optionally be substituted by halogen or $C_1$–$C_4$-alkoxy, and $C_3$–$C_7$-cycloalkyl can in turn optionally be substituted by halogen, $C_1$–$C_4$-alkyl or $C_1$–$C_4$-alkoxy,

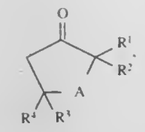
$R^1$ and $R^2$ represent identical or different $C_1$–$C_4$-alkyl or $C_3$–$C_7$-cycloalkyl radicals which are unsubstituted or substituted whereby $C_1$–$C_4$-alkyl can be substituted by halogen, $C_1$–$C_4$-alkoxy, halogeno-$C_1$–$C_4$-alkoxy, $C_2$–$C_4$-alkenyl, $C_2$–$C_4$alkinyl, halogeno-$C_2$–$C_4$-alkenyl or halogeno-$C_2$–$C_4$-alkinyl, and $C_3$–$C_7$-cycloalkyl can be substituted by halogen, $C_1$–$C_4$-alkoxy or $C_1$–$C_4$-alkyl, or $R^1$ and $R^2$, together with the carbon atom between them, form a $C_3$–$C_7$-cycloalkyl radical,

$R^3$, $R^4$ and $R^5$ are identical or different and represent hydrogen, $C_1$–$C_4$-alkyl or $C_3$–$C_7$-cycloalkyl, which are unsubstituted or substsituted whereby $C_1$–$C_4$-alkyl can be substituted by halogen or $C_1$–$C_4$-alkoxy and $C_3$–$C_7$-cycloalkyl can be substituted by halogen, $C_1$–$C_4$-alkyl or $C_1$–$C_4$-alkoxy, it also being possible for $R^3$ and $R^4$, together with the carbon atom between them, to form a $C_3$–$C_7$-cycloalkyl radical,

X represents halogen, cyano, nitro, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-halogenoalkyl, $C_1$–$C_4$-alkoxy or $C_1$–$C_4$-halogenoalkoxy, and where two or more radicals X are present they may be identical or different.

and

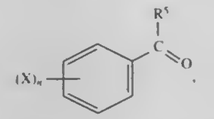
n represents zero or an integer from 1 to 5, in which a substituted cycloalkanone of the formula (II)



(II)

in which

the symbols used have the meaning given for formula (I), are reacted with aromatic carbonyl compounds of the formula (III)



(III)

in which

the symbols used have the meaning given for formula(I),

in the presence of a basic catalyst, water and up to 20% by volume of organic solvents.

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5,741,938

## PRODUCTION OF ALKYL ARALKYL KEONES FROM ALLYLIC-ARALKENYL SECONDARY ALCOHOLS

Stephen E. Belmont, Baton Rouge, La., assignor to Albemarle Corporation, Richmond, Va.

Filed Feb. 21, 1997, Ser. No. 804,528

Int. Cl.[6] C07C *45/51*

U.S. Cl. 568—322 19 Claims

1. A process for forming an alkyl aralkyl ketone from an aralkenyl secondary alcohol having an allylic double bond relative to the hydroxycarbinyl group, and having the allylic double bond disposed between the aryl moiety and the hydroxycarbinyl group, which process comprises heating said alcohol in a suitably inert organic liquid medium to which a catalytic quantity of an iron polycarbonyl has been added.

6. A process which comprises heating a liquid phase mixture formed at least from (i) one or more aralkenyl secondary alcohols having an allylic double bond relative to the hydroxycarbinyl group, and having the allylic double bond disposed between the aryl moiety and the hydroxycarbinyl group, and (ii) at least one iron polycarbonyl, said heating being conducted at one or more temperatures and for a period of time such that transformation of at least a portion of said one or more aralkenyl secondary alcohols to one or more alkyl aralkyl ketones occurs.

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5,741,939

## PROCESS FOR THE COPOLYMERIZATION OF CARBON MONOXIDE WITH AN OLEFINICALLY UNSATURATED COMPOUND

Frank Baardman; Arleen Marie Bradford; Jayne Jubb; Pieter Scheerman, and Rudolf Jacobus Wijngaarden, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 21, 1996, Ser. No. 619,868

Claims priority, application European Pat. Off., Mar. 22, 1995, 95200717

Int. Cl.[6] C07C *45/49*

U.S. Cl. 568—387 13 Claims

1. A process for preparing linear alternating polyketones comprising contacting carbon monoxide and an olefinically unsaturated compound in the presence of a liquid diluent with a catalyst composition comprising:

(a) a source of Group VIII metal;

(b) a bidentate ligand of the formula:

$R^1R^2M^1—R—M^2R^3R^4$ wherein $M^1$ and $M^2$ independently represent a phosphorus, arsenic or antimony atom, each of $R^1$, $R^2$, $R^3$

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and $R^4$ independently represents substituted or unsubstituted hydrocarbyl groups with the proviso that at least one of $R^1$, $R^2$, $R^3$ and $R^4$ is a polar substituted aryl group and R is a bivalent bridging group containing two to four carbon atoms in the bridge, and

(c) a hydrocarbyl borane compound, and imparting a stirring mixture of at least 0.25 $kW/m^3$.

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**5,741,940**

## PROCESS FOR THE PRODUCTION AND PURIFICATION OF VINYL CARBONYLS

**William A. Beavers, Longview, Tex., assignor to Eastman Chemical Company, Kingsport, Tenn.**

**Division of Ser. No. 536,317, Sep. 29, 1995, Pat. No. 5,637,774. This application Jun. 28, 1996, Ser. No. 671,887**

**Int. Cl.[6] C07C *45/82***

**U.S. Cl. 568—410** **12 Claims**

1. A process for the separation of vinyl carbonyl from methyl isoalkenyl ketones comprising;

(a) fractionally distilling a mixture of vinyl carbonyl, methyl isoalkenyl kentone, and unreacted reactants, methyl carbonyl and formaldehyde, at a temperature below 50° C. and a pressure below 35 mmHg to remove methyl carbonyl;

(b) steam distilling at a water to distillant ratio of 1:1 to 3:1, a temperature below 100° C., and a pressure no greater than 760 mmHg to remove formaldehyde;

(c) azeotropically drying in the presence of antioxidant, at a temperature of 10° C. to 60° C. and a pressure of 5 mmHg to 150 mmHg to remove water; and

(d) fractionally distilling under acidic conditions, in the presence of antioxidant, at a temperature of about −10° C. to 40° C. and a pressure of 0.1 mmHg to 50 mmHg, to remove methyl isoalkenyl ketone thereby recovering vinyl carbonyl.

5. A process for the preparation and separation of vinyl carbonyls from methyl isoalkenyl ketones comprising;

producing vinyl carbonyl by the process comprising contacting a methyl carbonyl with formaldehyde in the presence of an acidic zeolite catalyst at a temperature of about 50° to 1,000° C. for a time between 0.01 to 1,000 seconds, said time varying inversely proportional to the temperature such that at 1,000° C. the contacting time is nearer 0.01 seconds than 1,000 seconds thereby producing vinyl carbonyl;

(a) fractionally distilling a mixture of vinyl carbonyl methyl isoalkenyl ketone, and unreacted reactants, methyl carbonyl and formaldehyde, at a temperature below 50° C. and a pressure below 350 mmHg to remove methyl carbonyl;

(b) steam distilling at a water to distillant ratio of 1:1 to 3:1, a temperature below 100° C., and a pressure no greater than 760 mmHg to remove formaldehyde;

(c) azeotropically drying in the presence of antioxidant, at a temperature of 10° C. to 60° C. and a pressure of 5 mmHg to 150 mmHg to remove water; and

(d) fractionally distilling under acidic conditions, in the presence of antioxidant, at a temperature of about −10° C. to 40° C. and a pressure of 0.1 mmHg to 50 mmHg, to remove methyl isoalkenyl ketone thereby recovering vinyl carbonyl.

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**5,741,941**

## PROCESS FOR PREPARING ALDEHYDES

**Helmut Bahrmann, Hamminkeln, Germany, assignor to Hoechst Aktiengesellschaft, Germany**

**Filed Mar. 5, 1997, Ser. No. 811,825**

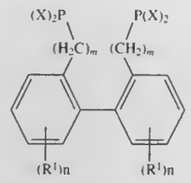
**Claims priority, application Germany, Mar. 20, 1996, 196 10 869.1**

**Int. Cl.[6] C07C *45/50***

**U.S. Cl. 568—451** **16 Claims**

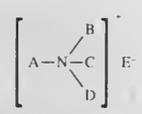
1. A process for preparing aldehydes comprising reacting olefinically unsaturated compounds of at least 3 carbon atoms with carbon monoxide and hydrogen in the liquid phase in the presence of water, solubilizers and a catalyst system comprising water-soluble rhodium complexes, wherein the water-soluble rhodium complexes present in the catalyst system contain as ligands diphosphines of the formula

I



substituted by at least one sulfonic acid, wherein the Xs are individually selected from the group consisting of alkyl of 1 to 9 carbon atoms, cycloalkyl of 6 to 10 carbon atoms, substituted or unsubstituted aryl of 6 to 10 carbon atoms and biaryl of 12 carbon atoms, $R^1$s are individually selected from the group consisting of hydrogen, alkyl of 1 to 14 carbon atoms, alkoxy of 1 to 14 carbon atoms, cycloalkyl of 6 to 14 carbon atoms, aryl of 6 to 14 carbon atoms, aryloxy of 6 to 14 carbon atoms and a fused-on benzene ring, ms are individually an integer from 0 to 5 and ns are individually integers from 0 to 4, and the solubilizers used are compounds of the formula

II



wherein A is a straight-chain or branched alkyl of 6 to 25 carbon atoms, ω-hydroxyalkyl of 6 to 25 carbon atoms, substituted or unsubstituted aryl of 6 to 25 carbon atoms and $R^7$—CONH—$CH_2$—$CH_2$—$CH_2$—, wherein $R^7$ is a straight-chain or branched alkyl of 5 to 11 carbon atoms, B, C and D are individually straight-chain or branched alkyl or ω-hydroxyalkyl of 1 to 4 carbon atoms or C and D together with N form a five- or six-membered heterocyclic ring and $E^-$ is an inorganic or organic anion.

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**5,741,942**

## METAL-LIGAND COMPLEX CATALYZED PROCESSES

**David Robert Bryant, South Charleston, W. Va.; Tak Wai Leung, Houston, Tex.; Ernst Billig, Huntington, W. Va.; Thomas Carl Eisenschmid, Cross Lanes, W. Va., and James Clair Nicholson, South Charleston, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.**

**Filed Nov. 26, 1996, Ser. No. 753,505**

**Int. Cl.[6] C07C *45/50***

**U.S. Cl. 568—454** **20 Claims**

1. A process for separating one or more phosphorus acidic compounds from a reaction product fluid containing said one or more phosphorus acidic compounds, a metal-organophosphite ligand complex catalyst and optionally free organophosphite ligand which process comprises treating said reaction product fluid with an aqueous buffer solution sufficient to neutralize and remove at least some amount of said one or more phosphorus acidic compounds from said reaction product fluid, wherein said reaction product fluid comprises an organic phase and said aqueous buffer solution comprises a separate aqueous phase.



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**5,741,943**

## HYDROFORMYLATION PROCESSES EMPLOYING INDICATOR LIGANDS

**David Robert Bryant, South Charleston, W. Va., and Tak Wai Leung, Houston, Tex., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.**

**Filed Nov. 26, 1996, Ser. No. 756,500**

**Int. Cl.[6] C07C *45/50***

**U.S. Cl. 568—454** **17 Claims**

1. A hydroformylation process which comprises reacting one or more olefinic unsaturated compounds with carbon monoxide and hydrogen in the presence of a metal-organopolyphosphite ligand complex catalyst and optionally free organopolyphosphite ligand, and an amount of a sterically hindered organophosphorus ligand different from the organopolyphosphite ligand of said metal-organopolyphosphite ligand complex catalyst sufficient to give indications that the organopolyphosphite concentration has reached a point which needs to be increased, to produce one or more aldehydes, wherein said sterically hindered organophosphorus ligand (i) has a coordination strength with respect to the metal of said metal-organopolyphosphite ligand complex catalyst greater than carbon monoxide, (ii) has a coordination strength with respect to the metal of said metal-organopolyphosphite ligand complex catalyst less than the organopolyphosphite ligand of said metal-organopolyphosphite ligand complex catalyst, (iii) when complexed with the metal to form a metal-sterically hindered organophosphorus ligand complex catalyst, provides a reaction rate of at least 25 percent of the reaction rate provided by the organopolyphosphite ligand of said metal-organopotyphosphite ligand complex catalyst, and (iv) when complexed with the metal to form a metal-sterically hindered organophosphorus ligand complex catalyst, provides a normal:branched aldehyde isomer ratio lower than the normal:branched aldehyde isomer ratio provided by the organopolyphosphite ligand of said metal-organopolyphosphite ligand complex catalyst.

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**5,741,944**

## HYDROFORMAYLATION PROCESSES

**David Robert Bryant, South Charleston, W. Va.; Tak Wai Leung, Houston, Tex.; Ernst Billig, Huntington, W. Va.; Thomas Carl Eisenschmid, Cross Lanes, W. Va., and James Clair Nicholson, Saint Albans, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.**

**Filed Nov. 26, 1996, Ser. No. 756,501**

**Int. Cl.[6] C07C *45/50***

**U.S. Cl. 568—454** **20 Claims**

1. A process for separating one or more phosphorus acidic compounds from a hydroformylation reaction product fluid containing said one or more phosphorus acidic compounds, a metal-organophosphite ligand complex catalyst and optionally free organophosphite ligand which process comprises treating said hydroformylation reaction product fluid with an aqueous buffer solution sufficient to neutralize and remove at least some amount of said one or more phosphorus acidic compounds from said hydroformylation reaction product fluid, wherein said hydroformylation reaction product fluid comprises an organic phase and said aqueous buffer solution comprises a separate aqueous phase.

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**5,741,945**

## PROCESSES EMPLOYING INDICATOR LIGANDS

**David Robert Bryant, South Charleston, W. Va., and Tak Wai Leung, Houston, Tex., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.**

**Filed Nov. 26, 1996, Ser. No. 757,741**

**Int. Cl.[6] C07C *45/50***

**U.S. Cl. 568—454** **17 Claims**

1. A process which comprises reacting one or more reactants in the presence of a metal-organopolyphosphite ligand complex catalyst and optionally free organopolyphosphite ligand, and an amount of a sterically hindered organophosphorus ligand different from the organopolyphosphite ligand of said metal-organopolyphosphite ligand complex catalyst sufficient to give indications that the organopolyphosphite concentration has reached a point which needs to be increased, to produce one or more products, wherein said sterically hindered organophosphorus ligand (i) has a coordination strength with respect to the metal of said metal-organopolyphosphite ligand complex catalyst less than the organopolyphosphite ligand of said metal-organopolyphosphite ligand complex catalyst, (ii) when complexed with the metal to form a metal-sterically hindered organophosphorus ligand complex catalyst, provides a reaction rate of at least 25 percent of the reaction rate provided by the organopolyphosphite ligand of said metal-organopolyphosphite ligand complex catalyst, (iii) optionally has a coordination strength with respect to the metal of said metal-organopolyphosphite ligand complex catalyst greater than carbon monoxide, and (iv) optionally when complexed with the metal to form a metal-sterically hindered organophosphorus ligand complex catalyst, provides a normal:branched product isomer ratio lower than the normal:branched product isomer ratio provided by the organopolyphosphite ligand of said metal-organopolyphosphite ligand complex catalyst.

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**5,741,946**

## POLYETHER LUBRICANTS AND METHOD FOR THEIR PRODUCTION

**Liwen Wei, Belle Mead, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.**

**Division of Ser. No. 329,913, Oct. 27, 1994, Pat. No. 5,648,557. This application Oct. 16, 1996, Ser. No. 733,056**

**Int. Cl.[6] C07C *43/11***

**U.S. Cl. 568—617** **22 Claims**

1. A process for the polymerization of cyclic ether monomers for the production of polyoxyalkylene polymer lubricants, said process comprising:

polymerizing at least one of said cyclic ether monomers in a reaction mixture consisting essentially of a single homogeneous liquid phase of said monomers and 0.1 to 5 weight percent of a hydrated or anhydrous heteropolyacid catalyst, wherein said process is carried out under conditions sufficient to produce said polyoxyalkylene polymer with yields of said lubricants of at least 80 weight percent and with less than 2 weight percent cyclic oligomer formation.

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**5,741,947**

## PREPARATION OF ALKOXYLATION PRODUCTS IN THE PRESENCE OF MIXED HYDROXIDES MODIFIED WITH ADDITIVES

**Gerhard Wolf, Ketsch; Bernd Burkhart, Mutterstadt; Guenter Lauth, Grosskarlbach; Horst Trapp, Plankstadt, and Alfred Oftring, Bad Duerkheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**PCT No. PCT/EP94/02195, § 371 Date Jan. 29, 1996, § 102(e) Date Jan. 29, 1996, PCT Pub. No. WO95/04024, PCT Pub. Date Feb. 9, 1995**

**PCT Filed Jul. 5, 1994, Ser. No. 586,803**

**Claims priority, application Germany, Jul. 28, 1993, 43 25 237.0**

**Int. Cl.[6] C07C *43/11***

**U.S. Cl. 568—618** **11 Claims**

1. A process for preparing an alkoxylation product comprising reacting a compound having active hydrogen atoms with at least one of $C_2$–$C_4$-alkylene oxides in the presence of a mixed hydroxide built up of polycations and modified with one or more additives and having the general formula I or II

$$[M(II)_{1-x}M(III)_x(OH)_2]A^{n-}_{x/n}\cdot m\,H_2O \quad (I)$$

$$[Li_2M_z(OH)_6]A^{n-}_{1/n}\cdot m\,H_2O \quad (II)$$

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where
M(II) is at least one divalent metal ion,
M(III) is at least one trivalent metal ion,
A is at least one inorganic anion and
L is an organic solvent or water,
n is the valence of the inorganic anion A or in the case of a plurality of anions A is their mean valence and
x can assume a value of from 0.1 to 0.5 and
m can assume a value of from 0 to 10,
as alkoxylation catalyst, wherein said one or more additives is at least one selected from the group consisting of
(a) aromatic or heteroaromatic mono-or polycarboxylic acids or their salts,
(b) aliphatic monocarboxylic acids or their salts from the group phenyl-$C_2$–$C_4$-alkanoic acids, cyclopentanecarboxylic acid, cyclohexanecarboxylic acid, cyclohexyl-$C_2$–$C_4$-alkanoic acids, cinnamic acid, o- or p-chlorocinnamic acid and pyridylacetic acids,
(c) monoesters of dicarboxylic acids or their salts,
(d) carboxylic anhydrides,
(e) aliphatic or aromatic sulfonic acids or their salts,
(f) $C_8$–$C_{18}$-alkyl sulfates,
(g) $C_8$–$C_{50}$-n-alkanes,
(h) polyetherols or polyether polyols, and
(j) alcohols or phenols,which are not build in between the layers of the mixed hydroxide I or II.

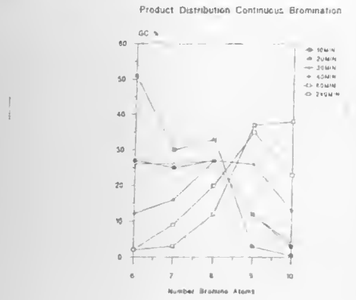
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**5,741,948**
**PROCESS FOR PRODUCTION OF (POLY) ALKYLENE GLYCOL MONOALKYL ETHER**
**Masaru Kirishiki, Suita; Yukio Kadono, Yokohama; Isamu Maeda, Mishima-gun; Yasuhiko Satoh, Yokohama; Fumiaki Morishita; Yoshiyuki Onda, both of Suita, and Hideaki Tsuneki, Tokyo, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan**
**Filed Jun. 6, 1996, Ser. No. 659,350**
**Claims priority, application Japan, Jun. 8, 1994, 7-141881**
**Int. Cl.[6] C07C** *41/01*
**U.S. Cl. 568—619** **7 Claims**

1. A process for producing a (poly)alkylene glycol monoalkyl ether, which comprises reacting an olefin with a (poly)alkylene glycol in the presence of a crystalline metallosilicate as a catalyst, wherein part or all of the cation is replaced with $H^+$.

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**5,741,949**
**CONTINUOUS BROMINATION PROCESS AND PRODUCTS THEREOF**
**Art Mack, Lafayette, Ind., assignor to Great Lakes Chemical Corporation, West Lafayette, Ind.**
**Continuation-in-part of Ser. No. 318,076, Oct. 5, 1994, abandoned. This application Apr. 8, 1996, Ser. No. 629,103**
**Int. Cl.[6] C07C** *41/22;22/04;25/18;* **C09K** *21/08*
**U.S. Cl. 568—639** **18 Claims**




1. A process for preparing a brominated, non-fused aromatic composition, comprising:
a) continuously feeding liquid bromine and a non-fused aromatic compound to be brominated to a reaction zone to form a reaction mixture, said reaction zone including an input and an output at spaced locations, and said liquid bromine being fed to the reaction zone in at least about a 100% stoichiometric excess relative to that necessary to produce said brominated, non-fused aromatic composition;
b) maintaining the reaction mixture in the reaction zone at a temperature at which bromination of the non-fused polyaromatic compound in the presence of the liquid bromine occurs;
c) continuously passing the reaction mixture through the reaction zone from the input of the reaction zone to the output of the reaction zone;
d) continuously withdrawing the reaction mixture from the output of the reaction zone; and
e) terminating the bromination of the non-fused aromatic compound;
wherein an average residence time for the reaction mixture in the reaction zone is established to provide the brominated, non-fused aromatic composition.

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**5,741,950**
**METHOD OF PREPARING NONAFLUOROISOBUTYL METHYL ETHER**
**Michael G. Costello, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Filed Dec. 16, 1996, Ser. No. 767,563**
**Int. Cl.[6] C07C** *41/00*
**U.S. Cl. 568—683** **20 Claims**

1. A method of preparing nonafluoroisobutyl methyl ether comprising the step of fluorinating heptafluoroisobutenyl methyl ether.

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**5,741,951**
**CONJOINT MANUFACTURE OF MTBE AND DIISOBUTYLENE**
**Kyle Lee Preston, Port Arthur, Tex., assignor to Huntsman Specialty Chemicals Corporation, Austin, Tex.**
**Continuation-in-part of Ser. No. 512,615, Aug. 8, 1995, abandoned. This applicatinn Dec. 30, 1996, Ser. No. 778,204**
**Int. Cl.[6] C07C** *41/09;41/05*
**U.S. Cl. 568—698** **7 Claims**

1. A method for preparing methyl tertiary butyl ether and diisobutylene from methanol and tertiary butyl alcohol by a process wherein methanol is reacted with tertiary butyl alcohol to provide an etherification reaction product containing methyl tertiary butyl ether, tertiary butyl alcohol, methanol, isobutylene, oxygenated by-products and water which comprises the steps of:
a) recovering a methyl tertiary butyl ether product fraction and an isobutylene fraction from said etherification reaction product,
b) charging said isobutylene fraction to an isobutylene conversion reaction zone and contacting it therein with a solid resin etherification catalyst to convert isobutylene to diisobutylene and to form a diisobutylene conversion product containing isobutylene, methyl tertiary butyl ether and diisobutylene, and
c) charging said diisobutylene conversion product to a diisobutylene distillation zone and separating it therein into a lower boiling distillation fraction comprising isobutylene, and diisobutylene and a higher boiling distillation fraction consisting essentially of diisobutylene.



**5,741,952**
**CATALYTIC DECOMPOSITION OF PEROXIDES TO PURIFY A METHYL TERTIARY BUTYL ETHER RECYCLE STREAM**
**John Ronald Sanderson, Leander, and John Frederick Knifton, Austin, both of Tex., assignors to Huntsman Specialty Chemicals Corporation, Austin, Tex.**
**Continuation-in-part of Ser. No. 833,200, Feb. 10, 1992, abandoned. This application Jan. 11, 1993, Ser. No. 2,563**
**Int. Cl.[6] C07C** *29/88*
**U.S. Cl. 568—699** **2 Claims**

1. A method for the catalytic decomposition of peroxides to purify a methyl tertiary butyl ether recycle stream consisting essentially of about 40 to about 60 wt. % of methanol, about 50 to 25 wt. % of tertiary butyl alcohol, about 5 to about 15 wt. % of methyl tertiary butyl ether, from about 0.5 to about 5 wt. % of tertiary butyl hydroperoxide and from about 0.05 to about 5 wt. % of ditertiary butyl peroxide which comprises the steps of:
contacting said recycle stream in a reaction zone with a catalyst at a temperature of about 160° to about 180° C., a pressure of about 200 to 1000 psig and a flow rate of about 100 to about 500 cc of feed per hour per 250 cc of reactor volume sufficient to substantially completely decompose said peroxide contaminants and to form additional methyl tertiary butyl ether,
said catalyst being a silica-supported catalyst consisting essentially of from about 40 to about 95 wt. % of silica and about 5 to about 60 wt. % of nickel, copper, chromium and iron, the metal components of the catalyst being proportioned, on an oxides-free basis, so as to contain about 30 to about 60 wt. % of nickel, about 5 to about 40 wt. % of copper, about 1 to about 5 wt. % of chromium and about 1 to about 20 wt. % of iron, with the nickel and copper being proportioned in the weight ratio of about 2 to 3 parts of nickel per part of copper.

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**5,741,953**
**USE OF REACTIVE DISTILLATION IN THE MANUFACTURE OF METHYL TERTIARY BUTYL ETHER**
**Kyle Lee Preston, Port Arthur, Tex., assignor to Huntsman Specialty Chemicals Corporation, Austin, Tex.**
**Filed Aug. 17, 1995, Ser. No. 516,039**
**Int. Cl.[6] C07C** *41/34*
**U.S. Cl. 568—699** **5 Claims**

1. A method for the distillation of an aqueous methanol feed stream contaminated with tertiary butyl alcohol in a reactive distillation column having a reaction distillation section in the upper portion thereof containing an acid cation exchange resin which comprises:
charging an aqueous methanol feed stream contaminated with tertiary butyl alcohol to the lower portion of the reactive distillation column under distillation conditions effective for the separation of the methanol and tertiary butyl alcohol from the water contained in the feed stream to provide a higher boiling water fraction and a lower boiling methanol fraction containing a tertiary butyl alcohol-water azeotrope for upward flow into the reactive distillation section
reacting the tertiary butyl alcohol flowing into the reactive distillation section to convert the tertiary butyl alcohol to isobutylene, MTBE and water and to provide a mixture of isobutylene, MTBE, methanol and water, and recovering a substantially anhydrous lower boiling methanol fraction contaminated with isobutylene and MTBE.

**5,741,954**
**PROCESS OF SELECTIVE DESULFONATION**
**Elias Suokas; Markku Niemi; Pekka Somersalo, all of Espoo, and Jouko Kujala, Kokkola, all of Finland, assignors to Kemira Agro Oy, Espoo, Finland**
**Filed Jul. 19, 1995, Ser. No. 504,161**
**Claims priority, application Japan, Jul. 28, 1994, 6-176550**
**Int. Cl.[6] C07C** *37/00;37/04*
**U.S. Cl. 568—795** **3 Claims**

1. A process for the preparation of m-ethylphenol from a hot mixture of sulfuric acid and ethylbenzenesulfonic acid isomers which is rich in the m-isomer, comprising the steps of:
(a) selectively desulfonating the isomers other than the m-isomer into ethylbenzene by addition of steam to the mixture and by removal of said ethylbenzene as formed from the mixture through desulfonation and evaporable water,
wherein the steam is fed to the mixture in excess of the amount of water evaporated from the mixture,
wherein the desulfonation step is carried out at a temperature which is maintained above 160° C. during the desulfonation step, and which is decreased so as to reach a final temperature of 160° C. at the end of the desulfonation step, and
wherein the content of sulfuric acid in the mixture is decreased during the desulfonation step to reach a final sulfuric acid concentration of less than 40%;
(b) mixing the hot reaction mixture with water after the desulfonation; and
(c) caustically fusing the undesulfonated m-isomer of the ethylbenzenesulfonic acid contained in the mixture into m-ethylphenol.

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**5,741,955**
**PROCESS FOR REDUCTIVE HYDROLYSIS OF NITRILES**
**Richard Paul Beatty, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**
**Continuation-in-part of Ser. No. 381,597, Jan. 31, 1995, abandoned. This application Oct. 17, 1995, Ser. No. 544,227**
**Int. Cl.[6] C07D** *307/28;* **C07C** *31/38;31/20;31/125*
**U.S. Cl. 568—842** **21 Claims**

1. A process for the reductive hydrolysis of an organic nitrile, comprising the steps of:
(a) contacting said nitrile with gaseous hydrogen and water in the presence of a catalyst having the formula $MHZ_t(CO)_nL_m(PR_3)_2$, wherein:
M is a transition metal selected from the group consisting of: Fe, Ru and Os;
Z is a formally anionic ligand selected from the group consisting of: H, halogen, R, C(O)R, OC(O)R, $CO_2R$, CN, $NR_2$ and OR;
L is a neutral ligand selected from the group consisting of: $H_2$; $N_2$; CO; a monofunctional compound selected from the group consisting of: nitriles, amines, alcohols, ethers, esters, amides, alkenes, alkynes, aldehydes, ketones and imines; and a multifunctional compound containing at least two functional groups independently derived from the monofunctional compounds;
$(PR_3)_2$ represents phosphine ligands present as either separate ligands or cojoined together;
each R is a substituent independently selected from the group consisting of: H; and a hydrocarbyl group, optionally substituted with one or more halo, hydrocarbyloxy, hydrocarbylamino or dihydrocarbylamino groups; and
n is 0 or 1; and

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(h) subsequently agitating the nitrile, water, hydrogen and catalyst to form an alcohol.

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**5,741,956**

**PROCESS FOR THE PREPARATION OF PENTAERYTHRITOL**

**Lluis Eek, Barcelona, Spain, assignor to Patentes y Novedades, Barcelona, Spain**

**Filed Nov. 26, 1996, Ser. No. 756,340**

**Claims priority, application Spain, May 22, 1996, 9601129**

**Int. Cl.[6] C07C** *29/20*

**U.S. Cl. 568—853** **11 Claims**

1. A process for the preparation of pentaerythritol, comprising the initial steps of: [a] reacting formaldehyde with acetaldehyde, to give pentaerythritose; and subsequent reaction of said pentaerythritose with formaldehyde and sodium hydroxide, to give a solution containing pentaerythritol; and [b] acidification of said pentaerythritol-containing solution with formic acid; said steps [a] and [b] being conducted in a reactor, with the supply of formaldehyde ($CH_2O$), sodium hydroxide (NaOH), acetaldehyde (AcH) and formic acid (HCOOH) and at the end of said steps the formed pentaerythritol-containing solution being drained to a buffer tank of a capacity greater than that of the reactor, new reactions and a new acidification operation being successively reinitiated in said reactor by fresh supplies, wherein, in the first place, a formaldehyde solution and thereafter, simultaneously but separately, sodium hydroxide solution and acetaldehyde are supplied, forming a reaction mixture and because the exit flow from the said buffer tank is substantially constant and continuous.

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**5,741,957**

**TRANSGENIC BOVINE**

**Herman A. Deboer, Roelofarendsveen; Rein Strijker, Oegstgeest, both of Netherlands; Herbert L. Heyneker, Hillsborough, Calif.; Gerard Platenburg, Voorschoten, Netherlands; Sang He Lee, Leiden, Netherlands; Frank Pieper, Utrecht, Netherlands, and Paul J. A. Krimpenfort, Heemstede, Netherlands, assignors to Pharming B.V., Leiden, Netherlands**

**Division of Ser. No. 154,019, Nov. 16, 1993, Pat. No. 5,633,076, which is a continuation-in-part of Ser. No. 77,788, Jun. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 898,956, Jun. 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 619,131, Nov. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 444,745, Dec. 1, 1989, abandoned. This application Jun. 5, 1995, Ser. No. 461,333**

**Int. Cl.[6] C12N** *5/00;15/00;* **C12P** *21/06*

**U.S. Cl. 800—2** **36 Claims**

1. A transgenic bovine whose somatic and germ cells contain a transgene, wherein the transgene comprises in operable association:

a mammary gland specific promoter;

a mammary gland specific enhancer;

a DNA sequence encoding a signal sequence functional in bovine mammary gland secretory cells; and

a DNA sequence encoding a heterologous polypeptide of interest; wherein the transgenic bovine or a female descendant of the transgenic bovine expresses the transgene in mammary secretory cells such that the polypeptide of interest is detectable in milk produced by the transgenic bovine or a female descendant of the transgenic bovine.



**5,741,958**

**METHOD FOR DETECTING AND DOCUMENTING EXHAUST-GAS RELEVANT MALFUNCTIONS OF A MOTOR VEHICLE HAVING AN INTERNAL COMBUSTION ENGINE WITH THE AID OF ON-BOARD MEANS**

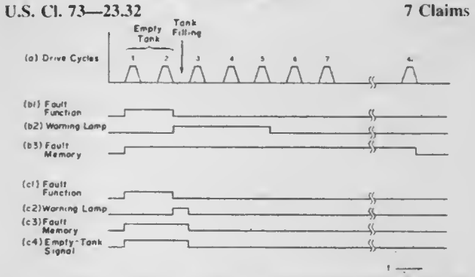
**Helmut Denz, Stuttgart, and Andreas Blumenstock, Ludwigsburg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Nov. 27, 1996, Ser. No. 757,772**

**Claims priority, application Germany, Dec. 23, 1995, 195 48 684.6**

**Int. Cl.[6] G01M** *15/00*

**U.S. Cl. 73—23.32** **7 Claims**




1. A method for detecting and documenting exhaust-gas relevant malfunctions of a vehicle having an internal combustion engine and a fuel tank utilizing on-board diagnosis, the vehicle being driven by an operator in successive drive cycles with each two successive drive cycles being separated by a standstill of the vehicle and a shutoff of the engine, the method comprising the steps of:

detecting malfunctions utilizing sensor means and evaluating said malfunctions in a circuit unit with said malfunctions including those malfunctions which are based on an empty tank;

storing fault announcements of said malfunctions in a memory in dependence upon a pregiven number of drive cycles;

determining a fill-level value indicative of the level of fuel in said fuel tank and storing said fill-level value in said memory;

outputting and storing fault announcements of said malfunctions in said memory in dependence upon said fill-level value thereby eliminating fault announcements of said malfunctions based on an empty tank;

directly outputting each fault announcement occurring in a drive cycle and storing said fault announcement together with the fill-level value; and,

ending the output of the fault announcement in a further drive cycle and erasing the memory only when said fill-level value exceeds a pregiven value in said further drive cycle and when said fill-level value had been below said fill-level value in the drive cycle directly preceding said further drive cycle.

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**5,741,959**

**PORTABLE TESTER FOR DETERMINING GAS CONTENT WITHIN A CORE SAMPLE**

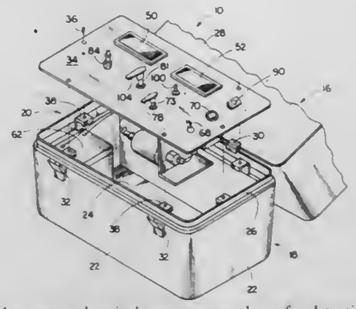
**Fred Garcia, Jr., Donora, and Steven J. Schatzel, Bethel Park, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Aug. 9, 1996, Ser. No. 694,574**

**Int. Cl.[6] G01N** *7/00*

**U.S. Cl. 73—19.05** **6 Claims**

1. A portable tester for reading and displaying the pressure of a gas released from a core sample stored within a sealed container and for taking a sample of the released pressurized gas for chemical analysis thereof for subsequent use in a moditied direct method test which determines the volume of gas and specific type of gas contained within said core sample, said tester consisting of:




(a) a low range electrical pressure transducer for detecting a gas pressure within a first range and for producing an electrical signal related to the detected pressure;

(b) a high range electrical pressure transducer for detecting a gas pressure within a second range and for producing an electrical signal related to the detected pressure, said second range of gas pressure being greater than said first range of gas pressure;

(c) a low range display unit electrically connected to said low range electrical pressure transducer for receiving the electrical signal produced therefrom and visually displaying the pressure of said detected gas;

(d) a high range display unit electrically connected to said high range electrical pressure transducer for receiving the electrical signal produced therefrom and visually displaying the pressure of said detected gas;

(e) a selector valve means in flow communication with said low range and high range pressure transducers and having a first flow path to said low range pressure transducer and a second flow path to said high range pressure transducer and a selector knob for selecting gas flow to one of said first and second flow paths;

(f) a control valve means having an inlet port for flow communication to said sealed container, a first outlet port for flow communication to a sample gas canister, a second outlet port in flow communication with said selector valve means for reading the pressure of the flow of gas from said sealed container to said first and second flow paths of said respective low range and high range pressure transducers, a third outlet port for venting to the atmosphere gas contained within said sealed container, and a control knob for selecting the flow of gas from said inlet port to one of said first and second outlet ports;

(g) a battery electrically interconnecting said low range and high range pressure transducers with said respective low range and high range display units; and

(h) a portable protective casing for housing said low range and high range pressure transducers, said low range and high range display units, said valve means, and said battery, said protective casing including a box-like hollow base with a hinged enclosure cover and a mounting plate extending over said box-like base and enclosed by said hinged cover, said control knob being mounted on an outer surface of said mounting plate toward said cover and said detector means, said display unit means, and said valve means being mounted on an inner surface of said mounting plate toward a bottom wall of said box-like base.

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**5,741,960**

**PROBE CHROMATOGRAPH APPARATUS AND METHOD**

**Glen D. Payne; Wallace J. Trochesset, and Edward M. Browne, all of Houston, Tex., assignors to Daniel Industries, Inc., Houston, Tex.**

**Filed May 27, 1994, Ser. No. 250,440**

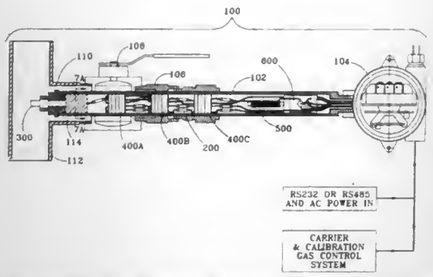
**Int. Cl.[6] B01D** *15/08*

**U.S. Cl. 73—23.41** **36 Claims**

1. A probe for making chromatographic measurements at the location of sampling of a fluid, rather than at a remote location, to

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obtain information concerning one or more components of the fluid wherein the fluid is in a conduit, vessel or reactor, the probe comprising:

(a) a housing having a first end, the housing attached to the conduit for extending the first end of the housing into the conduit with the fluid,

(b) a sampler affixed within the housing such that a portion thereof extends from the first end of the housing into the conduit, the sampler for acquiring a sample from the fluid in the conduit such that the sampler is in the fluid in the conduit,

(c) a processor for receiving the acquired sample from the sampler and for initiating processing of the acquired sample within the housing such that the processor is in the housing in the fluid inside the conduit,

(d) a separator for accepting the processed sample from the processor and for separating the processed sample into respective components such that the separator is in the housing, and

(e) a detector for accepting the separated components of the processed sample and for analyzing the separated components to obtain information concerning one or more components of the fluid such that the detector is in the housing whereby the probe is affixed to the conduit.

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**5,741,961**

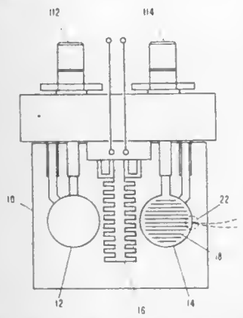
## QUARTZ RESONATOR FLUID DENSITY AND VISCOSITY MONITOR

**Stephen J. Martin; James J. Wiczer; Richard W. Cernosek, all of Albuquerque; Gregory C. Frye, Cedar Crest; Charles T. Gebert, Albuquerque; Leonard Casaus, Bernalillo, and Mary A. Mitchell, Tijeras, all of N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.**

**Filed Aug. 18, 1993, Ser. No. 108,397**

**Int. Cl.[6] G01N** *9/00*

**U.S. Cl. 73—32 R** **48 Claims**




1. An apparatus for real-time in situ measurement of fluid density and viscosity comprising:

a first resonator comprising a smooth surface;

a second resonator comprising a textured surface;

first measuring means connected to at least one of the first and second resonators for measuring density of a fluid disposed on said resonators; and

second measuring means connected to at least one of the first and second resonators for measuring viscosity of the fluid disposed on said resonators.

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**5,741,962**

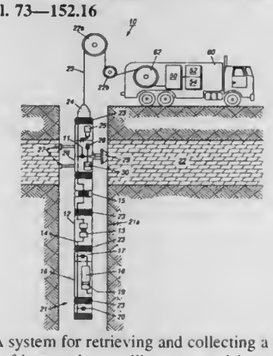
## APPARATUS AND METHOD FOR ANALYZING A RETRIEVING FORMATION FLUID UTILIZING ACOUSTIC MEASUREMENTS

**James R. Birchak, Spring, and Mark A. Proett, Houston, both of Tex., assignors to Halliburton Energy Services, Inc., Houston, Tex.**

**Filed Apr. 5, 1996, Ser. No. 628,408**

**Int. Cl.[6] E21B** *47/10;43/00;* **G01V** *1/40*

**U.S. Cl. 73—152.16** **26 Claims**



17. A system for retrieving and collecting a formation fluid from a zone of interest in a wellbore, comprising:

(a) a probe adapted for placement against the zone of interest in the wellbore for receiving the formation fluid;

(b) a pump for controlling the flow rate of the formation fluid from the probe into a flowline used for retrieving said formation fluid;

(c) an acoustic density cell coupled along the flowline for providing signals representative of the speed of sound in the fluid, acoustic impedance and acoustic absorption coefficient of the formation fluid flowing through the flowline;

(d) a control valve for controlling the flow rate of the formation fluid from the flowline into a chamber; and

(e) a control unit for causing the flow rate through the pump to change as a function of the fluid density and compressibility of said formation fluid in a manner which ensures that the pressure in the flowline remains above the bubble point pressure of the fluid, said control unit further determining when the fluid in the flowline is substantially free of mud filtrates and causing the valve to discharge such filtrate free fluid into the chamber.

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**5,741,963**

## ADJUSTMENT METHOD FOR SPARK PLUG AND APPARATUS THEREFOR

**Hiroshi Nakatani; Tsutomu Ozawa; Syoiti Umekawa, all of Kuwana, and Hirofumi Nishiwaki, Yokkaichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Continuation of Ser. No. 563,821, Nov. 28, 1995, abandoned. This application Apr. 3, 1997, Ser. No. 832,337**

**Claims priority, application Japan, Nov. 29, 1994, 6-294673**

**Int. Cl.[6] H01T** *13/20*

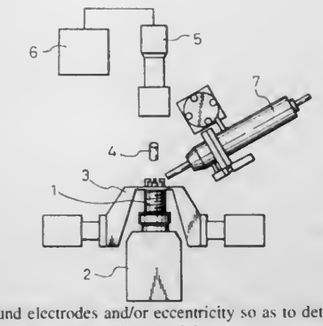
**U.S. Cl. 73—118.1** **13 Claims**

1. An adjustment method for a spark plug, comprising the steps of:

supporting and fixing a spark plug having a center electrode and ground electrodes;

executing an image processing of image signals obtained by imaging a spark gap defined by said center electrode and said






ground electrodes and/or eccentricity so as to determine said spark gap and/or said eccentricity;

determining a hammering operation quantity providing an impact working pressure several times to said ground electrodes in such a manner as to correspond to said spark gap and/or said eccentricity obtained by said image processing;

imparting an impact working pressure several times to said ground electrodes in accordance with said hammering operation quantity corresponding to said spark gap and/or said eccentricity;

executing an image processing of image signals obtained by imaging said spark gap and/or said eccentricity after said hammering operation so as to determine said spark gap and/or said eccentricity after said hammering operation; and

imparting again said impact working pressure to said ground electrode when said spark gap and/or said eccentricity obtained by said image processing does not reach a predetermined value, wherein said ground electrode has a bent portion so formed as to extend from one of the ends thereof to the other and said hammering operation imparts an impact working pressure directly to said bent portion.

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**5,741,964**

## APPARATUS AND METHOD FOR DETECTING ABNORMALITY OF AIR FLOW METER

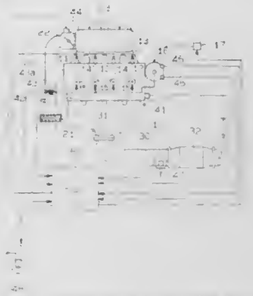
**Koichi Mizutani, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Filed Dec. 5, 1996, Ser. No. 760,825**

**Claims priority, application Japan, Dec. 5, 1995, 7-316797**

**Int. Cl.[6] G01M** *15/00*

**U.S. Cl. 73—118.2** **25 Claims**



1. An apparatus for detecting an abnormality in an air flow meter comprising:

an engine having an air intake passage;

an air flow meter disposed in said air intake passage to detect an actual flow rate of air flowing through said intake passage;

a throttle valve disposed in said intake passage to control the actual flow rate of the air flowing in said intake passage;

said throttle devised to vary an opening between a maximum size and a minimum size, wherein said throttle valve adjusts the actual flow rate of the air when the opening size is defined by a first range that covers at least an intermediate opening size, and wherein the throttle valve adjusts the actual flow rate regardless of the engine speed when the opening size is defined by a second range that covers the vicinity of the minimum opening size;

detecting means for detecting the opening size of said throttle valve;

computing means for computing a target rate of the air flowing in said intake passage based on the detected opening size of said throttle valve, said computing means designed to compute a marginal range for allowing a deviation of the actual flow rate of the air with respect to the target rate; and

determining means for determining the abnormality of the air flow meter when the opening size of the throttle valve is in the second range and the actual flow rate of the air is out of the marginal range.

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**5,741,965**

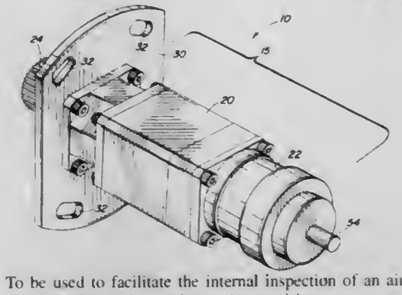
## AIRCRAFT JET ENGINE TESTING TOOL

**Carlos M. Hernandez, 1803 SW. 107th Ave., #2103, Miami, Fla. 33165, and Charles Ramos, 14364 SW. 176th Ter., Miami, Fla. 33177**

**Filed Nov. 29, 1996, Ser. No. 758,483**

**Int. Cl.[6] G01M** *15/00*

**U.S. Cl. 73—119 R** **30 Claims**




1. To be used to facilitate the internal inspection of an aircraft engine; an aircraft engine testing tool comprising:

(a) a power driver structured to selectively and in a precisely controlled manner turn internal engine blades into an inspection orientation, said power driver comprising:

a gear down assembly structured to produce substantial amounts of low speed torque,

a gear spline connected with said gear down assembly and structured to rotate at substantially low speeds in accordance with said low speed torque produced by said gear down assembly,

said gear spline being structured to be drivingly disposed within an aircraft engine gear socket such that said low speed rotation thereof results in corresponding rotation of a plurality of internal engine gears of an aircraft engine's constant speed drive and the engine blades thereof, and

mount means structured and disposed to maintain said gear spline operatively within the aircraft engine gear socket, during said low speed rotation thereof, such that said low speed torque produced by said gear down assembly is directed through said gear spline towards rotating the plurality of internal engine gears;

(b) a processor unit, said processor unit comprising:

power receiving means structured and disposed to receive power from a power source,

power supply means structured and disposed to supply power to said power driver,

output regulating means structured and disposed to regulate a power output and directional control to said gear down assembly of said power driver, and

control means structured and disposed to permit facilitated control of said output regulating means so as to regulate a direction and speed of said low speed rotation of said gear spline.

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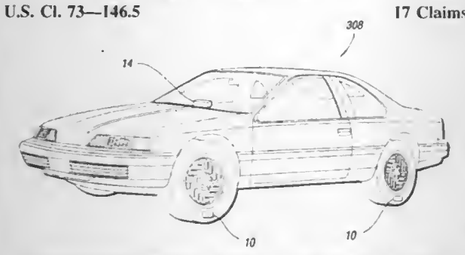


5,741,966

## METHOD AND SYSTEM FOR MONITORING A PARAMETER OF A VEHICLE TIRE

Michael Handfield, and Helene Laliberte, both of 910 Sherwood Ct., Rochester, Mich. 48307

Division of Ser. No. 101,379, Aug. 3, 1993, Pat. No. 5,473,938.
This application Jun. 6, 1995, Ser. No. 465,763
Int. Cl.[6] B60C *23/00*
U.S. Cl. 73—146.5 17 Claims




1. A system for monitoring a status of a parameter of a tire for a vehicle, the system comprising:
- a sensor, disposed within the tire, for generating a signal indicative of the parameter of the tire independently of magnitude of the parameter;
- a programmable processor, in electrical communication with the sensor for determining status of the tire parameter by comparing the tire parameter to a selected threshold;
- a transmitter, in electrical communication with the processor for transmitting a status signal indicative of the status of the tire parameter along a first communications link;
- a monitor, in communication with the first communications link, for monitoring the status of the tire parameter;
- a communication unit in electrical communication with the processor having a first receiver for receiving a processor control command; and
- a remote controller, positionable for communication with the communication unit via a second communications link, for initiating the processor control command.

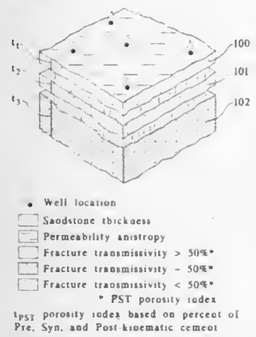
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5,741,967

## METHOD FOR DETERMINING OPTIMUM HORIZONTAL DRILLING DIRECTION AND DRILLING HORIZON

Stephen E. Laubach, Austin, Tex., assignor to Gas Research Institute, Chicago, Ill.

Filed Apr. 15, 1996, Ser. No. 632,590
Int. Cl.[6] E21B *49/06*
U.S. Cl. 073—152.11 8 Claims




1. A method for determining the azimuth of microfractures of a sandstone formation through which a borehole has been drilled, the method comprising the following steps:
- a. retrieving a plurality of drilled sidewall core samples from the portion of the borehole passing through the sandstone formation;
- b. determining the azimuth of each core sample;
- c. cutting each sample at an angle that is substantially parallel to bed angle to provide cut samples;
- d. polishing each cut sample to provide polished samples;
- e. detecting microfractures in each polished sample with photomultiplier-based imaging of electron beam-induced luminescence; and
- f. determining the azimuth of the microfractures in polished sample.

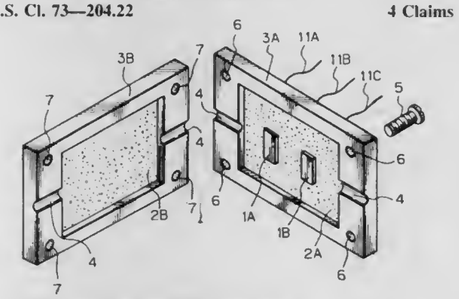
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5,741,968

## FLOW DETECTING ASSEMBLY

Mayumi Arai, Tokyo, Japan, assignor to MKS Japan, Inc., Tokyo, Japan

Filed Jun. 7, 1996, Ser. No. 660,236
Claims priority, application Japan, Jun. 14, 1995, 7-147018
Int. Cl.[6] G01F *1/68*
U.S. Cl. 73—204.22 4 Claims




1. A flow detecting assembly comprising:
- a one-piece pipe laid to pass a fluid therethrough and formed of a good thermal conductive and homogeneous material;
- first and second heating or cooling and thermal sensitive means disposed in contact with any two locations on an outer surface of said pipe and spaced from each other by a predetermined distance in a longitudinal direction of said pipe, each of said first and second heating or cooling and thermal sensitive means heating or cooling said pipe to a predetermined temperature and detecting the temperature at their respective locations;
- a housing securing said first and second heating or cooling and thermal sensitive means on said surface of said pipe, said housing comprising a pair of open boxes which are two splittable halves and which are formed of a thermal conductive material, and elastic members which are formed of an elastic and thermal insulating material and are disposed within each of said open boxes, said elastic members holding said pipe and said heating or cooling and thermal sensitive means in close contact with each other and thermally insulating said pipe and said first and second heating or cooling and thermal sensitive means from said open boxes, said a pair of open boxes being provided at any position on said pipe while being secured to each other in a condition in which said open boxes surround said outer surface of said pipe;
- a flow detecting means for obtaining a flow rate of the fluid flowing through said pipe on the basis of outputs of said first and second heating or cooling and thermal sensitive means; and
- said heating or cooling and thermal sensitive means having structure achieving insulation and thermal diffusion functions.

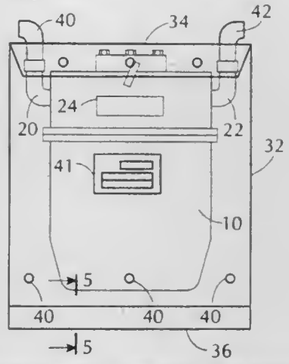


5,741,969

## UTILITY METER ASSEMBLY AND METHOD OF USE

Clement Vincent Sebastopoli, Bellmore, N.Y., assignor to Brooklyn Union, Brooklyn, N.Y.

Filed Jan. 14, 1997, Ser. No. 783,515
Int. Cl.[6] G01F *15/14*; B65D *33/34*
U.S. Cl. 73—273 10 Claims




1. A fluid meter assembly comprising a fluid meter having fluid input and output conduits and a meter reading window,
- a cover enclosing the meter, said cover being transparent at least in the vicinity of said window,
- said cover having air inlet openings for admission of air to circulate around the meter, and drain openings to allow drainage of condensate that forms within the cover,
- said cover having a second opening through which said meter is removable from said cover, said second opening being closeable, and
- a closure element which maintains said second opening closed and which cannot be opened without causing a permanent indication that it has been opened.

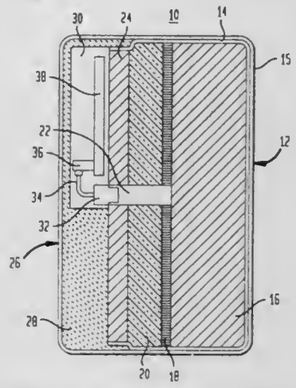
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5,741,970

## IMPACT MEASURING APPARATUS

Martin D. Rubin, 11 Wharton Ct., Kendall Park, N.J. 08824

Filed Mar. 24, 1995, Ser. No. 410,323
Int. Cl.[6] A63B *69/00*; G01L *5/02*; A61B *5/22*
U.S. Cl. 73—379.05 12 Claims




1. An apparatus for measuring impacts delivered by a user, comprising:
- impact receiving means for absorbing an impact delivered by the user and generating a pressure pulse in response to the impact delivered on said impact receiving means by the user; and
- signaling means communicating with said impact receiving means for receiving the pressure pulse generated by said impact receiving means and providing an electrical signal which is indicative of the force and speed of the impact delivered by the user;
- wherein said impact receiving means includes a layer of resilient open cell material for generating the pressure pulse, a layer of fibrous material for guiding the pressure pulse toward said signaling means and a layer of resilient closed cell material for reflecting said pressure pulse if received from said layer of resilient open cell material, said layer of fibrous material being oriented between said layer of resilient open cell material and said layer of resilient closed cell material, wherein said layer of fibrous material and said layer of resilient closed cell material coact to vary the amplitude of the pressure pulse generated in said layer of resilient open cell material according to the location where the impact is received on said impact receiving means by the user.

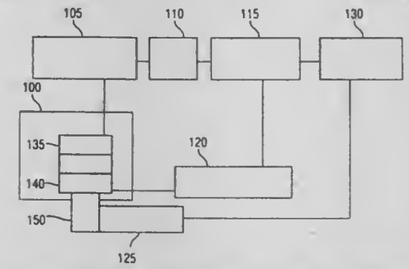
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5,741,971

## METHOD FOR ANALYZING PHYSICAL PROPERTIES OF MATERIALS

Lewis L. Lacy, The Woodlands, Tex., assignor to BJ Services Company, Houston, Tex.

Filed Jan. 17, 1996, Ser. No. 587,700
Int. Cl.[6] G01N *29/18*
U.S. Cl. 73—597 14 Claims




1. A method for simulating a sample of cement contained within a well in a subterranean formation, comprising:
- maintaining the sample in a housing having walls including a wall variable in position to vary the housing length and volume in response to expansion or contraction of the sample;
- controlling the temperature and pressure of the sample at the temperature and pressure prevailing within the well;
- transmitting an ultrasonic signal through the sample length following such expansion or contraction;
- detecting the ultrasonic signal subsequent to its transit through the sample length;
- measuring and recording the time required for the signal to transit the sample length;
- measuring and recording any changes in the sample length through which the ultrasonic signal passes; and
- determining the ultrasonic velocity of the ultrasonic signal by a predetermined relationship of ultrasonic velocity with the transit time of the ultrasonic signal and the measurement of the length of the sample through which the ultrasonic signal passes; and
- non-destructively characterizing the changes in one or more certain parameters over a period of time and relative to the temperature and pressure within the well, said parameters including the density, viscosity, degree of cement slurry thickening, cement shrinkage or expansion, cement compressive strength, and dynamic Young's Modulus, from predetermined relationships between the above-listed parameters with the measurements of the ultrasonic signal transit time and the measurements of the sample lengths through which the ultrasonic signals pass.

VOL 1209 ISS 3 AP 21 1998 UMI



**5,741,972**

**Patent Not Issued For This Number**

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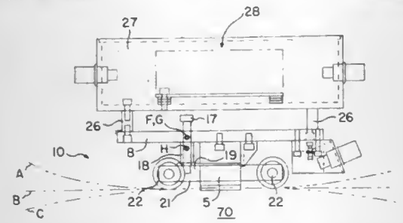
**5,741,973**

## SPRING RELEASE MECHANISM FOR ELECTROMAGNETIC ACOUSTIC TRANSDUCER (EMAT) PROBE

**Steven Paul Clark, Bedford County, and Daniel T. MacLauchlan, Lynchburg, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Feb. 24, 1995, Ser. No. 394,683**
**Int. Cl.[6] G01N** *29/04*

**U.S. Cl. 73—643** **20 Claims**




1. In an electromagnetic acoustic transducer, a spring release mechanism for facilitating removal of the transducer from a surface of the workpiece, comprising:

a frame;

magnet means movable against the surface past the frame;

a base for supporting the magnet means for movement past the frame against the surface and for movement away from the surface;

compression spring biasing means connected between the frame and the base for biasing the base away from the frame to urge the magnet means away from the surface; and

means, connected between the compression spring biasing means and the frame, for adjusting a final deflection of the compression spring biasing means and thus an opposing force produced thereby.

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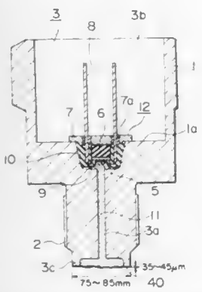
**5,741,974**

## PRESSURE SENSOR WITH RESONANT VIBRATION PREVENTING MEANS

**Fumito Uemura, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 2, 1993, Ser. No. 12,401**
**Claims priority, application Japan, Feb. 4, 1992, 4-019126**
**Int. Cl.[6] G01L** *7/08*

**U.S. Cl. 73—706** **3 Claims**




1. A pressure sensor for sensing a pressure within a cylinder of an internal combustion engine, comprising:

a hollow main body defining a bore extending therethrough and adapted to be mounted to an engine cylinder;

a pressure sensing assembly disposed within said bore of said main body and dividing said bore into a detection cavity for transmitting therethrough the pressure to be detected at a pressure receiving end thereof disposed in communication with an interior of the cylinder and an output cavity through which an output signal from said pressure sensing assembly is to be supplied;

a flexible metal diaphragm attached to said main body at said pressure receiving end of said detection cavity for sealing said detection cavity;

a pressure transmitting medium filled within said detection cavity; and

means for preventing resonant vibrations of the flexible metal diaphragm due to oscillations of the pressure being detected, said preventing means comprising

said flexible metal diaphragm being configured and dimensioned to have a resonance frequency above an oscillation frequency range of the pressure to be detected.

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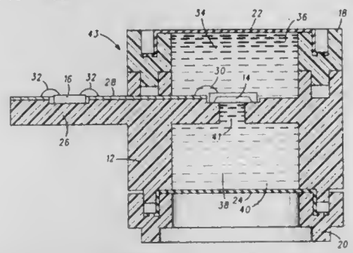
**5,741,975**

## MEDIA ISOLATED DIFFERENTIAL PRESSURE SENSOR AND FLUID INJECTION METHOD

**John Howard Vaughn, II, Tempe, Ariz.; Donald Ora Myers, Cary, Ill., and Jeffrey Alan Bykowski, Franksville, Wis., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Jul. 31, 1996, Ser. No. 688,979**
**Int. Cl.[6] G01L** *7/00*

**U.S. Cl. 73—706** **11 Claims**




1. A media isolated differential pressure sensor comprising:

a base having a first surface opposite a second surface;

a leadframe insert molded to the first surface;

a pressure sensing element mounted to the base and electrically connected to the leadframe, the pressure sensing element having a first pressure sensing region opposite a second pressure sensing region;

a first diaphragm mounting frame engaging the first surface of the base and having a first diaphragm insert molded thereto;

a first incompressible fluid region contacting the first pressure sensing region of the pressure sensing element and the first diaphragm;

a second diaphragm mounting frame engaging the second surface of the base having a second diaphragm insert molded thereto; and

a second incompressible fluid region contacting the second diaphragm and contacting the second pressure sensing region through an opening in the base,

wherein each of the first and second diaphragm mounting frames include a mounting surface having a groove for receiving the first and second diaphragms and an adhesive within the groove sealing the first and second diaphragms to the mounting surface, and

wherein a plurality of insert molded studs contact the mounting surface through holes in a peripheral portion of the first and second diaphragms.



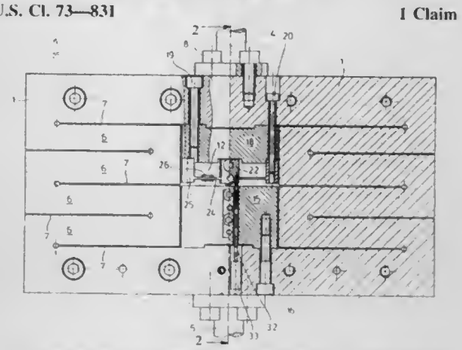
**5,741,976**

## APPARATUS FOR THE SINGLE-AXIS EXAMINATION OF MICRO-TENSION SAMPLES

**Bernd Schinke, Bruchsal; Herbert Schneider, Stutensee, and Achim Iizhöfer, Karlsruhe, all of Germany, assignors to Firschungszeutrwm Karlsruhe GmbH, Karlsruhe, Germany**

**Filed Dec. 6, 1996, Ser. No. 761,773**
**Int. Cl.[6] G01N** *3/08*

**U.S. Cl. 73—831** **1 Claim**




1. An apparatus for single-axis examination of micro-tension samples in a tensile testing machine having opposite pull rods between which said apparatus is mounted for the application of tensile forces to said micro-tension samples; said apparatus comprising:

a load frame for connection to said opposite pull rods, said load frame having a front and a rear frame part and comprising two parallel spring structures in the form of serially arranged cantilevered beams defining multiple S structures with slots formed between adjacent beams, said spring structures interconnecting a bottom and a top frame part with some resiliency, mechanical first mounting means for engaging and firmly holding one end of a micro-tension sample mounted on one of said frame parts, a force measuring dement mounted on the other of said frame parts and including hydraulic second mounting means for engaging and holding the other end of said micro-tension sample, said force measuring element including flexible means which bend depending on a pulling force applied thereto, tension measuring means on said force measuring element for sensing the pulling force applied to said micro-tension sample by said second mounting means, and means for sensing any movement of said second mounting means relative to said one frame part.

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**5,741,977**

## HIGH VOID FRACTION MULTI-PHASE FLUID FLOW METER

**Joram Agar, Grand Cayman, Cayman Islands, and David Farchi, Houston, Tex., assignors to Agar Corporation Inc., Houston, Tex.**

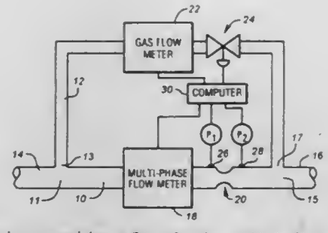
**Continuation of Ser. No. 305,344, Sep. 13, 1994, Pat. No. 5,589,642. This application Aug. 29, 1996, Ser. No. 705,573**
**The portion of the term of this patent subsequent to Sep. 13, 2014, has been disclaimed.**
**Int. Cl.[6] G01F** *1/74*

**U.S. Cl. 73—861.04** **18 Claims**

1. A multi-phase fluid flow meter comprising:

a. a first fluid flow path comprising a first flow measuring device capable of measuring gas and liquid flow, an inlet and an outlet;

b. a second fluid flow path in parallel with said first fluid flow path, having an inlet and connected to said first fluid flow path near the inlet of said first fluid flow path and having an outlet connected to said first fluid flow path near the outlet of said first fluid flow path, and further comprising a second flow measuring device capable of measuring gas flow; and




c. a device comprising a flow chamber, said device installed at the junctions of the inlets to said first and second flow paths, said flow chamber comprising a flow restrictor such that the flow of liquid through said flow restrictor creates a differential pressure that inhibits liquid flow from entering said second fluid flow path.

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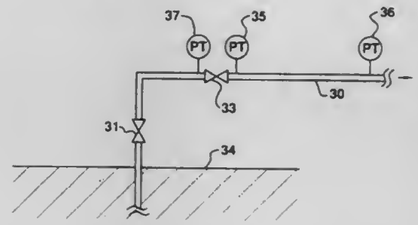
**5,741,978**

## METHOD FOR DETERMINATION OF FLOW RATE IN A FLUID

**Jon Steinar Gudmundsson, Alfheimsvingen 4, N-7022 Trondheim, Norway**

**PCT No. PCT/NO95/00211, § 371 Date Jul. 8, 1997, § 102(e) Date Jul. 8, 1997, PCT Pub. No. WO96/15427, PCT Pub. Date May 23, 1996**
**PCT Filed Nov. 9, 1995, Ser. No. 817,829**
**Claims priority, application Norway, Nov. 9, 1994, 944264**
**Int. Cl.[6] G01F** *1/74*

**U.S. Cl. 73—861.04** **4 Claims**




1 Method for measuring the flow rate in a fluid flow (30), particularly a two-phase flow comprising oil, water and gas from a development well offshore, characterized in: performing a temporary transistory shut-off of the fluid flow by means of a valve (33), and recording the fluid pressure at a location (37) immediately upstream of the valve (33) from a moment of time when the valve starts closing to a selected moment of time after the valve is fully closed, and opening the valve to re-establish the fluid flow, and determining the fluid mass flux G according to the ratio

$$G = \frac{\rho \Delta p^{*}_{f}}{\frac{ft^{*}}{4d}\,\Delta p_{s}}$$

where ρ=fluid density, f=friction factor, d=pipe diameter, t'=a selected moment of time after closure of the valve, $\Delta p_f^*$ is friction loss recorded at time t' and $\Delta p_s$ is pressure surge pressure represented by recorded pressure increase at the moment the valve is fully closed.

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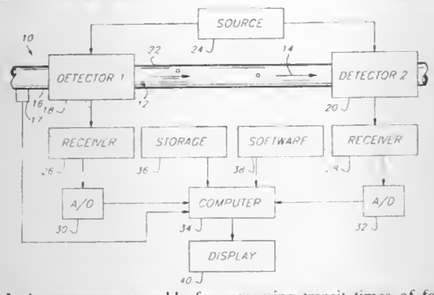


5,741,979

## PARTICLE VELOCITY MEASURING SYSTEM

G. Dickey Arndt, Friendswood, and James R. Carl, Houston, both of Tex., assignors to The United States of America as represented by the Administrator of National Aeronautics and Space Adminstrator, Washington, D.C.

Filed Nov. 9, 1995, Ser. No. 556,241
Int. Cl.[6] G01F *1/708*
U.S. Cl. 73—861.05 31 Claims




1. An apparatus operable for measuring transit times of food elements within a food slurry traveling through a flowline including a metallic tubular portion, said food slurry having an impedance, said apparatus comprising:

an injector operable for injecting material into said food slurry;

a downstream microwave transducer, said downstream transducer having a downstream transmitter and downstream receiver spaced from each other for transmitting a microwave signal through said food slurry;

at least one microwave energy source to supply a transmitter signal to said downstream transmitter;

at least one marker for injection into said food slurry with said injector, said at least one marker being operable for producing a transitory signal loss of said transmitter signal that is distinguishable with respect to an average signal loss of said transmitter signal through said slurry;

at least one detector for detecting a downstream signal from said downstream receiver;

at least one sampler circuit operable for obtaining digital samples of said downstream signal at a sampling rate of over one thousand samples per second; and

a storage member for storing said digital samples.

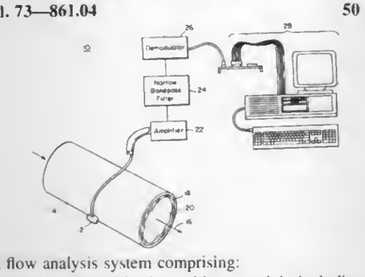
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5,741,980

## FLOW ANALYSIS SYSTEM AND METHOD

Wayne S. Hill, Westborough, and Bruce N. Barck, Franklin, both of Mass., assignors to Foster-Miller, Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 333,213, Nov. 2, 1994, Pat. No. 5,600,073. This application Jan. 16, 1997, Ser. No. 784,787
Int. Cl.[6] G01F *1/74*
U.S. Cl. 73—861.04 50 Claims




1. A flow analysis system comprising:

a sensor in communication with a conduit including a flow therein for transmitting a signal which varies depending on the characteristics of the flow in the conduit;

a filter, responsive to said signal, tuned to pass a narrow band of frequencies proximate the resonant frequency of the sensor;

means for generating an amplitude envelope of the filtered signal;

means, responsive to the amplitude envelope, for calculating a plurality of flow indicator quantities representative of the flow in the conduit; and

means, responsive to the flow indicator quantities, for determining the flow rate of the flow in the conduit.

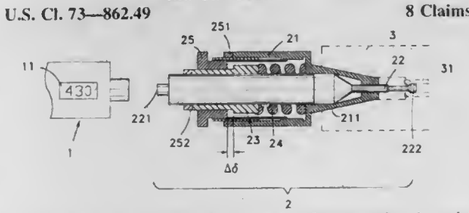
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5,741,981

## DEVICE AND METHOD OF MEASURING THE DRAW-IN FORCE FOR STATIONARY AND ROTATING SPINDLE

Cheng-Chang Ling, Chung-Cheng; Yong-Dar Chen, Chiayi; Wen-Hsin Hsieh, Taipei, and Chun-Hung Huang, Chutung County, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchen, Taiwan

Filed Nov. 22, 1996, Ser. No. 755,428
Int. Cl.[6] G01L *5/12*
U.S. Cl. 73—862.49 8 Claims




1. A draw-in force measuring apparatus for measuring the axial draw-in force of a draw-in mechanism within a spindle, said apparatus comprising:

a measuring mechanism fitted to an end of said spindle and clamped by said draw-in mechanism in said spindle, said measuring mechanism comprising a hollow body having a first end whose outer rim forms a taper; a sliding shaft slidably mounted within said body and having a measuring end and a clamped end respectively projecting from the ends of said body, said sliding shaft having a sliding element at its waist portion capable of displacing therewith; and an elastic element disposed within said body and maintained between said sliding element and an interior of said body for stopping said sliding element from moving towards the first end of said body; and

a displacement sensor fixedly mounted near said measuring end of said sliding shaft for sensing a displacement value of said sliding shaft.

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5,741,982

## METHOD FOR MANUFACTURING A MAGNETOSTRICTIVE SHAFT

Nobuaki Kobayashi; Satoshi Kaise, and Hideki Kano, all of Atsugi, Japan, assignors to Unisia JECS Corporation, Atsugi, Japan

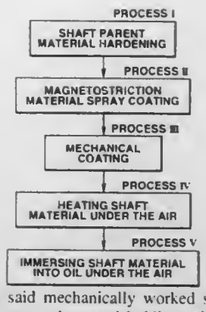
Division of Ser. No. 345,751, Nov. 22, 1994, Pat. No. 5,589,645. This application Aug. 13, 1996, Ser. No. 696,095
Claims priority, application Japan, Nov. 30, 1993, 5-326325; Dec. 3, 1993, 5-339290
Int. Cl.[6] G01L *3/00*
U.S. Cl. 73—862.336 5 Claims

1. A process for making a magnetostrictive shaft of a magnetostriction-type torque sensor, comprising the steps of:

(a) providing a magnetostrictive shaft to be interposed between intermediate ends of a rotatable shaft and having an outer peripheral surface made of a magnetostriction material and having a mother shaft made of a non-magnetic austenitic-series metallic material;

(b) mechanical working a shaft material of the magnetostrictive shaft;






(c) heating said mechanically worked shaft material under an inert gas atmosphere and holding said mechanically worked shaft material at a heated temperature; and

(d) immersing the heated shaft material into an oil filled bath under the inert gas atmosphere so as to increase a cooling velocity of the heated shaft material.

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5,741,983

## SOIL SAMPLER FOR ANALYSIS FOR FERTILIZER DETERMINATION

Andrey V. Skotnikov; Vladimir Pisarchik, and Gennady Valjushkevich, all of Minsk, Belarus, assignors to Iboco, Inc., Benson, Minn.

Continuation of Ser. No. 286,769, Aug. 5, 1994, abandoned. This application Mar. 8, 1996, Ser. No. 610,568
Claims priority, application Belarus, Aug. 5, 1993, 00600-01
Int. Cl.[6] G01N *1/08*
U.S. Cl. 73—864.45 15 Claims



1. An automatic soil sampler for providing a plurality of soil samples along a selected path of movement comprising a frame, a container on the frame, a probe assembly mounted on said frame, said probe assembly being adaptable for insertion in the soil to remove a core of soil comprising a soil sample in a first probe assembly position, a transporter for moving said probe assembly repeatedly to and from a second position adjacent the container, a packaging assembly for receiving said soil sample from the probe assembly and including a series of individual packages, each individual package receiving and soil sample from the probe assembly, a package drive for moving the individual packages in sequence in response to movement of the probe assembly to the second position; wherein said packaging assembly includes sealable sheet portions of material, said sheet portions of material merging in a bight portion, said probe assembly being positionable adjacent the bight portion for ejecting the soil sample carried thereby into the bight portion, and means for sealing the sheet portions together around the soil sample to form an individual package for each soil sample.

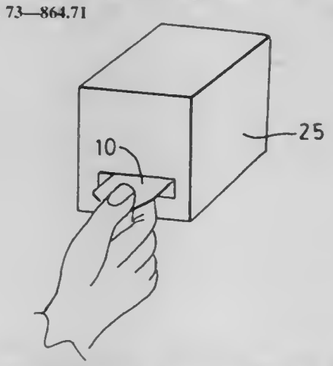
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5,741,984

## METHOD AND APPARATUS FOR SAMPLE COLLECTION BY A TOKEN

Ludmila Danylewych-May, North York; Frank J. Kuja, Brampton, and John Henry Davies, Port Credit, all of Canada, assignors to Barringer Technologies Inc., New Providence, N.J.

Filed Oct. 21, 1996, Ser. No. 734,234
Int. Cl.[6] G01N *1/04*
U.S. Cl. 73—864.71 22 Claims




1. A method of collecting a sample from the hand of an individual for analysis, the method comprising:

(a) dispensing a token, which includes a substrate defining an area for contact with the fingers of the individual;

(b) having the individual manually grasp and remove said token, thereby transferring a sample from the fingers of the individual to said substrate;

(c) having the individual release the token; and

(d) delivering the token to an analyzer and analyzing the sample on the token, to determine whether said sample includes a predetermined analyte.

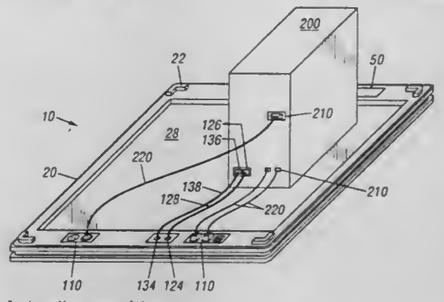
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5,741,985

## ELECTRONIC ASSEMBLY PALLET

Jorge Robinsnn Gaete, Seabrook, Tex., assignor to PFI Vacuum Forming, Inc., Houston, Tex.

Filed Jul. 10, 1996, Ser. No. 677,496
Int. Cl.[6] G01N *15/00*; B65G *37/00*
U.S. Cl. 73—865.9 5 Claims




1. A pallet comprising:

a base, said base having a top and a bottom, said top of said base having a pocket for placing articles onto said pallet, said base further having at least one side;

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guiding means for guiding said pallet along a predetermined path on an assembly line, said guiding means attached to each of said sides of said base;

tracking means for determining the location of said pallet along said assembly line, said tracking means embedded within said base; and

testing means for testing articles on said pallet, said testing means comprises a fluid container and two fluid connection fittings, said fluid container and said fluid fittings constructed and arranged to contain and to transfer a fluid, said fluid used to test said article placed on said pallet.

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**5,741,986**

## THICKNESS FILTER DEVICE FOR USE IN AN INSERTION CHUTE OF A READER FOR TICKETS, CARDS AND THE LIKE

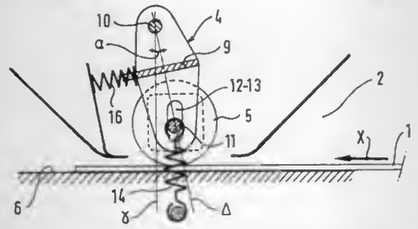
**Daniel Schoenhenz, Ballencourt, France, assignor to Compagnie Generale D'Automatisme—CGA-HBS, Bretiqny sur Orge, France**

**Filed Feb. 12, 1997, Ser. No. 799,572**

**Claims priority, application France, Feb. 16, 1996, 96 011947**

**Int. Cl.[6] G06K** *13/08*

**U.S. Cl. 73—865.9** **8 Claims**




1. Thickness filter device for use in an insertion chute of a reader for cards, said cards following a common path upon insertion and upon return, so that a surface of said card is pressed against a plane support, said device including a mobile assembly comprising a stirrup member in the form of a yoke pivoting about a fixed shaft parallel to said plane support and perpendicular to a direction of displacement of said card along said plane support and a roller mounted in said stirrup member, said roller having a support shaft parallel to said fixed shaft and mounted in said stirrup member with play so that, in the absence of any card between said roller and said plane support, it allows said roller to be pressed onto said support with a pressure calibrated by traction spring means acting on said support shaft in a direction towards said plane support and perpendicular thereto, said play also allowing said roller, under the effect of a force opposing the action of said spring means, to bear against a wall of said stirrup member linking two parallel flanges of said stirrup member forming a yoke, wherein with no card on said plane support, the plane containing said fixed shaft and said support shaft is at an acute angle $\alpha$ to a plane normal to said support plane and containing said fixed shaft, said plane containing said two shafts being on the same side of said normal plane as said card before it is inserted into said chute of said machine, said stirrup member being additionally acted on by a second spring means for maintaining said angle $\alpha$ constant provided that the only friction force on said roller is that of its support shaft during its rotation, and therefore with no contact between said roller and said wall of said stirrup member.

**5,741,987**

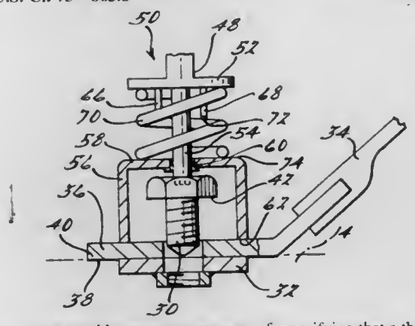
## ASSEMBLY ASSURANCE APPARATUS

**Thomas F. Hrynik, Troy; Joseph J. Melotik, White Lake, and Robert C. Pazdzierz, Utica, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.**

**Filed Jan. 16, 1997, Ser. No. 784,892**

**Int. Cl.[6] G01M** *19/00*

**U.S. Cl. 73—865.8** **13 Claims**




1. An assembly assurance apparatus for verifying that a threaded fastener is seated against a mounting tab of an automotive seat belt component, the apparatus comprising:

a rotatably driven drive tool having a free end adapted to drivingly engage the fastener for movement toward the mounting tab;

a cup-like cage member having a base portion including an aperture formed therethrough slidably receiving said drive tool and an axially extending retainer portion projecting normally from said base portion and having a free end adapted to abuttingly engage the seat belt component; and

a pair of spaced electrical contacts carried for movement with said drive tool toward the seat belt component mounting tab said spaced electrical contacts having free ends positioned with respect to said drive tool free end to engage said base portion of said cage member only when the threaded fastener is seated with respect to the seat belt component mounting tab, thereby electrically interconnecting said contacts to provide an indication that the threaded fastener is so seated.

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**5,741,988**

## LEAD FRAME DETECTION APPARATUS

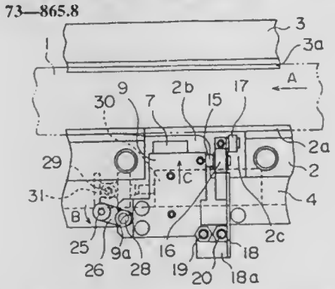
**Eiji Kikuchi, Musashi-Murayama, and Takashi Kobayashi, Akiruno, both of Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan**

**Continuatinn of Ser. No. 662,929, Jun. 13, 1996, abandoned. This application Sep. 18, 1997, Ser. No. 933,235**

**Claims prinrity, application Japan, Jun. 14, 1995, 7-170482**

**Int. Cl.[6] G01M** *19/00*

**U.S. Cl. 73—865.8** **2 Claims**




1. A lead frame detection device comprising a contact assembly which is biased towards a surface of one of two guide grooves of lead frame guide rails of a lead frame feeding apparatus which feed lead frames and a sensor means for distinguishing differences in an amount of movement of said contact assembly in accordance with a number of lead frames present on said lead frame guide rails, wherein a guide groove contacting part of said contact assembly is provided so as to advance onto one of said two guide grooves and to withdraw off of said one of said two guide grooves and said sensor means distinguishes said differences when said lead frames are present; whereby the number of lead frames on said lead frame guide rails is determined.



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**5,741,989**

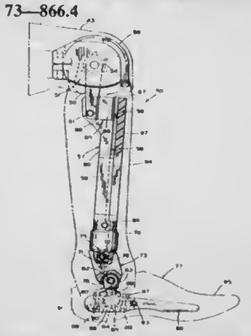
## LOWER LEG FOR CRASH TEST DUMMY

**David C. Viano, Bloomfield Hills; Edward A. Jedrzejczak, Brown City, and Joseph G. Smrcka, Northville, all of Mich., assignors to First Technology Safety Systems, Inc., Plymouth, Mich.**

**Division of Ser. No. 331,282, Oct. 28, 1994, Pat. No. 5,589,651. This application Nov. 27, 1996, Ser. No. 757,514**

**Int. Cl.[6] G01N** *33/00*

**U.S. Cl. 73—866.4** **5 Claims**



1. A lower leg assembly for a crash test dummy having a thigh bone comprising:

a tibia having an upper end for coupling to a lower end of a thigh bone of a crash test dummy and a lower end;

a lower leg to ankle connector connected to said lower end of said tibia and having a lower end;

an ankle joint having an upper end pivotally connected to said lower end of said lower leg to ankle connector for pivoting about an axis transverse to a longitudinal axis of said ankle joint and having a ball on a lower end thereof; and

a foot assembly having a socket for retaining said ball whereby said ball and socket cooperate to simulate a range of motion of a human foot-ankle joint.

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**5,741,990**

## METHOD OF AND MEANS FOR PRODUCING MUSICAL NOTE RELATIONSHIPS

**Peter Max Crofts Davies, Northants, Great Britain, assignor to Notepool, Ltd., Kettering, United Kingdom**

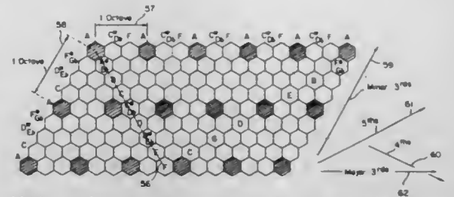
**Continuation of Ser. No. 590,181, Jan. 23, 1996, abandoned, which is a continuation-in-part of Ser. No. 500,144, Jul. 10, 1995, abandoned, which is a continuation of Ser. No. 132,694, Oct. 6, 1993, abandoned, which is a division of Ser. No. 761,775, Aug. 14, 1991, Pat. No. 5,415,071. This application Jun. 25, 1997, Ser. No. 882,361**

**Claims priority, application United Kingdom, Feb. 17, 1989, 8903672; WIPO, Feb. 16, 1990, PCT/GB90/00263**

**Int. Cl.[6] G10C** *3/12*

**U.S. Cl. 84—423 R** **12 Claims**

1. A keyboard for a musical instrument, the keyboard comprising a plurality of keys arranged in a two-dimensional array and means associated with each key for producing a signal indicative of a particular musical note, said array consisting of parallel columns of said keys in which any given column is arranged relative to an adjacent column which is immediately to one side of said given column such that successive keys of said given column each lies between two successive keys of said adjacent column, and wherein said means associated with any given key of said given column are adapted to produce a signal indicative of a first musical note, said means associated with a key immediately above said given key of said given column are adapted to produce a signal indicative of a second musical note, and said means associated with keys which lie between said given key and the key immediately thereabove and which are respectively in the adjacent columns on either side of the given column are adapted to produce signals indicative of a third and a fourth musical note respectively, and wherein the first and second musical notes form a musical interval of a fifth, the first and third musical notes form a musical interval of a minor third, and the first and fourth musical notes form a musical interval of a major third.




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**5,741,991**

## TONE SIGNAL GENERATOR HAVING A SOUND EFFECT FUNCTION AND EFFICIENT MEMORY ACCESS

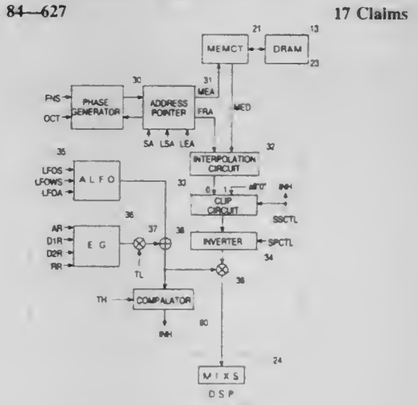
**Mitsuhiro Kurata, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan**

**Filed Mar. 31, 1995, Ser. No. 414,929**

**Claims priority, application Japan, Mar. 31, 1994, 6-062561; Mar. 31, 1994, 6-062564**

**Int. Cl.[6] G10H** *1/02;7/00*

**U.S. Cl. 84—627** **17 Claims**




1. A tone signal generator comprising:

memory means for storing tone signal data;

parameter generation means for generating parameter data;

tone signal data generation means for generating the tone signal data by reading it from the memory means, according to the parameter data generated by the parameter generation means;

level monitor means for monitoring a level of the tone signal data generated by the tone signal data generation means; and

access control means for inhibiting access of the tone signal data generation means to the memory means when the level monitor means detects that the level of the tone signal data monitored by the level monitor means is less than a specified value.

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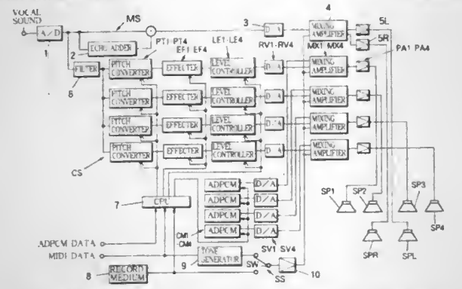


5,741,992

## MUSICAL APPARATUS CREATING CHORUS SOUND TO ACCOMPANY LIVE VOCAL SOUND

Yuichi Nagata, Hamamatau, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Sep. 3, 1996, Ser. No. 707,221
Claims priority, application Japan, Sep. 4, 1996, 7-226604
Int. Cl.[6] G09B *5/00*; G10H *1/02*
U.S. Cl. 84—631 15 Claims




1. A karaoke apparatus for creating an artificial chorus sound and an instrument karaoke accompaniment in parallel with a live vocal sound which is a live singing voice, the karaoke apparatus comprising:

a pickup device that collects the live vocal sound and converts the collected live vocal sound into a corresponding vocal sound signal;

a generator device that generates a chorus sound signal representative of an artificial chorus sound, that is a synthesized singing voice belonging to a different melodic part than the live singing voice, in synchronization with the vocal sound signal; and

a plurality of output devices installed separately from each other to define different sound sources, one of the output devices receiving the vocal sound signal and acoustically reproducing therefrom the live vocal sound, and another of the output devices receiving the chorus sound signal and acoustically reproducing therefrom the artificial chorus sound so that the live vocal sound and the artificial chorus sound can be mixed as if sounded from different sound sources.

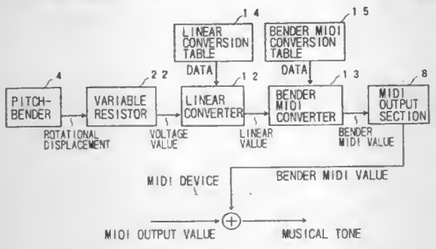
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5,741,993

## ELECTRONIC KEYBOARD HAVING A DISCRETE PITCH BENDER

Kiyomichi Kushimiya, Shizuoka-ken, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Jul. 17, 1996, Ser. No. 682,267
Claims priority, application Japan, Aug. 1, 1995, 7-213941
Int. Cl.[6] G10H *7/00*
U.S. Cl. 84—645 9 Claims




1. An electronic keyboard having a plurality of keys, each of which generate a musical tone, the electronic keyboard having a sequentially variable operating terminal, the electronic keyboard comprising:

detection means for detecting an operational displacement of said sequentially variable operating terminal,

linear conversion means for converting into a linear value said operational displacement of said sequentially variable operating terminal that is detected by said detection means,

a linear conversion table that is to be referred to when said linear conversion means converts said operational displacement into said linear value,

bender MIDI conversion means for converting into a bender MIDI value said linear value that is obtained by said linear conversion means, the bender MIDI value modifying the musical tone generated by each of the keys; and

a bender MIDI conversion table that is to be referred to when said bender MIDI conversion means converts said linear value into said bender MIDI value; and

wherein said bender MIDI conversion means refers to said bender MIDI conversion table to convert said operational displacement of said sequentially variable operating terminal into a discrete bender MIDI value.

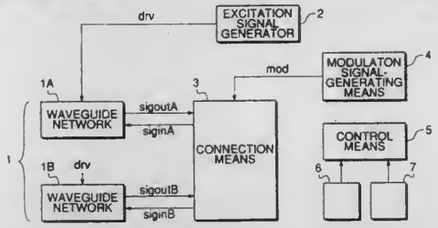
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5,741,994

## WAVEGUIDE MUSICAL TONE SYNTHESIZING APPARATUS WITH NOISE MODULATION OF WAVEGUIDE COUPLING

Chifumi Takeuchi, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Feb. 27, 1996, Ser. No. 607,793
Claims priority, application Japan, Feb. 28, 1995, 7-040612
Int. Cl.[6] G10H *1/08*
U.S. Cl. 84—660 5 Claims




1. A musical tone-synthesizing apparatus comprising:

a plurality of waveguide networks each including at least one waveguide, each of said waveguides having a closed loop in which a signal circulates as a circulating signal in response to an external excitation signal, said closed loop having an output through which said circulating signal is output as a waveguide output signal, and an input through which a signal is input to be superposed on said circulating signal each waveguide network further including signal-forming means for forming a network output signal based on said waveguide output signal,

modulating signal-generating means for carrying out signal processing on an externally provided noise signal to form an external modulating signal, and

connection means connected to said waveguide networks, for carrying out signal processing on said network output signal delivered from each of said waveguide networks, based on the external modulating signal, and for inputting the resulting processed signal to said input of said closed loop of said at least one waveguide of each of said waveguide networks, said connection means controlling connection characteristics of said plurality of waveguide networks based on said external modulating signal.

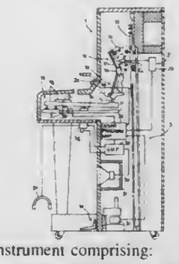


5,741,995

## KEYBOARD INSTRUMENT FOR SELECTIVELY PRODUCING MECHANICAL SOUNDS AND SYNTHETIC SOUNDS WITHOUT ANY MECHANICAL VIBRATIONS ON MUSIC WIRES

Kiyoshi Kawamura; Shinya Koseki; Nobuo Sugiyama, and Masahiro Wada, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 324,685, Oct. 18, 1994, Pat. No. 5,541,353, which is a division of Ser. No. 73,092, Jun. 7, 1993, Pat. No. 5,374,775. This application Jan. 11, 1996, Ser. No. 586,076
Claims priority, application Japan, Jun. 9, 1992, 4-174813; Jul. 10, 1992, 4-207352; Oct. 12, 1992, 4-299234; Jan. 27, 1993, 5-31420
Int. Cl.[6] G10H *1/32*
U.S. Cl. 84—721 1 Claim



1. A keyboard instrument comprising:

an acoustic piano having strings, a keyboard responsive to fingering by a player for causing said strings to be struck and thereby vibrate to produce acoustic sounds, and a pedal system for imparting effects to said acoustic sounds;

an electronic sound producing system responsive to fingering on said keyboard for electronically producing sounds, and imparting effects to said electronic produced sounds in response to operation of the pedal system; and

an arbiter for allowing one of said acoustic piano and said electronic sound producing system to produce said acoustic sounds or said electronic produced sounds, wherein said arbiter is movable between a blocking position and a free position, said arbiter moving into said free position to allow the strings to be struck and said acoustic piano to produce said acoustic sounds and moving into said blocking position to prevent the strings from being struck while allowing said electronic sound producing system to produce said electronic produced sounds.

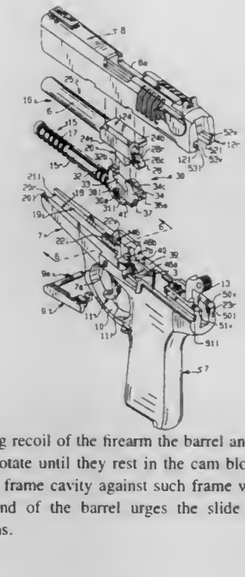
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5,741,996

## FIREARM FRAME INCLUDING A FIREARM BARREL AND TRIGGER MOUNT CONTROL MECHANISM

William B. Ruger, Croydon, N.H., and James McGarry, Prescott, Ariz., assignors to Sturm, Ruger & Company, Inc., Southport, Conn.

Filed Feb. 12, 1996, Ser. No. 599,659
Int. Cl.[6] F41A *5/00*
U.S. Cl. 89—196 14 Claims



1. In a frame for a firearm having a reciprocating slide, a barrel and a chamber block which barrel and chamber block together translate and rotate into and out of engagement with the slide during recoil, the improvement comprising

a) a cam block with a plurality of cam block surfaces;

b) a frame constructed of plastic material having a forward portion, a middle portion which middle portion includes a cam block receiving cavity having cavity frame wall surfaces for receiving and holding the cam block, its surfaces being in recoil in energy absorbing contact, and the frame forther having a rear portion; and

c) rail guidance means on the forward portion of the frame providing guidance for the slide as it reciprocates wherehy during recoil of the firearm the barrel and chamber block translate and rotate until they rest in the cam block positioned in the cam block frame cavity against such frame wall surfaces and the forward end of the barrel urges the slide against the rail guidance means.

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5,741,997

## LOW POLYDISPERSITY GLYCIDYL AZIDE POLYMER

Birger Johannessen, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 750,910, Jul. 1, 1985, Pat. No. 4,879,419. This application Dec. 30, 1988, Ser. No. 292,228
Int. Cl.[6] C06B *45/10*
U.S. Cl. 149—19.6 11 Claims

1. A normally liquid, polyglycidyl azide product said product being produced by reacting, with an inorganic azide, a polyepichlorohydrin product comprising predominantly secondary hydroxyl-terminated polyepichlorohydrin polymer having a number average molecular weight of at least 2000, and a polydispersity of less than 1.2, and essentially no non-hydroxyl functional cyclic ether oligomer; said polyepichlorohydrin product being made by polymerizing epichlorohydrin in the presence of anhydrous stannic chloride catalyst, a strong carboxylic acid co-catalyst, and an alcohol as an initiator.

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5,741,998

## PROPELLANT FORMULATIONS BASED ON DINITRAMIDE SALTS AND ENERGETIC BINDERS

Carol J. Hinshaw, Ogden; Robert B. Wardle, Logan, and Tom K. Highsmith, North Ogden, all of Utah, assignors to Thiokol Corporation, Ogden, Utah

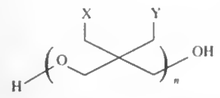
Continuation-in-part of Ser. No. 52,035, Apr. 21, 1993, Pat. No. 5,498,303. This application Mar. 12, 1996, Ser. No. 614,303
Int. Cl.[6] C06B *45/10*
U.S. Cl. 149—19.6 21 Claims

1. A composite propellant formulation comprising:

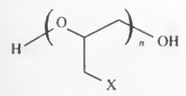
an energetic binder in the range from about 10% to about 35% by weight of the composite propellant formulation, wherein the energetic binder is selected from energetically substituted oxetane polymers having a formula:

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where X is $—NO_2$, $—ONO_2$, $—N_3$, $—NF_2$, or —H and Y is $—NO_2$, $—ONO_2$, $—N_3$, or $—NF_2$, energetically substituted oxirane polymers having a formula:



where X is $—NO_2$ or $—N_3$, and energetic nitramine polyester polymers based on nitraminodiacetic acid and a diol or mixture of diols, wherein said diol is an aliphatic diol containing from 2–6 carbon atoms and primary alcohol functional groups;

a solids loading of from about 65 to 90% by weight of the composite propellant formulation, wherein said solids loading comprises:

a dinitramide salt oxidizer; and

a reactive metal; and

a polyfunctional curative.

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**5,741,999**

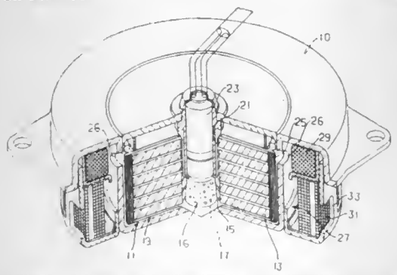
**GAS GENERATING AGENT COMPOSITION**

**Takashi Kazumi, and Takeshi Okada, both of 2-1 Dobu, Nagasaka Aza, Oaza, Nishigo-mura, Nishishirakawa-gun, Fukushima-ken, Japan**

**Filed Jun. 26, 1995, Ser. No. 494,414**

**Int. Cl.[6] C06B** *35/00*

**U.S. Cl. 149—35** **8 Claims**



1. A gas generating agent composition comprising 50 to 70% by weight of azide of alkali metal or alkaline earth metal, 20 to 40% by weight of metallic silicide, and 1 to 15% by weight of perchlorate of alkali metal or alkaline earth metal.

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**5,742,000**

**DEVICE AND METHOD FOR PREVENTING ARCING AND RESULTANT FLASHING DURING REPAIRS PERFORMED INSIDE PAD-MOUNTED TRANSFORMERS**

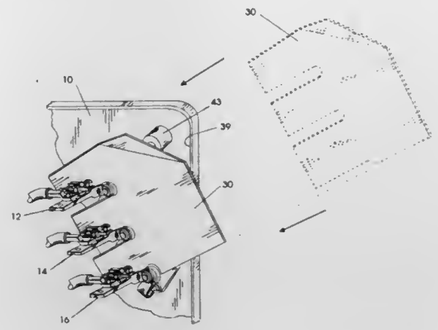
**Sammie D. Stevens, Raleigh, N.C., assignor to Carolina Power & Light Company, Raleigh, N.C.**

**Filed Nov. 3, 1993, Ser. No. 146,915**

**Int. Cl.[6] H02G** *1/02*

**U.S. Cl. 174—5 R** **13 Claims**

1. In combination, a pad mounted transformer having an access side, a windings side, a vertical transformer face separating the access side from the windings side, three secondary bushings defining an uppermost bushing, a middle bushing and a lowermost bushing located on the access side of the transformer face with the secondary bushings being generally aligned and spaced apart, and



a connector bar joined to each of said secondary bushings carrying junctions for wires routed from the bushings to an utility customer, and a safety shield for preventing contact of a worker's tool engaging said junctions with adjacent portions of the transformer face, said safety shield comprising a planar, rigid sheet of dielectric material having a thickness sufficient to provide insulative protection for the voltage levels found at the access side of the pad-mounted transformer, said sheet including an edge and a slot structure opening to said edge, said slot structure including first and second full slots and a third half slot spaced apart by distances corresponding to distances between the uppermost, middle and lowermost bushings, and said slot structure further including an aligned base structure defined by respective base portions of said slots in engaging contact with the uppermost, middle and lowermost bushings, said slots serving to locate and maintain the sheet in operative position with respect to the secondary bushings and associated connector bars, with said sheet covering portions of the transformer face adjacent to the secondary bushings to prevent contact of the worker's tool with the covered portions and resultant arcing and flashing.

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**5,742,001**

**BURIED ELECTRICAL TRANSMISSION LINE EQUIPPED WITH A COOLING DEVICE**

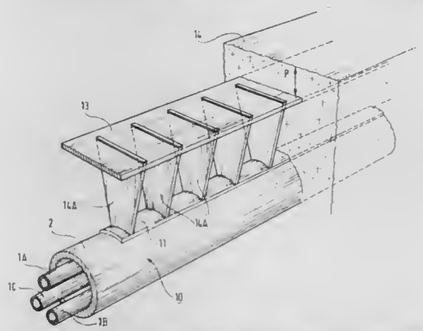
**Edmond Thuries, Meyzieu, France, assignor to GEC Alsthom T & D SA, Paris, France**

**Filed Nov. 6, 1996, Ser. No. 744,525**

**Claims priority, application France, Nov. 7, 1995, 95 13155**

**Int. Cl.[6] H01B** *7/34*

**U.S. Cl. 174—15.6** **8 Claims**



1. An armored power transmission line adapted to be buried in soil, comprising a metal jacket housing at least one conductive busbar, and a cooling device for transferring heat from said jacket to a surface of the soil, said cooling device comprising a metallic structure fixed to said jacket and extending towards said surface of said soil, said metallic structure comprising a plurality of vertical



first plates connected to said jacket and each having a vertical dimension such that a top edge thereof is at a permissible calculated depth below said surface of said soil to allow said transmission line to operate without overheating.

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**5,742,002**

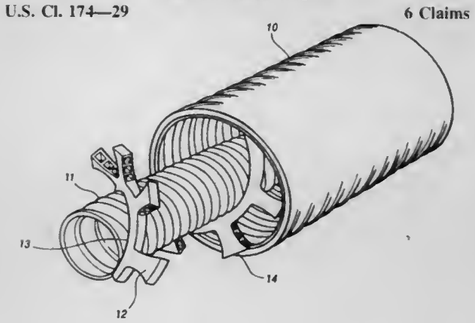
**AIR-DIELECTRIC COAXIAL CABLE WITH HOLLOW SPACER ELEMENT**

**James M. Arredondo, Oak Forest; Thomas A. Fleisher, Chicago Heights; James A. Krabec, Oak Lawn, and James R. Gentile, Chicago, all of Ill., assignors to Andrew Corporation, Orland Park, Ill.**

**Filed Jul. 20, 1995, Ser. No. 504,893**

**Int. Cl.[6] H01B** *7/02*

**U.S. Cl. 174—29** **6 Claims**



1. A coaxial cable comprising coaxial inner and outer conductors separated by a single helix of dielectric material extending through an annular space between the inner and outer conductors, said helix being wound around the inner conductor with an inner surface of the helix engaging the inner conductor and portions of an outer surface of the helix along an outer edge of the helix engaging the outer conductor, the portions of the outer surface being separated along a length of the helix by multiple notches which are recessed from the outer conductor along the length of the helix and the helix having a hollow interior which is divided by a plurality of interior ribs extending longitudinally through said hollow interior to reinforce the helix, the helix being substantially rigid in a radial direction between said inner and outer conductors and the inner surface and the portions of said outer surface that engage said inner and outer conductors being substantially solid surfaces.

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**5,742,003**

**COMPUTER TERMINAL BOX WITH IMPROVED GROUNDING STRUCTURE**

**Hsin Chien Ho, 20F-1, 268, Sec. 1, Wen-Hua Road, Pan Cjiao City, Taipei, Taiwan**

**Filed Aug. 12, 1996, Ser. No. 695,893**

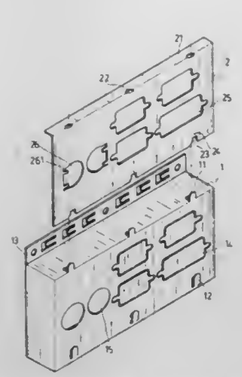
**Int. Cl.[6] H05K** *9/00*

**U.S. Cl. 174—35 R** **1 Claim**

1. A grounding structure for computer terminal boxes comprising:

a terminal box adapted to be fixed to a wall of a computer housing and an electrically conductive plate; wherein

said terminal box includes an inner wall with a plurality of positioning pieces extending upward from an upper side thereof, said inner wall further includes a plurality of hook pieces near a lower side thereof, said inner wall includes an extension plate adapted to facilitate securing said terminal box to the computer housing, and said inner wall includes a plurality of detachable rectangular through hole cover plates and a plurality of detachable circular through hole cover plates.



said electrically conductive plate includes an angled portion at an upper end thereof, a plurality of positioning holes are provided at a junction of a main body of said electrically conductive plate and said angled portion, said positioning holes correspond in location to said positioning pieces of said terminal box, said electrically conductive plate further includes a plurality of notches at a lower end thereof, said notches correspond in location to said hook pieces of said terminal box, a projecting boss is positioned above each of said notches, said electrically conductive plate further includes a plurality of rectangular terminal through holes and a plurality of circular through holes, said circular through holes include elastic guide pieces extending from sides thereof, said rectangular through holes and said circular through holes correspond in position to said rectangular cover plates and said circular cover plates of said terminal box; such that

said electrically conductive plate is fitted onto said inner wall of said terminal box, said positioning holes being received on said positioning pieces, and said notches engaging said hook pieces so that said bosses urge said electrically conductive plate toward said inner wall of said terminal box.

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**5,742,004**

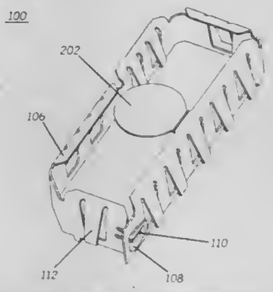
**COPLANAR INTERLOCKING SHIELD**

**Paul M. Greco, Boca Raton, and Julio C. Castañeda, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Sep. 9, 1996, Ser. No. 709,703**

**Int. Cl.[6] H05K** *9/00*

**U.S. Cl. 174—35 R** **7 Claims**



1. A metallic fence for protecting components on a circuit carrying substrate, comprising:

a single piece sheet metal part stamped to a desired specification, the sheet metal part comprising:

first and second ends;

a tab having a biasing feature and a tab width, the biasing feature including a cut in the tab; and

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a locating slot for accepting the tab when the sheet metal is bent to a desired form, the locating slot having a width equal to or smaller than the tab width;

wherein the biasing feature forces the tab down in order to align the first and second ends of the sheet metal part to form a co-planar fence.

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**5,742,005**

**ELECTRICAL CONNECTION BOX**

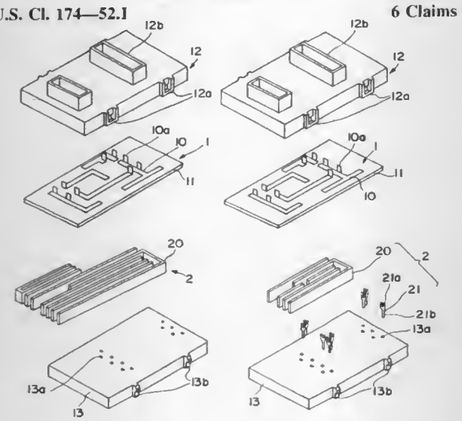
**Yuuji Saka, and Takahiro Onizuka, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan**

**Filed Aug. 14, 1995, Ser. No. 514,956**

**Claims priority, application Japan, Sep. 14, 1994, 6-220608**

**Int. Cl.[6] H02G** *3/08*

**U.S. Cl. 174—52.1** **6 Claims**




1. An electrical connection box for connection to a selected one of a plurality of external circuits, said external circuits including a plurality of common external circuit elements that are substantially identical for all of said external circuits and a plurality of special external circuit elements that are not common for all of said external circuits, such that said external circuits achieve a plurality of different purposes, said electrical connection box having an internal circuitry, wherein:

the internal circuitry is divided into a common circuitry (**1**) common for all purposes and connectable to the common external circuit elements and a special circuitry (**2**) which is not common for all purposes and connectable to the special external circuit elements of the selected external circuit, and

a conductive layer (**10**;**14A**;**20A**;**25A**) on which the common circuitry (**1**) is formed and another conductive layer (**14**;**20**;**25**;**14B**;**20B**;**25B**) on which the special circuitry (**2**) is formed, said conductive layers being arranged one over the other at different levels in the electrical connection box, the conductive layer of the common circuitry (**1**) being formed by flat busbars (**10**) and having tabs (**10***a*; **30**) which extend into connector receptacles (**12***b*) so as to form terminals for the connection of the common circuitry (**1**) with external circuitry, the special circuitry (**2**) being formed by longitudinal busbars (**20**).

**5,742,006**

**ELECTRIC CELL OF THE TYPE COMPRISING TWO PARALLEL PLATES OR SUBSTRATES IN PARTICULAR MADE OF PLASTIC MATERIAL SEPARATED FROM EACH OTHER BY A SEALING FRAME**

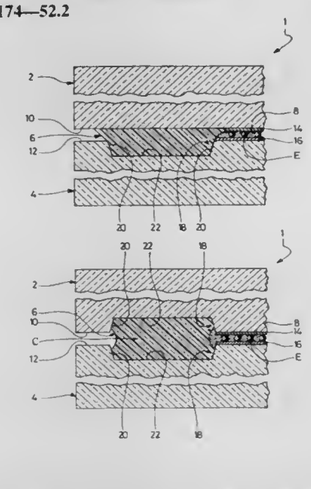
**Joachim Grupp, Neuchatel, Switzerland, and Bernard Lemarie, Granges-les-Valences, France, assignors to Asulab S.A., Bienne, Switzerland**

**Filed Mar. 22, 1996, Ser. No. 620,312**

**Claims priority, application France, Mar. 24, 1995, 95 03477**

**Int. Cl.[6] H01L** *23/28*

**U.S. Cl. 174—52.2** **20 Claims**




1. An electric cell of the type comprising a first and a second parallel flexible substrates, set apart from each other at a determined distance, carrying electrodes on their opposing faces, these substrates enclosing between them a layer of sensitive material which can change its physical properties as a result of a voltage applied to the electrodes, said sensitive material being protected from contact with the atmosphere by a sealing frame which connects, in a sealed manner, peripheral parts of said substrates, said frame having a width parallel to the substrates, wherein at least the first substrate comprises on its face opposing the second substrate at least a first continuous peripheral groove into which at least a part of said sealing frame extends, the cross-section of the sealing frame being a multiple of an area equal to the product of said width multiplied by said spacing, the thickness of the sealing frame at any point being greater than or equal to said spacing and said multiple being equal to or greater than 2.

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**5,742,007**

**ELECTRONIC DEVICE PACKAGE AND METHOD FOR FORMING THE SAME**

**Robert R. Kornowski, Schaumburg; Carl Missele, Elgin, both of Ill., and Thomas W. Rice, Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Aug. 5, 1996, Ser. No. 695,813**

**Int. Cl.[6] H05K** *5/06*

**U.S. Cl. 174—52.3** **14 Claims**

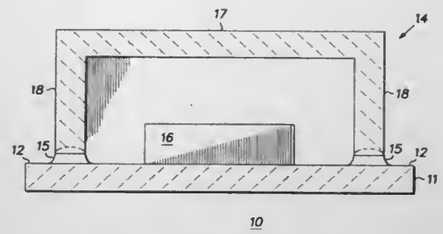
1. A gas permeable package, comprising:

a support structure having a major surface;

a cap over the major surface of the support structure, the cap including a top and a porous side-wall, wherein the porous side-wall is substantially permeable to a gas; and

a bonding agent being in one of a first state characterized by a low viscosity of the bonding agent or a second state characterized by a solidity of the bonding agent, the bonding agent coupling the porous side-wall of the cap to the major surface






of the support structure, wherein the bonding agent in the first state is absorbable by the porous side-wall of the cap.

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**5,742,008**

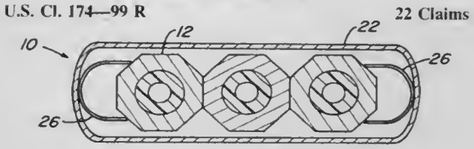
**ARMORED CABLE**

**Larry V. Dalrymple, Claremore, Okla., assignor to Baker Hughes Incorporated, Houston, Tex.**

**Filed Nov. 28, 1995, Ser. No. 563,712**

**Int. Cl.[6] H01B** *7/18*

**U.S. Cl. 174—99 R** **22 Claims**




1. An electrical cable for use in oil and gas wells, comprising:

an insulated center conductor;

an insulated first outer conductor adjacent said center conductor;

an insulated second outer conductor adjacent said center conductor and opposite said first outer conductor, forming a parallel array of conductors in a flat cable configuration;

a pair of longitudinal spring members, one adjacent an outside edge of each of said outer conductors; and

an outer armor layer wrapped around and in contact with said conductors and said spring members, such that the wrapping of said armor layer flexes said pair of spring members thereby urging said outer conductors toward said center conductor, and wherein after the flattening of said armor layer against said parallel array of conductors, said spring members substantially return to their original form, thereby urging said conductors together, maintaining their parallel array.

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**5,742,009**

**PRINTED CIRCUIT BOARD LAYOUT TO MINIMIZE THE CLOCK DELAY CAUSED BY MISMATCH IN LENGTH OF METAL LINES AND ENHANCE THE THERMAL PERFORMANCE OF MICROELETRONICS PACKAGES VIA CONDUTION THROUGH THE PACKAGE LEADS**

**Ahmad Hamzehdoost, Sacramento, and Chin-Ching Huang, Saratoga, both of Calif., assignors to VLSI Technology Corporation, San Jose, Calif.**

**Filed Oct. 12, 1995, Ser. No. 541,213**

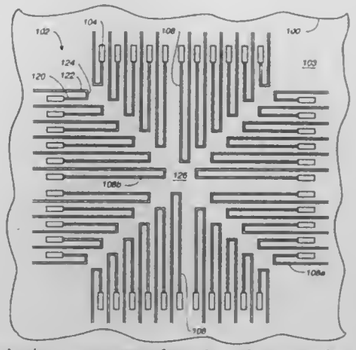
**Int. Cl.[6] H05K** *1/16*

**U.S. Cl. 174—260** **8 Claims**

1. A printed circuit board layout for minimizing signal delays caused by mismatch in the lengths of inner leads of a package lead frame, said layout comprising:

an electrically-insulated, heat-conducting printed circuit board having a top surface;

a plurality of bonding areas formed in a rectangular configuration and disposed on the top surface of said printed circuit board in a footprint of a quad flat pack;




a conductive trace pattern formed on the top surface of said printed circuit board, said trace pattern including a plurality of U-shaped metallized traces each of said traces having first and second ends;

said first ends being joined to a corresponding one of said plurality of bonding areas, said second ends extending outwardly from a central region of said printed circuit board so as to be proximate to a respective side edge of the quad flat pack; and

each of said plurality of U-shaped metallized traces being of varying length so that certain ones adjacent the inner leads at the center of the package lead frame are longer than certain ones adjacent the inner leads at the corners of the package lead frame.

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**5,742,010**

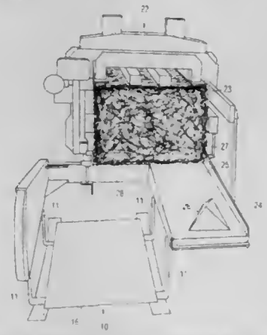
**HAY BALER SCALE**

**Thomas J. Griffin, P.O. Box 743, Oakdale, Calif. 95361**

**Filed Aug. 28, 1996, Ser. No. 703,963**

**Int. Cl.[6] G01G** *23/00:19/00:21/22*

**U.S. Cl. 177—161** **14 Claims**




1. A hay baler scale for a hay baler with a bale output opening and a chute attached thereto, said chute including a horizontal opening having longitudinal side edges, said chute for rotating a hay bale emerging from said bale output opening 90 degrees and ejecting said hay bale through said horizontal opening, comprising:

weight transducer means;

supporting means having a lower end attached to said weight transducer means and an upper end adapted to be attached to said chute for supporting said weight transducer means under said horizontal opening of said chute; and

plate means supported on said weight transducer means, so that when said hay bale is ejected by said chute through said horizontal opening and onto said plate means, a weight of said hay bale is sensed by said weight transducer means.

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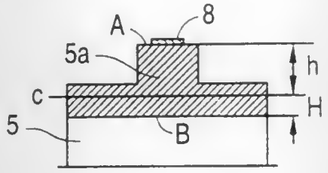


5,742,011

## LOAD CELL HAVING A NEUTRAL PLANE SPACED FROM A TOP SURFACE THEREOF BY A DISTANCE GREATER THAN FROM A BOTTOM SURFACE THEREOF

Kenji Imai; Yoshinobu Shimomae, and Yoshiaki Shinada, all of Shiga, Japan, assignors to Ishida Co., Ltd., Kyoto, Japan

Filed Oct. 26, 1995, Ser. No. 548,477
Claims priority, application Japan, Oct. 28, 1994, 6-288900
Int. Cl.[6] G01G *3/14;3/08;* G01L *1/04;1/22*
U.S. Cl. 177—229 5 Claims




1. A load cell, comprising:
a strain induced element including:
a fixed rigid body;
a movable rigid body;
an upper beam having at least one thin-walled strain generating area and provided between said fixed rigid body at an end and said movable rigid body at the other end;
a lower beam having at least one thin-walled strain generating area and provided between said fixed rigid body at an end and said movable rigid body at the other end; and
a strain detecting element provided on a surface of each of said strain generating areas;
wherein said strain generating area of each of said upper and lower beams has a cross section of such a geometry that a neutral plane which develops no strain in response to a bending moment acting on said strain generating area is spaced from a top surface of said strain generating area by a distance unequal to that from a bottom surface of said strain generating area; and
wherein said strain detecting element is provided on whichever of the top and bottom surfaces of said strain generating area that is more remote from said neutral plane.

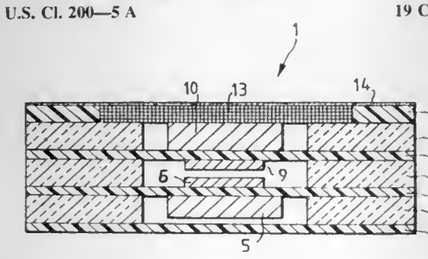
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5,742,012

## SWITCHING FIELD

Jörg Franzke, and Wolfgang Kraft, both of Berlin, Germany, assignors to Krone Aktiengesellschaft, Berlin-Zehlendorf, Germany

Filed Sep. 3, 1996, Ser. No. 707,131
Claims priority, application Germany, Aug. 16, 1995, 195 29 974.4
Int. Cl.[6] H01H *13/70*
U.S. Cl. 200—5 A 19 Claims




9. A switching field for switching electrical signal lines for communication and data transfer applications, comprising:
crosspoints disposed in a matrix, said crosspoints including two contact surfaces, said contact surfaces being movable relative to each other;
a permanent magnet connected with one of said contact surfaces; and
a ferromagnetic material with a coil connected with another of said contact surfaces.

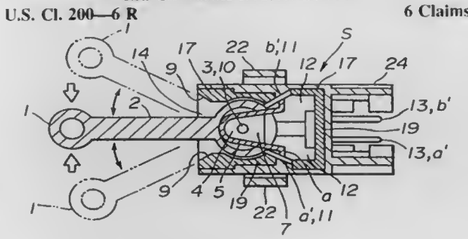
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5,742,013

## TWO-WAY LEVER SWITCH

Satoshi Myojin, Tokyo, and Shuji Tanaka, Kanagawa-ken, both of Japan, assignors to Mutsuki Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1996, Ser. No. 653,497
Claims priority, application Japan, May 26, 1995, 7-152695
Int. Cl.[6] H01H *3/12;15/02;9/16*
U.S. Cl. 200—6 R 6 Claims




1. A two-way lever switch comprising:
a spring-equipped lever including a lever member and a U-shaped spring;
said lever member being formed at a rear end thereof with a pivot shaft inserting hole;
said lever member being formed at the rear end thereof with a recess in a manner to be arranged about said pivot pin inserting hole;
said U-shaped spring having contacts defined at both distal ends thereof;
said U-shaped spring being fitted in said recess of said lever member while rearwardly projecting said contacts from said recess of said lever member;
an upper casing including a top plate and divided into a front section and a lower section;
said front section including a front portion of said top plate which is provided at a center of a lower surface thereof with a pivot shaft;
said rear section including a rear portion of said top plate and being formed therein with fixed contacts;
said fixed contacts each including a vertical portion arranged on each of lateral side surfaces of said rear section of said top plate and a horizontal portion arranged on each of both sides of a lower surface of said rear portion of said top plate so as to be contiguous to said vertical portion and having a terminal defined at a distal end thereof so as to rearwardly outwardly project from said top plate; and
a lower casing including a bottom plate and lateral side plates;
said bottom plate being provided on an upper surface thereof with a fit recess which is formed into a shape conforming to an outer configuration of said upper casing;
said lateral side plates each being formed on an outer surface thereof with a pawl-equipped spring element for mounting the lever switch;
said bottom plate being provided on a lower surface thereof with positioning projections;
said pivot shaft of said upper casing being inserted into said pivot shaft inserting hole of said spring-equipped lever, to thereby cause said lever member to be forwardly projected at a distal end thereof from said opening of said upper casing, resulting in said lever member being pivotally moved within a range defined by said opening and each of said contacts of said U-shaped spring being pressedly contacted with said



vertical portion of each of said fixed contacts, leading to mounting of said spring-equipped lever on said upper casing;
said upper casing thus mounted with said spring-equipped lever being fitted in said fit recess of said lower casing, to thereby assemble said spring-equipped lever, upper casing and lower casing together;
wherein said lever member is movable within a predetermined movable range and is biased by said U-shaped spring such that said lever member being in an intermediate position of said movable range when no external force is provided thereto, said two-way lever switch being in an ON state when said lever member is in said intermediate position, while said two-way switch being in an OFF state when said lever member being positioned to either end of said movable range by an external force.

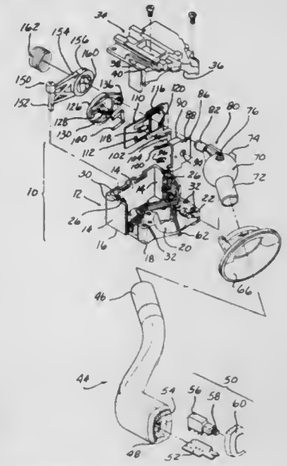
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5,742,014

## MULTI-FUNCTION STEERING COLUMN STALK SWITCH

Allen K. Schwartz, Oxford, and Dennis J. Fitzpatrick, Berkley, both of Mich., assignors to ITT Automotive, Inc., Auburn Hills, Mich.

Filed Sep. 11, 1996, Ser. No. 714,925
Int. Cl.[6] H01H *3/16;9/00*
U.S. Cl. 200—61.27 24 Claims



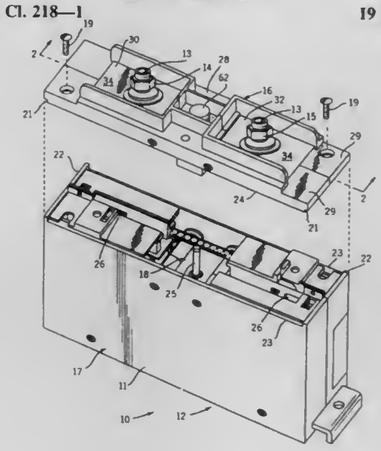

1. A switch apparatus comprising:
a housing;
a lever mounted in the housing for pivotal movement in a first plane about a first pivot axis and for pivotal movement in a second mutually exclusive plane about a second pivot axis;
circuit means, disposed in the housing, for forming a plurality of electrical conductive traces;
a first contactor movably disposed with respect to the circuit means for movement from a first position to a second position completing an electrical circuit between two of the conductive traces on the circuit means;
a second contactor movably disposed with respect to the circuit means for movement from a first position to a second position completing an electrical circuit between two of the conductive traces on the circuit means; and
actuator means, carried by and movable with movement of the lever, for moving the first contactor to the second position upon movement of the lever in one direction in the first plane and for moving the second contactor to the second position upon movement of the lever in one direction in the second plane.

5,742,015

## ELECTRIC CURRENT SWITCHING APPARATUS WITH UNITIZED REMOVABLE CONTACTS

Peter K. Moldovan, Cascade; Michael E. Bauer, Hartland; Stephen R. Fiacchino, Saukville; Earl T. Piber, Oconomowoc; Brad L. Myers, Milwaukee, and Kurt D. Matschull, Greendale, all of Wis., assignors to Eaton Corporation, Milwaukee, Wis.

Filed Oct. 7, 1996, Ser. No. 726,991
Int. Cl.[6] H01H *33/00*
U.S. Cl. 218—1 19 Claims




1. An electric current switching apparatus comprising:
a switching assembly having a body of electrically insulating material, first and second stationary contacts mounted to the body, a movable contact movably coupled to the body and selectively engaging the first and second stationary contacts to complete electrical connection therebetween; and
an actuator assembly having an enclosure to which is attached an electrically operated driver that includes a member releasably attached to the moveable contact for alternately operating the moveable contact into engagement and disengagement with the first and second stationary contacts;
wherein the switching assembly is sealingly attached to the actuator assembly to prevent arcs produced between the moveable contact and the first and second stationary contacts from escaping outside the electric current switching apparatus, with the switching assembly being removable as a single unit from the actuator assembly for repair and replacement.

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5,742,016

## ELECTRICAL GAS-BLAST SWITCH

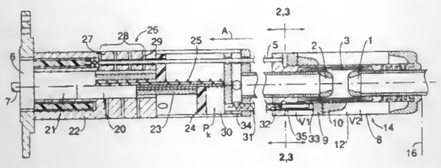
Klaus-Peter Rolff, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/DE94/01298, § 371 Date Jul. 9, 1996, § 102(e) Date Jul. 9, 1996, PCT Pub. No. WO95/14303, PCT Pub. Date May 26, 1995
PCT Filed Oct. 27, 1994, Ser. No. 646,369
Claims priority, application Germany, Nov. 19, 1993, 43 39 923.1
Int. Cl.[6] H01H *33/88*
U.S. Cl. 218—61 7 Claims

1. An electrical gas-blast switch comprising:
at least one fixed contact piece;
a movable switching piece;
a compression device including a compression piston and a compression cylinder, the compression piston and the compression cylinder forming a compression space;
an armature;

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a stator arranged for moving the armature into a cut-in position of the compression device via a magnetic field; and

a drive piston defining a compression chamber, the drive piston being mechanically coupled with the armature,

wherein a first side of the compression piston is arranged opposite to the compression space, the compression chamber having a compression chamber pressure acting on the first side of the compression piston so that an increase in the compression chamber pressure causes the compression piston to move toward the compression cylinder.

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**5,742,017**

**CIRCUIT-BREAKER PROVIDED WITH A CLOSURE RESISTANCE HAVING AN INSERTION ASSEMBLY**

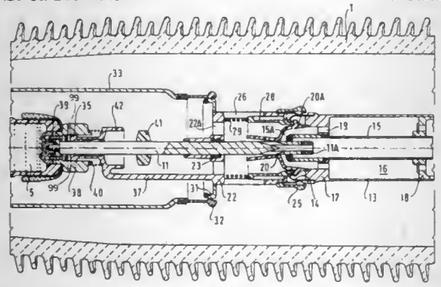
**Michel Perret, Bourgoin-Jallieu, France, assignor to GEC Alsthom T & D SA, Paris, France**

**Filed Aug. 16, 1996, Ser. No. 689,914**

**Claims priority, application France, Aug. 18, 1995, 95 09935**

**Int. Cl.[6] H01H** *33/16;33/88*

**U.S. Cl. 218—143** **5 Claims**



**1**. A circuit-breaker having one or more phases, each phase comprising an interrupting chamber enclosed by an insulating casing (**1**), said circuit-breaker comprising the following components arranged coaxially inside said insulating casing:

a moving assembly comprising a moving main contact (**14**), a moving arcing contact (**15A**), and a blast piston (**18**) co-operating with a blast cylinder (**13**) terminated by a blast nozzle (**20**), said moving contacts being electrically connected to a first terminal (**2A**); and

a fixed assembly including a fixed arcing contact in series and in alignment with a resistance (**5**) and co-operating with a temporary insertion assembly for temporarily inserting the resistance on circuit-breaker closing, said resistance being connected to a second terminal (**3A**), wherein

said fixed arcing contact comprises an elongated metal rod (**11**) having a first end (**11A**), the insertion assembly comprises a ring (**22**) mounted to slide along said metal rod and in electrical contact with said metal rod, said ring carrying first contacts (**25**) on a moving assembly side of said ring, said first contacts cooperating with said moving main contact (**14**), and said ring carrying second contacts (**31**) on a side of said ring opposite said moving assembly side, said second contacts cooperating with fixed third contacts (**32**) connected electrically to the second terminal (**3A**), the insertion assembly further comprising a cylindrical insulating pusher (**28**) pushed by a first spring (**29**) bearing against said ring, the insertion assembly being subjected to a drive force from a second (**40**) bearing against said fixed assembly and tending to displace the insertion assembly towards the moving assembly, wherein

the moving main contact (**14**), the first contacts (**25**), the second contacts (**31**), and the third contacts (**32**) are disposed so that, when the circuit-breaker is in the disengaged position, a first distance (**d1**) between the first contacts (**25**) and the moving main contact (**14**), and a second distance (**d2**) between the second contacts (**31**) and the third contacts (**32**) are both equal to or greater than a corresponding isolation distance for preventing re-striking of an arc between the contacts.

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**5,742,018**

**DEVICE FOR AND METHOD OF SETTING MACHINING CONDITIONS FOR ELECTRICAL DISCHARGE MACHINING**

**Osamu Akemura, Yokohama, Japan, assignor to Sodick Co., Ltd., Japan**

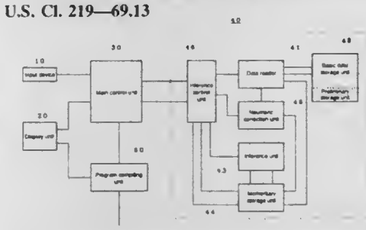
**PCT No. PCT/JP94/01777, § 371 Date Jun. 21, 1995, § 102(e) Date Jun. 21, 1995, PCT Pub. No. WO95/11105, PCT Pub. Date Apr. 27, 1995**

**PCT Filed Oct. 21, 1994, Ser. No. 464,663**

**Claims priority, application Japan, Oct. 21, 1993, 5-298867**

**Int. Cl.[6] B23H** *1/02*

**U.S. Cl. 219—69.13** **13 Claims**



**1**. An electrical discharge machining apparatus having an input device for inputting specification data including information regarding the electrode and workpiece materials and machining data and a setting data compiler for setting machining conditions and relative movement between the electrode and a workpiece in order to obtain a specified work product, said setting data compiler comprising:

a data storage unit for storing, as basic data, a plurality of sets of machining results and corresponding electrical discharge machining conditions;

a data reader for calling up from said data storage unit, as peripheral data, basic data close to or related to the machining data input from said input unit;

an inference unit for studying the peripheral data and for inferring machining conditions suited to said input machining data and relative movement between the electrode and the workpiece; and

an inference control unit for controlling said inference unit.

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**5,742,019**

**METHOD FOR MANUFACTURING AN ATHERECTOMY CUTTER HAVING A POSITIVE ANGLE OF ATTACK**

**Herbert R. Radisch, Jr., San Diego, Calif., assignor to Inter-Ventional Technologies Inc., San Diego, Calif.**

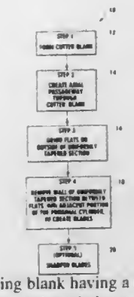
**Continuation-in-part of Ser. No. 368,698, Jan. 3, 1995, abandoned, which is a continuation of Ser. No. 136,561, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 820,748, Jan. 13, 1992, abandoned. This application Oct. 23, 1995, Ser. No. 546,676**

**Int. Cl.[6] B23H** *9/00*

**U.S. Cl. 219—69.17** **15 Claims**

**13**. A method for manufacturing an atherectomy cutter comprising the steps of:





providing a cutting blank having a tubular first section, a tubular second section, and a tubular tapered section which connects the first section to the second section;

creating two spaced apart flats on the tapered section; and

creating at least one blade by substantially removing the tapered section between at least two of the flats.

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**5,742,020**

**VALVE SEAT-BONDED CYLINDER HEAD AND METHOD FOR PRODUCING SAME**

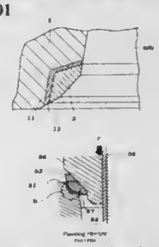
**Shuhei Adachi, and Junichi Inami, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan**

**Filed Jun. 7, 1995, Ser. No. 483,246**

**Claims priority, application Japan, Jan. 23, 1995, 7-027300; Mar. 31, 1995, 7-076623**

**Int. Cl.[6] B23K** *11/20*

**U.S. Cl. 219—78.01** **28 Claims**



**1**. A valve seat-bonded cylinder head comprising a cylinder head unit being comprised of a first material and having a flow passage extending therethrough, said flow passage terminating at one end in a combustion chamber surface, and at least one valve seat insert bonded to said cylinder head unit at said combustion chamber surface, said valve seat insert being formed of material different from and harder than that of said cylinder head unit material, wherein said valve seat insert is bonded to said cylinder head unit by solid-state diffusion, without forming an alloy between the base materials of said cylinder head unit and said valve seat insert, and a plastic deformation layer is formed on the bonding boundary at least in the cylinder head unit material.

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**5,742,021**

**HIGH THERMAL CONDUCTIVITY SUBSTRATE AND THE METHOD OF BRAZING A CAP THERETO**

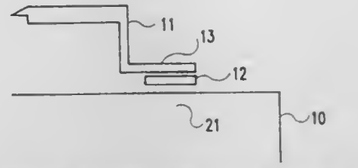
**Lacrtis Economikos; Robert Hannon, both of Wappingers Falls; Richard P. Surprenant, Poughkeepsie, and Thomas VanDuynhoven, Monroe, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 12, 1996, Ser. No. 695,433**

**Int. Cl.[6] B23K** *9/10*

**U.S. Cl. 219—85.22** **5 Claims**

**1**. A method for improving ability to braze on high thermal conductivity substrates comprising the steps of:



embedding a resistance heater wire in a substrate, the resistance heater wire having a geometric configuration conforming with a metallic device to be brazed to the substrate;

inserting a braze material between the embedded resistance heater wire and the metallic device to be brazed to the substrate; and

applying an electric current to the resistance heater wire to heat the substrate internally during braze operations.

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**5,742,022**

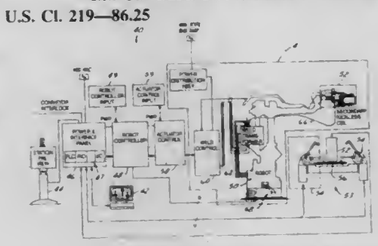
**INDUSTRIAL WORKCELL SYSTEM AND METHOD**

**Michael D. Crawford, Rochester Hills; Joseph L. Miller, Rochester, and Milton L. Turner, Fraser, all of Mich., assignors to DCT Avanced Engineering, Inc., Detroit, Mich.**

**Filed Apr. 19, 1995, Ser. No. 424,933**

**Int. Cl.[6] B25B** *27/14;* **B23K** *11/36;37/04*

**U.S. Cl. 219—86.25** **1 Claim**



**1**. An apparatus for securing a workpiece using a control signal comprising:

a base adapted to receive the workpiece;

first electrically-actuated clamp connected to said base and responsive to said control signal for fixing the workpiece in a predetermined position relative to said base, the apparatus further comprising a second electrically-actuated clamp, wherein said control signal includes an address portion and each clamp has associated therewith address detection means responsive to said control signal for detecting an address and for fixing, in response thereto, the workpiece in a predetermined position relative to said base.

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**5,742,023**

**METHOD FOR MONITORING A WELDING MACHINE, METHOD FOR REGULATING THE WELDING MACHINE AND DEVICE FOR CARRYING OUT THE METHOD**

**Manfred Fortmann, Much, Germany, assignor to Siemens Aktiengesellschaft, Muenchen, Germany**

**Filed May 13, 1996, Ser. No. 645,243**

**Claims priority, application Germany, Nov. 11, 1993, 43 38 449.8**

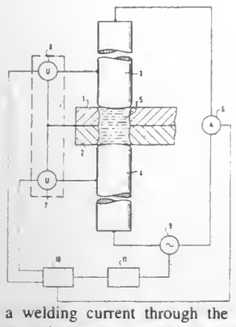
**Int. Cl.[6] B23K** *11/25*

**U.S. Cl. 219—109** **19 Claims**

**1**. In a method for monitoring a welding machine for producing a spot-welded joint between two components to be welded together by at least one electrode being in contact with one of the components, which comprises:

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passing a welding current through the components during a welding period, and measuring a thermo-electrical voltage between the electrode and the components outside the welding period,

monitoring functional capability of the welding machine on the basis of the thermo-electrical voltage, by determining a monitoring variable from the thermo-electrical voltage and comparing the monitoring variable with a reference variable of the welding machine.

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**5,742,024**

**Patent Not Issued For This Number**

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**5,742,025**

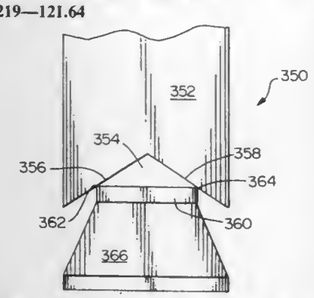
**LASER REFLOW SOLDERING PROCESS WITH LEAD-TIN SOLDER PADS**

**Eberhard Siegfried Dittman, Leger Granby, Canada, and Mukund Kantilal Saraiya, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 976,620, Nov. 16, 1992, Pat. No. 5,604,831. This application May 30, 1996, Ser. No. 794,762**

**Int. Cl.[6] B23K** *26/12*

**U.S. Cl. 219—121.64** **14 Claims**




1. A process for reflow soldering, comprising the steps of:

producing an electrical circuit assembly with a substrate and including a conductive pad for soldered connection on the surface of the substrate;

producing a solder pad of Pb and 3–20% Sn solder connected to a surface of the conductive pad;

positioning the circuit assembly at a laser soldering machine;

positioning a conductive lead across a surface of the solder pad;

extending a probe provided with a non-solder wettable surface having a tip configured to press against the lead only at edge corners thereof at a position adjacent to the laser beam; and

directing a laser beam onto the lead for heating the underlaying solder pad at the lead sufficient for soldering the lead onto the solder pad.

**5,742,026**

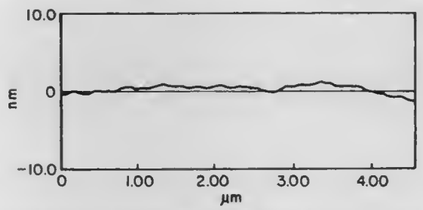
**PROCESSES FOR POLISHING GLASS AND GLASS-CERAMIC SURFACES USING EXCIMER LASER RADIATION**

**James E. Dickinson, Jr., Corning, and Bryan R. Wheaton, Cameron Mills, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.**

**Filed Jun. 26, 1995, Ser. No. 494,911**

**Int. Cl.[6] B23K** *26/00*

**U.S. Cl. 219—121.69** **17 Claims**




1. A process for polishing an entire surface on a glass, or a glass-ceramic article to smooth that surface, said process consisting essentially of:

exposing the surface to ultraviolet laser radiation under conditions effective to

remove material from the entire surface to improve the smoothness of the surface.

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**5,742,027**

**Patent Not Issued For This Number**

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**5,742,028**

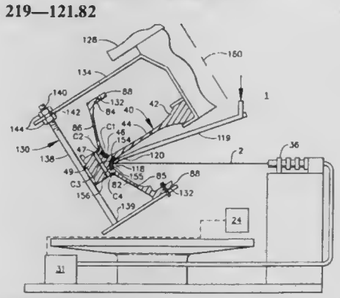
**PRELOADED LASER SHOCK PEENING**

**Seetharamaiah Mannava, Cincinnati, and William D. Cowie, Xenia, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio**

**Filed Jul. 24, 1996, Ser. No. 685,647**

**Int. Cl.[6] B23K** *26/00*

**U.S. Cl. 219—121.82** **9 Claims**



1. A method of laser shock peening an article, said method comprising the following steps:

loading the article such that a portion of the article to be laser shock peened is placed in a loaded condition, said loaded condition is one of two loaded conditions, said two consisting of tension and compression;

while the article portion is in said loaded condition, using a laser to fire a laser beam with sufficient power to vaporize material on a laser shock peening surface of said portion of the article with the laser beam to form a region in said portion having deep compressive residual stresses imparted by the laser shock peening process extending into the article from the laser shock peened surface.



**5,742,029**

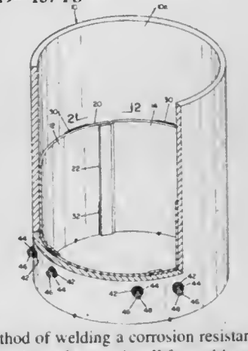
**METHOD OF WELDING WALLPAPER ALLOY AN ARC WELDER MODIFIED TO PRACTICE SAME**

**Elliott K. Stava, Sagamore Hills; and Peter L. Nicholson, Euclid, both of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio**

**Filed Jul. 15, 1996, Ser. No. 679,899**

**Int. Cl.[6] B23K** *9/10*

**U.S. Cl. 219—137 PS** **58 Claims**



1. A method of welding a corrosion resistant, wallpaper alloy to the inside surface of a vessel wall formed from a corrosion susceptible steel sheet after said wallpaper alloy has been affixed to said inside to provide an exposed seam of said wallpaper alloy extending in a given path, said method comprising the steps of:

(a) moving a welding wire toward said seam and along said path;

(b) melting and depositing said welding wire onto said seam along said path by a short circuit arc welding process of the type having a welding cycle with a short condition and an arcing condition, which arcing condition constitutes a plasma boost portion with a set peak current level followed by a plasma portion with a current decreasing from said peak current level toward a set background current level with a given time between said plasma boost portion and said short condition of said welding cycle; and.

(c) setting the length of time of said plasma portion of said arcing condition to a value greater than 25% of said given time.

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**5,742,030**

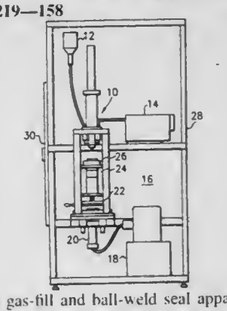
**FLEXIBLE MANUAL GAS-FILL AND BALL-WELD SEAL APPARATUS**

**Kent H. Booker, Ogden; Howard K. Jackman, Uintah; Kerry A. Cooke, Hooper, and L. John Pierotti, Huntsville, all of Utah, assignors to Morton International, Inc., Chicago, Ill.**

**Filed Feb. 5, 1996, Ser. No. 596,655**

**Int. Cl.[6] B21J** *13/08*

**U.S. Cl. 219—158** **11 Claims**



1. In a gas-fill and ball-weld seal apparatus having a ball-feed mechanism for delivering a ball to an airbag inflator having an opening therein for admitting compressed gas supplied from a compressed gas source to a fill head and to said inflator and welding a ball delivered to said opening from said ball-feed mechanism to seal said inflator after being filled with a compressed gas to a predetermined gas pressure:

said fill head being a removable fill head mounted on said ball feed mechanism;

a manually adjustable X–Y table positioned under said fill head;

a riser stand having a base removably mounted on said adjustable X–Y table, said riser having an upper mounting platform;

a nest mounted on said upper mounting platform of said riser stand adapted to receive the inflator in alignment with said fill head whereby said nest, said fill head and said riser may be removably replaced to accommodate a wide variety of different inflator configurations and sizes.

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**5,742,031**

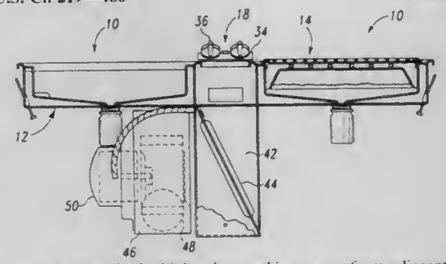
**METHOD AND APPARATUS FOR OPERATING A DOWNDRAFT COOKING VAPOR WITHDRAWAL SYSTEMS**

**Paul H. Kelly, and Ranya C. Hibbler, both of Indianapolis, Ind., assignors to Maytag Corporation, Newton, Iowa**

**Division of Ser. No. 509,358, Jul. 31, 1995, Pat. No. 5,619,982. This application Oct. 21, 1996, Ser. No. 734,140**

**Int. Cl.[6] H05B** *3/68;* **F24C** *15/20;3/00;* **A47J** *29/02*

**U.S. Cl. 219—460** **4 Claims**




1. In a method of withdrawing cooking vapor from adjacent a grill in which a grill operation is selectable and cooking vapor is withdrawn downwardly from adjacent the grill by a motor-driven fan operable at high and low rates of withdrawal selected by a multi-position electrical control switch, the improvement comprising:

sensing the selection of grill operation, and

bypassing the electrical control switch and connecting the motor driven fan for operation at only a high rate of withdrawal of cooking vapors.

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**5,742,032**

**MICROWAVE OVEN WITH TRANSFORMER HAVING RESISTIVE HEATING IN SERIES WITH THE PRIMARY WINDING**

**Kenneth Ian Eke, Orlando, Fla., assignor to Microwave Ovens Limited, Shirley, England**

**PCT No. PCT/GB95/00984, § 371 Date Mar. 3, 1997, § 102(e) Date Mar. 3, 1997, PCT Pub. No. WO95/34191, PCT Pub. Date Dec. 14, 1995**

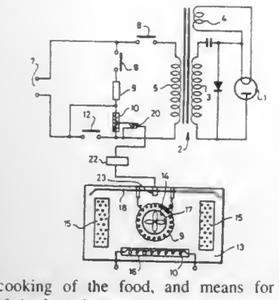
**PCT Filed May 10, 1995, Ser. No. 750,511**

**Claims priority, application United Kingdom, Jun. 7, 1994, 9411309**

**Int. Cl.[6] H05B** *6/68*

**U.S. Cl. 219—681** **8 Claims**

1. A microwave oven having a cavity to receive food to be cooked, a magnetron for delivering microwave power to the cavity, a transformer having a primary winding powered by an input voltage to the oven and having a secondary winding for supplying a high voltage to the magnetron, wherein an impedance is connected in series with the primary winding, primary current flowing through the impedance producing resistive heating, means for utilizing the resistive heating as hot air power to heat the air in the



cavity for cooking of the food, and means for adjusting the magnitude of the impedance so as to vary the magnitude of the primary current, resulting in a continuous stepless variation in the microwave power produced by the magnetron.

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**5,742,033**

## WAVE GUIDE HAVING AN IMPROVED STRUCTURE USED IN A MICROWAVE OVEN

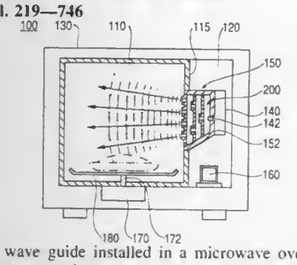
**Hyung-ki Park, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea**

**Filed Nov. 8, 1996, Ser. No. 746,335**

**Claims priority, application Rep. of Korea, Nov. 10, 1995, 95-40818**

**Int. Cl.[6] H05B** *6/72*

**U.S. Cl. 219—746** **8 Claims**



1. A wave guide installed in a microwave oven for guiding a high-frequency microwave into a heating chamber, the wave goide comprising:

a housing attached to a side wall of the heating chamber, the housing being provided at a side wall thereof with a magnetron for generating the high-freqoency microwave; and

a first means for guiding the high-frequency microwave generated from the magnetron into the heating chamber by distributing and superimposing the high-frequency microwave, the first means being installed in the housing, the first means including first, second, and third guide plates which are spaced at a predetermined distance apart from each other, the first guide plate being formed with a first wave diffusing opening, the second guide plate being formed with at least one second wave diffusing opening, each second wave diffusing opening being offset from the first wave diffusing opening, the third guide plate being formed with at least one third wave diffosing opening, each third wave diffusing opening being offset from each second wave diffusing opening.

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**5,742,034**

## DIGITAL DEPOSIT VALIDATING SAFE

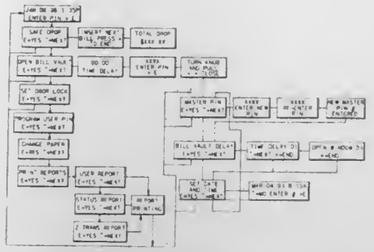
**Scott H. Meeker, Temecula, Calif., assignor to Phelps-Tointon, Inc., Vista, Calif.**

**Continuation-in-part of Ser. No. 543,477, Oct. 16, 1995. This application Jan. 19, 1996, Ser. No. 588,712**

**Int. Cl.[6] G06F** *17/00*

**U.S. Cl. 235—375** **9 Claims**

1. A paper currency deposit and validating system comprising



a plurality of safes each comprising a generally box-like housing having walls forming a chamber comprising a safe for securing money,

one of said safes comprising an intelligent safe and the remainder of said safes comprising economy safes,

bill receiving apparatus mounted on each said safe for receiving and validating bills of various denominations, for depositing validated bills in the safe, and for generating a signal proportionate to the denomination of each validated bill deposited in the safe,

a control system in said intelligent safe including a CPU programmable for recognition of identification data, for carrying out selected functions in response to identification data, and for storing transactions data,

data input means on each said safe accessible from the exterior of the safe for inputting identification data.

means for connecting the bill receiving apparatus and the data input means on each of said economy safes with said control system,

said control system upon receipt, recognition and processing of identification data accommodating in response to said data hill deposits into each said safe, access to each said safe and/or removal of bills from each said bill receiving apparatus, said control system recording and storing in memory each such transaction, and

means for retrieving transactions data from said control system, said control system and said retrieving means accommodating selective preparation of reports by individual bill receiving apparatus, by selected bill receiving apparatuses and by all of said bill receiving apparatuses.

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**5,742,035**

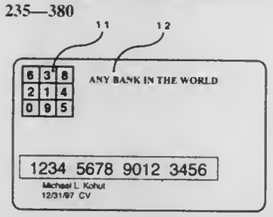
## MEMORY AIDING DEVICE FOR CREDIT CARD PIN NUMBERS

**Michael L. Kohut, 484 Aptos Creek Rd., Aptos, Calif. 95003-3950**

**Filed Apr. 19, 1996, Ser. No. 634,142**

**Int. Cl.[6] G06K** *5/00; 19/06*

**U.S. Cl. 235—380** **19 Claims**




1. A method for recalling a specific set of characters in a geometric matrix positioned on or in a device, comprising:

choosing a pattern with a specific progression, which creates a sequential pattern within said geometric matrix, so that said specific set of characters will exactly fill all positions in said chosen sequential pattern;

placing the specific set of characters within the geometric matrix, in the sequential pattern, in predetermined order;



positioning a random set of characters in selected non-sequential pattern vacant positions within said geometric matrix, so that the sequential pattern positions of the specific set of characters in the geometric matrix and said random set of characters in said non-sequential pattern positions within the geometric matrix fill all positions within the geometric matrix; and

Recognizing the sequential pattern within the geometric matrix, allows a determination of the specific set of characters in correct order.

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**5,742,036**

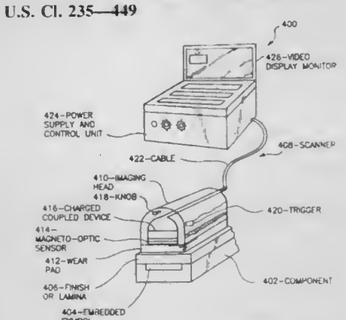
## METHOD FOR MARKING, CAPTURING AND DECODING MACHINE-READABLE MATRIX SYMBOLS USING MAGNETO-OPTIC IMAGING TECHNIQUES

**Harry F. Schramm, Jr., Winchester; Clyde S. Jones, Fayetteville, both of Tenn.; Donald L. Roxby, and James D. Teed, both of Huntsville, Ala., assignors to Rockwell Internationnal Corporation, Seal Beach, Calif.**

**Filed Oct. 4, 1994, Ser. No. 317,454**

**Int. Cl.[6] G06K** *7/08*

**U.S. Cl. 235—449** **11 Claims**




8. Apparatus for identifying a magnetic machine readable matrix symbol marking on a component, comprising: magneto-optical imager to be placed upon said

means for generating an energy medium,

means for transmitting said energy medium toward and away from a magneto-optic image of said component,

means for converting said energy medium to information signals,

computer means for analyzing said signals coming from said transmitting means to determine the content of information contained in the symbol marking, and

means for displaying said information in a human-readable format.

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**5,742,037**

## METHOD AND APPARATUS FOR HIGH SPEED IDENTIFICATION OF OBJECTS HAVING AN IDENTIFYING FEATURE

**Joseph R. Scola, Medfield, and David Y. Li, West Roxbury, both of Mass., assignors to Cognex Corp., Natick, Mass.**

**Filed Mar. 7, 1996, Ser. No. 612,032**

**Int. Cl.[6] G06K** *7/10*

**U.S. Cl. 235—454** **15 Claims**

1. A method for identifying an object having an identifying feature, said identifying feature having at least one predefined characteristic, said method comprising the steps of:

1) creating a representation of said object;

2) locating at least one feature in said representation of said object having a corresponding characteristic similar to said at least one characteristic of said identifying feature and creating a second representation of at least one other characteristic of said located feature, the step of locating including the substeps of:



sampling at least one portion of said representation of said object at a predefined position in said representation, including sampling, including sampling at predetermined locations across said representation of said object in a predefined direction, said locations being spaced apart by a distance corresponding to at least one characteristic of said identifying feature; and

creating said second representation of said sampled portion of said representation consisting of a representation of at least one other characteristic of said located feature;

3) normalizing at least a portion of said second representation of said at least one other characteristic of said located feature, to create a normalized representation of said feature;

4) comparing said normalized representation of said at least one other characteristic of said feature to a predefined representation of a corresponding characteristic of said identifying feature.

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**5,742,038**

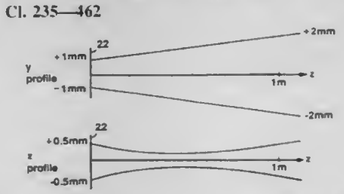
## BEAM SHAPING FOR OPTICAL SCANNERS

**Paul Dvorkis, Stony Brook; Edward Barkan, Miller Place, and Boris Metlitsky, Stony Brook, all of N.Y., assignors to Symbol Technologies, Inc., Holtsville, N.Y.**

**Continuation-in-part of Ser. No. 951,562, Sep. 25, 1992, Pat. No. 5,369,264, which is a continuation-in-part of Ser. No. 592,021, Sep. 29, 1990, Pat. No. 5,218,190. This application Jun. 30, 1994, Ser. No. 268,982**

**Int. Cl.[6] G06K** *7/10*

**U.S. Cl. 235—462** **14 Claims**




1. An optical scanner for scanning indicia, said scanner comprising:

a light source producing a light beam that converges in both x and y directions so that the beam has a waist in both x and y directions, where x and y are orthogonal directions; and

a scanning element mounted for scanning motion,

said scanning element positioned to receive said light beam and reflect said beam in a scanning motion along the x direction across the indicia,

said scanning element including a beam shaping surface shaped to cause divergence of the light beam in the y direction, said divergence being sufficient to remove the convergence of the beam in the y direction so that the beam leaving the scanning element has a waist in the x direction and does not have a waist in the y direction

wherein the light source is a laser source module comprising a laser diode, a focusing lens, and a beam shaping aperture,

wherein the beam shaping surface of the scanning element is a convex mirror surface.

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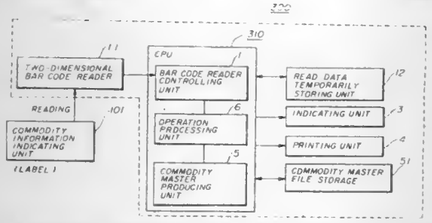


5,742,039

## COMMODITY MANAGEMENT SYSTEM

Miyuki Sato; Shinichi Yoshinaga; Shigeki Enoki, and Hiroyasu Suzuki, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 9, 1995, Ser. No. 385,815
Claims priority, application Japan, Feb. 9, 1994, 6-015087
Int. Cl.[6] G06K 7/10
U.S. Cl. 235—462 6 Claims




1. A commodity management system for managing commodities of plural different types, each commodity unit having a two-dimensional bar code pattern thereon storing coded commodity information characterizing the commodity unit in each of plural, prescribed information categories, the prescribed information categories being common to all of the plural, different types of commodities and the commodity units of a common type having respective two-dimensional bar code patterns thereon storing the respective two-dimensional bar code patterns thereon storing the same coded information, the commodity management system comprising:

a master file storage;

an optical reader reading the coded commodity information of the two-dimensional bar code pattern of each selected commodity unit, of the plural, different commodity units managed by the commodity management system, and supplying the read, coded commodity information to, and for storage in, the master file storage;

a data input unit inputting related information for each selected commodity unit and supplying the input, related information to the master file storage for storage therein in association with the coded commodity information read from the two-dimensional bar code pattern for the corresponding selected commodity unit and stored in the master file storage; and

a data sorter sorting the read and stored coded commodity information and controlling the storage of the sorted, coded commodity information in the master file storage in a prescribed order and in accordance with a selected one of the prescribed information categories thereof.

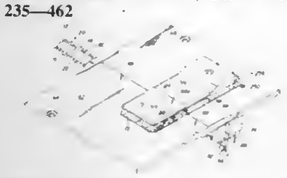
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5,742,040

## OPTICAL CODE READER HEAD FOR PHOTOGRAPHIC FILM

Carl Wilson Roy, Spencerport; John Adams Schempp, Jr., Fairport, and Lester John Sadowski, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 4, 1996, Ser. No. 608,024
Int. Cl.[6] G06K 7/10;13/00; G03D 13/08;13/14
U.S. Cl. 235—462 6 Claims



1. Apparatus for reading optical code on an edge of a web of photographic film, comprising:

a housing having a slot through which the edge of the web may be transported;

a light source mounted in said housing on one side of said slot;

a code reader mounted in said housing on an opposite side of said slot;

a first frame for supporting said housing; and

means for moving said housing relative to said first frame to adjust a location of said reader relative to the edge of the web.

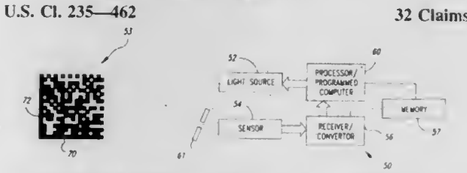
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5,742,041

## METHOD AND APPARATUS FOR LOCATING AND DECODING MACHINE-READABLE SYMBOLS, INCLUDING DATA MATRIX SYMBOLS

Lingnan Liu, Lynnwood, Wash., assignor to Intermec Corporation, Everett, Wash.

Filed May 29, 1996, Ser. No. 654,925
Int. Cl.[6] G06K 7/10
U.S. Cl. 235—462 32 Claims




1. A method of locating an image of a machine-readable symbol within a stored image, the machine-readable symbol having a recognition pattern that includes first and second solid linear features meeting at a common corner, and having first and second dashed linear features extending from free ends of the first and second solid features, the method comprising the steps of:

locating an edge point of one of the first and second solid features;

locating at least a portion of one of the first and second solid features based on the located edge point;

locating at least a portion of another of the first and second solid features based on the located portion of the one solid feature;

locating at least a portion of the first dashed feature based on the located portion of the first or second solid feature;

locating at least a portion of the second dashed feature based on the located portion of the second solid feature or first dashed feature; and

locating a position of the symbol in the stored image based on the located portions of the first and second solid and dashed features.

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5,742,042

## BAR CODE READER HAVING A POSITION SENSOR IN COMMUNICATION WITH A RASTER MIRROR

Robert E. Scofield, Pewaukee, Wis., assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

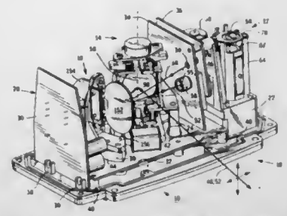
Continuation-in-part of Ser. No. 312,249, Sep. 26, 1994, Pat. No. 5,532,468, which is a division of Ser. No. 312,203, Sep. 26, 1994, Pat. No. 5,484,995, which is a division of Ser. No. 312,264, Sep. 26, 1994, Pat. No. 5,464,976, which is a division of Ser. No. 312,262, Sep. 26, 1994, Pat. No. 5,532,480, which is a division of Ser. No. 312,263, Sep. 26, 1994, Pat. No. 5,512,744, which is a division of Ser. No. 312,208, Sep. 26, 1994, Pat. No. 5,539,192, which is a division of Ser. No. 453,947, May 30, 1995, Pat. No. 5,508,503. This application Apr. 29, 1996, Ser. No. 639,565
Int. Cl.[6] G06K 7/10
U.S. Cl. 235—467 20 Claims

1. In an optical code reader including a mirror assembly for scanning a light beam over a code, a mirror control system comprising:

a mirror;

a motor in mechanical communication with the mirror, the motor providing mechanical motion to the mirror;





a non-contact sensor in communication with the mirror, the non-contact sensor providing an actual position signal, the actual position signal being representative of a position of the mirror; and

a control circuit in electrical communication with the motor and the non-contact sensor, the control circuit providing a motor drive signal to the motor to effect the mechanical motion of the mirror, the control circuit including a memory, the memory storing calibration data representative of a desired position, the control circuit comparing the calibration data to the actual position signal and adjusting the motor drive signal if the actual position signal is outside of an error range.

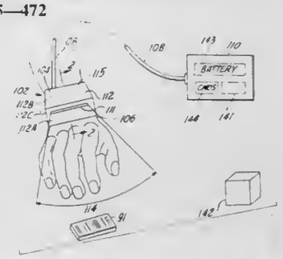
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5,742,043

## BODY-NEARABLE LASER SCANNING SYSTEM WITH PROGRAMMED MODE FOR CONSECUTIVELY READING BAR CODE SYMBOLS WITHOUT SYSTEM REACTIVATION

Carl Harry Knowles, Moorestown; George B. Rockstein, Audubon; David M. Wilz, Sr., Sewell, and David P. Bubnoski, Glassboro, all of N.J., assignors to Metrologic Instruments, Inc., Blackwood, N.J.

Continuation of Ser. No. 632,899, Apr. 16, 1996, which is a continuation of Ser. No. 489,305, Jun. 9, 1995, abandoned, which is a continuation of Ser. No. 821,917, Jan. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 583,421, Sep. 17, 1990, Pat. No. 5,260,553, and a continuation-in-part of Ser. No. 580,740, Sep. 11, 1990, abandoned. This application May 22, 1996, Ser. No. 651,235
Int. Cl.[6] G06K 7/10
U.S. Cl. 235—472 11 Claims




1. A body-wearable laser scanning system having a programmed mode of automatic code symbol reading for consecutively reading code symbols without system reactivation, said body-wearable laser scanning system comprising:

housing support means wearable on the arm of an operator;

a housing having a light transmission aperture through which visible light can exit and enter said housing, and being operably connected to said housing support means so that said light transmission aperture is orientable in a scanning direction;

system activation means in said housing, for generating an activation signal for use in activating one or more components of said body-wearable scanning system;

activatable scan data producing means in said housing for producing, when activated, scan data from an object located in at least a portion of a scan field definable external to said housing, said activatable scan data producing means including a laser beam producing means for producing a laser beam within said housing and projecting said laser beam through said light transmission aperture, and scanning said laser beam across said scan field and a code symbol on said object, and

laser light detecting means for detecting the intensity of laser light reflected off said code symbol and passing through said light transmission aperture, and automatically producing scan data indicative of said detected light intensity;

activatable scan data processing means for processing, when activated, produced scan data so as to detect and decode said scanned code symbol and automatically produce symbol character data representative of said decoded code symbol;

system control means for automatically activating said activatable scan data producing means and said activatable scan data processing means in response to the generation of said activation signal, and controlling the operation thereof during said programmed mode of automatic code symbol reading such that two or more code symbols on one or more objects in said scan field can be consecutively detected and decoded without reactivation of said activatable scan data processing means or said activatable scan data processing means; and

battery power supply means, supportable on the body of said operator, for supplying electrical power to said system activation means, said activatable scan data producing means, said activatable scan data processing means, and said system control means.

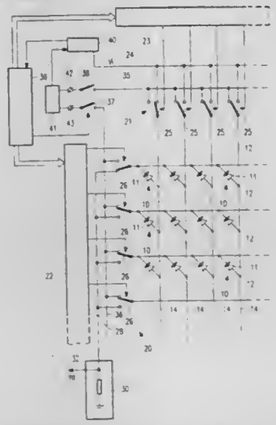
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5,742,044

## LIGHT SENSING ARRAY DEVICE AND APPARATUS INCORPORATING SUCH

Stephen J. Battersby, Haywards Heath, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 22, 1996, Ser. No. 754,347
Claims priority, application United Kingdom, Nov. 30, 1995, 9524483.6
Int. Cl.[6] H01J 40/14
U.S. Cl. 250—208.1 6 Claims



1. A light sensing array device comprising an array of photoelectric light sensing elements for sensing incident light, the sensing elements being arranged in rows and columns and addressed via sets of row and column address conductors, each sensing element being connected between a respective row conductor and a respective column conductor, and a drive circuit connected to the sets of row and column address conductors for addressing the sensing elements and providing an output according to photoconduction in the individual sensing elements resulting from light incident thereon, characterised in that the device includes first and second terminals for an electrical power output from the array and switching means selectively operable to electrically connect at least some

VOL 1209 ISS 3 AP 21 1998 UMI



of the row address conductors and the column address conductors respectively to the first output terminal and the second output terminal with the photoelectric sensing elements connected therebetween being operable in a photovoltaic mode so as to generate an electrical power output at the said first and second terminals in response to the illumination thereof.

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**5,742,045**

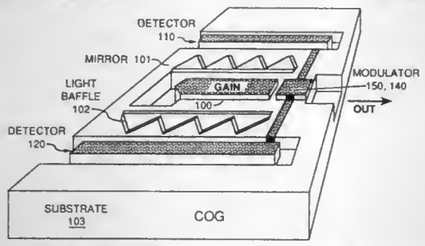
## APPARATUS USING DIODE LASER LOGIC TO FORM A CONFIGURABLE OPTICAL GATE SYSTEM

**Michael A. Parker, Liverpool; Paul D. Swanson, Ithaca, both of N.Y.; Stuart I. Libby, Albuquerque, N. Mex., and James S. Kimmet, Rome, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Continuation of Ser. No. 331,070, Oct. 26, 1994, abandoned. This application Mar. 14, 1996, Ser. No. 617,001**

**Int. Cl.[6] H01J** *40/14*

**U.S. Cl. 250—214 A** **26 Claims**




1. Apparatus to manipulate the optical properties of light, said apparatus comprising:

means for generating a stimulated optical emission, said means for generating having at least one gain section and at least one monolithically integrated intra-cavity element to modulate said stimulated optical emission,

at least one semiconductor photodetector for receiving optical energy and converting said optical energy to electrical energy;

at least one current source to bias said at least one intra-cavity element and said at least one photodetector;

at least one monolithically integrated optical isolator to prevent an optical emission from entering said at least one photodetector; and

said at least one photodetector transforming an optical input into a photocurrent that flows into said at least one current source and said at least one intra-cavity element, thereby modulating an optical output from said at least one gain section.

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**5,742,046**

## AMPLIFIER CIRCUIT FOR PROVIDING OUTPUTS AS A FUNCTION OF SENSED LIGHT

**Samuel Reele, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 18, 1996, Ser. No. 731,807**

**Int. Cl.[6] G01J** *1/20;* **G11B** *7/00*

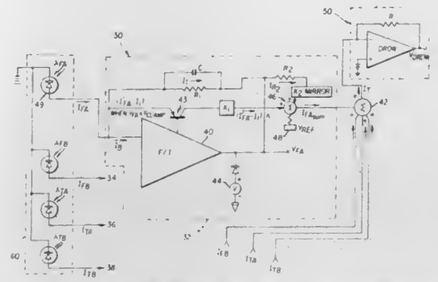
**U.S. Cl. 250—214 A** **5 Claims**

1. An amplifier circuit for providing outputs as a function of sensed light comprising:

a photodetector element for providing a current output as a function of sensed light;

an amplifier having an input for receiving the current output from said photodetector element and for providing at an output an output signal that is a clamped function of sensed light;

feedback means connected between the input and the output of said amplifier;



clamping means connected to the output of said amplifier for clamping the output of said amplifier to a predetermined value;

a summing node having first, second, and third inputs, and an output at which a signal that is a function of sensed light is provided;

a first current path connected between the input to said amplifier and to a first input to said summing node for passing excess current from the input to said amplifier to the summing node when the output of said amplifier is at its clamped output;

a second current path connected between the output of said amplifier and a second input to summing node; and

a reference voltage source connected to a third input to said summing node for limiting the current flowing through the second current path.

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**5,742,047**

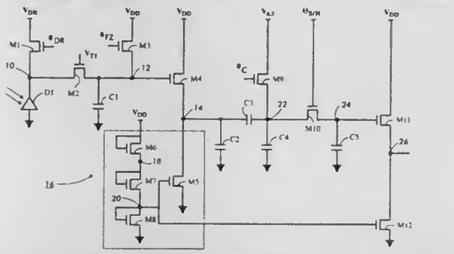
## HIGHLY UNIFORM FIVE VOLT CMOS IMAGE PHOTODIODE SENSOR ARRAY WITH IMPROVED CONTRAST RATIO AND DYNAMIC RANGE

**Steven A. Buhler, Sunnyvale, and Mehrdad Zomorrodi, West Hills, both of Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 1, 1996, Ser. No. 723,085**

**Int. Cl.[6] H01J** *40/14*

**U.S. Cl. 250—214 R** **2 Claims**



1. A photodiode sensor circuit comprising:

A) a photodiode which receives light input and produces an electronic current output which varies according to the intensity of the light input,

B) a single stage transfer circuit using only 5 volt clock signals for receiving the electronic output from the photodiode which produces an electronic output according to the input received comprising,

i) an NMOS pull-up with a gate terminal, a drain terminal, and a source terminal,

ii) a pass transistor with a gate terminal, a drain terminal, and a source terminal,

iii) a PMOS pull-up with a gate terminal, a drain terminal, and a source terminal, and

iv) the drain terminal of the NMOS pull-up and the drain terminal of the pass transistor are electrically connected to each other and to the electronic output of the photodiode, the source terminal of the pass transistor and the source terminal of the PMOS pull-up are connected to each other and provide the electronic output for the single stage transfer circuit,

C) a source follower circuit for receiving the electronic output from the single stage transfer circuit and which produces an electronic output according to the input received,

D) a correlated double sampling circuit for elimination of pattern noise which receives the electronic output from the single source follower and produces an electronic output according to the input received, and

E) a buffer which receives the output from the correlated double sampling circuit and produces a buffered output.



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**5,742,048**

## SUCKING FAILURE DETECTING DEVICE

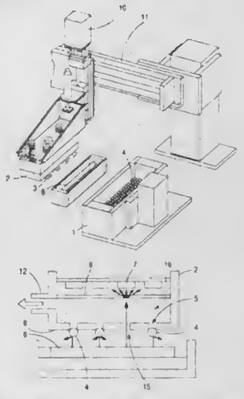
**Shigeharu Kobayashi; Satoshi Kinoshita, and Koji Shimada, all of Ishikawa, Japan, assignors to Shibuya Kogyo Co., Ltd., Ishikawa, Japan**

**Filed Jun. 20, 1996, Ser. No. 667,808**

**Claims priority, applicatinn Japan, Jun. 30, 1995, 7-188692**

**Int. Cl.[6] H01J** *40/14;* **B23K** *1/00*

**U.S. Cl. 250—222.1** **15 Claims**



1. A sucking failure detecting device built into an apparatus which transfers an object by sucking the object onto a sucking hole of a sucking head of the apparatus, the detecting device comprising:

a light-emitting device emitting light and disposed on a movement path of the sucking head;

a light-receiving device disposed inside the sucking head which is made of light-shielding material, the light-receiving device receiving the light emitted by the light emitting device and passing through the sucking hole; and

a diffusing board disposed inside the sucking head and diffusing the light.

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**5,742,049**

## METHOD OF IMPROVING MASS RESOLUTION IN TIME-OF-FLIGHT MASS SPECTROMETRY

**Armin Holle, Oyten; Claus Köster, Lilienthal, and Jochen Franzen, Bremen, all of Germany, assignors to Bruker-Franzen Analytik GmbH, Bremen, Germany**

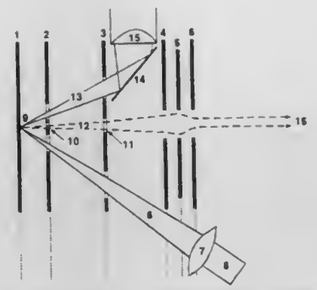
**Filed Mar. 20, 1996, Ser. No. 618,843**

**Claims priority, application Germany, Dec. 21, 1995, 195 47 949.1**

**Int. Cl.[6] B01D** *59/44;* **H01J** *49/00*

**U.S. Cl. 250—282** **8 Claims**

1. A method for generating a parallel ion beam for use in an analysis of analyte substances in a time-of-flight mass spectrometer, the method comprising:



providing a gridless ion source including: a sample support electrode; an intermediate electrode substantially parallel to the sample support electrode, the intermediate electrode having a gridless central aperture through which the ion beam may pass and an adjacent lateral aperture through which laser light may pass; and a base electrode substantially parallel to the intermediate electrode and having a gridless aperture through which the ion beam may pass;

locating an analyte substance on the support sample electrode;

vaporizing and ionizing a portion of the analyte substance with laser energy directed through the lateral aperture of the intermediate electrode;

applying a first set of predetermined voltages to the electrodes such that, immediately following said vaporizing and ionizing, a substantially field free region exists between the sample support electrode and the intermediate electrode, and a strong acceleration field exists in the region between the intermediate electrode and the base electrode;

applying a second set of predetermined voltages to the electrodes after said first set such that, a predetermined amount of time after said vaporizing and ionizing, a strong acceleration field exists between the sample support electrode and the intermediate electrode; and

focusing the ion beam after its passage through the apertures with an electrostatic lens arrangement.

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**5,742,050**

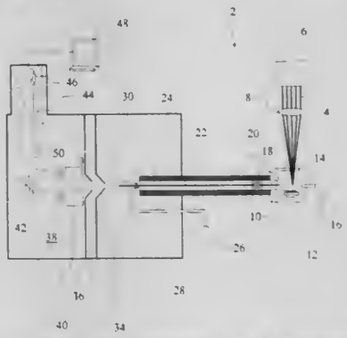
## METHOD AND APPARATUS FOR SAMPLE INTRODUCTION INTO A MASS SPECTROMETER FOR IMPROVING A SAMPLE ANALYSIS

**Aviv Amirav, Ramat Hasharon; Tzvi Shahar, Petach-Tiqwa, and Shai Dagan, Ramat Gan, all of Israel, assignors to Aviv Amirav, Ramat Hasaroh, Israel**

**Filed Sep. 30, 1996, Ser. No. 723,095**

**Int. Cl.[6] H01J** *49/04*

**U.S. Cl. 250—288** **33 Claims**



1. A method for sample introduction into a mass spectrometer for performing sample analysis, comprising:

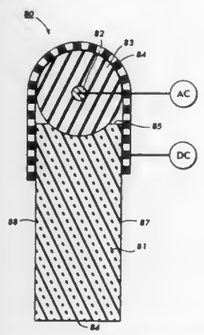
VOL 1209 ISS 3 AP 21 1998 UMI



desorbing a sample by means of a laser beam and forming gaseous sample compounds;
sweeping desorbed sample compounds with a carrier gas into a transfer line;
transferring the sample compounds in said transfer line into a supersonic nozzle;
expanding the sample compounds, mixed with said carrier gas, from the supersonic nozzle to form a supersonic free jet inside a vacuum chamber of a mass spectrometer, and
ionizing and mass analyzing the sample compounds for the purpose of identification and/or quantification of said sample.

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**5,742,051**
**MICRO SIZED ION GENERATING DEVICE**
**Richard F. Bergen, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.**
**Filed Sep. 26, 1996, Ser. No. 720,278**
**Int. Cl.[6] H05F *3/06***
**U.S. Cl. 250—326** **12 Claims**

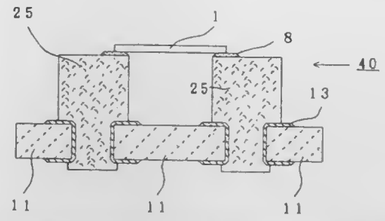



1. A printing machine having an imaging member and a charging device for charging the imaging member, the charging device, comprising:
an insulated support substrate having a flat portion and an edge portion orthogonal to said flat portion of said insulated support substrate;
a coronode;
an insulated member in contact with and surrounding said coronode, said insulated member being mounted on said edge portion of said support substrate; and
a conductive screen member positioned to hold said insulated member and said coronode on said edge portion of said insulated support substrate by extending over and around a portion of said insulated member while being attached to said insulated support substrate.

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**5,742,052**
**THERMAL INFRARED DETECTOR**
**Toshihiro Noguchi; Nobuo Kobayashi; Yukitoshi Tamura, and Toshiei Matsuzaki, all of Ichikawa, Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan**
**PCT No. PCT/JP95/02367, § 371 Date Jul. 18, 1996, § 102(e) Date Jul. 18, 1996, PCT Pub. No. WO96/16441, PCT Pub. Date May 30, 1996**
**PCT Filed Nov. 20, 1995, Ser. No. 676,295**
**Claims priority, application Japan, Nov. 18, 1994, 6-309741**
**Int. Cl.[6] G01J *5/02*; H01L *23/14***
**U.S. Cl. 250—338.1** **4 Claims**

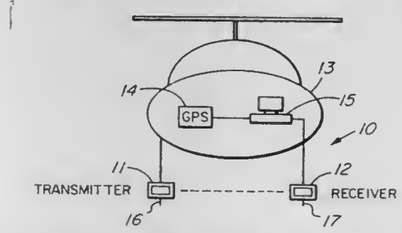
1. An infrared detector comprising an infrared detector element for generating an electrical signal, a support for the infrared detector element, and a circuit board for receiving the electrical signal from the infrared detector element, wherein the support is formed with a matrix of composite material essentially consisting




of one of thermosetting resins and thermoplastic resins and carbon fibers dispersed in the matrix, said one of thermosetting resins and thermoplastic resins having a thermal deformation temperature of at least 100° C. and a tensile elastic modulus of at least 100 kgf/mm$^2$, said carbon fibers constituting in the range of 10% to 40% by weight of the matrix, and wherein the circuit board is formed with a through-hole having an inner surface processed so as to be electrically conductive, and the support is formed integrally with the circuit board.

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**5,742,053**
**INFRARED GAS DETECTION METHOD AND APPARATUS**
**Horace Rekunyk, R.R. #1, P.O. Box #19 Site #5 NE, Calgary, Alberta, Canada**
**Filed Nov. 29, 1996, Ser. No. 770,365**
**Int. Cl.[6] G01N *21/00***
**U.S. Cl. 250—338.5** **23 Claims**



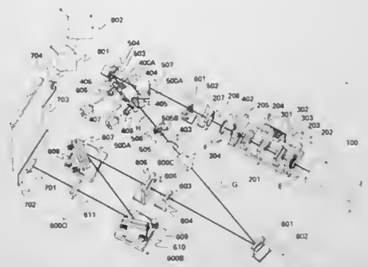

1. Apparatus to measure predetermined gases present between an infrared transmitter and an infrared receiver mounted on a movable platform, means to measure the quantity of predetermined gases present in the area between said infrared transmitter and said infrared receiver and means to correlate the measurement of said predetermined gases present between said infrared receiver and said infrared transmitter and the geographic location of said movable platform.

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**5,742,054**
**ULTRA-SENSITIVE DETECTION OF CONTAMINANTS IN CORROSIVE GAS VIA INTRACAVITY LASER SPECTROSCOPY (ILS)**
**George H. Atkinson, Tucson, Ariz., assignor to Innovative Lasers Corporation, Tucson, Ariz.**
**Continuation-in-part of Ser. No. 522,963, Sep. 1, 1995, Pat. No. 5,689,334. This application Jul. 3, 1996, Ser. No. 675,554**
**Int. Cl.[6] G01J *3/02***
**U.S. Cl. 250—339.13** **18 Claims**

1. A method for detecting the presence of gaseous species in a gas sample containing corrosive gas, comprising the steps of:
(a) selecting a spectral region wherein (i) said gaseous species has at least one absorption feature and (ii) said corrosive gas has essentially no interfering absorption features;
(b) providing a laser comprising a laser cavity and a gain medium which resides therein, said gain medium outputting

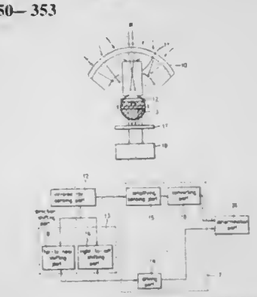




light having a wavelength distribution at least a portion of which is in said selected spectral region;
(c) providing a gas sample cell having windows which are transparent to light in said selected spectral region such that a beam of light can pass through said gas sample cell;
(d) inserting said gas sample cell in said laser such that light output from said gain medium passes through said gas sample cell prior to exiting said laser cavity;
(e) inserting said gas sample containing said corrosive gas in said gas sample cell such that light output from said gain medium passes through said gas sample, said gas sample sealed within said gas sample cell such that said corrosive gas does not react with said laser; and
(f) directing said light output from said gain medium after exiting said laser cavity to a detector assembly for determining the presence and/or concentration of said gaseous species in said gas sample.

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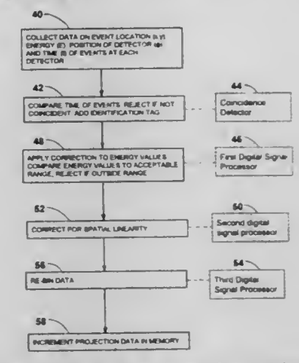
**5,742,055**
**DEVICE FOR SENSING POSITION OF HUMAN BODY USING INFRARED SENSOR**
**Don-Hee Lee, Bisan-dong, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea**
**Filed Jul. 10, 1996, Ser. No. 677,501**
**Claims priority, application Rep. of Korea, Jul. 13, 1995, 20671 1995**
**Int. Cl.[6] G08B *13/18;13/191;13/193***
**U.S. Cl. 250— 353** **6 Claims**



1. A device for sensing the position of a human body using an infrared ray sensor comprising:
a light focusing means for converging infrared rays emitted from the human body;
a guiding means for guiding only said infrared rays emitted from the human body at a predetermined direction;
an infrared ray sensing means for sensing the infrared rays guided by said guiding means;
a direction shifting means for shifting the guiding means and a sensing direction of said infrared ray sensing means up, down, right and left for every scan line within along distance, a medium distance and a short distance range;
a circuit for amplifying an output of said infrared ray sensing means, A/D converting said output, and driving said direction shifting means; and
a determination means for determining the position, movement direction and amount of activity of a human body using a signal output from said circuit and a driving signal output from said direction shifting means.

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**5,742,056**
**REAL TIME PET IMAGING PROCESSOR FOR A SINGLE PHOTON GAMMA CAMERA**
**Frank C. Valentino, Solon; Robert Zahn, Chagrin Falls, and Frank P. DiFilippo, Mayfield Heights, all of Ohio, assignors to Picker International, Inc., Cleveland, Ohio**
**Filed Nov. 21, 1996, Ser. No. 752,559**
**Int. Cl.[6] G01T *1/164***
**U.S. Cl. 250—363.03** **13 Claims**




1. A method of forming an image from positron emissions comprising the steps of:
collecting positron emission data from a gamma camera having an axis and a plurality of detectors with faces movable about a path in a plane transverse to the axis of the camera, the data relating to the actual location and energy of events at each of two of the detectors and to the actual angular position of each detector in its path at the moment of the events;
in a first real time processor comparing the time of each event at each of two detectors to determine whether the two events occurred simultaneously;
thereafter passing actual location data and actual energy data associated with simultaneous events from the first real time processor to a second real time signal processor;
in the second real time signal processor transforming the actual location data received from the first real time signal processor to equivalent location data for a frame of reference in which a line connecting the two simultaneous events is at a preselected angle to the face of the detector when viewed in a transverse plane normal to the axis of the camera and calculating an equivalent detector angular position of the detector; and thereafter
recording an event by incrementing a tally at a memory location corresponding to the equivalent location and detector angular position while collecting additional data.

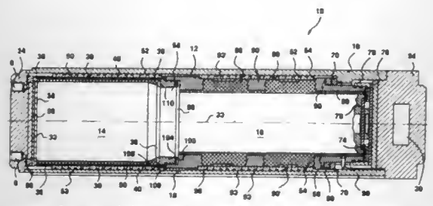
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**5,742,057**
**UNITIZED SCINTILLATION DETECTOR ASSEMBLY WITH AXIAL AND RADIAL SUSPENSION SYSTEMS**
**Larry D. Frederick, Huntsville, and Larry David Frederick, Jr., Madison, both of Ala., assignors to Frederick Energy Products, Huntsville, Ala.**
**Filed May 3, 1996, Ser. No. 642,525**
**Int. Cl.[6] G01T *1/20***
**U.S. Cl. 250—368** **26 Claims**

1. A unitized scintillation shock assembly including:

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means for receiving and transforming radiation into light impulses;

means for receiving and quantifying said light impulses;

elastomeric material surrounding said light impulse receiving and quantifying means;

an inner housing surrounding said elastomeric material;

an optical coupling positioned between said radiation receiving and transforming means and said light impulse receiving and quantifying means;

a compression cap located at an end of said light impulse receiving and quantifying means farthest from said optical coupling;

a first pad positioned between said light impulse receiving and quantifying means and said compression cap;

said elastomeric material including a plurality of outwardly extending projections surrounding said light impulse receiving and quantifying means;

a plurality of openings through said inner housing, said openings receiving said projections; and

wherein said compression cap axially biases said light impulse receiving and quantifying means toward said optical coupling.

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**5,742,058**

**DEVICE AND A METHOD OF DIGITALIZATION FOR PHOTOSENSITIVE DETECTORS AND A METHOD OF READING A MATRIX OF PHOTONIC DETECTORS**

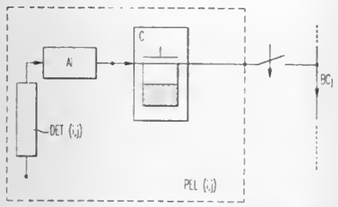
**Philippe Pantigny, Claix; Patrick Audebert, Grenoble; Eric Mottin, St Martin le Vinaux, and Frédéric Rothan, Fontaine, all of France, assignors to Commissariat A l'Energie Atomique, Paris, France**

**Filed May 30, 1996, Ser. No. 655,670**

**Claims priority, application France, Jun. 14, 1995, 95 07079**

**Int. Cl.[6] H05G *1/64*; G01T *1/24***

**U.S. Cl. 250—370.08** **13 Claims**




1. A digitizing device for a column of photosensitive detectors in a matrix of photosensitive detectors arranged in columns and rows, each photosensitive detector having an identical exposure time and supplying a current whose intensity varies as a function of an incident flux, and each photosensitive detector in a row of photosensitive detectors being activated simultaneously, the digitizing device comprising:

a column bus;

plural elementary points, each of the plural elementary points including:

an impedance matching device coupled to a corresponding photosensitive detector in the column of photosensitive detectors, the impedance matching device receiving a current supplied by the corresponding photosensitive detector during a first clock signal,

at least one MOS transistor for storing charge, the at least one MOS transistor including a gate input receiving a second clock signal for integrating the current supplied by the corresponding photosensitive detector, and

an addressing device for selectively coupling the at least one MOS transistor to the column bus during a third clock signal and for controlling conversion of the current supplied by the corresponding photosensitive detector into a current pulse during evacuation;

a regeneration device for receiving the current pulse from each of the plural elementary points, one at a time, and outputting a regenerated signal;

a counter receiving the regenerated signal and a fourth clock signal for producing a binary signal; and

a device for reading the binary signal.

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**5,742,059**

**READOUT SYSTEM FOR A SOLID STATE IMAGE CONVERTER**

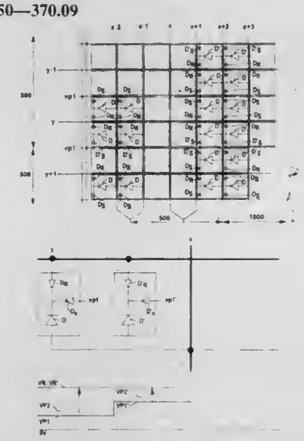
**Dietrich Hassler, Uttenreuth, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed May 20, 1996, Ser. No. 650,711**

**Claims priority, application Germany, Jul. 7, 1995, 195 24 856.2**

**Int. Cl.[6] H01L *27/146*; G01T *1/24***

**U.S. Cl. 250—370.09** **1 Claim**



1. A readout system for a solid state image converter comprising:

x-ray detector matrix containing a plurality of pixels arranged in lines, said plurality of pixels containing two groups of pixels and each pixel containing voltage-responsive electrical components with pixels in a first of said two groups containing voltage-responsive components responsive to a first voltage level and pixels in a second of said two groups containing voltage-responsive components responsive to a second voltage level, different from said first voltage level;

means for reading out said pixels line-by-line;

a common electrical conductor connected to said two groups of pixels; and

said means for reading out said pixels including means for producing voltages of said first and second voltage levels on said common conductor for separately reading out the pixels of said two groups using said common conductor.



**5,742,060**

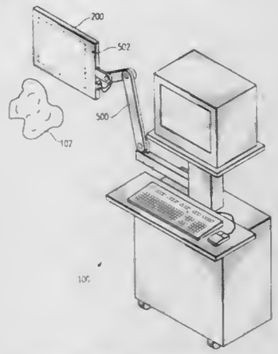
**MEDICAL SYSTEM FOR OBTAINING MULTIPLE IMAGES OF A BODY FROM DIFFERENT PERSPECTIVES**

**William L. Ashburn, La Jolla, Calif., assignor to Digirad Corporation, San Diego, Calif.**

**Continuation-in-part of Ser. No. 672,831, Jun. 28, 1996, which is a continuation-in-part of Ser. No. 372,807, Dec. 23, 1994, abandoned. This application Aug. 9, 1996, Ser. No. 694,819**

**Int. Cl.[6] G01T *1/161***

**U.S. Cl. 250—370.09** **54 Claims**




1. A nuclear imaging system, comprising:

(a) a primary imaging detector including a gamma camera mounted on a gantry, and an electronic image processing system; and

(b) a secondary imaging detector comprising a planar array gamma camera wherein the secondary detector is secured to one of the gantry or primary imaging detector by means for attachment so as to supplement the field of view of the primary imaging detector.

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**5,742,061**

**IONIZING RADIATION DETECTOR HAVING PROPORTIONAL MICROCOUNTERS**

**Marc Lemonnier, Les Ulis; Thierry Claude Bucaille, Paris; Joël Robert Charlet, Verrieres le Buisson; Michel Bordessoule, Les Ulis; François Bartol, Bures sur Yvette, and Stephan Megtert, Villebon sur Yvette, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France**

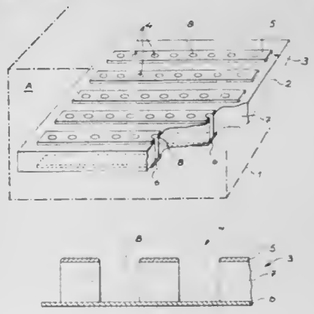
**PCT No. PCT/FR95/01548, § 371 Date Aug. 19, 1996, § 102(e) Date Aug. 19, 1996, PCT Pub. No. WO96/17373, PCT Pub. Date Jun. 6, 1996**

**PCT Filed Nov. 23, 1995, Ser. No. 676,222**

**Claims priority, application France, Nov. 25, 1994, 94 14158**

**Int. Cl.[6] H01J *47/06*; G01T *1/18***

**U.S. Cl. 250—385.1** **20 Claims**



1. An ionizing radiation detector comprising:

an enclosure filled with a gas having located therein a proportional counter and an absorption zone in which a gas is ionized by radiation;

wherein the proportional counter has at least one lower electrode and at least one upper electrode, which are parallel to one another and separated by an insulating material layer, the upper electrode and the insulating material layer having at least one opening, in which prevails a substantially uniform electric field and which constitutes a multiplication zone for electrons resulting from ionization of the gas by radiation.

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**5,742,062**

**ARRANGEMENT FOR MASKED BEAM LITHOGRAPHY BY MEANS OF ELECTRICALLY CHARGED PARTICLES**

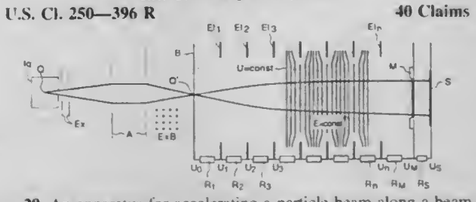
**Gerhard Stengl, Wernberg; Alfred Chalupka, Vienna; Herbert Vonach, Klosterneuburg, and Hans Loeschner, Vienna, all of Austria, assignors to IMS Mikrofabrikations Systeme GmbH, Vienna, Austria**

**Filed Feb. 8, 1996, Ser. No. 598,081**

**Claims priority, application Austria, Feb. 13, 1995, 259/95**

**Int. Cl.[6] H01J *37/10*;*37/30***

**U.S. Cl. 250—396 R** **40 Claims**




29. An apparatus for accelerating a particle beam along a beam path, comprising:

an electrode arrangement that receives said particle beam and is adapted to concentrate it so that charged particles in said particle beam are guided on substantially parallel paths with respect to a beam direction of said beam path, said electrode arrangement generating an electrostatic acceleration field having a constant gradient potential in said beam direction and having a substantially constant potential in a direction perpendicular to said beam path at least within a cross-section of said particle beam.

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**5,742,063**

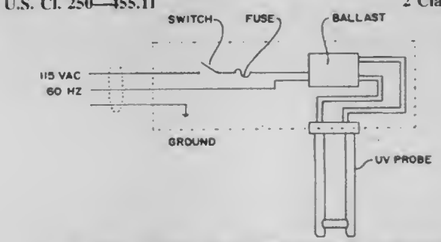
**AIR SANITIZER ATTACHMENT FOR AIR DUCTS**

**William Henry Scroggins, 5639 Silvian Rd., W. Palm Beach, Fla. 33415, and Charles Philip Hawkins, 933 Almeria Rd., West Palm Beach, Fla. 33405**

**Continuation-in-part of Ser. No. 519,963, Aug. 28, 1995, abandoned. This application Dec. 16, 1996, Ser. No. 766,929**

**Int. Cl.[6] G01N *23/00***

**U.S. Cl. 250—455.11** **2 Claims**




1. A sterilizing unit for air ducts comprising: a housing of substantially rectangular shape and cross section, said housing having side walls, an upper flange and an underside so as to enclose an area, said housing comprising aluminum material and said upper flange overhanging said side walls of said housing, a

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UV emitting means in connection with said housing, said housing having a passageway in said underside for said UV emitting means to extend through; an electrical power circuit in connection with said UV emitting means, said electrical circuit secured inside said housing, a sensor comprising light transmissive material in connection with said housing, said sensor extending from said upper flange to said underside, said sensor in close proximity to said UV emitting means so as to provide a visual indication of the condition of said UV emitting means; wherein said UV emitting means is of a double tube, single ended design having electrical connections for said tube at said single end.

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**5,742,064**

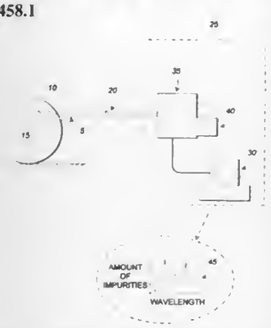
**SYSTEM FOR DETECTING IMPURITIES CONTAINED IN A FLOWING PETROLEUM PRODUCT**

**David A. Infante, 1285 Brooks Rd., Pendergrass, Ga. 30567**

**Filed Apr. 24, 1996, Ser. No. 637,232**

**Int. Cl.[6] G01N** *21/64;21/85;21/88*

**U.S. Cl. 250—458.1** **14 Claims**




1. A probe for measuring impurities contained in a petroleum product flowing through a pipeline, said probe comprising:

a pressure cell having first and second openings formed therein for allowing the petroleum product to enter and exit the cell, respectively, and a hollow bore extending from the first opening to the second opening for allowing the petroleum product to flow from the first opening to the second opening;

a first optical waveguide mount secured to said cell, said first optical waveguide mount having means for securing a first optical waveguide therein for transmitting light from a light source into the petroleum product flowing through said pressure cell;

a second optical waveguide mount secured to said cell, said second optical waveguide mount having means for securing a second optical waveguide therein for receiving light transmitted by the first optical waveguide through the petroleum product flowing through said cell; and

a third optical waveguide mount secured to said cell, said third optical waveguide mount having means for securing a third optical waveguide therein for receiving light fluoresced by impurities contained in the petroleum product flowing through said cell.

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**5,742,065**

**HEATER FOR MEMBRANE MASK IN AN ELECTRON-BEAM LITHOGRAPHY SYSTEM**

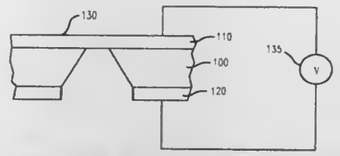
**Michael Stuart Gordon, Somers, N.Y.; Rodney Arthur Kendall, Ridgefield; David John Pinckney, Danbury, both of Conn., and James Louis Speidell, Poughquag, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 22, 1997, Ser. No. 787,069**

**Int. Cl.[6] H01J** *31/08*

**U.S. Cl. 250—492.23** **12 Claims**

1. A method of reducing contamination in a silicon membrane mask comprising the steps of:




doping at least one surface of said silicon membrane mask with boron to lower the electrical resistance of said mask; and

applying a voltage between opposite surfaces of said membrane mask, wherein at least one of said opposite surfaces has been doped by said boron, said voltage generating an electric field that passes through said membrane mask, heating said membrane mask.

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**5,742,066**

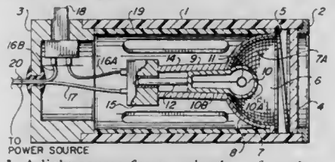
**LIGHT SOURCE FOR USE IN LEAK DETECTION IN HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS THAT UTILIZE ENVIRONMENTALLY-SAFE MATERIALS**

**Richard C. Cavestri, Columbus, Ohio, assignor to Bright Solutions, Inc., Troy, Mich.**

**Filed Feb. 8, 1996, Ser. No. 598,434**

**Int. Cl.[6] G01J** *1/00*

**U.S. Cl. 250—504 R** **21 Claims**




1. A light source for examination of a substance which reemits light at a wavelength greater than the wavelength of light emitted from said light source, said light source comprising:

a lamp assembly including;

a dichroic white light reflector;

said dichroic white light reflector is a focusing reflector;

a lamp positioned between said dichroic white light reflector and said substance;

said lamp connected to a source of electrical power and operated in response to said electrical power to emit light;

said dichroic white light reflector functioning to reflect a selected portion of said light emitted from said lamp;

a lens filter positioned between said lamp assembly and said substance;

said lens filter operated to further restrict said light from said lamp and said light reflected by said dichroic white light reflector;

whereby said light emitted from said light source is restricted to a predetermined range effective to enhance the reemission of light from said substance.

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**5,742,067**

**EXPOSURE METHOD AND APPARATUS THEREFOR**

**Yuji Imai, Omiya, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Filed Nov. 27, 1995, Ser. No. 563,096**

**Claims priority, application Japan, Nov. 29, 1994, 6-294270; Nov. 16, 1995, 7-322131**

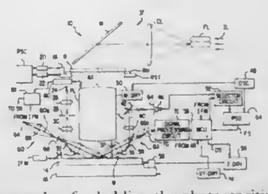
**Int. Cl.[6] G01N** *21/86*

**U.S. Cl. 250—548** **17 Claims**

13. A step-and-repeat type exposure apparatus for successively transferring an image of a pattern formed on a mask onto a plurality of shot areas on the photosensitive substrate respectively, comprising:

a projection optical system for projecting the image of the pattern formed on the mask onto the photosensitive substrate;





a movable member for holding the photosensitive substrate, the movable member being movable in a direction of an optical axis of the projection optical system, and able to incline with respect to an image plane of the projection optical system;

a substrate stage for bearing the movable member, the substrate stage being movable two-dimensionally in a plane perpendicular to the optical axis of the projection optical system;

a first detecting sensor for optically detecting positions on a surface of the photosensitive substrate in the direction of the optical axis of the projection optical system;

a second detecting sensor for optically detecting inclination of surfaces of shot areas on the photosensitive substrate with respect to the image plane of the projection optical system;

a first leveling device for inclining the movable member on the basis of positions which are measured in the direction of the optical axis on at least three shot areas by using the first detecting sensor, in order to correct relative inclination between the image plane of the projection optical system and the surface of the photosensitive substrate;

a first controller for controlling the substrate stage for its movement position while monitoring the movement position of the substrate stage so that a plurality of shot areas on the photosensitive substrate are successively exposed with the pattern image of the mask;

a focusing device for driving the movable member on the basis of an output of the first detecting sensor so that a surface of one shot area on the photosensitive substrate having been corrected for inclination coincides with a focal position of the projection optical system;

a second leveling device for driving the movable member on the basis of an output of the second detecting sensor so that the surface of the one shot area is parallel to the image plane of the projection optical system; and

a second controller for determining a positional discrepancy amount from the image plane of the projection optical system for a surface of another shot area which is different from the one shot area and onto which the mask pattern is subsequently transferred on the basis of inclination amount of the surface of the one shot area on the photosensitive substrate driven by the second leveling device, and controlling movement of the movable member so that the photosensitive substrate is moved in the direction of the optical axis in an amount corresponding to the positional discrepancy amount during movement of the substrate stage for positioning the another shot area at an exposure position by the first controller.

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**5,742,068**

**OPTICAL SCANNING MEASUREMENT OF DIMENSIONS WITH A DOUBLE-CONCAVE MIRROR**

**Stig Dybdahl, Nesbru; Stian Holte, Kongsberg; Arild Staver, Slependen; Gudmunn Slettemoen, Klæbu; Einar Sørensen, and Morten Løken, both of Oslo, all of Norway, assignors to Cargoscan A/S, Oslo, Norway**

**PCT No. PCT/NO94/00090, § 371 Date Nov. 8, 1995, § 102(e) Date Nov. 8, 1995, PCT Pub. No. WO94/27166, PCT Pub. Date Nov. 24, 1994**

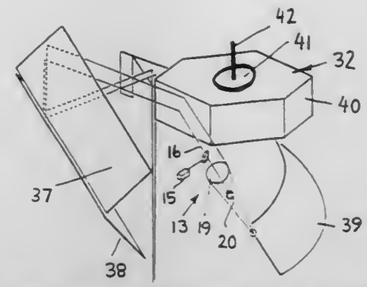
**PCT Filed May 13, 1994, Ser. No. 545,801**

**Claims priority, application Norway, May 13, 1993, 931741**

**Int. Cl.[6] G01N** *21/86*

**U.S. Cl. 250—559.19** **26 Claims**

16. An apparatus for measuring the distance to one or more areas of an object in order to determine one or more dimensions of the object, comprising means for directing a light beam towards the object, means for registering the light beams that are reflected from the object, means for calculating the time it takes for the beams to travel to and from the object, and means for causing the light beam to sweep across the object perpendicular in relation to a fixed reference plane during the entire sweeping operation, and with relative movement between the apparatus and the object which is to be measured, said light which is reflected by the object returning back to the light registration means via said light beam sweeping means, and said light beam sweeping means including a stationary mirror which is arced in its longitudinal direction, and means causing the light beam to move over the stationary mirror, wherein the stationary mirror in the longitudinal direction has an arced cross section so that the mirror forms a double concave mirror surface, the radius of curvature of the arc changing along the length of the stationary mirror and being greatest at the ends of said mirror, and wherein said means for moving the light beam is a rotating polygonal mirror unit.




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**5,742,069**

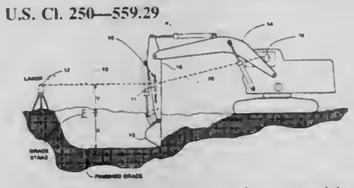
**DIGITALLY FILTERED LASER RECEIVER**

**Timothy E. Steenwyk, Grand Rapids, and Ross C. Stoepker, Kentwood, both of Mich., assignors to Laser Alignment, Inc., Grand Rapids, Mich.**

**Filed Mar. 20, 1996, Ser. No. 619,926**

**Int. Cl.[6] G01N** *21/86*

**U.S. Cl. 250—559.29** **28 Claims**



1. A digitally filtered laser receiver, comprising:

a plurality of radiation sensors which are spatially arranged in a manner which identifies a relative position of said sensors with respect to rotating laser radiation source as a function of which of said radiation sensors are impinged by radiation from said rotating laser radiation source; and

a microcomputer having inputs that are responsive to impingement of said radiation sensors by radiation, said microcomputer programmed to process data from said inputs in a manner which produces output data only when at least one of said radiation sensors is impinged by radiation from said rotating laser radiation source, said output data indicative of a relative position of said radiation sensors and said rotating laser radiation source wherein said microcomputer is programmed to identify an invalid combination of said sensors being impinged by radiation and to inhibit production of output data in response to an invalid combination of said sensors being impinged by radiation.

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5,742,070

## METHOD FOR PREPARING AN ACTIVE SUBSTANCE OF CHEMICAL CELLS

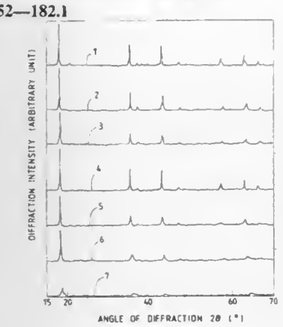
Yasushi Hayashi, Oobu-chi; Norikazu Adachi, Nogoyo, and Hisanao Kojima, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 308,531, Sep. 21, 1994, Pat. No. 5,565,688. This application Jun. 3, 1996, Ser. No. 657,183

Claims priority, application Japan, Sep. 22, 1993, 5-236252; Dec. 28, 1993, 5-336002; Jun. 2, 1995, 7-136942; Mar. 13, 1996, 8-056541

Int. Cl.[6] H01M 4/88

U.S. Cl. 252—182.1 50 Claims




1. A method for preparing an active substance for use in a positive electrode in a chemical cell comprising a negative electrode and a positive electrode, said method comprising the steps of:

preparing a mixed aqueous solution of at least one water-soluble lithium compound, at least one water-soluble transition metal compound, and at least one organic acid selected from the group consisting of organic acids having at least one carboxyl group and at least one hydroxyl group, organic acids having at least two carboxyl groups, and mixtures thereof;

preparing an organic acid complex consisting of lithium, at least one transition metal, and oxygen; and

thermally decomposing the complex at temperatures sufficient for the decomposition to obtain the active substance.

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5,742,071

## WIRINGLESS LOGICAL OPERATION CIRCUITS

Shiroo Kamohara, Berkeley, Calif.; Peter M. Lee; Hitoshi Matsuo, both of Kokubunji, Japan, and Sigeo Ihara, Tokorozawa, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

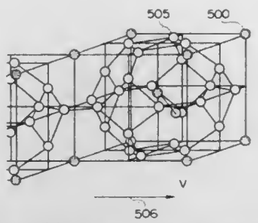
Continuation-in-part of Ser. No. 394,767, Feb. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 117,801, Sep. 8, 1993, Pat. No. 5,422,496, which is a continuation of Ser. No. 961,547, Oct. 15, 1992, Pat. No. 5,258,625. This application Aug. 12, 1996, Ser. No. 695,533

Claims priority, application Japan, Oct. 15, 1991, 3-265940; Feb. 25, 1994, 6-027710; Aug. 26, 1994, 6-201763

Int. Cl.[6] H01L 29/06;31/0328;31/0336

U.S. Cl. 257—17 21 Claims

1. A wiringless logical operation circuit for performing a logical operation in response to a predetermined input, said circuit having polygonal conducting materials arranged in the vicinity of respective lattice points obtained by dividing an N-dimensional region, N being an integer of at least 2 and no greater than 3, of said circuit by a grating so that single-electron tunneling occurs between nearest conducting materials, wherein a logical operation is carried out under conditions that a site having a state of an excess m of electrons, m being a positive real number, in a conducting material is made to correspond to logic "1", and an excess-electron vacancy state is made to correspond to logic "0", and that the case where an electron introduced into a predetermined conducting material for signal inputting can reach a conducting material for signal outputting is made to correspond to a result of "1" of the logical operation but the case where the electron cannot reach the signal output conducting material is made to correspond to a result of "0" of the logical operation.




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5,742,072

## LIGHT CONTROL SUBSTANCE AND LIGHT CONTROL METHOD USING THE SAME

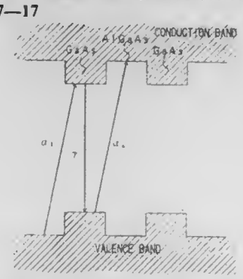
Yoshinobu Maeda, Yokkaichi, Japan, assignor to Research Development Corporation of Japan, Japan

Filed Jun. 13, 1996, Ser. No. 663,530

Claims priority, application Japan, Jul. 10, 1995, 7-173797

Int. Cl.[6] H01L 29/06;31/0328;31/0336;33/00

U.S. Cl. 257—17 12 Claims




1. A light control device for controlling light transmission from a first light source comprising a light control substance in a path of light from the first light source, said light control substance serving as an absorbing substance and having a multi-level energy structure such that ground state absorption occurs between a ground level and a level higher than the ground level and excited state absorption occurs between an excited level and a level higher than the excited level, whereby a variation Δlout in the intensity of output light becomes negative with respect to a variation Δlin in the intensity of input light and the value of Δlout/Δlin becomes negative, at an optical wavelength at which the ground state absorption and the excited state absorption occur; and a second light source for impinging light on the light control substance to control the transmission of light from the first light source.

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5,742,073

## SUPERCONDUCTING WEAK LINK ARRAY SWITCH

Hua Jiang, Mansfield, and Alvin J. Drehman, Chelmsford, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

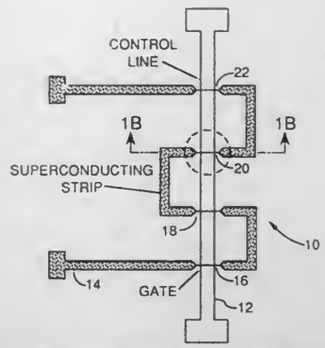
Filed Sep. 27, 1996, Ser. No. 725,222

Int. Cl.[6] H01L 29/06;39/22

U.S. Cl. 257—34 6 Claims

1. A superconducting weak link array switch, said superconducting weak link array switch being used to control a flow of current therethrough from other devices connected thereto, said superconducting weak link array switch being maintained at a temperature near $T_c$, said superconducting weak link array switch comprising:






a substrate, said substrate being insulating, said substrate having a flat upper surface;

a control line, said control line being attached to said flat upper surface of said substrate, said control line having a controllable current flowing therethrough, said control line being able to provide Joule heating and a magnetic field;

a buffer layer, said buffer layer being deposited on top of said substrate and said control line, said buffer layer being insulating; and

a strip, said strip being made of a superconducting material, said strip being deposited on top of said buffer layer, said strip being patterned wherein said strip has a plurality of intersections with said control line, each of said intersections forming an on-off gate, said strip and said control line not being in physical contact, said strip having two step edge junctions with said control line thereunder

whereby, a very small current change in said control line will be able to turn each of said gates to either an on or an off condition.

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5,742,074

## THIN FILM TRANSISTOR MATRIX DEVICE AND METHOD FOR FABRICATING THE SAME

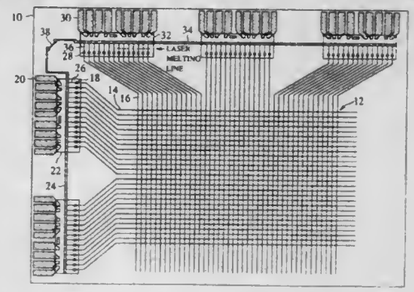
Hidaki Takizawa; Shougo Hayashi; Takeshi Kinjo; Makoto Tachibanaki, and Kenji Okamoto, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 29, 1996, Ser. No. 669,272

Claims priority, application Japan, May 31, 1995, 7-134400

Int. Cl.[6] H01L 29/04;31/032

U.S. Cl. 257—59 13 Claims




1. A thin film transistor matrix device comprising:

a transparent insulating substrate;

a plurality of thin film transistors arranged on said transparent insulating substrate in a matrix, each said transistor having a source, a gate and a drain;

a plurality of picture element electrodes arranged in a matrix on said transparent insulating substrate and connected to said sources of said thin film transistors;

a plurality of bus lines for commonly connecting one of said gates and said drains of said thin film transistors;

outside terminals formed on a margin of said transparent insulating substrate and opposed to ends of said bus lines; and

connection lines formed on regions of said transparent insulating substrate inner of said outside terminals and commonly connecting said plurality of bus lines.

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5,742,075

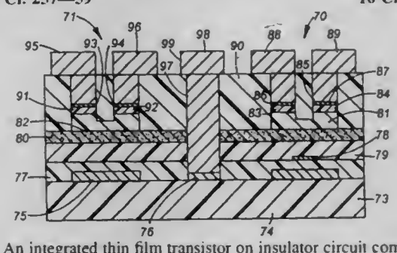
## AMORPHOUS SILICON ON INSULATOR VLSI CIRCUIT STRUCTURES

Stanley G. Burns, Ames, Iowa; Carl Gruber, Le Sueur, Minn.; Howard R. Shanks; Alan P. Constant, both of Ames, Iowa; Allen R. Landin, Boone, Iowa, and David H. Schmidt, Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation of Ser. No. 319,752, Oct. 7, 1994, abandoned. This application Nov. 18, 1996, Ser. No. 751,785

Int. Cl.[6] H01L 29/04

U.S. Cl. 257—59 16 Claims




1. An integrated thin film transistor on insulator circuit comprising a plurality of thin film transistors formed on an insulating substrate in an interconnected complex circuit arrangement and comprising, in combination:

an insulating substrate to serve as a base for the integrated circuit;

a lower metallization layer on the substrate patterned to form a plurality of control gates for a plurality of thin film transistors;

a dielectric layer over the control gates;

an amorphous silicon layer deposited on the dielectric layer and carrying doped source and drain regions separated by no more than about 5 microns;

an upper metallization layer interconnecting the source regions, the drain regions, and the gates of the respective thin film transistors to form a complex circuit;

narrow trenches etched in the amorphous silicon layer between transistors to provide isolation between said transistors; and

the transistors being densely packed to minimize interconnection length and thereby improve the speed of performance of the interconnected circuit.

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5,742,076

## SILICON CARBIDE SWITCHING DEVICES HAVING NEAR IDEAL BREAKDOWN VOLTAGE CAPABILITY AND ULTRALOW ON-STATE RESISTANCE

Srikant Sridevan, Raleigh, N.C.; Peter Kerr McLarty, Plano, Tex., and Bantval Jayant Baliga, Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Jun. 5, 1996, Ser. No. 658,733

Int. Cl.[6] H01L 29/161;29/12;29/51;29/78

U.S. Cl. 257—77 34 Claims

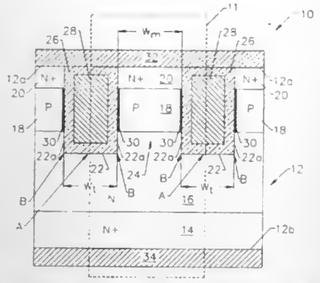
28. A silicon carbide power semiconductor device, comprising:

a silicon carbide substrate; and

an insulated gate power semiconductor device in said silicon carbide substrate, said insulated gate power semiconductor device including a gate electrode, a silicon carbide drift region of first conductivity type, a silicon carbide base region of second conductivity type adjacent said drift region and a gate

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electrode insulating region disposed between said gate electrode and said base and drift regions, said gate electrode insulating region selected from the group consisting of electrical insulators having electrical permittivities greater than about ten times the permittivity of free space.

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**5,742,077**

**SEMICONDUCTOR DEVICE**

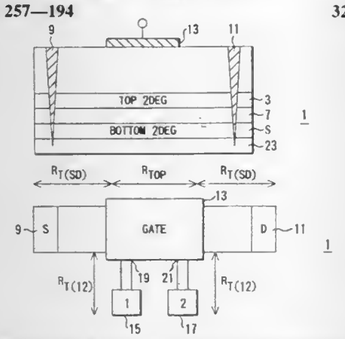
**N. K. Patel, and I. S. Millard, both of Cambridge, United Kingdom, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jul. 30, 1996, Ser. No. 689,137**

**Claims priority, application United Kingdom, Jul. 31, 1995, 9515681**

**Int. Cl.[6] H01L** *29/778*

**U.S. Cl. 257—194** **32 Claims**



1. A semiconductor device comprising a heterostructure which includes first and second mutually separated conductive layers; source and drain regions being provided, each contacting both of said first and second conductive layers; a gate electrode being disposed over the first and second conductive layers and between the source and drain regions; and first and second output contact regions being provided, each contacting both of said first and second conductive layers, the first and second output contact regions being positioned between the source and drain regions and each being overlapped by the gate electrode.

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**5,742,078**

**INTEGRATED CIRCUIT SRAM CELL LAYOUTS**

**Soo-cheol Lee, Seoul; Jun-eui Song, Kyungki-do, and Heon-jong Shin, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

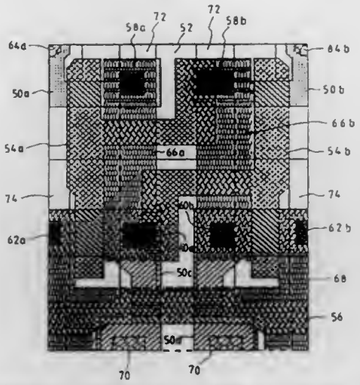
**Filed Jun. 7, 1996, Ser. No. 663,326**

**Claims priority, application Rep. of Korea, Aug. 31, 1995, 1995-28487**

**Int. Cl.[6] H01L** *27/148;27/10;29/76;27/108*

**U.S. Cl. 257—202** **19 Claims**

1. An integrated circuit nonvolatile memory cell comprising:



a semiconductor substrate having a field region and first, second, third and fourth active regions therein, said first and second active regions each including a horizontal leg and a vertical leg which define a vertex therebetween, such that said horizontal leg extends horizontally from the vertex and said vertical leg extends vertically from the vertex, said first and second active regions being mirror images of each other about a vertical axis, said third and fourth active regions each including a horizontal leg and a vertical leg which define a vertex therebetween, such that said horizontal leg extends horizontally from the vertex and said vertical leg extends vertically from the vertex, said third and fourth active regions being mirror images of each other about a vertical axis; and

first and second vertically extending gate conductive layers on said semiconductor substrate, said first vertically extending conductive layer extending vertically over said first active region horizontal leg and extending vertically over said third active region horizontal leg, and said second vertically extending conductive layer extending vertically over said second active region horizontal leg and extending vertically over said fourth active region horizontal leg.

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**5,742,079**

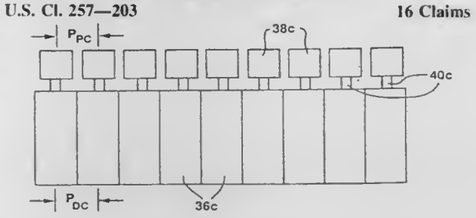
**INTEGRATED CIRCUIT WITH VARIABLE PAD PITCH**

**Bryan Cary Doi, Freemont, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.**

**Continuation of Ser. No. 415,183, Apr. 3, 1995, Pat. No. 5,610,417, which is a division of Ser. No. 142,839, Oct. 25, 1993, Pat. No. 5,424,248, which is a continuation of Ser. No. 805,418, Dec. 10, 1991, abandoned. This application Dec. 24, 1996, Ser. No. 773,099**

**Int. Cl.[6] H01L** *27/10;23/48;23/52*

**U.S. Cl. 257—203** **16 Claims**



1. An integrated circuit comprising:

a base structure provided with a plurality of drivers having a first pitch between adjacent centers of said drivers;

a customization structure disposed over said base structure, said customization structure being provided with a plurality of bonding pads having a second pitch between adjacent centers of said bonding pads, wherein said second pitch is greater than said first pitch; and



a coupling structure connecting some, but not all, of said drivers to said bonding pads.

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**5,742,080**

**MAGNETICALLY CONTROLLED LOGIC CELL**

**Mikhail Lvovich Baranochnikov, Moscow; Gennady Yakovlevich Krasnikov, Zelenograd; Viktor Naumovich Mordkovich, Moscow; Pavel Sergeevich Prikhodko, Zelenograd, and Valery Alexandrovich Mikhailov, Moscow, all of Russian Federation, assignors to Aktsionernoe Obschestvo VL, Russian Federation**

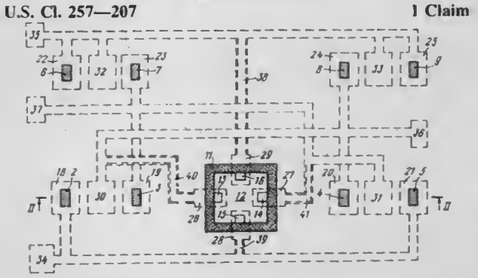
**PCT No. PCT/RU95/00001, § 371 Date Sep. 18, 1996, § 102(e) Date Sep. 18, 1996, PCT Pub. No. WO95/19648, PCT Pub. Date Jul. 20, 1995**

**PCT Filed Jan. 5, 1995, Ser. No. 676,182**

**Claims priority, application Russian Federation, Jan. 14, 1994, 94.000985/25**

**Int. Cl.[6] H01L** *29/82;43/00;27/10*

**U.S. Cl. 257—207** **1 Claim**



1. A magnetically controlled logic cell comprising a semiconductor substrate (**1**) of the first type conductivity, eight alloyed regions of the second type conductivity (**2–9**) creating in pairs drain and source regions of four field-effect transistors, a dielectric film (**17**) arranged on the surface of the substrate having openings over each of the drain and source regions, eight conducting contact regions (**18–25**) located over the drain and source regions on their surface and on the surface of the dielectric film (**17**), four conducting gate regions (**30–33**) each situated on the surface of the dielectric film (**17**) between the drain and source regions of each transistor, four current supply buses (**34–37**) arranged on the surface of the dielectric film (**17**) the first (**34**) of which is adjoining the source regions of the first and second transistors and being a power supply bus, the second one (**35**) is adjoining the source and gate regions of the third and fourth transistors and being a power supply bus, the third one (**36**) is adjoining the gate region of the first transistor, source regions of the second and fourth transistors and being an output bus, the fourth one (**37**) is adjoining the gate region of the second transistor, drain regions of the first and third transistors and being an output bus, characterized in, that the substrate of the first type conductivity comprises a concealed dielectric region (**10**) an insulating region (**11**) arranged on the perimeter of the concealed dielectric and adjoining it and the dielectric film (**17**), four highly alloyed regions of the first type conductivity (**13–16**) adjoining the insulating region (**11**) and the concealed dielectric region (**10**) and arranged symmetrically in pairs in respect to each other near the opposite sides of the region of the first type conductivity created by the concealed dielectric region (**10**) and insulating region (**11**), four conducting contacts (**26–29**) to the highly alloyed regions of the first type conductivity and current supply buses (**38–41**), the first one (**39**) of which is adjoining the power supply bus (**34–35**) and the contact of one of the highly alloyed regions of the first type conductivity, the second one (**38**) is adjoining another power supply bus and the opposite contact of another highly alloyed region of the first type conductivity, the third one (**40**) is adjoining the output bus (**36**) and the contact of the second pair of the highly alloyed regions of the first type conductivity, the fourth on (**41**) is adjoining the opposite contact of the second pair of the highly alloyed regions and another output bus (**37**).

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**5,742,081**

**CHARGE TRANSFER IMAGE PICKUP DEVICE**

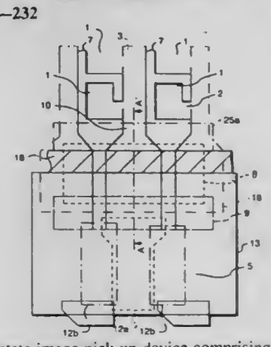
**Masayuki Furumiya, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Feb. 6, 1995, Ser. No. 383,820**

**Claims priority, application Japan, Feb. 16, 1994, 6-019350**

**Int. Cl.[6] H01L** *27/148*

**U.S. Cl. 257—232** **14 Claims**



1. A solid state image pick up device comprising:

a plurality of photoelectric conversion elements producing signal charges in response to light applied thereto;

a vertical charge transfer part including a first region having a first well layer and transferring said signal charges produced by said photoelectric conversion elements;

a horizontal charge transfer part including a second region having a second well layer and coupled to said vertical charge transfer part to receive signal charges transferred from said vertical charge transfer part by using a terminal vertical transfer electrode of said vertical charge transfer part, said first and second well layers being partially overlapped to form an overlap section without extending over said terminal vertical transfer electrode in a direction from said second region to said first region; and

a barrier layer selectively formed adjacent said first region to allow a potential to descend gradually in a direction from said first region to said second region.

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**5,742,082**

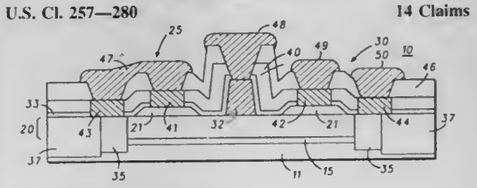
**STABLE FET WITH SHIELDING REGION IN THE SUBSTRATE**

**Saied N. Tehrani, Tempe; Jenn-Hwa Huang, Gilbert; Herbert Goronkin, Tempe; Ernest Schirmann, and Marino J. Martinez, both of Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Nov. 22, 1996, Ser. No. 753,312**

**Int. Cl.[6] H01L** *29/80*

**U.S. Cl. 257—280** **14 Claims**



1. A stable FET comprising:

a substrate structure:

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an electrically conductive shielding region positioned in the substrate structure, the electrically conductive shielding region including a doped layer of the substrate structure;

a channel region positioned on the shielding region;

a drain positioned on the channel region and overlying the electrically conductive shielding region;

a source positioned on the channel region in spaced relationship from the drain and overlying the electrically conductive shielding region, the source having an externally accessible electrical contact;

a gate positioned in overlying relationship on the channel region between the drain and source and overlying the electrically conductive shielding region; and

an externally accessible electrical contact connected to the shielding region, the externally accessible electrical contact including an implant extending through the externally accessible electrical contact of the source, through the channel region and into contact with the shielding region, and the externally accessible electrical contact is formed integrally with the externally accessible electrical contact of the source.

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**5,742,083**

**ELECTROSTATIC DISCHARGE PROTECTION METAL-OXIDE SEMICONDUCTOR FIELD-EFFECT TRANSISTOR WITH SEGMENTED DIFFUSION REGIONS**

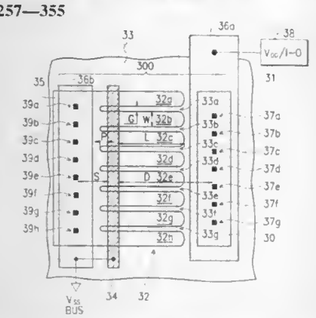
**Shi-Tron Lin, Taipei, Taiwan, assignor to Winbond Electronics Corporation, Taiwan**

**Filed Jan. 2, 1997, Ser. No. 778,742**

**Claims priority, application Taiwan, Aug. 14, 1996, 85109874**

**Int. Cl.[6] H01L** *23/62*

**U.S. Cl. 257—355** **12 Claims**




1. A semiconductor field-effect transistor device for electrostatic discharge protection of a semiconductor integrated circuit device, said transistor having a segmented diffusion region and comprising:

a substrate;

a gate having an extended strip-shaped structure, formed on said substrate;

a well region formed in said substrate on a first side of said gate;

a first drain diffusion region formed in said well region;

a source diffusion region formed in said substrate, on a second side of said gate opposite the first side of said gate;

a second drain diffusion region formed partially inside said well region on the first side of said gate and substantially between the source diffusion region and the first drain diffusion region; and

a field oxide layer formed over a surface of said substrate, said field oxide layer comprising a plurality of finger-shaped extensions originating from said first side of said gate and extending to said second side of said gate, wherein said plurality of finger-shaped extensions divide said second drain diffusion region into a plurality of parallel-aligned segmented diffusion regions but do not fully divide said source diffusion region.

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**5,742,084**

**PUNCHTHROUGH-TRIGGERED ESD PROTECTION CIRCUIT THROUGH GATE-COUPLING**

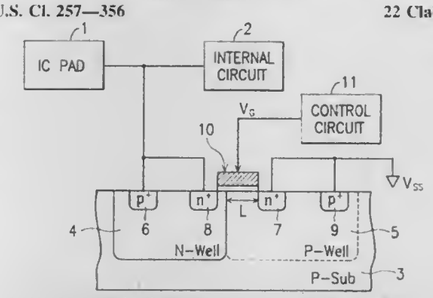
**Ta-Lee Yu, Hsinchu Hsien, Taiwan, assignor to Winbond Electronics Corporation, Taiwan**

**Filed Jul. 23, 1996, Ser. No. 681,381**

**Claims priority, application Taiwan, May 3, 1996, 85105305**

**Int. Cl.[6] H01L** *23/62*

**U.S. Cl. 257—356** **22 Claims**




1. An electrostatic discharge protection circuit to be arranged at an IC pad for protecting an internal circuit within an integrated circuit from ESD damage, the electrostatic discharge protection circuit comprising:

a P-type silicon substrate;

an N-well region formed in the P-type silicon substrate;

a P-type doped region formed in the N-well region to be electrically connected to the IC pad;

an N-type doped region formed in the P-type silicon substrate and separated from the N-well region by a spacing, for electrical connection to a circuit ground of the integrated circuit, wherein the P-type doped region, the N-well region, the P-type silicon substrate, and the N-type doped region form a silicon-controlled rectifier;

a gate structure overlying the P-type silicon substrate between the N-well region and the N-type doped region, wherein the gate structure, the N-type doped region, and the N-well region form a transistor; and

a control circuit for providing a gate voltage to the gate structure, wherein a punchthrough voltage of the transistor is determined by the spacing as well as by the gate voltage.

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**5,742,085**

**LOW-VOLTAGE TRIGGER ELECTROSTATIC DISCHARGE PROTECTION CIRCUIT**

**Ta-Lee Yu, Hsien, Taiwan, assignor to Winbond Electronics Corporation, Hsinchu, Taiwan**

**Filed Nov. 25, 1996, Ser. No. 756,173**

**Claims priority, application Taiwan, Jul. 19, 1996, 85108799**

**Int. Cl.[6] H01L** *23/62*

**U.S. Cl. 257—360** **4 Claims**

1. A low-voltage trigger electrostatic discharge protection circuit disposed on a bonding pad of an IC to protect an internal circuit of said IC from electrostatic discharge damage, comprising:

a p-type silicon substrate;

two n-type well regions separated from each other and formed in said p-type silicon substrate;

two first n-type diffusion regions each of which is formed in a different one of said n-type well regions;

two first p-type diffusion regions each of which is formed in a different one of said n-type well regions;

a second n-type diffusion region formed in said p-type silicon substrate and extending from between said n-type well regions to one side of said n-type well regions;

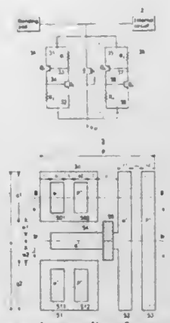
a third n-type diffusion region spaced from said second n-type diffusion region and formed in said p-type silicon substrate;

a gate structure formed on said p-type silicon substrate between said second n-type diffusion region and said third n-type diffusion region and extending from said second n-type diffusion region to said third n-type diffusion region; and

a second p-type diffusion region formed in said p-type silicon substrate.

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**5,742,086**

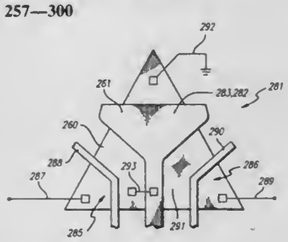
**HEXAGONAL DRAM ARRAY**

**Michael D. Rostoker, Boulder Creek; James S. Koford, Mountain View; Ranko Scepanovic, San Jose; Edwin R. Jones; Gobi R. Padmanahben, both of Sunnyvale; Ashok K. Kapoor, Palo Alto, all of Calif.; Valeriy B. Kudryavtsev, Moscow, Russian Federation; Alexander E. Andreev, Moskovskata Oblast, Russian Federation; Stanislav V. Aleshin, and Alexander S. Podkolzin, both of Moscow, Russian Federation, assignors to LSI Logic Corporation, Milpitas, Calif.**

**Continuation-in-part of Ser. No. 333,367, Nov. 2, 1994, Pat. No. 5,578,840. This application Aug. 21, 1995, Ser. No. 517,153**

**Int. Cl.[6] H01L** *29/78;29/41*

**U.S. Cl. 257—300** **40 Claims**




1. A DRAM cell, comprising:

a triangular semiconductor structure formed on a semiconductor substrate having a first transistor, a second transistor, and a third transistor;

the first transistor having a gate electrode connected to a drain of the second transistor, the gate electrode of the first transistor comprising a layer of doped polysilicon forming a Y-shaped capacitor for storage;

the second transistor having a source connected to a write bit line, the second transistor having a gate electrode connected to a write select line;

the third transistor having a gate electrode connected to a read select line, the third transistor having a drain connected to a read bit line; and,

the first transistor and the third transistor having a common source-drain.

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**5,742,087**

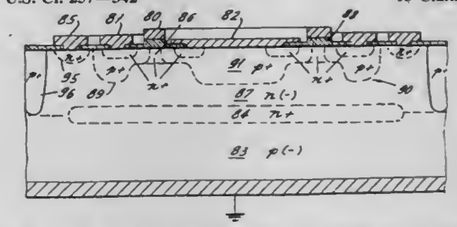
**HIGH POWER MOSFET WITH LOW ON-RESISTANCE AND HIGH BREAKDOWN VOLTAGE**

**Alexander Lidow, Hermosa Beach, and Thomas Herman, Manhattan Beach, both of Calif., assignors to International Rectifier Corporation, El Segundo, Calif.**

**Continuation of Ser. No. 288,685, Aug. 11, 1994, abandoned, which is a continuation of Ser. No. 17,511, Feb. 12, 1993, Pat. No. 5,338,961, which is a contiouation of Ser. No. 303,818, Jan. 30, 1989, Pat. No. 5,191,396, which is a division of Ser. No. 90,664, Aug. 28, 1987, abandoned, which is a division of Ser. No. 456,813, Jan. 10, 1983, Pat. No. 4,705,759, which is a division of Ser. No. 232,713, Feb. 9, 1981, Pat. No. 4,376,286, which is a continuation of Ser. No. 951,310, Oct. 13, 1978, abandoned. This application Oct. 26, 1995, Ser. No. 548,782**

**Int. Cl.[6] H01L** *29/76;29/94;31/062;29/00*

**U.S. Cl. 257—342** **13 Claims**




1. A semiconductor device comprising, in combination: a thin, flat semiconductor wafer, junction isolation means for dividing said semiconductor wafer into at least first and second laterally separated segments; said first segment containing at least one power MOSFET device; said junction isolation means including a P+ sinker diffusion which encloses said first segment; said at least one power MOSFET device in said first segment including at least first and second spaced base regions each having a respective source region which forms a surface channel region within its respective base region extending from said source region to a respective edge of said respective base region, the respective edges each adjoining a common conduction region; and a gate means disposed parallel to said channel regions and operable to invert said channel regions; source electrode means connected to each of said source and base regions and disposed on the top surface of said wafer; and a drain electrode electrically coupled to said common conduction region, and disposed on the top surface of said wafer.

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**5,742,088**

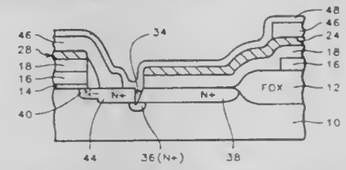
**PROCESS HAVING HIGH TOLERANCE TO BURIED CONTACT MASK MISALIGNMENT BY USING A PSG SPACER**

**Yang Pan, Singapore, Singapore; Lap Chan, San Francisco, Calif., and Ravi Sundaresan, Singapore, Singapore, assignors to Chartered Semiconductor Manufacturing Pte Ltd., Singapore, Singapore**

**Division of Ser. No. 636,086, Apr. 22, 1996, Pat. No. 5,652,152. This application Apr. 18, 1997, Ser. No. 837,486**

**Int. Cl.[6] H01L** *29/08;29/40;27/11*

**U.S. Cl. 257—382** **3 Claims**




1. An integrated circuit device having a conduction channel between a source/drain region and an adjoining buried contact junction comprising:

a gate electrode on the surface of a semiconductor substrate;

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source/drain regions within said semiconductor substrate surrounding said gate electrode;

a polysilicon contact on the surface of said semiconductor substrate;

a buried contact junction underlying said polysilicon contact and adjoining one of said source/drain regions;

a glasseous material partially filling a trench in said semiconductor substrate at the junction between said buried contact junction and one of said source/drain regions; and

a heavily doped region within said semiconductor substrate surrounding said trench wherein said heavily doped region provides said conduction channel between said source/drain region and said adjoining buried contact junction.

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**5,742,089**

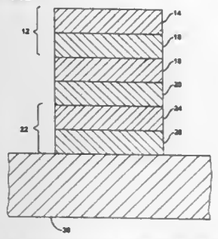
**GROWTH OF LOW DISLOCATION DENSITY HGCDTE DETECTOR STRUCTURES**

**Damodaran Rajavel, Aaoura, and Terence J. de Lyon, Newbury Park, both of Calif., assignors to Hughes Electronics, Los Angeles, Calif.**

**Filed Jun. 7, 1995, Ser. No. 484,802**

**Int. Cl.[6] H01L** *21/00;31/00*

**U.S. Cl. 257—442** **7 Claims**



1. An epitaxial structure for a detector structure comprising:

a buffer layer comprising a first Hg-based II–VI material, wherein the buffer layer is transparent at the operating frequencies:

an overlayer over the buffer layer, said overlayer comprising a detector comprising a second Hg-based II–VI material, said detector being capable of operating at one or more operating frequencies, and

further comprising a semiconductive support under the buffer layer comprising a semiconductive substrate selected from the group consisting of Si, Ge, Si/Ge, Ge/Si and $Si_aGe_{1-a}$, and

an initiation layer between the buffer layer and the semiconductive support, said initiation layer comprising a II–VI semiconductor material.

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**5,742,090**

**NARROW WIDTH TRENCHES FOR FIELD ISOLATION IN INTEGRATED CIRCUITS**

**André Stolmeijer, Santa Clara, and Farrokh Omid-Zohoor, Sunnyvale, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

**Filed Apr. 4, 1996, Ser. No. 625,814**

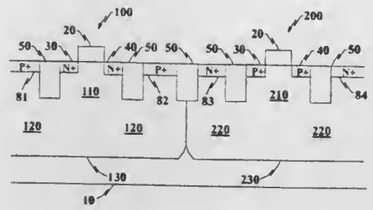
**Int. Cl.[6] H01L** *29/00;29/76;29/94*

**U.S. Cl. 257—510** **15 Claims**

1. A field effect transistor (FET) integrated circuit device comprising:

a semiconductor body of a certain impurity type and with a top surface, said body having at least a pair of FET transistors with each having a source and drain disposed in the body and each having a gate disposed on the top surface;

at least two spaced apart, narrow, substantially equally wide isolating regions of insulating material in the body and extending from the top surface into the body and separating said pair of transistors; and



a region in said body with an impurity the same type as in the body but of a greater concentration and extending from the top surface between the isolating regions.

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**5,742,091**

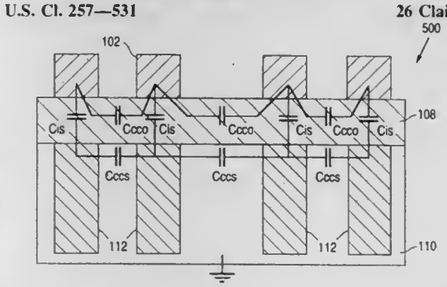
**SEMICONDUCTOR DEVICE HAVING A PASSIVE DEVICE FORMED OVER ONE OR MORE DEEP TRENCHES**

**Francois Hébert, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.**

**Continuation of Ser. No. 501,233, Jul. 12, 1995, abandoned. This application Jan. 24, 1997, Ser. No. 788,361**

**Int. Cl.[6] H01L** *29/76;29/00*

**U.S. Cl. 257—531** **26 Claims**



1. A semiconductor device within which parasitic capacitances are minimized, the semiconductor device comprising:

a substrate layer formed of a substrate material characterized by a first dielectric constant, said substrate layer including a trench portion, characterized by a trench pitch, said trench portion of said substrate layer having at least one trench formed therein and said trench portion of said substrate layer also including substrate material, said at least one trench formed in said trench portion of said substrate layer being filled with a trench fill material characterized by a second, effective, dielectric constant lower than said first dielectric constant, wherein the trench portion of said substrate layer has a surface, the surface of the trench portion including a plurality of first portions, formed of trench fill material, and a plurality of second portions, formed of substrate material;

a field layer formed on a surface of the substrate layer, including over said first portions of said surface of said trench portion of said substrate layer, formed of trench fill material, and over said second portions of said surface of said trench portion of said substrate layer, formed of substrate material; and

a passive device, characterized by a device pitch, formed on a surface of said field layer over said trench portion of said substrate layer, wherein said trench pitch is less than ½ of said device pitch.



**5,742,092**

**SEMICONDUCTOR STRUCTURES, METHODS FOR CONTROLLING THEIR CONDUCTIVITY AND SENSING ELEMENTS BASED ON THESE SEMICONDUCTOR STRUCTURE**

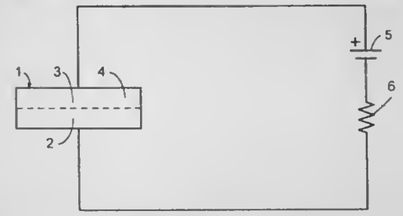
**Vladislav Dmitrievich Zotov, Ulitsa Serpukhovskoi val, 9 kv. 20; Vladimir Nikolaevich Bodrov, Ulitsa Vinnitskaya 13, kv. 84; Elena Petrovna Vinogradova, Ulitsa Bestuzhevykh 7V, kv. 20, and Anatoly Trofimovich Serov, Dmitrovskoe Shosse, 13, Korpus 3, kv. 23, all of Moscow, Russian Federation**

**Continuation of Ser. No. 158,050, Nov. 24, 1993, abandoned, which is a continuation of Ser. No. 764,919, Sep. 24, 1991, abandoned. This application Apr. 15, 1996, Ser. No. 632,771**

**Claims priority, application WIPO, Dec. 29, 1989, PCT/SU89/00340**

**Int. Cl.[6] H01L** *29/167;29/207;29/227*

**U.S. Cl. 257—610** **22 Claims**



1. A semiconductor device comprising a body of semiconductor material including first and second adjacent regions having an interface therebetween, said body being doped with a first impurity of a concentration providing said first region with an amount of first charge carriers of a first type of conductivity, the second region being doped with a second impurity of a concentration providing said second region with an amount of second charge carriers of a type of conductivity opposite said first type of conductivity, the concentrations of said first and second impurities being such that the amount of said first charge carriers in said first region is in the range of around 1 to 10 times the amount of all said second charge carriers in said second region, said body being doped with a third impurity of a concentration providing, trapping, in the absence of a current filament, at high energy levels of said third impurity, all of the first charge carriers produced by said first impurity.

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**5,742,093**

**FREQUENCY COMPENSATOR**

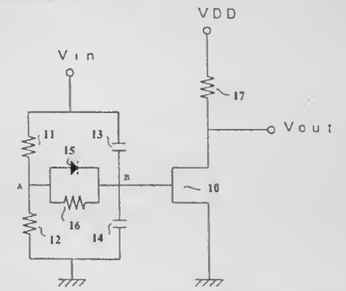
**Kazuaki Kunihiro, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jun. 27, 1996, Ser. No. 673,821**

**Claims priority, application Japan, Jun. 30, 1995, 7-188307**

**Int. Cl.[6] H01L** *29/167*

**U.S. Cl. 257—610** **7 Claims**



1. A frequency compensator provided as a stage preceding a semiconductor circuit which is subject to frequency variation due to deep level trap, comprising a first node, at which an input signal is divided by resistances, and a second node, at which the input signal is divided by capacitances, the first and second nodes being connected to each other via a diode such that the diode is biased forward when the first node is biased positively with respect to the second node, the second node being connected to the input side of the semiconductor circuit.

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**5,742,094**

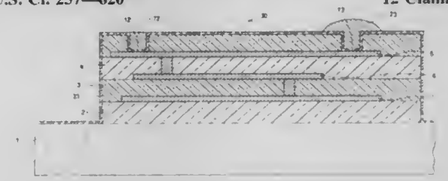
**SEALED SEMICONDUCTOR CHIP**

**Chiu H. Ting, Saratoga, Calif., assignor to Intel Corporation, Santa Clara, Calif.**

**Continuation of Ser. No. 138,956, Oct. 19, 1993, abandoned, which is a division of Ser. No. 8,469, Jan. 25, 1993, Pat. No. 5,300,461. This application Aug. 19, 1994, Ser. No. 293,120**

**Int. Cl.[6] H01L** *21/80;23/29;23/31*

**U.S. Cl. 257—620** **12 Claims**



1. A semiconductor chip comprising

a semiconductor substrate, said semiconductor substrate having a first surface;

a plurality of integrated circuit devices extending from said first surface, said integrated circuit devices being separated by a scribe lane, said scribe lane having a bottom surface and at least one side surface extending from said bottom surface to a top dielectric layer located on at least one of said integrated circuit devices, said first surface of said substrate defining said bottom surface of said scribe lane, each of said integrated circuit devices comprising at least one conductive layer and one dielectric layer, said dielectric layer including at least one bonding pad opening having a side wall extending from said conductive layer to a top surface of said integrated circuit device, said conductive layer defining a bottom surface of said bonding pad opening, said bottom surface of said bonding pad opening comprising a first portion and a second portion; and

a first protective film covering said top surface of said integrated circuit device, said side and bottom surfaces of said scribe lane, said side wall and said first portion of said bottom surface of said bonding pad opening; and

a second protective film covering said second portion of said bottom surface of said bonding pad opening and a portion of said first protective film.

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**5,742,095**

**METHOD OF FABRICATING PLANAR REGIONS IN AN INTEGRATED CIRCUIT**

**Frank Randolph Bryant, Denton, and Robert Louis Hodges, Euless, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.**

**Continuation of Ser. No. 434,472, Apr. 1, 1996, abandoned, which is a division of Ser. No. 172,636, Dec. 22, 1993, Pat. No. 5,543,343. This application Nov. 20, 1996, Ser. No. 752,749**

**Int. Cl.[6] H01L** *23/58*

**U.S. Cl. 257—647** **8 Claims**

1. A structure consisting of a portion of a semiconductor integrated circuit formed at a surface of a body, comprising:

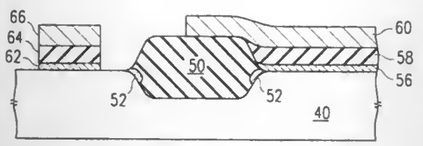
a plurality of active regions at the surface;

an isolation structure formed above the surface and into a recess of the surface between a pair of the plurality of active regions;

an undoped oxide layer disposed over at least a portion of the surface of each active regions within the pair of active regions;

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a doped first polysilicon layer disposed over the oxide layer wherein the first polysilicon layer over the oxide layer in one active region forms a gate electrode and the first polysilicon layer over the oxide layer forms an interconnect in the other active region within the pair of active regions; and wherein an upper surface of the first polysilicon layer is substantially planar with a central portion of the upper surface of the isolation structure; and

a nitride spot at an interface between the isolation structure and the surface of the body.

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**5,742,096**

**LEAD ON CHIP PACKAGE**

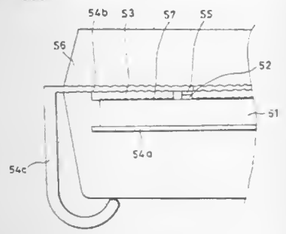
**Hee Gook Lee, Gaepo-2nd Woosung Apt. 11-605, Daechi-dong, Kangnam-ku, Seoul, Rep. of Korea**

**Filed Sep. 11, 1992, Ser. No. 943,908**

**Claims priority, application Rep. of Korea, Sep. 11, 1991, 15863/1991**

**Int. Cl.[6] H01L** *21/56*

**U.S. Cl. 257—666** **3 Claims**




1. A lead on chip package comprising:

a semiconductor chip having a plurality of bonding pads arranged in a line at the center portion of the upper surface of the semiconductor chip and a plurality of minute protrusions formed at both side portions of the upper surface;

a fluoroethylene film having a thickness of 60 micrometers to 70 micrometers formed over both side portions of the upper surface of the semiconductor chip and provided at its upper and lower surfaces with knurled surfaces;

a plurality of inner leads each directly connected to each corresponding bonding pad of the semiconductor chip so as to be electrically connected to the semiconductor chip, each of the inner leads having knurled surfaces at its upper and lower surfaces wherein the lower knurled surface of each inner lead is in contact with the upper knurled surface of the fluoroethylene film;

a package body surrounding the semiconductor chip, the insulating film and the inner leads; and

a plurality of outer leads each extending from each corresponding inner lead and connected to an external element outwardly of the package body.

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**5,742,097**

**MULTILEVEL SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE**

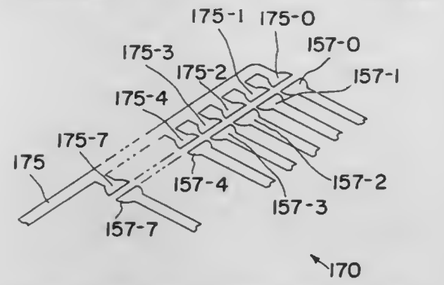
**Hayami Matsunaga; Masao Iwata, both of Hirakata; Yoshikazu Suehiro, Ikoma; Hideo Kurokawa, Hirakata, and Izumi Okamoto, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 223,517, Apr. 5, 1994, abandoned. This application Jan. 15, 1997, Ser. No. 782,302**

**Claims priority, application Japan, Apr. 5, 1993, 5-077822**

**Int. Cl.[6] H01L** *23/02*

**U.S. Cl. 257—686** **11 Claims**




1. A multilevel semiconductor integrated circuit device comprising:

a mother board on which at least one module unit part is installed, said module unit part comprising a multilayer structure in which at least three of TAB packages are stacked,

wherein each of said plurality of TAB packages comprises:

a quadrangular insulating film frame;

a plurality of inner leads extending inside said film frame;

a plurality of outer leads extending outside said film frame along at least one peripheral edge thereof and being electrically connected with said plurality of inner leads; and

a semiconductor device supported by said plurality of inner leads and being electrically connected with said plurality of inner leads,

and wherein a plurality of terminal pads are formed on said mother board for connecting to said plurality of outer leads of said plurality of TAB packages,

wherein all the terminal pads on said mother board are arranged so as to be grouped into not more than two groups, said not more than two groups including first and second terminal pad groups which form opposing edges of a quadrangular installation area, each of said plurality of terminal pads being connected in a one-to-one way to said respective outer leads.

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**5,742,098**

**SEMICONDUCTOR COMPONENT WITH PLASTIC SHEATH AND METHOD FOR PRODUCING THE SAME**

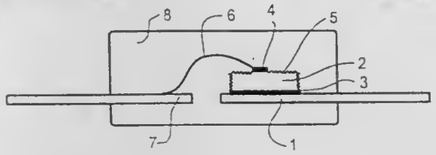
**Herbert Brunner, Rebensburg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Mar. 15, 1996, Ser. No. 616,319**

**Claims priority, application Germany, Mar. 15, 1995, 195 09 262.7**

**Int. Cl.[6] H01L** *23/04;23/28;33/00;* **H05K** *5/00*

**U.S. Cl. 257—730** **4 Claims**




1. A semiconductor component, comprising:

a light-emitting semiconductor body having a surface;



at least one contact metallizing covering at least one portion of said surface of said semiconductor body, defining at least one free portion of said surface of said semiconductor body not covered by said at least one contact metallizing;

a plastic sheath covering said semiconductor body having said at least one contact metallizing; and

said at least one free portion of said surface of said semiconductor body having a roughening forming a microscopic toothing, and said plastic sheath having a complementary microscopic toothing for interlocking with said microscopic toothing of said semiconductor body for reducing light transmission loses between said semiconductor body and said plastic sheath.

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**5,742,099**

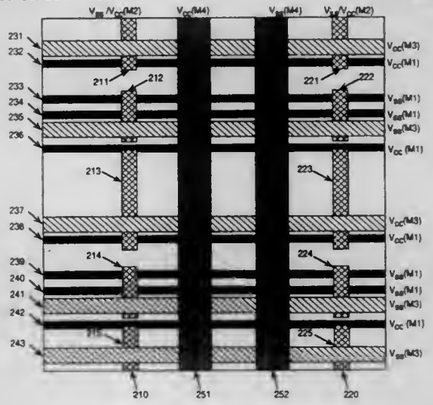
**POWER BUS FOR AN INTEGRATED CIRCUIT INCLUDING END-TO-END ARRANGED SEGMENTS PROVIDING POWER AND GROUND**

**Goutam Debnath, and Kelly Fitzpatrick, both of Beaverton, Oreg., assignors to Intel Corporation, Santa Clara, Calif.**

**Continuation of Ser. No. 314,765, Sep. 29, 1994, abandoned. This application Mar. 19, 1997, Ser. No. 821,707**

**Int. Cl.[6] H01L** *23/48*

**U.S. Cl. 257—758** **12 Claims**




1. An integrated circuit comprising:

a substrate;

a first insulative layer disposed on said substrate;

a first conductive layer disposed on said first insulative layer,

said first conductive layer having first and second power supply tracks, the first power supply track providing a power connection, and the second power supply track providing a ground connection, to cells in said integrated circuit,

a second insulative layer disposed on said first conductive layer; and

a second conductive layer disposed on said second insulative layer, said second conductive layer having:

a third power supply track divided into power and ground segments, the power segment of the third power supply track providing a power connection and being coupled to the first power supply track, and the ground segment of the third power supply track providing a ground connection and being coupled to the second power supply track; and

a fourth power supply track divided into power and ground segments;

a third insulative layer disposed on said second conductive layer; and

a third conductive layer disposed on said third insulative layer, said third conductive layer providing an interconnection between said power segments and between said ground segments of said third and fourth power supply tracks, said interconnection provided by tracks in said third conductive layer.

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**5,742,100**

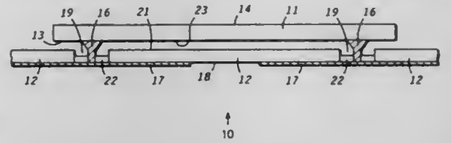
**STRUCTURE HAVING FLIP-CHIP CONNECTED SUBSTRATES**

**Jack A. Schroeder, and Conrad S. Monroe, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 27, 1995, Ser. No. 411,355**

**Int. Cl.[6] H01L** *23/48;23/52*

**U.S. Cl. 257—778** **13 Claims**




1. An electronic component comprising: an electrically insulating substrate having a via extending from a first side of the electrically insulating substrate to a second side of the electrically insulating substrate; a conductive element covering a portion of the second side of the electrically insulating substrate and covering at least part of the via over the second side of the electrically insulating substrate wherein the conductive element is comprised of copper and wherein the conductive element non-planar with the second side of the electrically insulating substrate; another substrate containing a conductive bump located in the via and electrically coupled to the conductive element; and a filler material in the via wherein the electronic component is devoid of a leadframe.

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**5,742,101**

**SEMICONDUCTOR DEVICE**

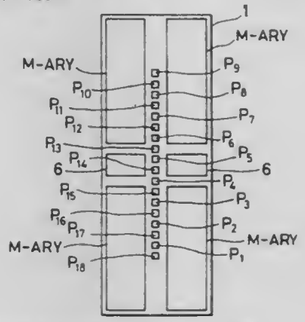
**Toshiyuki Sakuta, Hamura-machi; Kazuyuki Miyazawa, Iruma; Satoshi Oguchi, Ohme; Aizo Kaneda, Yokohama; Masao Mitani, Yokohama; Shozo Nakamura, Yokohama; Kunihiko Nishi, Kokubunji, and Gen Murakami, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Division of Ser. No. 329,824, Oct. 27, 1994, Pat. No. 5,514,905, which is a division of Ser. No. 000,125, Jan. 4, 1993, Pat. No. 5,365,113, which is a continuation of Ser. No. 640,584, Jan. 14, 1991, Pat. No. 5,184,208, which is a continuation of Ser. No. 212,485, Jun. 28, 1988, abandoned. This application Jun. 2, 1995, Ser. No. 458,166**

**Claims priority, application Japan, Jun. 30, 1987, 62-161333; Sep. 17, 1987, 62-234654**

**Int. Cl.[6] H01L** *23/48;29/46;23/02*

**U.S. Cl. 257—786** **25 Claims**




1. A semiconductor memory device comprising:

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a semiconductor chip having a rectangular shaped main surface including a first pair of edges and a second, relatively shorter pair of edges;

a plurality of bonding pads formed on said rectangular shaped main surface of said semiconductor chip and arranged in a direction substantially parallel to the first edges of said rectangular shaped main surface;

first memory cell array regions and second memory cell array regions formed on said rectangular shaped main surface of said semiconductor chip, respectively, said first memory cell array regions being arranged between said plurality of bonding pads and one of said first pair of edges of said rectangular shaped main surface and extending in a direction of the first edges of said rectangular shaped main surface, and said second memory cell array regions being arranged between said plurality of bonding pads and the other of said first pair of edges of said rectangular shaped main surface and extending in a direction of the first edges of said rectangular shaped main surface;

first and second peripheral circuit regions formed on said rectangular shaped main surface of said semiconductor chip, said first peripheral circuit region being arranged between said first memory cell array regions, and said second peripheral circuit region being arranged between said second memory cell array regions;

a plurality of leads formed over said rectangular shaped main surface of said semiconductor chip, each of said plurality of leads being extended in an outwardly direction via one of said first pair of edges of said rectangular shaped main surface, and said plurality of leads being electrically connected with said plurality of bonding pads; and

a resin sealing said semiconductor chip.

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**5,742,102**

**Patent Not Issued For This Number**

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**5,742,103**

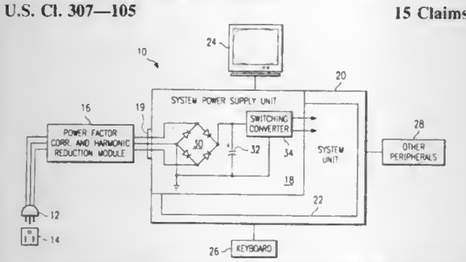
**EXTERNAL LINE HARMONICS REDUCTION MODULE FOR POWER SUPPLIES**

**Gerard Ashok, Austin, Tex., assignor to Dell U.S.A., L.P., Austin, Tex.**

**Continuation of Ser. No. 549,040, Oct. 27, 1995, abandoned. This application Aug. 8, 1997, Ser. No. 908,885**

**Int. Cl.[6] H02J** *3/01*

**U.S. Cl. 307—105** **15 Claims**




1. An electronic equipment system supplied from an AC power source line comprising:

a system unit including a switching power supply having an AC power receptacle, a rectifier, a capacitor and switching circuitry;

a line harmonics reduction module connected externally of said system unit and directly to said AC power receptacle via a plug mounted on an external wall of said module, said module comprising a circuit including an inductor, the module being in series with the rectifier, capacitor and switching circuitry of the power supply and adapted to improve the power factor of said system unit by reducing the amplitudes of current components at harmonics of said power source line frequency; and

an AC power cord connectable between said AC power source line and said module for providing AC power to said system unit through said AC power receptacle via said module.

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**5,742,104**

**MAIN OPERATED ELECTRIC FENCE ENERGIZER**

**Lars-Arne Eriksson, Sundsvall, and Göran Karl-Olov Karlsson, Enhörna, both of Sweden, assignors to Alfa Laval Agri AB, Tumba, Sweden**

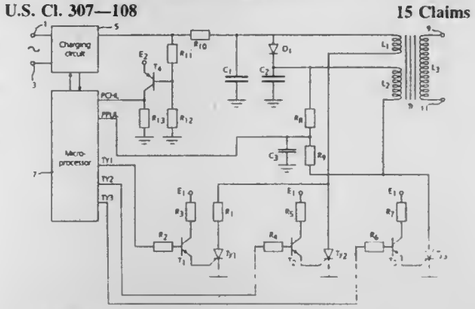
**PCT No. PCT/SE94/01269, § 371 Date Aug. 22, 1996, § 102(e) Date Aug. 22, 1996, PCT Pub. No. WO95/18520, PCT Pub. Date Jul. 6, 1995**

**PCT Filed Dec. 29, 1994, Ser. No. 663,110**

**Claims priority, application Sweden, Dec. 29, 1993, 9304343**

**Int. Cl.[6] G08B** *13/26*

**U.S. Cl. 307—108** **15 Claims**




1. An electric fence energizer comprising:

a first storage capacitor;

a charging circuit connected to an alternating voltage and the first storage capacitor for charging the storage capacitor to a high voltage;

a transformer being subject to a load and having a first primary winding and a secondary winding, the primary winding being connected to the first storage capacitor and the secondary winding being connectable to an electric fence;

a discharge circuit for the first storage capacitor which is arranged to periodically discharge the first storage capacitor through its connected primary winding for generating discharge pulses supplied from the secondary winding of the transformer to a connected electric fence; and

a sense circuit for sensing the load on the transformer from a connected electric fence and for providing a signal representing the load, the transformer having a second separate primary winding connected to the sense circuit via a sense line,

the sense circuit including means for sensing the instantaneous magnitude of the voltage induced in the second primary winding at a selected time during a discharge of the first storage capacitor.

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**5,742,105**

**TRICKLE POWER SUPPLY**

**David Allen Lech, Hoffman Estates, Ill., assignor to Molex Incorporated, Lisle, Ill.**

**Filed Mar. 5, 1996, Ser. No. 611,228**

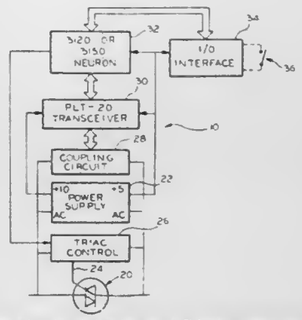
**Int. Cl.[6] H01H** *47/00*

**U.S. Cl. 307—125** **13 Claims**

1. A switch circuit for selectively supplying power to a load from a source of AC power including a hot line and a neutral line, the neutral line being connected directly to the load, the switch circuit comprising:

a controlled switch connected between the hot line and the load;






a power supply circuit having an AC input connected across the controlled switch and including means for converting AC power at the AC input to DC power;

input-means for determining the operating status of the load; and

a control circuit powered by DC power from the power supply circuit and connected to the input means and the controlled switch, the control circuit controlling switching of the controlled switch to maintain the operating status of the load determined by the input means, the control circuit including means for limiting conduction time of the controlled switch during each AC operating cycle to provide sufficient AC power across the switch to power the power supply circuit.

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**5,742,106**

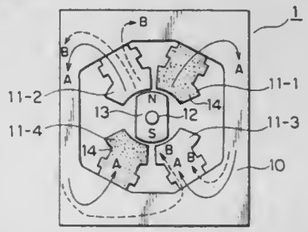
**THERMO-SENSITIVE ACTUATOR AND IDLE SPEED CONTROLLER EMPLOYING THE SAME**

**Tetsuo Muraji, Kanagawa, Japan, assignor to Mikuni Corporation, Tokyo, Japan**

**Filed Aug. 28, 1995, Ser. No. 519,874**

**Int. Cl.[6] H02K** *33/02*

**U.S. Cl. 310—36** **19 Claims**




1. A thermo-sensitive actuator having a stator made of magnetic material to form a yoke, a rotor rotatably provided in an opening provided in said stator, pole pieces for magnetically connecting said stator and rotor, and at least one magnetic source disposed in any of said constituent elements, said thermo-sensitive actuator comprising:

a thermo-sensitive magnetic material which shows a change in magnetic characteristics according to temperature, said thermo-sensitive magnetic material being provided in a part of a magnetic path,

wherein said rotor is a permanent magnet, said pole pieces being disposed so that an air gap between each of a first pair of opposing pole pieces and said rotor is unbalanced with an air gap between each of a second pair of opposing pole pieces, and said thermo-sensitive magnetic material being interposed in a magnetic path of said stator which lies between each of said first pair of pole pieces and one of said second pair of pole pieces which is adjacent to it on one side thereof.

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**5,742,107**

**ROTARY COOLING FAN**

**Yoshihito Asao, and Katsumi Adachi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 21, 1994, Ser. No. 360,454**

**Claims priority, application Japan, Dec. 28, 1993, 5-335955**

**Int. Cl.[6] H02K** *9/04;9/06;* **B63H** *3/00;1/06*

**U.S. Cl. 310—62** **12 Claims**



1. A rotary fan, comprising:

a rotatable base plate;

a plurality of fan blades mounted rotatably on said base plate at a peripheral portion thereof by means of supporting studs; and

a blade angle adjusting mechanism mounted in association with each of said fan blades for allowing said fan blade to rotate pivotally about said supporting stud under a centrifugal force acting on said fan blade such that the rate of increase of said air quantity produced by said fan blade decreases as a rotation number of said rotatable base plate increases in a predetermined high-speed rotation range of said base plate, while in other rotation speed range outside of said high-speed rotation range, said blade angle adjusting mechanism acts to suppress the rotation of said fan blade around said supporting stud;

wherein said blade angle adjusting mechanism includes:

urging means for urging said fan blade in opposite direction to said centrifugal force applied to said fan blade;

first stopper means for limiting the rotation of said fan blade under the urging force of said urging means; and

second stopper means for limiting the rotation of said fan blade taking place under the centrifugal force applied to said fan blade;

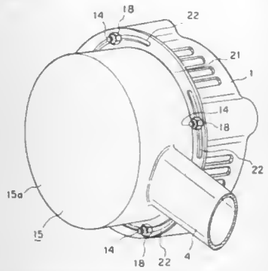
wherein a discharge angle defined by an angle formed between a straight line extending between an outermost peripheral point on a side surface of said fan blade located at a front side as viewed in a direction of the rotation of said rotatable base plate and a center thereof and a line extending tangentially to said outermost peripheral point is regulated in dependence on rotation number of said rotatable base plate within said predetermined high-speed rotation range; and

wherein said urging means includes a torsion coil housed inside said fan blade and mounted around said supporting stud and having one end secured to said fan blade and the other end secured to one of said first and second stoppers formed in said rotatable base plate for limiting the rotation of said fan blade.

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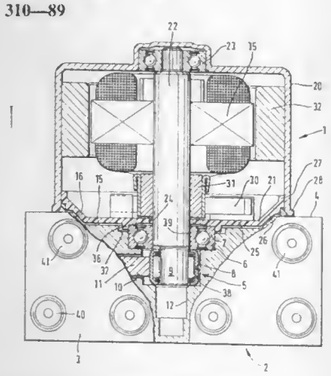
5,742,108
**VEHICLE GENERATOR HAVING DUCT COVER**
**Masaru Kuribayashi, and Katsumi Adachi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Nov. 18, 1994, Ser. No. 344,598**
**Claims priority, application Japan, May 6, 1994, 6-094357**
**Int. Cl.[6] H02K** *11/00*
**U.S. Cl. 310—89** **8 Claims**



1. A vehicle generator having a duct cover to cool a generator body by introducing outside air through a duct into an engine room, said duct cover being disposed between a bracket end, covering one side surface of said generator body, and said duct, wherein one of said duct cover and said duct is attached to said bracket end and adjustably rotatable in a circumferential direction of said bracket end.

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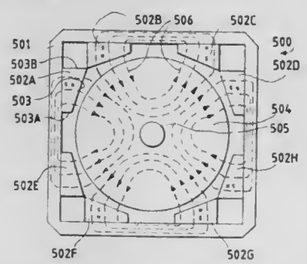
5,742,109
**ELECTRIC MOTOR, PUMP AND AN ELECTRIC MOTOR/PUMP SYSTEM**
**Peter Volz, Darmstadt; Hans-Dieter Reinartz, Frankfurt am Main, and Dieter Dinkel, Eppstein/Ts., all of Germany, assignors to ITT Automotive Europe GmbH, Germany**
**PCT No. PCT/EP95/03715, § 371 Date Jul. 10, 1996, § 102(e) Date Jul. 10, 1996, PCT Pub. No. WO96/09682, PCT Pub. Date Mar. 28, 1996**
**PCT Filed Sep. 21, 1995, Ser. No. 649,642**
**Claims priority, application Germany, Sep. 23, 1994, 44 33 972.0**
**Int. Cl.[6] H02K** *5/04;5/22*
**U.S. Cl. 310—89** **5 Claims**



1. Electric motor for a pump, comprising:
a pot-shaped housing,
a shaft located in the housing,
a plate sealing off an open end of the housing,
wherein the plate includes a collar portion having a passage through which extends the shaft, said collar surrounding the outer edge of the plate, onto which the housing is located,
wherein the plate further includes a flat base portion in whose center there is a passage for the shaft, and also includes of an edge portion that protrudes at a slant outward from the base portion and at whose outer edge the collar is formed, wherein the inner side of the plate, brushes are provided which contact a collector at the shaft, with the diameter of the base plate being larger than the region filled by the brushes in a radial direction.

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5,742,110
**DC MOTOR MAGNETIC CIRCUIT CONFIGURATION WITH HIGH FLUX DENSITY**
**Steven P. Hefner, Niles, Ill., assignor to MPC Products Corporation, Niles, Ill.**
**Filed Aug. 25, 1995, Ser. No. 519,202**
**Int. Cl.[6] H02K** *21/26;21/28*
**U.S. Cl. 310—154** **4 Claims**



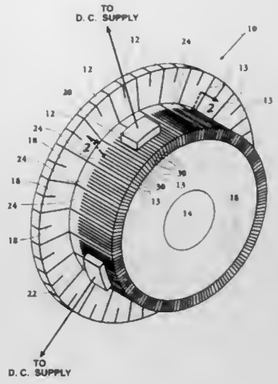

4. A permanent magnet DC motor comprising:
a rectangular stator frame;
a rotor rotatably accommodated within the stator frame;
a plurality of pole pieces arranged as four pairs of pole pieces, with one pair of pole pieces disposed in each corner of the stator frame;
each pair of pole pieces including first and second orthogonally mounted pole pieces, each pole piece having interior and exterior sidewalls defining a planar pole face therebetween, with an exterior edge defined by the intersection of the pole face with the exterior sidewall and an interior edge defined by the intersection of the pole face with the interior sidewall;
each pole face lying in a plane that intersects both isotropic and anisotropic planes of the pole piece; and
each pole piece being mounted such that the interior edge is a first distance from the rotor and the exterior edge is a second distance from the rotor, with the first distance being greater than the second distance.

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5,742,111
**D.C. ELECTRIC MOTOR**
**Troy Gene Reed, Tulsa, Okla., assignor to Surge Power Corporation, Tulsa, Okla.**
**Filed Jan. 18, 1996, Ser. No. 588,342**
**Int. Cl.[6] H02K** *13/00*
**U.S. Cl. 310—236** **4 Claims**

1. In a d.c. motor, energizable by a d.c. electrical source having,
a cylindrical stator with field magnets;
a rotor;
armature coils;
a commutator connected to said rotor for switching a d.c. source to each armature coil in timed synchronism with the rotation of said rotor, said commutator having a cylindrical contact surface comprised of a plurality of insulatively separated segments, each segment electrically connected to an armature coil;
a plurality of fixed d.c. conductive brushes in conductive contact with said contact surface;
the improvement comprising a plurality of slots extending partially in a radial direction in said contact surface of each segment.



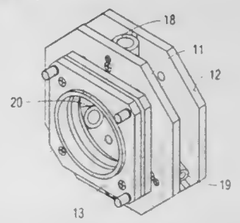



5,742,112

**Patent Not Issued For This Number**

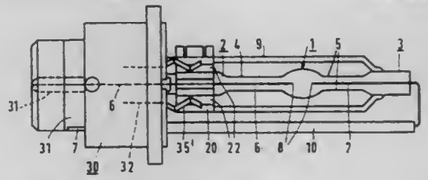
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5,742,113
**DEVICE FOR TILT-FREE TRANSLATION OF ONE PLATE RELATIVE TO A REFERENCE PLATE**
**Bryan E. Loucks, Altos Hills, Calif., assignor to K Laser Technology, Inc., Hsinchu, Taiwan**
**Filed May 7, 1996, Ser. No. 646,048**
**Int. Cl.[6] H02N** *2/00;* **H01L** *41/08*
**U.S. Cl. 310—328** **8 Claims**



1. A device for precision displacement of a second plate with respect to a first plate, said device comprising said first and second plates, said plates being arranged in parallel spaced-apart planes with a common central axis, said device also including first, second and third tubular flexure assemblies, said flexure assemblies being sandwiched between said first and second plates and arranged symmetrically therebetween, each of said flexure assemblies including therein signal responsive elements aligned along the diameter thereof and being capable of expansion or contraction in response to said signal, said device also including signal generating means responsive to operator input for applying like voltage signals to said elements for producing like expansion or contraction of the diameters of said flexure assemblies controllably.

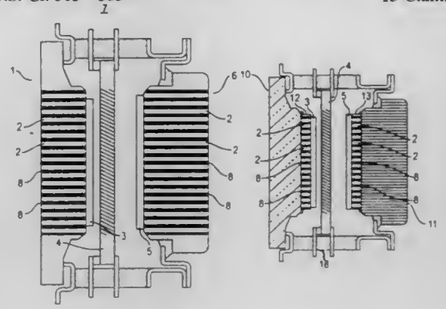
5,742,114
**LAMP ENVELOPE WITH A METAL CLAMPING MEMBER AND A FIXATION MEMBER**
**Hans J. Kohl; Ralf Schäfer, both of Aachen; Manfred Westemeyer, Aldenhoven, all of Germany, and Cornelis J. Janson, Breda, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**
**Filed May 2, 1996, Ser. No. 642,011**
**Claims priority, application European Pat. Off., May 3, 1995, 95201150**
**Int. Cl.[6] H01J** *5/48*
**U.S. Cl. 313—318.01** **20 Claims**



1. A capped electric lamp comprising:
a quartz glass lamp vessel which is closed in a vacuumtight manner and which has a mutually opposed first and second neck-shaped portion each with a seal through which a respective current condcutor is passed to an electric element arranged in the lamp vessel;
a glass envelope around the lamp vessel and fastened to the first neck-shaped portion thereof;
a metal clamping member provided with a clamping zone with which it clamps around said envelope;
a lamp cap provided with electric contacts and with a metal fixation member which is welded to the clamping member, the electric contacts being connected to respective current conductors;
said clamping member comprising a welding zone which lies clear of the envelope and to which the fixation member is fixed by welding;
wherein the clamping member has welding regions distributed over its circumference in the clamping zone, which regions clear the clamped-in envelope and in which regions the fixation member is fixed by welding.

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5,742,115
**COLOR IMAGE INTENSIFIER DEVICE AND METHOD FOR PRODUCING SAME**
**Michael Gertsenshteyn, Jerusalem, Israel, assignor to Orlil Ltd., Kazrin, Israel**
**Filed Jun. 14, 1996, Ser. No. 663,698**
**Claims priority, application Israel, Jun. 15, 1995, 114181**
**Int. Cl.[6] H01J** *40/16;31/50*
**U.S. Cl. 313—365** **13 Claims**



1. A color image intensifier device for producing a colored output image, comprising:

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(a) an evacuated envelope having an input window for receiving incident light from the environment into said image intensifier and an output window through which an output image is projected from said intensifier;

(b) input filter located and integrated at the input window having means incorporated in said input window for filtering said incident light, a first portion of said input filter having means for passing red light, a second portion having means for passing green light and a third portion having means for passing blue light, said means for filtering the incident light, each subdivided into a plurality of input filter coloring elements interspersed and distributed in a multi-beam structure as an integral part of said input window;

(c) output filter located and integrated at the output window having means incorporated in said output window output filter having means for providing red light, a second portion having means for providing green light and a third portion having means for providing blue light, said means for providing red, green and blue light each subdivided into a plurality of input filter coloring elements interspersed and distributed in a multi-beam structure as an integral part of the output window, the output filter and input filter being stationary with respect to the intensifier when producing the output image and having a spacial alignment relative to each other, the input filter coloring elements of said first, second and third portions having an approximate one-to-one correspondence with the output filter coloring elements of the said first, second and third portions respectively, so that incident light passing through the the first, second and third portions of the input filter means generates an output signal from said intensifier which is colorized by said first, second and third portions, respectively, of the output filter means to represent the coloring of the the incident light, wherein the means for filtering the incident light and coloring the output image—are coloring elements of the input and the output filters colorized by doping glass beams distributed in the said multi-beam structure incorporated in the input and output windows, said colored glass beams being colorized core glass beams means—having higher coefficient of refraction being surrounded by clad glass means with lesser coefficient of refraction, and wherein the said colored core glass beam elements of the input filter and the output filters being one of the structural constituent part forming of the input and the output windows, and the surrounded clad glass being second structural integral part of the input and the output windows, comprising the solid glass input and output windows, constituting the end caps of said intensifier, and the input and the output windows being matched pairs means—having an identical position and orientation of said coloring elements of said input and said output filters within said matched pairs of said input and said output windows means—said input filter colorized core glass beam elements of the first, second and third portions of the input filter means having a precise one-to-one correspondence with the output filter colorized core glass beam elements of said first, second and third portions respectively;

(d) a photocathode deposited upon the interior surface of the envelope of the input window for converting the incident light passing through the input window—into a photoelectron signal, and having amplifying—means for amplifying the photoelectron signal and reconverting means for converting the amplified signal into a visible light output image, and the said reconverting means being a phosphor layer deposited upon an interior surface of the envelope of the output window and the phosphor layer emitting several wavelength of light in the visible region when struck by said amplified signal, said light of several wavelength approximating white light and propagating through the coloring elements of the output filter, and the output image being colorized.

**5,742,116**

## SHADOW MASK FRAME STRUCTURE WITH LONG-SIDES HAVING HIGHER MECHANICAL STRENGTH

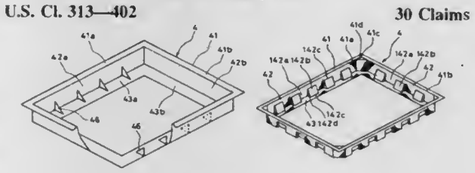
**Hideaki Maki; Jun Araya; Mayumi Ishihashi, all of Osaka, and Takami Okamoto, Kyoto, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan**

**Filed Oct. 24, 1995, Ser. No. 547,306**

**Claims priority, application Japan, Oct. 28, 1994, 6-265081; Oct. 31, 1994, 6-267007**

**Int. Cl.[6] H01J** *29/81*

**U.S. Cl. 313—402** **30 Claims**



1. A color cathode ray tube apparatus comprising a funnel, a panel, a phosphor screen disposed inside of said panel, a shadow mask disposed in the vicinity of said phosphor screen, a frame on which said shadow mask is fixed and an electron gun disposed in a neck part of said funnel, and wherein

said frame has a shadow mask welding face which has a substantially rectangular shape defined by opposed pairs of longer and shorter sides, side walls which are continuously formed along an inner periphery of said shadow mask welding face and are substantially perpendicular to said shadow mask welding face, and a flange face which is formed along said side walls and is substantially parallel to said shadow mask welding face;

said shadow mask is fixed on the longer sides and shorter sides of said shadow mask welding face of said frame by welding under a condition that a predetermined tension is applied to said shadow mask; and

a mechanical strength of the longer sides of said frame is higher than that of the shorter sides of said frame.

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**5,742,117**

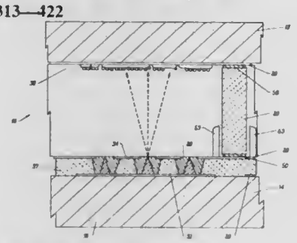
## METALLIZED HIGH VOLTAGE SPACERS

**Christopher J. Spindt, Menlo Park, and David L. Morris, San Jose, both of Calif., assignors to Candescent Technologies Corporation**

**Continuation-in-part of Ser. No. 188,857, Jan. 31, 1994, abandoned, which is a continuation-in-part of Ser. No. 12,542, Feb. 1, 1993, Pat. No. 5,589,731, which is a continuation-in-part of Ser. No. 867,044, Apr. 10, 1992, Pat. No. 5,424,605. This application Oct. 3, 1994, Ser. No. 317,299**

**Int. Cl.[6] H01J** *19/44*

**U.S. Cl. 313—422** **33 Claims**



1. A flat panel apparatus, comprising:

a faceplate including a faceplate interior side;

a backplate including a backplate interior side in an opposing relationship to the faceplate interior side;

envelope sidewalls positioned between the faceplate and backplate to form an enclosed sealed envelope between the envelope sidewalls, backplate interior side and the faceplate interior side;



a resistive spacer, or an insulating spacer with a resistive coating on an exterior of the insulating spacer, positioned in the envelope including a spacer backplate face with a periphery positioned adjacent to the backplate interior side, and a spacer faceplate face with a periphery positioned adjacent to the faceplate interior face;

a first conductive layer that extends across substantially the entire spacer backplate face to the backplate face periphery; and

a second conductive layer that extends across substantially the entire spacer faceplate face to the faceplate face periphery.

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**5,742,118**

## ULTRAFINE PARTICLE FILM, PROCESS FOR PRODUCING THE SAME, TRANSPARENT PLATE AND IMAGE DISPLAY PLATE

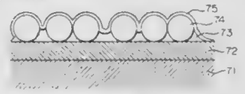
**Yoshishige Endo, Tsuchiura; Masahiko Ono, Ibaraki-ken; Hiromitsu Kawamura, Mobara; Katsumi Kobara, Mobara; Yoshifumi Tomita, Mobara; Masahiro Miyazaki, Mobara; Takao Kawamura, Chiba; Toshihiro Yamada, Ibaraki-ken; Toshiaki Kawabata, Tokyo, and Takeshi Araya, Higashikurume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 855,055, Mar. 19, 1992, abandoned, and a continuation-in-part of Ser. No. 977,250, Nov. 16, 1992, Pat. No. 5,396,148, and a continuation-in-part of Ser. No. 62,747, May 18, 1993, and a continuation-in-part of Ser. No. 404,553, Sep. 8, 1989, Pat. No. 5,189,337. This application Apr. 20, 1994, Ser. No. 230,252**

**Claims priority, application Japan, Sep. 9, 1988, 63-224658; Mar. 19, 1991, 3-054371; May 18, 1992, 4-124502; Apr. 20, 1993, 5-092651; Jun. 30, 1993, 5-162420**

**Int. Cl.[6] C09K** *3/16;* **B32B** *18/00;* **H01J** *29/88*

**U.S. Cl. 313—479** **15 Claims**



1. A transparent plate comprising a transparent substrate, an antistatic layer comprising electrically conductive ultrafine particles formed on said substrate, an anti-reflective layer comprising visible light anti-reflection ultrafine particles arranged in a single layer on said antistatic layer of electrically conductive ultrafine particles and having a surface exhibiting consistent unevenness with a depth of 20–100 nm, and a monomolecular layer of a water repellant agent formed on said anti-reflective layer of visible light anti-reflection ultrafine particles.

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**5,742,119**

## CATHODE RAY TUBE COMPRISING A DISPLAY SCREEN HAVING AN ELECTROCONDUCTIVE COATING

**Gerardus V. A. Aben, and Leo H. M. Krings, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

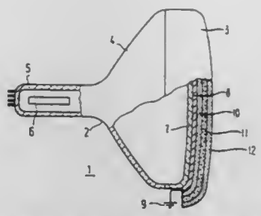
**Filed Aug. 8, 1995, Ser. No. 512,424**

**Claims priority, application European Pat. Off., Aug. 8, 1994, 94202280**

**Int. Cl.[6] H01J** *31/00*

**U.S. Cl. 313—479** **7 Claims**

1. A cathode ray tube comprising a display screen having an electroconductive coating which contains poly-3,4-ethylene dioxythiophene, characterized in that the coating has a layer thickness of maximally 100 nm and a sheet resistance of less than 3 kΩ/□.



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**5,742,120**

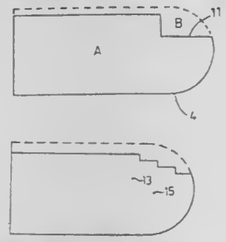
## LIGHT-EMMITING DIODE LAMP WITH DIRECTIONAL COVERAGE FOR THE EMMITTED LIGHT

**Li-Yu Lin, Taipei, Taiwan, assignor to Rebif Corporation, Taipei, Taiwan**

**Filed May 10, 1996, Ser. No. 644,274**

**Int. Cl.[6] H01L** *23/13;* **H05B** *33/02*

**U.S. Cl. 313—512** **3 Claims**



1. An LED lamp, comprising:

(a) an LED; and

(b) a transparent housing for accommodating said LED, said transparent housing being formed with a substantially semi-convex top formed with at least a total reflection plane;

wherein said LED is placed at a specific position which allows part of the emitted light of said LED to be totally reflected from said total reflection plane, and

wherein said substantially semi-convex top is formed with a plurality of stair-like total reflection planes.

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**5,742,121**

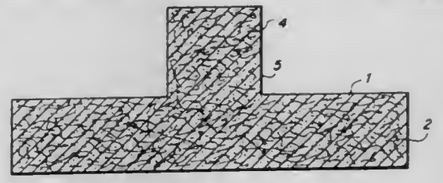
## THIN-FILM EDGE FIELD EMITTER DEVICE AND METHOD OF MANUFACTURE THEREFOR

**David S. Y. Hsu, and Henry F. Gray, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Division of Ser. No. 321,642, Oct. 11, 1994, Pat. No. 5,584,740, which is a continuation of Ser. No. 40,944, Mar. 31, 1993, Pat. No. 5,382,185. This application Jun. 5, 1996, Ser. No. 658,296**

**Int. Cl.[6] H01J** *1/62;63/04;1/02;1/16*

**U.S. Cl. 313—512** **22 Claims**



1. A thin-film edge field emitter device comprising:

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(a) a substrate having a first portion and having a protuberance extending from said first portion, said protuberance defining at least one side-wall, said side-wall constituting a second portion;

(b) at least one emitter layer disposed on said substrate including said second portion, wherein said at least one emitter layer is selected from the group consisting of semiconductors and conductors and comprises a thin-film including a portion extending beyond said second portion and defining an exposed emitter edge; and

(c) a pair of supportive layers disposed on opposite sides of said at least one emitter layer, said pair of supportive layers each being selected from the group consisting of semiconductors and conductors and each having a higher work function than said at least one emitter layer.

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**5,742,122**

## SURFACE DISCHARGE TYPE PLASMA DISPLAY PANEL

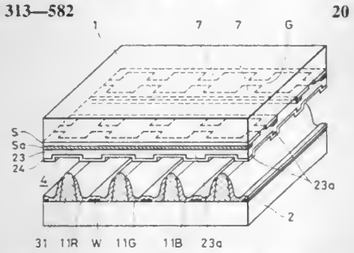
**Kimio Amemiya; Yukio Tanaka, and Hitoshi Teshirogi, all of Koufu, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Mar. 12, 1996, Ser. No. 614,274**

**Claims priority, application Japan, Mar. 15, 1995, 7-055618**

**Int. Cl.[6] H01J** *17/49;1/62*

**U.S. Cl. 313—582** **20 Claims**




1. A surface discharge type plasma display panel comprising:

a pair of first and second substrates spaced parallel to each other and sandwiching a discharge gas space;

a plurality of pairs of row electrodes extending horizontally and being arranged on an internal surface of said first substrate;

each pair of row electrodes including:

a pair of transparent electrodes disposed apart from each other to form a discharge gap, and arranged to extend in a horizontal direction; and

a pair of bus electrodes respectively formed on or beneath far ends of said transparent electrodes from said discharge gap, and each bus electrode of said pair of bus electrodes having an area smaller that of the transparent electrode;

a dielectric layer formed on the internal surface of said first substrate and said plurality of pairs of row electrodes;

a plurality of column electrodes extending vertically and arranged on an internal surface of said second substrates; and

a plurality of barrier ribs extending vertically and being formed at least between said column electrodes on the internal surface of said second substrate to define a plurality of emission regions in said discharge gas space;

wherein said dielectric layer comprises protruding portions each being disposed on a respective one of said bus electrodes overlapped on a respective one of said transparent electrodes, being arranged in the vertical direction, and each having a thickness on said respective one of said bus electrodes being larger than a thickness on other portions of said dielectric layer located on said respective one of said transparent electrodes and between the bus electrodes.

**5,742,123**

## SEALING STRUCTURE FOR LIGHT-EMITTING BULB ASSEMBLY AND METHOD OF MANUFACTURING SAME

**Hiroyuki Nagayama, Fukuoka, Japan, assignor to Toto Ltd., Fukuoka, Japan**

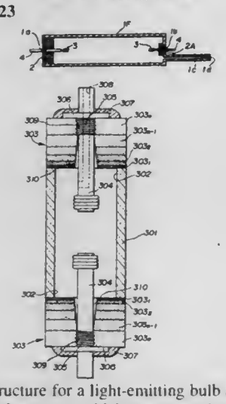
**Continuation of Ser. No. 370,310, Jan. 9, 1995, abandoned.**

**This application Jun. 5, 1997, Ser. No. 869,877**

**Claims priority, application Japan, Jul. 9, 1992, 4-206092; Nov. 9, 1992, 4-323676; Jan. 25, 1993, 5-028682**

**Int. Cl.[6] H01J** *5/04*

**U.S. Cl. 313—623** **37 Claims**




1. A sealing structure for a light-emitting bulb assembly, including a closure, having a core which serves an electrode, for sealing an open end of a bulb, said closure including a bulb-side region disposed adjacent to the open end of said bulb and made of a compositional ingredient having a coefficient of thermal expansion which is substantially the same as that of the bulb, a core-side region disposed adjacent to said core and made of a compositional ingredient having a coefficient of thermal expansion which is substantially the same as that of the core, and an intermediate region disposed between said bulb-side region and said core-side region and made of a compositional ingredient having compositional proportions adjusted such that a coefficient of thermal expansion thereof is gradually increased from the coefficient of thermal expansion of said bulb-side region toward the coefficient of thermal expansion of said core-side region; and

said bulb-side region and said core-region are separated from each other by said intermediate region and comprise a bulb-side region layer and a core-side layer, respectively, which are independent of each other, and wherein said intermediate region comprises at least one layer whose coefficient of thermal expansion varies gradually from said bulb-side region toward said core-side region and whose electrical conductivity gradually increases from said bulb-side region toward said core-side region.

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**5,742,124**

## HIGH-PRESSURE DISCHARGE LAMP

**Antonie H. M. Kees, Uden; Martinus J. M. Kessels, Eindhoven, both of Netherlands, and Fransiscus H. Van Lierop, Bath, N.Y., assignors to U.S. Phillips Corporation, New York, N.Y.**

**Filed Mar. 11, 1996, Ser. No. 613,934**

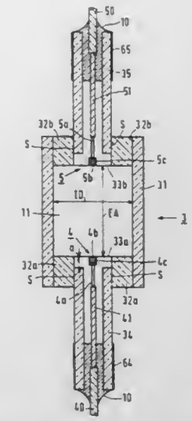
**Claims priority, application European Pat. Off., Mar. 9, 1995, 95200576**

**Int. Cl.[6] H01J** *17/16*

**U.S. Cl. 313—625** **19 Claims**

1. A high-pressure discharge lamp which comprises a discharge vessel enclosing a discharge space, having a ceramic wall and a projecting ceramic plug, the discharge vessel being sealed at one end by means of said projecting ceramic plug which encloses with clearance a current lead-through to an electrode arranged in the discharge vessel and is connected to said lead-through in a gastight manner by means of a melting-ceramic connection at an end facing away from the discharge space, characterized in that: the projecting ceramic plug comprising means for rendering at least an end portion of the projecting ceramic plug adjacent the end facing away from the discharge space impermeable to light.






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**5,742,125**

## HIGH-PRESSURE DISCHARGE LAMP WITH TORSIONALLY WOUND ELECTRODE STRUCTURE

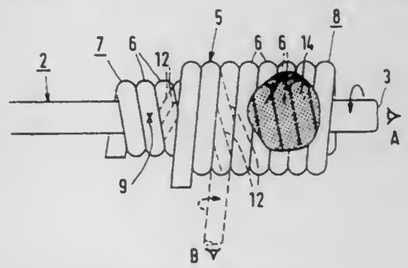
**Jacobus L. J. Ruigrok, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Oct. 31, 1996, Ser. No. 742,054**

**Claims priority, application European Pat. Off., Nov. 2, 1995, 95202963**

**Int. Cl.[6] H01J** *61/06;61/073*

**U.S. Cl. 313—628** **4 Claims**




1. A high-pressure discharge lamp comprising:

a lamp vessel which is closed in a vacuumtight manner and which contains an ionizable filling;

a pair of heat-resistant electrodes each with a tip in the lamp vessel and each connected to a respective current conductor which issues from the lamp vessel to the exterior.

a winding of turns of heat-resistant metal wire being present around a free-end portion of each electrode, said winding fixed in a location remote from the electrode tip, said turns having a winding direction.

wherein the turns are made with torsion in the metal wire, said torsion having a direction opposed to the winding direction of the turns, such that adjoining turns press against one another.

**5,742,126**

## HIGH-PRESSURE DISCHARGE LAMP, METHOD FOR MANUFACTURING A DISCHARGE TUBE BODY FOR HIGH-PRESSURE DISCHARGE LAMPS AND METHOD FOR MANUFACTURING A HOLLOW TUBE BODY

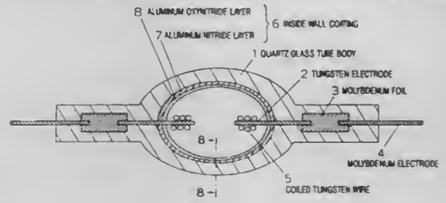
**Kenichi Fujii, Kobe, and Mamoru Takeda, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan**

**Filed Sep. 28, 1995, Ser. No. 535,650**

**Claims priority, application Japan, Sep. 28, 1994, 6-233835; Apr. 5, 1995, 7-080084**

**Int. Cl.[6] H01J** *61/35*

**U.S. Cl. 313—635** **16 Claims**




1. A high-pressure discharge lamp incorporating

a coating comprising at least an oxynitride layer of one or more elements and a nitride layer of one or more elements disposed on the inside wall of a quartz glass hollow tube body in which an inert gas and either one or more metals or one or more metal halides are sealed.

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**5,742,127**

## DEGAUSSING SYSTEM FOR CATHODE RAY TUBE WHICH PREVENTS DISPLAY OF VISUAL DISTORTION

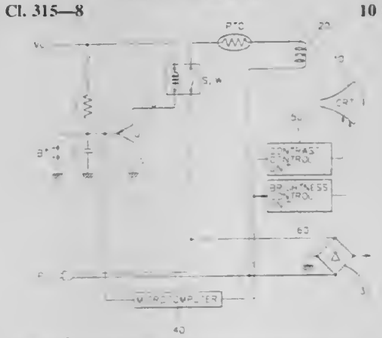
**Jong Ki Ahn, Jindalae Apt. 201, 125-6, Hyungkok-Dong, Kumi, Kyungsangbook-Do, Rep. of Korea**

**Filed Jan. 4, 1996, Ser. No. 582,926**

**Claims priority, application Rep. of Korea, Dec. 7, 1995, 1995/47366**

**Int. Cl.[6] H04N** *9/29*

**U.S. Cl. 315—8** **10 Claims**




1. A system for degaussing a cathode ray tube (CRT) comprising:

a detector, including a microcomputer, operable to detect when a user has initiated a manual degaussing operation while the CRT is in an active state by sensing that a capacitor is in a discharged state;

a controller for adjusting a display of the CRT from the active state to a black state in accordance with the result of said detector so that visual effects caused by degaussing are not displayed to the user and for returning the CRT to the active state after degaussing; and

a degaussing unit for degaussing the CRT while the CRT display is in the black state.

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5,742,128

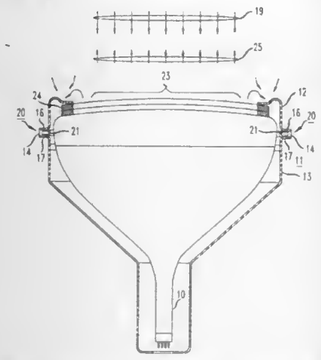
## APPARATUS FOR MITIGATING THE EFFECTS OF AMBIENT MAGNETIC FIELDS ON THE OPERATION OF A CRT

Winfield Scott Bearce, Hungtington; Christopher N. Haywood, Franklin Square, and John Druchunas, Sea Cliff, all of N.Y., assignors to Orwin Associates, Inc., Amityville, N.Y.

Continuation of Ser. No. 382,437, Feb. 2, 1995, abandoned. This application May 22, 1996, Ser. No. 651,448

Int. Cl.[6] H04N *9/29*

U.S. Cl. 315—8 32 Claims



11. A shield enclosure for shielding a cathode ray tube from magnetic field interference comprising a front bezel fabricated of magnetic material spaced apart about a substantial portion of its periphery by a non-magnetic gap from a rear enclosure also fabricated of magnetic material.

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5,742,129

## ORGANIC ELECTROLUMINESCENT DISPLAY PANEL WITH PROJECTING RAMPARTS AND METHOD FOR MANUFACTURING THE SAME

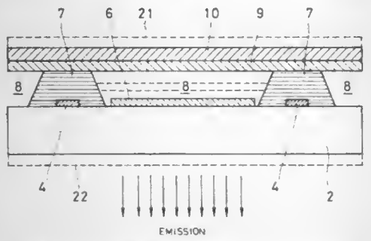
Kenichi Nagayama, and Satoshi Miyaguchi, both of Tsurugashima, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 16, 1996, Ser. No. 602,341

Claims priority, application Japan, Feb. 21, 1995, 7-032043

Int. Cl.[6] H05B *33/02*

U.S. Cl. 315—167 15 Claims




1. An organic electroluminescent display panel having a plurality of emitting portions arranged as a matrix comprising:

a substrate on which a plurality of first display electrodes corresponding to emitting portions are formed;

electrical insulation ramparts formed on said substrate so as to project higher than a level of said first display electrodes from said substrate between said first display electrodes;

organic function layers each including at least one organic electroluminescent medium formed on said first display electrodes between said ramparts; and

at least one second display electrode formed on said ramparts and said organic function layers.

5,742,130

## INTELLIGENT LAMP OR INTELLIGENT CONTACT TERMINAL FOR A LAMP

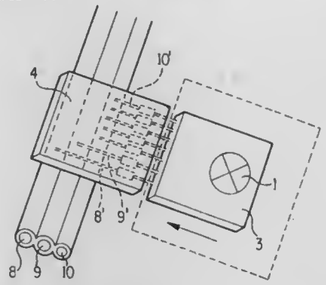
Heikki Korkala, Juurikastie 22, Oulunsalo, Finland, SF-90460

Continuation of Ser. No. 524,119, Aug. 24, 1995, Pat. No. 5,592,051, which is a continuation of Ser. No. 244,059, Jul. 11, 1994, abandoned. This application Nov. 8, 1996, Ser. No. 746,342

Claims priority, application Finland, Nov. 12, 1991, 915346

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—77 2 Claims



1. An intelligent contact terminal for a lamp for use in a lighting system of a vehicle, comprising:

a plurality of individually controlled replaceable lamps linked in a common power-supply circuit having insulated conductors, each of said lamps being connected to an intelligent contact terminal and associated electronic control elements;

at least one common code conductor which is connected to each of said electronic control elements;

an operation control device for transmitting a desired identification code signal over said at least one common code conductor to the electronic control elements associated with each contact terminal, said elements selectively reacting or failing to react to various identification code signals;

wherein each replaceable contact terminal has connecting studs pressed into contact with said conductors through the insulation thereof, said electronic control elements including means for identifying a predetermined identification code included in the identification code signal, means for switching on the lamp upon identification of said predetermined identification code, means for monitoring the operating condition of the lamp and means for giving a fault indication if the current passing through the lamp is higher or lower than a predetermined maximum or minimum value; and

wherein the intelligent contact terminal has additional coding means for locally defining each lamp to operate as a particular lamp according to its location.

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5,742,131

## DIMMABLE BALLAST CONTROL CIRCUIT

James C. Sprout, Los Altos, and Jerome M. Mix, Redwood City, both of Calif., assignors to The Watt Stopper, Santa Clara, Calif.

Continuation-in-part of Ser. No. 156,492, Nov. 23, 1993, Pat. No. 5,402,040. This application Jan. 10, 1995, Ser. No. 370,949

Int. Cl.[6] H05B *37/02*

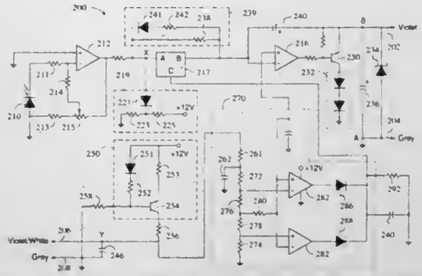
U.S. Cl. 315—157 10 Claims

1. A circuit for controlling the brightness level of a light coupled to a dimmable electronic ballast, said circuit comprising:

a photosensor for sensing an ambient light level;

an intensity setting circuit, coupled to said photosensor, for setting variable intensity level of the light in response to signals received from said photosensor, said intensity setting circuit increasing the intensity level of the light at a first rate of change and decreasing the intensity level of the light at a second rate of change, said intensity setting circuit including a first RC circuit which has a resistance and a capacitance,





associated therewith, defining a variable time delay, with said variable time delay establishing said first rate to be faster than said second rate; and

a control circuit, coupled to said intensity setting circuit to selectively reduce said resistance, thereby allowing the intensity level of the light to vary at a third rate and independent of the signals received from the photosensor.

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5,742,132

## METHOD AND SYSTEM FOR STARTING AND OPERATING A DISCHARGE LAMP

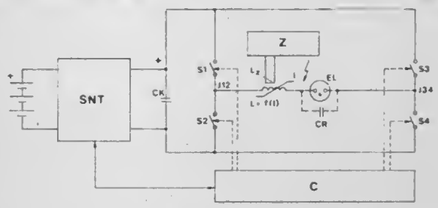
Andreas Huber, Maisach, and Dieter Lang, Bruckmuehl, both of Germany, assignors to Patent-Treuhand-Gesellschaft F. Elektrische Gluehlampen mbH, Munich, Germany

Filed Mar. 25, 1996, Ser. No. 622,519

Claims priority, application Germany, Apr. 27, 1995, 195 15 511.4

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—209 R 14 Claims




1. A method to start and then operate a discharge lamp (EL) having a rated, nominal operating current

comprising the steps of:

starting the lamp in a first, or ignition phase;

then, during a second or run-up phase,

operating the lamp by supplying the lamp with a run-up phase current which has an effective value ($I_{eff}$) which is higher than the rated effective value of the nominal operating current, and

wherein said run-up phase current supplied to the lamp has a form factor F greater than one or unity,

in which said form factor is defined as the ratio of effective current ($I_{eff}$) to rectified value of the current ($I_{el}$) supplied to the lamp; and

operating said lamp in a third, or normal operating phase subsequent to said second or run-up phase with alternating current of essentially square-wave shape, and having a form factor of essentially one or unity.

5,742,133

## DRIVER CIRCUIT FOR AN LED

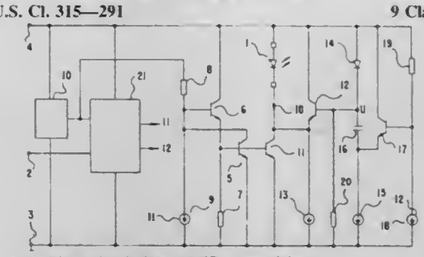
Wilhelm Wilhelm, and Johann Wuertele, both of München, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 9, 1996, Ser. No. 711,020

Claims priority, application Germany, Sep. 7, 1995, 195 33 116.8

Int. Cl.[6] H03K *3/01;5/01*

U.S. Cl. 315—291 9 Claims



1. A driver circuit for an LED, comprising:

a switch device being connected to an LED, being controlled by an input signal, and having a current source circuit; said switch device short-circuiting the LED after a transition to a first switching state, and said switch device supplying the LED from said current source circuit after a transition to a second switching state, causing a higher current to flow initially and causing a lesser current to flow after a predetermined time period has elapsed; and

said current source circuit, including:

a first transistor having a control terminal and having a load path connected in series with the LED;

a first current limiting element connected between the control terminal of said first transistor and a first reference potential;

a second transistor having a control terminal and having a load path connected between the control terminal of said first transistor and a first supply potential;

a resistor connected between the control terminal of said second transistor and a second reference potential;

a controllable current source connected between the control terminal of said second transistor and the first reference potential;

a third transistor having a load path connected between the control terminal of said second transistor and the first reference potential and having a control terminal connected to the control terminal of said first transistor; and

a trigger device for adjusting said controllable current source as a function of the input signal to a maximal value during the first switching state and initially for the predetermined time period to a medium value and then to a minimal value during the second switching state.

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5,742,134

## INVERTER DRIVING SCHEME

Ihor T. Wacyk, Briarcliff Manor, N.Y., and Demetri J. Giannopoulos, Norwalk, Conn., assignors to Philips Electronics North America Corp., New York, N.Y.

Filed May 3, 1996, Ser. No. 642,688

Int. Cl.[6] G05F *1/00*

U.S. Cl. 315—307 15 Claims

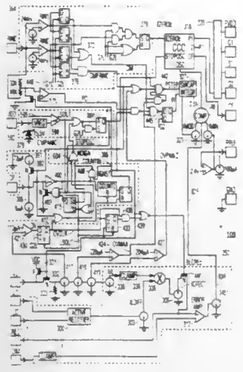
1. An inverter for powering a load having a lamp, comprising:

switching means responsive to driving signals for switching into conductive and nonconductive states whereby power is delivered to the load such that a voltage is applied to and current flows through the lamp; and

control circuitry for producing the driving signals based on a lamp power signal and including a multiplier for generating the lamp power signal which is proportional to the product of lamp current and lamp voltage.

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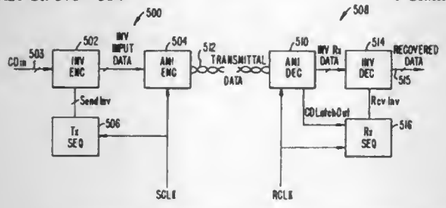


5,742,135

## SYSTEM FOR MAINTAINING POLARITY SYNCHRONIZATION DURING AMI DATA TRANSFER

Robert W. Horst, Saratoga, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Jun. 28, 1996, Ser. No. 693,000
Int. Cl.[6] H04L *7/00*
U.S. Cl. 375—354 4 Claims




1. A communication system for transmitting AMI encoded data, where successive one bit values of original input data are AMI encoded as pulses of opposite polarity and where zero bit values are AMI encoded by the lack of a pulse, with the communication system forcing a latent error due to lack of polarity synchronization to occur within a predetermined time duration from an event which generated the latent error, said system comprising:

an inverting unit, coupled to receive a sequence of original input data bit values at a clock rate, for periodically inverting spaced apart bit values in the sequence of original input data bit values to generate inverted bit values separated in time by no more than the predetermined time duration, with the inverting unit providing an output sequence of inverted bit values including at least one original bit value;

an AMI encoder, coupled to said inverting unit to receive said output sequence and to a communication channel, for AMI encoding and transmitting a transmitted sequence of bit values including the original bit values and inverted bit values in said output sequence;

an AMI decoder, coupled to the communication channel to receive and decode the transmitted sequence of original and inverted bit values; and

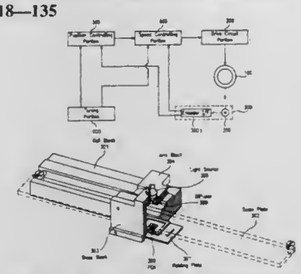
an uninverting unit, coupled to the AMI decoder, for inverting only the inverted bit values in the decoded transmitted sequence of original and inverted bit values to recover the sequence of original bit values.

5,742,136

## LINEAR MOTOR DRIVE SYSTEM

Yutaka Ono; Haruo Higuchi; Yutaka Koizumi, and Shigeru Hashida, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Sep. 5, 1995, Ser. No. 523,990
Claims priority, application Japan, Sep. 20, 1994, 6-224579; Jul. 12, 1995, 7-175884
Int. Cl.[6] H02K *41/00;* H02P *8/00*
U.S. Cl. 318—135 4 Claims



1. A linear motor drive system for detecting movement of a slider of a linear pulse motor by an optical encoder and for feedback controlling said linear pulse motor on basis of a sensor signal; said system comprising:

a scale plate whose position is fixed and on which a plurality of rows of slits arrayed in a same direction as direction of an array of teeth of a stator and with a same pitch as that of said teeth of said stator;

a sliding block connected to said slider of said linear pulse motor and sliding together therewith;

a light source mounted on said sliding block for irradiating light on said plurality of rows of slits;

a photodiode array comprising a plurality of photodiodes mounted on said sliding block and disposed facing said light source with said scale plate interposed therebetween and arrayed with one pitch of said slits;

each of said photodiodes extending over said plurality of rows of slits and detecting light passed through said plurality of rows of slits; and

a signal processing means for generating a feedback signal for feedback control of said linear pulse motor based light sensor signal from said photodiode array.

5,742,137

## STARTER MOTOR CONTROL CIRCUIT AND METHOD

Harold D. Bratton, Graz, Austria; Frank O. Klegon, White Lake, Mich.; David C. Baker, Rochester, Mich.; Gary F. Kajdasz, Commerce Twp, Mich.; David M. Patasky, Sterling Heights, Mich.; Walter Wolfe, South Lyon, Mich.; James Lewandowski, Clinton Twp., Mich., and Robert E. Hojna, Franklin, Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Continuation of Ser. No. 531,569, Sep. 5, 1995, which is a continuation of Ser. No. 270,344, Jul. 5, 1994, abandoned.
This application Feb. 20, 1997, Ser. No. 804,164
Int. Cl.[6] H02P *1/00*
U.S. Cl. 318—139 10 Claims

1. In a starter relay control circuit of a vehicle, the vehicle having an automatic transmission with a "park" position and a "neutral" position, the starter relay control circuit including a battery for providing power to the starter relay control circuit, a starter motor for providing transfer power to a vehicle engine in electrically operable relation with the battery, and an ignition switch for receiving input from a vehicle operator in electrically operable relation with the starter motor and battery, the starter relay control circuit comprising:

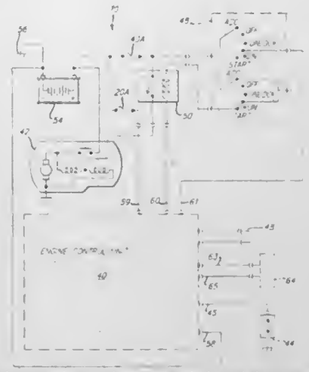
means for relaying power to the starter motor, the means for relaying power having input and output terminals, the means for relaying power having input terminals in electrically operable relation with the ignition switch and the output terminals in electrically operable relation with the starter motor;

means for controlling the starter motor by creating an open circuit across leads of the starter motor when the engine is running and the ignition switch is engaged in an engine "start" position, the starter motor having input terminals, the starter motor input terminals in electrically operable relation with the means for relaying power;

an Electronic Control Unit (ECU) for energizing and de-energizing the means for relaying power, the ECU including a microprocessor, memory capabilities, at least one bus line, and input and output terminals in electrically operable relation with the means for relaying power; and

a transmission state switch in electrically operable relation with the ECU and having a conducting closed position and an open position, the transmission state switch only being in the conducting closed position when the transmission is in the "park" position and when the transmission is in the "neutral" position.





5,742,138

## CONTROL METHOD FOR SERVO SYSTEM WITH ADJUSTABLE SOFTNESS IN RECTANGULAR COORDINATE SYSTEM

Tetsuaki Kato, Hadanoshi, and Yukinobu Tsuchida, Oshino-mura, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP96/00329, § 371 Date Oct. 21, 1996, § 102(e) Date Oct. 21, 1996, PCT Pub. No. WO96/26473, PCT Pub. Date Aug. 29, 1996
PCT Filed Feb. 15, 1996, Ser. No. 732,409
Claims priority, application Japan, Feb. 21, 1995, 7-055189
Int. Cl.[6] G05B *19/00*
U.S. Cl. 318—568.18 5 Claims




1. A control method for a servo system for performing processes including a position loop process and a velocity loop process for each of axes of a robot so as to control servomotors for driving the axes of the robot, said method comprising the steps of:

(a) calculating a force acting on a center point of a tool mounted on said robot in a rectangular coordinate system defined in a working space based on a set of parameter values representing a degree of softness of said servo system in the direction of each coordinate axis of the rectangular coordinate system and a position deviation in the direction of each coordinate axis of the rectangular coordinate system;

(b) calculating a torque Ti (i=1, 2, . . . , n, where n is the number of the robot axes) based on said force calculated in said step (a), using inverse dynamics;

(c) calculating an input value Ei based on said torque Ti calculated in said step (b) for each axis, a gain Kp of the position loop process and a gain Kv of the velocity loop process; and

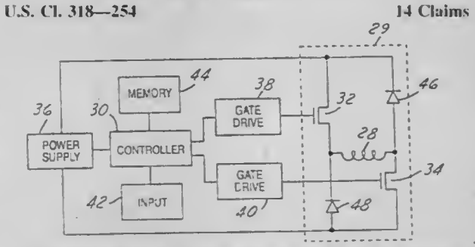
(d) inputting said input value Ei calculated in said step (c) to the position loop process for each axis, to perform the position loop process and the velocity loop process for each axis so that said servo system has the degree of softness in accordance with the parameter values.

5,742,139

## METHOD AND APPARATUS FOR REDUCING NOISE IN A VARIABLE RELUCTANCE MOTOR

Sergei Kolomeitsev, Saline, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed Jul. 26, 1996, Ser. No. 690,172
Int. Cl.[6] H02P *7/05*
U.S. Cl. 318—254 14 Claims




1. A control circuit for a motor having at least a first and second winding comprising:

switch means coupled for energizing said first winding and said second winding; and

control means operatively coupled to said switch means for controlling a first current in said first winding according to a first current profile and for controlling a second current in said second winding according to a second current profile different from said first current profile, wherein said first current profile includes an increasing current portion and a decaying current portion comprising first and second stages, said second current profile including an increasing current portion and a decaying current portion comprising first and second stages;

wherein said first stage of said first current profile has a first duration and said first stage of said second current profile has a second duration different from said first duration.

5,742,140

## NUMERICAL-CONTROL MACHINE TOOL

Shigeru Yamada, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Japan

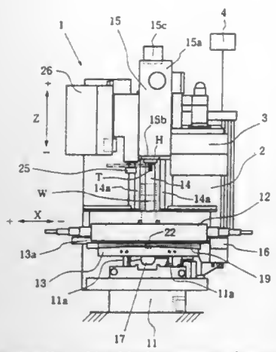
PCT No. PCT/JP94/02170, § 371 Date Nov. 2, 1995, § 102(e) Date Nov. 2, 1995, PCT Pub. No. WO95/28252, PCT Pub. Date Oct. 26, 1995
PCT Filed Dec. 21, 1994, Ser. No. 545,728
Int. Cl.[6] G05B *19/408*
U.S. Cl. 318—568.22 9 Claims

1. A numerical-control machine tool for compensating backlash errors of a positioning member (12, 13, 15) driven along at least one positioning axis (x, y, z) by a feed screw (19, 20, 21), comprising:

at least one backlash compensation means (203, 204, 205) for compensating backlash errors of said positioning member (12, 13, 15) along said axis (x, y, z), the backlash compensation means (203, 204, 205) having a memory means (214) for

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storing a plurality of backlash compensation values in accordance with a plurality of driving modes, the driving modes including a plurality of feed length modes being defined on the basis of feed length,

wherein the plurality of driving modes are selected from the group consisting of an editing, a memory operation, a tape operation, an MDI operation, three kinds of handle feed, a jog feed, a rapid feed, and a zero-return.

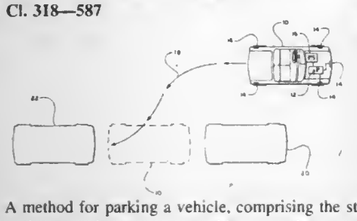
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**5,742,141**

**SEMI-AUTONOMOUS PARKING CONTROL SYSTEM FOR A VEHICLE PROVIDING TACTILE FEEDBACK TO A VEHICLE OPERATOR**

**James L. Czekaj, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Jun. 4, 1996, Ser. No. 658,113**
**Int. Cl.[6] B64C** *13/18*
**U.S. Cl. 318—587** **10 Claims**



1. A method for parking a vehicle, comprising the steps of:

engaging a semi-autonomous parking control system for providing tactile feedback;

receiving inputs from sensors and determining vehicle position, and calculating desired and actual vehicle trajectories;

comparing said trajectories and determining a trajectory error;

determining a trajectory error tolerance;

determining whether said trajectory error is decreasing;

determining whether a required steering effort to maneuver said vehicle is less than a maximum steering effort when said trajectory error exceeds said trajectory error tolerance and said trajectory error is not decreasing;

incrementing said required steering effort by a predetermined amount to increase required steering effort and thereby provide said tactile feedback when said required steering effort is less than said maximum steering effort and when said trajectory error exceeds said trajectory error tolerance and said trajectory error is not decreasing;

determining whether parking is completed after incrementing said required steering effort, and returning to step of receiving inputs when parking is not complete; and

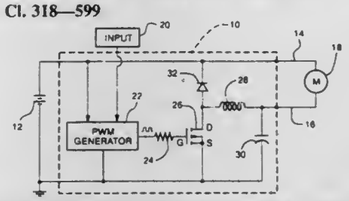
determining whether parking is completed when said required steering effort is not less than said maximum steering effort, said trajectory error exceeds said trajectory error tolerance and said trajectory error is not decreasing, and returning to step of receiving inputs when parking is not complete.

**5,742,142**

**LOW RADIATED EMISSION MOTOR SPEED CONTROL WITH PWM REGULATOR**

**Gerald Jay Witt, Noblesville, Ind., assignor to Delco Electronics Corp., Kokomo, Ind.**

**Filed Aug. 9, 1996, Ser. No. 694,724**
**Int. Cl.[6] G05B** *11/28;* **H02J** *1/02*
**U.S. Cl. 318—599** **5 Claims**




1. A speed control for a DC motor having a voltage supply and comprising:

a PWM generator having a duty cycle controllable according to desired motor speed;

a voltage control means for determining the motor voltage wherein the motor speed is dependent on motor voltage;

the control means including

a controlled switch that closes and opens in response to the PWM generator duty cycle for periodically coupling the motor to the voltage supply to afford voltage pulses,

an inductor connected between said motor and said switch, and a capacitor connected to a junction between said inductor and said motor such that said capacitor alternately charges through one of the inductor and motor, and discharges through the other of the inductor and motor to produce a sinusoidal ripple on the motor voltage at the frequency of the PWM generator.

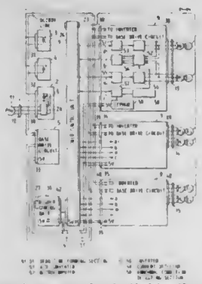
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**5,742,143**

**MOTOR CONTROL SYSTEM WITH SELECTIVELY OPERATED A/D CONVERTOR**

**Takashi Katagiri, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan**

**Filed Jan. 19, 1996, Ser. No. 588,699**
**Claims priority, application Japan, Jan. 20, 1995, 7-026230**
**Int. Cl.[6] H02P** *7/00*
**U.S. Cl. 318—625** **14 Claims**



1. A motor control system for individually feedback-controlling a plurality of servomotors comprising:

motor drive means for converting DC power into AC power and applying said AC power to said plurality of servomotors;

current detecting means for detecting the current value of said AC current to feed back the current value thus detected to said motor drive means; and

A/D converter means for converting an output signal of said current detecting means into a digital signal,

wherein at least two of said plurality of servomotors form a unitary group and, said motor drive means, said current detecting means and said A/D converter means are accommodated in a casing for every said unitary group, and



said A/D converter means is a converter of multi-channel input and serial output type to which output signals of said current detecting means are applied,

wherein the number of said output signals corresponds to the number of said servomotors forming said unitary group, and in which output signals of said current detecting means are selectively subjected to analog-to-digital conversion.

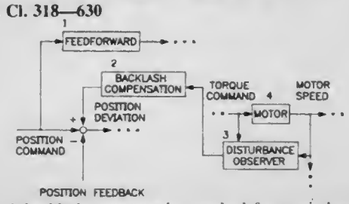
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**5,742,144**

**BACKLASH COMPENSATION METHOD FOR SEMI-CLOSED-LOOP TYPE SERVO CONTROL**

**Tetsuaki Kato, Hadano, and Kokoro Hatanaka, Oshino-mura, both of Japan, assignors to Fanuc Ltd., Minamitsuru-gun, Japan**

**Filed Jan. 29, 1996, Ser. No. 593,336**
**Claims priority, application Japan, Feb. 2, 1995, 7-035924**
**Int. Cl.[6] G05B** *11/01*
**U.S. Cl. 318—630** **7 Claims**




1. A backlash compensation method for semi-closed-loop type servo control, comprising the steps of:

estimating a disturbance acting on a motor, using a disturbance observer, in response to receiving a torque command and a motor speed of the motor; and

compensating for the backlash in accordance with the estimated disturbance, including changing a direction of backlash compensation in accordance with a sign of the estimated disturbance.

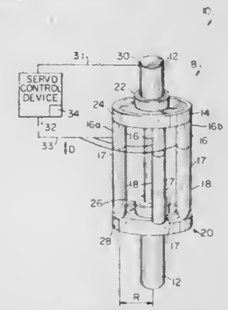
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**5,742,145**

**APPARATUS FOR REDUCING VIBRATION INPUTS TO A DEVICE AND/OR FOR POSITIONING THE DEVICE**

**Farshad Khorrami, Brooklyn, and Jahangir Rastegar, Stony Brook, both of N.Y., assignors to Polytechnic University, and Omnitek Research and Development, Inc., both of Brooklyn, N.Y.**

**Division of Ser. No. 301,698, Sep. 7, 1994, Pat. No. 5,604,413.**
**This application Dec. 1, 1995, Ser. No. 565,906**
**Int. Cl.[6] G05D** *3/00*
**U.S. Cl. 318—632** **19 Claims**




1. Apparatus for reducing vibration inputs to a device, said apparatus comprising:

means for detecting vibration along at least two directions of said device and for supplying therefrom a vibration signal corresponding to the detected vibration;

control means for generating a control signal in response to said vibration signal;

support means for supporting said device; and

a plurality of actuator means each coupled to said support means for moving said device in response to said control signal so as to reduce the vibration inputs to said device in at least two directions.

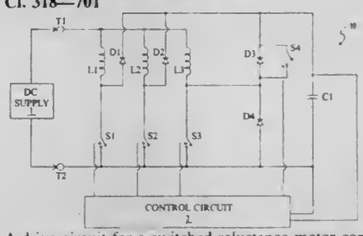
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**5,742,146**

**DRIVE CIRCUIT FOR A SWITCHED RELUCTANCE MOTOR WITH IMPROVED ENERGY RECOVERY USING A COMMON DUMP CAPACITOR AND RECOVERING PHASE CIRCUIT**

**Phillip G. Langhorst, Crestwood, Mo., assignor to MagneTek, Inc., Nashville, Tenn.**

**Filed Dec. 3, 1996, Ser. No. 753,920**
**Int. Cl.[6] H02P** *5/40;7/05*
**U.S. Cl. 318—701** **7 Claims**




1. A drive circuit for a switched reluctance motor comprising:

a. a first motor phase coil having a first end electrically connected to a first DC voltage supply terminal;

b. a second motor phase coil having a first end electrically connected to the first DC voltage supply terminal;

c. first switch means for connecting and disconnecting a switched end of the first phase coil to a second DC voltage supply terminal;

d. second switch means for connecting and disconnecting a switched end of the second phase coil to the second DC voltage supply terminal;

e. first conduction means for providing a current path from the switched end of the first phase coil to first end of a dump storage capacitor when the first switch means is in a disconnect position;

f. second conduction means for providing a current path from the switched end of the second phase coil to the first end of the dump storage capacitor when the second switch means is in a disconnect position;

g. third switch means for connecting and disconnecting the switched end of the second phase coil to the first end of the dump storage capacitor to provide a discharge path from the dump storage capacitor into the second phase coil when a voltage across the dump storage capacitor reaches a predetermined level; and

h. third conduction means for providing a current path from the switched end of the second phase coil to the second DC voltage supply terminal.

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**5,742,147**

**DC BASED POWERING AND CHARGING CIRCUIT FOR COMPRESSOR SYSTEMS AND OTHER MECHANICAL DEVICES**

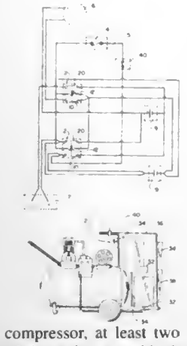
**Daniel Ralph Molina, 1389 S. Highland, Sanger, Calif. 93657, and Michael Timothy Molina, 562 S. Crawford, Dinuba, Calif. 93618**

**Filed Apr. 25, 1994, Ser. No. 231,695**
**Int. Cl.[6] H02J** *7/00;7/14;* **F04B** *17/00;49/06*
**U.S. Cl. 320—7** **2 Claims**

1. A direct current based powering and charging system for powering a compressor, comprising: an electric motor in connec-

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tion with an air compressor, at least two 12-volt, direct current, batteries connected in series to said electric motor to form a powering circuit, a charging circuit comprising a parallel electric connection of said batteries in connection with a means for charging said batteries, said charging circuit and said powering circuit in connection with a switching means for making either of said switching and said charging circuits operable, said air compressor in connection with an enclosed tank containing air under pressure, said air compressor having a means to increase the pressure of said air, a sensor in connection with said tank and having a means for measuring when said pressure of said air is at or below a certain optimal pressure, said sensor in connection with said switching means so that said switching means will operate said charging circuit when said pressure in said tank is optimal and for operating said powering circuit when said pressure in said tank is below said optimal pressure.

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**5,742,148**

## CHARGE/DISCHARGE CONTROL CIRCUIT AND CHARGEABLE ELECTRIC POWER SOURCE APPARATUS

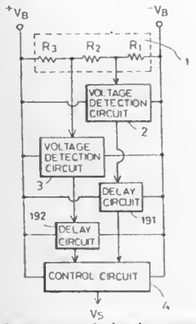
**Minoru Sudo; Takayuki Takashina; Yoshikazu Kojima; Sadashi Shimoda, and Hiroshi Mukainakano, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan**

**Filed Nov. 17, 1993, Ser. No. 154,463**

**Claims priority, application Japan, Nov. 24, 1992, 4-313515; Jan. 12, 1993, 5-003561; Mar. 11, 1993, 5-051110; Mar. 12, 1993, 5-052476; Mar. 16, 1993, 5-056208; Mar. 17, 1993, 5-057563; Mar. 17, 1993, 5-057564; Mar. 22, 1993, 5-062259; Mar. 22, 1993, 5-062260; Mar. 24, 1993, 5-065758; Mar. 25, 1993, 5-067132; Apr. 21, 1993, 5-094677; May 21, 1993, 5-120198; May 27, 1993, 5-126238; Sep. 3, 1993, 5-220279; Sep. 8, 1993, 5-223647; Sep. 9, 1993, 5-224186; Oct. 19, 1993, 5-261285**

**Int. Cl.[6] H01M** *10/46*

**U.S. Cl. 320—14** **33 Claims**




3. A charge/discharge control circuit comprising: voltage dividing means for dividing a voltage of an electric power source and producing a plurality of divided output voltages; overcharge voltage detection means and overdischarge voltage detection means for detecting a level of the divided output voltages from the voltage dividing means; control means for receiving and processing a signal from the overcharge voltage detection means and overdischarge voltage detection means and for outputting a signal for controlling the charge/discharge of the electric power source; and current limiting means controlled by the control means for limiting the current drain by the charge/discharge control circuit on the electric power source.

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**5,742,149**

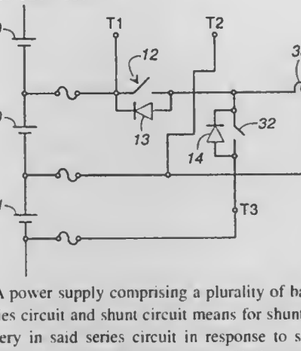
## ADAPTABLE BATTERY CHARGER SYSTEM

**Russell L. Simpson, Miami, Fla., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Jun. 3, 1997, Ser. No. 868,328**

**Int. Cl.[6] H02J** *7/00*

**U.S. Cl. 320—113** **6 Claims**



1. A battery charging system, comprising: a charger unit; and a replaceable pocket insertable into the charger unit, the replaceable pocket having a memory chip for storing battery parameter information, the charger unit charging a battery based on the battery parameter information stored in the memory chip of the replaceable pocket.

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**5,742,150**

## POWER SUPPLY AND METHOD OF PROTECTING BATTERIES THEREIN

**Thakoengdet Khuwatsamrit, 197 Honey Tree Dr., Athens, Ga. 30605**

**Filed Sep. 16, 1996, Ser. No. 713,126**

**Int. Cl.[6] H01M** *10/46*

**U.S. Cl. 320—116** **8 Claims**




1. A power supply comprising a plurality of batteries connected in series circuit and shunt circuit means for shunting current about a battery in said series circuit in response to said battery being charged to a preselected upper charge limit; a sump battery connected in series circuit with said plurality of batteries series circuit; and a load connected across said sump battery.



**5,742,151**

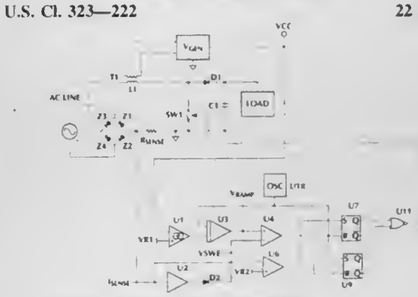
## INPUT CURRENT SHAPING TECHNIQUE AND LOW PIN COUNT FOR PFC-PWM BOOST CONVERTER

**Jeffrey Hwang, Saratoga, Calif., assignor to Micro Linear Corporation, San Jose, Calif.**

**Filed Jun. 20, 1996, Ser. No. 670,181**

**Int. Cl.[6] G05F** *1/70;1/613*

**U.S. Cl. 323—222** **22 Claims**




1. A power converter circuit comprising:

a. a switching mode power factor correction circuit comprising a first inductor and a second inductor inductively coupled to the first inductor wherein a first current in the first inductor charges an output capacitor and a second current in the second inductor is induced by the first current and provides power for generating a dc supply voltage; and

b. a control circuit for controlling switching of the power factor correction circuit for maintaining the first current in phase with an input voltage wherein the control circuit senses the dc supply voltage for controlling switching.

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**5,742,152**

## CONTINUOUSLY RECTIFIABLE LINEARITY COIL CIRCUIT

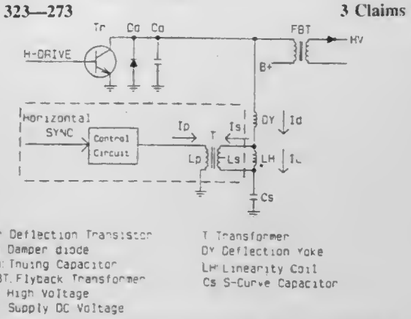
**Hsiu-Chyi Lee, Taipei, Taiwan, assignor to Chuntex Eletronic Co., Ltd., Taiwan**

**Continuation-in-part of Ser. No. 620,224, Mar. 22, 1996, abandoned, which is a continuation of Ser. No. 348,212, Nov. 28, 1994, abandoned. This application Mar. 22, 1996, Ser. No. 621,095**

**Claims priority, application China, May 12, 1994, 94105692.9**

**Int. Cl.[6] G05F** *1/56*

**U.S. Cl. 323—273** **3 Claims**




1. A continuously rectifiable linearity coil circuit comprising a saturated transformer serially connected with a deflection yoke of a computer monitor, a linearity coil and a control circuit, wherein in a nearly saturated state, the inductance of the saturated transformer decreases when the input DC current increases, so that by means of changing the value of the current passing through the linearity coil, the horizontal linearity of the computer monitor is kept optimal with respect to different input horizontal frequency signals.

**5,742,153**

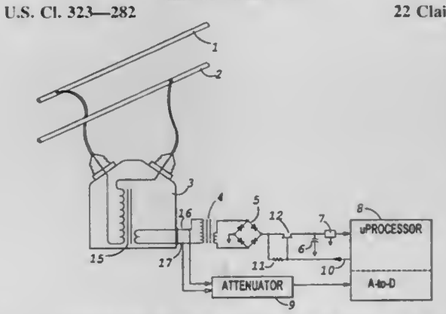
## COASTING POWER SUPPLY FOR AC POWER SYSTEM WAVEFORM MEASURING INSTRUMENT

**Alexander McEachern, Oakland, and Bryan D. Hord, San Francisco, both of Calif., assignors to Basic Measuring Instruments, Santa Clara, Calif.**

**Continuation of Ser. No. 931,718, Aug. 18, 1992, abandoned. This application Dec. 28, 1993, Ser. No. 173,922**

**Int. Cl.[6] G05F** *1/56*

**U.S. Cl. 323—282** **22 Claims**




1. A power supply for an electronic circuit that measures an AC (alternating current) power line signal, the power supply drawing its power from the same power line signal that the electronic circuit is measuring, comprising:

a. means for receiving the AC power line signal from a power line, said means for receiving coupled to the power line;

b. means for converting the AC power line signal received from the power line to DC (direct current) power, said means for converting coupled to the means for receiving;

c. means for supplying the electronic circuit with the DC power from the means for converting, said means for operating coupled to the means for converting and to the electronic circuit;

d. means for storing DC power to be used by the electronic circuit, said means for storing coupled to the means for converting and to the electronic circuit; and

e. means for disabling the means for supplying and furnishing power to the electronic circuit from the means for storing for a pre-determined interval of time; said means for disabling coupled to the means for supplying and the means for storing.

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**5,742,154**

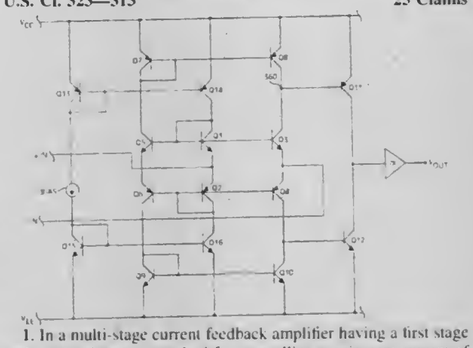
## MULTI-STAGE CURRENT FEEDBACK AMPLIFIER

**Madhav V. Kolluri, Sunnyvale, Calif., assignor to Maxim Integrated Products, Sunnyvale, Calif.**

**Filed Jun. 30, 1995, Ser. No. 497,323**

**Int. Cl.[6] G05F** *3/16;3/20;3/30*

**U.S. Cl. 323—313** **25 Claims**




1. In a multi-stage current feedback amplifier having a first stage and a second stage, a method for controlling a quiescent current of said second stage, comprising the steps of:

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providing a transistor device having a base, an emitter, and a collector, the emitter receiving an input signal to be amplified;

providing a replicating device having a base, an emitter, and a collector, said base of said replicating device being coupled to said base of said transistor device, wherein a voltage in said emitter of said transistor device is substantially replicated in said emitter of said replicating device;

providing a current mirror circuit having a current mirror circuit input and a current mirror circuit output, said current mirror circuit input being coupled to said collector of said replicating device, said current mirror circuit output being coupled to said collector of said transistor device; and

providing a second stage device having a base, an emitter, and a collector, said base of said second stage device being coupled to said current mirror circuit output, wherein a base drive current to said second stage device substantially comprises the difference between a current in said current mirror circuit output and a collector current in said collector of said second mirror device,

wherein said base drive current is generated in an open loop manner without requiring feedback control based on said collector current of said second stage device.

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**5,742,155**

**ZERO-CURRENT START-UP CIRCUIT**

**David M. Susak, Phoenix, and Joseph A. Thomsen, Gilbert, both of Ariz., assignors to Microchip Technology Incorporated, Chandler, Ariz.**

**Filed Nov. 25, 1996, Ser. No. 755,682**

**Int. Cl.[6] G05F** *1/62;3/16;* **H02M** *1/12*

**U.S. Cl. 323—901** **26 Claims**



1. A zero-current start-up circuit comprising, in combination:

a reference circuit which is initially unbiased and which has internal nodes that needs to be regulated to a predetermined voltage;

kick start means coupled to said reference circuit for sending a signal when activated to said reference circuit which generates a reference current within said reference circuit wherein said reference current regulates an output current to a predetermined value set by said reference circuit once said reference current is generated;

current mirror means coupled to said reference circuit for outputting said output current;

voltage drop means coupled to said current mirror means for generating a reference voltage when said output current is run through said voltage drop means; and

logic gate means having a logical level input and a second input which is an absolute level input which is coupled to said voltage drop means for generating an output signal to activate said kick start means and for generating an output signal to deactivate said kick start means after said kick start means has been activated when said reference voltage reaches a predetermined level.

**5,742,156**

**DIGITAL PROCESS FOR OBTAINING A MEASURED PARAMETER FROM AN ELECTRIC SIGNAL**

**Tevfik Sezi, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Germany**

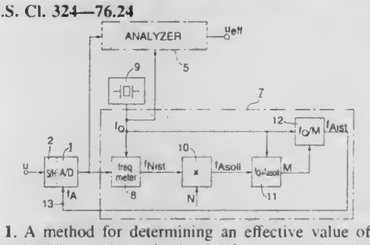
**PCT No. PCT/DE94/00873, § 371 Date Apr. 24, 1996, § 102(e) Date Apr. 24, 1996, PCT Pub. No. WO95/06880, PCT Pub. Date Mar. 9, 1995**

**PCT Filed Jul. 15, 1994, Ser. No. 604,935**

**Claims priority, application Germany, Aug. 31, 1993, 43 30 179.7**

**Int. Cl.[6] G01R** *19/25;23/00*

**U.S. Cl. 324—76.24** **4 Claims**




1. A method for determining an effective value of an electric signal with a predetermined rated frequency, wherein:

the electric signal is scanned and digitized in an analog-to-digital converter with a scanning device having a scanning frequency corresponding to a factor N times the rated frequency of the electric signal, the analog-to-digital converter generating digital sample values from the electric signal, and an analyzer is used to determine the effective value from the digital sample values, the method comprising the steps of:

measuring the digital sample values generated by the analog-to-digital converter, with a frequency meter, to obtain a measured value corresponding to an instantaneous frequency of the electric signal;

multiplying the measured value by the factor N to yield a derived measured value;

generating an intermediate value M corresponding to a quotient of a clock frequency generated by a clock generator and the derived measured value;

generating the scanning frequency by dividing, in a frequency divider, the clock frequency by an adjustable divider ratio; and

adjusting the divider ratio of the frequency divider using the intermediate value M so that the scanning frequency of the scanning device is equal to the derived measured value,

wherein the step of adjusting the divider ratio is delayed for several periods of the electric signal.

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**5,742,157**

**OPTICAL FIBER MAGNETIC-FIELD SENSOR**

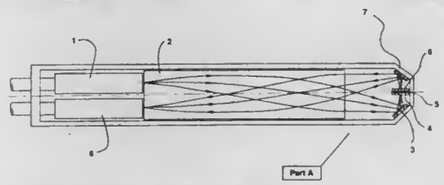
**Satoshi Ishizuka, Hirakata; Hisashi Minemoto, Otsu, and Nobuki Itoh, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Nov. 18, 1996, Ser. No. 751,683**

**Claims priority, application Japan, Nov. 17, 1995, 7-299379**

**Int. Cl.[6] G01R** *31/00*

**U.S. Cl. 324—96** **27 Claims**




1. An optical magnetic-field sensor comprising:

a GRIN rod lens;

optical fiber for incident light and optical fiber for outgoing light, which are arranged on one end of the GRIN rod lens;



first and second reflection means both being on the other end of the GRIN rod lens; and

a magneto-optical crystal between the first and the second reflection means, wherein

light leaving the optical fiber for incident light is converted into convergent light by the GRIN rod lens,

the convergent light is reflected by the first reflection means so that an optical axis of the convergent light is substantially vertical to the central axis of the GRIN rod lens, and that the convergent light is focused on the central axis of the GRIN rod lens,

the reflected light passes through the central axis and is converted into divergent light,

the divergent light is then reflected by the second reflection means which is placed at a position being symmetrical with the first reflection means, relative to the central axis,

the reflected divergent light is converted into convergent light by the GRIN rod lens again to be fed into the optical fiber for outgoing light.

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**5,742,158**

**IC TEST HANDLER HAVING A PLANET ROTATING MECHANISM FOR COOLING OR HEATING ICS**

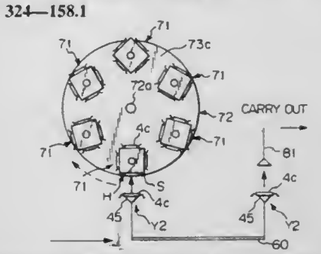
**Masato Itoh, Nagano, Japan, assignor to Sinano Electronics Co., Ltd., Nagano-ken, Japan**

**Filed Jul. 1, 1996, Ser. No. 675,299**

**Claims priority, application Japan, Dec. 22, 1995, 7-335365**

**Int. Cl.[6] G01R** *31/26*

**U.S. Cl. 324—158.1** **4 Claims**




1. An IC test handler equipped with an IC constant temperature chamber for cooling or heating ICs to perform temperature tests of the ICs, said IC constant temperature chamber comprises:

a plurality of planet IC holders, the number of said planet IC holders being M, each of said plurality of planet IC holders being able to rotate on its own shaft for the planet, and having a plurality of surfaces of rotation symmetric with respect to said shaft for the planet, the number of said surfaces being K, said surfaces functioning as IC holding parts;

a planet holder arranging mechanism that can rotate around a shaft for a sun, for arranging said plurality of planet IC holders in an annular array with equal intervals around said shaft for the sun, said plurality of planet IC holders being able to revolve around said shaft for the sun; and

an intermittent rotation driving mechanism for intermittently rotating said planet holder arranging mechanism in step of 360°/M, where said intermittent rotation comprising alternate periods of stop period and rotation period, so that, when said plurality of planet IC holders makes one rotation around said shaft for the sun, the number of rotations of each of said planet IC holders on its own shaft is {N±(1/K)}, where N is an arbitral integer,

at least one IC which was attached to one of said surfaces during one of the stop periods in said intermittent rotation being removed from said surface during another one of the stop periods in said intermittent rotation after said planet holder arranging mechanism has been rotated around the sun for a time sufficient for said IC to be preheated for the temperature test.

**5,742,159**

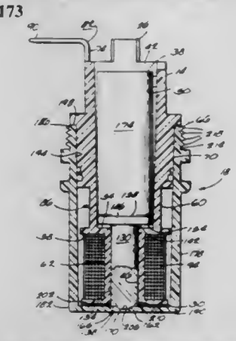
**ANGULAR VELOCITY SENSOR WITH HOUSING AND BOBBIN FORMING WEDGE FIT SEAL**

**Brian G. Babin, Clinton Township, Mich., and Daniel D. Jarodsky, St. Charles, Ill., assignors to SSI Technologies, Inc., Janesville, Wis.**

**Division of Ser. No. 363,900, Dec. 27, 1994, Pat. No. 5,629,618. This application Sep. 12, 1996, Ser. No. 712,793**

**Int. Cl.[6] G01P** *1/02;3/488;* **H01F** *27/02*

**U.S. Cl. 324—173** **17 Claims**



1. A sensor for detecting the angular velocity of a rotating member, said sensor comprising:

a bobbin having an end portion defining an annular recess, said bobbin having a tapered outer surface portion;

a coil mounted on said bobbin and within said recess; and

a housing constructed and arranged to receive said end portion of said bobbin to enclose said coil within said housing, said housing having a tapered inner surface portion in sealing engagement with said tapered outer surface portion to form a non-threaded wedge fit seal.

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**5,742,160**

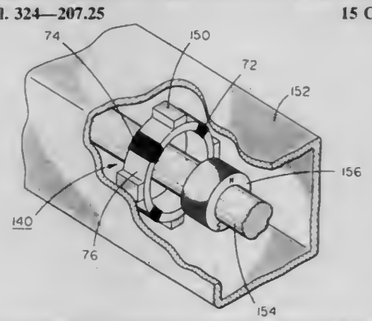
**APPARATUS FOR DETERMINING ANGULAR POSITION AND ROTATIONAL SPEED USING A ROTATING MAGNET AND A DIRECTIONAL MAGNETOMETER**

**Roderick G. Bergstedt, Fort Wayne; Donald J. Schreiber, Columbia City; Thomas G. Klapheke, Fort Wayne, and Russell C. Smith, Albion, all of Ind., assignors to Hughes Electronics, Los Angeles, Calif.**

**Division of Ser. No. 546,343, Oct. 20, 1995, Pat. No. 5,602,472, which is a continuation of Ser. No. 242,156, May 13, 1994, abandoned, which is a continuation-in-part of Ser. No. 5,318, Jan. 15, 1993, abandoned. This application Oct. 9, 1996, Ser. No. 727,942**

**Int. Cl.[6] G01B** *7/30;* **G01P** *3/487;15/00;* **B60T** *8/32*

**U.S. Cl. 324—207.25** **15 Claims**




1. An apparatus for detecting the angular position of a rotatable member, comprising:

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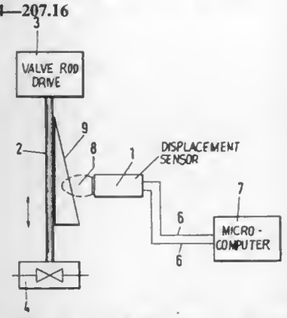
(a) an annular magnetic source circumferentially disposed on said rotatable member and rotatable therewith, said annular magnetic source generating a tangential magnetic flux field component;
(b) a directional fluxgate magnetometer, having a toroidal core, disposed at a location in proximity to said magnetic source, with said rotatable member passing through said toroidal core, said directional magnetometer being oriented so as to detect the amplitude and/or change of amplitude of only said tangential magnetic flux field component of said magnetic source, and to provide outputs indicative thereof; and
(c) means to receive said outputs and to determine therefrom the angular position of said rotatable member.

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**5,742,161**
**METHOD AND DEVICE FOR DETECTING DISPLACEMENT OF VALVE ROD MOVEMENT IN AN ELECTROPNEUMATIC POSITION REGULATOR WITH AT LEAST ONE PROXIMITY SENSOR**

**Thomas Karte, Lemgo, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany**

**Continuation of Ser. No. 156,072, Nov. 23, 1993. This application Jan. 11, 1996, Ser. No. 584,730**
**Claims priority, application Germany, Nov. 23, 1992, 42 39 635.2**
**Int. Cl.[6] G01B** *7/14;* **G01D** *5/20*
**U.S. Cl. 324—207.16** **5 Claims**




1. A method for detecting displacement of valve rod movement in electropneumatic position regulators, comprising the steps of: generating a high-frequency electromagnetic alternating field by exciting a high-frequency oscillation within an LC oscillating circuit in an inductive sensor arranged perpendicular to a direction of the valve rod movement; damping the high-frequency oscillation as a function of displacement of the valve rod via an electrically conductive body connected to and moved by the valve rod so that the surface of the conductive body moves toward and away from the sensor as a function of valve rod movement; demodulating the oscillator signal and feeding the demodulated signal to a microcomputer without amplification for evaluation of the displacement-dependent damping of the oscillation amplitude; measuring the temperature within the inductive sensor; correlating the temperature with the measured oscillation amplitude in the microcomputer; and determining a corrected displacement signal from the correlation in the microcomputer.

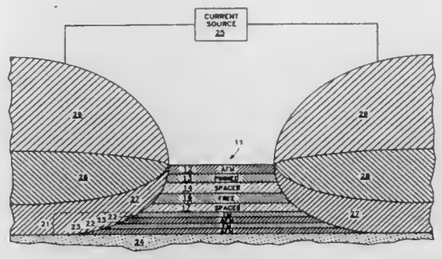
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**5,742,162**
**MAGNETORESISTIVE SPIN VALVE SENSOR WITH MULTILAYERED KEEPER**

**Daniel A. Nepela, San Jose, and Marcos M. Lederman, San Francisco, both of Calif., assignors to Read-Rite Corporation, Milpitas, Calif.**

**Filed Jul. 17, 1996, Ser. No. 682,276**
**Int. Cl.[6] G01R** *33/09;* **H01L** *43/08*
**U.S. Cl. 324—252** **7 Claims**

1. A magnetic sensing structure comprising:



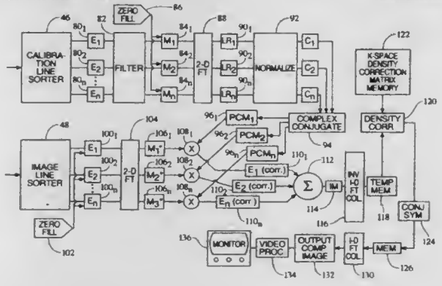

a layered spin valve sensor including first and second layers of ferromagnetic material separated by a layer of nonmagnetic metallic conductive material,
said second layer of ferromagnetic material having a fixed direction of magnetization, the magnetization direction of said first layer at a zero applied magnetic field being substantially parrallel to the longitudinal axis of said spin valve sensor and substantially perpendicular to said fixed magnetization direction of said second layer;
said magnetization direction of said first layer rotating in response to variations in the magnitude of said applied field;
a multilayer magnetic keeper structure separated from said layered spin valve sensor by a spacer layer of high resistivity material, said multilayer magnetic keeper structure having a fixed magnetization direction substantially anti-parallel to said fixed direction of said magnetization of said second layer; and
a magnetic biasing structure magnetically coupled through a contiguous junction to said layered spin valve sensor and said multilayer magnetic keeper structure to provide longitudinal magnetic bias to said spin valve sensor.

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**5,742,163**
**MAGNETIC RESONANCE SCAN CALIBRATION AND RECONSTRUCTION TECHNIQUE FOR MULTI-SHOT, MULTI-ECHO IMAGING**

**Haiying Liu, Euclid; Gordon D. DeMeester, Wickliffe, and James M. McNally, Chagrin Falls, all of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio**

**Filed Apr. 26, 1996, Ser. No. 638,643**
**Int. Cl.[6] G01V** *3/00*
**U.S. Cl. 324—309** **20 Claims**




1. In a magnetic resonance imaging system which includes a magnet for generating a temporally constant magnetic field through an examination region, a radio frequency pulse controller and transmitter for inducing dipoles in the examination region to resonance such that radio frequency resonance signals are generated, gradient magnetic field coils and a gradient magnetic field controller for generating at least phase and read magnetic field gradient pulses in orthogonal directions across the examination region and for repeatedly reversing the read gradient, a receiver for receiving and demodulating the radio frequency magnetic resonance signals after each reversal of the read gradient to produce a series of data



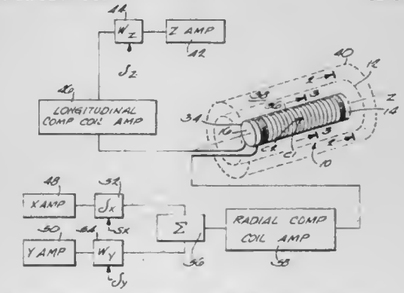
lines, and an image memory for storing a reconstructed image representation, the improvement comprising:
a two-dimensional phase-correction processor which generates a plurality of two-dimensional phase-correction matrices, each two-dimensional phase-correction matrix corresponding to one of the read gradient reversals, the two-dimensional phase-correction processor receiving data lines collected at a data collection period following each of the read gradient reversals and independently generating a corresponding two-dimensional phase-correction matrix for each data collection interval;
a partial image processor which receives image data generated during each of the data collection intervals, the partial image processor reconstructing an incomplete set of data lines collected during each of the data collection intervals independently into a corresponding partial image;
a matrix multiplier for multiplying each partial image by the two-dimensional phase-correction matrix corresponding to the same data collection interval to generate a plurality of two-dimensionally phase-corrected partial images;
an image adder for adding the two-dimensionally phase-corrected partial images to generate a composite image for storage in the image memory.

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**5,742,164**
**MISALIGNMENT COMPENSATION FOR MR GRADIENT COIL ASSEMBLY**

**Peter B. Roemer, North Andover, Mass., and William D. Barber, Clifton Park, N.Y., assignors to General Electric Company, Milwaukee, Wis.**

**Filed Dec. 28, 1995, Ser. No. 579,755**
**Int. Cl.[6] G01V** *3/00;3/14*
**U.S. Cl. 324—318** **12 Claims**



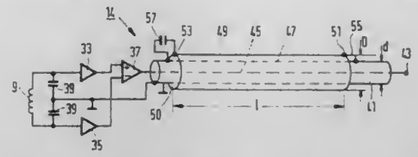

1. A gradient coil system for MR imaging comprising:
a first gradient coil set comprising first inner and outer gradient coils, said first inner gradient coil located within said first outer gradient coil and proximate to an imaging volume;
a second gradient coil set comprising second inner and outer gradient coils, said second inner gradient coil located within said second outer gradient coil proximate to said imaging volume;
means for selectively energizing said first inner and outer gradient coils to generate a resultant first gradient field in said imaging volume, said energized first inner and outer gradient coils also disposed to collectively generate a first eddy current field component in a region between said outer coil and a conductive structure spaced apart therefrom when said inner gradient coil is displaced by a given amount from a specified position with respect to said outer gradient coil along a first axis;
said energizing means further comprising means for selectively energizing said second inner and outer gradient coils to generate a resultant second gradient field in said imaging volume, said energized second inner and outer gradient coils also disposed to collectively generate a second eddy current field component in said region when said second gradient coil is displaced from a specified position with respect to said second outer gradient coil along a second axis in mutually orthogonal relationship with said first axis;
a compensation coil selectively positioned with respect to said first and second inner and outer gradient coils; and
means for applying a compensation current to said compensation coil, said compensation current comprising first and second current components, the first current component having a specified relationship to the displacement of said first inner gradient coil along said first axis, and said second current component having a specified relationship to the displacement of said second inner gradient coil along said second axis, said compensation current energizing said compensation coil to generate a magnetic field substantially canceling both said first and second eddy current components in said region.

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**5,742,165**
**MAGNETIC RESONANCE APPARATUS**

**Jeroen Snelten, and Peter H. Wardenier, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 14, 1996, Ser. No. 749,936**
**Claims priority, application European Pat. Off., Nov. 14, 1995, 95203102**
**Int. Cl.[6] G01V** *3/00*
**U.S. Cl. 324—318** **3 Claims**



1. A magnetic resonance apparatus, comprising a magnet system for generating a steady magnetic field, a coil system for generating gradient fields, and at least one RF coil which is connected, via a connection circuit, to a transmission and/or receiving device for RF signals, which connection circuit includes a coaxial cable having a central conductor and a conductor sheath which coaxially encloses the central conductor, and one or more sheath current suppressing elements in succession along the longitudinal direction of the coaxial cable, each sheath current suppressing element comprising a tubular conductor enclosing said coaxial cable over at least a part of its length, which tubular conductor has a first end which is directly electrically connected to the conductor sheath and a second end which is connected to the conductor sheath via a capacitor such that the sheath current suppressing element attains a resonance condition at a respective frequency.

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**5,742,166**
**SEISMIC ACTIVITY PREDICTOR INCLUDING A DIELECTRIC FOR RECEIVING PRECURSOR SEISMIC ELECTROMAGNETIC WAVEFORMS**

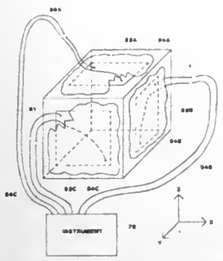
**Larry Park, 50631 N. W. Gheen Rd., Manning, Oreg. 97125**

**Filed Nov. 4, 1996, Ser. No. 743,909**
**Int. Cl.[6] G01V** *3/12;1/16;11/00;* **G01R** *29/00*
**U.S. Cl. 324—344** **24 Claims**

1. A method of detecting precursor seismic electromagnetic waveforms and predicting future seismic activity in the form of an earthquake based thereon, comprising the steps of:
(a) placing a detector including a dielectric material in contact with the earth;
(b) receiving within said dielectric material in said contact with said earth said precursor seismic electromagnetic waveforms traveling within said earth emanating from a region of seismic activity;
(c) sensing with a sensor responsive to said receiving said precursor seismic electromagnetic waveforms within said dielectric material a series of individual discrete signals

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imposed by said waveforms at said dielectric material, said each of said signals having the characteristic of a rise time that is shorter than its fall time; and

(d) predicting based on said series of said signals the occurrence of said earthquake.

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**5,742,167**

**FILM THICKNESS MEASURING CAPACITIVE SENSORS**

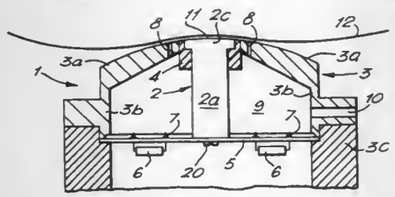
**Anthony Charles Rendell Haynes, Lewes, England, assignor to Sussex Instruments Plc., Lewes, England**

**Continuation of Ser. No. 142,388, Dec. 23, 1993, abandoned. This application Sep. 10, 1996, Ser. No. 707,024**

**Claims priority, application United Kingdom, May 23, 1991, 9111140**

**Int. Cl.[6] G01N** *27/22*; **G01R** *27/26*

**U.S. Cl. 324—671** **21 Claims**



1. A capacitance sensor for non-contact measurement of the thickness of sheet material, said sensor comprising:

a central electrode having a sensing surface which is symmetric with respect to an axis and an outer electrode having a sensing surface surrounding said sensing surface of said central electrode, said sensing surface of said outer electrode also being symmetric with respect to said axis and said sensing surfaces being spacially separated and coaxial, said sensing surfaces cooperating to define a non-planar reference surface, a capacitance between said sensing surfaces of said central and outer electrodes being influenced by sheet material suspended adjacent said reference surface so as to bridge at least part of the space separating said coaxial sensing surfaces;

gas outlet means, said gas outlet means providing a layer of pressurized gas between said sensing surfaces of said electrodes and the sheet material to keep said sensing surfaces from contacting the sheet material during thickness measurement, gas passed through said outlet means flowing between said sensing surfaces and the sheet material and causing the sheet material to generally conform to the shape of said reference surface; and

electronic means for determining the thickness of the sheet material from the capacitance measured between said sensing surfaces while the sheet material is held away from said sensing surfaces by the layer of pressurized gas.

**5,742,168**

**TEST SECTION FOR USE IN AN IC HANDLER**

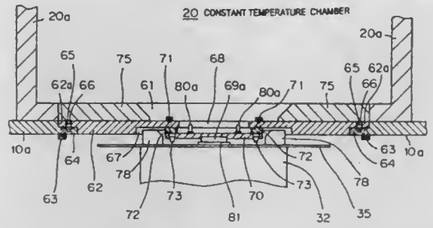
**Toshiyuki Kiyokawa, Kuki, and Keiichi Fukumoto, Gyoda, both of Japan, assignors to Advantest Corporation, Tokyo, Japan**

**Filed Aug. 2, 1996, Ser. No. 691,724**

**Claims priority, application Japan, Aug. 4, 1995, 7-199926**

**Int. Cl.[6] G01R** *31/02*

**U.S. Cl. 324—754** **4 Claims**




1. An IC handler transporting semiconductor devices and coupled to a test head of a semiconductor device testing apparatus, said IC handler comprising:

a constant temperature chamber maintaining the semiconductor devices to be tested at a predetermined constant temperature and comprising an opening formed in the bottom thereof;

a test section disposed inside of the constant temperature chamber and testing the semiconductor devices;

means for transporting one of the semiconductor devices to be tested to said test section

a mounting fixture attached to the opening formed in the bottom of the constant temperature chamber and connecting the test head of the semiconductor device testing apparatus to the constant temperature chamber, said mounting fixture including an opening formed generally in the center of said mounting fixture;

a performance board mounted on a surface of said test head of the semiconductor device testing apparatus;

securing means for detectably attaching said mounting fixture to said opening formed in the bottom of the constant temperature chamber;

a socket guide comprising at least one socket mounted therein and mounted on the surface of said performance board; and

second securing means for detachably attaching said socket guide to the undersurface of said mounting fixture such that said at least one socket is exposed through said opening formed in the mounting fixture, whereby an electric path between said performance board and said at least one socket is minimized in length.

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**5,742,169**

**APPARATUS FOR TESTING INTERCONNECTS FOR SEMICONDUCTOR DICE**

**Salman Akram, Boise, and Warren M. Farnworth, Nampa, both of Id., assignors to Micron Technology, Inc., Boise, Id.**

**Filed Feb. 20, 1996, Ser. No. 604,007**

**Int. Cl.[6] G01R** *31/02*

**U.S. Cl. 324—755** **20 Claims**

1. An apparatus for testing a semiconductor die comprising:

a base for retaining the die, said base including a plurality of external leads;

an interconnect mounted to the base, said interconnect including a substrate and contact members for electrically contacting the die, said contact members electrically connected to conductors formed on the substrate, said conductors in electrical communication with the external leads; and

an electrical connector on the base, said electrical connector in electrical communication with a dedicated external lead on the base, said electrical connector configured to electrically contact the substrate to provide an electrical path for detecting a leakage current.





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**5,742,170**

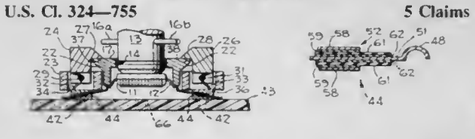
**SEMICONDUCTOR TEST SOCKET AND CONTACTS**

**George L. Isaac, 980 Kiely Blvd., #326, Santa Clara, Calif. 95051; Donald C. Miller, 1139 Blair Ave., Sunnyvale, Calif. 94087, and Rodney Scott Ziegenhagen, II, 2905 Kilo Ave., San Jose, Calif. 95124**

**Division of Ser. No. 342,171, Nov. 18, 1994, Pat. No. 5,557,212. This application Jun. 17, 1996, Ser. No. 664,695**

**Int. Cl.[6] G01R** *31/02*

**U.S. Cl. 324—755** **5 Claims**



1. A solderless flexible contact array for use in contacting an array of accessible semiconductor device terminals for providing eletrical contact between the device terminals and a pattern of conducting pads in eletrical communication with a semiconductor device test circuit, comprising

a plurality of flexible upper contacts arranged in registration with the array of accessible semiconductor device terminals,

a plurality of lower contacts arranged in registration with the pattern of conducting pads,

a plurality of conducting paths extending between ones of said plurality of upper and lower contacts,

an upper electrical shield overlying said plurality of conducting paths,

a lower electrical shield underlying said plurality of conducting paths,

insulation means disposed between and affixed to said upper electrical shield and said plurality of conducting paths and between and affixed to said lower electrical shield and said plurality of conducting paths, and

holding means surrounding said upper and lower electrical shields in orientation when mounted on the semiconductor test board so that said plurality of conducting paths extend from and are in electrical communication with ones of the pattern of conducting pads.

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**5,742,171**

**TEST DEVICE FOR MULTI-CONTACT INTEGRATED CIRCUIT**

**Hitoshi Matsunaga, and Kaori Tashiro, both of Tokyo, Japan, assignors to Unitechno, Inc., Tokyo, Japan**

**Filed Aug. 29, 1996, Ser. No. 705,210**

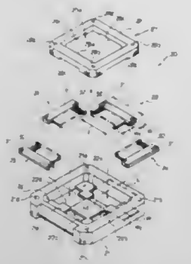
**Claims priority, application Japan, Sep. 19, 1995, 7-239527**

**Int. Cl.[6] G01R** *31/02*; **H01R** *9/09*

**U.S. Cl. 324—755** **14 Claims**

1. A test device for testing a multi-contact integrated circuit chip package having a plurality of side edge portions each having a set of contact leads, the test device comprising:

a socket base on which said integrated circuit chip package is to be set;



a plurality of replaceable contact modules each including contact members for contacting said contact leads of said integrated circuit chip package and support member means for holding said contact members; and

a contact module retainer means detachably mounted on said socket base for retaining said contact modules in said socket base with said contact members positioned to contact said contact leads of said integrated circuit chip package when said integrated circuit chip package is inserted in said socket base.

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**5,742,172**

**SCANNING PROBE MICROSCOPE AND METHOD FOR OBTAINING TOPOGRAPHIC IMAGE, SURFACE POTENTIAL IMAGE, AND ELECTROSTATIC CAPACITANCE DISTRIBUTION IMAGE**

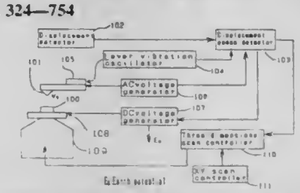
**Masatoshi Yasutake, Chiba, Japan, assignor to Seiko Instruments Inc., Japan**

**Continuation of Ser. No. 441,975, May 12, 1995, abandoned. This application Oct. 11, 1996, Ser. No. 728,942**

**Claims priority, application Japan, May 23, 1994, 6-108756**

**Int. Cl.[6] G01R** *11/00*

**U.S. Cl. 324—754** **24 Claims**



1. A scanning probe microscope comprising: a probe extending in a Z direction attached to an electroconductive lever; oscillator means for producing a resonance signal to oscillate the probe at a resonance frequency ωr thereof in close proximity to a specimen; displacement detecting means for detecting the lever vibration and producing a corresponding displacement signal according to a change in a resonant amplitude and phase around the resonance frequency ωr of the lever; positioning means responsive to the displacement signal for scanning one of the probe and the specimen in X and Y directions and extending and retracting one of the probe and the specimen in the Z-direction so as to control the relative distance between the probe and the specimen; means for vibrating the lever at an applied angular frequency ω and at a doubled angular frequency 2ω by use of electrostatic coupling between the probe and the specimen; means for applying a DC voltage between the specimen and the probe so as to maintain the average amplitude of an ω-component of the probe vibration at zero to permit detection of a surface potential of the specimen in accordance with the DC voltage and to permit detection of an electrostatic capacitance of the specimen; displacement phase detecting means for detecting the respective amplitude components of said lever vibration and a phase difference between an ωr component of said lever vibration and that of an output of said oscillator means, and for multiplying the phase difference component and the amplitude of the ωr component, the multiplied value being input to said positioning means for controlling the Z-direction distance between the probe and the specimen in order

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to keep the multiplied value constant, so that the collision of the probe and a surface of the specimen can be detected since such a collision results in the positioning means separating the probe and the specimen rapidly due to a large phase delay in response to the collision.

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**5,742,173**

## METHOD AND APPARATUS FOR PROBE TESTING SUBSTRATE

**Yoichi Nakagomi, Yamanashi-ken; Hidehito Yokomori, Nirasaki; Shinji Iino, Yamanashi-ken, and Satoshi Sano, Yamanashi, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan**

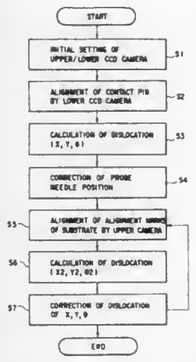
**PCT No. PCT/JP96/00699, § 371 Date Nov. 18, 1996, § 102(e) Date Nov. 18, 1996, PCT Pub. No. WO96/29607, PCT Pub. Date Sep. 26, 1996**

**PCT Filed Mar. 18, 1996, Ser. No. 737,338**

**Claims priority, application Japan, Mar. 18, 1995, 7-086176; Mar. 18, 1995, 7-086177; Mar. 27, 1995, 7-091766; Mar. 31, 1995, 7-100019**

**Int. Cl.[6] G01R** *1/04*

**U.S. Cl. 324—753** **12 Claims**




1. A substrate inspecting method in which a pad of a substrate is aligned with a probe; the pad is contacted with the probe; and a test signal is sent to a pattern circuit formed on the substrate to inspect; having:

a step of storing as initial setting data the positional information of a mounting table on which the substrate is placed and the positional information of the probe;

a step of moving a first alignment member provided at a position away by a specified distance from the mounting table together with the mounting table, and aligning the first alignment member with respect to a second alignment member fixed to a position away by a specified distance from the probe to provide an aligned position;

a step of calculating a distance between the aligned position and the mutual probe/pad contact position on the basis of the previously stored initial setting data, and moving the mounting table on the basis of the calculated results to position the pad at the probe; and

a step of contacting the pad of the substrate on the mounting table with the probe, and sending a test signal to a pattern circuit on the substrate to inspect.

**5,742,174**

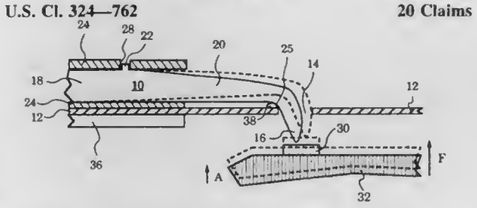
## MEMBRANE FOR HOLDING A PROBE TIP IN PROPER LOCATION

**January Kister, Menlo Park, and Jerzy Lobacz, San Mateo, both of Calif., assignors to Probe Technology, Santa Clara, Calif.**

**Filed Nov. 3, 1995, Ser. No. 553,069**

**Int. Cl.[6] G01R** *31/02*

**U.S. Cl. 324—762** **20 Claims**




1. A device for electronic testing, the device comprising:

a) a cantilever probe having an arm, a tip, and a distal end opposite the tip;

b) a support structure for supporting the probe, the probe being attached to the support structure at the distal end;

c) a membrane for positioning the tip, the membrane being attached to the support structure and the membrane having a slot through which the tip is inserted; and

d) a means for attaching the probe to the membrane such that the tip, the arm, and the membrane move from an initial position to a deflected position when an overdrive is applied to the tip and such that the tip, the arm, and the membrane return to the initial position when the overdrive is removed from the tip.

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**5,742,175**

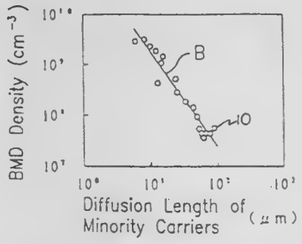
## METHOD OF EVALUATING A DENSITY OF OXYGEN-PRECIPITATION DEFECTS IN A SILICON WAFER

**Hirotaka Kato, and Kei Matsumoto, both of Hiratsuka, Japan, assignors to Komatsu Electronic Metals, Inc., Hiratsuka, Japan**

**Filed Feb. 20, 1996, Ser. No. 603,081**

**Int. Cl.[6] G01R** *31/26*

**U.S. Cl. 324—765** **3 Claims**




1. A method for evaluating oxygen-precipitation defects in a silicon wafer in which both side surfaces thereof are covered with non-defect layers and oxygen-precipitation defects exist in the bulk of the silicon wafer, comprising the steps of:

determining a correlation between a diffusion length L of minority carriers and an oxygen-precipitation defect density to calculate a constant A having units of measure of $\mu m^2/cc$;

measuring the diffusion length L of minority carriers in the silicon wafer by using the surface photovoltage (SPV) method after removal of at least one of the non-defect layers; and

calculating a density of oxygen-precipitation defects by substituting the constant A into a formula $A \times L^{-2}$.



**5,742,176**

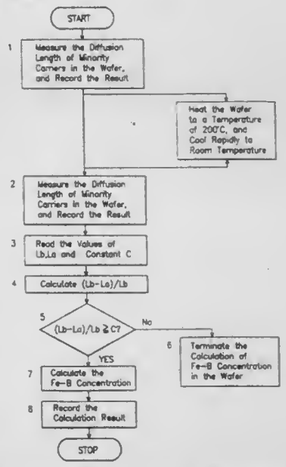
## METHOD OF MEASURING A FE-B CONCENTRATION OF A SILICON WAFER

**Hirotaka Kato, and Kei Matsumoto, both of Hiratsuka, Japan, assignors to Komatsu Electronic Metals Co., Ltd., Hiratsuka, Japan**

**Filed Feb. 20, 1996, Ser. No. 603,083**

**Int. Cl.[6] G01R** *31/26*

**U.S. Cl. 324—765** **4 Claims**




1. A method of measuring a Fe—B concentration of a P-type silicon wafer, comprising the steps of:

measuring a diffusion length Lb of minority carriers in a P-type silicon wafer by the surface photovoltage method;

measuring a diffusion length La of minority carriers in the silicon wafer which has been activated to form dissociated $Fe_{int}+B_{sub}$ and then cooled rapidly;

calculating a value of (Lb—La)/Lb from the measured La and Lb;

comparing the calculated value with a predetermined value C obtained from a relationship between Lb—La and Lb;

determining that oxygen-precipitation defects are proved to exist in the silicon wafer and being terminated instead of proceeding with calculating the Fe—B concentration if the value of (Lb—La)/Lb is smaller than C; and

calculating the Fe—B concentration from the measured La and Lb if the value of (Lb—La)/Lb is equal to and larger than C.

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**5,742,177**

## METHOD FOR TESTING A SEMICONDUCTOR DEVICE BY MEASURING QUIESCENT CURRENTS (IDDQ) AT TWO DIFFERENT TEMPERATURES

**Jeffrey C. Kalb, Jr., Phoenix, Ariz., assignor to Intel Corporation**

**Filed Sep. 27, 1996, Ser. No. 705,844**

**Int. Cl.[6] G01R** *31/26;* **G01N** *25/72*

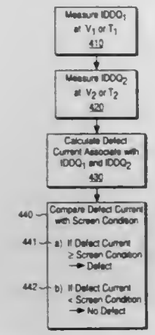
**U.S. Cl. 324—765** **3 Claims**

1. Method for detecting defects in a semiconductor device comprising the steps of:

measuring a first quiescent current at a first temperature;

measuring a second quiescent current at a second temperature, wherein said second temperature is different from said first temperature;

calculating, based on said first quiescent current and said second quiescent current and said first temperature and said second temperature, the component of said first and second quiescent currents corresponding to a defect current; and




determining if said device is defective by comparing said defect current to a screen condition.

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**5,742,178**

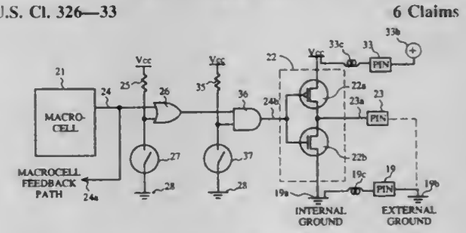
## PROGRAMMABLE VOLTAGE STABILIZING CIRCUIT FOR A PROGRAMMABLE INTEGRATED CIRCUIT DEVICE

**Jesse H. Jenkins, IV, Danville; Nicholas Kucharewski, Jr., Pleasanton, and David Chiang, Saratoga, all of Calif., assignors to Xilinx, Inc., San Jose, Calif.**

**Continuation of Ser. No. 307,983, Sep. 14, 1994, abandoned. This application Oct. 22, 1996, Ser. No. 740,118**

**Int. Cl.[6] H03K** *19/003*

**U.S. Cl. 326—33** **6 Claims**




5. A circuit for a programmable device comprising:

a logic block having an output terminal;

an external pin of said device;

a CMOS inverter having an input terminal, and having an output terminal connected to said external pin;

means for selectively driving said input terminal of said a CMOS inverter, wherein in a first mode said input terminal of said a CMOS inverter is driven independently of a signal at said output terminal of said logic block, and in a second mode said input terminal of said a CMOS inverter is driven by said signal at said output terminal of said logic block.

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**5,742,179**

## HIGH SPEED PROGRAMMABLE LOGIC ARCHITECTURE

**Paul T. Sasaki, Sunnyvale, Calif., assignor to Dyna Logic Corporation, Sunnyvale, Calif.**

**Continuation of Ser. No. 188,499, Jan. 27, 1994, Pat. No. 5,504,440. This application Dec. 29, 1995, Ser. No. 580,668**

**Int. Cl.[6] H03K** *19/177*

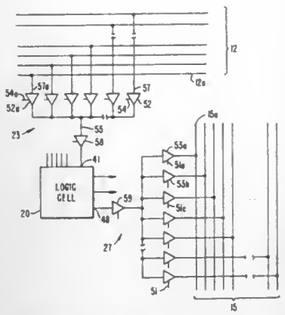
**U.S. Cl. 326—39** **1 Claim**

1. An architecture for a programmable logic circuit comprising:

a plurality of logic cells having input and output nodes, each of the logic cells being for performing a logic function on input signals supplied to its input nodes and supplying resulting output signals on its output nodes;

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a plurality of input lines for supplying the input signals to the logic cells;

a plurality of output lines for receiving the output signals from the logic cells;

first and second pluralities of controllable active driver circuits associated with each of the logic cells, the first plurality of the controllable active driver circuits being disposed to selectively interconnect selected ones of the input lines to the input nodes of the associated logic cell, and the second plurality of the controllable active driver circuits being disposed to selectively interconnect selected ones of the output lines to the output nodes of the associated logic cell; and

wherein each of the controllable active driver circuits comprises a buffer circuit capable of being placed in at least an active state in which the controllable active driver circuit replicates a signal supplied to it and a passive state in which it presents a high impedance between its input and output.

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**5,742,180**

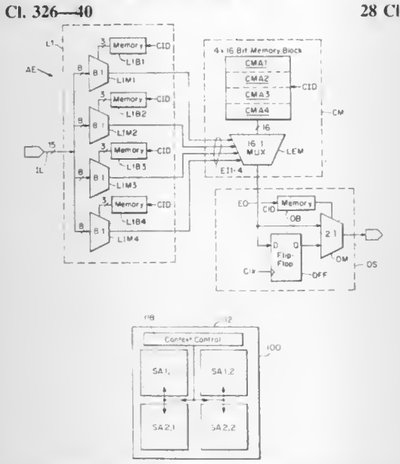
**DYNAMICALLY PROGRAMMABLE GATE ARRAY WITH MULTIPLE CONTEXTS**

**André DeHon, Cambridge; Thomas F. Knight, Jr., Belmont; Edward Tau, Boston; Michael Bolotski, Somerville; Ian Eslick, Cambridge; Derrick Chen, Cambridge, and Jeremy Brown, Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed Feb. 10, 1995, Ser. No. 386,851**

**Int. Cl.[6] H03K** *19/177*

**U.S. Cl. 326—40** **28 Claims**



**1**. An integrated dynamically programmable logic array, comprising:

at least a two dimensional array of programmable logic elements, each one of the logic elements receiving plural input logic signals from plural other logic elements and including locally stored multiple contexts dictating different combinatorial logic operations performed by the logic elements; and

a context signal source that provides a context signal, indicating an active one of the contexts, commonly to the programmable logic elements of the array; and

wherein the contexts for each one of the logic elements are individually accessible so that a new context can be loaded into the logic elements while another context is controlling logic operations of the logic elements.

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**5,742,181**

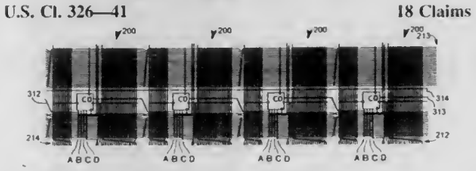
**FPGA WITH HIERARCHICAL INTERCONNECT STRUCTURE AND HYPERLINKS**

**Kenneth Rush, Colorado Springs, Colo., assignor to Hewlett-Packard Co., Palo Alto, Calif.**

**Filed Jun. 4, 1996, Ser. No. 657,990**

**Int. Cl.[6] H03K** *19/177;19/173*

**U.S. Cl. 326—41** **18 Claims**



**1**. A programmable logic device comprising:

a plurality of programmable atomic logic elements (PALEs) wherein each PALE has a plurality of .data inputs and generates a data output signal;

a plurality of leafs wherein each leaf comprises a number ot PALEs and a level one interconnect bus confined within the leaf;

a plurality of blocks wherein each block comprises a number of leafs and a level two interconnect bus confined within the block;

a plurality of sectors wherein each sector comprises a plurality of blocks and a level three interconnect bus confined within the sector;

a first driver within each PALE for driving the data output signal out of the PALE into one or more immediately adjacent PALEs;

a second driver within each PALE for driving the data output signal out of the PALE;

a first programmable hyperlink associated with each PALE coupling the second driver to the level one interconnect bus of one of the leafs;

a second programmable hyperlink associated with each PALE coupling the second driver to the level two interconnect bus of one of the blocks;

a third driver within each PALE for driving the data output signals out of the PALE; and

a third programmable hyperlink associated with each PALE coupling the third driver to the level three interconnect bus of one of the sectors.

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**5,742,182**

**SYMMETRIC SELECTOR CIRCUIT FOR EVENT LOGIC**

**Ivan E. Sutherland, Santa Monica, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.**

**Filed Jun. 13, 1996, Ser. No. 665,154**

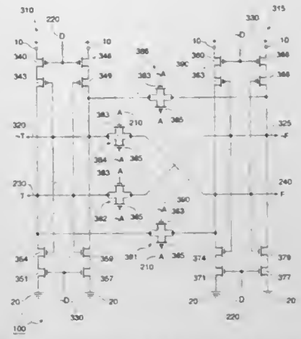
**Int. Cl.[6] H03K** *19/00*

**U.S. Cl. 326—4** **17 Claims**

**1**. A logic element comprising:

a first flip-flop having a first enabled state and a second disabled state, wherein in said second state, a first flip-flop output is placed in a tristate condition, the first flip-flop being coupled to a second flip-flop; and





the second flip-flop having a first disabled state and a second enabled state, wherein in said first state, a second flip-flop output is placed in a tristate condition, wherein data from said first flip-flop is passed to said second flip-flop in said first state, and data from said second flip-flop is passed to said first flip-flop in said second state.

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**5,742,183**

**LEVEL SHIFT SEMICONDUCTOR DEVICE**

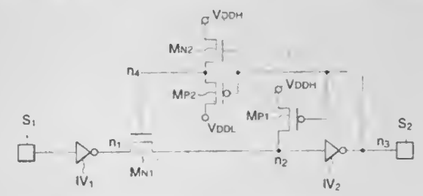
**Tadahiro Kuroda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan**

**Filed Aug. 26, 1996, Ser. No. 702,924**

**Claims priority, application Japan, Aug. 25, 1995, 7-217636**

**Int. Cl.[6] H03K** *19/0185*

**U.S. Cl. 326—81** **7 Claims**



**1**. A level shift semiconductor device, comprising:

a first MOS transistor of a first-conductivity type having a source supplied with an input signal;

an inverter having an input terminal connected to a drain of the first MOS transistor of the first-conductivity type and an output terminal for outputting an output signal;

a first MOS transistor of a second-conductivity type having a drain connected to the input terminal of the inverter and a gate connected to the output terminal of the inverter, the second conductivity type being opposite of the first conductivity type;

a second MOS transistor of the first-conductivity type having a gate connected to the output terminal of the inverter and a source connected to a gate of the first MOS transistor of the first-conductivity type;

a second MOS transistor of the second-conductivity type having a gate connected to the gate of the second MOS transistor of the first-conductivity type and a source connected to the source of the second MOS transistor of the first-conductivity type;

a first voltage supply for supplying a first supply voltage to a drain of the second MOS transistor of the second-conductivity type; and

a second voltage supply for supplying a second voltage to the inverter, a source of the first MOS transistor of the second-conductivity type, and a drain of the second MOS transistor of the first-conductivity type, the second voltage being larger in absolute value than the first voltage.

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**5,742,184**

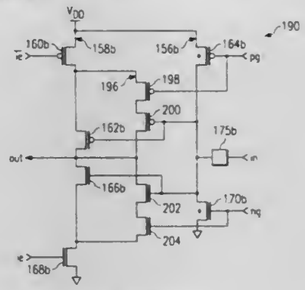
**MICROPROCESSOR HAVING A COMPENSATED INPUT BUFFER CIRCUIT**

**Marvin W. Martinez, Jr., Plano, Tex., assignor to Cyrix Corporation, Richardson, Tex.**

**Filed Feb. 16, 1996, Ser. No. 603,053**

**Int. Cl.[6] H03K** *19/0185;19/0948*

**U.S. Cl. 326—83** **5 Claims**



**3**. An input buffer circuit, comprising:

an input signal line, said input signal line being capable of conducting an input signal;

an output signal line, said output signal line being capable of conducting an output signal;

a voltage source line, said voltage source line being capable of coupling to a voltage source;

a first weak transistor having an input, said first weak transistor being coupled intermediate said voltage source line and said input signal line;

first and second transistors connected in series, one of said first and second transistors being connected to said output signal line, each of said first and second transistors having an input and a size, said first transistor input being coupled to said input signal line, and said second transistor input being coupled to said first weak transistor input;

a third transistor connected in series with said first and second transistors intermediate said voltage source line and the other one of said first and second transistors; and

a fourth transistor connected in parallel with said first and second transistors intermediate said third transistor and said output signal line, said fourth transistor having an input coupled to said input signal line,

wherein said first and fourth transistors are switchable in response to said input signal and said second transistor is switchable in response to a signal on said first weak transistor input.

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**5,742,185**

**DATA BUS DRIVE CIRCUIT FOR SEMICONDUCTOR MEMORY DEVICE**

**Jae Jin Lee, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Ichon, Rep. of Korea**

**Filed Jun. 28, 1996, Ser. No. 670,840**

**Claims priority, application Rep. of Korea, Jun. 30, 1995, 95-18876**

**Int. Cl.[6] H03K** *17/16*

**U.S. Cl. 326—86** **6 Claims**

**1**. A data bus drive circuit for a semiconductor memory device, comprising:

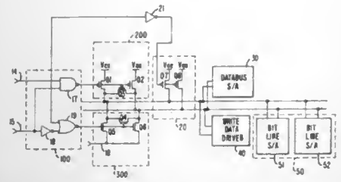
true and complementary data buses for transferring true and complementary data from the outside of the semiconductor memory device or from memory cells in the semiconductor memory device, respectively;

a first control line for inputting an external read/write control signal;

a second control line for inputting an external precharge command signal;

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first switching means for switching a voltage from a first voltage source to said true and complementary data buses in response to the read/write control signal from said first control line;

second switching means for switching a voltage from a second voltage source to said true and complementary data buses in response to the read/write control signal from said first control line; and

demultiplexing means for selectively applying the read/write control signal from said first control line to said first and second switching means in response to the precharge command signal from said second control line.

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**5,742,186**

**ASYNCHRONOUS SERIAL COMMUNICATION CHANNEL NETWORK**

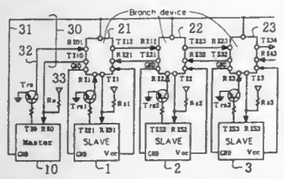
**Akira Nakamura, Kanagawa-ken, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Mar. 26, 1996, Ser. No. 622,092**

**Claims priority, application Japan, Apr. 28, 1995, 7-129108**

**Int. Cl.[6] H03K** *17/16;19/0175*

**U.S. Cl. 326—90** **5 Claims**



**1**. An asynchronous serial communication circuit network, that is connected with a three-wire circuit consisting of a signal ground line and two signal lines using a dispersion and branch system, comprising:

a master that is connected to the three-wire circuit by providing both input and output circuits;

slaves that are connected to the three-wire circuit by providing both input and output circuits; and

branch devices that are provided at the connection between said slaves and the three-wire circuit, and comprise first, second, and third output circuits having an OR circuit and open collector circuit, and first, second, and third input circuits that form pairs with these first, second, and third output circuits, respectively, and are terminated by being connected to an electrical power by means of a terminal resistor.

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**5,742,187**

**DECODER WITH REDUCED ARCHITECTURE**

**Luigi Pascucci, Sesto San Giovanni, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy**

**Filed Nov. 17, 1995, Ser. No. 560,090**

**Claims priority, application European Pat. Off., Nov. 18, 1994, 94830539**

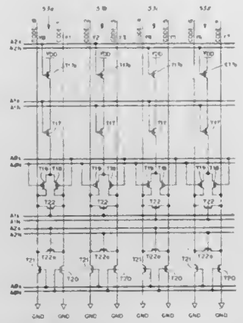
**Int. Cl.[6] H03K** *19/084;19/20*

**U.S. Cl. 326—106** **26 Claims**

**24**. A logic circuit comprising:

a first logic gate;

a second logic gate coupled to the first logic gate, the second logic gate sharing a first plurality of shared transistors with the first logic gate;



a third logic gate; and

a fourth logic gate coupled to the third logic gate, the fourth logic gate sharing a second plurality of shared transistors with the third logic gate, the second plurality of shared transistors being distinct from the first plurality of shared transistors, so that the first and second logic gates are independent of the third and fourth logic gates.

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**5,742,188**

**UNIVERSAL INPUT DATA SAMPLING CIRCUIT AND METHOD THEREOF**

**Leon Li-Feng Jiang, Gaithersburg; Kai Liu, and Dae Sun Kang, both of Germantown, all of Md., assignors to Samsung Electronics., Ltd., Suwon, Rep. of Korea**

**Filed Dec. 10, 1996, Ser. No. 763,123**

**Int. Cl.[6] H03K** *19/92;17/16*

**U.S. Cl. 327—99** **11 Claims**



**1**. A circuit for detecting timing errors and for selecting the correct clock edge for data input sampling, comprising:

a rising edge sampling device for sampling an input data signal at a rising edge of an input clock and generating a first interim data signal;

a falling edge sampling device for sampling the input data signal at a falling edge of the input clock and generating a second interim data signal;

error signal generation means, disposed in each of said rising edge and falling edge sampling devices, for generating an error signal if designated setup time and hold time requirements are not met, said error signal being one of an error-rise or error-fall signal; and

a state machine for receiving the first and second interim signals and the error signal, said state machine having

selection means for automatically outputting the first interim data signal to a logic device if the error-fall signal is detected, and outputting the second interim data signal to the logic device if the error-rise signal is detected.



**5,742,189**

**FREQUENCY CONVERSION CIRCUIT AND RADIO COMMUNICATION APPARATUS WITH THE SAME**

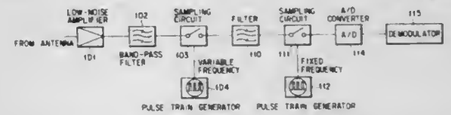
**Hiroshi Yoshida, Yokohama; Miyuki Ogura, Kawasaki; Koji Iino, Tokyo, and Shoji Otaka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Sep. 14, 1995, Ser. No. 528,008**

**Claims priority, application Japan, Sep. 16, 1994, 6-221228**

**Int. Cl.[6] H02M** *5/00*

**U.S. Cl. 327—113** **19 Claims**



**17**. A radio communication equipment comprising:

a first frequency conversion circuit which includes a first sampling circuit for receiving one of a plurality of reception signals of different frequency bands and sampling the one of the reception signals in accordance with a first sampling frequency signal to output a first intermediate frequency signal, and a first sampling signal generator for supplying the first sampling frequency signal to said first sampling circuit, the sampling frequency signal having a frequency determined so that an integer multiple of not less than three times the sampling frequency is outside a frequency range of the first intermediate frequency signal;

a second frequency conversion circuit including a second sampling circuit for sampling the first intermediate frequency signal in accordance with a second sampling frequency signal to output a second intermediate frequency signal, and a second sampling signal generator for outputting the second sampling frequency signal to said sampling circuit, the second sampling frequency signal having a frequency determined so that an integer multiple of not less than three times the second sampling frequency signal is outside a frequency range of the first intermediate frequency signal; and

demodulating means for demodulating the second intermediate frequency signal.

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**5,742,190**

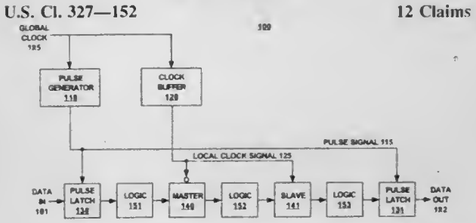
**METHOD AND APPARATUS FOR CLOCKING LATCHES IN A SYSTEM HAVING BOTH PULSE LATCHES AND TWO-PHASE LATCHES**

**Jashojiban Banik, Aloha, and Keng L. Wong, Portland, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Jun. 27, 1996, Ser. No. 670,486**

**Int. Cl.[6] H03L** *7/00*

**U.S. Cl. 327—152** **12 Claims**



**1**. An apparatus for clocking latches in a system, wherein the system includes a data path having both a pulse latch and a two-phase latch, wherein the two-phase latch comprises a first portion and a second portion, the apparatus comprising:

a clock generating circuit for generating a local clock signal based on a global clock signal;

a pulse generating circuit for generating a pulse signal based on the same global clock signal in a complementary manner, resulting in edges of the local clock signal and the pulse signal being synchronized;

a clock signal path for transferring the local clock signal from the clock generating circuit to the first portion and the second portion; and

a pulse signal path for transferring the pulse signal from the pulse generating circuit to the pulse latch.

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**5,742,191**

**D/A FOR CONTROLLING AN OSCILLATOR IN A PHASE LOCKED LOOP**

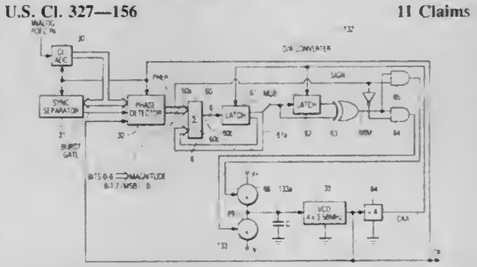
**Eric Douglas Romesburg, Chapel Hill, N.C., and Mark Francis Rumreich, Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**

**PCT No. PCT/US93/11996, § 371 Date Jun. 4, 1996, § 102(e) Date Jun. 4, 1996, PCT Pub. No. WO95/16309, PCT Pub. Date Jun. 15, 1996**

**PCT Filed Dec. 8, 1993, Ser. No. 647,981**

**Int. Cl.[6] H03L** *7/06*

**U.S. Cl. 327—156** **11 Claims**



**1**. A phase locked loop circuit for generating an oscillatory signal phase locked to a synchronizing component signal of an input signal, comprising,

a controllable oscillator for generating said oscillatory signal;

means responsive to said component and oscillatory signal for generating a phase error signal that is indicative of a phase error of said oscillatory signal;

means responsive to said phase error signal for generating a first control signal having pulses at a variable frequency that varies in accordance with a magnitude of said phase error signal; and

a filter responsive to said first control signal for generating a filtered control signal that is coupled to said oscillator for varying a phase of said oscillatory signal.

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**5,742,192**

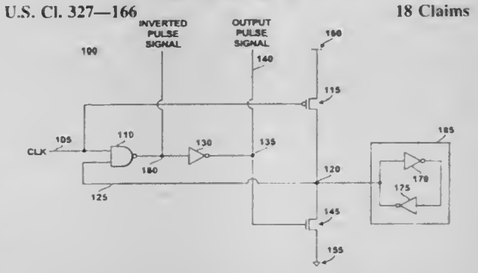
**CIRCUIT FOR GENERATING A PULSE SIGNAL TO DRIVE A PULSE LATCH**

**Jashojiban Banik, Aloha, Oreg., assignor to Intel Corporation, Santa Clara, Calif.**

**Filed Jun. 15, 1995, Ser. No. 491,489**

**Int. Cl.[6] H03K** *5/01*

**U.S. Cl. 327—166** **18 Claims**



**1**. A pulse generating circuit for generating a pulse signal used to drive a pulse latch, the circuit comprising:

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a first portion including,

a logical AND device to receive a control signal and a first signal,

a first transistor having a first terminal to be coupled to a voltage source, a second terminal coupled to the first signal, and a gate terminal coupled to the control signal,

wherein the first portion is operative to generate a rising edge of the pulse signal in response to the control signal transitioning to a first state, and wherein the first portion is also operative to provide the pulse signal to the pulse latch; and

a second portion, coupled to the first portion, operative to receive the rising edge of the pulse signal and to cause the first signal to transition to a second state in response to the rising edge of the pulse signal, the first portion operative to generate a falling edge of the pulse signal in response to the first signal transitioning to the second state.

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**5,742,193**

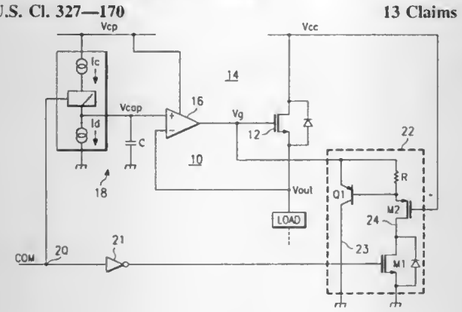
## DRIVER CIRCUIT INCLUDING PRESLEWING CIRCUIT FOR IMPROVED SLEW RATE CONTROL

**Gianluca Colli, Santa Clara, and Massimiliano Brambilla, San Jose, both of Calif., assignors to SGS-THOMSON Microelectronics, Inc., Carrollton, Tex.**

**Filed Oct. 24, 1996, Ser. No. 740,195**

**Int. Cl.[6] H03K** *5/12*

**U.S. Cl. 327—170** **13 Claims**




1. A preslewing circuit, for reducing a gate voltage Vg of a power device of a driver circuit in order to turn off the power device when vg is above the output voltage of the power device, comprising:

a bipolar transistor in a first circuit branch between the power device gate and ground;

a complementary pair of field effect transistors in a second circuit branch between the power device gate and ground, said field effect transistors add said bipolar transistor being integrated within a single circuit chip with the power device;

one of the field effect transistors having a gate terminal connected to receive on-off command signals, the other of the field effect transistors having a gate terminal connected to a power supply; and

circuit means for interconnecting the first and second circuit branches comprising a connection from the second circuit branch to the bipolar transistor of the first circuit branch to turn on the bipolar transistor wherein the first and second circuit branches and the circuit means for interconnecting are arranged such that one of the command signals for an on to off transition initiates conduction between the power device gate and ground to reduce Vg down to a level substantially equal to the maximum power device output voltage, and wherein conduction by both of the field effect transistors causes turn-on of the bipolar transistor.

**5,742,194**

## INTERNAL CLOCK GENERATOR FOR A SYNCHRONOUS DYNAMIC RAM

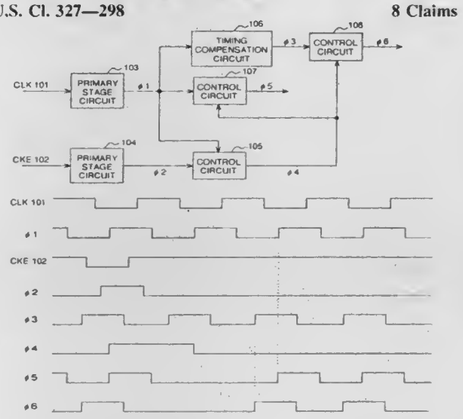
**Takanori Saeki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Mar. 14, 1996, Ser. No. 615,824**

**Claims priority, application Japan, Mar. 14, 1995, 7-053889**

**Int. Cl.[6] H03K** *5/13*

**U.S. Cl. 327—298** **8 Claims**




1. An internal clock generator for a synchronous dynamic RAM comprising:

a first primary stage circuit for receiving an external clock signal and producing a first signal synchronized to said external clock signal;

a second primary stage circuit for receiving a clock enabling signal and producing a second signal synchronized to said clock enable signal;

a first control circuit for generating a control signal from said first signal and said second signal, said control signal becoming logic HIGH with a first rising edge of said first signal during logic HIGH of said second signal and turning to logic LOW with a next first rising edge of said first signal after turning to logic LOW of said second signal;

a timing compensation circuit for generating a phase compensated signal from said first signal, said phase compensated signal being a phase-advanced signal of said first signal; and

a second control circuit for generating a phase-advanced internal clock from said phase compensated signal and said control signal, said phase-advanced internal clock being set and reset, respectively, at each rising and falling edges of said phase compensated signal when said control signal is at logic LOW and setting of said phase-advanced internal clock being inhibited when said control signal is at logic HIGH.

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**5,742,195**

## SEMICONDUCTOR INTEGRATED CIRCUIT WITH MOS TRANSISTORS COMPENSATED OF CHARACTERISTIC AND PERFORMANCE DEVIATIONS AND DEVIATION COMPENSATION SYSTEM THEREIN

**Masayuki Mizuno, and Masakazu Yamashina, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Feb. 2, 1996, Ser. No. 597,582**

**Claims priority, application Japan, Feb. 10, 1995, 7-046484**

**Int. Cl.[6] G06G** *7/12*

**U.S. Cl. 327—362** **27 Claims**

1. A deviation compensation system in a semiconductor integrated circuit including a plurality of pMOS transistors and a plurality of nMOS transistors, the system comprising:

a first power source having a first power source voltage;





a second power source having a second power source voltage;

a third power source having a third power source voltage;

a fourth power source having a fourth power source voltage;

a delay circuit composed of a plurality of basic gates each consisting of one of the pMOS transistors having the third power source voltage as a substrate voltage thereof and one of the nMOS transistors having the fourth power source voltage as a substrate voltage thereof, the delay circuit receiving a signal obtained from a clock signal line, as an input signal thereto, and being operated with a power supply voltage equivalent to a potential difference between the second power source voltage and an output voltage of a voltage converter so that the input signal to the delay circuit is delayed by a predetermined time to be output therefrom;

a phase comparator for outputting a signal depending on a difference between a phase of the signal obtained from the clock signal line and a phase of the signal output from the delay circuit;

a charge pump circuit receiving the signal output from the phase comparator, as an input thereto;

a low-pass filter receiving a signal output from the charge pump circuit, as an input thereto;

the voltage converter generating the output voltage thereof having a potential difference variable relative to the first power source voltage in dependence on a change of a signal output from the low-pass filter;

an internal signal line as a power supply line for source electrodes of remaining ones of the pMOS transistors not having the third power source voltage as a substrate voltage, the internal signal line being supplied with the output voltage of the voltage converter;

a first subsidiary power supply line for substrate electrodes of said remaining pMOS transistors, the first subsidiary power supply line being connected to the third power source; and

a second subsidiary power supply line for substrate electrodes of remaining ones of the nMOS transistors not having the fourth power source voltage as a substrate voltage, the second substrate power supply line being connected to the fourth power source.

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**5,742,196**

## LEVEL-SHIFTING CIRCUIT AND HIGH-SIDE DRIVER INCLUDING SUCH A LEVEL-SHIFTING CIRCUIT

**Robert J. Fronen, Nijmegen, and Johannes P. T. De Vries, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

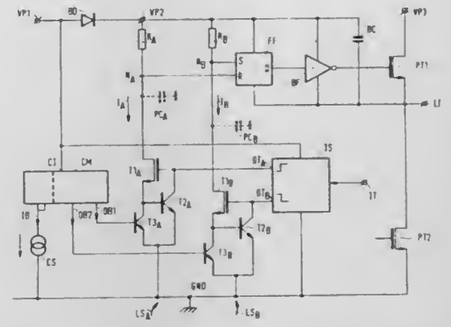
**Filed Apr. 9, 1996, Ser. No. 631,296**

**Claims priority, application European Pat. Off., Apr. 10, 1995, 95200895**

**Int. Cl.[6] H03K** *17/687*

**U.S. Cl. 327—382** **4 Claims**

1. A high-side driver arrangement comprising:




an input stage for supplying complementary first and second drive signals in response to a switching signal;

a set-reset flip-flop having a set input, a reset input and a logic output at which a driver signal is supplied to a high-side switching transistor (PT1) having a main current path coupled to a load terminal (LT);

first and second level-shifting circuit which each comprise a series arrangement of a load resistor, a main current path of an input transistor ($T1_A$/$T1_B$), and a current-conduction element ($T3_A$/$T3_B$); the set and reset inputs of the flip-flop being respectively coupled to the load resistors of the first and second level-shifting circuits; each of the current-conduction elements being a bipolar series transistor having a structure which also forms a parasitic transistor with a small current gain factor; and

a current mirror having an input branch coupled to a bias current source and having two output branches respectively coupled to the bases of the bipolar series transistors ($T3_A$/$T3_B$) of the first and second level-shifting circuits;

whereby in each level-shifting circuit, while the input transistor is non-conductive charge builds up in the collector region of the series transistor connected thereto, which charge is greater with a smaller current gain factor of the associated parasitic transistor and which increases the speed of voltage change across the load resistor when the input transistor is turned on by a drive signal from said input stage.

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**5,742,197**

## BOOSTING VOLTAGE LEVEL DETECTOR FOR A SEMICONDUCTOR MEMORY DEVICE

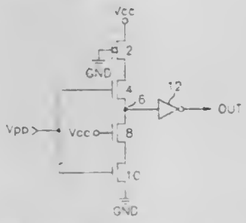
**Hyung-Dong Kim, and Chan-Jong Park, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Nov. 18, 1994, Ser. No. 341,108**

**Claims priority, application Rep. of Korea, Nov. 18, 1993, 24669/1993**

**Int. Cl.[6] G05F** *1/10*

**U.S. Cl. 327—537** **21 Claims**




20. A boosting voltage level detector for a semiconductor memory device which utilizes a power supply voltage and a

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boosting voltage, the level of said boosting voltage intended to be higher than that of said power supply voltage, said detector comprising:

a PMOS transistor having a first electrode coupled to the power supply voltage, a gate electrode coupled to a first reference voltage, and a second electrode;

a first NMOS transistor having a first electrode coupled to said second electrode of said PMOS transistor, a gate electrode coupled to the boosting voltage, and a second electrode coupled to an output node;

a second NMOS transistor having a first electrode coupled to said output node, a gate electrode coupled to a second reference voltage, and a second electrode;

a third NMOS transistor having a first electrode coupled to said second electrode of said second NMOS transistor, a gate electrode coupled to the boosting voltage, and a second electrode coupled to said first reference voltage;

an inverter circuit coupled to said output node, said inverter having a trip point level; and,

wherein said voltage value of said output node rises above said trip point level in response to the boosting voltage rising above a predetermined voltage level that is higher than that of said power supply voltage, and said voltage value of said output node falls below said trip point level in response to the boosting voltage falling below said predetermined voltage level.

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**5,742,198**

**WAVEFORM SHAPING APPARATUS**

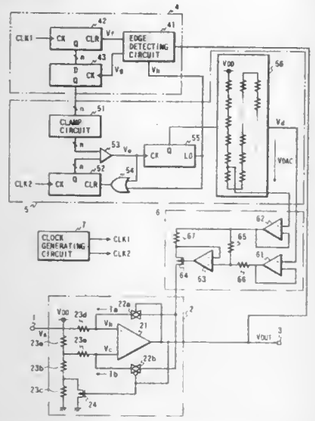
**Masakiyo Horie, Toyohashi, and Takuya Harada, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Jul. 29, 1996, Ser. No. 687,915**

**Claims priority, application Japan, Jul. 28, 1995, 7-193262**

**Int. Cl.[6] H03B** *1/00*

**U.S. Cl. 327—551** **19 Claims**




1. A waveform shaping apparatus comprising:

a comparing means for comparing a sensor signal with a. threshold signal to generate an output signal whose waveform is shaped;

a clock signal generating means for generating a clock signal having a period proportional to a period of the output signal of said comparing means;

a counting means, initialized in synchronism with a change of the output signal of said comparing means, for performing a counting operation of said clock signal generated from said clock signal generating means; and

an offset means for producing an offset signal attenuating in a stepwise fashion from a predetermined signal level in accordance with the counting operation of said counting means, and adding said offset signal to either said sensor signal or said threshold Signal when said sensor signal crosses a signal level of said threshold signal, so as to increase a difference between a level of said sensor signal and a level of said threshold signal.

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**5,742,199**

**FILTER CIRCUIT AND ELECTRONIC APPARATUS**

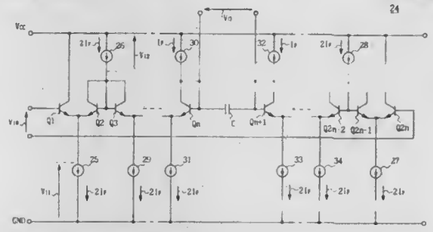
**Norio Shoji, and Katsuyuki Yonezawa, both of Kanagawa, Japan, assignors to Sony Corporation, Japan**

**Filed Jun. 18, 1996, Ser. No. 665,446**

**Claims priority, application Japan, Jun. 21, 1995, 7-179504**

**Int. Cl.[6] H03K** *5/00*

**U.S. Cl. 327—552** **6 Claims**



1. A filter circuit comprising:

a first differential pair composed of a first transistor to which one input signal of a differential input signal is supplied at the base of said first transistor, and a first diode, connected in series to the emitter of said first transistor;

a first current source, provided between the emitter of said first transistor and a first power-supply source, for driving at least said first transistor;

a second current source, provided between said first diode and a second power-supply source, for constantly conducting said first diode;

a second differential pair composed of a second transistor to which a second input signal of said differential input signal is supplied at the base of said second transistor, and a second diode, connected in series to the emitter of said second transistor;

a third current source, provided between the emitter of said second transistor and said first power-supply source, for driving at least said second transistor;

a fourth current source, provided between said second diode and said second power-supply source, for constantly conducting said second diode; and

a capacitor, connected in series to said first and second diodes between the emitters of said first and second transistors, for taking out a signal component in a predetermined band from both ends.

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**5,742,200**

**ENVIRONMENTALLY RUGGED OPTICAL SENSOR WITH IMPROVED NOISE CANCELLATION**

**Gang He, Morristown, N.J., assignor to AlliedSignal Inc., Morristown, N.J.**

**Filed May 14, 1996, Ser. No. 644,996**

**Int. Cl.[6] H03D** *1/00;3/00;* **G01N** *21/00*

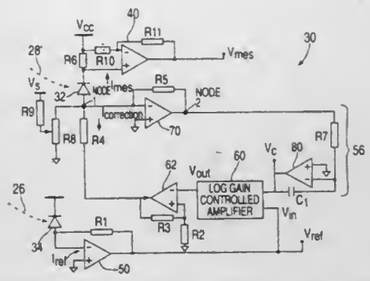
**U.S. Cl. 329—320** **3 Claims**

1. An electronic signal noise cancellation system comprising:

a) a source of measurement current representing information signals impressed on a carrier current signal that is modulated by undersirable noise signals;

b) a source of reference current representing said carrier current signal exclusive of said information signals and modulated by said noise signals;






c) a voltage source generated as a function of said reference current and a feedback control voltage, said voltage source causing the flow of a correction current modulated by said noise signals;

d) combining means for additively combining said measurement current and said correction current in a way which substantially cancels the undesirable noise signals from said measurement current and further produces said feedback control voltage which comprises an output signal containing the information component of said measurement current.

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**5,742,201**

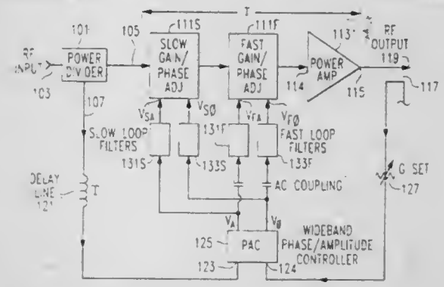
**POLAR ENVELOPE CORRECTION MECHANISM FOR ENHANCING LINEARITY OF RF/MICROWAVE POWER AMPLIFIER**

**John A. Eisenberg, Los Altos; Brian L. Baskin, Cupertino; Charles Stuart Robertson, III, Sunnyvale; Dieter Werner Statezni, Palo Alto; Lance Todd Mucenieks, Boulder Creek, and David Lee Brubaker, Los Altos, all of Calif., assignors to Spectrian, Sunnyvale, Calif.**

**Filed Jan. 30, 1996, Ser. No. 594,089**

**Int. Cl.[6] H03F** *1/32*

**U.S. Cl. 330—2** **12 Claims**




9. A power amplifier circuit comprising:

an input port to which an input signal to be amplified is applied;

an output port from which an output signal is derived;

a first signal path coupled to said input port;

a power amplifier disposed in said first signal path and being operative to amplify said input signal applied to said input port and to provide an amplified output signal at said output port;

a gain and phase adjustment circuit installed in said first signal path and coupled in circuit with said power amplifier;

a second signal path coupled to said input port and being operative to delay a portion of said input signal conveyed thereover; and

a phase/amplitude controller having a first input coupled via a feedback signal path to receive a portion of said amplified output signal and a second input port coupled to receive a delayed portion of said input signal conveyed over said second signal path, and controlling gain and phase adjustments imparted by said gain and phase adjustment circuit to said input signal to be amplified by said power amplifier, in accordance a relationship between the amplitudes and phases of the envelope of the delayed portion of said input signal conveyed over said second signal path and the envelope of said portion of said amplified output signal conveyed over said feedback signal path, so as to maintain constant gain and phase through said power amplifier between said input port and said output port;

and wherein said gain and phase adjustment circuit comprises a slow gain/phase adjuster, connected in cascade with a fast gain/phase adjuster.

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**5,742,202**

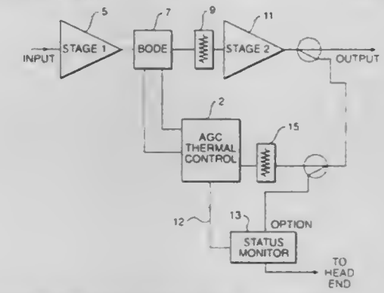
**METHOD AND APPARATUS FOR DYNAMIC AUTOMATIC GAIN CONTROL WHEN PILOT SIGNAL IS LOST**

**Stephan W. Vogt, Lawrenceville, Ga., assignor to Scientific-Atlanta, Inc., Norcross, Ga.**

**Filed May 31, 1996, Ser. No. 651,651**

**Int. Cl.[6] H03F** *3/66;* **H03G** *3/30*

**U.S. Cl. 330—52** **22 Claims**




1. An automatic gain control circuit, comprising:

a gain element controlling a gain of the automatic gain control circuit;

a detector for detecting a pilot signal;

a comparator connected to said detector and comparing the detected pilot signal to a predetermined reference signal;

a switch connected between an output of said comparator and said gain control element, said switch being activated when the output of the comparator indicates that a level of the detected pilot signal falls below a level of said predetermined reference signal; and

a thermal circuit connected to said gain element via said switch, said gain element providing a signal representing an attenuation characteristic of a transmission medium of a system in which said automatic gain control circuit is implemented based on a signal representing a temperature of a housing in which said automatic gain control circuit is disposed, said temperature signal being provided by said thermal circuit and being used by said gain element in place of said pilot signal to control a gain of the automatic gain control circuit.

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**5,742,203**

**GAIN-CONTROLLABLE AMPLIFIER, RECEIVER**

**Rudy J. Van De Plassche, Eindhoven, and Petrus J. G. Van Lieshout, Nijmegen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Oct. 16, 1995, Ser. No. 543,731**

**Claims priority, application European Pat. Off., Oct. 28, 1994, 94203139**

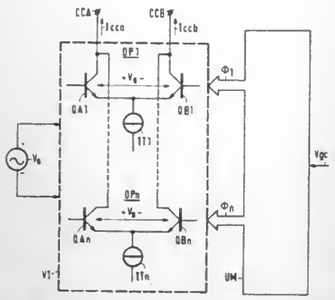
**Int. Cl.[6] H03F** *3/45;* **H03G** *3/30*

**U.S. Cl. 330—254** **11 Claims**

1. A gain-controllable amplifier comprising at least one controllable transadmittance stage formed by a plurality of differential pairs coupled in parallel which have mutually coupled control

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terminals to which an input signal can be applied and which have mutually coupled main current terminals from which an output signal can be taken, characterized in that said gain controllable amplifier comprises means for providing unbalance within said differential pairs as a function of a gain control signal.

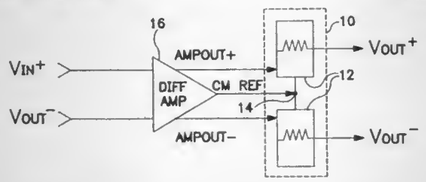
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**5,742,204**

**DIGITALLY PROGRAMMABLE DIFFERENTIAL ATTENUATOR WITH TRACKING COMMON MODE REFERENCE**

**Timothy Arthur Bell, Melbourne Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.**

**Filed Feb. 29, 1996, Ser. No. 608,812**
**Int. Cl.[6] H03F** *3/45*
**U.S. Cl. 330—258** **17 Claims**




1. A differential attenuator for receiving an input which has AC and DC common mode components and for providing an attenuated differential output in which the AC common mode component has been reduced, the differential attenuator comprising:

a voltage divider comprising two resistive elements for providing the attenuated differential output, and a common mode node between said two elements; and

a differential amplifier for receiving the differential attenuator input, for providing a separate differential outer to each of said two elements, and for generating a DC common mode reference which is the same as the DC common mode component in the differential outputs of said differential amplifier, said differential amplifier having a common mode output connected to said common mode node for providing said common mode reference thereto,

whereby the AC common mode component is reduced in the attenuated differential output, and

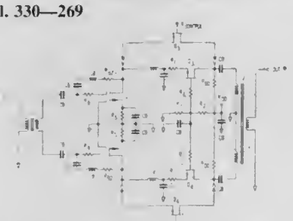
wherein said differential amplifier comprises a difference circuit for generating the separate differential outputs with the common mode components therein and a common mode circuit for generating the DC common mode reference, said difference and common mode circuits having first resistors and first transistors therein which decrease a first supply voltage and which have respectively similar operating characteristics so that the decreases in the first supply voltage are the same.

**5,742,205**

**FIELD EFFECT TRANSISTOR CABLE TELEVISION LINE AMPLIFIER**

**Martin A. Cowen, Lawrenceville, Ga.; Scott R. Siclari, Collegeville, Pa.; Leo J. Thompson, Lilburn, Ga., and Steven Veneman, Joppa, Md., assignors to Scientific-Atlanta, Inc., Norcross, Ga.**

**Filed Jul. 25, 1996, Ser. No. 686,022**
**Int. Cl.[6] H03F** *3/26*
**U.S. Cl. 330—269** **32 Claims**



1. In a cable access television line amplifier, an amplifier circuit having a circuit input and a circuit output, the amplifier circuit comprising:

a first amplifier having a first input and a first output;

a second amplifier having a second input and a second output, the second amplifier being coupled in a push-pull arrangement with the first amplifier;

input circuitry for coupling the circuit input to the first and second inputs; and

output circuitry for coupling the first and second outputs to the circuit output,

wherein the first amplifier includes a first field effect transistor coupled to the first input,

wherein the second amplifier includes a second field effect transistor coupled to the second input,

wherein the first amplifier further includes a third field effect transistor coupled to the first output,

wherein the second amplifier further includes a fourth field effect transistor coupled to the second output;

wherein a fifth field effect transistor is coupled between the first transistor and the first output; and

wherein a sixth field effect transistor is coupled between the second transistor and the second output.

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**5,742,206**

**GAIN CONTROL CIRCUIT AND VARIABLE GAIN POWER AMPLIFIER USING SAME**

**Shinji Ishida, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan**

**Filed Sep. 20, 1996, Ser. No. 717,275**
**Claims priority, application Japan, Sep. 21, 1995, 7-243049**
**Int. Cl.[6] H03G** *3/30*
**U.S. Cl. 330—284** **18 Claims**




1. A gain control circuit for controlling gain of a circuit operative on the basis of a positive supply voltage, in accordance with strength of electric power pulled out by the gain control circuit from a control node of the gain-controlled circuit, comprising:



a depletion-type transistor having one end connected to the control node of the gain-controlled circuit, the other end connected to a voltage supply terminal to which an external supply voltage is applied, and a gate terminal connected to a control signal terminal to which an external positive voltage control signal is applied; and

voltage applying means connected in parallel to both ends of said depletion-type transistor, for shifting a threshold voltage of said transistor in a positive direction by applying a shift voltage between both the ends of said transistor so that turn-on resistance of said transistor can be controlled on the basis of the positive voltage control signal, the gain of the gain-controlled circuit being controlled by controlling strength of electric power pulled out from the gain-controlled circuit on the basis of the positive voltage control signal.

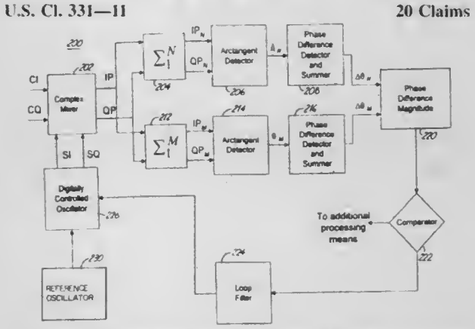
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**5,742,207**

**TRACKING LOOP HAVING INSTANTANEOUS FREQUENCY SHIFT PROTECTION**

**Jeffery C. Rambo, Cedar Rapids, and Thomas W. Laraway, Marion, both of Iowa, assignors to Rockwell International Corporation, Costa Mesa, Calif.**

**Filed Jul. 25, 1996, Ser. No. 687,045**
**Int. Cl.[6] H03L** *7/087*
**U.S. Cl. 331—11** **20 Claims**




1. A tracking loop for maintaining lock on a transmitted signal, comprising:

a mixer having an input signal that represents a processed digital value of the transmitted signal;

an oscillator coupled to the mixer and providing a signal of a predetermined frequency for generating a tuning signal for the tracking loop;

a plurality of phase detectors operating simultaneously at different sampling rates and each coupled to the mixer in such manner as to have the mixer output signal as the input signal for each phase detector;

means for determining the difference between the output values of each phase detector and at least one of the other phase detectors, said means having input ports coupled to the output signal of each detector;

a comparator, coupled to the determining means that evaluates the magnitude of the difference values of said phase detectors to a predetermined threshold value; and

a filter coupled to the comparator for receiving an input signal and the oscillator for providing an input signal to said oscillator;

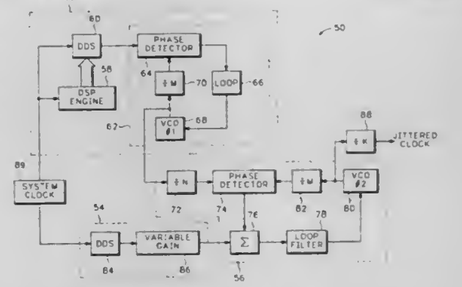
whereby the loop filter is provided an additional input signal if the comparator evaluation indicates that the threshold value is exceeded.

**5,742,208**

**SIGNAL GENERATOR FOR GENERATING A JITTER/WANDER OUTPUT**

**Stephen F. Blazo, Portland, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.**

**Filed Sep. 6, 1996, Ser. No. 709,024**
**Int. Cl.[6] H03B** *29/00*; **H03L** *7/06;7/18*
**U.S. Cl. 331—23** **12 Claims**




1. An signal generator for generating a variable phase/frequency output comprising:

a variable reference oscillator for generating a reference having a varying phase offset over a first phase modulation frequency interval and a constant output over a second phase modulation frequency interval;

a variable oscillator for generating a constant output over the first phase modulation frequency interval and a variable output over the second phase modulation frequency interval; and

a phase locked loop having a phase detector, a phase summing node and oscillator with the phase detector coupled to receive the outputs of the variable reference oscillator and the oscillator, and phase summing node coupled to receive the outputs of the variable oscillator and the phase detector wherein the output of the phase locked loop tracks the variable reference oscillator over the first phase modulation frequency interval and generates a phase modulated output in response to the variable output of the variable oscillator over the second phase modulation frequency interval.

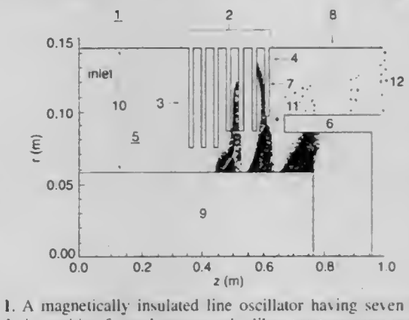
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**5,742,209**

**FOUR CAVITY EFFICIENCY ENHANCED MAGNETICALLY INSULATED LINE OSCILLATOR**

**Raymond W. Lemke; Miles C. Clark, and Steve E. Calico, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jul. 10, 1996, Ser. No. 677,542**
**Int. Cl.[6] H03B** *9/08*
**U.S. Cl. 331—82** **9 Claims**




1. A magnetically insulated line oscillator having seven vanes and six cavities formed upon a tube-like structure surrounding a cathode, comprising:

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a) a primary slow wave structure comprised of four of said vanes and four of said cavities located near a microwave exit end of said tube-like structure, wherein said primary slow wave structure is a four cavity magnetically insulated line oscillator; and

b) an RF choke comprised of three of said vanes and two of said cavities located near a pulsed power source end of said tube-like structure, wherein said RF choke increases feedback in said primary slow wave structure and prevents microwaves generated in said primary slow wave structure from propagating towards said source end.

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**5,742,210**

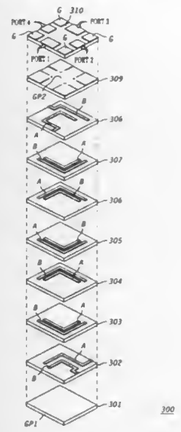
**NARROW-BAND OVERCOUPLED DIRECTIONAL COUPLER IN MULTILAYER PACKAGE**

**Rahul Chaturvedi, and Richard Kommrusch, both of Albuquerque, N. Mex., assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Feb. 12, 1997, Ser. No. 799,516**

**Int. Cl.[6] H01P** *5/18*

**U.S. Cl. 333—116** **20 Claims**




1. A directional coupler, comprising:

a laminated structure including a plurality of dielectric substrates, at least two dielectric substrates including a primary and a secondary transmission line disposed thereon;

the primary transmission line includes an input and an output, and the secondary transmission line includes a coupled output that is about 90 degrees out of phase with respect to the output of the primary transmission line and an isolation output that is connectable to ground;

the primary transmission line and the secondary transmission line are coupled by a combination of edge type coupling and broadside type coupling;

the edge type coupling comprising at least portions of the primary transmission line and the secondary transmission line being substantially parallel with each other on a major surface of one of the dielectric substrates and broadside type coupling comprising at least portions of the primary transmission line and secondary transmission line being substantially vertically aligned through an adjacent dielectric substrate; and

the primary and secondary transmission lines being substantially overcoupled, defining an overcoupled region having an overcoupled center frequency and a high-side half-power cross-over node and a low-side half-power cross-over node, an area in proximity to the high-side half-power cross-over node and the low-side half-power crossover node defining a high-side half-power coupling region and a low-side half-power coupling region, at least one of the high-side half-power coupling region and low-side half-power coupling regions defining a predetermined off-center frequency which is different from the overcoupled center frequency.

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**5,742,211**

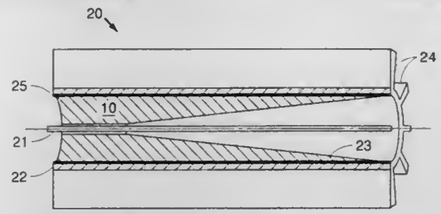
**RADIO-FREQUENCY AND MICROWAVE LOAD COMPRISING A CARBON-BONDED CARBON FIBER COMPOSITE**

**Robert J. Lauf, Oak Ridge; April D. McMillan, Knoxville, both of Tenn.; Arvid C. Johnson, Lake in the Hills, Ill.; Carl A. Everleigh, Raleigh, N.C., and Arthur J. Moorhead, Knoxville, Tenn., assignors to Lockheed Martin Energy Systems, Inc., Oak Ridge, Tenn.**

**Filed Mar. 22, 1996, Ser. No. 620,616**

**Int. Cl.[6] H01P** *1/26;1/22*

**U.S. Cl. 333—22 R** **16 Claims**




1. An RF attenuator comprising at least:

a coaxial transmission line comprising an inner and an outer conductor; and,

a tapered resistive body disposed between said inner and said outer conductors, said resistive body comprised of a carbon-bonded carbon fiber composite having a bulk density less than 2 g/cc, and bulk resistivity greater than 0.2 ohm.cm, and said resistive body maintaining thermal contact with at least one of said conductors.

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**5,742,212**

**HIGH-FREQUENCY SWITCH**

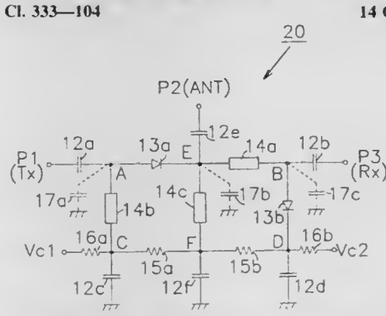
**Mitsuhide Kato, Shiga-ken, and Norio Nakajima, Takatsuki, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan**

**Filed Dec. 5, 1996, Ser. No. 760,523**

**Claims priority, application Japan, Dec. 5, 1995, 7-316724**

**Int. Cl.[6] H01P** *1/15;5/12*

**U.S. Cl. 333—104** **14 Claims**




1. A high-frequency switch having first through third ports wherein the second port can be connected either to the first port or to the third port, said high-frequency switch comprising:

a series circuit formed of a first transmission line and a first diode which is connected between the first and third ports;

a second transmission line connected between a reference potential and a node between the first port and said first diode;

a second diode connected between a reference potential and a node between the third port and said first transmission line;



a series circuit formed of first and second resistors connected between a node between said second transmission line and the reference potential, and a node between said second diode and the reference potential;

a first control voltage terminal connected to one end of said first resistor; and

a second control voltage terminal connected to one end of said second resistor,

wherein a node between said first diode and said first transmission line is connected to a node between said first and second resistors and to said second port.

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**5,742,213**

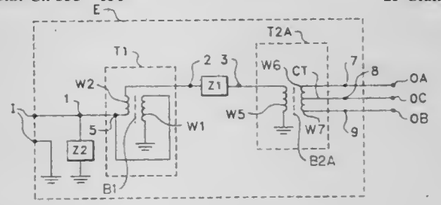
**UNBALANCED TO BALANCED HIGH IMPEDANCE RATIO WIDEBAND TRANSFORMER CIRCUIT**

**Robert L. Reynolds, Platteville, Colo., assignor to Vari-L Company, Inc., Denver, Colo.**

**Continuation-in-part of Ser. No. 527,861, Sep. 14, 1995, Pat. No. 5,619,172. This application Nov. 25, 1996, Ser. No. 755,705**

**Int. Cl.[6] H03H** *7/46;7/42*

**U.S. Cl. 333—131** **25 Claims**




1. A high impedance ratio wideband transformer circuit comprising:

transmission line transformer means having a first port and a second port, said transmission line transformer means including first and second transformers,

said first transformer being a transmission line transformer having a first primary winding and a first secondary winding inductively coupled to said first primary winding,

said second transformer being a transmission line transformer having a second primary winding and a second secondary winding that provides a balanced output, said second secondary winding inductively coupled to said second primary winding,

said first and second transformers connected in series so that the impedance ratio of said first transformer is multiplied by the impedance ratio of said second transformer to reduce the length of said first and second secondary windings of said transformers thereby increasing the range of frequency,

a first reactive impedance connected between said first secondary winding and said second primary winding,

a second reactive impedance connected at said first port with the values of said first and second reactive impedances being selected to optimize an impedance match from said first port to said second port for a selected turns ratio of said transmission line transformer means and a desired transformation ratio and frequency response to provide transformation ratios of above about 4:1 over a range of frequencies of about 10 MHz to 1.6 GHz.

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**5,742,214**

**DIELECTRIC FILTER HAVING OBLIQUELY ORIENTED STEPPED RESONATORS**

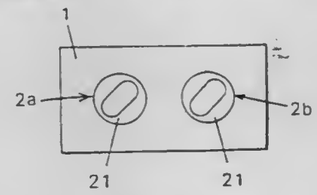
**Jun Toda, Ishikawa-ken, and Haruo Matsumoto, Kanazawa, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto-fu, Japan**

**Filed Mar. 6, 1996, Ser. No. 612,027**

**Claims priority, application Japan, Mar. 8, 1995, 7-048664**

**Int. Cl.[6] H01P** *1/20*

**U.S. Cl. 333—202** **4 Claims**




1. A dielectric filter comprising a dielectric block having a thickness direction, a width direction and a length direction, a plurality of resonator cavities in said dielectric block arranged along said length direction, a respective inner conductor on a corresponding surface of each of said resonator cavities and an outer conductor on an outer surface of said dielectric block, at least one of said resonator cavities being stepped, said at least one resonator cavity comprising a large inner-diameter portion, a small inner-diameter portion and a step portion between said large and small inner-diameter portions, said large inner-diameter portion and said small inner-diameter portion of the at least one stepped resonator cavity having different respective cross-sectional shapes; wherein one of said large and small inner-diameter portions of the at least one stepped resonator cavity has an elongated cross-sectional shape; wherein said inner-diameter portion of the at least one stepped resonator cavity with elongated cross-sectional shape has a longest diameter extending obliquely with respect to said thickness direction and said width direction of said dielectric block.

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**5,742,215**

**TRANSMISSION LINE FILTER HAVING A SWITCHING FUNCTION**

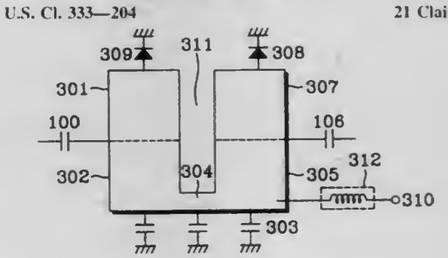
**Joung-Kyou Park, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**

**Filed Jul. 19, 1996, Ser. No. 684,245**

**Claims priority, application Rep. of Korea, Jul. 21, 1995, 21625/1995**

**Int. Cl.[6] H01P** *1/203;1/10*

**U.S. Cl. 333—204** **21 Claims**




1. A transmission line filter having a switching function, comprising: an inputting unit resonator and an outputting unit resonator,

said inputting unit resonator having a conducting strip connected to receive an input signal at a first portion thereof, a first open stub on a first side of said first portion, a second open stub on a second side of said first portion opposite said first side, with said first open stub connected to ground through at least one capacitor;

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said outputting unit resonator having a conducting strip with a first section connected to provide an output signal, a third open stub on a first side of said first section and a fourth open stub on a second side of said first section, said third open stub is connected to ground through at least one capacitor;

said filter further comprising:

(i) a central conducting strip connecting said inputting unit resonator to said outputting unit resonator such that said inputting unit resonator, said central conducting strip and said outputting unit resonator together form a continuous conducting path;

(ii) a first switch coupled between said second open stub and ground;

(iii) a second switch coupled between said fourth open stub and ground; and

(iv) means for selectively applying a DC bias to said switches to selectively turn said switches on or off;

wherein when said switches are in a first switching state, the transmission line filter acts as a bandpass filter and when said switches are in a second switching state, said transmission line filter exhibits a high insertion loss in a passband of the bandpass filter.

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**5,742,216**

**CONTACT MAKING AND BREAKING DEVICE AND SYSTEM FOR MEASURING LOW CURRENT**

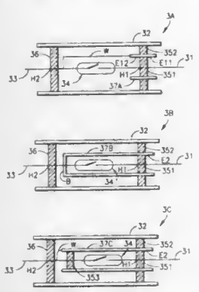
**Yuko Iwasaki; Susumu Takagi, and Hideyuki Norimatsu, all of Tokyo, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Apr. 2, 1996, Ser. No. 626,790**

**Claims priority, application Japan, Apr. 5, 1995, 7-104720**

**Int. Cl.[6] H01H** *1/66*

**U.S. Cl. 335—151** **8 Claims**



1. A contact making and breaking device, comprising:

a reed switch including two terminals, a first signal wire connected to a first of said terminals and a second signal wire connected to a second of said terminals;

an external conductive casing;

insulating means positioned between said first signal wire and the external conductive casing;

a tubular conductor positioned in the insulating means and between said first signal wire and the external conductive casing for decoupling said first signal wire from said external conductive casing; and

means for electrically connecting the tubular conductor to the second signal wire.

**5,742,217**

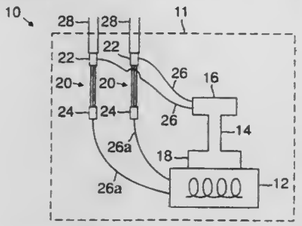
**HIGH TEMPERATURE SUPERCONDUCTOR LEAD ASSEMBLY**

**Bruce R. Bent, Scituate; Anthony J. Rodenbush, Marlborough, and William E. Brockenborough, Brighton, all of Mass., assignors to American Superconductor Corporation, Westborough, Mass.**

**Filed Dec. 27, 1995, Ser. No. 579,304**

**Int. Cl.[6] H01F** *1/00*

**U.S. Cl. 335—216** **20 Claims**



1. A high temperature superconductor lead assembly for carrying current to a superconductor device, comprising:

a superconductor,

a first lead connector bonded to a first end of said superconductor, said lead connector including a mount for attachment to a mechanical cryocooler for cooling said connector, and

a second lead connector bonded to a second end of said superconductor, said second lead connector including a mount for attachment of said lead connector to a superconductor magnet, said superconductor magnet being at a lower temperature than a temperature at a point of attachment of said cryocooler to said first lead connector.

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**5,742,218**

**FLYBACK TRANSFORMER**

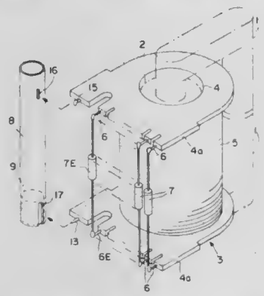
**Soji Yamaguchi, Shiga-ken, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan**

**Filed Feb. 26, 1996, Ser. No. 606,943**

**Claims priority, application Japan, Feb. 27, 1995, 7-038044**

**Int. Cl.[6] H01F** *27/40;* **H02M** *7/06*

**U.S. Cl. 336—192** **12 Claims**



1. A flyback transformer comprising:

a bobbin, including jaw sections, of a high-voltage coil section of said flyback transformer;

mounting pins for mounting electrical components, said mounting pins protruding from each of said jaw sections of said bobbin;

a holder for holding an anode lead and housing at least one of an electrically conductive rubber and a connection fitting at one end thereof, said holder being positioned and secured to said bobbin; and

a connection pin having a male-contact shape protruding from one of said jaw sections, said connection pin being inserted into and held by one of said electrically conductive rubber and said connection fitting housed in said holder,



wherein one of said mounting pins serves as the anode end of said high-voltage coil section and is electrically connected to said one of said electrically conductive rubber and said connection fitting through said connection pin.

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**5,742,219**

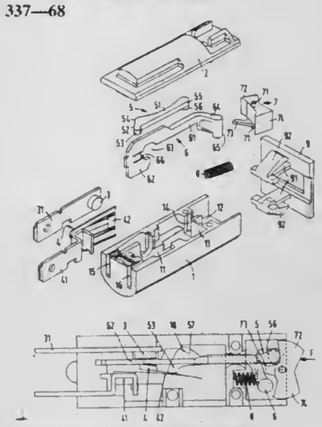
**SWITCHABLE CIRCUIT BREAKER**

**Fred Moalem, Shelton, Conn., and John R. Joyce, Jr., Haubstadt, Ind., assignors to Siemens Electromechanical Components, Inc., Princeton, Ind.**

**Filed Apr. 28, 1994, Ser. No. 234,750**

**Int. Cl.[6] H01H** *71/16*

**U.S. Cl. 337—68** **22 Claims**



1. A switchable circuit breaker comprising:

a housing;

a pair of contacts disposed within said housing;

switching means for actuating said contacts to assume a first condition in which said contacts are open and a second condition in which said contacts are allowed to close; and

breaker means disposed within said housing to interrupt current flow through said contacts in response to said current flow exceeding a predetermined level and in response to actuation of said switching means to open said contacts,

said switching means including a pusher member, having a front active end and a rear drive end, that is arranged in said housing so as to be movable between an advanced position in which said active end acts on said contacts to assume said first condition and a retracted position in which said pusher member releases the contacts to assume said second condition,

said pusher member being guided within said housing so as to convert a linear motion of its drive end into a step-like motion of its active end in order to provide a snapping transition between said closing and opening conditions and vice versa of the contacts.

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**5,742,220**

**HANDLING TOOL FOR OVERHEAD-MOUNTED DEVICES**

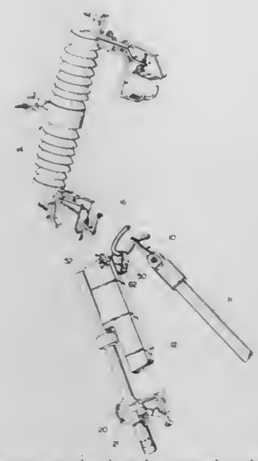
**Henry W. Scherer, Gurnee, Ill., assignor to S&C Electric Company, Chicago, Ill.**

**Filed Mar. 15, 1995, Ser. No. 404,686**

**Int. Cl.[6] H01H** *71/10;* **B25B** *23/16*

**U.S. Cl. 337—171** **8 Claims**

1. A handling-tool fitting for devices having a handling loop of predetermined width, the handling tool comprising a first portion including means for attachment to a pole and defining an axis, a second portion of generally circular cross-section extending from said first portion and including a substantially straight section having an orientation that is substantially perpendicular to said axis and having an expanse that is at least equal to the predetermined width of the handling loop, and a third portion of generally circular cross-section extending from said second portion and including a section defined by a curvature and an angle of inclination with respect to said second section, said curvature being inward with respect to said second section and said angle of inclination being upward with respect to said second portion and said first portion.



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**5,742,221**

**ELECTRIC POWER DISCONNECTION APPARATUS FOR MICROWAVE OVEN**

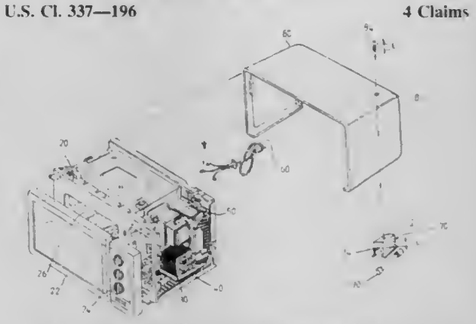
**Yoon Gun Baeg, Kyungsangnam-Do, Rep. of Korea, assignor to LG Electronics, Inc., Seoul, Rep. of Korea**

**Filed Oct. 15, 1996, Ser. No. 730,232**

**Claims priority, application Rep. of Korea, Oct. 16, 1995, 1995/28973**

**Int. Cl.[6] H01H** *85/143*

**U.S. Cl. 337—196** **4 Claims**



1. An electric power disconnection apparatus for a microwave oven, comprising:

an outer casing covering the upper portion and both sides of a frame;

a fuse holder having a fuse insertion groove formed in a lower portion of the fuse holder and fixed to the outer casing, with a fuse being detachably inserted into the fuse insertion groove; and

a noise filter connected to the frame of the microwave oven, having a plurality of power terminals formed on the surface thereof and a pair of spaced-apart fuse contact members, with the noise filter serving to prevent a noise generated inside the frame, with the both ends of the fuse electrically contacting with the fuse contact portions of the fuse contact members.

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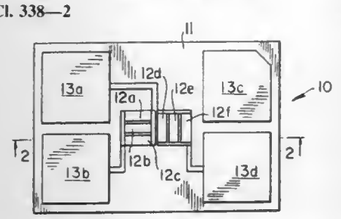


5,742,222

## DIRECT ADHERING POLYSILICON BASED STRAIN GAGE

Thomas M. Young, Oakland, and Pierre R. Irisson, Sunnyvale, both of Calif., assignors to AVI Systems, Inc., Oakland, Calif.

Filed May 26, 1995, Ser. No. 451,670
Int. Cl.[6] G01L *1/22*
U.S. Cl. 338—2 21 Claims




1. A semi-conductor strain gage for directly adhering to and for operably connecting with, a system being measured, said strain gage comprising:

an inert substrate having a first surface portion and a second surface portion, the second surface portion being metallized with a thin layer of metal, the second surface portion providing a surface for soft solder attachment of the strain gage to the system;

a thin polysilicon layer deposited on the first surface portion;

a half bridge strain gage pattern etched from the thin polysilicon layer of the first surface portion of the inert substrate.

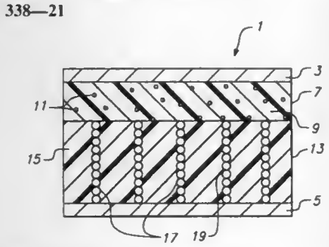
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5,742,223

## LAMINAR NON-LINEAR DEVICE WITH MAGNETICALLY ALIGNED PARTICLES

William H. Simendinger, III; Charles A. Boyer, both of Raleigh, and Rudolf R. Bukovnik, Chapel Hill, all of N.C., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 7, 1995, Ser. No. 568,716
Int. Cl.[6] H01C *7/10*
U.S. Cl. 338—21 17 Claims




1. An electrical device which comprises

(A) a first laminar resistive element which (a) comprises a first surface and a second surface, and (b) is composed of a first electrically non-linear composition which (i) has a resistivity at 25° C. of more than $10^9$ ohm-cm and (ii) comprises

(1) a first polymeric component, and

(2) a first particulate filler dispersed in the first polymeric component;

(B) a second laminar resistive element which (a) comprises a third surface and a fourth surface, said third surface being in physical and electrical contact with the second surface of the first element, and (b) is composed of a second composition which (i) has a resistivity of less than 100 ohm-cm and (ii) comprises

(1) a second polymeric component, and

(2) a second particulate filler which (a) is magnetic and electrically conductive, and (b) is aligned in discrete regions in the second polymeric component in planes which are perpendicular to the first element;

(C) a first electrode which is in contact with the first surface; and

(D) a second electrode which is in contact with the fourth surface so that current can flow between the electrodes through the first element and the second element.

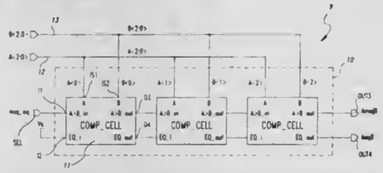
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5,742,224

## BASIC CELL FOR COMPARING A FIRST AND A SECOND DIGITAL SIGNAL AND A CORRESPONDING DIGITAL COMPARATOR

Paolo Gadducci, Bareggio, Italy; David Moloney, Dublin, Ireland; Francesco Brianti, Piacenza, and Valerio Pisati, Bosnasco, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Jun. 28, 1996, Ser. No. 675,772
Claims priority, application European Pat. Off., Jun. 30, 1995, 95830278
Int. Cl.[6] G06F *7/02*
U.S. Cl. 340—146.2 27 Claims




1. A one-bit digital comparator unit for comparing first and second digital signals, comprising:

a comparison logic circuit having a comparison output, and first and second inputs for respectively receiving the first and second digital signals;

an inequality input and inequality output;

an equality input and equality output;

a first transmission gate connected between the inequality input and the inequality output, the first transmission gate being operable to pass the logic value at the inequality input onto the inequality output in response to the comparison output;

a second transmission gate connected between the equality input and the equality output, the second transmission gate being operable to pass the logic value at the equality input onto the equality output in response to the comparison output; and

an output circuit having first and second inputs respectively connected to the first and second inputs of the comparison logic circuit, the output circuit having an output connected to the inequality output.

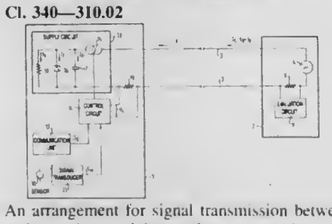
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5,742,225

## ARRANGEMENT FOR SIGNAL TRANSMISSION BETWEEN A TRANSMITTING STATION AND A RECEIVING STATION

Gustav Wetzel, Lörrach, and Jürgen Meier, Maulburg, both of Germany, assignors to Endress + Hauser GmbH + Co., Maulburg, Germany

Filed May 1, 1996, Ser. No. 637,925
Claims priority, application European Pat. Off., May 24, 1995, 95108008
Int. Cl.[6] H04M *11/04*
U.S. Cl. 340—310.02 6 Claims



1. An arrangement for signal transmission between a transmitting station and a receiving station connected to each other by a two-wire line, via which, on the one hand, the supply current required for operating said transmitting station is transmitted from said receiving station to said transmitting station and via which, on the other hand, an analog signal current variable between two limit values is transferred from said transmitting station to said receiving station, which signal current is composed of said supply current for said transmitting station and a supplementary current determined by said transmitting station, and which signal current is superimposed by a symmetrical communication current for the transfer of communication information between said transmitting station and said receiving station, wherein said transmitting station comprises a supply circuit which includes a voltage regulator for maintaining the operating voltage of said transmitting station constant and an energy store for compensating current and/or voltage fluctuations, and wherein said communication current is superimposed in said transmitting station on the current flowing from said two-wire line into said supply circuit.



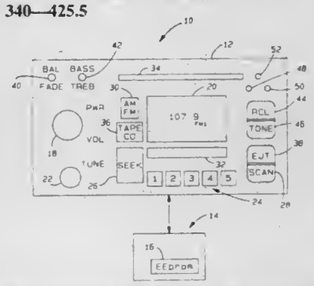
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5,742,226

## SIMPLE THEFT DETERRENT FOR ELECTRONIC CONTROL MODULES

Ronald Julius Szabo, Noblesville, and Dan Darryl Carman, Russiaville, both of Ind., assignors to Delco Electronics Corporaiton, Kokomo, Ind.

Filed Jul. 5, 1994, Ser. No. 270,357
Int. Cl.[6] B60Q *1/00*
U.S. Cl. 340—425.5 26 Claims




1. A method of activating and deactivating a theft guard system that deters theft of an electronic device, said method comprising the steps of:

setting a predetermined theft guard state, said theft guard state being set by a first control of the device, said first control being used in the normal operation of the device that is unrelated to the theft guard system during the normal operation of the device such that the theft guard state is a normal state of the device during the normal operation of the device; and

activating a theft guard condition, said step of activating a theft guard condition including activating a second control of the device, said second control being used in the normal operation of the device and being unrelated to the theft guard system during the normal operation of the device, said step of activating a theft guard condition further including storing the theft guard state in a memory to provide a stored theft guard state, said step of activating the theft guard condition further including at least partially disabling the electronic device.

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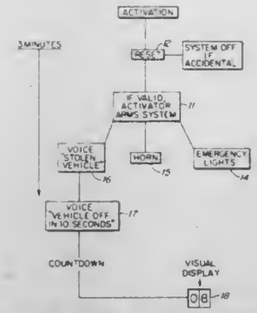
5,742,227

## SYSTEM AND METHOD FOR VEHICLE THEFT PREVENTION AND RECOVERY

Joe Escareno, #382, 17350 E. Temple Ave., La Puente, Calif. 91744, and Manny Argomaniz, 5383 Yale St., Montclair, Calif. 91763

Filed May 3, 1996, Ser. No. 642,791
Int. Cl.[6] B60R *25/10*
U.S. Cl. 340—426 18 Claims

1. A vehicle theft prevention and recovery system comprising:




pager means at the vehicle to receive a telephonic signal and to initiate a radio signal with digital modulation for digital data readout formatted to provide predetermined formats,

activator means for receiving said formatted digital data from the pager means and transmit respective digital formats to respective actuators to actuate at least means for providing a count-down warning of vehicle disablement to an occupant of the vehicle, and means for disabling the vehicle engine a predetermined time after the means for disabling is activated.

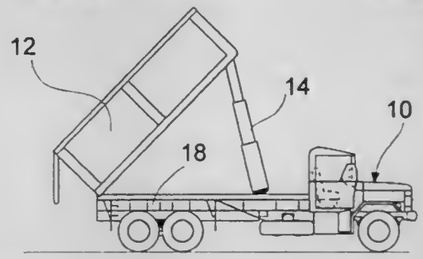
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5,742,228

## SYSTEM FOR PREVENTING TIPPER TRUCK OVERTURNING

Nisim Levy, Kiryat Tivon, Israel, assignor to Litan Advanced Instrumentation Ltd., Nesher, Israel

Continuation-in-part of Ser. No. 352,149, Dec. 1, 1994, abandoned. This application Sep. 4, 1996, Ser. No. 707,560
Claims priority, application Israel, Dec. 24, 1993, 108170
Int. Cl.[6] B60R *25/10*
U.S. Cl. 340—429 16 Claims




1. A system for preventing the overturning of a tipper truck during the raising of a bin for purposes of unloading, the system comprising:

(a) a lateral level sensor associated with the tipper truck generating an output indicative of the lateral orientation of the tipper truck;

(b) a longitudinal level sensor associated with the bin of the tipper truck generating an output indicative of the longitudinal inclination of the bin;

(c) a processor for processing said outputs of said lateral and longitudinal level sensors to derive a measure of risk of overturning based on said inputs from both said lateral and longitudinal level sensors; and

(d) means for displaying an indication responsive to said measure of risk.

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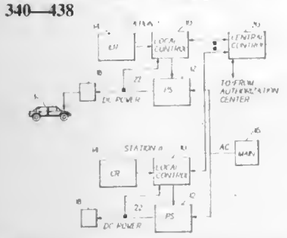


**5,742,229**

## METHODS AND APPARATUS FOR DISPENSING A CONSUMABLE ENERGY SOURCE TO A VEHICLE

**Harry F. Smith, Newtown, Conn., assignor to Intellectual Property Development Associates of Connecticut, Inc., Trumbull, Conn.**

**Continuation of Ser. No. 66,967, May 25, 1993, Pat. No. 5,327,066. This application Jun. 3, 1994, Ser. No. 253,983**
**Int. Cl.[6] B60Q *1/00***
**U.S. Cl. 340—438** **20 Claims**




1. Apparatus for dispensing a consumable energy source to a vehicle, comprising:

energy source input means adapted for coupling to the vehicle for inputting a consumable energy source into the vehicle; and

communication means coupled to said input means and adapted for at least receiving information from a corresponding communication means that is located upon or within the vehicle, the information being transferred from a memory means that is located within the vehicle, said memory means storing information representing at least a user-generated message and a destination for said user generated message, said communication means including means for transmitting information to said vehicle communication means for indicating that a user-generated message was delivered to a destination associated with said message.

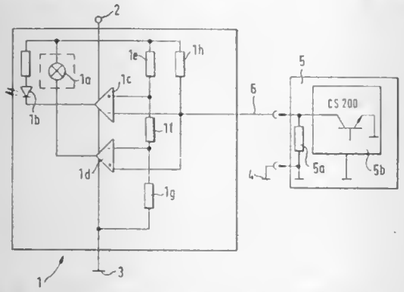
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**5,742,230**

## APPARATUS FOR TRIGGERING A WARNING DEVICE

**Karl-Friedrich Kühner, Ilsfeld; Thomas Beitler, Plochingen; Thomas Schneider, Markgröningen, and Gerhard Walter, Gerlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**PCT No. PCT/DE94/00992, § 371 Date May 13, 1996, § 102(e) Date May 13, 1996, PCT Pub. No. WO95/06928, PCT Pub. Date Mar. 9, 1995**
**PCT Filed Aug. 27, 1994, Ser. No. 604,934**
**Claims priority, application Germany, Sep. 1, 1993, 9313129 U; Nov. 22, 1993, 9317810 U**
**Int. Cl.[6] B60Q *1/00***
**U.S. Cl. 340—439** **11 Claims**




1. An apparatus for triggering a vehicle warning device, the warning device being coupled to a control unit of on-board controller, the apparatus comprising:

at least one comparator coupled to the control unit and to the warning device, the at least one comparator having a first input receiving one of a first comparison voltage and a second comparison voltage, a second input receiving a second voltage and an output coupled to the warning device, the at least one comparator becoming conductive when one of the second voltage is less than the first comparison voltage and the second voltage is greater than the second comparison voltage; and

wherein when a fault occurs in the on-board controller, a ground signal is applied to the at least one comparator via the control unit, the output of the at least one comparator providing the ground signal to the warning device, the on-board controller controlling one of a braking pressure, an engine torque and steering as a function of a movement of the vehicle.

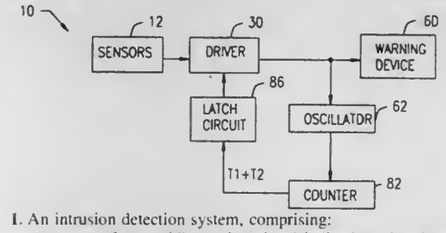
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**5,742,231**

## INTRUSION DETECTION SYSTEM

**Louis Kolodin, 208 Rabbit Run Rd., Cherry Hill, N.J. 08003**

**Filed Jul. 16, 1996, Ser. No. 680,670**
**Int. Cl.[6] G08B *13/00***
**U.S. Cl. 340—541** **20 Claims**




1. An intrusion detection system, comprising:

sensor means for providing a first signal indicative of an intrusion and a second signal indicative of an absence of the intrusion; and

alarm control means coupled to said sensor means including an oscillator coupled to a counter, wherein said oscillator is normally in a "static" state where said oscillator is turned off and does not provide an oscillation signal, said control means responsive to said first signal to activate said oscillator and counter in a first interval (T1) during which said first signal remains indicative of an intrusion and to lock said sensing means in a second interval (T2) indicative of a continuous alarm condition, said control means for further resetting said sensor means in said continuous alarm condition after said second interval.

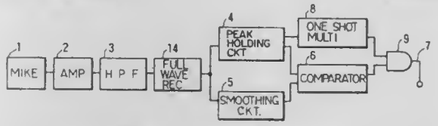
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**5,742,232**

## GLASS BREAKING DETECTION DEVICE

**Akira Kurahashi, Nukata-gun, and Toshio Hayashi, Anjou, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Jul. 17, 1995, Ser. No. 503,047**
**Claims priority, application Japan, Jul. 18, 1994, 6-188842**
**Int. Cl.[6] G08B *13/00***
**U.S. Cl. 340—550** **4 Claims**




1. A glass breaking detection device comprising:

converting means for converting a glass breaking sound into an electric signal;

a high pass filter which cuts off a signal having a frequency less than a predetermined frequency of said electric signal; and

breaking determination means for determining said glass breaking in response to attenuation characteristics of said first impact wave included in an output signal of said high pass filter, wherein the determination is based on a relative comparison with respect to the level of said first impact wave and an elapsed time after detecting said first impact wave, said breaking determination means including:

largest peak detection means for detecting a largest peak value of a signal voltage of said first impact wave;

latest peak detection means for detecting a latest peak value against an elapsed time among many peaks included in said first impact wave; and

signal level determination means for determining the glass breaking occurrence when said latest peak value detected by said latest peak detection means falls below a level defined as a predetermined fraction of said largest peak value within a predetermined time period after said largest peak value is detected by said largest peak detection means.



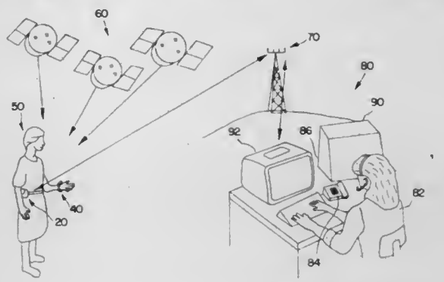
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**5,742,233**

## PERSONAL SECURITY AND TRACKING SYSTEM

**Mark S. Hoffman; Judd A. Hoffman, both of Medfield; Ann Hoffman, Stoughton, and David G. Doe, Walpole, all of Mass., assignors to Hoffman Resources, LLC, Walpole, Mass.**

**Filed Jan. 21, 1997, Ser. No. 786,411**
**Int. Cl.[6] G08B *23/00***
**U.S. Cl. 340—573** **22 Claims**




1. A personal security and tracking system that provides a reliable personal alarm system for an individual to be monitored, the system comprising:

(a) a portable signaling unit capable of generating one or more priority levels of alarm signal data,

(b) a remote alarm switch unit functionally related to the portable signaling unit such that the remote alarm switch unit transmits a periodic signal to the portable signaling unit and such that, when the remote alarm switch unit is in a non-triggered state, it does not cause alarm signal data to be generated by the portable signaling unit and, when the remote alarm switch unit is in a triggered state, it does cause the alarm signal data to be generated by the portable signaling unit, the triggered state being caused by a triggering condition,

(c) means for the portable signaling unit to identify its geographical location,

(d) a central dispatch station capable of receiving and interpreting the alarm signal data generated by the portable signaling unit and having

(i) a human operator, capable of determining by analyzing the data received from the portable signaling unit to determine the priority level of the alarm signal data and the location of the individual being monitored,

(ii) a computer system capable of interpreting, validating, and storing all the alarm signal data received from the portable signaling unit at the central dispatch station and account data entered into the system,

(iii) means to enable the central dispatch station operator to identify the origination location of the alarm signal data,

(iv) means to make available to the dispatch operator all validated data received at the central dispatch station together with any stored information, and

(v) means for displaying the type of alarm and the location of the individual in a convenient format, part of which will display the individual's location on a digitized map, all of which will allow efficient dispatching of appropriate emergency assistance to the exact location of the individual in distress in possession of the signaling unit,

(e) means for data and voice communications between the portable signaling unit and the central dispatch station,

wherein the triggering condition causes the remote alarm switch unit to instruct the portable signaling unit to generate an alarm signal that will be transmitted to the central dispatch station by the data and voice communications means.

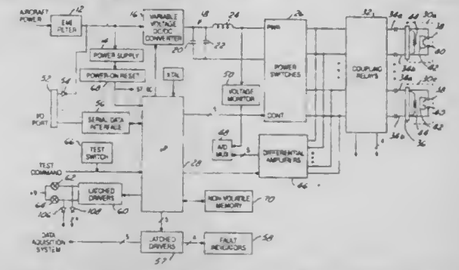
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**5,742,234**

## PARTICLE DETECTION AND DESTRUCTION IN FLUID SYSTEMS

**Allan B. Owen, Exton, Pa., assignor to Vickers, Inc., Maumee, Ohio**

**Filed Feb. 28, 1995, Ser. No. 395,845**
**Int. Cl.[6] G08B *17/00***
**U.S. Cl. 340—631** **52 Claims**




1. Apparatus for monitoring particles in fluid systems comprising:

a detector for positioning in a fluid system and having electrical contacts to be bridged by particles in such system,

means coupled to said detector for detecting presence of a particle bridging said contacts,

first energy storage means for storing electrical energy,

means for establishing a preselected level of electrical energy needed to be stored at said first energy storage means to burn off particles at said detector, and

control means responsive to said detecting means for first storing said preselected level of electrical energy on said first storage means upon detection of a particle at said detector and then discharging said preselected level of energy into said detector across said contacts to burn off particles detected by said detecting means bridging said contacts.

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**5,742,235**

## VERTICAL, UNIDIRECTIONAL SEISMIC SWITCH

**John Andrew Miché , 1405 S. 58th St., Richmond, Calif. 94804**

**Filed Jul. 21, 1995, Ser. No. 505,705**
**Int. Cl.[6] G08B *21/00***
**U.S. Cl. 340—690** **12 Claims**

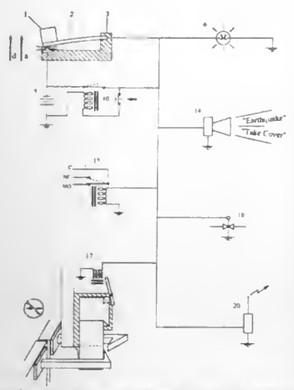
2. A vertical, unidirectional seismic switch to detect the initial shocks of major earthquakes and activate earthquake safety devices before the onset of destructive ground motions, comprised of:

a) a base that may be fastened to objects within, or elements of structures in contact with the earth:

b) a mass suspended above the base with a flat horizontal spring connecting the mass and base, so as to decouple the vertical motion of the mass from that of the base allowing the mass to move downward relative to the base, when the whole assem-

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bly experiences the upward accelerations and displacements characteristic of the initial shocks of a major earthquake;

c) the inertial mass, spring and damping forces of the assembly being adjusted so as to tune the spectral response of the assembly specifically to the vertical accelerations and displacements characteristic of the initial shocks of major earthquakes;

d) electric contacts on the bottom of the mass and on the base directly below the mass which are normally open and make momentary contact when the assembly experiences the upward vertical threshold accelerations and displacements characteristic of the initial shocks of a major earthquake; and

e) electric means to connect the contacts on the mass and base to electromechanical earthquake safety devices.

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**5,742,236**

**ELECTRONIC CODE LOCKING MECHANISM, ESPECIALLY THE DEACTIVATION OF A MOTOR DRIVE INTERLOCK**

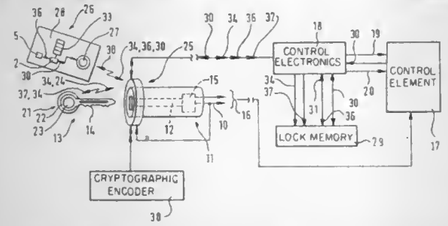
**Rolf Cremers, Marxzell, and Wolfgang Ziegler, Karlsbad, both of Germany, assignors to Valeo Borge Instruments GmbH & Co. KG, Remchingen, Germany**

**Filed Mar. 10, 1995, Ser. No. 401,714**

**Claims priority, application Germany, Mar. 10, 1994, 44 07 966.4**

**Int. Cl.[6] B60R** *25/04*

**U.S. Cl. 340—825.31** **9 Claims**




1. Electronic code locking mechanism with wireless information transmission between a read-write unit with an object memory, and a key with a transponder, whereby provision is made for a control element for the allocation of a code between the key and the locking mechanism comprising a key memory, and an object-specific identification data memory in the control element for first-time allocation to the locking mechanism.

**5,742,237**

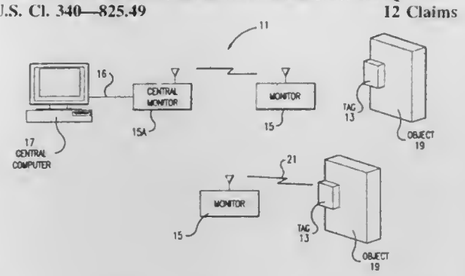
**TAG LOCATION MONITOR**

**William Byron Bledsoe, Marietta, Ga., assignor to Lockheed Martin Corporation, Bethesda, Md.**

**Filed Nov. 30, 1995, Ser. No. 565,092**

**Int. Cl.[6] G06K** *15/00*; **H04B** *7/00*; **G08B** *5/22*; **H04Q** *7/00*

**U.S. Cl. 340—825.49** **12 Claims**




1. A monitor network for a tag location system having a plurality of tags which each transmit a tag signal unique to an individual tag and a central station, remote from the monitor network, for communicating with the monitor network using central station messages, and for determining the location of each individual tag based on information derived from the tag signals, the monitor network comprising:

a grid of monitors, positioned at a space adjacent to a location of the plurality of tags, for receiving tag signals and delivering monitor messages containing information derived from the tag signals to the central station, for receiving central station messages from the central station and for respectively issuing and delivering monitor messages, from and to individual monitors of the grid;

wherein the grid of monitors includes monitor software for causing selected adjacent monitors of the grid to transfer messages from a source to an intended destination by sequentially relaying the messages from one monitor to a selected adjacent monitor when the source and intended destination are not adjacent to one another;

wherein each monitor of the grid receives tag signals and monitor messages, respectively, from tags and monitors within range;

wherein each monitor of the grid transmits monitor messages including information derived from tag signals to a selected monitor of the grid for forwarding to the central station by sequentially relaying the monitor messages from one monitor to a selected adjacent monitor, and transmits received monitor messages to the selected adjacent monitor of the grid for forwarding to the central station by relaying the monitor messages from one monitor to a selected adjacent monitor; and

wherein each monitor of the grid transmits central station messages by sequentially relaying the central station messages from one monitor to a selected adjacent monitor toward an intended monitor destination.

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**5,742,238**

**SYSTEM FOR COMMUNICATION BETWEEN A CENTRAL CONTROLLER AND ITEMS IN A FACTORY USING INFRARED LIGHT**

**Christopher Wayne Fox, Englewood, Colo., assignor to Emtrak, Inc., Chanhassen, Minn.**

**Filed Sep. 1, 1995, Ser. No. 522,692**

**Int. Cl.[6] H04B** *1/16*; **H04Q** *1/00*; **G08B** *13/14*

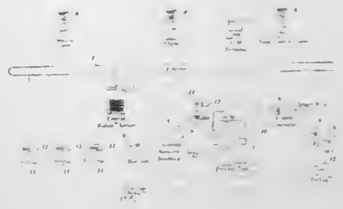
**U.S. Cl. 340—825.49** **9 Claims**

1. A communications and tracking system for use in a workplace having a plurality of distinct work areas comprising:

(a) a computer system;

(b) a system controller connected to said computer system via a network;





(c) a plurality of transceivers, each transceiver:

(1) being fixed in one of said distinct areas of the workplace;

(2) having an infrared transmitter and receiver for modulated light beam communication within the said distinct area where said transceiver is fixed;

(3) having means for electronically communicating with said system controller;

(4) having means for translating modulated light communication into electrical communication and electrical communication into modulated light communication; and

(5) having means for generating beacon messages having a unique identification code imbedded therein.

(d) a plurality of microterminals, each microterminal having:

(1) a microcontroller;

(2) operator input means;

(3) a display;

(4) an infrared transmitter and infrared receiver for modulated light beam communication with a transceiver when the microterminal is located in the same distinct work area of the workplace as the transceiver; and

(5) four modes of operation including:

(a) an operate mode wherein said microcontroller, display and infrared receiver are powered so the microterminal is ready to communicate with the system controller through one of said transceivers;

(b) a stand-by mode wherein the microcontroller and receiver are periodically activated at a constant predetermined interval to receive beacon messages, to check for a change in the location of the microterminal based upon the identification code imbedded in the beacon message received, and to check for messages directed to the microterminal by the system controller;

(c) a power saving mode wherein the portable microterminal is activated to check for messages at a predetermined interval which increases incrementally from about 5 seconds to more than 4 minutes over time if no transceiver beacon messages are received by the portable microterminal; and

(d) an extended sleep mode invoked by a message issued to the microterminal by the system controller through one of said transceivers, in which the microterminal cannot communicate with the system controller or changing to another mode in the absence of activation of the operator input means.

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**5,742,239**

**BACKGROUND ARBITRATION MONITORING TO IMPROVE ACCESS ON LIGHTLY CONSUMED NETWORK**

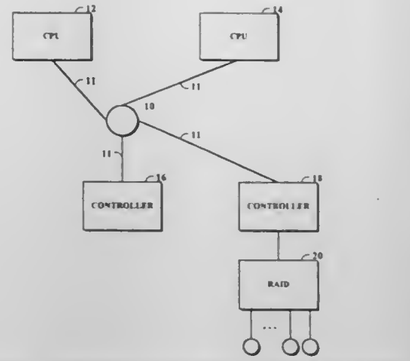
**Alex Siloti, Yorba Linda, Calif., assignor to MTI Technology Corporation, Anaheim, Calif.**

**Continuation of Ser. No. 111,146, Aug. 24, 1993, abandoned. This application Aug. 22, 1996, Ser. No. 703,112**

**Int. Cl.[6] H04Q** *1/00*

**U.S. Cl. 340—825.5** **14 Claims**

1. A method for arbitrating at a node among a plurality of nodes for control of a network medium for transmission, said node having a physical location and a logical address on said medium, said method comprising the steps of:




determining a first number of time slots for said node to monitor said medium, where said first number is a function of said logical address of said node; and determining a single second number of time slots for each of said plurality of nodes to monitor said medium, said second number common to each of said plurality of nodes and a function of the count of said plurality of nodes;

always, immediately following the end of a transmission, monitoring said medium for said first number of time slots for a request transmission requesting control of said medium; and in the time slot following said first number of time slots, beginning a transmission if

an internal transmission request is received before the end of the time slot following said first number of time slots, and

no request transmission is detected in any of said first number of time slots;

otherwise, immediately continuing to monitor said medium for time slots numbering the difference between said first and second numbers for a request transmission requesting control of said medium if

an internal transmission request is not received before the end of the time slot following said first number of time slots; and

no request transmission is detected in any of said first number of time slots; and

then beginning a transmission, without first obtaining control of said medium, if

an internal transmission request is not received before the end of the time slot following said first number of time slots but is received after the end of the time slot following said first number of time slots, and

no request transmission is detected in any of said second number of time slots.

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**5,742,240**

**TRAVEL CONTROL UNIT FOR VEHICLE**

**Nobuyoshi Asanuma, and Hiroshi Sekine, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 15, 1995, Ser. No. 389,109**

**Claims priority, application Japan, Feb. 16, 1994, 6-019586**

**Int. Cl.[6] G09G** *1/123*

**U.S. Cl. 340—995** **12 Claims**

1. A travel control unit comprising:

a map information outputting means for outputting map information representing an output map;

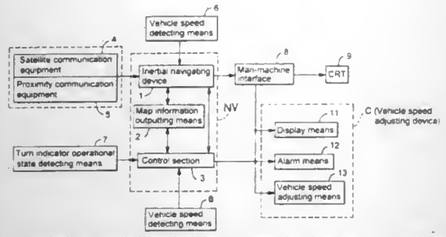
a subject-vehicle position indicating means for indicating a position of a subject vehicle on said output map;

a course setting means which outputs a set travel course to a destination;

a course travel judging means for judging whether the subject vehicle is traveling on said set course;

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a deviation-possibility judging means for judging a possibility that the subject vehicle may deviate from said set course;

a deviatable course setting means for setting a deviatable course into which the subject vehicle may possibly deviate from said set course;

a travel control means for controlling the traveling state of the subject vehicle based on at least one of said set course and said deviatable course; and

an alarm means for giving an alarm to a driver of the vehicle; wherein

when said deviation-possibility judging means judges that there is a possibility that the subject vehicle may deviate from said set course, an alarm is given to the driver, and said travel control means switches from said control based on the set course to said control based on said deviatable course and said set course.

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**5,742,241**

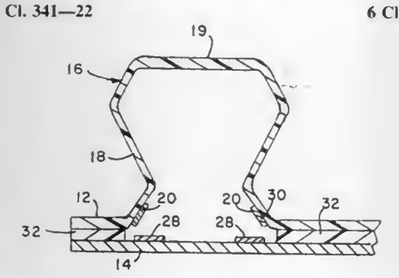
**FLEXIBLE DATA ENTRY PANEL**

**Robert J. Crowley, 64 Puritan La., Sudbury, Mass. 01776, and Donald N. Halgren, 35 Central St., Manchester, Mass. 01944**

**Continuation of Ser. No. 98,851, Jul. 29, 1993, Pat. No. 5,459,461. This application Aug. 18, 1995, Ser. No. 447,117**

**Int. Cl.[6] H03K** *17/94*

**U.S. Cl. 341—22** **6 Claims**




1. A data entry panel arranged for entry and sending of electrical signals therefrom, comprised of:

a first layer of flexible material;

a second layer of flexible material with a fluid pressurizable cavity arranged between said first layer and said second layer of flexible material;

a flexible conductive circuit disposed between said first and second layers of flexible material, wherein flexure of at least one of said layers causes said circuit to generate a particular electrical signal, which signal is transmitted from said panel.

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**5,742,242**

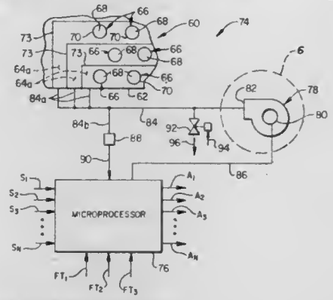
**KEYBOARD USING PRESSURIZED FLUID TO GENERATE KEY STROKE CHARACTERISTICS**

**Charles A. Sellers, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.**

**Filed Dec. 19, 1996, Ser. No. 769,796**

**Int. Cl.[6] H03K** *17/94*; **H03M** *11/00*

**U.S. Cl. 341—22** **37 Claims**




1. Switch apparatus comprising:

a support structure;

a manually operable switch member carried on said support structure for a stroke movement relative thereto between first and second positions;

a biasing structure operative to yieldingly bias said switch member toward said first position utilizing a selectively variable fluid pressure biasing force; and

control apparatus operative to sense the stroke position of said switch member and responsively vary said fluid pressure biasing force as a function of the sensed stroke position in accordance with a predetermined desired relationship between the switch member stroke position and the magnitude of said fluid pressure biasing force.

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**5,742,243**

**METHOD AND APPARATUS FOR REDUCING DC COMPONENT OF RLL CODES**

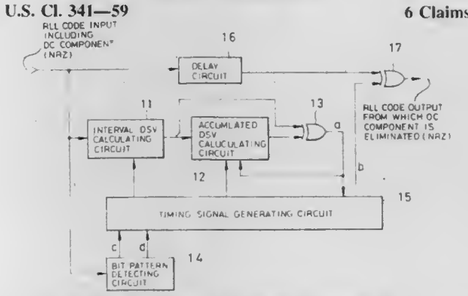
**Yoshiaki Moriyama, Tsurugashima, Japan, assignor to Pioneer Electric Corporation, Tokyo, Japan**

**Filed Feb. 14, 1996, Ser. No. 599,963**

**Claims priority, application Japan, Feb. 20, 1995, 7-030691**

**Int. Cl.[6] H03M** *7/00*

**U.S. Cl. 341—59** **6 Claims**




1. A data converting method comprising the steps of:

dividing an input data sequence expressed by binary codes into blocks each consisting of m bits when assuming that m, n, d, k, and $k_1$ are natural numbers having a relationship such that $m<n$ and $d<k\leqq k_1$ and sequentially converting into code words, consisting of a plurality of bits whose number is an integer multiple of n including n, every one or a plurality of said blocks at a ratio of (m-bits:n-bits) by a predetermined conversion rule in a manner such that after completion of a conversion, the number of bits "0" between the neighboring bits "1" is equal to d at a minimum and k at a maximum; and



setting a predetermined bit in a predetermined bit pattern which appears in said code word sequence according to said predetermined conversion rule as a control bit, said predetermined bit causing a bit pattern that is not generated by said predetermined conversion rule when its value is changed from "1" to "0", and forming a new code word sequence in which the number of bits "0" between the neighboring bits "1" is equal to d at a minimum and $k_1$ at a maximum and a DC component can be controlled by selectively setting the value of said control bit to "0" or "1".

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**5,742,244**

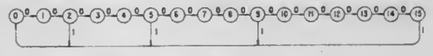
**NONLINEAR RUN-LENGTH CODING**

**Robert Earl Swanson, Del Mar; Thomas Daniel Carr, Leucadia, and Norman Lee Koren, Encinitas, all of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Apr. 22, 1996, Ser. No. 636,075**

**Int. Cl.[6] H03M** *7/00*

**U.S. Cl. 341—59** **14 Claims**



1. A method of selectively spaced encoding of an input string of binary data bits which is a random sequence of 0s and 1s into an output string of binary channel bits which is a sequence of 0s and 1s, comprising the steps of:

recursively encoding an input string of binary data bits according to run-length selection means having rate p/q where p is the number of input data bits that are encoded into q channel bits; wherein the channel bits obey constraints such that the encoding specifies an ordered n element list of integers that are the lengths of the selected runs of consecutive zeros, denoted $(b_0-1, b_1-1, \ldots, b_{n-1}-1)$ where the elements of the list are not all equally spread, wherein there exists three consecutive elements of the list $(b_j, b_j, b_k)$, such that $b_j-b_j\neq b_k-b_j$; and wherein successive spacings between elements are nonlinear and increase from previous spacings, thus optimizing encoding in a high jitter environment.

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**5,742,245**

**DIGITAL-TO-ANALOG CONVERTER CIRCUIT USING CURRENT MIRROR CIRCUIT FOR CONVERSION OF LAW-ORDER BITS**

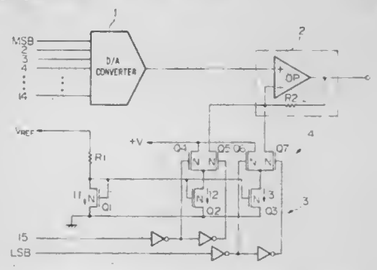
**Masao Noro, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan**

**Filed May 7, 1996, Ser. No. 644,645**

**Claims priority, application Japan, May 8, 1995, 7-134833**

**Int. Cl.[6] H03M** *1/66*

**U.S. Cl. 341—144** **5 Claims**




1. A digital-to-analog converter circuit, the digital-to-analog converter circuit comprising:

a digital-to-analog converter for receiving data of m bits (where 'm' is an integer arbitrarily selected), wherein the data of m bits are extended by bits $b_H$ and $b_L$ in low-order positions thereof and $b_H$ is placed in a higher order than $b_L$;

a voltage-follower circuit containing an operational amplifier whose noninverting input is connected to an output of the digital-to-analog converter, wherein a feedback resistor is connected between an inverting input and an output of the operational amplifier;

a current-mirror circuit for providing two constant currents $I_H$ and $I_L$ in response to the bits $b_H$ and $b_L$ respectively, wherein a relationship between the constant currents $I_H$ and $I_L$ is defined by an equation of $I_H=2\times I_L$; and

a current-switching circuit, connected between the current-mirror circuit and the voltage-follower circuit, for selectively providing the two constant currents to the inverting input of the operational amplifier in accordance with values of the bits $b_H$ and $b_L$.

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**5,742,246**

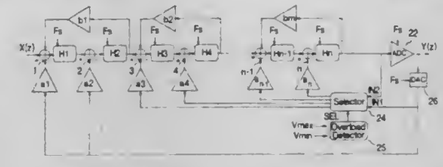
**STABILIZING MECHANISM FOR SIGMA-DELTA MODULATOR**

**Tai-Haur Kun; Wen-Chyi Wang; Kuan-Dar Chen; Jhy-Rong Chen, and Jhy-Woei Yeh, all of Tainan, Taiwan, assignors to National Science Council, Taipei, Taiwan**

**Filed Mar. 22, 1996, Ser. No. 622,449**

**Int. Cl.[6] H03M** *3/02*

**U.S. Cl. 341—143** **18 Claims**




1. An internal linear feedback (ILF) mechanism for stabilizing a multiple-feedback type high-order sigma-delta modulator utilized in analog-to-digital converters, said high-order sigma-delta modulator comprising at least three cascaded integrator stages, an analog-to-digital converter (ADC) means to which the output of the last integrator stage is coupled, and a digital-to-analog converter (DAC) means to which the output of the ADC means is coupled, wherein an output of said DAC means is coupled to an input of each integrator stage and wherein at least the first integrator stage in the high-order sigma-delta modulator forms a low-order modulator said ILF mechanism comprising:

an overload detector, coupled to each of said cascaded integrator stages, said overload detector generating an overload signal when an output signal of at least one of said cascaded integrator stages exceeds a predetermined range corresponding to upper and lower limits of a stable operation range of said high-order sigma-delta modulator; and

a selector circuit, coupled to and receiving said overload signal from said overload detector, that decouples the inputs of the integrator stages following the low-order modulator from the output of said DAC means and simultaneously couples the input of said ADC means to the inputs of the integrator stages following the low-order modulator when said overload detector generates said overload signal, said selector circuit recoupling the output of said DAC means to the inputs of the integrator stages following the low-order modulator and simultaneously decoupling the inputs of the integrator stages following the low-order modulator from the input of said ADC means when said output signal of said at least one of said cascaded integrator stages no longer exceeds said predetermined range.

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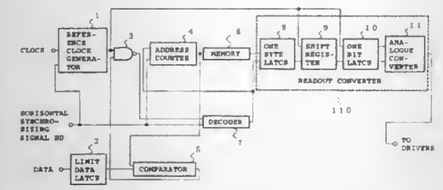


5,742,247

## ONE BIT TYPE CONTROL WAVEFORM GENERATION CIRCUIT

Takeshi Chujo, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1996, Ser. No. 726,603
Claims priority, application Japan, Jun. 11, 1996, 8-149566
Int. Cl.[6] H04N *3/00*
U.S. Cl. 341—144 16 Claims




1. A one bit type control waveform generation circuit comprising:

reference clock generation means for generating a reference clock having a desired frequency value in synchronism with a synchronizing signal;

decoder means for generating an address count clock in synchronism with the reference clock and the value of the address count clock from the decoder means being reset by receiving the synchronizing signal;

address counter means for counting the number of the address count clocks transferred from the decoder means;

comparator means for comparing the counted value from the address counter means with a desired count value and for halting the transmission of the reference clock to the decoder means when both the counted value and the desired count value are equal to each other; and

read-out conversion means for reading out a data item having a predetermined data length from memory means addressed by the counted value transferred from the address counter means and for reading out a bit data item per bit from the readout data having the predetermined data length, for converting the bit data item of a digital form to an analogue signal to form an optional control waveform, and for providing the optional control waveform to outside.

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5,742,248

## DIFFERENTIAL AMPLIFIER WITH SIGNAL-DEPENDENT OFFSET, AND MULTI-STEP DUAL-RESIDUE ANALOG-TO-DIGITAL CONVERTER INCLUDING SUCH A DIFFERENTIAL AMPLIFIER

Pieter Vorenkamp, and Johannes P. M. Verdaasdonk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

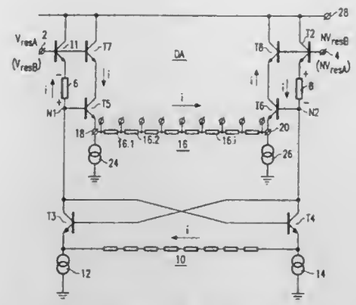
Filed Mar. 21, 1996, Ser. No. 616,083
Claims priority, application European Pat. Off., Mar. 24, 1995, 95200744
Int. Cl.[6] H03M *1/14*
U.S. Cl. 341—156 11 Claims

1. A differential amplifier comprising: a first and a second input terminal for receiving an input voltage; a first, a second, a third, a fourth, a fifth and a sixth transistor, each having a control electrode, a first main electrode and a second main electrode,

the first transistor having its control electrode coupled to the first input terminal and

the second transistor having its control electrode coupled to the second input terminal,

the first transistor having its first main electrode, the fourth transistor having its control electrode and the third transistor having its second main electrode coupled to a first node,




the second transistor having its first main electrode, the third transistor having its control electrode and the fourth transistor having its second main electrode coupled to a second node, and

the fifth transistor having its control electrode coupled to the first node and the sixth transistor having its control electrode coupled to the second node;

a first resistor connected between the first main electrode of the third transistor and the first main electrode of the fourth transistor;

a second resistor connected between the first main electrode of the fifth transistor and the first main electrode of the sixth transistor,

wherein amplifier further comprises: a first series resistor is connected between the first main electrode of the first transistor and the first node and a second series resistor is connected between the first main electrode of the second transistor and the second node.

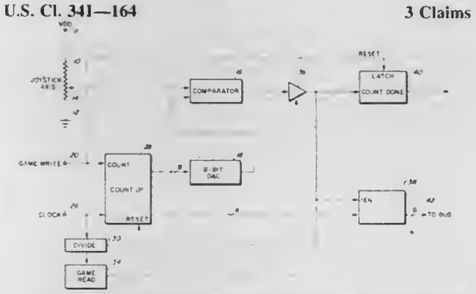
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5,742,249

## SYSTEM USING A DIGITAL TIMER FOR A JOYSTICK POTENTIOMETER READOUT

Gary Hicok, Mesa; Kenneth Potts, Gilbert, and Scott Harrow, Scottsdale, all of Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed May 24, 1996, Ser. No. 652,955
Int. Cl.[6] H03M *1/34*
U.S. Cl. 341—164 3 Claims




1. A system for digitizing the setting of a joystick potentiometer including in combination:

a comparator having first and second inputs and an output, with the first input thereof coupled with said joystick potentiometer;

a digital counter with a clock input and having digital outputs representative of the count therein from an initial count;

a source of free running clock signals coupled to said clock input of said counter to incrementally change the count therein;

a digital-to-analog converter having the input thereof coupled with the digital outputs of said counter, and with an output coupled with the second input of said comparator to produce an output signal from said comparator when a predetermined count is attained by said counter corresponding to the setting of said potentiometer;

a latch circuit coupled to the output of said comparator for storing said output signal indicative of said attainment of said predetermined count by said counter, and said counter further having a reset input coupled with the output of said comparator whereupon said counter is reset to said initial count upon the occurrence of an output from said comparator; and

a gated circuit coupled with the digital outputs of said counter and enabled by the output of said comparator for providing a digital output representative of said predetermined count in said counter which corresponds to the setting of said potentiometer.



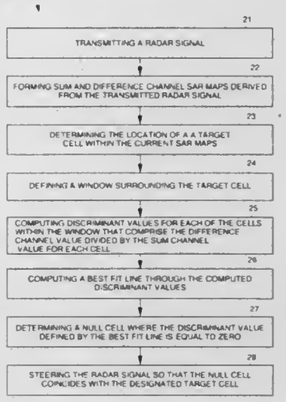
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5,742,250

## ENHANCED BEAMSPLITTING TECHNIQUE FOR USE WITH THREE-DIMENSIONAL SYNTHETIC ARRAY RADAR

Kapriel V. Krikorian, Agoura, and Robert A. Rosen, Agoura Hills, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 29, 1996, Ser. No. 705,436
Int. Cl.[6] G01S *13/90*
U.S. Cl. 342—25 2 Claims




1. A data processing method for use in processing synthetic array radar data to more accurately steer its antenna toward a target, said method comprising the steps of:

transmitting a radar signal;

forming sum and difference channel synthetic array radar maps derived from the transmitted radar signal;

determining the location of a target cell within current synthetic array radar maps;

defining a window surrounding the target cell;

computing discriminant values for each of the cells within the window that comprise the difference channel value divided by the sum channel value for each cell;

computing a best fit line through the computed discriminant values;

determining a null cell where the discriminant value defined by the best fit line is equal to zero; and

steering the radar signal so that the null cell coincides with the designated target cell.

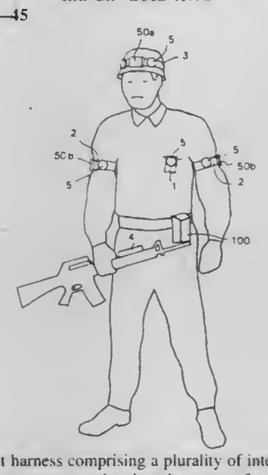
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5,742,251

## COMBAT HARNESS

Peter Gerber, Berikon, Switzerland, assignor to Oerlikon-Contraves AG, Switzerland

Filed Oct. 11, 1996, Ser. No. 730,682
Int. Cl.[6] G01S *13/78*
U.S. Cl. 342—45 18 Claims




1. A combat harness comprising a plurality of intercommunicating electrical components, wherein at least part of said components comprise an ultrasonic emitter and a modulator for emitting data communication signals and wherein at least part of said components comprise an ultrasonic receiver and demodulator for receiving said data communication signals.

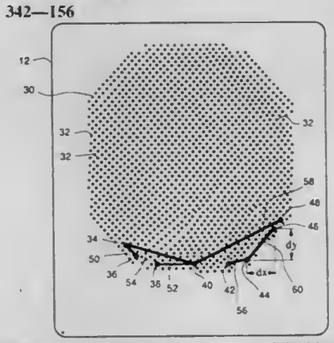
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5,742,252

## AMBIGUITY RESOLVING ALGORITHM FOR INTERFEROMETERS OF ARBITRAY TOPOLOGIES

Trung T. Nguyen, Huntington Beach, and Loan Taree Bui, Rosemead, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 26, 1996, Ser. No. 703,310
Int. Cl.[6] G01S *5/02*
U.S. Cl. 342—156 5 Claims




1. A system for determining an angle of incidence for an incoming electromagnetic signal, the system comprising:

a plurality of interferometers for detecting the incoming electromagnetic signal, each interferometer measuring a phase based upon the incoming electromagnetic signal in accordance with the position of the interferometer relative the incoming electromagnetic energy, where each interferometer is separated by a distance defined as a linear baseline between the two; and

a signal processor for computing the angle of the electromagnetic signal in accordance with the phases measured by the interferometers, the processor performing the steps of:

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(a) determining an initial phase estimate in accordance with two selected baselines in order to predict a phase measured for another of the plurality of baselines,

(b) for the other baselines, predicting a phase for a next baseline in accordance with the phases measured for a previously selected baseline and measuring the phase of the next baseline to determine if the measured phase is within a predetermined range of the predicted phase, and

(c) determining the angle of the incoming electromagnetic signal in accordance with the phases of the last baseline falling within the predetermined ranges of the predicted phases;

wherein the phase measurements $\tilde{\phi}_i$ for an ith baseline may be defined as follows:

$$\tilde{\phi}_2 = \phi_i(\mathrm{mod}2\pi) = \phi_i + 2\pi K_i;\ \tilde{\phi}_i \epsilon [0,2\pi];$$

where

$$\phi_i = \frac{2\pi d_x^i}{\lambda}\sin(Az)\cos(El) + \frac{2\pi d_y^i}{\lambda}\sin(EL) + n_i;$$

$$|K_i| \leq \kappa_i = int\left(\frac{\sqrt{(d_x^i)^2 + (d_y^i)^2}}{\lambda}\right) + 1;$$

$d_x^i, d_y^i$ are the x and y components, respectively, of baseline i;

$n_i$ is the phase noise with zero mean and variance $\sigma_n^2$;

Az and El are the azimuth and elevation, respectively, defined with respect to the normal of the antenna plane; and

$\lambda$ is the wavelength of the incoming electromagnetic signal.

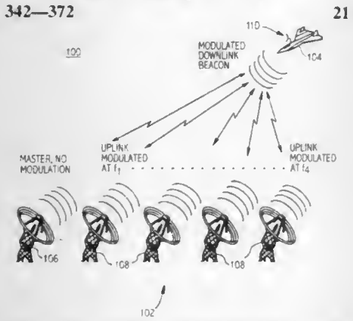
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**5,742,253**

**SYSTEM AND METHOD FOR CONTROLLING THE PHASE OF AN ANTENNA ARRAY**

**Bruce Conroy, Altadena, and Daniel Hoppe, Saugus, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.**

**Filed Mar. 12, 1996, Ser. No. 615,505**
**Int. Cl.[6] H01Q** *3/22;3/24*
**U.S. Cl. 342—372** **21 Claims**




1. A system for controlling power transferred to an aircraft, comprising:

(a) a master antenna for transmitting a master uplink signal;

(b) a plurality of slave antennas, each for transmitting a slave uplink signal that is phase modulated at a frequency different from other slave uplink signals;

(c) a receiver, located on the aircraft, for receiving the master uplink signal and the plurality of slave uplink signals and for producing a composite signal;

(d) a modulator, located on the aircraft, for modulating the composite signal to produce a downlink beacon having a plurality of phase components, each phase component corresponding to one of the slave antennas and having a frequency different from all other phase components; and

(e) each of the plurality of slave antennas being further for receiving the downlink beacon and adjusting the phase of the slave uplink signal relative to the master uplink signal using the corresponding phase component.

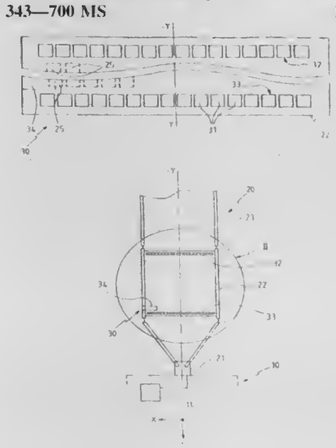
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**5,742,254**

**THREE-AXIS STABILIZED GEOSTATIONARY SATELLITE CARRYING OUT RADAR SURVEILLANCE OF THE SURROUNDING SPACE**

**Pierre Bassaler, Mouans Sartoux, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France**

**Filed Dec. 5, 1995, Ser. No. 567,331**
**Claims priority, applicatinn France, Dec. 8, 1994, 94 14769**
**Int. Cl.[6] H01Q** *1/38*
**U.S. Cl. 343—700 MS** **18 Claims**



1. Geostationary satellite including a three-axis stabilized body including an onboard computer and at least one solar generator wing extending in a longitudinal direction from the body and coupled to the body by a drive system controlled by the onboard computer and adapted to rotate said wing at least about its longitudinal axis, said satellite further comprising a static radar surveillance device including at least one antenna located on a backside of said at least one solar generator wing, said antenna comprising elementary plane radiating patches and adapted to scan at least part of the space surrounding said satellite body.

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**5,742,255**

**APERTURE FED ANTENNA ASSEMBLY FOR COUPLING RF ENERGY TO A VERTICAL RADIATOR**

**George D. Afendras, Glenview, Ill., assignor to Maxrad, Inc., Hanover Park, Ill.**

**Continuation of Ser. No. 273,714, Jul. 12, 1994, abandoned. This application Oct. 28, 1996, Ser. No. 739,502**
**Int. Cl.[6] H01Q** *1/32*
**U.S. Cl. 343—713** **35 Claims**

1. An antenna assembly for use in combination with a glass window having an inside surface and an outside surface and a signal transmission line, with a connector at one end, carrying a transmission signal and having a preselected electrical impedance comprising:

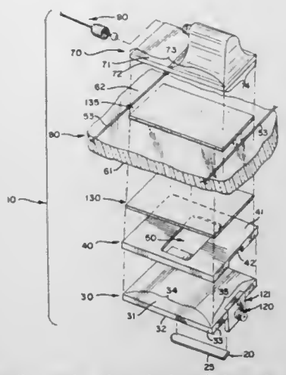
a microstrip feedline receiving and transmitting the transmission signal;

a radiating antenna receiving and transmitting the transmission signal;

means disposed between the radiating antenna and the microstrip feedline for electromagnetically, aperture coupling the transmission signal between the radiating antenna and the microstrip feedline signal by the transmission signal electromagnetically passing through the window, the transmission signal being solely vertically polarized as it passes through the window; and,

connection means for conductively connecting the microstrip feedline to the connector of the signal transmission line.





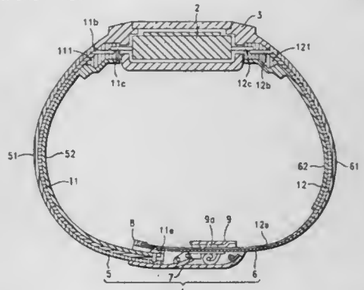
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**5,742,256**

**WRISTBAND HAVING EMBEDDED ELECTRICALLY CONDUCTIVE MEMBERS FOR A WRIST-MOUNTABLE TYPE ELECTRONIC DEVICE**

**Teruhiko Wakabayashi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan**

**Filed Apr. 29, 1994, Ser. No. 236,290**
**Claims priority, application Japan, May 7, 1993, 5-106935; Jun. 3, 1993, 5-133632**
**Int. Cl.[6] H01Q** *1/12*
**U.S. Cl. 343—718** **27 Claims**



1. A wristband for a wrist-mountable type electronic device, comprising;

first and second wristband segments each for coupling to one side of the electronic device, each of said wristband segments comprising:

an electrically insulating inner layer member for contact with a wrist of a wearer;

an electrically insulating outer layer member made of a material different from that of said inner layer member; and

an antenna strip, made of an electrically conductive member and sandwiched between said inner layer member and said outer layer member, for electrically coupling to the electronic device;

wherein in at least one of said two wristband segments, at least one of said inner and outer layer members includes extended portions on two opposite sides along the lengthwise direction, said extended portions extending beyond adjacent edges of said antenna strip and covering at least a portion of adjacent edges of the other layer member.

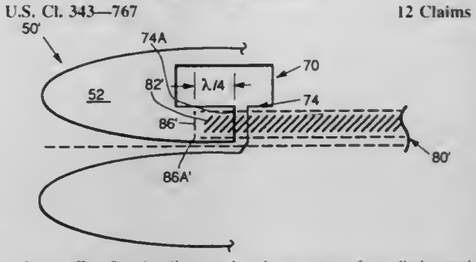
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**5,742,257**

**OFFSET FLARED RADIATOR AND PROBE**

**John M. Hadden, Redondo Beach; Anthony J. Fahey, Thousand Oaks, and James P. Treinen, Playa del Rey, all of Calif., assignors to Raytheon Company, Lexington, Mass.**

**Filed Aug. 13, 1996, Ser. No. 689,756**
**Int. Cl.[6] H01Q** *13/10*
**U.S. Cl. 343—767** **12 Claims**




1. An offset flared radiator and probe apparatus for radiating and receiving electromagnetic energy, comprising:

a flared radiator comprising first and second electrically conductive flared regions which taper toward a first slotline region extending generally along a radiator axis, wherein the flared radiator is formed of an electrically conductive slab member;

a transverse slotline region extending transversely to the first slotline region, the transverse and first slotline regions meeting at a slotline bend;

an offset reflective resonator comprising a non-circular resonator cavity defined in said first flared region, said transverse slotline region terminating at said resonator, said resonator disposed nonsymmetrically with respect to said radiator axis; and

an offset probe offset from the radiator axis, said probe extending transversely to said transverse slotline region at a coupling junction, the offset probe including a probe conductor having no bends formed therein, thereby reducing reflections of the electromagnetic energy propagating along the offset probe, disposed within a channel formed in the conductive slab member and extending parallel to the radiator axis, wherein electromagnetic energy is coupled between the transverse slotline region and the probe;.

wherein said transverse slotline region is of a predetermined length in relation to the width of said probe so that the probe extends between the resonator and the first slotline region.

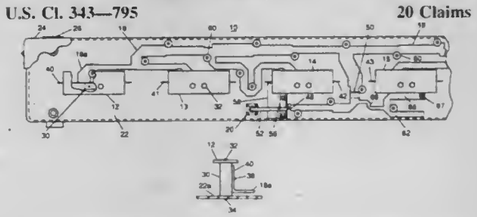
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**5,742,258**

**LOW INTERMODULATION ELECTROMAGNETIC FEED CELLULAR ANTENNAS**

**Richard J. Kumpfbeck, Huntington, and Gary Schay, Stony Brook, both of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.**

**Filed Aug. 22, 1995, Ser. No. 518,059**
**Int. Cl.[6] H01Q** *21/10*
**U.S. Cl. 343—795** **20 Claims**



1. An electromagnetic exciter feed dipole array antenna, operable over a frequency band, comprising:

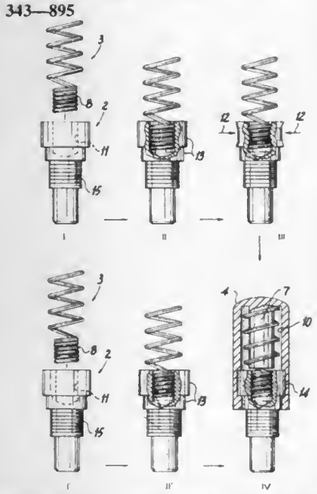
VOL 1209 ISS 3 AP 21 1998 UMI



a conductive ground plane unit;
a microstrip feed assembly including,
a plurality of two-dimensional exciter resonators extending perpendicularly in spaced relationship to said ground plane unit, and
a signal distribution portion spaced from said ground plane unit, extending from an input/output point to each of said exciter resonators and arranged to feed signals in parallel to said exciter resonators;
a plurality of dipole radiators arranged in a linear array, each said dipole radiator positioned in spaced non-contact relationship to one of said exciter resonators and electromagnetically coupled thereto;
a coaxial line section having one end of an inner conductor connected to said input/output point of said distribution portion of the feed assembly; and
a quarter-wave section of microstrip line connected to an outer conductor of said coaxial line section and extending in spaced non-contact relationship to said ground plane unit, said quarter-wave section providing a non-contact low impedance RF path to said ground plane unit.

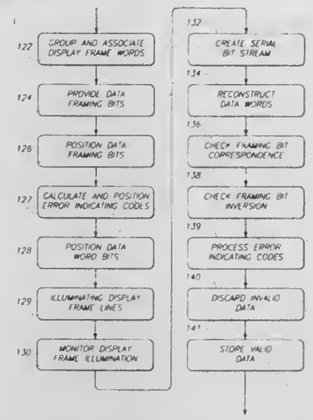
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**5,742,259**
**RESILIENT ANTENNA STRUCTURE AND A METHOD TO MANUFACTURE IT**
**Petteri Annamaa, Oulu, Finland, assignor to LK-Products Oy, Kempele, Finland**
**Filed Apr. 2, 1996, Ser. No. 630,040**
**Claims priority, application Finland, Apr. 7, 1995, 951670**
**Int. Cl.[6] H01Q *1/36***
**U.S. Cl. 343—895** **17 Claims**



1. An antenna for a radio-frequency communication device, comprising a helix formed of a wire of a resilient material wound into a cylindrical coil, and a connector part coupled electrically and mechanically to it, the connector part is a solid piece made of a conducting material and at the side of the helix adjacent to the connector part there is a part which is wound more closely than the rest of the helix, thus forming a support coil which is connected to the connector part and applies a spring force against it which prevents the connector pan from being disconnected from the helix.

**5,742,260**
**SYSTEM AND METHOD FOR TRANSFERRING DATA USING A FRAME-SCANNING DISPLAY DEVICE**
**Neil S. Fishman, Bothell; J. Mark Miller, Kirkland, both of Wash., and Thomas J. Dvorachek, III, Kensington, Conn., assignors to Microsoft Corporation, Redmond, Wash.**
**Filed May 22, 1995, Ser. No. 447,012**
**Int. Cl.[6] G09G *5/00***
**U.S. Cl. 345—2** **22 Claims**



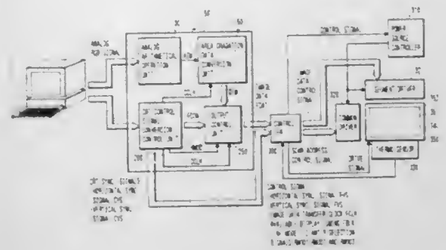

1. A method of serially transmitting a sequence of data bits, the method comprising the following steps:
displaying sequential display frames on a frame-scanning graphics display device, the sequential display frames being associated with individual groups of data bits;
associating at least one data framing bit with each individual group of data bits;
selectively illuminating sequentially-scanned data transmission lines within the display frames to represent the individual groups of data bits associated with the display frames and the associated data framing bits, wherein bits having a first binary value are represented by the data transmission lines which are illuminated, and wherein bits having a second binary value are represented by the data transmission lines which are not illuminated;
changing the binary values of the framing bits associated with the individual groups of data bits from one sequential display frame to the next;
wherein the illuminating step comprises writing the sequentially-scanned data transmission lines of the sequential display frames to a frame buffer, the data transmission line representing one of the data framing bits associated with an individual group of data bits being written only after all of the other data transmission lines of a particular display frame have been written.

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**5,742,261**
**DISPLAY CONTROL APPARATUS AND DISPLAY DEVICE WITH SAMPLING FREQUENCY CONTROL FOR OPTIMIZING IMAGE SIZE**
**Osamu Yuki, Atsugi, and Hiroshi Inoue, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**
**Continuation of Ser. No. 899,606, Jun. 16, 1992, abandoned.**
**This application Oct. 7, 1994, Ser. No. 319,480**
**Claims priority, application Japan, Jun. 21, 1991, 3-150324**
**Int. Cl.[6] G09G *5/00***
**U.S. Cl. 345—3** **6 Claims**

1. A display control apparatus for controlling formation of an image on a display device having a plurality of scanning electrodes and a plurality of information electrodes disposed in a matrix and an effective display frame comprised of a plurality of dots each

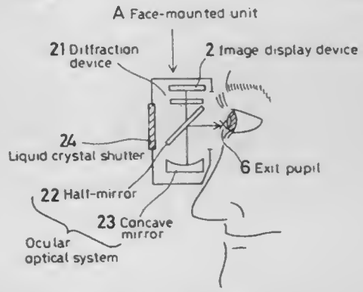




formed at an intersection of the scanning and information electrodes, said apparatus comprising:
a. sampling means for sampling a continuous system analog primary color signal to provide digital signal comprised of a plurality of pixels;
b. first selecting means for selecting one of at least two different display units for the display device so that a size of the image is optimized as displayed in the effective display frame, each display unit being defined by a respective different number of dots of the effective display frame per single pixel of the digital signal; and
c. second selecting means for selecting, in accordance with the selected display unit, one of a plurality of predetermined sampling frequencies, where said sampling means uses the selected sampling frequency to sample the continuous system analog primary color signal.

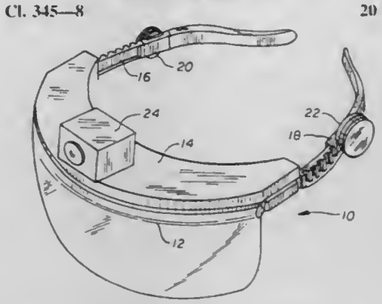
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**5,742,262**
**IMAGE DISPLAY APPARATUS**
**Seiichiro Tabata, Hino, and Yoichi Iha, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**
**Filed Jun. 22, 1994, Ser. No. 264,065**
**Claims priority, application Japan, Jun. 23, 1993, 5-151719; Mar. 11, 1994, 6-041166**
**Int. Cl.[6] H04N *5/64;17/00***
**U.S. Cl. 345—8** **14 Claims**




1. An image display apparatus comprising:
a face-mounted unit including an image display device for displaying an image, an ocular optical system for forming an exit pupil by using a bundle of rays emitted from said image display device, and diffraction means provided between said image display device and said exit pupil; and
support means for retaining said face-mounted unit on an observer's head,
wherein said diffraction means enlarges a size of said exit pupil by diverging said bundle of rays emitted from said image display device.

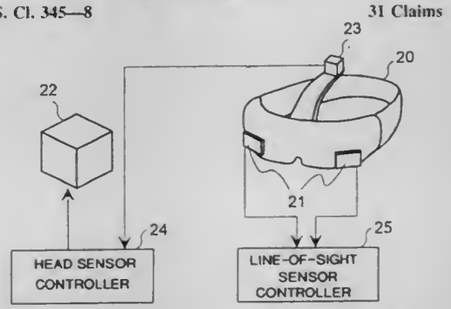
**5,742,263**
**HEAD TRACKING SYSTEM FOR A HEAD MOUNTED DISPLAY SYSTEM**
**Ynjiun P. Wang, and Timothy P. O'Hagan, both of Fort Myers, Fla., assignors to Telxon Corporation, Akron, Ohio**
**Filed Dec. 18, 1995, Ser. No. 574,261**
**Int. Cl.[6] G09G *5/00***
**U.S. Cl. 345—8** **20 Claims**




1. A head mounted display system comprising:
a frame to be supported on a user's head;
a display for depicting video information, said display being mounted on said frame;
an optical system mounted on said frame with respect to said display for projecting an enlarged image of said video information depicted on said display at a distance from said user;
a barcode sensor mounted on said frame for detecting one or more barcodes in a field of view of said sensor; and
a processor for decoding a barcode detected in said barcode sensor's field of view, said processor controlling the video information depicted on said display in accordance with a decoded barcode.

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**5,742,264**
**HEAD-MOUNTED DISPLAY**
**Satoru Inagaki, Suita, and Yoshihisa Nishigori, Ikeda, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**
**Filed Jan. 23, 1996, Ser. No. 589,959**
**Claims priority, application Japan, Jan. 24, 1995, 7-028745; Feb. 24, 1995, 7-036828**
**Int. Cl.[6] G09G *3/02***
**U.S. Cl. 345—8** **31 Claims**




1. A head-mounted display for displaying an image on a display while controlling a viewing angle of the image and a moving speed of an entire image on the basis of a viewer's head position, head orientation, and line-of-sight direction, comprising:
head detecting means for detecting the viewer's head position and head orientation, and for outputting the result of the detection as a head information signal;
line-of-sight detecting means for detecting the viewer's line-of-sight direction, and for outputting the result of the detection as a line-of-sight information signal;

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adaptive filtering means for filtering head jitter from said head information signal based on said head information signal and said line-of-sight information signal; and

image generating means for generating an image by using said filtered head information signal and said line-of-sight information signal.

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**5,742,265**

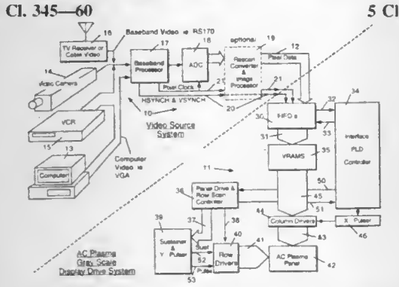
**AC PLASMA GAS DISCHARGE GRAY SCALE GRAPHIC, INCLUDING COLOR AND VIDEO DISPLAY DRIVE SYSTEM**

**Ray A. Stoller, Paulding, and Michael B. Stalker, Sylvania, both of Ohio, assignors to Photonics Systems Corporation, Northwood, Ohio**

**Continuation of Ser. No. 626,718, Dec. 17, 1990, abandoned. This application Jan. 21, 1993, Ser. No. 8,239**

**Int. Cl.[6] G09G** *3/28*

**U.S. Cl. 345—60** **5 Claims**




1. A drive system for an AC plasma display panel having pixel elements located by column (X) and row (Y) electrodes, X electrode driver means connected to the X electrodes and Y driver means connected to the Y electrodes and a source of N-bit word signals representing the amplitude of video signals for each pixel element located by the crossing of said X and Y electrodes and means for translating said N-bit word to driver signals for controlling the X and Y driver means to cause each pixel element to selectively emit light output storage elements, a first voltage driver means connected between the output storage elements and said X electrodes for supplying X axis control voltages to said column X electrodes, said first voltage driver means being dedicated solely to high speed pixel control which is logic ground based and a second voltage driver means connected between said output storage elements and said row (Y) electrodes for supplying Y axis control voltages to said row electrodes, said X axis control voltages being applied to said column (X) electrodes at selected times to selectively cancel said Y axis control voltage.

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**5,742,266**

**IMAGE DISPLAY DEVICE USING HIGH-VOLTAGE ELECTRODES AND METHOD OF DRIVING SAME**

**Kuniharu Onozuka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Feb. 6, 1995, Ser. No. 383,870**

**Claims priority, application Japan, Feb. 22, 1994, 6-024345**

**Int. Cl.[6] G09G** *3/10;* **H01J** *29/10*

**U.S. Cl. 345—74** **8 Claims**

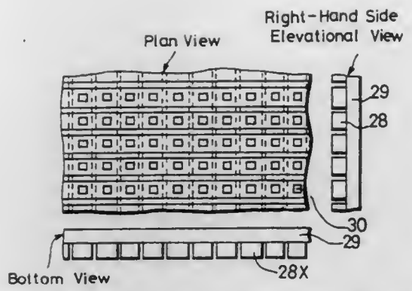
1. An image display device, comprising:

a planar cathode for emitting electrons from substantially an entire planar surface thereof;

a control electrode having two layers, each of said two layers being composed of a planar conductive grid which together define a plurality of co-planar electron passage holes at a respective plurality of junctions thereof, said control electrode having a plurality of capacitive bodies disposed at said plurality of junctions for storing a control voltage to control the electrons emitted from said planar cathode and passing through said plurality of co-planar electron passage holes;

a planar light emitting layer; and

a high-voltage electrode for applying a high voltage to said planar light emitting layer to attract the electrons that have passed through said plurality of co-planar electron passage holes and have been controlled by said control voltage to said planar light emitting layer for emitting light in response to bombardment of the electrons thereon.




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**5,742,267**

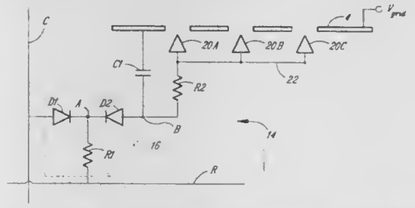
**CAPACITIVE CHARGE DRIVER CIRCUIT FOR FLAT PANEL DISPLAY**

**Dean Wilkinson, Boise, Id., assignor to Micron Display Technology, Inc., Boise, Id.**

**Filed Jan. 5, 1996, Ser. No. 583,565**

**Int. Cl.[6] G09G** *3/30*

**U.S. Cl. 345—77** **21 Claims**




1. A driver circuit for driving the emitter in a flat panel display, comprising:

a capacitor coupled to the emitter; and

a charge circuit having an intensity control terminal adapted to receive an intensity control signal and an enable terminal adapted to receive an enable signal, the charge circuit including a first unidirectional current device coupled between the intensity control terminal and a circuit node to which the enable terminal is coupled, and a second unidirectional current device coupled between the circuit node and the capacitor, the first unidirectional current device allowing current to flow responsive to a predetermined relationship between the magnitude of the intensity control signal and the magnitude of a voltage on the circuit node, the second unidirectional current device allowing current to flow responsive to a predetermined relationship between the magnitude of the voltage on the circuit node and the magnitude of a voltage on the capacitor, the charge circuit altering the charge on the capacitor to place a voltage on the capacitor corresponding to the magnitude of the intensity control signal so that the charge on the capacitor can subsequently change by electrons flowing through the emitter until the voltage on the emitter reaches an emission threshold voltage.



**5,742,268**

**OPTICAL MODULATION DEVICE HAVING BIAS RESET MEANS**

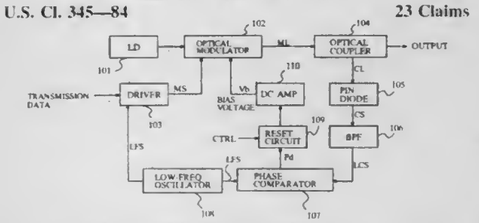
**Arihide Noda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Nov. 6, 1995, Ser. No. 554,356**

**Claims priority, application Japan, Nov. 4, 1994, 6-270986**

**Int. Cl.[6] G02F** *1/03; 1/295*

**U.S. Cl. 345—84** **23 Claims**




1. An optical modulation device comprising:

an optical modulator operable to modulate an input light wave according to an input signal at an operating point which is determined by a bias voltage;

detecting means for detecting a deviation of said operating point from a selected optimal operating point based on an output of said optical modulator;

bias generating means for generating said bias voltage within a predetermined voltage range of bias voltages so as to reduce said deviation; and

reset means for setting said bias voltage at a predetermined voltage associated with said selected optimal operating point when said optical modulator is initialized, said optical modulator being operable to modulate the input light wave according to the input signal as said predetermined voltage is set as said bias voltage,

wherein said predetermined voltage corresponds to a central voltage of said predetermined voltage range.

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**5,742,269**

**LCD CONTROLLER, LCD APPARATUS, INFORMATION PROCESSING APPARATUS AND METHOD OF OPERATING SAME**

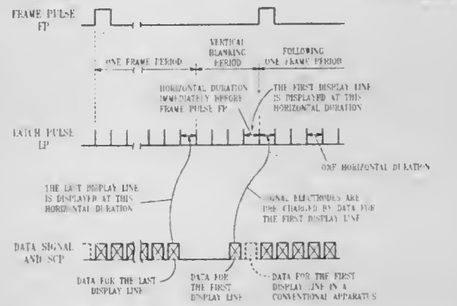
**Fumiei Hayashiguchi, Kamakura, and Takayuki Tokuda, Fujisawa, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 27, 1992, Ser. No. 826,575**

**Claims priority, application Japan, Jan. 25, 1991, 3-023720**

**Int. Cl.[6] G09G** *3/36*

**U.S. Cl. 345—87** **10 Claims**




1. In a controller for a liquid crystal display for displaying data from an image data source, said liquid crystal display having a plurality of signal electrodes and a plurality of scanning electrodes, said controller having data voltage applying means for applying a voltage representative of data for successive lines of an image, from said image data source, to be displayed by said liquid crystal display, the improvement comprising:

control means for controlling transfer of data from said image data source to said data voltage applying means so that data for a first line of said image is transferred early enough in a blanking period between display of a last line of a first frame of said image and display of a first line of a next frame of said image, to charge said data lines to said voltages representative of data for said first line of said image, before the blanking period has ended, said blanking period being a period during which none of said scanning electrodes are activated.

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**5,742,270**

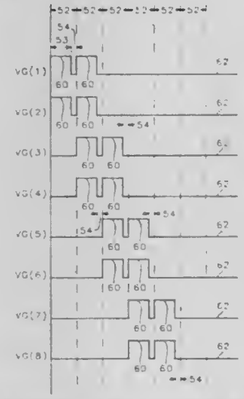
**OVER LINE SCAN METHOD**

**Fang-Chien Kuo, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan**

**Filed Mar. 6, 1996, Ser. No. 612,619**

**Int. Cl.[6] H04N** *7/00*

**U.S. Cl. 345—100** **26 Claims**




1. A method of driving a display, comprising the steps of:

providing a display having a matrix array of cells formed in N rows by M columns, where N and M are positive integers, wherein each said cell comprises a pixel connected to a switching element, each said switching element having a row electrode and a column electrode, and each said cell is selected by applying a selecting voltage to said row electrode or not selected by applying a non selecting voltage to said row electrode;

connecting said row electrodes in each of said N rows of cells to a row select line thereby forming row select lines 1 through N;

connecting said column electrodes in each of said M columns of cells to a column data line thereby forming column data lines 1 through M;

providing N periodic voltages each said periodic voltage having a scanning period consisting of a first field followed by a second field, wherein each said scanning period consists of an integral number of sweep periods and each said sweep period consists of an integral number of block widths, wherein in each said sweep period each said periodic voltage is in select mode, having said non selecting voltage during the last said block width of said sweep period and said selecting voltage during the remainder of said sweep period, or in non select mode, having said non selecting voltage during the entire said sweep period;

providing means for selecting rows 1 through N of said cells by connecting said N periodic selecting voltages to said N row select lines so that during said first field, after the first said sweep period of said first field, said row select lines are selected in groups of two, three, or four and during said second field, after the first or second said sweep period of said second field, said row select lines are selected in groups of three or four, wherein the number of row select lines selected

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in said second field is equal to or one greater than the number of row select lines selected in said first field;

providing video signals 1 through M; and

applying said video signals 1 through M to said column data lines 1 through M.

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**5,742,271**

**MATRIX TYPE DISPLAY DEVICE, ELECTRONIC SYSTEM INCLUDING THE SAME AND METHOD OF DRIVING SUCH A DISPLAY DEVICE**

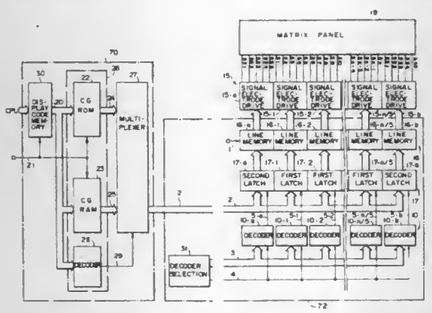
**Yohichi Imamura; Shigeki Aoki, and Norio Koizumi, all of Suwa, Japan, assignors to Seiko Epson Corporaiton, Tokyo, Japan**

**Filed Nov. 8, 1994, Ser. No. 337,492**

**Claims priority, application Japan, Nov. 11, 1993, 5-282720**

**Int. Cl.[6] G09G** *5/40*

**U.S. Cl. 345—116** **21 Claims**



1. A matrix type display device comprising a matrix panel including display pixels arranged in a matrix and a plurality of signal electrodes crossing a plurality of scan electrodes, signal electrode driving means for applying drive voltages to the signal electrodes of said matrix panel, scan electrode driving means for applying drive voltages to the scan electrodes of said matrix panel, means for generating a display signal for character and icon pattern and means for transferring said display signal to said signal electrode driving means,

said display signal generating means comprising a display code storage for storing display codes for at least one image in order to store both character display codes for specifying character patterns and icon display codes for specifying icon patterns in a desired address arrangement, means for generating dot image patterns for display codes stored in said display code storage means, and means for outputting the dot image patterns as the display signal for every dot line, wherein characters and icons are displayed on said matrix panel in a desired arrangement without overlapping each other.

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**5,742,272**

**ACCELERATED FULL SCREEN VIDEO PLAYBACK**

**John Kitamura, Toronto; Indra Laksono, Richmond Hill, and Adrian H. Hartog, Toronto, all of Canada, assignors to ATI Technologies Inc., Thornhill, Canada**

**Filed Apr. 29, 1996, Ser. No. 638,808**

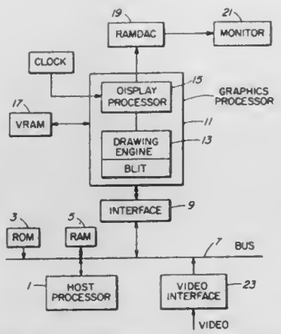
**Int. Cl.[6] G09G** *5/00*

**U.S. Cl. 345—127** **6 Claims**

1. A method of drawing moving images on a graphics display comprising:

(a) receiving data defining an input image in a predetermined resolution,

(b) commanding a graphics processor to draw a corresponding image frame on a display having a number of scanning lines which is a multiple m of a number of scanning lines of the



input image and a multiple n of a number of pixels in a horizontal line of the input image,

(c) drawing successive lines of the input image on a first and on each $m^{th}$ scanning line of the graphics display, while stretching each pixel on each drawn line over n pixels,

(d) copying each drawn line on respective immediately following m−1 lines, and

(e) repeating steps (b)–(d) for successive frames of the input image.

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**5,742,273**

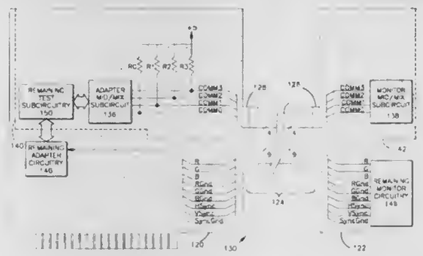
**VIDEO MONITOR/ADAPTER INTERCONNECT EXTENSION ARCHITECTURE**

**Michael Flinders; Adrian John Hawes, both of Chandlers Ford, England; Cynthia Kocialski, and Marco Michael Rengan, both of Boca Raton, Fla., assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed Feb. 16, 1996, Ser. No. 17,794**

**Int. Cl.[6] G09G** *5/00*

**U.S. Cl. 345—132** **16 Claims**



1. A video subsystem of a computer system comprising:

a video adapter device;

a video monitor device; and

a display cable electrically connecting said video monitor to said video adapter; said display cable including at least one monitor identification line;

said video monitor having means to generate selected, fixed monitor identification information on said at least one monitor identification line;

said video adapter having means to receive said monitor identification information via said at least one monitor identification line;

said video adapter and said video monitor having means for generating a communications link for dynamic communications between said video adapter and said video monitor via said at least one monitor identification line;

said video monitor generating said fixed monitor identification information on said at least one monitor identification line before a triggering event; and

after said triggering event, said video monitor ceasing generating said monitor identification information on said at least one monitor identification line and said video adapter and said video monitor generating said communications link along said at least one monitor identification line.

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**5,742,274**

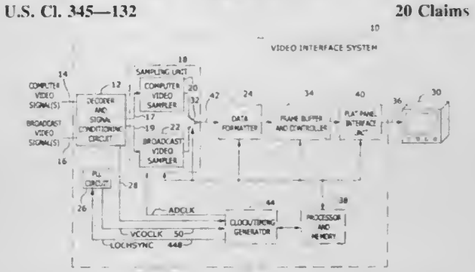
**VIDEO INTERFACE SYSTEM UTILIZING REDUCED FREQUENCY VIDEO SIGNAL PROCESSING**

**Keith E. Henry, Tyngsboro; Barry N. Mansell, Groton, and Burt Hashizume, Littleton, all of Mass., assignors to PixelVision Inc., Acton, Mass.**

**Filed Oct. 2, 1995, Ser. No. 538,116**

**Int. Cl.[6] G09G** *5/00; 5/04*

**U.S. Cl. 345—132** **20 Claims**



1. A video signal interface system comprising:

a sampling unit for sampling a video signal comprising a plurality of pixels to capture a first subset of pixels from a first frame of said video signal and for sampling said plurality of pixels to capture a second subset of pixels from a second frame of said video signal; and

a display for simultaneously displaying said first subset of pixels of said first frame of said video signal and said second subset of pixels of said second frame of said video signal.

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**5,742,275**

**APPARATUS AND METHOD FOR DISPLAYING A SIGNAL WAVEFORM**

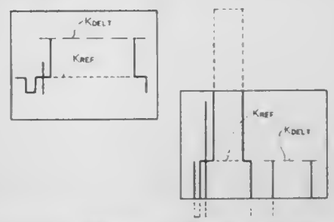
**Kentaro Ozawa, Kanagawa-ken, Japan, assignor to Leader Electronics Corp., Kanagawa, Japan**

**Filed Sep. 14, 1994, Ser. No. 305,708**

**Claims priority, application Japan, Sep. 14, 1993, 5-229026**

**Int. Cl.[6] G09G** *5/36*

**U.S. Cl. 345—134** **1 Claim**



1. A method for displaying a waveform of an input signal and reference and delta cursors for measuring the differences between pedestal and top levels of said input signal on a display screen, said method comprising the steps of:

generating a synchronization detecting pulse synchronously with a synchronous signal incorporated in said input signal;

generating a sweep signal synchronously with a sweep trigger signal obtained by dividing said synchronization detecting pulses by N, where N is a positive integer;

generating a cursor signal including two different voltage portions respectively corresponding to said reference and delta cursors;



multiplexing said input signal and cursor signal to provide a multiplexed input/cursor signal;

amplifying said multiplexed input/cursor signal at a given gain;

generating a vertical location arrangement signal to arrange reference display locations on a vertical axis for the waveform of said input signal and said reference and delta cursors, said vertical location arrangement signal being stepwise varied synchronously with said sweep trigger signal;

combining said vertical location arrangement signal and said multiplexed input/cursor signal which has been amplified with said gain to obtain a vertical axis drive signal;

driving a horizontal axis of said display screen on the basis of said sweep signal;

driving a vertical axis of said display screen on the basis of said vertical axis drive signal;

displaying at least two sliced portions of said waveform of said input signal with said references and delta cursors being displayed on the left and right sides of the same display screen in an enlarged/divided display mode (N≧2), or the whole waveform of said input signal on the display screen in a normal display mode (N=1); and

displaying at least two sliced portions of said waveform of said input signal with said reference and delta cursors being displayed on the same display screen when N is increased.

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**5,742,276**

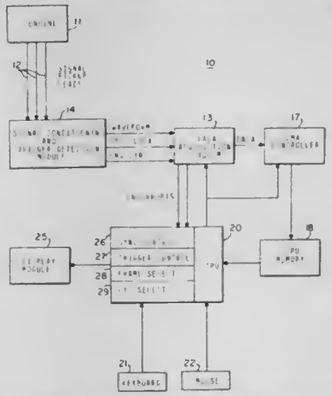
**ENGINE ANALYZER WITH DUAL-TRACE SCOPE AND SELECTIVE CONTROL OF SYNCHRONIZATION OF THE SCOPE TRACES**

**Yosuf M. Taraki, Evanston, Ill., assignor to Snap-on Technologies, Inc., Lincolnshire, Ill.**

**Filed Apr. 10, 1996, Ser. No. 631,796**

**Int. Cl.[6] G09G** *5/36;* **F02P** *17/00*

**U.S. Cl. 345—134** **18 Claims**



1. Apparatus for monitoring waveforms from an associated source, said apparatus comprising:

waveform acquisition means adapted to be coupled to the associated source for receiving analog input waveforms therefrom and generating digitized waveform data representative of such analog waveforms,

memory means for storing digitized waveform data by frames wherein a frame represents waveform data for a particular time period,

display means including a display screen for displaying stored waveform data as plural waveform representations respectively on different traces,

processing means coupled to said memory means and to said display means and operating under stored program control for controlling storage and display of the waveform data,

said processing means including synchronizing means selectively operable between an activated condition wherein the waveform representations displayed on the different traces of

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the display means are required to be synchronized with one another and a deactivated condition wherein no waveform representation displayed on any trace of the display means is required to be synchronized with the waveform representation displayed on any other trace of the display means, and

switch means selectively operable for activating and deactivating said synchronizing means as to simultaneously displayed waveform representations.

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**5,742,277**

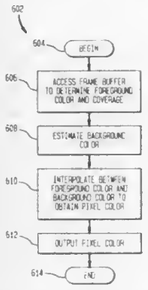
**ANTIALIASING OF SILHOUETTE EDGES**

**Carroll Phillip Gossett, Mountain View, and Timothy J. Van Hook, Menlo Park, both of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.**

**Filed Oct. 6, 1995, Ser. No. 539,956**

**Int. Cl.[6] G09G *5/00***

**U.S. Cl. 345—136** **21 Claims**




1. A method of antialiasing a silhouette edge, the silhouette edge representing an edge of a polygon which is coincident with an edge of a surface on which the polygon is located, the method comprising the steps of:

(1) retrieving a color value for a silhouette edge pixel which falls on the silhouette edge from a frame buffer, the retrieved color value representing a color of one or more foreground polygons which fall within the silhouette edge pixel;

(2) estimating a background color of the silhouette edge pixel based on colors of neighboring pixels that are proximate to the silhouette edge pixel, the estimated background color representing a color of a portion of the silhouette edge pixel which is not occupied by the one or more foreground polygons; and

(3) determining an output color of the silhouette edge pixel by interpolating between the retrieved color and the estimated background color.

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**5,742,278**

**FORCE FEEDBACK JOYSTICK WITH DIGITAL SIGNAL PROCESSOR CONTROLLED BY HOST PROCESSOR**

**Elaine Y. Chen, Boston; Bin An; Timothy R. Osborne, both of Arlington; Paul DiLascia, Reading, and Matthew Coill, Tyngsboro, all of Mass., assignors to Microsoft Corporation, Redmond, Wash.**

**Continuation-in-part of Ser. No. 187,646, Jan. 27, 1994, abandoned. This application Nov. 1, 1995, Ser. No. 502,430**

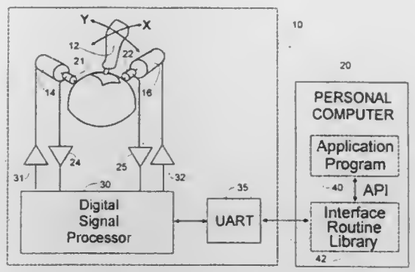
**Int. Cl.[6] G09G *5/00***

**U.S. Cl. 345—156** **19 Claims**

1. A programmable input and output device for use with a digital computer to which it is electrically coupled, said device comprising:

a. a moveable member manipulatable by a human user in at least one degree-of-freedom;

b. a sensor that produces position signals specifying a position of said moveable member with respect to said one degree-of-freedom;




c. a memory in which force effect definitions and for associating each of said stored definitions with a unique effect identifier for each force effect definition are stored;

d. a processor that is electrically coupled to the memory to access the force effect definitions in response to force commands received from the digital computer, said processor producing a control signal in response to the force commands; and

e. an actuator, electrically coupled to the processor and mechanically coupled to said movable member, said actuator applying a force to said moveable member in said one degree-of-freedom in response to the control signal, a direction and a magnitude of said force being specified by at least one of said force effect definitions that is referenced by a corresponding effect identifier included in said force commands.

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**5,742,279**

**INPUT/DISPLAY INTEGRATED INFORMATION PROCESSING DEVICE**

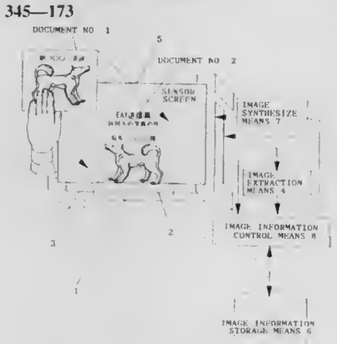
**Hiroshi Yamamoto, Katano; Yasuharu Shimeki, Suita; Kazuhiro Kayashima, Hirakata; Susumu Maruno, Osaka; Makoto Fujimoto, Ibaraki, and Yoshihiro Kojima, Kobe, all of Japan, assignors to Matsushita Electrical Co., Ltd., Osaka, Japan**

**Filed Nov. 8, 1994, Ser. No. 337,372**

**Claims priority, application Japan, Nov. 8, 1993, 5-278617; Apr. 12, 1994, 6-073201; Jul. 29, 1994, 6-178079; Aug. 3, 1994, 6-182288; Aug. 12, 1994, 6-190465**

**Int. Cl.[6] G09G *5/00***

**U.S. Cl. 345—173** **8 Claims**




1. An input/display integrated information processing device comprising:

image display means for displaying image information;

image input means for inputting two-dimensional image information of a two-dimensional image prepared prior to image information input by said input means, said image input means includes:

a line light source for illuminating a presented article on said input screen,



a line optical sensor for reading one-dimensional light reflected by the presented article,

sensor drive means for driving said line light source and said line optical sensor, and

read control means for controlling said sensor drive means, said read control means including background light elimination means for, at each reading of one line, detecting image information from a difference between an output of said line optical sensor in the case where said line light source is on, and an output of said line optical sensor in the case where said line light source is off, thereby reducing noise due to external light from illumination;

a visual coincidence structure for integrally combining a display screen of said image display means with an input screen of said image input means so as to establish visual coincidence of said screens as viewed from an user;

image extraction means for extracting a previously identified portion from image information input through said image input means;

image information storage means for storing the image information of the two-dimensional image;

image information control means for controlling input/output operations of the image information; and

wherein, in the integral combination in said visual coincidence structure, said image input means is placed before said image display means as viewed from the user.

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**5,742,280**

**HAND-WRITTEN GRAPHIC FORM INPUTTING APPARATUS**

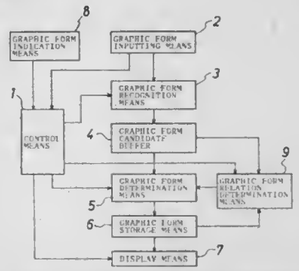
**Yutaka Ohyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Continuation of Ser. No. 364,974, Dec. 28, 1994, abandoned. This application Aug. 12, 1996, Ser. No. 695,532**

**Claims priority, application Japan, Dec. 28, 1993, 5-336608**

**Int. Cl.[6] G09G *5/00***

**U.S. Cl. 345—173** **6 Claims**




1. A hand-written graphic form inputting apparatus, comprising:

graphic form inputting means for inputting a hand-written graphic form;

a graphic form candidate buffer;

graphic form recognition means for recognizing the hand-written graphic form inputted by way of said graphic form inputting means; producing a plurality of graphic form candidates; and storing the plurality of graphic form candidates as types of forms, coordinate values and likelihoods representative of likelihood degrees of the graphic form candidates into said graphic form candidate buffer;

graphic form storage means for storing a graphic form candidate;

graphic form relation determination means for detecting correlation between at least one graphic form candidate among said plurality of graphic form candidates stored in said graphic form candidate buffer and said graphic form candidate stored in said graphic form storage means, and determining if said at least one graphic form candidate corresponds in shape to said graphic form candidate stored in said graphic form storage means;

graphic form determination means for, (a) if no graphic form candidate is stored in said graphic form storage means, determining one of the graphic form candidates stored in said graphic form candidate buffer which is highest in likelihood, extracting said one of the graphic form candidates from said graphic form candidate buffer, storing said one of the graphic form candidates into said graphic form storage means, and clearing said graphic form candidate buffer, and for, (b) if said graphic form relation determination means has determined that said at least one graphic form candidate corresponds in shape to said graphic form candidate stored in said graphic form storage means, extracting said at least one graphic form candidate from said graphic form candidate buffer, storing said at least one graphic form candidate into said graphic form storage means, and clearing said graphic form candidate buffer; and

display means for displaying the graphic form candidates stored in said graphic form storage means.

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**5,742,281**

**IMAGE CONTROL DEVICE**

**Katsutoshi Nakamura, Suwa, Japan, assignor to Seiko Epson Corp., Tokyo, Japan**

**Continuation of Ser. No. 934,689, Sep. 23, 1992, abandoned. This application Sep. 8, 1994, Ser. No. 303,131**

**Claims priority, application Japan, Jan. 23, 1991, 3-006249**

**Int. Cl.[6] G06F *15/64***

**U.S. Cl. 345—191** **4 Claims**

| | Plain 0 | Plain 1 | Plain 2 | Plain 3 | Plain 4 | Plain 5 | Plain 6 | Plain 7 |
|---|---|---|---|---|---|---|---|---|
| RAM450 | x 0 | x 1 | x 2 | x 3 | x 4 | x 5 | x 6 | x 7 |
| RAM451 | x 1 | x 0 | x 3 | x 2 | x 5 | x 4 | x 7 | x 6 |
| RAM452 | x 2 | x 3 | x 0 | x 1 | x 6 | x 7 | x 4 | x 5 |
| RAM453 | x 3 | x 2 | x 1 | x 0 | x 7 | x 6 | x 5 | x 4 |
| RAM454 | x 4 | x 5 | x 6 | x 7 | x 0 | x 1 | x 2 | x 3 |
| RAM455 | x 5 | x 4 | x 7 | x 6 | x 1 | x 0 | x 3 | x 2 |
| RAM456 | x 6 | x 7 | x 4 | x 5 | x 2 | x 3 | x 0 | x 1 |
| RAM457 | x 7 | x 6 | x 5 | x 4 | x 3 | x 2 | x 1 | x 0 |

1. An image control device having an image drawing unit for handling a number of bits of data and for outputting a plurality of planes, each of the planes corresponding to one frame of information to be displayed, an image storing unit for storing the plurality of planes, and an image display, the image control device further comprising:

(a) a plurality of memory blocks included in the image storing unit, each of the plurality of memory blocks having a capacity capable of storing at least one of the planes in the image storing unit, each of the memory blocks having a data port number, the data port number of each memory block being smaller than the number of bits of data handled in the image drawing unit,

(b) a first data bus converting circuit, the first data bus converting circuit having a plurality of input terminals for inputting data units from the image drawing unit in parallel, the data units being divided from at least one of the planes, and a plurality of output terminals for outputting the data units to the memory blocks in parallel,

(c) a second data bus converting circuit, the second data bus converting circuit having a plurality of input terminals for inputting the data units from the memory blocks in parallel and a plurality of output terminals for outputting the data units to the display, each of the output terminals of the second data bus converting circuit being allocated to a selected one of the planes in the image storing unit, and

(d) an address controller for controlling connections between the input and output terminals of the first data bus converting circuit such that the data units constituting the at least one of

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the planes to be stored in the image storing unit are respectively stored in the different memory blocks, wherein

connections between the input and output terminals of the second data bus converting circuit are controlled such that the data units constituting the selected one of the planes in the image storing unit and stored in the different memory blocks are outputted through the allocated output terminal for the selected one of the planes in the image storing unit of the output terminals of the second bus converting circuit.

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**5,742,282**

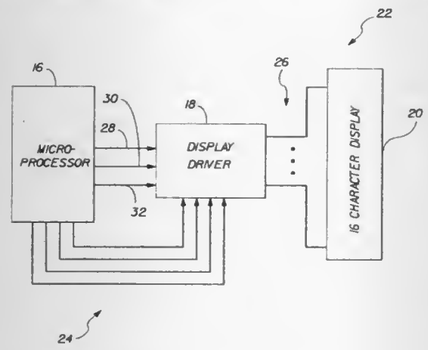
**16 BIT ADDRESS ACCESS USING 8 BIT REGISTERS**

**Michael Timothy Malley, LeRoy, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 28, 1995, Ser. No. 395,958**

**Int. Cl.[6] G09G** *5/22*

**U.S. Cl. 345—193** **5 Claims**




1. A camera, comprising:

a display for displaying a message to a user, wherein said message is preceded at a 16 bit address with a software interrupt instruction; and

a microprocessor for controlling said display, wherein said microprocessor comprises a 16 bit program counter, a stack including a plurality of 8 bit registers, and a memory for storing a plurality of messages, said memory including a plurality of 8 bit registers, and wherein said microprocessor is programmed to:

invoke said message and place said 16 bit address in said 16 bit program counter, said 16 bit address including a first byte and a second byte,

cause a software interrupt by executing said software interrupt instruction,

push said first byte and said second byte from said 16 bit program counter onto said stack,

pop said first byte and said second byte off said stack,

store said first byte in a first location in said memory and store said second byte in a second location in said memory, and return from said software interrupt.

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**5,742,283**

**HYPERSTORIES: ORGANIZING MULTIMEDIA EPISODES IN TEMPORAL AND SPATIAL DISPLAYS**

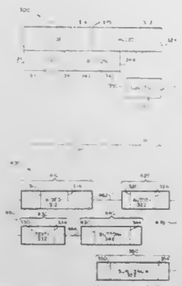
**Michelle Yoonkyung Lee Kim, Scarsdale, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 127,863, Sep. 27, 1993, abandoned. This application Apr. 15, 1997, Ser. No. 843,312**

**Int. Cl.[6] G06F** *17/00*

**U.S. Cl. 345—302** **17 Claims**

1. A method of organizing multimedia segments, the multimedia segments having one or more sensory qualities when played on a



multimedia computer system, the multimedia segments being stored on a memory of the computer system, and the multimedia segments being organized to play on the computer system, the method being executed by the computer system and comprising the steps of:

selecting one or more multimedia segments from a plurality of segments, the selected segments each having a temporal component including a start, an end, and a duration, the selected segments being episodes of a story;

scheduling the story episodes in a schedule sequence that defines the story; grouping the story episodes into one or more temporal cliques, each of one or more first episodes in each temporal clique overlapping one or more of the other episodes in the temporal clique by having any one of the start and end of the first episode scheduled at a time in the schedule sequence that is the same as any one of the start, end, and duration of at least one, but not all, of the other episodes in the temporal clique, at least one of the temporal components of at least one of the first episodes being different than the respective temporal component of one or more of the other episodes;

spatially organizing the episodes in each temporal clique independently of the episodes in other temporal cliques, the spatial organizing placing any of the first episodes in the temporal clique in a spatial organization so that the first episode does not clash with any of the other episodes in the temporal clique when the episodes in the temporal clique are played, a clash occurring when a first multimedia segment plays at the same time as one or more other multimedia segments and the first multimedia segment interferes with the one or more of the other multimedia segments; and

playing the episodes of the story in the schedule sequence with the spatial organization of the temporal cliques.

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**5,742,284**

**OBJECT BASED SYSTEM COMPRISING WEAK LINKS**

**Hugh Duggan, Bristol, England, and William Morel, Redmond, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 297,683, Aug. 29, 1994, which is a continuation of Ser. No. 735,992, Jul. 25, 1991. This application May 22, 1996, Ser. No. 651,622**

**Claims priority, application European Pat. Off., Jul. 31, 1990, 90308450**

**Int. Cl.[6] G06F** *15/00;9/445;* **H01J** *13/00*

**U.S. Cl. 345—335** **29 Claims**

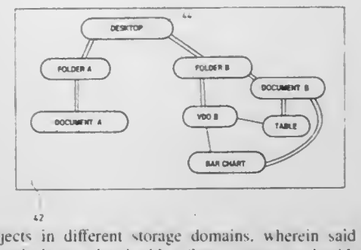
1. An object based computer system, comprising:

a plurality of objects;

graphics display means for displaying representations of said objects; and

linking means for sustaining containership links between a first semantic object in a storage domain and other semantic objects that are in the same storage domain and are contained in said first semantic object wherein the system is configured so that said first semantic object cannot be deleted without also deleting said other semantic objects having a containership link with said first object; and for sustaining weak links between said first semantic object and said other semantic






objects in different storage domains, wherein said storage domain is associated with a first computer and said different storage domains are associated with at least one other computer, and wherein the system is configured so that either said first semantic object or said one of said other semantic objects to which it is weakly linked can be deleted without deleting the other weakly linked object and wherein said weak links cause selected items associated with said first semantic object to be inserted automatically into said other semantic object(s).

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**5,742,285**

**VIRTUAL SCREEN DISPLAY SYSTEM**

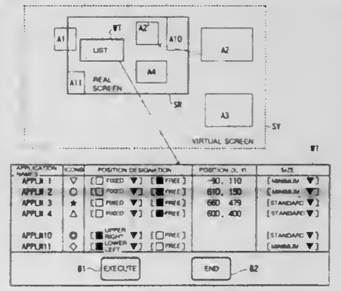
**Suguru Ueda, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan**

**Continuation of Ser. No. 610,246, Mar. 4, 1996, abandoned. This application Apr. 18, 1997, Ser. No. 839,385**

**Claims priority, application Japan, Mar. 28, 1995, 7-069006**

**Int. Cl.[6] G06F** *15/00*

**U.S. Cl. 345—342** **24 Claims**




1. A virtual screen display system comprising:

input means for inputting information;

display means for displaying images on a screen;

application processing means for executing a plurality of applications;

virtual screen processing means for setting a virtual screen larger than an actual screen of said display means, displaying a part of said virtual screen as a real screen on said display means, and controlling a position of said real screen as needed in accordance with an operational input made by using said input means;

window processing means operable in association with said application processing means and said virtual screen processing means for arranging display screens based on execution of said applications as application windows on said virtual screen;

list display instructing means for instructing a display of a list of application windows to be used by applications currently run by said application processing means, by an operational input made by said input means; and

list display processing means for collecting window information including application information indicative of running applications and position information of said application windows of said running applications on said virtual screen, application by application, and displaying a window information list based on said window information on said display means.

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**5,742,286**

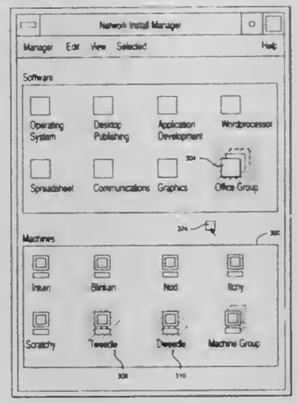
**GRAPHICAL USER INTERFACE SYSTEM AND METHOD FOR MULTIPLE SIMULTANEOUS TARGETS**

**Jonathan Sc Kung, and James Lee Lentz, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 20, 1995, Ser. No. 560,870**

**Int. Cl.[6] G06F** *3/00*

**U.S. Cl. 345—349** **9 Claims**




1. A computerized method for graphically facilitating interaction of one or more source objects with multiple target objects utilizing a graphic user interface in a computer network, comprising:

registering selection of said one or more source objects in said interface by selecting one from a group comprised of one of said selected source objects or a source container object associated with a plurality of selected source objects;

registering selection of said multiple target objects as a subset of a target objects in said interface by selecting one from a group comprised of one of said selected target objects or a target container object associated with a plurality of selected target objects; and

initiating interaction of said one or more source objects with said subset of multiple target objects in response to an action in said graphic user interface, said interaction comprising

moving said selected one from a group comprised of said one of said selected source objects or said source container object onto said one of said group comprised of said one of said selected targets or said target container object, and wherein

in response to said interaction said one of said selected target objects registers acceptance or rejection of one or more of said selected source objects;

in response to said registering by said one of said selected target objects and said acceptance of said one or more of said selected source objects, at least one of said selected target objects registers in said graphical user interface a visual indication of an ongoing process of said one or more of said selected source objects onto said selected one of said target objects; and

upon termination of said install process, said at least one of said selected target objects having said visual indication of said ongoing install remains with a visual indication of being said selected one of said target objects.

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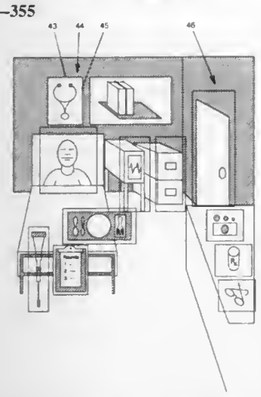


**5,742,287**

## CONTEXT SENSITIVE BORDERS WITH COLOR VARIATION FOR USER SELECTABLE OPTIONS

David Bruce Lection, Raleigh, and Mark Edward Molander, Cary, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 17, 1996, Ser. No. 682,204
Int. Cl.[6] G06F *3/00*
U.S. Cl. 345—355 64 Claims




1. A method of displaying a user selectable option in a user interface environment displayed on a display device having a plurality of picture elements, the method comprising the steps of:

providing a border to the user selectable option comprised of a plurality of border picture elements wherein color characteristics from picture elements neighboring the border are varied to define the color characteristics of the border picture elements.

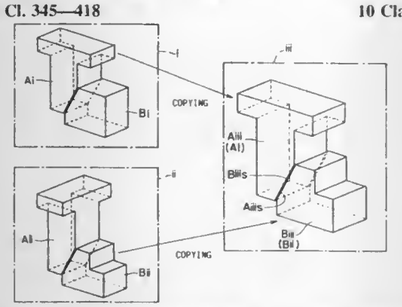
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**5,742,288**

## METHOD OF GENERATING OR MODIFYING SOLID MODEL OF AN OBJECT ACCORDING TO CROSS-SECTIONAL SHAPES AND A PREDETERMINED RELATIONSHIP AND APPARATUS SUITABLE FOR PRACTICING THE METHOD

Koichi Nishizaka, Toyota; Akihiko Higashi, Hiroshima, and Jun Mukai, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, and BPA Inc., Fukuoka, both of Japan

Division of Ser. No. 286,570, Aug. 5, 1994, Pat. No. 5,649,076.
This application Jan. 16, 1997, Ser. No. 783,345
Claims priority, application Japan, Aug. 6, 1993, 5-196340; Dec. 24, 1993, 5-328984
Int. Cl.[6] G06T *17/00*
U.S. Cl. 345—418 10 Claims




1. A method of generating solid models of structural assemblies each consisting of a plurality of components, according to cross sectional shapes of said components and attributes associated with said cross sectional shapes, said cross sectional shapes and said attributes being based on wire frame models defining shapes of said components of said each structural assembly, said method comprising the steps of:

providing a plurality of part data files corresponding to said plurality of structural assemblies, respectively, each of said part data files including a plurality of component data files corresponding to said plurality of components of said each structural assembly, respectively, and a relation data file;

storing wire-frame-related data or surface model data and solid model data of each of said components of said each structural assembly, in respective areas of a corresponding one of said component data files of a corresponding one of said part data files, said wire-frame-related data including wire frame data representative of said wire frame models of said components, and said surface model data being representative of surface models of said components, while said solid model data being representative of said solid models of said components;

storing component relation data of said each structural assembly in said relation data file of the corresponding part data file, said component relation data being representative of a positional relationship of said plurality of components of said each structural assembly;

retrieving said wire-frame-related data or surface model data of a desired one of said components of one of said plurality of structural assemblies, from the part data file corresponding to said one of said plurality of structural assemblies, and retrieving said wire-frame-related data or surface model data of a desired one of said components of another of said plurality of structural assemblies, from the part data file corresponding to said another of said plurality of structural assemblies; and

generating solid model data of a new structural assembly consisting of said desired one of the components of said one of said plurality of structural assemblies and said desired one of the components of said another of said plurality of structural assemblies, according to the retrieved wire-frame-related data or surface model data of said components of said one and another of said plurality of structural assemblies, and component relation data representative of a desired positional relationship between said components of said one and another of said plurality of structural assemblies.

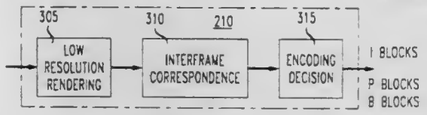
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**5,742,289**

## SYSTEM AND METHOD OF GENERATING COMPRESSED VIDEO GRAPHICS IMAGES

Bruce F. Naylor, Summit, and Eric David Petajan, Watchung, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 221,732, Apr. 1, 1994, abandoned.
This application Aug. 16, 1996, Ser. No. 689,962
Int. Cl.[6] G06T *13/00*
U.S. Cl. 345—419 34 Claims




1. A hybrid system for synthesizing a compressed video bitstream from a dynamic 3-D model said video bitstream representing an image sequence comprised of a plurality of image frames which are sequential in time, each image frame being partitioned into a set of nonoverlapping contiguous regions, each block of said image frame being encoded as indicated by a predictive encoding type, the system comprising:

means for performing low resolution rendering upon the 3-D objects which compose the 3-D model to derive a mapping definition for each object and to thereby produce a 2-D image frame and to partition each image frame of a time sequence of frames into a set of regions;



means for generating motion vectors for at least one region within a current image frame, said motion vectors representing a projected direction of motion for the dynamic 3-D model;

means for computing a prediction error value for said at least one region based on the generated motion vectors;

means for determining a type of predictive encoding to be performed on said at least one region in a succeeding image frame based on the value of the prediction error; and

means for encoding said at least one region in the succeeding image frame as indicated by the determined predictive encoding type.

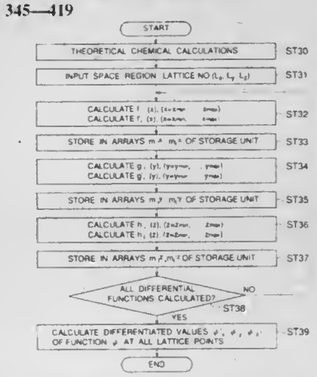
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**5,742,290**

## MOLECULAR ORBITAL MODELING SYSTEM WITH AN IMPROVED FUNCTION PROCESSOR

Tomoaki Hayano, and Azuma Matsuura, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 115,098, Sep. 2, 1993, abandoned.
This application Sep. 18, 1996, Ser. No. 714,286
Claims priority, application Japan, Sep. 3, 1992, 4-236145
Int. Cl.[6] G09B *23/06*
U.S. Cl. 345—419 23 Claims




1. A function processing system for processing functions for a molecular system of materials utilizing a computer system to make a three-dimensional display on a screen of a display by connecting a plurality of lattice points of a space coordinate in a three-dimensional space region, said function processing system comprising:

computing means for computing a function value at each of the lattice points by a multivariable function having the space coordinate as an independent variable, said computing means replacing the multivariable function directly by a product of a predetermined number of single variable functions and computing each of the single variable functions in advance so that the multivariable function is computed based on function values of each of the single variable functions;

storage means, coupled to said computing means to form the computer system, for storing the function values of the single variable functions which are computed in advance by said computing means, said computing means reading the stored function values of the single variable functions from said storage means when computing the multivariable function; and

output means for outputting the function values computed by said computing means to provide the three-dimensional display of lattice points.

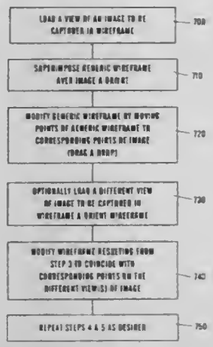
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**5,742,291**

## METHOD AND APPARATUS FOR CREATION OF THREE-DIMENSIONAL WIRE FRAMES

Charles S. Palm, Westlake Village, Calif., assignor to Synthonics Incorporated, Westlake Village, Calif.

Filed May 9, 1995, Ser. No. 437,771
Int. Cl.[6] G06T *17/20*
U.S. Cl. 345—420 8 Claims




1. Apparatus for rapidly creating wire frame representations of three dimensional objects comprising:

a. computer having an input/output device, a display, a memory and mass storage;

b. generic wire frames stored on said mass storage; and

c. software, for controlling said computer, permitting a generic wire frame to be oriented so it aligns with a first view of a three dimensional object, modifying, if needed, the location of at least one vertex of the generic wire frame to overlay a feature point in said first view to create a modified wire frame, orienting said modified wire frame so it aligns with a second view of said object, and modifying the location of said vertex to overlay said feature point in said second view.

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**5,742,292**

## SYSTEM AND METHOD FOR REALISTICALLY DISPLAYING IMAGES INDICATING THE EFFECTS OF LIGHTING ON AN OBJECT IN THREE DIMENSIONAL SPACE

Katsuyuki Murata, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 330,867, Oct. 28, 1996, abandoned.
This application Mar. 24, 1997, Ser. No. 826,102
Claims priority, application Japan, Oct. 29, 1993, 5-272251
Int. Cl.[6] G06T *15/50*
U.S. Cl. 345—426 14 Claims

1. A realistic image display system comprising:

storage means for storing three-dimensional object data defining a three-dimensional object to be located within three-dimensional space containing a light source, the location of said object within said three-dimensional space, an object attribute indicating optical properties of said object for said light source, light source data including the location of said light source within said three-dimensional space, a light source attribute indicating illumination properties of said light source, and parameters of an image to be displayed;

polygon generating means for generating a basic polygon and a set of extension polygons indicating effects of said light source on said three-dimensional space in accordance with a computing process which uses said light source data, said parameters, the three dimensional object, the location of said object, and the object attribute of said object, said set of extension polygons being generated by defining vertices of the extension polygons using vertices of the basic polygon added to vectors defining the basic polygon having a magnitude based on said parameters of the image to be displayed;

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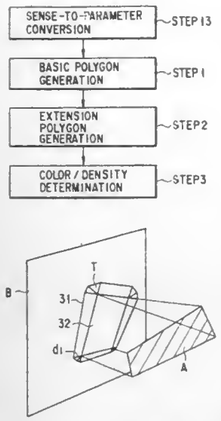



image generating means for generating a display image using said three-dimensional object and said set of polygons on the basis of said three-dimensional object data, said light source data, and said parameters; and display means for displaying said display image generated by said image generating means.

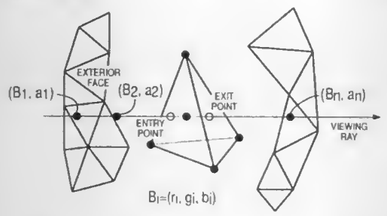
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**5,742,293**

**DATA VISUALIZER UTILIZING EXTERIOR SELECTED AND DEPTH SORTED POLYHEDRON FACES**

**Koji Koyamada, Hadano; Akio Doi, Machida, and Sakae Uno, Hachioji, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 78,715, Jun. 17, 1993, abandoned. This application Feb. 26, 1996, Ser. No. 607,048**
**Claims priority, application Japan, Jun. 19, 1992, 4-159909**
**Int. Cl.[6] G06T** *15/40*
**U.S. Cl. 345—421** **6 Claims**




1. A data visualizer that transforms data distributed over a specified area of three-dimensional space into color and opacity information and displays said data in graphics on the basis of said color and opacity information, said data visualizer comprising:

means for storing information that defines two or more polyhedrons having as their vertices respective points to which said data is distributed;

a means for selecting from the stored information only a plurality of exterior faces that form a boundary of said specified area and face toward a viewing point from among the exterior faces of said polyhedrons and sorting only said plurality of exterior faces that face toward the viewing point according to distance from the viewing point, or otherwise selecting only the exterior faces that face away from a viewing point and sorting only the exterior faces that face away from the viewing point according to distance from the viewing point;

a means for specifying said selected exterior faces in said sorting order according to the distance from said viewing point, retrieving said selected exterior faces in sequence for each of said polyhedrons and carrying out the following processing:

(a) determining a viewing ray traveling through a viewing point, a pixel on a projection surface, and a point on said exterior faces,

(b) determining along said viewing ray from the entry of said viewing ray into said specified area to said boundary of said specified area each polyhedron intersecting said viewing ray and the exterior faces where said viewing ray enters and exits said polyhedrons,

(c) generating color and opacity information along said viewing ray on the basis of data distributed to each vertex of the polyhedrons determined by said processing (b), and

(d) determining pixel values on the basis of said generated color and opacity information;

a storage means for storing said pixel values;

a means for computing new pixel values by accumulating said pixel values when there are pixel values generated for one polyhedron facing toward a viewing point or facing away from a viewing point and pixel values are to be computed for another polyhedron facing toward or away from a viewing point with respect to the corresponding pixel; and

a means for displaying graphics on the basis of the pixel values stored in said storage means.

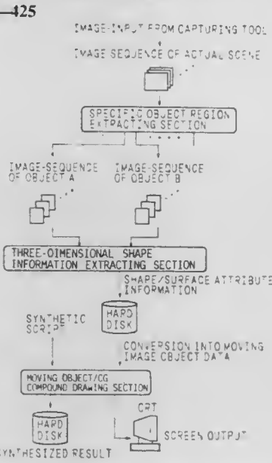
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**5,742,294**

**METHOD AND APPARATUS FOR SYNTHESIZING IMAGES**

**Masaki Watanabe; Naohisa Kawaguchi; Kazuki Matsui, and Shuichi Shiitani, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Feb. 8, 1995, Ser. No. 385,441**
**Claims priority, application Japan, Mar. 17, 1994, 6-047491**
**Int. Cl.[6] G06T** *15/00*
**U.S. Cl. 345—425** **40 Claims**




1. An image synthesizing method of synthesizing an actual scene image and a computer-graphics image, comprising the steps of:

extracting a designated region from the actual scene image;

displaying the extracted region on a screen;

preparing data of a plurality of geometric shapes beforehand;

selecting one of said geometric shades and displaying said selected geometric shape on a screen substantially where said extracted region is displayed;

adjusting the position, orientation and size of said selected geometric shape to make said selected geometric shape coincide with said extracted region;

calculating three-dimensional shape information from said adjusted geometric shape; and

constructing a computer-graphics model of said extracted region on the basis of said extracted region and three-dimensional shape information.

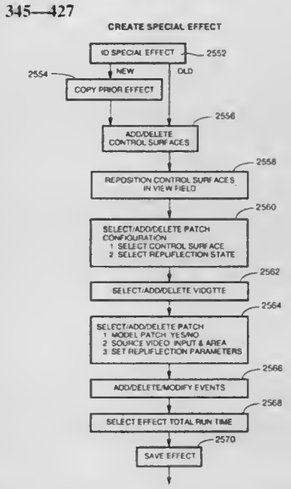


**5,742,295**

**VIDEO SPECIAL EFFECTS SYSTEM WITH GRAPHICAL OPERATOR INTERFACE**

**Dennis Allen Lindholm, Oakland, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Division of Ser. No. 810,758, Dec. 18, 1991, Pat. No. 5,592,599. This application Nov. 4, 1996, Ser. No. 743,260**
**Int. Cl.[6] G06T** *15/00*
**U.S. Cl. 345—427** **8 Claims**




1. A method of defining a control curve comprising the steps of:

defining a template curve by a plurality of ordered template curve points, each of which lies on the template curve;

defining a control curve by a plurality of ordered control curve points and a selected interpolation function that defines all points of the control curve in response to the control curve points, each control curve point having a corresponding template curve point and being initially identical in position to the corresponding template curve point but being movable to other positions independently of any movement of another of the control curve points under control of an operator; and

storing parameters defining both the template curve points and the control curve points.

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**5,742,296**

**IMAGE PROCESSING METHOD AND APPARATUS THEREFOR**

**Osamu Yamada, Yokohama; Susumu Sugiura, Atsugi, and Yoshizumi Yasuda, Kashiwa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

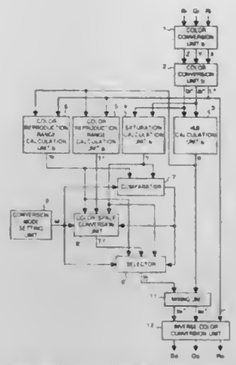
**Continuation of Ser. No. 998,865, Dec. 30, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 479,859**
**Claims priority, application Japan, Jan. 8, 1992, 4-001566**
**Int. Cl.[6] H04N** *1/46*
**U.S. Cl. 345—431** **52 Claims**

1. An image processing method comprising:

an input step of inputting color image data obtained by an input device;

a first calculating step of calculating a first color reproduction range which is independent of devices in accordance with visual characteristics of a human eye;

a second calculating step of calculating a second color reproduction range which is dependent on an output device which reproduces an image;



a conversion step of executing a color space conversion on the color image data so that the converted color image data is within said second color reproduction range, in accordance with said first color reproduction range; and

an output step of outputting the color image data on which the color space conversion is executed, to said output device,

wherein said first calculating step performs the calculation of the most vivid color in each of lightness and hue.

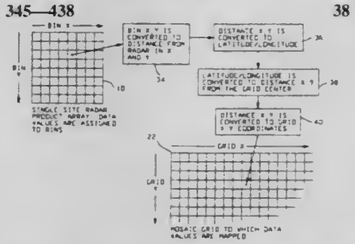
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**5,742,297**

**APPARATUS AND METHOD FOR CONSTRUCTING A MOSAIC OF DATA**

**Mark J. Logan, Langhorne, Pa., assignor to Lockheed Martin Corporation, Syracuse, N.Y.**

**Filed Nov. 4, 1994, Ser. No. 334,292**
**Int. Cl.[6] G06F** *15/00*
**U.S. Cl. 345—438** **38 Claims**




1. A method for inserting a first set of data having a first coordinate system into a data mosaic having a second coordinate system which may be different from the first coordinate system, comprising the steps of:

converting the coordinate position of one item of the first set of data into a first distance from a first reference point in the first coordinate system;

converting the first distance to a coordinate position in a third coordinate system, wherein the coordinate position of the first reference point in the third coordinate system is known;

converting the coordinate position in the third coordinate system to a second distance from a second reference point in the second coordinate system, wherein the coordinate position of the second reference point in the third coordinate system is known; and

converting the second distance to a coordinate position in the second coordinate system.

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**5,742,298**

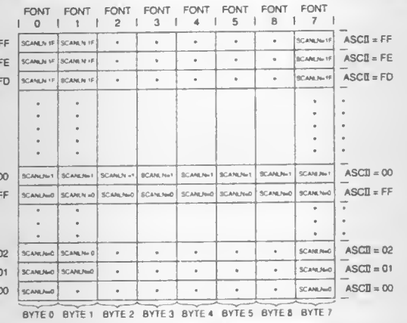
## 64 BIT WIDE VIDEO FRONT CACHE

**Vlad Bril, Campbell, and Dwarka Partani, Fremont, both of Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.**

**Continuation-in-part of Ser. No. 176,563, Dec. 30, 1994, Pat. No. 5,539,428. This application Aug. 14, 1995, Ser. No. 514,887**

**Int. Cl.[6] G09G** *5/22*

**U.S. Cl. 345—501** **16 Claims**




1. A Video Graphics Array (VGA) compatible graphics controller for receiving alphanumeric character data and generating alphanumeric characters on a video display, said VGA compatible graphics controller comprising:

a display memory having at least four planes, storing alphanumeric character data in a first plane, each of said alphanumeric character data representing at least one character of a character set, storing character attribute data in a second plane, said character attribute data including at least font selection data, and storing two character font bit maps in a third plane, each of said two character font bit maps representing a display font; a video font cache, formed in a fourth plane of the display memory for storing eight character font bit maps in a page mode, wherein said display memory comprises at least one DRAM having a width of at least 64 bits, and said at eight character font bit maps comprise eight character font bit maps, one scan line for one character of each of the eight character font bit maps being stored as a different byte at one memory address in said video font cache;

a display memory controller, coupled to said display memory, said video font cache, and a host CPU, for receiving from the host CPU data representing at least one scan line of a character font bit map and storing the data representing at least one scan line of a character font bit map in a first memory cycle in said display memory at an address indicated by the host CPU, translating the address indicated by the host CPU into a video font cache address, and storing, in a subsequent memory cycle, the data representing at least one scan line of a character font bit map at the video font cache address, said display memory controller receiving font select data as a portion of the address indicated by the CPU and storing data representing at least one scan line of a character font bit map at the video font cache address at a byte selected by the font select data, wherein said address indicated by the host CPU comprises font select bits, character select bits, and scan line select bits, and said video font cache address comprises a video font cache offset address, scan line select bits, and character select bits, said font select bits are used by said display memory controller as a byte select mask to store data representing at least one scan line of a character font bit map at a selected byte in the video font cache at the video font cache address;

a first retrieval means, for retrieving from an address in said video font cache, data representing one scan line for one character for each of said at least two character font bit maps;

primary font selection means, for receiving a primary font selection signal and selecting from said first retrieval means data representing one scan line for one character of a primary font;

secondary font selection means, for receiving a secondary font selection signal and selecting from said first retrieval means data representing one scan line for one character of a secondary font; and

display font selection means, coupled to said primary font selection means and said secondary font selection means, for receiving from an attribute byte associated with a character a primary/secondary font selection signal and selecting from said primary font selection means and said secondary font selection means display data representing one scan line for one character of a selected display font.

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**5,742,299**

## PRINTING APPARATUS USING A CONTROL PROGRAM AND FONT DATA FROM DIFFERENT EXTERNAL MEMORY CARTRIDGES

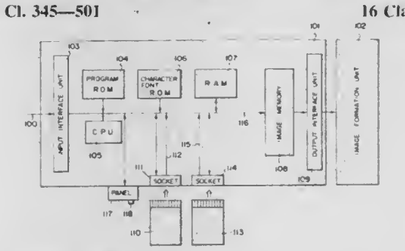
**Masaru Igarashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisa, Tokyo, Japan**

**Continuation of Ser. No. 302,990, Sep. 14, 1994, abandoned, which is a continuation of Ser. No. 989,887, Oct. 12, 1992, abandoned, which is a continuation of Ser. No. 309,877, Feb. 14, 1989, abandoned. This application Apr. 18, 1997, Ser. No. 844,369**

**Claims priority, application Japan, Feb. 17, 1988, 63-32653**

**Int. Cl.[6] G06F** *3/12*

**U.S. Cl. 345—501** **16 Claims**




1. A printing apparatus comprising:

first connecting means for detachably connecting first memory means storing a first print control program and first font data;

second memory means for storing a second, different print control program therein;

selecting means for selecting execution of the first print control program or execution of the second print control program;

developing means for developing a first dot pattern corresponding to entered code information using the first font data stored in the first memory means when the execution of the second print control program is selected by said selecting means and the second print control program is executed;

generating means for generating a control table corresponding to the first font data;

printing means for effecting printing based on the first dot pattern;

a host computer for supplying character code to be printed to said printing apparatus;

second connecting means for detachably connecting third memory means storing a third print control program, different from the first and second print control programs, and second font data therein; and

developing means for developing a second dot pattern corresponding to entered code information using the first font data stored in the first memory means when execution of the third print control program is selected by said selecting means and the third print control program is executed.



**5,742,300**

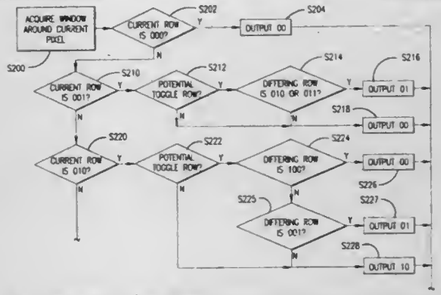
## RESOLUTION ENHANCEMENT AND THINNING METHOD FOR PRINTING PIXEL IMAGES

**R. Victor Klassen, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jan. 3, 1995, Ser. No. 368,139**

**Int. Cl.[6] B41J** *29/38;2/05*

**U.S. Cl. 347—9** **29 Claims**




16. A resolution enhancement method for printing a pixel image using an ink jet printer having a defined resolution along a raster scan axis, the pixel image comprising a plurality of pixel rows each extending along the raster scan axis and a plurality of pixel columns each extending along a direction perpendicular to the raster scan axis, the method comprising the steps of:

receiving the pixel image having the defined resolution along the raster scan axis;

producing an altered pixel image having a resolution along the raster scan axis greater than the defined resolution;

turning OFF pixels in the altered pixel image, the thinned altered pixel image including added pixels along edges based on information contained in an adjacent scanline; and

printing remaining pixels from the altered pixel image using the ink jet printer having the defined resolution to visibly reproduce the pixel image at the resolution along the raster scan axis greater than the defined resolution.

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**5,742,301**

## INK JET PRINTING METHOD AND APPARATUS

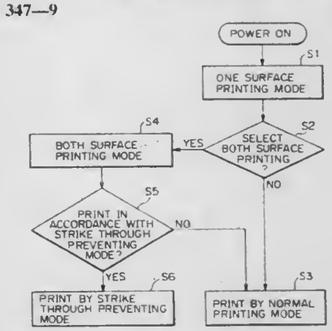
**Kunihiko Ikeda, Kodaira, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 17, 1995, Ser. No. 443,270**

**Claims priority, application Japan, May 20, 1994, 6-106600**

**Int. Cl.[6] B41J** *29/38;2/01*

**U.S. Cl. 347—9** **22 Claims**




1. An ink jet printing method of printing on both surfaces or one surface of a sheet-shaped printing medium by using an ink jet head including a plurality of ink ejecting ports facing the sheet-shaped printing medium and energy generating elements for ejecting ink from the ejecting ports to the printing medium, the method comprising the steps of:

designating either of a both surface printing mode for printing on both surfaces of the printing medium and a one surface printing mode for printing on one surface of the printing medium;

selecting a low printing density when the both surface printing mode is designated, the printing density being selectable between a normal printing density and the low printing density lower than the normal printing density; and

changing the printing density on the printing medium to the selected printing density.

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**5,742,302**

## LIQUID JETTING APPARATUS AND METHOD OF CONTROLLING RECOVERY BASED ON DETECTION OF MOUNTED HEAD

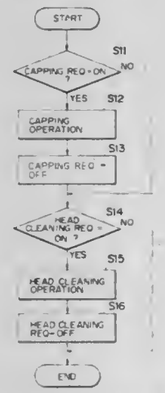
**Shinichiro Kohri, Kawasaki, and Shunichi Tachibana, Urayasu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 92,781, Jul. 19, 1993, abandoned. This application Feb. 8, 1996, Ser. No. 597,384**

**Claims priority, application Japan, Jul. 24, 1992, 4-198657**

**Int. Cl.[6] B41J** *2/165*

**U.S. Cl. 347—23** **13 Claims**




1. A liquid jetting apparatus for jetting the liquid employing a liquid jetting head, comprising:

a mounting section for mounting the liquid jetting head;

a covering member for covering a liquid jetting region of said liquid jetting head, wherein said covering member at least partially covers the liquid jetting region following a operation for manually mounting the liquid jetting head on the mounting section;

driving means for driving said covering member;

detecting means for detecting information regarding whether said liquid jetting head is mounted on the mounting section; and

control means for controlling the driving of said covering member by said driving means, wherein said control means controls said driving means, to separate said covering member covering the liquid jetting region in association with the operation for manually mounting the liquid jetting head on the mounting section once away from the liquid jetting region of said liquid jetting head, and then controls said covering member to cover again and to establish an airtight capping seal with respect to the liquid jetting region.

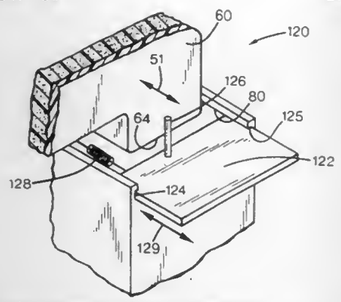
VOL 1209 ISS 3 AP 21 1998 UMI



5,742,303
**TRAP DOOR SPITTOON FOR INKJET AEROSOL MIST CONTROL**

**Bret K. Taylor, and Mark S. Hickman, both of Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed May 24, 1995, Ser. No. 449,164**
**Int. Cl.[6] B41J** *2/165*
**U.S. Cl. 347—36** **20 Claims**

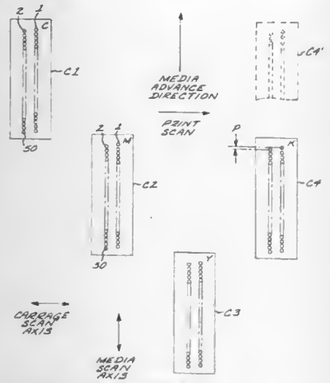



1. An inkjet printing mechanism, comprising:
an inkjet printhead that selectively ejects ink, with ink ejection generating airborne ink aerosol satellites, said printhead movable within a printzone and a servicing region;
a spittoon, located in the servicing region, having a mouth to receive ink ejected from the printhead dining purging;
and
a trap door member attached to the spittoon to selectively open the spittoon mouth in response to the printhead movement from the printzone to the servicing region to receive purged ink and to close the spittoon mouth to trap airborne ink aerosol satellites within the spittoon after purging.

5,742,304
**INK JET PAINTER HAVING STAGGERED NOZZLE ARRAY FOR COLOR PRINTING**

**Brent W. Richtsmeier; Alpha N. Doan, both of San Diego, Calif., and Mark S. Hickman, Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 329,555, Oct. 25, 1994, abandoned, which is a continuation of Ser. No. 877,905, May 1, 1992, Pat. No. 5,376,958. This application Jun. 28, 1996, Ser. No. 671,101**
**Int. Cl.[6] B41J** *2/145*
**U.S. Cl. 347—40** **8 Claims**

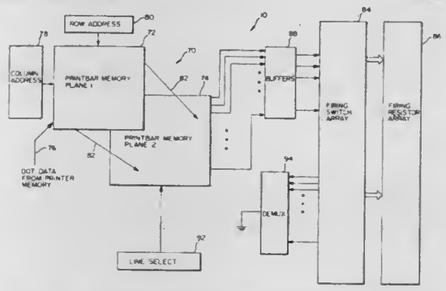



1. A color ink jet printer comprising:
a print carriage movable along a carriage scan axis;
means for moving said print carriage along the carriage scan axis;
means for moving print media along a media scan axis that is substantially orthogonal to said carriage scan axis; and
a plurality of ink jet printheads supported by said print carriage in side-by-side sequential locations along the carriage scan axis and having respective nozzle arrays for providing respectively different color outputs, each of said nozzle arrays having a plurality of nozzles relatively positioned along said media scan axis at a same predetermined nozzle pitch for each of the printheads, said respective nozzle arrays being offset relative to each other along the media scan axis so that said respective nozzle arrays are non-overlapping along the media scan axis and are spaced apart along the media scan axis by at least 2 units of said predetermined nozzle pitch;
whereby the respective nozzle arrays of said plurality of ink jet printheads traverse spaced apart non-overlapping print regions as said carriage is scanned along the carriage scan axis.

5,742,305
**PWA INKJET PRINTER ELEMENT WITH RESIDENT MEMORY**

**David E. Hackleman, Monmouth, Oreg., assignor to Hewlett-Packard, Palo Alto, Calif.**

**Filed Jan. 20, 1995, Ser. No. 376,320**
**Int. Cl.[6] B41J** *2/155*
**U.S. Cl. 347—42** **11 Claims**



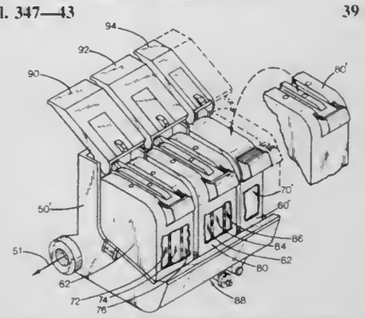

1. A page-wide-array printer element with printhead nozzles for ejecting ink droplets and with printbar memory for off loading dot data throughput between printer memory and printhead nozzles, comprising:
an elongated printbar for defining a printbar chamber for holding ink and defining a first surface;
a plurality of nozzle circuits, each one of said nozzle circuits defining a nozzle chamber for receiving ink from the printbar chamber and a firing resistor for ejecting ink;
a flex circuit defining a plurality of conductive paths, wherein each one of the conductive paths is electronically coupled to a corresponding one of the nozzle circuits;
a plurality of firing switches, each one of the plurality of firing switches coupled to a corresponding firing resistor by a corresponding one of the plurality of conductive paths;
a plurality of buffers, each one of the plurality of buffers coupled to a subset of the plurality of firing switches, the subset comprising multiple firing switches;
memory for storing dot data for each one of the printhead nozzles, wherein dot data for each one of the printhead nozzles is output from memory to the nozzle circuit of a corresponding one of the printhead nozzles; and
a first circuit for selecting a portion of memory to output dot data to the plurality of buffers; and
a second circuit for selecting a firing switch from each subset of firing switches that is to respond to the dot data stored in the plurality of buffers;
wherein the flex circuit, plurality of nozzle circuits and memory are in electrical communication and are attached to the printbar to define a page-wide-array printhead of printhead nozzles.



5,742,306
**IMAGING CARTRIDGE SYSTEM FOR INKJET PRINTING MECHANISMS**

**Ronald S. Gompertz, Camas; Mark S. Hickman, and Michael D. Dobbs, both of Vancouver, all of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jul. 31, 1995, Ser. No. 508,435**
**Int. Cl.[6] B41J** *2/21;29/38*
**U.S. Cl. 347—43** **39 Claims**

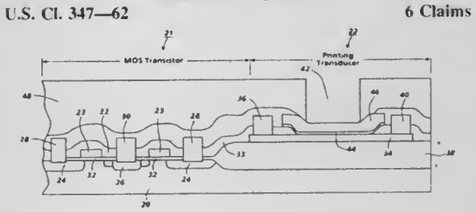



1. An inkjet printing mechanism for printing an image, comprising:
at least two inkjet cartridges comprising:
(1) either one of:
(a) a first cartridge responsive to a first firing signal for monochrome printing, or
(b) a second cartridge responsive to a second firing signal for multi-color printing, wherein the first cartridge contains a first ink formulation and the second cartridge contains a second ink formulation different from the first ink formulation, and
(2) a third cartridge responsive to a third firing signal; and
a carriage that receives the third cartridge, and that interchangeably receives the first cartridge or the second cartridge; and
controller that generates the third firing signal, and that determines whether the first cartridge or the second cartridge is installed in the carriage, and then generates the first firing signal when the first cartridge is installed or the second firing signal when the second cartridge is installed.

5,742,307
**METHOD FOR ELECTRICAL TAILORING DROP EJECTOR THRESHOLDS OF THERMAL INK JET HEATER ELEMENTS**

**Thomas E. Watrobski, Penfield; William G. Hawkins, Webster, and Sophie V. Vandebroek, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Continuation of Ser. No. 359,174, Dec. 19, 1994, abandoned. This application Jan. 21, 1997, Ser. No. 786,067**
**Int. Cl.[6] B41J** *2/05*
**U.S. Cl. 347—62** **6 Claims**

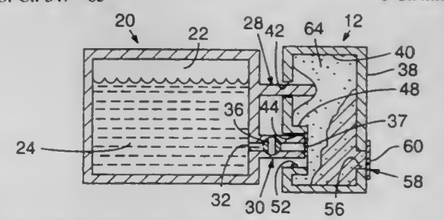



1. A thermal ink jet drop ejector, for ejecting an ink drop, generating thermal energy in response to an operating condition pulse, having a operating condition pulsewidth, being applied thereto during normal operation of the drop ejector, comprising:
a silicon substrate;
a field oxide layer, deposited on said silicon substrate;
a polysilicon resistor, formed on said field oxide layer, said polysilicon resistor including a doped polysilicon material having a resistance value, the resistance value determined by adjustment with the application of a current pulse, generated by a signal generator, applied thereto, the current pulse, including a pulsewidth being equal to or greater than the operating condition pulsewidth, being applied repeatedly to said polysilicon resistor; and
an insulator layer deposited on said polysilicon resistor.

5,742,308
**INK JET PRINTER CARTRIDGE REFILLING METHOD AND APPARATUS**

**Bruce Cowger;, Robert R. Beeson, and Fred E. Tarver, all of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Mar. 30, 1994, Ser. No. 220,767**
**Int. Cl.[6] B41J** *2/175;2/195*
**U.S. Cl. 347—85** **8 Claims**




1. An ink-jet printer comprising:
a pen housing including an enclosed chamber with chamber walls, the chamber walls including an inlet for receiving ink, an orifice for expelling droplets of ink and an aperture;
an ink retaining structure within the chamber;
an ink source having an ink reservoir;
a compression element located on the ink source and protruding therefrom; the compression element being aligned with the aperture in the pen housing for contacting the ink retaining structure, a movement of the compression element within the aperture serving to selectively reduce and expand the ink retaining structure;
an ink outlet distinct from the compression element connected to the ink source in communication with the ink reservoir, the ink outlet being selectively sized to engage with the pen inlet when the compression element moves within the aperture in the pen housing;
a sensor positioned adjacent the chamber for detecting a selected amount of ink in the chamber; and
an ink flow control coupled to the sensor and to the ink outlet for controlling ink flow from the ink outlet.

5,742,309
**INK CARTRIDGE**

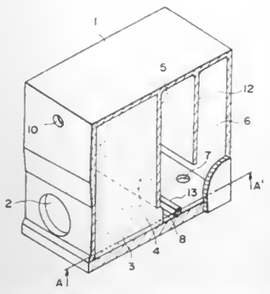
**Hiroki Tajima, Kawasaki; Masami Ikeda, Yokohama; Tsutomu Abe, Isehara; Toshio Kashino, Chigasaki; Masahiko Higuma, Tohgane, and Takeshi Okazaki, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 19, 1994, Ser. No. 292,198**
**Claims priority, application Japan, Aug. 20, 1993, 5-206302**
**Int. Cl.[6] B41J** *2/175*
**U.S. Cl. 347—86** **3 Claims**

1. An ink cartridge for supplying ink to an ink jet recording head, comprising:
a first chamber containing negative pressure producing material and having an ink outlet connectable to the ink jet recording head to supply ink from the cartridge to the ink jet recording head and an air vent for allowing air into the cartridge;
a second chamber having a communication port and an interior bounded by inner surfaces, said second chamber and said first

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chamber being separated by a partition portion therebetween, said partition portion having a bottom portion, said communication port being disposed at the bottom portion of the partition portion, said second chamber communicating with the first chamber through said communication port and providing an ink reservoir for said first chamber; and

an inward projection in said second chamber, said projection extending at least substantially the length of a width of said second chamber and being adjacent to the bottom portion of said partition portion, said projection being located between 0.2 mm and 1.5 mm away from the bottom portion of said partition portion.

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**5,742,310**

## INK JET PRINTER AND AN INK STORING MEMBER MOUNTED ON THE PRINTER

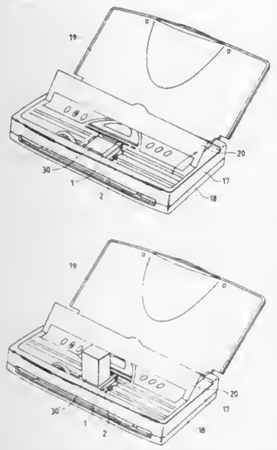
**Yasuo Kotaki, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 27, 1996, Ser. No. 606,756**

**Claims priority, application Japan, Feb. 28, 1995, 7-040815**

**Int. Cl.[6] B41J** *2/175*

**U.S. Cl. 347—86** **20 Claims**



1. An ink jet printer for recording on a recording medium by discharging the ink supplied from an ink storing member from an ink jet head to the recording medium, comprising:

a mount portion for mounting detachably said ink storing member;

a space for receiving said mount portion; and

a recording selection unit for selecting a first recording mode in which a first ink storing member received within said space is mounted on said mount portion in recording, or a second recording mode in which a second ink storing member large enough not to be received within said space is mounted on said mount portion in recording.

**5,742,311**

## REPLACEABLE INK CARTRIDGE

**Noribumi Koitabashi; Masami Ikeda, both of Yokohama; Sadayuki Sugama, Tsukuba; Naohito Asai; Hiromitsu Hirabayashi, both of Yokohama; Tsutomu Abe, Isehara; Hirnshi Sato, Yokohama; Shigeyasu Nagoshi, Kawasaki; Elichiro Shimizu, Urawa; Masahiko Higuma, Tohgane; Yuji Akiyama, Yokohama; Hitoshi Sugimoto, Kawasaki; Miyuki Matsubara, Tokyo; Shinichi Sato, Kawasaki; Fumihiro Gotoh, Yokohama, and Masaya Uetsuki, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

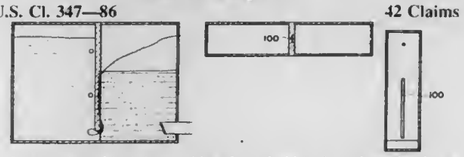
**Division of Ser. No. 94,317, Jul. 21, 1993, Pat. No. 5,509,140.**

**This application Mar. 7, 1996, Ser. No. 612,498**

**Claims priority, application Japan, Jul. 24, 1992, 4-198661; Jul. 24, 1992, 4-198680; Jul. 24, 1992, 4-198681; Jul. 24, 1992, 4-198733; Feb. 4, 1993, 5-017562; May 25, 1993, 5-122618**

**Int. Cl.[6] B41J** *2/175*

**U.S. Cl. 347—86** **42 Claims**



1. A replaceable ink cartridge for a bubble jet printer having a carriage adapted to scan a recording sheet, an ink jet print head having an ink port for supplying liquid ink thereto and being mounted to the carriage for ejecting liquid ink onto the recording sheet by the action of thermal energy while the carriage scans the recording sheet, and a mounting on the carriage for receiving said replaceable ink cartridge and supporting same for connection to the ink port of the ink jet print head, said replaceable ink cartridge comprising:

a container having front, back, top, bottom and side walls;

said container being divided internally into a first chamber and a second chamber;

said first chamber and said second chamber having a common partition extending downward perpendicularly toward said bottom wall to provide an opening between said first chamber and second chamber formed by said partition proximate to said bottom wall;

said first chamber being generally sealed from ambient air except through said opening;

said second chamber having an air vent for admitting ambient air into said second chamber;

said first chamber containing a reservoir of liquid ink;

said second chamber having an ink supply outlet in said front wall proximate to said bottom wall for supplying ink to the ink port of the ink jet print head;

said second chamber containing a sponge-like material for retaining ink;

at least one groove in the second chamber side of said partition extending from said opening and terminating at a point partly up said partition to form an air flow passage from said second chamber to said first chamber;

said sponge-like material being positioned in said second chamber to permit flow of air from said air vent to said groove when the level of retained ink in said sponge-like material is proximate to said point where said groove terminates partly up said partition thereby permitting introduction of air into said first chamber and flow of liquid ink to said ink supply outlet through said opening; and

said container being removably mountable in the bubble jet printer mounting with said bottom wall facing downward and said front wall facing the ink jet print head so that said ink supply outlet is connectable to the ink port of the ink jet print head.

15. A replaceable cartridge for a bubble jet printer having a mounting for receiving said replaceable cartridge and supporting same during bubble jet printing, said replaceable cartridge comprising:

a container formed by front, back, top, bottom and side walls;

said container being divided internally into a first chamber and a second chamber;



said first chamber and said second chamber having a common partition extending downward perpendicularly toward said bottom wall to provide an opening between said first chamber and second chamber formed by said partition proximate to said bottom wall;

said first chamber being generally sealed from ambient air except through said opening;

said second chamber having an air vent for admitting ambient air into said second chamber;

said first chamber containing a reservoir of liquid ink;

said second chamber having an ink supply outlet;

said second chamber containing a sponge-like material for retaining ink;

at least one groove in the second chamber side of said partition extending from said opening and terminating at a point partly up said partition to form an air flow passage from said second chamber to said first chamber;

said sponge-like material being positioned in said second chamber to permit flow of air from said air vent to said groove when the level of retained ink in said sponge-like material is proximate to said point where said groove terminates partly up said partition thereby permitting introduction of air into said first chamber and flow of liquid ink to said ink supply outlet through said opening; and

said container being removably mountable in the bubble jet printer mounting with said bottom wall facing downward.

29. A replaceable cartridge for a liquid jet printer having a mounting for receiving said replaceable cartridge and supporting same during printing, said replaceable cartridge comprising:

a container having front, back, top, bottom and side walls;

said container being divided internally into a first chamber and a second chamber;

said first chamber and said second chamber having a common partition extending downward perpendicularly toward said bottom wall to provide an opening between said first chamber and second chamber formed by said partition proximate to said bottom wall;

said second chamber having an air vent for admitting ambient air into said second chamber;

said first chamber for containing a reservoir of said liquid;

said second chamber having a supply outlet proximate to said bottom wall;

said second chamber containing a sponge-like material for retaining liquid;

at least one groove in the second chamber side of said partition extending from said opening and terminating at a point partly up said partition to form an air flow passage from said second chamber to said first chamber;

said sponge-like material being positioned in said second chamber to permit flow of air from said air vent to said groove when the level of retained liquid in said sponge-like material is proximate to said point where said groove terminates partly up said partition thereby permitting introduction of air into said first chamber and flow of said liquid to said supply outlet through said opening; and

said container being removably mountable in the liquid jet printer mounting with said bottom wall facing downward.

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**5,742,312**

## PRINTHEAD CARTRIDGE HAVING A FLUID VALVED BREATHER

**Michael Carlotta, Sodus, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Continuation of Ser. No. 333,704, Nov. 3, 1994, abandoned.**

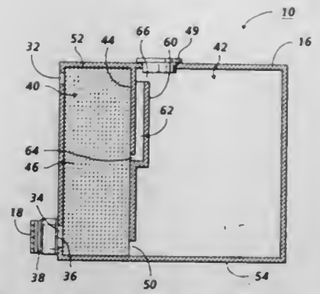
**This application Feb. 26, 1997, Ser. No. 807,857**

**Int. Cl.[6] B41J** *2/175*

**U.S. Cl. 347—87** **13 Claims**

13. An ink jet printer for printing on a recording medium, comprising:

an ink supply cartridge having a housing, said housing having an interior space, said housing including a floor and a wall extending from said floor, said wall including an air inlet to transfer air into said housing and being in communication with the interior space, said air inlet located a first distance measured perpendicularly from said floor, said wall further including an ink outlet in communication with the interior space, said ink outlet located closer to said floor than said air inlet, a dividing member, disposed in the interior space, contacting said housing and defining therein a first chamber and a second chamber, said first chamber coupled to said air inlet and said ink outlet, said dividing member including a vent inlet located a second distance measured perpendicularly from said floor, the second distance being less than the first distance, a vent tube, disposed in the interior space, including a vent outlet and a passageway, said passageway extending between said vent outlet and said vent inlet, said vent outlet communicating with the second chamber and being located a third distance measured perpendicularly from said floor, said third distance being greater than said second distance, said vent tube passing air from the first chamber through said vent inlet, said passageway, and said vent outlet to communicate said air from the first chamber to the second chamber, an ink inlet spaced apart from said vent inlet and located between said first chamber and said second chamber, so as to supply an ink located in said second chamber to said first chamber and to prevent air from directly passing through said ink located in the second chamber, and an ink retaining member disposed in the first chamber, said ink retaining member receiving said ink from the second chamber and releasing said ink received from the second chamber to the ink outlet;



a printhead coupled to said ink outlet of said ink supply cartridge; and

a frame supporting said printhead in spaced relationship with the recording medium.

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**5,742,313**

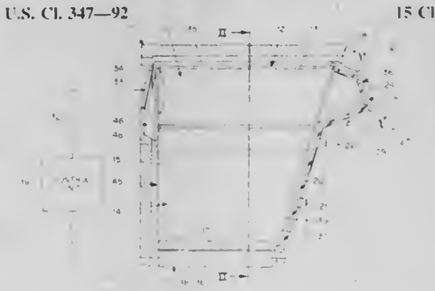
## EFFICIENT INK JET HEAD ARRANGEMENT

**Nathan P. Hine, South Strafford, Vt., assignor to Spectra, Inc., Hanover, N.H.**

**Filed Oct. 31, 1994, Ser. No. 331,921**

**Int. Cl.[6] B41S** *2/19*

**U.S. Cl. 347—92** **15 Claims**



1. An ink jet head arrangement comprising a reservoir body made of heat-conductive material containing a plurality of ink

VOL 1209 ISS 3 AP 21 1998 UMI



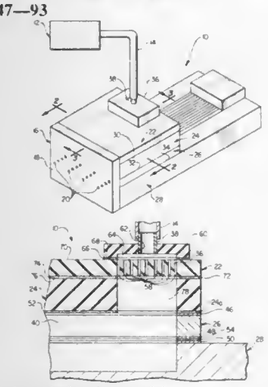
reservoirs and a vacuum reservoir, an ink jet array affixed to the reservoir body and arranged to eject ink drops selectively in response to electrical signals, and a lung plate interposed between the ink reservoirs in the reservoir body and the ink jet array having a plurality of air-permeable, ink-impermeable membranes, each membrane providing on one side one wall of one of a plurality of ink passages leading from the reservoirs to the ink jet array and each membrane communicating on another side of said membrane with the vacuum reservoir so as to extract dissolved air from ink in the ink passages without requiring a connection to an external vacuum generator.

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**5,742,314**
**INK JET PRINTHEAD WITH BUILT IN FILTER STRUCTURE**

**Donald J. Hayes, Plano, Tex., assignor to Compaq Computer Corporation, Houston, Tex.**

**Filed Mar. 31, 1994, Ser. No. 220,835**
**Int. Cl.[6] B41J *2/175***
**U.S. Cl. 347—93** **27 Claims**



6. An ink jet printhead comprising:

a body having a top section, a bottom section and an intermediate section, said top section, said bottom section, and said intermediate section being parallel, intersecured and generally plate-like, with each section having a top side surface, a bottom side surface and aligned front edge surfaces;

said body including means, disposed within said body, for heating said body, said heating means including a heating channel formed interiorly within said body and an electrical resistance heating wire positioned within said heating channel;

said top section being made of a photosensitive etchable glass material and said heating channel being integrally formed in said bottom side surface of said top section;

said intermediate section being comprised of a first intermediate portion secured along a first juncture area to a second intermediate portion, said first intermediate portion being secured to said top section along a second juncture area and said second intermediate portion being secured to said bottom section along a third juncture area;

an ink supply source;

an ink conduit;

means for filtering ink, interiorly disposed within said top section, said ink filter means communication with said ink supply source through said ink conduit, said ink conduit extending between said ink filter means and said ink supply source;

an ink manifold cavity formed within the interior of said body and being in fluid communication with said ink filter means;

a front end section joined to said top section, intermediate section and bottom section along said aligned front edge surfaces thereof, said front end section having a spaced series of ink discharge orifices extending rearwardly therethrough;

a spaced, parallel series of internal deflectable sidewall sections extending rearwardly through said body from said front end section thereof and laterally bounding a spaced series of internal ink receiving channels interdigitated with said sidewall sections and opening outwardly through said discharge orifices, said receiving channels being in fluid communication with said ink manifold cavity to receive an ink flow therefrom; and

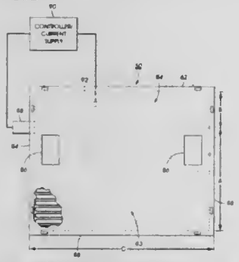
a cover section sealingly secured to said top side surface of said top section over said ink filter means, said cover section having a conduit member positioned therein in fluid communication with said ink filter means for receiving ink from the ink conduit.

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**5,742,315**
**SEGMENTED FLEXIBLE HEATER FOR DRYING A PRINTED IMAGE**

**Thomas F. Szlucha, and John H. Looney, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Sep. 5, 1995, Ser. No. 523,322**
**Int. Cl.[6] B41J *2/01***
**U.S. Cl. 347—102** **15 Claims**



1. A printing machine for printing on a recording medium moving along a path through a print zone, comprising:

a printhead, adapted to deposit ink on the recording medium; and

a segmented flexible heater, disposed adjacently to the path, for heating the recording medium, including a first portion defining a first heat region preheating the recording medium and a second portion defining a second heat region heating the recording medium in the print zone wherein said first portion generates heat energy having a first temperature and said second portion generates heat energy having a second temperature greater than the first temperature.

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**5,742,316**
**ACTUATION MECHANISM AND PRINTER USING SAME**

**Seiichi Hirano; Susumu Murayama; Kenichi Miyazaki; Kazumi Kamoi, and Hiromi Shishiuchi, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan**

**Division of Ser. No. 119,012, Sep. 9, 1993, Pat. No. 5,648,807.**
**This application Jun. 5, 1995, Ser. No. 464,151**
**Claims priority, application Japan, Sep. 10, 1992, 4-242228; Sep. 10, 1992, 4-242229; Sep. 10, 1992, 4-242230; Oct. 6, 1992, 4-267621; Oct. 8, 1992, 4-270561; Oct. 8, 1992, 4-270562; Oct. 8, 1992, 4-270563; Oct. 8, 1992, 4-270567**
**Int. Cl.[6] B41J *2/165***
**U.S. Cl. 347—104** **8 Claims**

1. A printer comprising:

a frame;

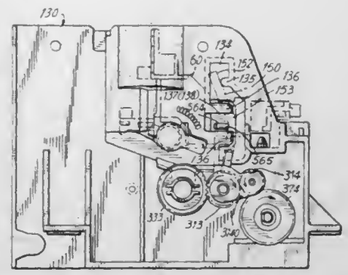
a feed-in roller for feeding sheets of paper one by one;

a carriage for printing the sheet fed by said feed-in roller;

a feed-in gear for rotating said feed-in roller;

a movable gear supported rotatably on a pivotally mounted arm and capable of assuming a first position at which said movable gear engages said feed-in gear to rotate said feed-in gear and a second position at which said movable gear does not engage said feed-in gear; and





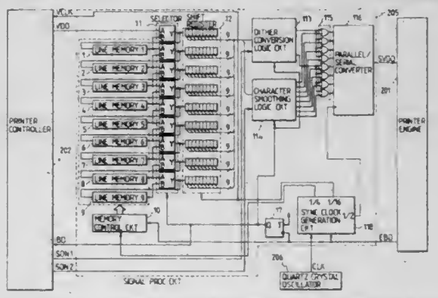
a spring member having one end supported by said arm and another end supported by said frame, said carriage including an actuating portion provided on said carriage to pivot said arm toward said first position at which said movable gear engages said feed-in gear by pressing and displacing an intermediate portion of said spring member.

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**5,742,317**
**IMAGE PROCESSING APPARATUS AND RECORDING APPARATUS**

**Atsushi Kashihara, Hachioji, Japan, assignor to Cannon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 3, 1993, Ser. No. 12,634**
**Claims priority, application Japan, Feb. 4, 1992, 4-018969; Nov. 12, 1992, 4-302540**
**Int. Cl.[6] B41J *2/385*; G03G *13/04*; H04N *1/21;1/40***
**U.S. Cl. 347—131** **16 Claims**



1. An image processing apparatus which is connected between a recording control section of a recording apparatus and a recording mechanism section, comprising:

input means for inputting image information of a density lower than a recording density of said recording mechanism section produced by said recording control section;

memory means for storing the image information supplied from said input means by an amount of a plurality of main scan lines;

referring means for referring to said memory means for image information of a recording pixel and peripheral pixels of the recording pixel from the stored image information;

detecting means for detecting that said recording pixel and the peripheral pixels form a part of a dither half-tone pattern processed by a dither method which is constructed by a plurality of pixels as a result of the reference by said referring means;

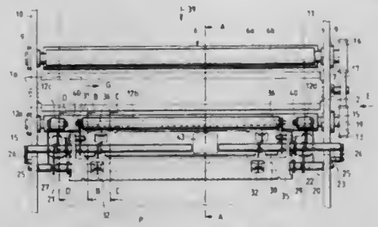
converting means for converting the image information of the recording pixel into the image information of a density which is at least equal to or larger than a recording density of said recording mechanism section in accordance with a result of the detection by said detection means; and

transmitting means for transmitting the image information converted by said converting means to said recording mechanism section.

**5,742,318**
**RECORDING APPARATUS**

**Yasuo Miyauchi; Shinji Kanemitsu, and Haruo Uchida, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 519,102, May 4, 1990, abandoned.**
**This application Aug. 27, 1993, Ser. No. 112,320**
**Claims priority, application Japan, May 8, 1989, 1-114530; May 8, 1989, 1-114531**
**Int. Cl.[6] B41J *11/00***
**U.S. Cl. 347—134** **41 Claims**



15. An image forming system comprising:

an image forming means for forming an image on a sheet;

a feeding means arranged at an upstream side of said image forming means, for pinching the sheet and for feeding the sheet in a sheet feeding direction to said image forming means;

a first rotary member arranged at a downstream side of said image forming means, for applying to the sheet a feeding force by contacting the sheet;

second and third rotary members disposed separated from each other and with their axial directions transverse to the sheet feeding direction, for pinching the sheet in cooperation with said first rotary member;

a fourth rotary member arranged between said second and third rotary members, for pinching the sheet in cooperation with said first rotary member; and

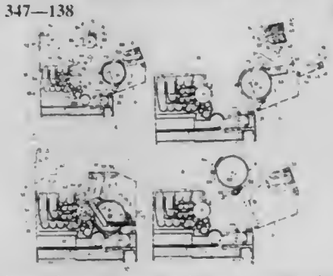
a shifting means for shifting said fourth rotary member between a first position where the sheet is pinched between said fourth rotary member and said first rotary member, and a second position where the sheet is not pinched between said first and said fourth rotary members.

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**5,742,319**
**IMAGE FORMING APPARATUS HAVING EASILY REPLACEABLE COMPONENTS**

**Keizo Fukunaga, Ikoma; Yoshinobu Tateishi, Nara; Yuhi Akagawa, Ikoma, and Mitsuyoshi Terada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 21, 1995, Ser. No. 407,654**
**Claims priority, application Japan, Apr. 12, 1994, 6-073341**
**Int. Cl.[6] B41J *2/385*; G03G *13/04***
**U.S. Cl. 347—138** **18 Claims**



1. An image forming apparatus having a main body having an upper section that is freely opened and closed, comprising:

a photoreceptor unit including a photoreceptor drum rotating on a supporting shaft, said photoreceptor unit being attachable to and detachable from said main body;

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a detachable developing unit disposed in the vicinity of said photoreceptor drum; and

a guide section provided in said main body and engaging said supporting shaft such that said photoreceptor unit is slidably disposed on said guide section between an operation position and a retracted position,

wherein said developing unit is detachable by opening said upper section of said main body and sliding said photoreceptor unit to the retracted position, thereby allowing said developing unit to be detached from said main body, and

further wherein said developing unit is detachable from said main body separately from said photoreceptor unit.

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**5,742,320**

**IMAGE-FORMING DEVICE AND AN IMAGE-FORMING ELEMENT FOR USE THEREIN**

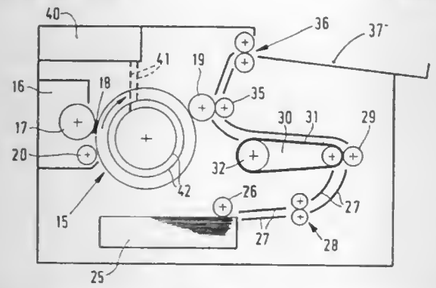
**Frederik Maria Van Beek, Venlo; Antonius Jacobus Maria Claessens, Castenray; Paulus Henricus Eijmherts, Eindhoven; Johannes Gerardus Venantius Van Stiphout, Beek en Donk; Lambertus Johannes Maria Luyten, Venlo, and Albert Gerardus Maria Van Welte, Baarlo, all of Netherlands, assignors to Oce-Technologies, B.V., Ma Venlo, Netherlands**

**Filed Nov. 22, 1994, Ser. No. 346,219**

**Claims priority, application Netherlands, Dec. 8, 1993, 9302135**

**Int. Cl.[6] B41J** *2/385; G03G 9/08; G01D 15/24*

**U.S. Cl. 347—153** **8 Claims**




1. An image-forming device comprising, in combination, a movable image-recording element including a support with a dielectric surface layer and, at least a set of separately energizable image-forming electrodes insulated from one another beneath said dielectric surface layer, an image-forming zone situated along a trajectory of said image-recording element, a backing electrode disposed a short distance above said dielectric surface layer of said image-recording element, and control means for applying a voltage between said image-forming electrodes and said backing electrode in accordance with an image pattern for recording, a toner powder source for presenting toner powder to said image-forming zone at said dielectric surface layer of said image-recording element in accordance with said image pattern, characterized in that said image-forming electrodes consist of an electrically conductive material having an electrical resistivity of between 0.008 and 0.2 Ω.cm.

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**5,742,321**

**METHOD AND APPARATUS FOR CONTROLLING THE HEAD OF A THERMAL LINE PRINTER**

**Alain Frederic, 20 rue du Pays de France, 95000 Cergy, France**

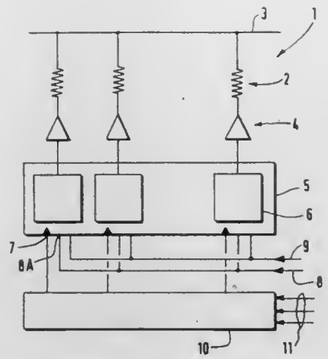
**Filed Aug. 4, 1994, Ser. No. 285,950**

**Claims priority, application France, Aug. 4, 1993, 93 09613**

**Int. Cl.[6] B41J** *2/35; G01D 15/16*

**U.S. Cl. 347—211** **6 Claims**

1. Method for controlling a line head of a thermal printing apparatus in which heating elements (2; 102) of the head (1; 101)




are activated for printing a line of points on a printing medium, comprising the steps of:

(a) storing positions of the heating elements (2; 102) to be activated in memory.

(b) selecting a predetermined single number N of the heating elements, while locating and storing positions thereof, and activating the selected heating elements for printing and then deactivating them,

and,

(c) after deactivation, the selecting step is repeated for points to be printed with positions not yet located,

until all the points of the line to be printed have been printed, before advancing the printing medium.

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**5,742,322**

**AC THIN FILM ELECTROLUMINESCENT DEVICE**

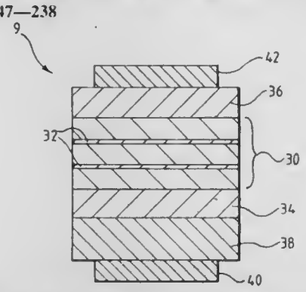
**Wayne Cranton, West Yorkshire; Robert Stevens, Wakefield, and Clive Thomas, Leeds, all of England, assignors to Ultra Silicon Technology(UK) Limited, England**

**Filed Aug. 19, 1994, Ser. No. 293,540**

**Claims priority, application United Kingdom, Aug. 20, 1993, 9317408**

**Int. Cl.[6] B41J** *2/45;2/385;* **H01L** *29/04;31/036;31/0376;31/20*

**U.S. Cl. 347—238** **12 Claims**




1. A thin film electroluminescent device consisting essentially of a first electrode layer, first and second dielectric layers with an active phosphor layer having a dielectric constant associated therewith disposed therebetween, and a second electrode layer, characterized in that there is provided within the phosphor layer at least one barrier layer that does not emit light, said barrier layer comprising a thin layer of insulating material having a dielectric constant greater than that of the phosphor layer, said barrier layer having a thickness of at least one hundred angstroms.



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**5,742,323**

**IMAGE FORMING APPARATUS WITH PULSE WIDTH MODULATED LASER DRIVER**

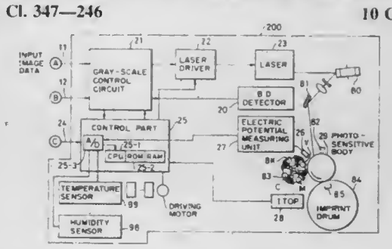
**Satoru Fukushima, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 4, 1993, Ser. No. 13,803**

**Claims priority, application Japan, Feb. 6, 1992, 4-021046**

**Int. Cl.[6] B41J** *2/47;2/435;* **G02B** *26/02;* **G03B** *27/72*

**U.S. Cl. 347—246** **10 Claims**




1. An image processing apparatus comprising:

gradation processing means for processing gradation data to generate a modulation signal for modulating a beam emitted from a light source;

bias current setting means for variably setting a bias current which is supplied to said light source; and

condition setting means for setting a condition of said gradation processing means to correct a rising characteristic of said light source which varies depending upon the bias current variably set by said bias current setting means.

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**5,742,324**

**EXPOSING DEVICE HAVING POWER CONTROLLER FOR CONTROLLING LASER POWER DURING DOT EXPOSING CYCLE IN AN ELECTROPHOTOGRAPHIC PROCESS**

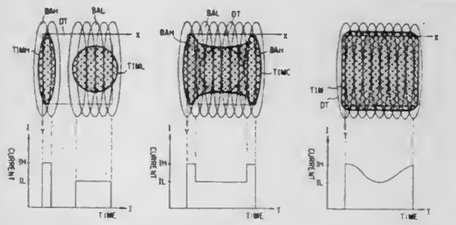
**Hidenobu Suzuki, Nimazu, Japan, assignor to Kabushiki Kaisha TEC, Shizuoka, Japan**

**Filed May 11, 1995, Ser. No. 439,466**

**Claims priority, application Japan, May 11, 1994, 6-097181**

**Int. Cl.[6] B41J** *2/47*

**U.S. Cl. 347—247** **3 Claims**




1. An exposing device comprising:

a laser light-source for emitting a laser beam;

a light source driving section for selectively driving said laser light source in dot exposing cycles; and

an optical scanning section for restricting a width of the laser beam in one scanning direction and scanning a photosensitive surface of an image carrier in the scanning direction with the laser beam emitted from said laser light source to form one of exposure and non-exposure dots for each exposing cycle; and

wherein said light source driving section includes a power controller for changing a laser power of the laser beam during each dot exposing cycle assigned to an exposure dot adjacent to a non-exposure dot, in a control pattern that causes the exposure dot to have a substantially square shape; and

wherein said control pattern is predetermined such that the laser power is linearly changed from a first level to a second level lower than the first level in a first half of the dot exposing cycle, and from the second level to the first level in the remaining half of the dot exposing cycle.

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**5,742,325**

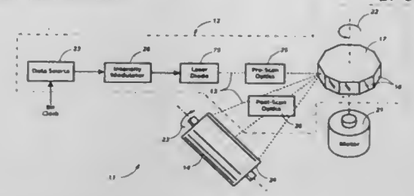
**MICRO SEGMENTATION IN A HYPERACUITY PRINTER**

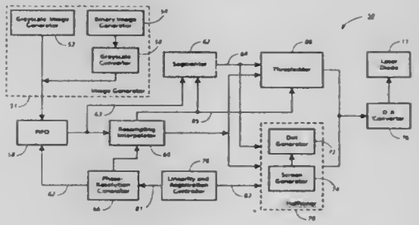
**Douglas N. Curry, and Donald J. Curry, both of Menlo Park, Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Continuation of Ser. No. 166,327, Dec. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 144,856, Oct. 28, 1993, Pat. No. 5,485,289. This application Dec. 8, 1995, Ser. No. 569,559**

**Int. Cl.[6] B41J** *2/47*

**U.S. Cl. 347—251** **27 Claims**




1. A hyperacuity printing system for rendering image data on a recording medium, said image data being rendered as an array of pixels across said recording medium in a fastscan direction, and an orthogonal slowscan direction, comprising:

a data source for supplying grayscale input image data;

a scanning device for rendering grayscale output image data, said scanning device having a writing device for writing scan spots on said recording medium at a writing pitch in said slowscan direction and a writing pitch in said fastscan direction;

transformation circuitry for transforming said grayscale input image data into grayscale output image data, said transformation circuitry including a halftoner, a thresholder, and a selection device, where said selection device selects either said thresholder or said halftoner to provide said grayscale output image data, said selection device including a macro selection function and a micro selection function, said micro selection function being able to select said thresholder or said halftoner with a precision finer than said writing pitch in either said slowscan or said fastscan direction; and,

a modulating device coupled between said transformation circuitry and said scanning device for intensity modulating each of said scan spots in accordance with said grayscale output image data.

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5,742,326

## FOCUS ADJUSTABLE IMAGE READING DEVICE FOR CALCULATING A FOCUS POSITION OF A SOURCE DOCUMENT

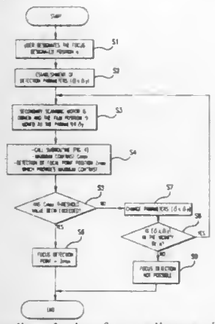
Kumiko Matsui, Yokohama; Hidehisa Tsuchihashi; Takahiro Ikeda, both of Tokyo; Toru Ochiai, Matsudo; Seiichi Morimatsu; Masashi Tazawa, both of Kawasaki; Toshiya Aikawa, Yokohama, and Eisaku Maeda, Sakura, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 313,904, Sep. 28, 1994, abandoned. This application Sep. 20, 1996, Ser. No. 717,615

Claims priority, application Japan, Sep. 28, 1993, 5-241049; Oct. 20, 1993, 5-262091; Oct. 27, 1993, 5-291375; Oct. 27, 1993, 5-291377

Int. Cl.[6] B41J *2/47;2/435;* G01D *15/34;15/24*

U.S. Cl. 347—257 39 Claims



1. An image reading device for reading an image of a source document, comprising:

mounting means for supporting the source document;

an optical system for forming an image of the source document;

imaging means for scanning the image formed by the optical system in a primary scanning direction and outputting an image signal;

driving means for moving a first one of said mounting means and said imaging means in a secondary scanning direction relative to a second one of said mounting means and said imaging means, said secondary scanning direction intersecting said primary scanning direction;

control means for controlling operation of said image reading device, said control means including:

position establishment means for establishing a designated position on said source document, and

focus detection means for detecting a focus position of the image of the source document based on said signal output by the imaging means at said designated position; and

adjustment means for adjusting a focus of the optical system based on said focus position of the image detected by the focus detection means.

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5,742,327

## RECORDING APPARATUS

Masaru Igarashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

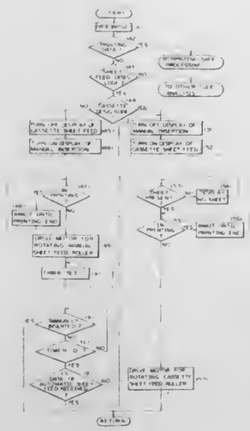
Division of Ser. No. 219,740, Mar. 29, 1994, Pat. No. 5,648,812, which is a continuation of Ser. No. 782,763, Oct. 22, 1991, abandoned, which is a continuation of Ser. No. 268,209, Nov. 7, 1988, abandoned, which is a division of Ser. No. 73,307, Jul. 13, 1987, Pat. No. 4,786,920, which is a continuation of Ser. No. 677,515, Dec. 3, 1984, abandoned. This application Apr. 25, 1995, Ser. No. 428,435

Claims priority, application Japan, Dec. 6, 1983, 58-229147; Dec. 6, 1983, 58-229148

Int. Cl.[6] B41J *13/00*

U.S. Cl. 347—262 13 Claims

1. A printer for performing a printing operation in accordance with printing information comprising:



a printing unit for performing printing on a printing medium in accordance with printing information provided by a printing information generation section;

a first feeding unit for feeding a printing medium from a storage means for storing plural printing media to said printing unit;

a second feeding unit for feeding a manually inserted printing medium to said printing unit;

a detector for detecting a manually inserted printing medium;

input means for inputting designating data for designating either a first mode in which the printing medium is fed from the storage means by said first feeding unit or a second mode in which the manually inserted printing medium is fed by said second feeding unit, said designating data being sent from said printing information generation section; and

memory means for storing plural pages of printing information, said memory means storing a page of printing information designated to be printed in the first mode and a page of printing information designated to be printed in the second mode,

wherein in a case where said detector detects no manually-inserted printing medium and where the page of printing information designated to be printed in the second mode has printing priority, said printer is adapted to perform printing by giving priority from the page of printing information designated to be printed in the second mode to the page of printing information designated to be printed in the first mode.

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5,742,328

**Patent Not Issued For This Number**

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5,742,329

## IMAGE PICKUP SYSTEM AND COMMUNICATION SYSTEM FOR USE IN VIDEO CONFERENCE SYSTEM OR THE LIKE

Makoto Masunaga, Tokyo, and Atsushi Inagaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 456,284, May 31, 1995, abandoned, which is a continuation of Ser. No. 140,604, Oct. 21, 1993, abandoned. This application Jul. 14, 1997, Ser. No. 892,464

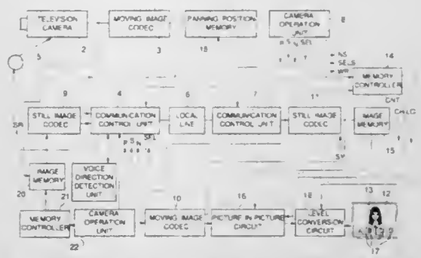
Claims priority, application Japan, Oct. 26, 1992, 4-287619; Dec. 25, 1992, 4-345682

Int. Cl.[6] H04N *7/14;9/77*

U.S. Cl. 348—15 25 Claims

1. An image processing apparatus comprising:





a) single image pickup means, of which a picking-up direction is changeable, for picking up objects to be imaged;

b) storing means for storing a plurality of picking-up directions of said single image pickup means in advance;

c) memory means for storing a plurality of images corresponding to the respective picking-up directions stored by said storing means while said picking-up direction of said image pick means is changed; and

d) synthesizing means for synthesizing the read-out images read out from said memory means on an image currently being picked up by said single image pickup means.

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5,742,330

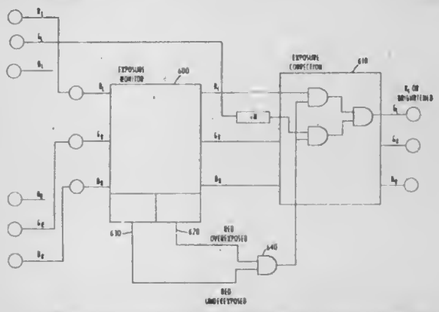
## METHODS AND APPARATUS FOR THE CREATION AND TRANSMISSION OF 3-DIMENSIONAL IMAGES

Raymond McLaine, and Charles S. Palm, both of Westlake Village, Calif., assignors to Synthonics Incorporated, Westlake Village, Calif.

Division of Ser. No. 335,381, Nov. 3, 1994. This application Oct. 4, 1996, Ser. No. 726,154

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—47 2 Claims



1. Apparatus for making three dimensional images comprising:

a. a left and a right color video camera each producing an output comprising 3 image planes each plane corresponding to red, green and blue color information respectively,

b. a combiner for providing green and blue image planes from one of the left or right color video cameras and a red image plane from the other color video camera as an output signal,

c. a monitor detecting the color values of each pixel of the output signal, and

d. an exposure corrector substituting a brightened value from one of the green or blue image planes of the other color video camera for the corresponding values in the red image plane used to create the output signal when the monitor detects that the red value of a number of pixels indicates underexposure or overexposure in red,

whereby information from two color video cameras is combined into three dimensional color video images.

5,742,331

## THREE-DIMENSIONAL IMAGE DISPLAY APPARATUS

Kenya Uomori, Hirakata, and Atsushi Morimura, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 15, 1995, Ser. No. 528,715

Claims priority, application Japan, Sep. 19, 1994, 6-223360; Sep. 19, 1994, 6-223361

Int. Cl.[6] H04N *13/00*

U.S. Cl. 348—51 30 Claims



1. A three-dimensional image display apparatus comprising:

an image display device for displaying an image;

a transparent body enclosing said image display device;

a support for supporting said image display device in movable fashion relative to said transparent body;

an orientation controller for maintaining said image display device in a prescribed orientation;

positional change detecting means for detecting one of a change in position and a change in orientation of said transparent body from a prescribed initial position of said transparent body; and

image display altering means for altering an image displayed on said image display device in accordance with the result of the detection.

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5,742,332

## VIEWING-POSITION TRACKING STEREOSCOPIC DISPLAY

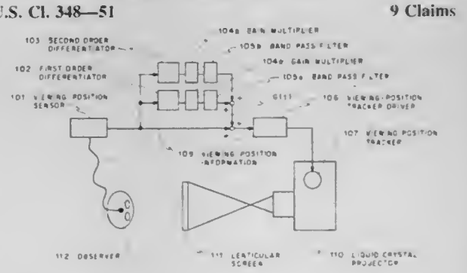
Hiroshi Imai, and Masao Imai, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 23, 1996, Ser. No. 652,739

Claims priority, application Japan, May 26, 1995, 7-128046

Int. Cl.[6] A04H *13/00;5/225*

U.S. Cl. 348—51 9 Claims



1. A viewing-position tracking stereoscopic-display having means for separately presenting right and left eye images to an observer, a viewing-position sensor for detecting a viewing-position of the observer, and a viewing-position tracker for controlling the means for presenting the eye images responsive to an

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output of the viewing-position sensor for representing a stereoscopic-view to the observer whenever the viewing-position moves; comprising:

means for obtaining a first order differentiation of positional information of the viewing-position of the observer to be used for controlling the viewing-position tracker;

means for obtaining a second order differentiation of positional information of the viewing-position of the observer detected by the viewing-position sensor; and

the first order differentiation being used together with the second order said second order differentiation has been multiplied by a half square of the delay time.

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**5,742,333**

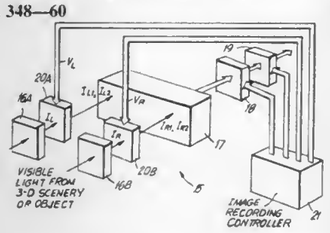
**ELECTRO-OPTICAL DEVICE FOR SELECTIVELY TRANSMITTING POLARIZED SPECTRAL COMPONENTS**

**Sadeg M. Faris, Pleasantville, N.Y., assignor to Reveco, Inc., Hawthorne, N.Y.**

**Continuation of Ser. No. 152,020, Nov. 12, 1993. This application Jan. 17, 1997, Ser. No. 784,376**

**Int. Cl.[6] H04N** *15/00*

**U.S. Cl. 348—60** **10 Claims**




1. An electro-optical device for selectively transmitting the spectral components of an image having at least first and second groups of spectral components, said electro-optical device comprising:

an optically transparent input surface through which the first and second groups of spectral components can enter said electro-optical device;

an optically transparent output surface through which the first and second groups of spectral components can exit said electro-optical device;

first means, disposed between said optically transparent input and output surfaces, for imparting a first polarization state P1 to said first group of spectral components;

second means, disposed between said optically transparent input and output surfaces, for imparting a second polarization state P2 to said second group of spectral components; and

third means, disposed between said optically transparent input and output surfaces, and being operative to selectively transmit one or both of said first and second groups of spectral components through said optical output surface in response to a control signal provided to said electro-optical device.

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**5,742,334**

**FILM IMAGE REPRODUCING APPARATUS AND A CONTROL METHOD FOR CONTROLLING REPRODUCTION OF FILM IMAGE**

**Hirokazu Yagura; Toshiyuki Tanaka, both of Sakai; Takeshi Ono, Ikoma, and Katsuyuki Nanba, Sakai, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan**

**Filed Oct. 29, 1996, Ser. No. 739,361**

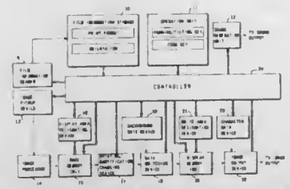
**Claims priority, application Japan, Oct. 30, 1995, 7-282283**

**Int. Cl.[6] H04N** *7/18*

**U.S. Cl. 348—96** **21 Claims**

1. A film image reproducing apparatus for reproducing a film image of each frame of a film, comprising:

an image pick up device which picks up a film image;



a reproducer which is operable to reproduce specified areas of the picked up film image;

an information reader which reads information recorded on the film concerning the orientation of the film image;

a reproducing direction designator which designates a reproducing direction of images in the areas; and

a controller which controls the reproducer based on the read information and the designated reproducing direction so as to reproduce the image areas in the designated reproducing direction while keeping an image in each image area in a specified reference orientation irrespective of the direction of the film image on the film.

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**5,742,335**

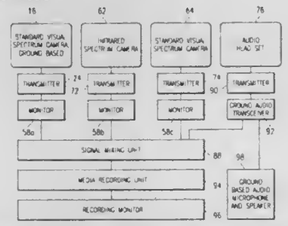
**EXAMINATION SYSTEM FOR ARCHITECTURAL STRUCTURE EXTERIORS**

**Michael W. Cannon, P.O. Box 624, Hampshire, Ill. 60140**

**Filed Jul. 19, 1995, Ser. No. 503,929**

**Int. Cl.[6] H04N** *7/18*

**U.S. Cl. 348—135** **5 Claims**




1. Apparatus for detecting, locating and recording defects in a plurality of areas of a surface of a structure comprising:

a local infrared camera for capturing a detailed image of a selected one of said plurality of areas, a transmitter coupled to said local infrared camera generating or transmitting a detailed infrared image signal;

a remote camera for capturing a reference image of a reference field of view including said selected one of said plurality of areas and sufficient other ones of said areas of said surface that a reference is provided for the spatial location of said selected one of said areas on said surface of said structure, a transmitter coupled to said remote camera for transmitting a reference image signal, said remote camera adaptable to be positioned farther away from said selected one of said areas than said local camera;

means for receiving said detailed image signal and said reference image signal;

means for attributing a time when said detailed image signal was captured and when said reference image was captured;

means coupled to said means for receiving and said means for attributing for generating a composite image including, for a particular time, a respective detailed image and a reference image;

a local visual-spectrum camera for capturing a local visual-spectrum image of said selected one of said areas of said surface of said structure, a transmitter coupled to said local visual-spectrum camera for transmitting a detailed visual-spectrum image signal, said means for receiving operable to receive said detailed visual-spectrum image signal, said means for generating a composite image incorporating a detailed visual-spectrum image derived from said detailed visual-spectrum signal; and

a helmet adaptable to be worn by a photographer, said local visual-spectrum camera and said local infrared camera mounted on said helmet to be positioned proximate to said selected one of said plurality of areas and adaptable to be repositioned to be proximate to other ones of the plurality of areas, said local visual-spectrum camera and said local infrared camera being aligned by said helmet to be adaptable to be pointed at said selected one of said plurality of areas by the photographer.



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**5,742,336**

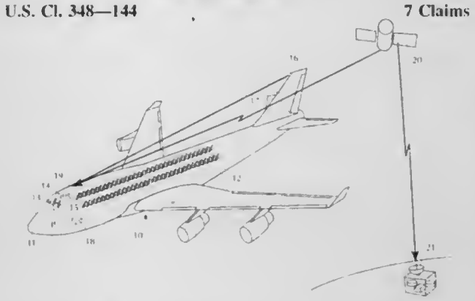
**AIRCRAFT SURVEILLANCE AND RECORDING SYSTEM**

**Frederick A. Lee, 682 Broadway, New York, N.Y. 10012**

**Filed Dec. 16, 1996, Ser. No. 766,331**

**Int. Cl.[6] H04N** *7/18*

**U.S. Cl. 348—144** **7 Claims**



1. An aircraft surveillance and recording system adapted to monitor conditions prevailing on the course of a flight and operating in conjunction with an active communication satellite, the aircraft including a cockpit section occupied by a flight crew provided with an instrument panel and controls, said system comprising:

A. a plurality of video cameras placed at different sites in the plane to yield real-time image video signals; one of said video cameras being placed in the cockpit section and being focused on said instrument panel and controls, a second of said cameras which include an audio function being placed in the cockpit section to view the faces of the flight crew and pick up their voices;

B. a transmitter installed in the plane which generates a radio frequency carrier and is coupled to an antenna which radiates the carrier so that it can be intercepted by the satellite;

c. means to apply the video signals from the cameras to the transmitter to modulate the carrier, whereby the satellite retransmits the modulated carrier; and

D. a ground recording station adapted to receive retransmitted video signals from the satellite and to record and store these signals, including those exhibiting the instrument panel and controls as well as the flight crew and their voices whereby an investigator of an aircraft accident, by playing the record, can then analyze the conditions which prevailed at the time of the accident.

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**5,742,337**

**Patent Not Issued For This Number**

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**5,742,338**

**DEVICE FOR MEASURING ECCENTRICITIES OF ELECTRON BEAMS OF A COLOR CATHODE RAY TUBE BASED UPON LUMINANCE PATTERN IN MAGNETICALLY NEUTRAL ENVIROMENT**

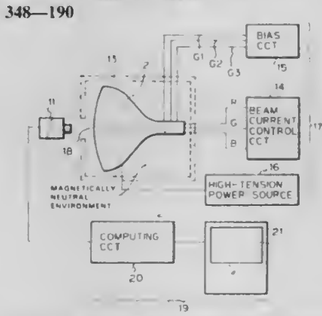
**Tadashi Nose, Shiga, Japan, assignor to NEC Corporation, Japan**

**Filed Jan. 26, 1996, Ser. No. 592,265**

**Claims priority, application Japan, Jan. 31, 1995, 7-013895**

**Int. Cl.[6] H04N** *17/00*

**U.S. Cl. 348—190** **3 Claims**




1. A device for measuring eccentricities of tricolor electron beams of a color cathode ray tube, comprising:

control means for controlling each of tricolor electron beam currents of the color cathode ray tube so as to cause each of the tricolor electron beam currents to have current which does not damage a fluorescent screen of the color cathode ray tube;

a video camera for detecting a luminance pattern resulting from impingement of the tricolor electron beams on the fluorescent screen; and

image processing means for processing said luminance pattern detected by the video camera to thereby determine eccentricities and eccentric positions of the electron beams;

whereby the eccentricities of the electron beams are measured on the basis of said luminance pattern in a magnetically neutral environment.

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**5,742,339**

**ELECTRONIC STILL VIDEO CAMERA**

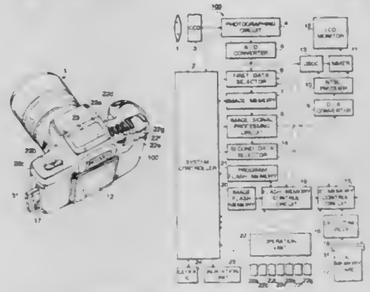
**Yoshio Wakui, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 577,376, Dec. 22, 1995, abandoned. This application Mar. 14, 1997, Ser. No. 818,030**

**Claims priority, application Japan, Dec. 27, 1994, 6-339172**

**Int. Cl.[6] H04N** *5/30*

**U.S. Cl. 348—233** **43 Claims**



1. An electronic still video camera comprising:

a built-in memory for storing a plurality of frames of image data;

a memory removable from said electronic still video camera, said removable memory storing a plurality of frames of image data;

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means for selecting a subset from said plurality of frames of image data, said subset comprising a variable number of frames of image data selected from said plurality of frames of image data stored in said built-in memory;

means for storing a transfer status of each frame of image data in said selected subset, said transfer status of each frame indicating whether said frame is to be transferred in a batch; and

means for batch transferring said selected subset, in accordance with said stored transfer statuses from said built-in memory to said removable memory.

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**5,742,340**

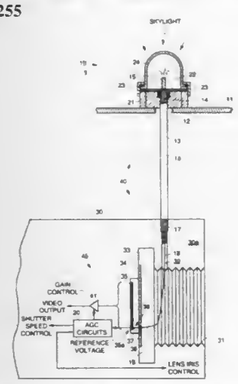
## AMBIENT LIGHT AUTOMATIC GAIN CONTROL FOR ELECTRONIC IMAGING CAMERAS AND THE LIKE

**James F. Alves, Tucson, Ariz., assignor to Hughes Missile Systems Company, Los Angeles, Calif.**

**Filed Jun. 6, 1995, Ser. No. 471,467**

**Int. Cl.[6] H04N** *5/20*

**U.S. Cl. 348—255** **22 Claims**




1. Ambient light automatic gain control apparatus for use with an electronic imaging camera having a multi-element light sensing array and a video amplifier for amplifying signals produced by the array, said apparatus comprising:

a fiber optic link that collects light from the sky, and couples the light to a predetermined plurality of light sensing elements of the light sensing array that produce a reference voltage in response thereto; and

automatic gain control circuits coupled to the light sensing array for controlling the gain of the video amplifier of the camera as a function of the reference voltage produced by the predetermined plurality of light sensing elements.

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**5,742,341**

## VIDEO CAMERA HAVING A PLURALITY OF HOUSINGS FOR A VARIETY OF OPERATIONS

**Masayuki Ohishi, Neyagawa; Tetsuya Ohno, Hirakata; Shusaku Yamamoto, Moriguchi; Yoshitada Moriyasu, Katano; Shouzou Tomikawa, Nabari; Seiki Morishita, Hirakata, and Kazuyoshi Suzuki, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan**

**Filed May 12, 1995, Ser. No. 440,234**

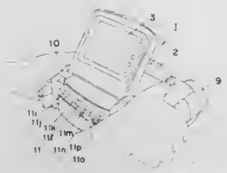
**Claims priority, application Japan, May 12, 1994, 6-98525; May 12, 1994, 6-98526; May 12, 1994, 6-98527; May 12, 1994, 6-98528; May 12, 1994, 6-98529; May 12, 1994, 6-98530**

**Int. Cl.[6] H04N** *5/222;5/225*

**U.S. Cl. 348—373** **9 Claims**

1. A video camera comprising:





a first housing adapted to accommodate a recording and reproducing means for recording and reproducing video signals, said first housing having a recess defined therein on an upper surface thereof;

a second housing having a first surface and a second surface opposite to each other and housed in the recess of said first housing at its rest position at which the first surface of said second housing is opposed to the upper surface of said first housing, said second housing having a recess defined therein on the second surface thereof;

a monitor screen mounted on the first surface of said second housing; and

a support member having a first end to which said second housing is connected via a first hinge and a second end connected to said first housing via a second hinge, said support member being housed in the recess of said second housing when said second housing is in the rest position,

wherein connection of said second housing with said first housing via said support member and said first and second hinges allows said monitor screen to rotate more than 180°, enabling a user to video himself while viewing said monitor screen.

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**5,742,342**

## APPARATUS FOR ENCODING AN IMAGE SIGNAL USING VECTOR QUANTIZATION TECHNIQUE

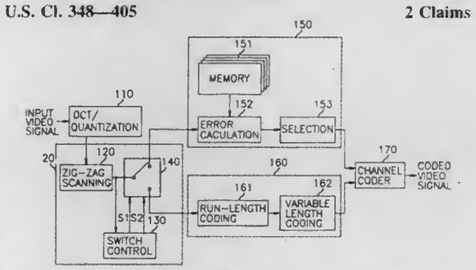
**Hae-Mook Jung, Seoul, Rep. of Korea, assignor to Daewoo Electronics, Co., Ltd., Seoul, Rep. of Korea**

**Filed Mar. 27, 1996, Ser. No. 622,233**

**Claims priority, application Rep. of Korea, Mar. 28, 1995, 95-6613**

**Int. Cl.[6] H04N** *7/30*

**U.S. Cl. 348—405** **2 Claims**




1. A digital video signal encoder for coding a digital video signal, wherein said digital video signal is represented by a series of video frames, each video frame being divided into a plurality of coding blocks, comprising:

a source coder for generating a set of quantized transform coefficients corresponding to each of the coding blocks;

a scanner for scanning the set of quantized transform coefficients to generate a first subset of scanned quantized transform coefficients having a predetermined number of quantized transform coefficients located on a predetermined low frequency zone and a second subset of scanned quantized transform coefficients having the rest of quantized transform coefficients, wherein said scanning means includes:

a zig-zag scanner for scanning the set of quantized transform coefficients in accordance with a zig-zag scanning path to sequentially generate scanned quantized transform coefficients;

a counter for counting the scanned quantized transform coefficients to generate a first control signal if a count number is equal to or less than the predetermined number and a second control signal if the count number is larger than the predetermined number;

a switch for providing the scanned quantized transform coefficients as the first subset and the second subset in response to the first control signal and the second control signal, respectively;

a statistical coder for statistically coding the second subset of quantized transform coefficients to generate statistically coded data; and

a vector quantization coder for vector quantizing the first subset of scanned quantized transform coefficients to generate vector quantized data, wherein the vector quantization coder includes:

a storage device for storing a plurality of vector patterns, each of the vector patterns having a predetermined number of vector elements and a plurality of indices corresponding to each of the vector patterns;

an error calculator for calculating a mean squared error between the first subset of scanned quantized transform coefficients and each of the vector patterns; and

a selector for selecting an index as the vector quantized data, said index representing a vector pattern corresponding to a minimum squared error.



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**5,742,343**

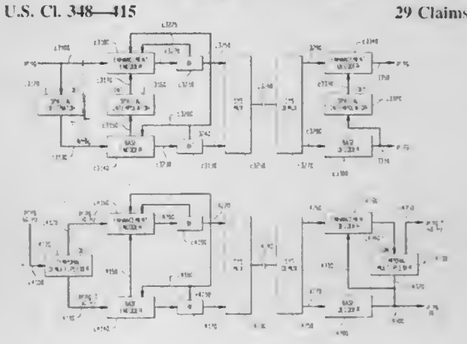
## SCALABLE ENCODING AND DECODING OF HIGH-RESOLUTION PROGRESSIVE VIDEO

**Barin Geoffry Haskell, Tinton Falls, N.J., and Atul Puri, Riverdale, N.Y., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Continuation of Ser. No. 91,144, Jul. 13, 1993, abandoned. This application Aug. 19, 1996, Ser. No. 699,221**

**Int. Cl.[6] H04N** *7/12;11/02;11/04*

**U.S. Cl. 348—415** **29 Claims**



1. A multi-layer video encoder, comprising:

an input for receiving progressive format video signals representing a first resolution level at a predetermined first frame rate;

separating means for separating, in response to the progressive format video signals received by the input, each progressive format video signal received by the input into a first progressive format video signal and a second progressive format video signal;

base layer encoding means for producing, in response to the first progressive format video signal, a third video signal and encoded video signals in a predetermined format, at a predetermined resolution level, and at a predetermined frame rate, at least one of the format, resolution level, and frame rate of the encoded video signals being different from the format, resolution level, and frame rate of the video signals received by the input;

enhancement layer encoding means for producing, in response to the second progressive format video signal and the third video signal, encoded video signals in a predetermined format at a predetermined resolution level and at a predetermined frame rate, at least one of the format, resolution level, and frame rate of the encoded video signals produced by the enhancement layer encoding means being different from the format, resolution level, and frame rate of the encoded video signals produced by the base layer encoding means; and

an output channel having a predetermined bandwidth shared by the encoded video signals produced by the base layer encoding means and the enhancement layer encoding means.

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**5,742,344**

## MOTION COMPENSATED VIDEO DECODING METHOD AND SYSTEM FOR DECODING A CODED VIDEO SIGNAL USING SPATIAL AND TEMPORAL FILTERING

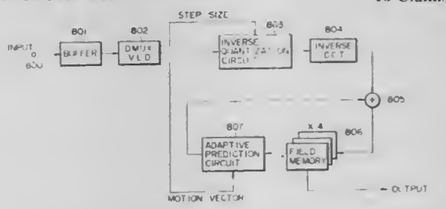
**Toshinori Odaka, Yokohama; Yoshiharu Uetani, Kawasaki; Tadaaki Masuda, Tokyo; Tomoo Yamakage, Kawasaki; Hideyuki Ueno, Tokyo; Noboru Yamaguchi, Yashio; Yoshihiro Kikuchi, Yokohama, and Tadahiro Oku, Urayasu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Division of Ser. No. 295,421, Aug. 25, 1994, Pat. No. 5,541,661, which is a continuation of Ser. No. 156,709, Nov. 24, 1993, Pat. No. 5,424,779, which is a continuation of Ser. No. 890,705, May 29, 1992, Pat. No. 5,317,397. This application Apr. 3, 1996, Ser. No. 626,969**

**Claims priority, application Japan, May 31, 1991, 3-130012; Oct. 17, 1991, 3-298316; Oct. 17, 1991, 3-298317; Oct. 31, 1991, 3-286855; Feb. 18, 1992, 4-30923**

**Int. Cl.[6] H04N** *7/32*

**U.S. Cl. 348—416** **16 Claims**




13. A method of decoding a coded signal containing codes corresponding to a motion vectors searched within the limited search range, comprising the steps of:

(a) variable-length decoding the coded signal containing codes corresponding to the motion vectors searched within the limited search range and outputting a variable length decoded prediction error signal and a plurality of motion vectors;

(b) decoding the variable length decoded prediction error signal to produce a decoded prediction error signal;

(c) storing a plurality of decoded picture signals as reference picture signals in a memory;

(d) producing a prediction picture signal on the basis of the reference picture signals and the motion vectors, said step (d) including a step for spatial-temporal filtering the reference picture signals which are designated by the motion vectors in a time advance direction to produce a spatial temporal filtered signal and for producing the prediction picture signal, using the spatial temporal filtered signal; and

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(e) reproducing a decoded picture signal by adding the decoded prediction error signal and the prediction picture signal.

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**5,742,345**

## SYSTEM FOR TRANSMITTING AND RECEIVING VIDEO SIGNALS USING INTERPOLATION OF ADAPTIVE FACTOR

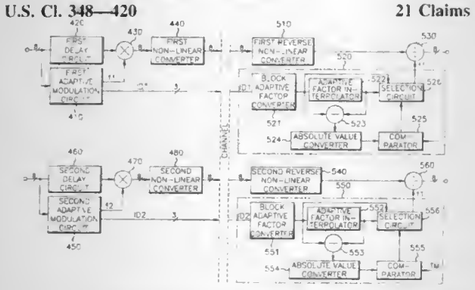
**Heon-Hee Moon, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**

**Continuation-in-part of Ser. No. 874,398, Apr. 27, 1992, abandoned. This application Apr. 29, 1994, Ser. No. 235,311**

**Claims priority, application Rep. of Korea, Jul. 8, 1991, 11489/1991**

**Int. Cl.[6] H04N** *7/24*

**U.S. Cl. 348—420** **21 Claims**



**9**. An adaptive modulator for an encoder and decoder system, comprising:

means for receiving video signals representative of a plurality of frequency band blocks;

maximum value detector means for detecting a maximum value of each frequency band block of said video signals;

block adaptive factor calculator means for producing each block adaptive factor corresponding to the detected maximum value and for producing index signals corresponding to said block adaptive factors;

interpolator means for interpolating said block adaptive factors to produce picture element adaptive factors in dependence upon peripheral blocks of said video signals;

subtractor means for producing difference signals by subtracting said picture element adaptive factors from said block adaptive factors;

comparator means for comparing said difference signals with reference signals to selectively provide first and second selected signals; and

means for providing first adaptive factors representative of one of said picture element adaptive factors and said block adaptive factors in dependence upon one of said first and second selected signals.

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**5,742,346**

## SPATIALLY ADAPTIVE BLUR FILTER

**John C. Sievers, Wakefield, and John E. Bruder, Arlington, both of Mass., assignors to Picture Tel Corporation, Peabody, Mass.**

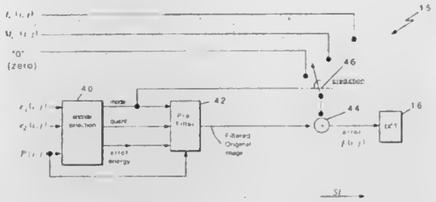
**Filed Aug. 9, 1994, Ser. No. 287,686**

**Int. Cl.[6] H04N** *7/24*

**U.S. Cl. 348—420** **25 Claims**

**2**. An apparatus for reducing a number of expected bits needed to transmit block portions of an image frame, the apparatus comprising:

a processor which generates a quantizer state value representative of the expected number of bits required for transmitting each block portion of the image frame, and a weighted energy error value based on a preselected coding method for the block portion of the image frame, the processor determining a level of filtering, for each said block portion, on the basis of the quantizer state value and the weighted energy error value associated with each said block portion by determining, for each said block portion, one of a plurality of filter state values on the basis of a preselected adjustable minimum state value, a preselected adjustable maximum state value, a preselected adjustable maximum filter value, and the quantizer state value, the processor determining the level of filtering, for each said block portion, on the basis of a preselected adjustable minimum energy value, a preselected adjustable maximum energy value, a determined filter state value, and the weighted energy error value; and



a filter which applies the determined level of filtering for the block of data representing the block portion whereby the expected number of bits needed to transmit each said block portion will be reduced depending upon the level of filtering.

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**5,742,347**

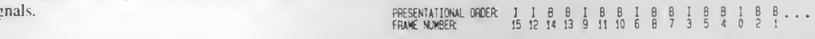
## EFFICIENT SUPPORT FOR INTERACTIVE PLAYOUT OF VIDEOS

**Dilip Dinkar Kandlur, Briarcliff Manor, and Ming-Syan Chen, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 308,763, Sep. 19, 1994. This application Jan. 24, 1996, Ser. No. 590,966**

**Int. Cl.[6] H04N** *7/32;7/34;7/36;7/50*

**U.S. Cl. 348—426** **18 Claims**




**1**. A method of transforming a compressed media stream used for distribution of video information to a local client station, comprising the steps of:

downloading the compressed media stream from an input source to a device in the local station, the compressed media stream having a compression format of a type that requires a temporally previous frame to fully decode a temporally subsequent frame;

playing out a video stream, decoded from the compressed media stream, from the local station;

transforming the compressed media stream to data having another storage format during the playing out by altering the compression format of the temporally subsequent frame to a temporally independent anchor frame format suitable for use in decoding interframe encoded frames during subsequent playing out of the video stream.



**5,742,348**

## SPATIAL FREQUENCY ADAPTIVE FIELD—INTERPOLATION METHOD AND APPARATUS THEREFOR

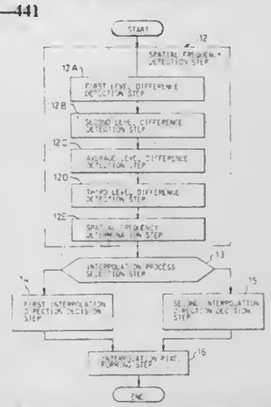
**Yasuhiro Kuwahara, Osaka; Haruo Yamashita, Ibaraki, and Tsumoru Fukushima, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-Fu, Japan**

**Continuation of Ser. No. 401,542, Mar. 10, 1995, abandoned. This application Jun. 7, 1996, Ser. No. 662,293**

**Claims priority, application Japan, Mar. 15, 1994, 6-043729**

**Int. Cl.[6] H04N** *7/01*

**U.S. Cl. 348—441** **17 Claims**



**1**. A spatial frequency adaptive field-interpolation method for setting interpolation lines in plural directions passing through an attentional pixel to be interpolated on a scanning line, plural pixels on an upper scanning line placed on one side of said scanning line and plural pixels on a lower scanning line placed on the other side of said scanning line in one field, and interpolating scanning lines of a video signal by interpolating said attentional pixel by the respective pixels belonging to said upper scanning line and said lower scanning line on an interpolation line in a direction of said plural directions, said method comprising the steps of:

(a) detecting a horizontal spatial frequency in the vicinity of said attentional pixel from image data of one field,

(b) selecting one interpolation line in said plural interpolation lines by performing plural steps for interpolation direction decision,

(c) selecting one of said plural interpolation direction decision steps on the basis of the spatial frequency obtained from said image data of one field by said detecting step (a), and

(d) forming said attentional pixel by using pixels of said upper scanning line and lower scanning line on an interpolation line obtained by said interpolation direction decision steps selected in step (c).

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**5,742,349**

## MEMORY EFFICIENT VIDEO GRAPHICS SUBSYSTEM WITH VERTICAL FILTERING AND SCAN RATE CONVERSION

**Tat Cheung Choi, Saratoga, and Peter J. Lim, San Jose, both of Calif., assignors to Chrontel, Inc., San Jose, Calif.**

**Filed May 7, 1996, Ser. No. 646,523**

**Int. Cl.[6] H04N** *11/20*

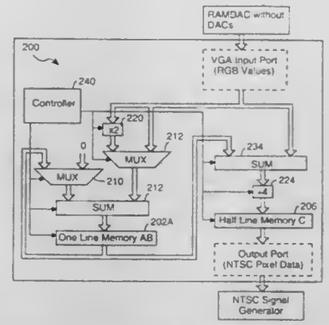
**U.S. Cl. 348—443** **12 Claims**

**1**. A graphics subsystem for converting a first graphics data stream for display on a computer monitor having a first refresh rate into a second graphics data stream for a television monitor having a second, slower refresh rate, comprising:

an input port for receiving said first graphics data stream;

a first memory for storing one horizontal scan line of pixel data;

a second memory for storing one half of a horizontal scan line of pixel data;




a first summing circuit having an output coupled to an input of said first memory and a second summing circuit having an output coupled to an input of said second memory; said second summing circuit having inputs coupled to the output of said first memory and to said input port;

multiplexers for directing data to said first summing circuit from said input port and from said first memory so that, for sequentially received first and second horizontal lines of input pixel data in said first graphics data stream, said first horizontal line of input pixel data is initially stored in said first memory and said second horizontal line of input pixel data is combined with said first horizontal line of data by said first summing circuit and the resulting combined pixel data is stored in said first memory; and

a controller for sending said combined pixel data from said first memory to one of said inputs of said second summing circuit while a next horizontal line of input pixel data is received at said input port;

said second summing circuit forming a combination of said next horizontal line of input pixel data with said combined pixel data to generate vertically averaged pixel data that is then stored in said second memory; and

said controller sending said vertically averaged pixel data stored in said second memory to an output port at a rate of no less than one half the rate at which pixel data is being received at said input port, wherein one horizontal line of said vertically averaged pixel data is sent to said output port for each two horizontal lines of input pixel data received at said input port.

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**5,742,350**

## VIDEO SYSTEM PERFORMING NON-UNIFORM INTERPOLATION OF COLOR SPACE SIGNALS AND METHOD OF USING SAME

**Shao Wei Pan, Schaumburg, and Shay-Ping T. Wang, Long Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Jun. 29, 1995, Ser. No. 496,641**

**Int. Cl.[6] H04N** *11/20*

**U.S. Cl. 348—453** **47 Claims**

**1**. A video system, comprising:

a converter for converting a video signal to a plurality of adjacent color space signals;

a memory for storing the plurality of adjacent color space signals of an input frame, the memory providing the adjacent color space signals as output;

a video circuit, operatively coupled to the memory, for generating a plurality of interpolated pixel signals of an output frame having a greater number of scan lines than the input frame by performing non-uniform interpolation based on a function

$$v=c_1*d_1+c_2*d_2,$$

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wherein y represents one of the interpolated pixel signals, $d_1$ and $d_2$ represent a pair of the adjacent color space signals and $c_1$ and $c_2$ represent a first and second coefficient; and

a sync generator for generating a first signal and a second signal as a function of the video signal, wherein the adjacent color space signals are transferable from the converter to the memory as a function of the first signal and the adjacent color space signals are transferable from the memory to the video circuit as a function of the second signal, wherein the video system is programmable to vary the number of scan lines in the output frame.

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**5,742,351**

**DEVICE FOR ENCODING SEQUENCES OF FRAMES CONSTITUTED BY FILM-TYPE IMAGES AND VIDEO-TYPE IMAGES, AND VIDEO-TYPE IMAGES, AND CORRESPONDING DECODING DEVICE**

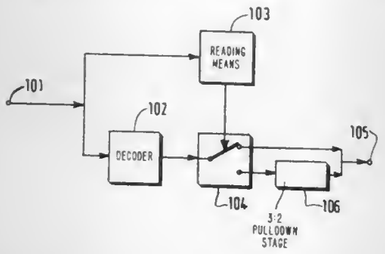
**Frédérique Guede, le Plessis Trevise, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 214,881, Mar. 15, 1994. This application Oct. 11, 1995, Ser. No. 541,024**

**Claims priority, application France, Mar. 17, 1993, 9303089**

**Int. Cl.[6] H04N** *11/20*

**U.S. Cl. 348—459** **14 Claims**




1. A device for decoding signals, referred to as encoded signals, corresponding to frame sequences comprising video-type image sequences and film-type image sequences which have previously been encoded, which device comprises:

a module for restoring the frame sequences,

means for reading the frequency of a sequence of frames from a stream of encoded signals, and

means for switching, in response to reading of the frequency, from a first to a second mode of operation of the module for restoring the frame sequences, said module for restoring the frame sequences comprising, exclusively in the second mode of operation, a stage for converting the frequency of the decoded film-type images into the frequency of the video-type images by adding an appropriate number of duplicated fields.

**5,742,352**

**VIDEO CAPTION DATA DECODING DEVICE**

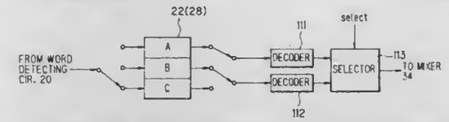
**Ikuo Tsukagoshi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 365,620, Dec. 28, 1994, abandoned. This application Feb. 29, 1996, Ser. No. 608,941**

**Claims priority, application Japan, Dec. 28, 1993, 5-334278**

**Int. Cl.[6] H04N** *7/08;7/087*

**U.S. Cl. 348—468** **6 Claims**




1. A caption data decoding device for decoding data of a caption to be displayed being superimposed on a video image, comprising:

separating means for separating the caption data from transmission data;

storing means including at least three banks, for temporarily storing the caption data sequentially output from the separating means;

first and second decoding means for decoding the caption data stored in the storing means and generating separate decoded outputs; and

selecting means for selecting and outputting either of the decoded outputs of the first and second decoding means,

wherein the storing means sequentially stores the caption data supplied from the separating means into the respective banks on a page-by-page basis;

wherein the first and second decoding means read and decode respective caption data of two consecutive pages of the caption data stored in the storing means at a timing delayed by a prescribed period from a horizontal sync signal timing of the video image; and

wherein the selecting means switches decoded caption data to be output at a prescribed timing in one horizontal scanning line period of the video image.

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**5,742,353**

**IMAGE PROCESSING APPARATUS**

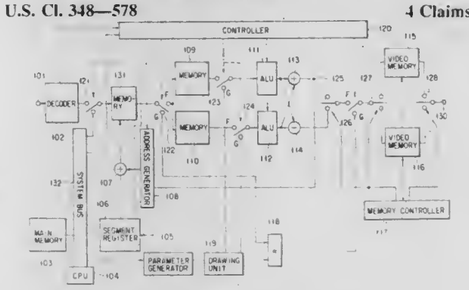
**Seijiro Yasuki, and Hiroyuki Chimoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 27, 1996, Ser. No. 622,145**

**Claims priority, application Japan, Mar. 30, 1995, 7-073298**

**Int. Cl.[6] H04N** *7/01*

**U.S. Cl. 348—578** **4 Claims**




1. An image processing apparatus comprising:

a first sum-of-product arithmetic device;

a second sum-of-product arithmetic device;

a mapping device for mapping texture data into a polygon by subjecting apex data of said polygon to inverse affine transformation, thereby calculating coordinates of said texture data, said mapping device including said first sum-of-product arithmetic device comprising a matrix for said inverse affine transformation;



a scanning line converting device for compressing and expanding an image signal in a horizontal direction and a vertical direction, said scanning line converting device including said second sum-of-product arithmetic device to execute a convolution calculation of a filtering process, wherein said scanning line converting device executes a scanning line converting operation with respect to a temporal high frequency component and a temporal low frequency component of said image signal; and

switching means for switching said first sum-of-product arithmetic device and said second sum-of product arithmetic device in a time dividing manner.

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**5,742,354**

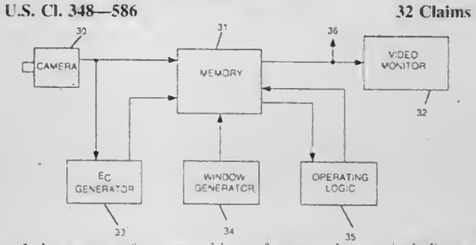
**METHOD FOR GENERATING NON-VISIBLE WINDOW EDGES IN IMAGE COMPOSITING SYSTEMS**

**Petro Vlahos, Lake Hughes, and Paul Vlahos, Tarzana, both of Calif., assignors to Ultimatte Corporation, Chatsworth, Calif.**

**Filed Jun. 7, 1996, Ser. No. 659,918**

**Int. Cl.[6] H04N** *9/75*

**U.S. Cl. 348—586** **32 Claims**




1. In a system for compositing a foreground scene including a subject before a nonuniformly illuminated colored backing, and a background scene, and where said nonuniformly illuminated colored backing is at least one of nonlinear from side to side and nonlinear from top to bottom, and where a window is employed to mask unwanted areas outside of, or on, the colored backing and where at least one window edge forms a visible join line where the at least one window edge joins the backing, wherein said visible join line is made nonvisible without affecting the subject by a horizontal and vertical linear interpolation method for obtaining backing corrections that cause a backing level control signal to be uniform at the window edge and match an assigned window signal level, said method comprising the steps of:

a) selecting a first reference point on the backing and storing RGB levels of said first reference point as RGB reference levels for horizontal linear interpolation,

b) comparing RGB levels of a first pixel on a first scan line to enter the colored backing with said RGB reference levels and storing their differences as RGB correction values for said first pixel,

c) comparing RGB levels of a last pixel on said first scan line to cross the colored backing with said RGB reference levels and storing their difference as RGB correction values for said last pixel,

d) determining RGB scan line correction values for all other pixels on said first scan line by horizontal linear interpolation between said stored RGB correction values determined for said first pixel and said last pixel and storing said all other scan line pixel correction values,

e) repeating steps b, c, and d, for each subsequent scan line which crosses the colored backing thereby determining RGB scan line correction values for all pixels on the colored backing,

f) adding said RGB scan line correction values to foreground scene RGB signals to correct said backing for nonuniformity in a vertical direction,

g) selecting a second reference point and storing RGB levels of said second reference point as second RGB reference levels for vertical interpolation,

h) comparing the RGB levels of the first pixel on the first scan line to enter the colored backing with said second RGB reference levels and storing their differences as second RGB correction values for said first pixel,

i) comparing RGB levels of a first pixel of a last scan line to enter the colored backing with said second RGB reference levels and storing their difference as a second RGB correction values for said first pixel on said last scan line,

j) determining RGB correction values for all other pixels in a column of pixels between said first pixels on said first and last scan lines by vertical linear interpolation between the stored RGB correction values for said two first pixels and storing said all other columnar pixel correction values,

k) repeating steps h, i, and j, for each subsequent pixel on the first and last scan lines thereby determining RGB columnar correction values for an area enclosed by the window,

l) adding said RGB columnar correction values to said foreground scene RGB signals to correct the backing for nonuniformity in a horizontal direction to thereby form a corrected backing,

m) generating a background scene level control signal proportional to the luminance and visibility of said corrected backing,

n) assigning said background scene level control signal at the at least one window edge as a window level control signal thus producing a non visible join line between the window edge and said corrected backing.

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**5,742,355**

**METHOD AND APPARATUS FOR REDUCING NOISE IN A VIDEO SIGNAL**

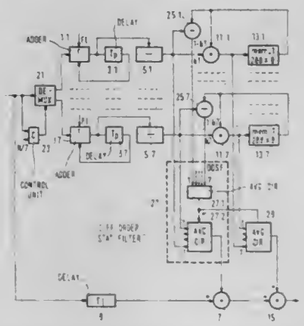
**Gerard De Haan, and Tatiana G. Kwaaitaal-Spassova, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 223,389, Apr. 5, 1994, Pat. No. 5,715,335, which is a continuation-in-part of Ser. No. 161,955, Dec. 2, 1993, abandoned. This application Oct. 3, 1995, Ser. No. 538,514**

**Claims priority, application WIPO, Aug. 11, 1994, IB95/00633; European Pat. Off., Nov. 14, 1994, 94203305**

**Int. Cl.[6] H04N** *5/21*

**U.S. Cl. 348—607** **4 Claims**




1. A clamp-noise reduction filter for image data signals, comprising:

means for calculating averages of groups of pixels for every line of pixels to obtain a zero frequency component;

memory means for storing one or more of these average values for every line of pixels;

filtering means for filtering these average values; and

means for modifying a DC level of all pixels in a line with a value related to a difference between an average value of a group of pixels taken from that line and the output of the filtering means.

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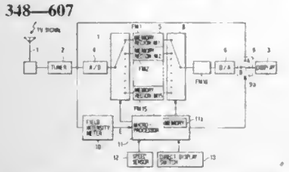


5,742,356

## MOBILE BODY TV RECEIVER HAVING OPTIMAL DISPLAY FRAME PATTERN SELECTION CAPABILITY

Takao Suzuki, Anjo, Japan, assignor to Denso Corporation, Kariya, Japan

Filed Nov. 8, 1996, Ser. No. 745,661
Claims priority, application Japan, Nov. 9, 1995, 7-291506
Int. Cl.[6] H04N 5/44
U.S. Cl. 348—607 13 Claims



1. A TV receiver for use in a mobile body, said TV receiver comprising:

reception means for receiving a TV signal which carries a set of static frame images per unit time;

display means for displaying said static frame images received by said reception means;

memory means for sequentially storing said set of static frame images received by said reception means;

image quality detection means for detecting image quality of each of said static frame images stored in said memory means;

pattern selection means for determining an optimal display pattern for displaying said set of static frame images in said display means by setting at least one of a frame speed and a frame display position to different values to obtain a plurality of display patterns and obtaining an evaluation value of each of said display patterns based on said image quality detected by said image quality detection means, said frame speed being a speed for displaying said static frame images in said display means, said frame display position indicating which of said static frame images will be displayed in said display means; and

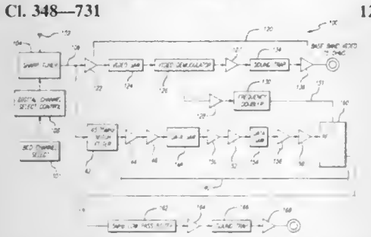
control means for controlling said display means to display said static frame images stored in said memory means based on said optimal display pattern determined by said pattern selection means.

5,742,357

## DIRECT DATA TUNER

Peter Griesbaum, Phoenix, Ariz., assignor to Wavephore, Inc., Phoenix, Ariz.

Filed Apr. 12, 1996, Ser. No. 631,266
Int. Cl.[6] H04N 5/50
U.S. Cl. 348—731 12 Claims



1. An apparatus for frequency shifting at least a portion of a video signal, the video signal having been produced at a baseband and having been transmitted by modulation with a video carrier having a frequency subject to drift, the apparatus comprising:

a first demodulator responsive to the transmitted video signal to shift the video signal to an intermediate frequency bandwidth;

a second demodulator responsive to the video signal to produce an intermediate frequency carrier that tracks the drift of the video carrier;

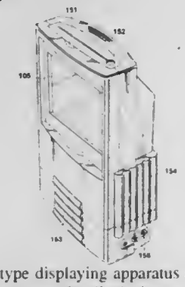
a third demodulator responsive to the shifted video signal and the intermediate frequency carrier to provide at least the portion of the video signal at baseband.

5,742,358

## PROJECTION TYPE DISPLAYING APPARATUS HAVING SCREEN

Jun Iijima, Fussa; Koichi Jinda, Mitaka, and Masahiro Ogawa, Ome, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 3, 1995, Ser. No. 433,550
Claims priority, application Japan, May 12, 1994, 6-124394; Aug. 8, 1994, 6-208171
Int. Cl.[6] H04N 5/74; 5/64
U.S. Cl. 348—789 7 Claims



1. A projection type displaying apparatus comprising:

image displaying means for displaying an image;

image projecting means for projecting the image displayed by said image displaying means;

a movable screen onto which the image is projected by said image projecting means;

detecting means for detecting a position of said movable screen;

memory means for storing latest states of said image projecting means when said movable screen is located out of a projection optical path of said image projecting means, said latest states corresponding to a condition wherein said movable screen is located out of a projection optical path of said image projecting means; and

control means for controlling said image projecting means based on said latest states of said image projecting means stored in the memory means in response to the position of the movable screen detected by said detecting means.

5,742,359

## ELECTRONIC APPLIANCE WITH CONSTRUCTION CAPABLE OF EASILY MAINTAINING DESIRED CONTACT SPACE BETWEEN ITS CONTROL KNOB AND SWITCH

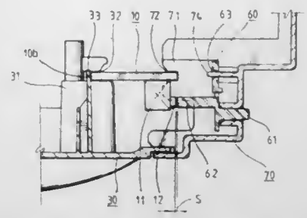
Sang-hyun Han, Suwon, Rep. of Korea, assignor to Samsung Electronics Ltd., Suwon, Rep. of Korea

Filed Aug. 22, 1996, Ser. No. 697,313
Claims priority, application Rep. of Korea, Aug. 23, 1995, 95-21922; Aug. 23, 1995, 95-21926; Aug. 23, 1995, 95-26206
Int. Cl.[6] H04N 5/64; H05K 5/00; A47B 81/00; H01H 9/02
U.S. Cl. 348—836 7 Claims

1. An electronic appliance comprising a first case, a second case mating with the first case, a control circuit board coupled between the first and second cases and provided with a plurality of control switches, and a control knob fixedly mounted to the first case and adapted to actuate the control switches, further comprising:

control circuit board supporting means adapted to support the control circuit board, the control circuit board supporting means having support grooves respectively formed at the first and second cases and adapted to receive front and rear end portions of the control circuit board when the first and second cases are assembled with each other; and





control circuit board urging means adapted to urge the control circuit board toward the first case, the control circuit board urging means having a plurality of elastic members provided at the second case and adapted to apply a resilience force generated therefrom to the control circuit board when they receive a force applied to the first case upon assembling the first case with the second case via the control circuit board, so that the control circuit board can move toward the first case in such a manner that an accurate contact space is maintained between the control knob fixedly mounted to the first case and the control switches of the control circuit board.

5,742,360

## DISPLAY APPARATUS USING AN INTERMEDIATE REINFORCING FRAME

Sung Su Kwon, Seoul; Jae Soo Sim, and Young Tai Kim, both of Suwon, all of Rep. of Korea, assignors to Samsung Electronics, Ltd., Suwon, Rep. of Korea

Continuation of Ser. No. 451,418, May 26, 1995. This application Dec. 11, 1996, Ser. No. 766,533
Claims priority, application Rep. of Korea, May 30, 1994, 94-12086; May 30, 1994, 94-12087
Int. Cl.[6] H04N 5/64; 5/645; 5/65; H01J 31/00
U.S. Cl. 348—839 18 Claims



1. A monitor case for housing and supporting a cathode ray tube, said monitor case comprising:

a front case section having a plurality of first fastening elements, each said first fastening element disposed at a corner of said front case section and a plurality of second fastening elements, each said second fastening element disposed adjacent to one of said first fastening elements;

a rear case section having a plurality of assembly holes, each said assembly hole disposed at a corner of said rear case section and located to be in correspondence with a corresponding one of said second fastening elements of said front case section to thereby align and assemble said rear case section to said front case; and

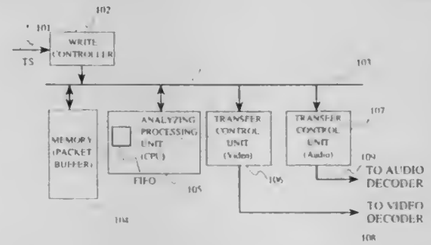
a rigid intermediate reinforcing frame for supporting a portion of the weight of said cathode ray tube, said intermediate frame having a plurality of first bosses, each said first boss disposed at a corner of said intermediate frame and located to be in correspondence with one of said first fastening elements, and a plurality of second bosses, each said second boss disposed adjacent to one of said first bosses and located to be in correspondence with one of said second fastening elements, said intermediate frame being of a color different from that of said front and rear case sections and being interposed between said front and rear sections so that said first fastening elements of said front section are received in said first bosses of said intermediate frame and said second fastening elements of said front section are received in said second bosses of said intermediate frame to thereby affix said front section to said intermediate frame to reinforce said case to prevent distortion of said case due to the weight of the cathode ray tube, and to enhance the visual appearance of said monitor case.

5,742,361

## DATA DEMULTIPLEXER

Junko Nakase, Kokubunji; Yukio Fujii, Yokohama; Hiroshi Gunji, Tokyo, and Katsumi Matsuno, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 29, 1996, Ser. No. 753,761
Claims priority, application Japan, Nov. 30, 1995, 7-312026; WIPO, Mar. 15, 1996, PCT/JP96/00676
Int. Cl.[6] H04N 7/24
U.S. Cl. 348—845 12 Claims




1. A data demultiplexer for demultiplexing an input stream formed by multiplexing a plurality of data and outputting desired data, said data demultiplexer comprising:

a memory for storing data of said input stream in a plurality of store areas;

a write controller for receiving the data of said input stream and writing data of a packet unit derived from said data into one store area included in said plurality of store areas of said memory;

an analyzing processing unit for reading out said data of the packet unit from said memory, analyzing a kind of said data read out, and generating analyzed information; and

a plurality of transfer control units responsive to said analyzed information supplied from said analyzing processing unit to transfer the data read out from said memory to outputs thereof,

wherein when writing data of a plurality of packet units successively from said write controller into said memory, write address information pieces respectively of said data of a plurality of packet units are successively stored in a FIFO memory,

wherein said analyzing processing unit reads out data of packet units successively from said memory in accordance with said write address information pieces successively read out from said FIFO memory, and generates successively analyzed information pieces by analyzing kinds of the data, and

wherein one of said plurality of transfer control units selectively responds to said analyzed information supplied from said analyzing processing unit, to transfer data read out from one store area of said memory to output thereof.

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**5,742,362**

**PROCESS FOR FORMING A PHOTOSENSITIVE MATERIAL AND AN EXPOSURE APPARATUS USED FOR THE PROCESS**

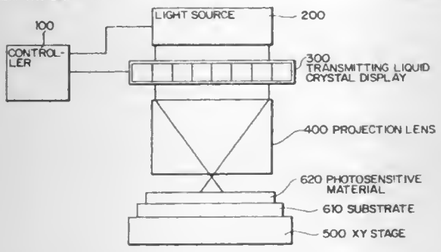
**Shoichi Chikamichi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jun. 21, 1994, Ser. No. 262,934**

**Claims priority, application Japan, Mar. 21, 1993, 5-148744**

**Int. Cl.[6] G02F** *1/13; G03C 1/492*

**U.S. Cl. 349—2** **5 Claims**




1. A process for forming a photosensitive material for use in forming the sectional shape of the photosensitive material, the process for forming the photosensitive material comprising the steps of:

(a) applying a photosensitive material to a substrate;

(b) exposing the photosensitive material to light, an exposure time thereof being adjusted in three or more grades, said exposure time being calculated on the basis of a desired amount of accumulated exposed light; and

(c) removing the uncured portion of said photosensitive material.

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**5,742,363**

**LIQUID CRYSTAL DISPLAY AND METHOD FOR FABRICATING THE SAME IN WHICH THE GATE ELECTRODE IS FORMED FROM TWO LAYERS HAVING DIFFERING WIDTHS**

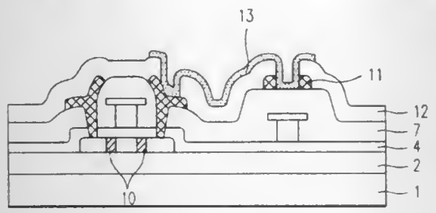
**Sung-Sik Bae, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea**

**Filed Aug. 21, 1996, Ser. No. 700,789**

**Claims priority, application Rep. of Korea, Aug. 22, 1995, 25950/1995**

**Int. Cl.[6] G02F** *1/1343;1/136;1/13;* **H01L** *29/76*

**U.S. Cl. 349—38** **35 Claims**




1. A thin film transistor comprising:

a substrate;

an active layer over the substrate, the active layer having a channel region, source and drain regions, and an offset region;

a gate insulating layer over the active layer;

a lower gate electrode having a first width over the gate insulating layer; and

an upper gate electrode over the lower gate electrode, the second width being different from the first width;

an interlayer insulating layer on an overall surface of the substrate including the active layer, the gate insulating layer, and the lower and upper gate electrodes, the interlayer insulating layer having a contact hole exposing the source and drain regions of the active layer; and

source and drain electrodes connected to the source and drain regions through the contact hole.

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**5,742,364**

**Patent Not Issued For This Number**

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**5,742,365**

**LIQUID CRYSTAL DISPLAY DEVICE AND METHOD FOR MANUFACTURING THE SAME IN WHICH A LIGHT SHIELDING LAYER IS OVER THE GATE ELECTRODE OR A GATE ELECTRODE IS IN A TRENCH**

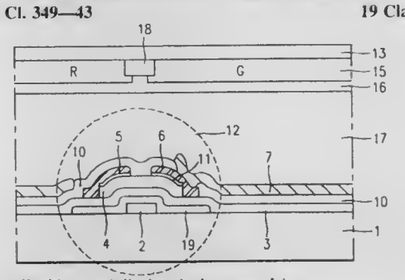
**Hyun Sik Seo, Seoul, Rep. of Korea, assignor to LG Electronics, Inc., Seoul, Rep. of Korea**

**Filed Jan. 14, 1997, Ser. No. 783,060**

**Claims priority, application Rep. of Korea, Jan. 15, 1996, 1996/672**

**Int. Cl.[6] G02F** *1/136;1/1333;* **H01L** *29/04;27/108*

**U.S. Cl. 349—43** **19 Claims**




1. A liquid crystal display device comprising:

a substrate;

a gate electrode on the substrate;

a light shielding layer over the gate electrode and the substrate;

an insulating layer over the light shielding layer and the substrate;

a semiconductor layer having a channel region on the insulating layer over the gate electrode;

source and drain electrodes over first and second portions of the semiconductor layer, respectively; and

an ohmic contact layer between the semiconductor layer and each of the source and drain electrodes.

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**5,742,366**

**LCD HAVING A HEAT CONDUCTION MEANS AND A HEAT ASSIST MEANS**

**Satoshi Imoto, Higashimurayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 171,455, Dec. 22, 1993, abandoned. This application Feb. 28, 1997, Ser. No. 808,176**

**Claims priority, application Japan, Dec. 25, 1992, 4-357790**

**Int. Cl.[6] G02F** *1/1333;1/1335*

**U.S. Cl. 349—62** **52 Claims**

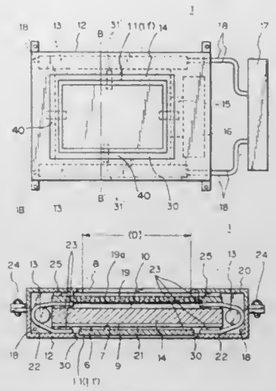
1. A display device including a planar display member constituted by liquid crystal display elements,

light-guide member opposed to said display member

a light-emitting member comprised of a tubular light source provided at least at an end portion of said light-guide member, and a holding member for holding at least said members as a unitary structure wherein

said planar display member is arranged at an upper surface of said light guide member,






a heat conduction member, said member being a heat conduction means constituted by a member having large heat conductivity is arranged at a lower side of the bottom surface of said light-guide member, and

a gap and a heat conduction assist means are arranged at a portion where said heat conduction member and said holding member are arranged next to each other, and wherein uniform display characteristic of said display member is obtained by changing the size or the shape of said gap and said heat conduction assist means.

21. A display device, comprising:

planar display means including liquid crystal display elements;

light-guide means having first and second opposite surfaces, said first surface being opposed to said display means;

light-emitting means provided at at least one end portion of said light-guide means;

reflection means covering said light-emitting means;

holding means holding at least one of said planar display means, said light-guide means, said light-emitting means, and said reflection means as a structure;

heat conduction means including a member having large heat conductivity at the structure, and opposed to said second surface of said light-guide means; and

a mechanism between said heat conduction means and said holding means close to said light emitting means, said mechanism limiting the conduction of heat between said heat conduction means and said holding means,

wherein the mechanism includes two portions, a first portion close to and parallel with the light-emitting means, a second portion between said heat conduction means and said holding means and perpendicular to the light-emitting means, the first portion having a greater ability of limiting heat conduction than the second portion.

37. A display device including a planar display means constituted by liquid crystal display elements, a light-guide member opposed to said planar display means, a light-emitting member comprised of a tubular light source provided at least at an end portion of said light-guide member, and holding means for holding at least said members as a unitary structure, wherein

said planar display means has right angles with the side portion of said light-guide member on which said light-emitting member is arranged, and is arranged at an upper side of the upper surface of said light-guide member,

heat conduction means constituted by a member having a large heat conductivity and which has right angles with the side portion of said light guide member on which said light-emitting member is arranged, is arranged at a lower side of the bottom surface of said light-guide member, and

a first mechanism for limiting heat conductivity is provided between said heat conduction means and said holding means,

a second mechanism for limiting heat conductivity is provided at a portion at right angles with the longitudal direction of the tubular light-emitting member,

wherein an ability of limiting heat conductivity of the first mechanism is set to be larger than that of the second mechanism, when said first mechanism is provided at a portion which is close to said light emitting member and is parallel to the longitudinal direction of the tube thereof.

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**5,742,367**

**LIQUID-CRYSTAL DISPLAY DEVICE HAVING A STACKED ARRANGEMENT OF AN LCD FOR DISPLAYING AN IMAGE, A LIQUID CRYSTAL SHUTTER, AND A SOLAR CELL PANEL**

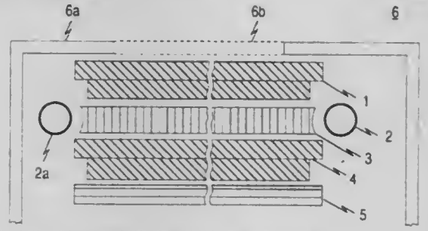
**Yoshiyuki Kozaki, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan**

**Filed May 2, 1996, Ser. No. 641,816**

**Claims priority, application Japan, May 11, 1995, 7-113304**

**Int. Cl.[6] G02F** *1/1335;1/1347;1/133*

**U.S. Cl. 349—64** **7 Claims**




1. A liquid-crystal display device comprising:

a liquid-crystal panel for displaying an image;

a solar-cell panel disposed behind said liquid-crystal panel;

a liquid-crystal shutter provided between said liquid-crystal panel and said solar-cell panel for controlling a quantity of light transmitted to said solar-cell panel through said liquid-crystal panel; and

a power source circuit which is charged by electromotive force generated in said solar-cell panel.

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**5,742,368**

**REFLECTION LIQUID CRYSTAL DISPLAY DEVICE**

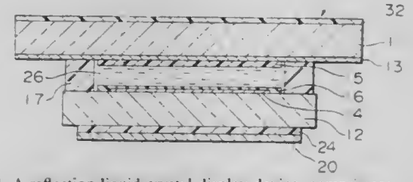
**GuoPing Chen, Iwate-ken, Japan, assignor to Alps Electric co., Ltd., Tokyo, Japan**

**Filed Dec. 30, 1996, Ser. No. 774,791**

**Claims priority, application Japan, Jan. 11, 1996, 8-003379**

**Int. Cl.[6] G02F** *1/1335;* **C09K** *19/60*

**U.S. Cl. 349—117** **4 Claims**




1. A reflection liquid crystal display device, comprising:

a display substrate and a back substrate each having an electrode, and disposed in spaced opposition to each other;

a liquid crystal layer which is provided between said display substrate and said back substrate, and composed of nematic liquid crystal to which dichromatic dye is added;

a reflector plate provided on said back substrate; and

a quarter-wave plate provided between said reflector plate and said liquid crystal layer,

wherein twist pitch P of the liquid crystal and the distance d between said substrates satisfy the following expression:

$$1/4 \leq d/P < 3/4$$

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5,742,369

## METHOD OF ALIGNING LIQUID CRYSTALS BY APPLYING AN ALTERNATING ELECTRIC FIELD UNDER PERIODICALLY CHANGING TEMPERATURE

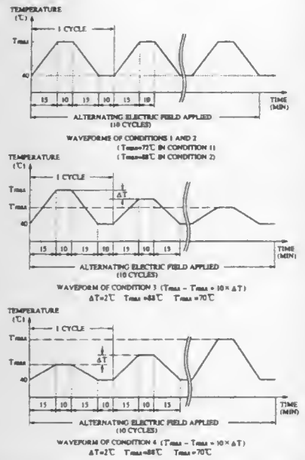
Tadashi Mihara; Yukio Hanyu, both of Isehara, and Sunao Mori, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,521

Claims priority, application Japan, Dec. 28, 1993, 5-352113; Dec. 21, 1994, 6-335595

Int. Cl.[6] G02F 1/1337;1/13

U.S. Cl. 349—123 26 Claims




1. A method of aligning liquid crystals, said method comprising the step of:

treating chiral smectic liquid crystal sandwiched between a pair of substrates each having an electrode by applying an alternating electric field between the substrates under periodically changing temperature conditions in which a width of changes of the temperature for a single period differs in every period,

wherein in the temperature conditions, a minimum temperature value of each period is fixed while a maximum temperature value is varied at every period.

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5,742,370

## FABRICATION METHOD FOR LIQUID CRYSTAL ALIGNMENT LAYER BY MAGNETIC FIELD TREATMENT

Chung Yup Kim; Young Chul Kim; Dong Young Kim; Hyun Nam Cho, and Jun Young Lee, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Feb. 26, 1997, Ser. No. 806,831

Claims priority, application Rep. of Korea, Sep. 12, 1996, 39463/1996

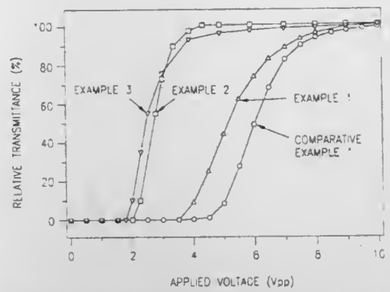
Int. Cl.[6] G02F 1/337

U.S. Cl. 349—124 2 Claims

1. A fabrication method for a liquid crystal alignment layer, comprising:

coating a polymer film on a transparent electrode to have a thickness of not less than 500 Å;

fabricating a temporary cell with a structure of transparent electrode (ITO glass) / polymer film / liquid crystal / polymer film / transparent electrode (ITO glass) by attaching two transparent electrodes having a polymer film coated thereon and infusing a liquid crystal therebetween, or fabricating a stack with a structure of transparent electrode (ITO glass) /polymer film / liquid crystal by contacting liquid crystal on the polymer film;




heating the temporary cell or the stack at lower than phase separation temperature of a blend of liquid crystal and the polymer film while applying a magnetic field stronger than 0.2 tesla; and

cooling the temporary cell or the stack in the magnetic field at a cooling rate of not more than 100° C. per minute.

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5,742,371

## LCD WITH AN ELECTRIC WIRING HAVING A LINE WIDTH NARROWER IN AN AREA WHERE A SEAL CROSS THE WIRING THAN WHERE THE SEAL DOES NOT CROSS

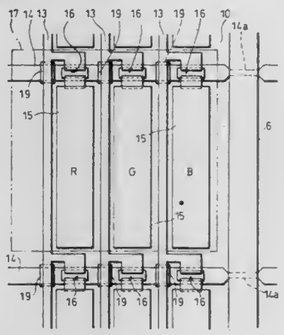
Yoshihiro Izumi, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 555,830, Nov. 13, 1995, Pat. No. 5,654,781. This application Mar. 14, 1997, Ser. No. 818,184

Claims priority, application Japan, Dec. 15, 1994, 6-312157; Dec. 15, 1994, 6-312160; Sep. 14, 1995, 7-237446

Int. Cl.[6] G02F 1/1333;1/1343;1/1339

U.S. Cl. 349—139 9 Claims




1. A liquid crystal display panel comprising:

a pair of substrates;

an electric wiring provided at least on one of said substrates; and

a seal member, applied to said substrate so as to partially cross said electric wiring, for combining said pair of substrates so that a liquid crystal is filled between said pair of substrates, said seal member being made of a ultraviolet ray hardening resin or a ultraviolet ray hardening resin used in combination with heat hardening,

wherein said electric wiring has a line width of narrower in an area where said seal member crosses said electric wiring than in an area where said seal member does not cross said electric wiring.



5,742,372

## APPARATUS FOR MANUFACTURING LIQUID-CRYSTAL PANELS

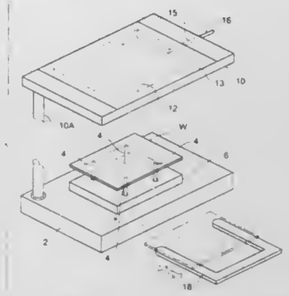
Kyoji Furukawa, Toyokawa, Japan, assignor to Sintokogio, Ltd., Nagoya, Japan

Filed Sep. 16, 1996, Ser. No. 714,654

Claims priority, application Japan, Sep. 22, 1995, 7-269151

Int. Cl.[6] G02F 1/13

U.S. Cl. 349—187 3 Claims



1. An apparatus for manufacturing liquid-crystal panels comprising

a pressure-contacting plate **6** mounted on a horizontally fixed base stand **2**, an upper surface of which plate is flat,

a suction frame **10**, a lower surface of which frame can tightly contact the base stand **2**, disposed movably up and down relative to the base stand **2** in an area just above the pressure-contacting plate **6**, the frame having a center opening **12**, which vertically passes through the frame, and which can accommodate the pressure-contacting plate **6** and an empty cell W, and a suction opening **15**, which is provided in a wall of the frame so as to have the opening **12** communicate with a mechanism for adjusting a pressure of a vacuum,

a film **13** for transmitting ultraviolet rays, hermetically adhering to the suction frame **10** to close the opening **12**, and

ultraviolet-ray radiation means **17** disposed just above the suction frame **10**.

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5,742,373

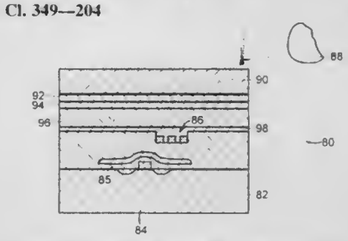
## COLOR MICRODISPLAYS AND METHODS OF MANUFACTURING SAME

Phillip Alvelda, Berkeley, Calif., assignor to Massachusetts Institute of Technology, Boston, Mass.

Filed Oct. 13, 1995, Ser. No. 543,088

Int. Cl.[6] G02F 1/1335;1/13

U.S. Cl. 349—204 39 Claims



1. A method for manufacturing a color generation device comprising:

providing a source of ineident light;

providing a semiconductor substrate;

forming an array of pixels on the substrate, which comprises

a) forming a planar array of diffraction grating elements, such that each pixel diffracts color components of the incident light from the source into a single order having a specific direction; and

b) forming an array of driving and addressing circuitry on the substrate.

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5,742,374

## FUNDUS CAMERA

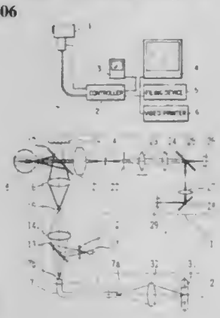
Tsuguo Nanjo, Toyohashi, and Masunori Kawamura, Nagoya, both of Japan, assignors to Nidek Company, Ltd., Japan

Filed Jan. 31, 1997, Ser. No. 791,345

Claims priority, application Japan, Jan. 31, 1996, 8-038973

Int. Cl.[6] A61B 3/14;3/10

U.S. Cl. 351—206 14 Claims




1. A fundus camera for photographing fundus of an eye to be examined, comprising:

observing illumination/target projection optical system provided with a slit-plate having a pin-hole aperture and a ring-slit, for illuminating the eye to be examined with an illumination light bundle for use in observation that is formed by said ring-slit to be ring-shaped by illuminating said slit-plate uniformly, and for projecting an alignment index onto a cornea of the eye to be examined by using a light bundle that has passed through said pin-hole aperture;

photographing illumination optical system for illuminating the eye to be examined with a ring-shaped illumination light bundle for use in photography by using a part of optical path of said observing illumination/target projection optical system;

observation optical system for observing the focused condition of an image of the alignment index projected onto the cornea of the eye to be examined and the fundus of the eye to be examined by using said observing illumination/target projection optical system; and

photographing optical system using a part of optical path of said observation optical system and for photographing the fundus of the eye to be examined that is illuminated with said photographing illumination optical system, whereby the suitability of the alignment is determined by observing the focused condition of the image of the alignment index by using said observation optical system.

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5,742,375

## HEAD MOUNTED LENS SUPPORT

Bernard Charles Szirth, Methuen, Mass., and Neil Milton Davis, Eugene, Oreg., assignors to Nikon, Inc., Melville, N.Y.

Filed May 24, 1996, Ser. No. 653,507

Int. Cl.[6] A61B 3/04

U.S. Cl. 351—229 18 Claims

1. A head mounted lens support comprising:

a lateral support member having a left end and a right end;

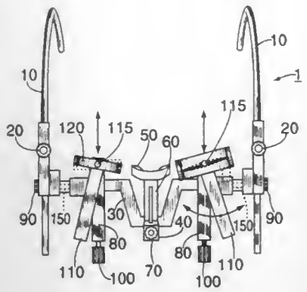
right and left earpieces respectively attached to said right and left ends of said lateral support member;

a nosebridge attached to said lateral support member;

right and left lens support members attached to said lateral support member; and

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right and left lens angle positioners pivotally attached, respectively, to said right and left lens support members.

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**5,742,376**

**PROJECTION EXPOSURE APPARATUS AND PROJECTION EXPOSURE METHOD**

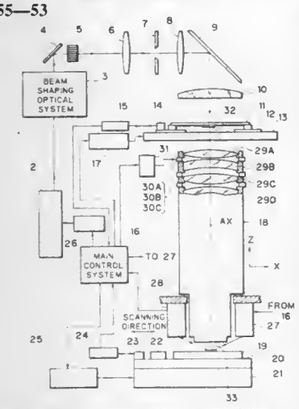
**Susumu Makinouchi, Zama, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 234,357, Apr. 28, 1994, abandoned. This application Dec. 2, 1996, Ser. No. 757,095**

**Claims priority, application Japan, Apr. 28, 1993, 5-103086**

**Int. Cl.[6] G03B** *27/52*

**U.S. Cl. 355—53** **20 Claims**




1. A projection exposure apparatus comprising:

an illumination optical system for illuminating an illumination area on a mask having a pattern to be transferred, with exposure light, said illumination area having a predetermined shape;

a projection optical system for projecting an image of said pattern within said illumination area of said mask to a photosensitive substrate;

a mask stage for scanning said mask in a predetermined scan direction with respect to said illumination area;

a substrate stage for scanning-said photosensitive substrate in a direction corresponding to said scan direction in synchronism with the scanning of said mask;

a changing device for changing relative position of an image plane of said projection optical system and an exposure surface of said photosensitive substrate in a direction of an optical axis of said projection optical system; and

a control system which controls said changing device to change said relative position in a cycle which is determined in accordance with a width of said illumination area in said corresponding direction and a velocity of scanning of said photosensitive substrate while the pattern on said mask is exposed onto said photosensitive substrate by said scanning.

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**5,742,377**

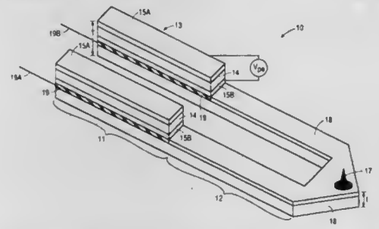
**CANTILEVER FOR SCANNING PROBE MICROSCOPE INCLUDING PIEZOELECTRIC ELEMENT AND METHOD OF USING THE SAME**

**Stephen Charles Minne, Danville, Ill.; Calvin F. Quate, and Scott Manalis, both of Stanford, Calif., assignors to The Board of Trustees of the Leland Stanford, Jr. University, Stanford, Calif.**

**Continuation-in-part of Ser. No. 296,340, Aug. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 226,784, Apr. 12, 1994, Pat. No. 5,517,280. This application Aug. 25, 1995, Ser. No. 519,108**

**Int. Cl.[6] H01J** *3/14*

**U.S. Cl. 355—71** **38 Claims**



1. A scanning probe microscope comprising:

a cantilever comprising an actuator section and a bending section, said actuator section including an actuator for bending said actuator section and said bending section being located closer to a free end of said cantilever than said actuator section;

a deflection detector for detecting a deflection of said bending section; and

a feedback system, an input of said feedback system being coupled to an output of said deflection detector and an output of said feedback system being coupled to an input of said actuator.

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**5,742,378**

**ELECTRONIC LEVELING APPARATUS AND LEVELING STAFF USED WITH THE SAME**

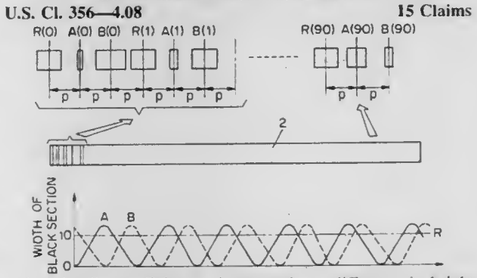
**Kaoru Kumagai; Shinji Kawashima; Kiichi Furuya, and Fumio Ohtomo, all of Tokyo, Japan, assignors to Kabushiki Kaisha TOPCON, Tokyo, Japan**

**Continuation of Ser. No. 557,549, Nov. 14, 1995, abandoned, which is a continuation of Ser. No. 82,082, Jun. 23, 1993, abandoned. This application Oct. 7, 1996, Ser. No. 726,997**

**Claims priority, application Japan, Jun. 24, 1992, 4-191696; Dec. 12, 1992, 4-353346; Dec. 12, 1992, 4-353347**

**Int. Cl.[6] G01C** *3/08;15/02;* **G01B** *11/00*

**U.S. Cl. 356—4.08** **15 Claims**




1. A leveling staff for use in measuring a difference in height between a starting position on said staff and a point of intersection with said staff of a line of sight of an electronic leveling apparatus, said leveling staff comprising:

a first pattern which is modulated in a first cyclic period relative to said starting position and

a second pattern which is modulated in a second cyclic period, different from said first period, relative to said starting position, said first and second patterns being aligned at a constant pitch along a length of said staff.



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**5,742,379**

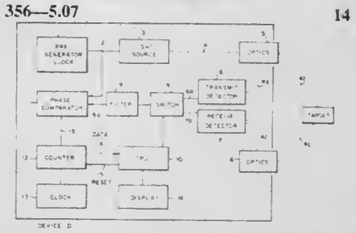
**DEVICE AND METHOD FOR ELECTRONICALLY MEASURING DISTANCES**

**Michael H. Reifer, 9605 Clocktower La., Columbia, Md. 21046**

**Filed Nov. 29, 1995, Ser. No. 563,966**

**Int. Cl.[6] G01C** *3/08*

**U.S. Cl. 356—5.07** **14 Claims**



1. A rangefinder device for electronically measuring range comprising:

a generator clock constructed so as to supply a first signal having a leading edge, to a light source;

said light source constructed so as to receive said first signal and generate a disseminated light output from said first signal;

a transmitting photodetector constructed so as to detect a first portion of said light output, said transmitting photodetector is further positioned such that said transmitting photodetector detects said first portion of said light output from a first optics, said first optics constructed so as to collimate, focus and filter said light output; wherein said transmitting photodetector is further constructed so as to generate a first electrical signal from said first portion of said light output;

said light output comprising a second portion, wherein said second portion is transmitted to a target, wherein a distance between said rangefinder device and said target defines said range;

a receiving photodetector constructed so as to detect a part of said second portion of said light output returning from said target, said receiving photodetector further comprising a second optics constructed so as to collect, focus and filter said second portion of said light output on said receiving photodetector, wherein said receiving photodetector is further constructed so as to generate a second electrical signal from said returning part of said light output;

a signal filter connected to a switch, said filter and switch constructed so as to process said first and second electrical signals from said transmitting photodetector and said receiving photodetector signals;

a central processing unit constructed so as to determine which of said first and second electrical signal is passed through said filter at what time and sequence, said signal filter further constructed so as to generate a filtered signal from each of said first and second electrical signals, wherein said filtered signal having a zero crossing point;

a phase comparator constructed so as to receive said each of said filtered signal, said phase comparator is further constructed so as to generate a comparator signal, wherein said comparator signal comprises a starting point as said leading edge of said first signal and a stopping point at a transition point from one side of said zero crossing point to another side of said zero crossing point of said filter signal;

a distance clock having a counter, said clock and counter constructed so as to count lapsed cycles during said comparator signal, wherein said clock and counter are further constructed so as to count said lapsed cycles for a plurality of samples, wherein said counter begins counting at said starting point and stops counting at said stopping point, said central processing unit is further constructed so as to reset said counter and wherein said clock and counter are further constructed such that said counted lapsed cycles are used as a representation of said range;

wherein said central processing unit is further constructed so as to average said count lapsed cycles from said plurality of samples, determine a filter delay measurement, determine a deviation based upon said averaged count lapsed cycles, determine a path delay measurement, determine a sum of said filter delay and said path delay, determine said distance measurement from said count lapsed cycles, said filter delay measurement and said path delay measurement, said computer processing unit is further constructed so as to display said distance measurement on a display unit, and said computer processing unit is further constructed so as to alert a user, through said display unit, when a threshold value of said deviation has been crossed, said threshold value being indicative of insufficient part of said second portion of said light output incident upon said receiving photodetector.

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**5,742,380**

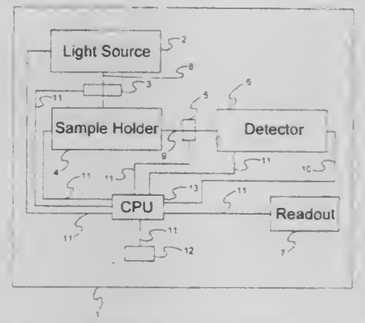
**PLASMA ASSAY SPECTROMETER**

**Avigdor M. Ronn, 27A Bond St., Great Neck, N.Y. 11021**

**Filed Dec. 31, 1996, Ser. No. 777,815**

**Int. Cl.[6] G01N** *21/64*

**U.S. Cl. 356—39** **12 Claims**




1. A fluorescence spectrometer for determining a concentration of the photosensitizing drug in the patient, for PhotoDynamic Therapy treatment of the patient by a treatment light at a treatment light wavelength, said fluorescence spectrometer comprising:

a CPU having a stored calibration curve for the photosensitizing drug that correlates on a one-for-one basis a measured emission light intensity with a calculated concentration of the photosensitizing drug;

a light source;

a sample holder;

a detector;

means for directing an interrogation light output from said light source to said sample holder;

means for directing an emissions light output from said sample holder to said detector;

means for measuring an intensity of said emission light output to produce said measured emission light intensity;

means for inputting said measured emission light intensity to said CPU;

means for comparing said measured emission light intensity to said stored calibration curve to produce a calculated concentration of the photosensitizing drug; and

means for displaying said calculated concentration of the photosensitizing drug.

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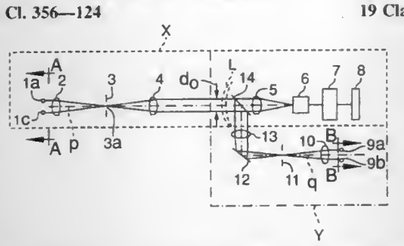


**5,742,381**

## APPARATUS FOR MEASURING REFRACTIVE POWER AND RADIUS OF CURVATURE OF A LENS

**Yasunori Ueno, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Filed Oct. 29, 1996, Ser. No. 739,270**
**Claims priority, application Japan, Nov. 15, 1995, 7-321023**
**Int. Cl.[6] G01B *9/00***
**U.S. Cl. 356—124** **19 Claims**




1. An apparatus for measuring refractive power and radius of curvature of a subject lens, the apparatus comprising:

(a) a refractive-power measurement subsystem arranged on a primary optical axis and comprising a primary light source for generating plural primary light fluxes appearing to originate from locations symmetrically displaced from the primary optical axis on a plane perpendicular to the primary optical axis, the refractive-power measurement subsystem also comprising on the primary optical axis a condenser lens, a collimator lens, an imaging lens, and a single stationary light-position sensor, the refractive-power measurement subsystem being for measuring the refractive power of a subject lens disposed on the primary optical axis between the collimator lens and the imaging lens by sensing the positions at which the primary light fluxes impinge on the light-position sensor as affected by refraction of the primary light fluxes passing through the subject lens, relative to positions at which the primary light fluxes impinge on the light-position sensor when no subject lens is placed between the collimator lens and the imaging lens; and

(b) a curvature-radius measurement subsystem arranged on a secondary optical axis and comprising a secondary light source for generating plural secondary light fluxes appearing to originate from locations symmetrically displaced from the secondary optical axis on a plane perpendicular to the secondary optical axis, the curvature-radius measurement subsystem also comprising on the secondary optical axis a condenser lens, a collimator lens, an imaging lens, and the light-position sensor, the curvature-radius measurement subsystem being for measuring the radius of curvature of a subject surface, facing the imaging lens, of the subject lens situated between the collimator lens and the imaging lens by sensing the positions at which the secondary light fluxes impinge on the light-position sensor as affected by reflection of the secondary light fluxes from the surface of the subject lens, relative to positions at which the secondary light fluxes impinge on the light-position sensor when the subject surface is planar.

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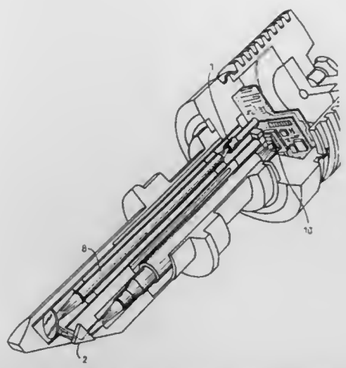
**5,742,382**

## REFRACTOMETER

**Jan Kåhre, Helsinki, Finland, assignor to Janeksko Oy, Vantaa, Finland**

**Continuation of Ser. No. 296,676, Aug. 26, 1994, abandoned. This application Jan. 22, 1996, Ser. No. 589,568**
**Claims priority, application Finland, Sep. 7, 1993, 933907**
**Int. Cl.[6] G01N *21/41***
**U.S. Cl. 356—136** **7 Claims**

1. A refractometer comprising a frame structure, in which are arranged a light source, a fibre optic clad rod of predetermined diameter, an optical window and a light sensitive detector, the optical window being positioned into contact with a solution




having a concentration and a critical angle of total reflection related thereto to be measured and said light source producing a beam of rays directed to an interface between the optical window and the solution such that part of the ray beam reflects back from the solution and part of it is absorbed partially into the solution, an image being created in which a light area and an adjacent dark area define a borderline therebetween, said borderline having a location depending on the critical angle of total reflection, this angle being a function of the concentration of the solution, the light sensitive detector for detecting and converting into electrical form the location of the borderline, said fibre optic clad rod being arranged between the light source and the optical window, such that said ray beam passes through said rod to the optical window, and said clad rod being fitted to the light source for collecting a conical ray beam from the light source while removing wide angles of light rays and mixing and homogenizing the ray beam by internal reflection in the clad rod to create a beam of rays comprising a multiplicity of non-parallel rays at differing angles such that all angles of the ray beam have substantially equal amounts of light as said beam of rays exits said fibre optic clad rod.

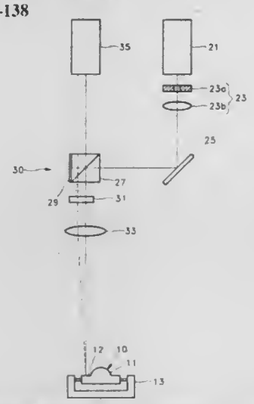
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**5,742,383**

## APPARATUS FOR MEASURING DEGREE OF INCLINATION OF OBJECTIVE LENS FOR OPTICAL PICKUP

**Byeonghwan Jeon, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Nov. 26, 1996, Ser. No. 756,642**
**Int. Cl.[6] G01B *11/26*; G01C *1/00***
**U.S. Cl. 356—138** **6 Claims**




1. An apparatus for measuring a degree of inclination of an objective lens for an optical pickup, comprising:

light source;



a collimator positioned between said light source and said objective lens, for collimating light emitted from said light source;

a condensing lens for converging light passed through said collimator on said objective lens;

a light receiving element for receiving light passed through said condensing lens and reflected from said objective lens; and

optical path converting means positioned along the optical path between said collimator and said condensing lens, for directing part of the light entering said optical path converting means from said light source to travel toward said condensing lens and directing the remaining light toward said light receiving element,

wherein a difference between the location of a light directly entering said light receiving element after being emitted from said optical converting means and a location of the light entering said light receiving element after being reflected from said objective lens is detected to measure the degree of inclination of said objective lens.

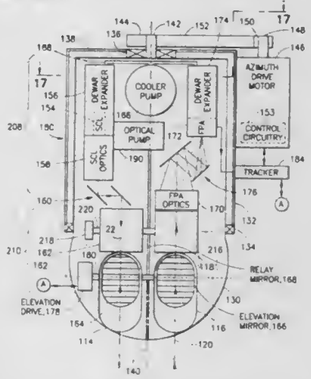
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**5,742,384**

## COMPACT SCANNING INFRARED COUNTERMEASURE EMITTER

**Roger C. Farmer, Arcadia, Calif., assignor to Lockheed Martin Corporation, Bethesda, Md.**

**Filed May 2, 1996, Ser. No. 641,840**
**Int. Cl.[6] G01B *11/26*; H01S *3/10***
**U.S. Cl. 356—141.4** **15 Claims**




1. A laser transmission system comprising:

a semiconductor laser and lens means for focusing light emitted by the laser to provide a transmitted beam;

a housing enclosing the laser and the lens means, and a rigid support for positioning the laser and the lens means within the housing;

means for rotating the housing about an axis for scanning the beam in azimuth; and

transmit mirror means positioned by the support means within the housing for scanning the beam in elevation.

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**5,742,385**

## METHOD OF AIRPLANE INTERIORS ASSEMBLY USING AUTOMATED ROTATING LASER TECHNOLOGY

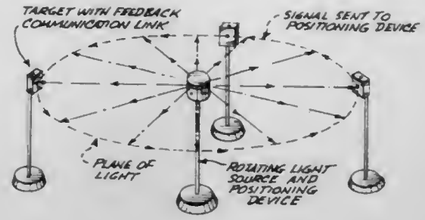
**James L. Champa, Port Orchard, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed Jul. 16, 1996, Ser. No. 701,906**
**Int. Cl.[6] G01B *11/26***
**U.S. Cl. 356—141.4** **4 Claims**

1. Apparatus for assembling interior components in an aircraft fuselage comprising in combination:

a rotating laser;

at least three reference targets;




at least one part locating target;

said at least three reference targets disposed in said aircraft fuselage;

said rotating laser establishing a reference plane based on said at least three reference targets disposed in said aircraft fuselage;

said interior components disposed in their approximate final locations; and said rotating laser utilized to locate said interior components based upon said at least one part locating target.

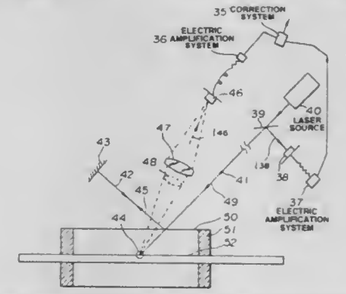
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**5,742,386**

## APPARATUS FOR DETECTING FOREIGN MATTER ON A SUBSTRATE, AND AN EXPOSURE APPARATUS INCLUDING THE SAME

**Noriyuki Nose, Atsuigi; Minoru Yoshii, Tokyo; Kyoichi Miyazaki, Utsunomiya; Toshihiko Tsuji, Utsunomiya, and Seiji Takeuchi, Utsunomiya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 711,309, Sep. 3, 1996, abandoned, which is a continuation of Ser. No. 281,181, Jul. 27, 1994, abandoned. This application Feb. 13, 1997, Ser. No. 799,879**
**Claims priority, application Japan, Jul. 30, 1993, 5-208367; Apr. 25, 1994, 6-110436**
**Int. Cl.[6] G01N *21/00***
**U.S. Cl. 356—237** **10 Claims**




1. An apparatus for detecting foreign matter on a substrate, said apparatus comprising:

optical means for projecting a monochromatic light beam through a first surface onto a second surface;

a first detector for detecting scattered light from foreign matter on the second surface and for producing a first detection signal;

first amplifying means for receiving and amplifying the first detection signal to produce a first amplified detection signal;

a second detector for detecting information relating to one of the reflectivity and the transmittance of the first surface by detecting a light beam reflected by the first surface and for producing a second detection signal;

second amplifying means for receiving and amplifying the second detection signal to produce a second amplified detection signal; and

correction means for receiving the first and second amplified detection signals and for changing one of (i) a slice level for the first amplified detection signal and (ii) again of said first amplifying means.

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5,742,387

## LASER BEAM LEVELLING DEVICE AND PROCESS FOR OPERATING A LASER BEAM LEVELLING DEVICE AND ASSOCIATED CONTRIVANCE

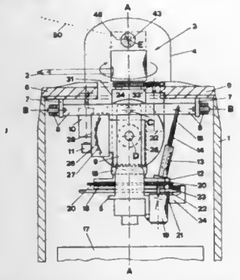
Hans-Rudolf Ammann, Amriswil, Switzerland, assignor to Ammann Lasertechnik AG, Amriswil, Switzerland

Filed Dec. 18, 1996, Ser. No. 769,233

Claims priority, application Switzerland, Dec. 21, 1995, 03642/95

Int. Cl.[6] G01C *9/02*; G01B *11/26*

U.S. Cl. 356—247 21 Claims



1. A laser beam levelling device having means for producing a laser beam and a rotatable head arranged to emit the laser beam, wherein the laser beam, which can be set into rotation by the rotating head, forms a laser plane which can be used for measurement purposes and wherein said device further comprises a rotating frame which is rotatable about an essentially vertical axis and at least one inclining arrangement connected to the rotating frame and pivotal about an essentially horizontal axis, said rotatable head being pivotable about said essentially vertical axis in response to movement of said rotating frame about said axis and said rotatable head being further pivotable about said essentially horizontal axis in response to movement of said at least one inclining arrangement about said axis, and said device further comprising an additional rotating arrangement for rotating the rotatable head, driving means for driving the rotating frame and the at least one inclining arrangement, a first measuring arrangement for determining the rotational position of the rotating frame, a second measuring arrangement for determining the pivotal position of the at least one inclining arrangement, each said measuring arrangement having a plurality of successive marks thereon, a mark reading device for reading the marks on said measuring arrangements, at least one controller connected to said driving means and said mark reading device and arranged to control the positions of the rotating frame and the at least one inclining arrangement by activating the driving means depending on the positions of the marks on the measuring arrangements which are read by the mark reading device, and a further rotational element provided with at least one reflector and rotatable about an essentially horizontal axis.

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5,742,388

## ATOMIC ABSORPTION SPECTROPHOTOMETER

Albert H. Gilmutdinow, and Konstantin J. Nagulin, both of Kasan, Russian Federation, assignors to Bodenseewerk Perkin-Elmer GmbH, Uberlingen, Germany

PCT No. PCT/EP94/01022, § 371 Date Oct. 30, 1995, § 102(e) Date Oct. 30, 1995, PCT Pub. No. WO94/23285, PCT Pub. Date Oct. 13, 1994

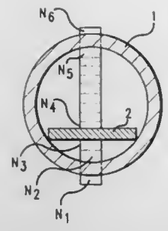
PCT Filed Mar. 31, 1994, Ser. No. 492,061

Claims priority, application Russian Federation, Apr. 2, 1993, 930 17 152

Int. Cl.[6] G01N *21/74*;*21/31*

U.S. Cl. 356—312 11 Claims

1. An atomic absorption spectrophotometer, comprising a radiation source (**1**), an illumination system (**2**,**4**), an atomizer (**3**), a



monochromator (**5**–**7**) and a linear solid-state detector (**9**) including an array of pixels for detecting optical radiation.

wherein the improvement comprises,

the linear solid-state detector (**9**) being arranged along a monochromator exit slit (**7**), and

an image of at least one portion of the atomizer (**3**) being projected onto the linear solid-state detector so that detector pixels measure the emission of said at least one portion to determine a temperature of the atomizer.

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5,742,389

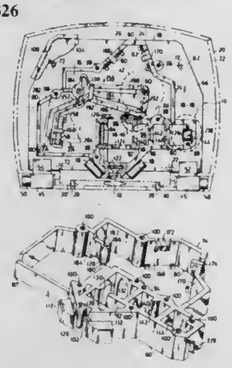
## SPECTROPHOTOMETER AND ELECTRO-OPTIC MODULE ESPECIALLY SUITABLE FOR USE THEREIN

James M. Zavislan; Jay M. Eastman, and Robert J. Hutchison, all of Pittsford, N.Y., assignors to Lucid Technologies Inc., Henrietta, N.Y.

Continuation-in-part of Ser. No. 210,806, Mar. 18, 1994, abandoned. This application Oct. 12, 1994, Ser. No. 322,244

Int. Cl.[6] G01J *3/28*

U.S. Cl. 356—326 28 Claims



1. An electro-optical module comprising a flexible base plate and a self-supporting wall assembled to said plate on one side thereof into a unitary structure consisting essentially of said wall and plate and more rigid than said plate and wall alone, said wall surrounding an area on said one side of said plate sufficient in size to contain plurality of electrical and optical components in assembled relationship with at least one of said plate and said wall, a cover having a top overlying said area and extending outwardly of said area beyond said wall, said cover also having sides and a rim, said base plate having an edge, and said rim extending outwardly of said edge, said cover being assembled with said base plate and said wall from said top via said wall.



5,742,390

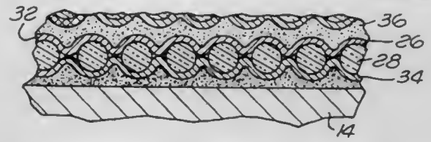
## POTTED GYRO SENSOR COIL WITH INTER-TURN STRESS RELIEF

Amado Cordova, West Hills; Robert J. Hoover, Newbury Park; Thomas McLean, Woodland Hills; Ralph A. Patterson, Moorpark, and John P. Rahn, West Hills, all of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Nov. 19, 1996, Ser. No. 751,984

Int. Cl.[6] G01C *19/64*

U.S. Cl. 356—350 23 Claims



1. A method for forming a potted sensor coil of predetermined size for a fiber optic gyroscope comprising the steps of:

a) applying a layer of potting material to a mandrel; then

b) applying a layer of predetermined lubricant; then

c) winding a layer of optical fiber in a predetermined pattern; then

d) applying a layer of predetermined lubricant; then

e) repeating steps a through d until a predetermined length of optical fiber has been wound; then

f) applying a final layer of potting material; and then

g) curing said potted coil.

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5,742,391

## OPTICAL TYPE SENSOR FOR USE AS AN OPTICAL MEASURING HEAD OR OPTICAL PICKUP

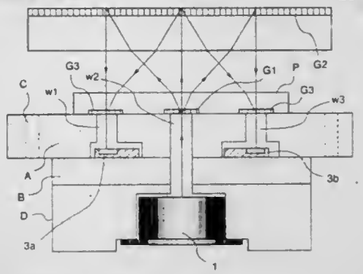
Yasushi Kaneda, Utsunomiya; Kou Ishizuka, Omiya, and Kenji Hisamoto, Utsunomiya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1995, Ser. No. 579,347

Claims priority, application Japan, Dec. 27, 1994, 6-325130

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—356 21 Claims



1. An optical type sensor comprising:

a light emitting element;

a light receiving element;

at least one optical element acting on a light beam emitted from said light emitting element, in an optical path before said light beam enters said light receiving element; and

a spacer member disposed to define a spacing between said light emitting element and/or said light receiving element and said at least one optical element, said light emitting element, said at least one optical element, and said spacer member constituting a head member, and said spacer member being structured so as to mount to another member to which said head member is to be mounted.

5,742,392

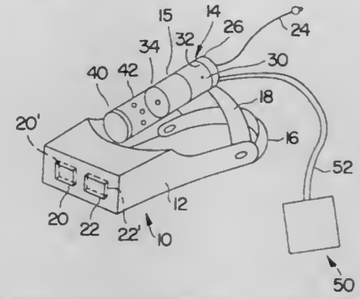
## POLARIZED MATERIAL INSPECTION APPARATUS

Richard Rox Anderson, Lexington; William A. Farinelli, Danvers, and Nikiforos Kollias, Watertown, all of Mass., assignors to Seymour Light, Inc., Watertown, Mass.

Filed Apr. 16, 1996, Ser. No. 634,311

Int. Cl.[6] G01N *21/21*

U.S. Cl. 356—364 7 Claims



1. An apparatus for material inspection comprising: an illuminator, said illuminator comprising a housing, said housing forming an optical path and housing a plurality of illuminator elements, said illuminator elements comprising a light source, a first polarizing means having a first plane of polarization, a lens, an aperture, an optical filter; a means for supporting said illuminator in a preferred orientation; and a viewing means, said viewing means comprising a second polarizing means having a second plane of polarization, wherein said first and second polarizing means are rotationally positionable with respect to each other such that their respective planes of polarization may be aligned in either a parallel or orthogonal relationship and wherein said means for supporting said housing comprises a headgear system, which allows said illuminator to be worn on the head of a user of the apparatus.

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5,742,393

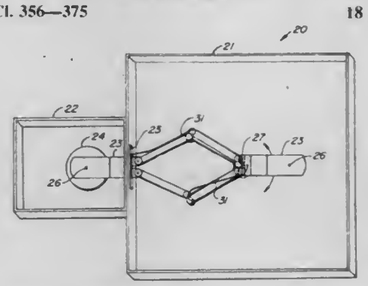
## OPTICAL POSITION CALIBRATION SYSTEM

Richard F. Landau, and Edward D. Schultheis, both of Mountain View, Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 7, 1995, Ser. No. 474,027

Int. Cl.[6] G01B *11/14*

U.S. Cl. 356—375 18 Claims



1. A method of calibrating a transfer arm in a sealable semiconductor processing system, said method comprising the steps of:

detecting a position of said transfer arm at an identifiable location in said sealable semiconductor processing system while said system is atmospherically evacuated to a desired pressure;

adjusting said position of said transfer arm while substantially maintaining said desired pressure of said sealable semiconductor processing system; and

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processing semiconductor wafers in said sealable semiconductor processing system while substantially maintaining said desired pressure of said sealable semiconductor processing system.

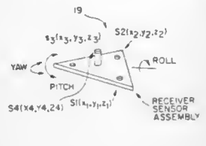
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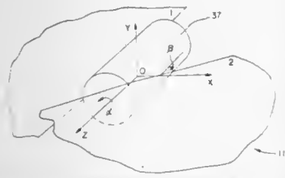
**5,742,394**

## OPTICAL 6D MEASUREMENT SYSTEM WITH TWO FAN SHAPED BEAMS ROTATING AROUND ONE AXIS

**Per Krogh Hansen, Burlington, Vt., assignor to Ascension Technology Corporation, Burlington, Vt.**

**Filed Jun. 14, 1996, Ser. No. 663,988**
**Int. Cl.[6] G01B *11/14;11/26***
**U.S. Cl. 356—375** **19 Claims**




1. A system for determining position and orientation of an object, comprising:

a) transmitter means for emitting two beams of light including a first beam and a second beam skewed with respect to said first beam, said beams extending from a common point;

b) drive means for rotating said transmitter means whereby said beams rotate as well;

c) a receiver attachable to an object within a space, said receiver carrying at least three sensors spaced in a prescribed configuration;

d) connection means for connecting said sensors to computer means whereby signals are conveyed to said computer means from said sensors indicative of each moment at which each respective beam intersects each respective sensor;

e) said computer means being programmed for calculating, from said signals, position and orientation of said receiver including x, y and z coordinates as well as pitch, roll and yaw.

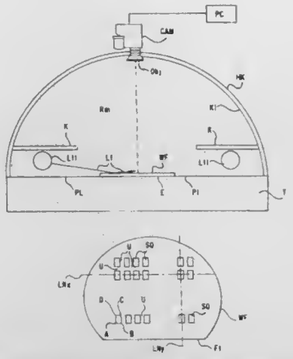
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**5,742,395**

## METHOD FOR CHECKING SEMICONDUCTOR WAFERS AND APPARATUSES FOR CARRYING OUT THE METHOD

**Ernst Biedermann, Regensburg; Matthias Grieshop, Neutraubling; Manfred Ben El Mekki, Fürstenfeldbruck; Kenneth Weisheit, Augsburg; Thomas Griebsch, and Gerhard Ross, both of München, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Apr. 20, 1995, Ser. No. 425,827**
**Claims priority, application Germany, Apr. 20, 1994, 44 13 831.8**
**Int. Cl.[6] G01B *11/00***
**U.S. Cl. 356—394** **16 Claims**




1. In a method for checking semiconductor wafers or a batch of semiconductor wafers used to produce integrated semiconductor memories, in which the semiconductor wafers have a lacquer layer and at least one layer having structures below the lacquer layer, the improvement which comprises automatically:

1) ascertaining regions to be omitted from the check and surfaces to be checked, at least for first semiconductor wafers to be checked, in accordance with the following steps:

1a) directly illuminating the semiconductor wafer for reflecting light from the applied lacquer layer;

1b) ascertaining and buffer-storing reflectance of the reflected light with a camera disposed vertically above the semiconductor wafer and an evaluator connected to the camera, in the following way:

1b1) ascertaining and buffer-storing the reflectance of the reflected light at selected points along two imaginary lines drawn over the semiconductor wafer at right angles to one another, with one of the lines being aimed in a forward direction of the structures;

1b2) repeating step 1b1) for a further imaginary lines being spaced apart from and parallel to the imaginary line and having multiple values below a predetermined minimum value, if multiple values for the reflectance being below the minimum value occur for at least one of the imaginary lines;

1b3) repeating step 1b2) with further imaginary lines being spaced apart from the last imaginary line measured most recently, if step 1b2) for the further imaginary line also leads to values of the reflectance being below the minimum value multiple times, often enough until an imaginary line is found having values of the reflectance meeting the criterion of the minimum value multiple times;

1c) discontinuing the check if steps 1b1) through 1b3) do not lead to two imaginary lines at right angles to one another meeting the criterion of the minimum value; otherwise ascertaining coordinates being above a predetermined maximum value but in the vicinity of position values having a reflectance below the maximum value for each of the two imaginary lines, from their position points, from associated values of the reflectance and from information stating that the semiconductor wafer serves to produce integrated semiconductor memories;

1d) utilizing a quantity of the coordinates thus found in a remainder of the method to eliminate regions of the semiconductor wafer to be checked, from the check, for finding a number of surfaces to be checked for the semiconductor wafer to be checked, having coordinates of corner points being equal to the ascertained respective coordinates;

2) checking each surface during illumination, by the following method steps:

2a) drawing at least one imaginary measuring line through the surface to be checked;

2b) ascertaining and buffer-storing a respective value of the reflectance of the reflected light at predetermined measuring points along the measuring line with the camera and the evaluator;

2c) ascertaining whether the checked surface is OK or defective in accordance with at least one predetermined evaluation criterion, from the ascertained and buffer-stored values of the reflectance; and

2d) ascertaining surfaces found to be defective.



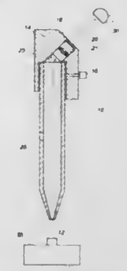
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**5,742,396**

## METHOD AND APPARATUS FOR DETECTING OBSTRUCTED VACUUM NOZZLES

**Vahid Kazem-Goudarzi, Sunrise; Alex Marron, and Val Jean F. Hillman, both of Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 657,129, Jun. 3, 1996, abandoned. This application Jan. 11, 1997, Ser. No. 781,464**
**Int. Cl.[6] G01B *11/02***
**U.S. Cl. 356—394** **20 Claims**



1. A method of detecting whether an opening in tip face of a vacuum nozzle for a high speed component placement machine is obstructed, comprising the steps of:

illuminating the opening in the tip face of the vacuum nozzle from inside the vacuum nozzle by illuminating a hollow interior portion of the vacuum nozzle, to project a beam of light through the opening in the tip face;

measuring, by means of a remote detector exterior to the vacuum nozzle, intensity of light emanating from the opening in the tip face; and

comparing the measured intensity of light emanating from the opening in the tip face to a predetermined standard in order to determine whether the opening in the tip face is obstructed.

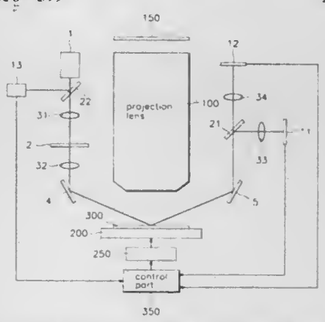
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**5,742,397**

## CONTROL DEVICE OF THE POSITION AND SLOPE OF A TARGET

**Sang-Cheol Kim, Kyounggi-do, Rep. of Korea, assignor to Samsung Aerospace Industries, Ltd., Kyeongsangnam-do, Rep. of Korea**

**Filed Aug. 21, 1995, Ser. No. 517,581**
**Claims priority, application Rep. of Korea, Aug. 24, 1994, 94-20931**
**Int. Cl.[6] G01B *11/00*; G01N *21/86***
**U.S. Cl. 356—399** **22 Claims**




1. A control system for controlling the position and slope of a target, comprising:

a single light source that emits light to be transmitted to and reflected from the target;

a first mask through which the light emitted from the single light source passes, said first mask having a non-periodic pattern recorded thereon;

first and second charge coupled devices for detecting the light from the single light source after reflection from the target;

control means for adjusting the position and slope of the target based on signals received from the first and second charge coupled devices; and

a first beam splitter positioned between the target and the charge coupled devices for dividing the emitted light into a first light path and a second light path, wherein the first light path is directed through a first lens to the first charge coupled device, and the second light path is directed through a second lens to the second charge coupled device.

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**5,742,398**

## DEVICE FOR THE AUTOMATIC DETECTION AND INSPECTION OF DEFECTS ON A RUNNING WEB, SUCH AS A TEXTILE FABRIC

**Gilles Laucournet, St. Maurice de Gourdans, France, assignor to ICBT Macotex, France**

**Filed Oct. 16, 1996, Ser. No. 731,587**
**Claims priority, application France, Oct. 16, 1995, 95 12318**
**Int. Cl.[6] G01N *21/89***
**U.S. Cl. 356—429** **10 Claims**




1. Inspection apparatus for detecting defects on a running web of material that includes,

drive means for drawing a web of material through an inspection zone,

a header means containing a light transmitting fiber bundle having a light entrance face and a linear light exit face that extends across the width of the inspection zone, a light source for illuminating the light entrance face of said bundle whereby a line of illumination passes out of said bundle, a cylindrical transparent bar positioned in said line of illumination having a back focal point that coincides with the light exit face of the fiber bundle, whereby said line of illumination forms a parallel beam of light upon the web of material passing through said inspection zone,

an array of photodetectors for detecting a reflected light image from the web passing through the inspection zone and generating a defect signal in response to the detected image, and

means for storing in memory the position of a detected defect on said web.

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5,742,399

## METHOD FOR STABILIZING THE WAVELENGTH IN A LASER SPECTROMETER SYSTEM

James McAndrew, Lockport, and Ronald S. Inman, Lyons, both of Ill., assignors to American Air Liquide, Inc., Walnut Creek, Calif.

Continuation-in-part of Ser. No. 634,448, Apr. 18, 1996, abandoned. This application Sep. 10, 1996, Ser. No. 711,780

Int. Cl.[6] G01N *21/31*

U.S. Cl. 356—437 24 Claims

1. A method for wavelength stabilization in a diode laser spectrometer useful in spectroscopic measurement, comprising:

(a) performing an initial scan which comprises applying a current to a diode laser, wherein a current value is increased incrementally from a minimum current value to a maximum current value over a predetermined total number of current values, wherein the minimum and maximum current values are selected such that an absorption feature of a species to be measured falls within the initial scan bounded by the minimum and the maximum current values;

(b) determining the relative position of the absorption feature with respect to the applied current values in the previous scan in time of step (a) or step (f) by analysis of detector signals corresponding to the current values in the previous scan;

(c) determining an absorption signal corresponding to the absorption feature in the previous scan;

(d) optionally calculating the concentration of the species to be measured;

(e) defining a new current scan by resetting the current values from the previous scan, so as to set the absorption feature in the new current scan in the same relative position with respect to the applied current values as in the previous scan;

(f) performing an additional scan; and

(g) repeating steps (b) through (f) until completion of the spectroscopic measurement.

5,742,400

## IMAGE PROCESSING APPARATUS

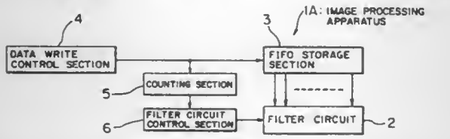
Keiji Satoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 15, 1996, Ser. No. 632,154

Claims priority, application Japan, Jul. 12, 1995, 7-175880

Int. Cl.[6] G06T *5/00;* H04N *1/21;1/409*

U.S. Cl. 358—262 5 Claims




1. An image processing apparatus including a filter circuit which performs median filter processing to obtain a median of multi-gradation image data with regard to a predetermined number of pixels including a target pixel and which uses the thus obtained median as multi-gradation image data for the target pixel, the image processing apparatus comprising:

an FIFO storage section which holds multi-gradation image data with regard to the predetermined number of pixels to be subjected to median filter processing by said filter circuit;

a data write control section for writing into said FIFO storage section in a predetermined order the multi-gradation image data with regard to the target pixel to be subjected to median filter processing by said filter circuit;

a counting section for counting the number of items of multi-gradation image data which are written into said FIFO storage section by said data write control section; and

a filter circuit control section for controlling the operation of said filter circuit in response to a resultant count of said counting section,

whereby when said counting section has counted up to the predetermined number, or when the counted value of said counting section is increased by a predetermined number after said counting section has counted up to the predetermined number, said filter circuit control section causes said filter circuit so as to perform median filter processing for the multi-gradation image data stored in said FIFO storage section.

5,742,401

## LASER-EXPOSED THERMAL RECORDING ELEMENT

Joseph F. Bringley; Kurt D. Sieber, and David P. Trauernicht, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 19, 1996, Ser. No. 769,336

Int. Cl.[6] H04N *1/23;1/40;* G01D *9/00;9/42*

U.S. Cl. 358—297 20 Claims

1. A laser-exposed thermal recording element comprising a flexible support having thereon the following imaging layers in sequence:

a) an electrically conductive layer, and

b) an electro-deposited black layer,

with the proviso that the sum of the optical densities of layers a) and b) is between about 0.5 and about 5.

5,742,402

## COMMUNICATION APPARATUS

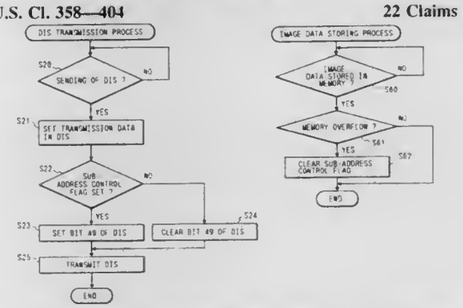
Makoto Kobayashi; Shinichiro Kohri, and Koichiro Ohtsuka, all of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 423,096, Apr. 18, 1995, abandoned. This application Jul. 3, 1997, Ser. No. 886,005

Claims priority, application Japan, Apr. 18, 1994, 6-103382

Int. Cl.[6] H04N *1/00*

U.S. Cl. 358—404 22 Claims




1. A communication apparatus having a function of performing a sub-address procedure to receive a sub-address signal, comprising:

sending means for sending to a destination information indicating whether or not said apparatus has the function of performing the sub-address procedure;

sub-address signal receiving means for receiving the sub-address signal from the destination in accordance with the sub-address procedure;

data receiving means for receiving data from the destination;

processing means for processing, in a case where said sending means has sent information to the destination indicating that said apparatus has the function of performing the sub-address procedure and where the sub-address signal is thereafter received in connection with data from the destination, the received data in accordance with the received sub-address signal; and



control means for determining whether or not said processing means is able to perform the processing operation, and for causing said sending means to send information indicating that said apparatus does not have the function of performing the sub-address procedure to the destination in accordance with the determination of whether or not said processing means is able to perform the processing operation.

said control means causing said apparatus to not accept data from the destination after said sending means sends the information indicating that said apparatus does not have the function of performing the sub-address procedure.

5,742,403

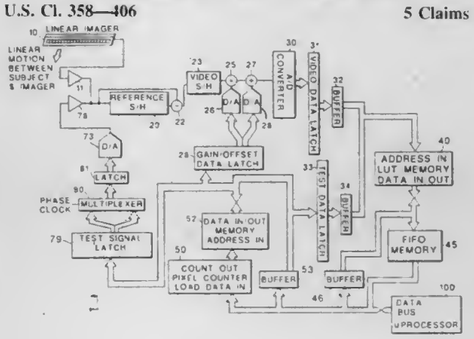
## TEST APPARATUS AND METHODS FOR A DIGITAL IMAGE SCANNING SYSTEM

John Thomas Compton, LeRoy, and Jon Leon Hoeft, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 22, 1996, Ser. No. 621,300

Int. Cl.[6] H04N *1/00;1/40;17/00;* G01C *25/00*

U.S. Cl. 358—406 5 Claims




1. Test apparatus for an image scanning system having a digital imaging device with at least one line of light-responsive photosites for producing a linear scan of image pixel analog signals and an analog signal processing channel for processing said image pixel signals derived from said imaging device, the test apparatus comprising:

means for supplying a map of photosite variable test data signals simulating photosite-by-photosite-variable analog data signals from the imaging device;

counter means for supplying count values corresponding to individual photosites in the imaging device;

memory means for storing said map of photosite variable test data signals at memory addresses corresponding to said photosite count values;

means operative during a test operation for inhibiting processing in said analog signal channel of image pixel analog signals from said imaging device; and

test signal supply means responsive to said counter means and memory means during said test operation for supplying said photosite variable test data signals as analog signals on a simulated photosite-by-photosite-variable basis for processing in said analog signal channel.

5,742,404

## IMAGE TRANSMISSION SYSTEM

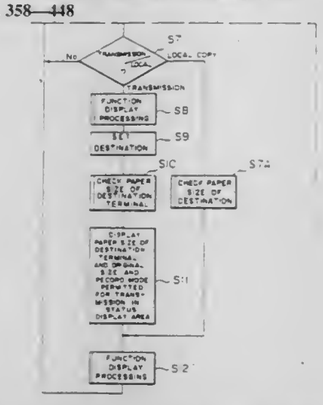
Masanori Miyata, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 407,396, Mar. 17, 1995, which is a continuation of Ser. No. 123,989, Sep. 21, 1993, which is a continuation of Ser. No. 804,066, Dec. 9, 1991, which is a division of Ser. No. 725,239, Jun. 27, 1991, Pat. No. 5,105,285, which is a continuation of Ser. No. 296,864, Jan. 13, 1989, abandoned, which is a continuation of Ser. No. 908,884, Sep. 15, 1986, abandoned, which is a continuation of Ser. No. 475,382, Mar. 14, 1983, abandoned. This application May 19, 1995, Ser. No. 444,736

Claims priority, application Japan, Mar. 19, 1982, 57-42530; Mar. 19, 1982, 57-42531; Mar. 19, 1982, 57-42534; Mar. 19, 1982, 57-42535

Int. Cl.[6] H04N *1/40;* G06F *15/00*

U.S. Cl. 358—448 12 Claims




1. An information processing apparatus comprising:

determination means for detecting a size of recording paper available at a remote receiving apparatus, and for determining an operable magnification power corresponding to an original size from a plurality of different original sizes based on the detected recording paper size; and

display means for displaying the original size and the operable magnification power determined by said determination means and for displaying information processing guidance information.

5,742,405

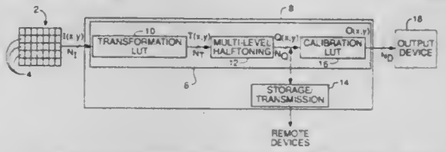
## METHOD AND SYSTEM FOR FORMING MULTI-LEVEL HALFTONE IMAGES FROM AN INPUT DIGITAL IMAGE

Kevin Edward Spaulding, Spencerport, and Rodney L. Miller, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 26, 1995, Ser. No. 378,851

Int. Cl.[6] H04N *1/40;1/46*

U.S. Cl. 358—456 27 Claims




1. A method for forming a multi-level halftone image from an input digital image having a plurality of pixels so that visibility of halftone patterns is minimized, comprising the steps of:

(a) transforming input pixel values which represent the tone level of each pixel into modified pixel values which are approximately linear with perceived lightness so that the

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modification of each said modified pixel value is based on input from only a single channel;

(b) applying a multi-level half toning process to the modified pixel values to produce halftone pixel values having a reduced number of tone levels which are uniformly distributed with respect to the modified pixel values; and

(c) transforming the halftone pixel values into output pixel values for permitting an output device to display the digital image so that visibility of halftone patterns is minimized.

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**5,742,406**

**IMAGE PROCESSING APPARATUS**

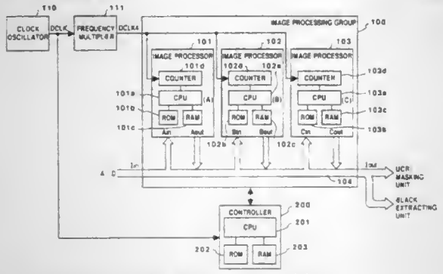
**Takashi Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 842,916, Feb. 27, 1992, abandoned. This application Nov. 4, 1994, Ser. No. 337,233**

**Claims priority, application Japan, Mar. 1, 1991, 3-035855**

**Int. Cl.[6] H04N** *1/40;1/32*

**U.S. Cl. 358—468** **52 Claims**




**1**. An image processing apparatus comprising:

image processing means having a plurality of different image processing methods to be applied sequentially to each pixel of an image;

setting means for variably setting an execution order of the plurality of image processing methods

generating means for generating a reference pixel clock;

selecting means for selecting first and second image processing methods from among the plurality of image processing methods in accordance with the execution order set by said setting means and the reference pixel clock generated by said generating means; and

executing means for executing the image processing methods selected by said selecting means on each pixel, wherein said executing means, while executing the first image processing method on a first pixel of the image, concurrently executes the second image processing method on a second pixel of the image.

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**5,742,407**

**ARRANGEMENT FOR SUPPORTING A DRAWER IN A DRAWER FEED SCANNER**

**Thomas S. Albrecht, Canandaigua; Eric P. Hochreiter, Bergen; Dale W. Ryan, Rochester, and Martin L. Slade, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

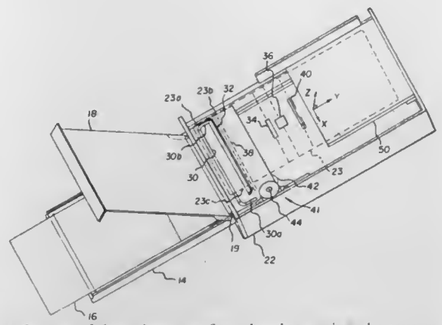
**Filed Mar. 20, 1996, Ser. No. 619,025**

**Int. Cl.[6] H04N** *1/04;* **G03G** *15/04;* **G03B** *27/62;* **H01L** *27/00*

**U.S. Cl. 358—496** **7 Claims**

**1**. A supporting arrangement for constraining unwanted motions of an original that is being supported for movement through a scanner, said supporting arrangement comprising:

a tray for transporting the original past an image scanning location, said tray including an elongated section arranged underneath the tray generally in the direction of the movement of the tray through the scanner;




a first set of three datum surfaces bearing against the tray so as to constrain unwanted motion of the tray in three degrees of motion;

means for impressing a first force from a side opposite to the first set of three datum surfaces;

a second set of two datum surfaces bearing against one side of the elongated section so as to constrain unwanted motion of the tray in two additional degrees of motion; and

means for impressing a second force against the other side of the elongated section between the two datum surfaces comprising the second set, whereby the tray is allowed to move in a scanning direction through the scanner without unwanted motions in other directions.

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**5,742,408**

**IMAGE PROCESSING APPARATUS AND METHOD WHICH ADDS PREDETERMINED INFORMATION TO INPUT IMAGE DATA**

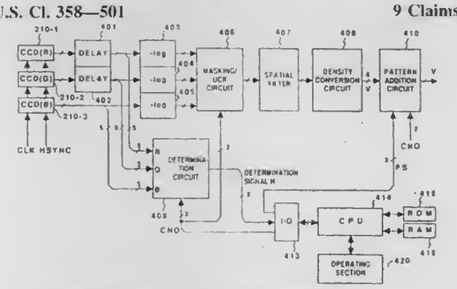
**Masahiro Funada, Yokohama; Toshiyuki Kitamura; Mitsuhiro Yamamoto, both of Kawasaki, and Eiji Ohta, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 454,682, May 31, 1995, which is a division of Ser. No. 85,088, Jul. 1, 1993, Pat. No. 5,465,161, which is a division of Ser. No. 856,996, Mar. 24, 1992, Pat. No. 5,257,119. This application Jan. 7, 1997, Ser. No. 779,391**

**Claims priority, application Japan, Mar. 25, 1991, 3-060248; May 8, 1991, 3-102354; May 29, 1991, 3-124345; Jul. 1, 1991, 3-160560**

**Int. Cl.[6] H04N** *1/50;1/44*

**U.S. Cl. 358—501** **9 Claims**




**1**. An image processing apparatus comprising:

input means for inputting image data representing an image to be formed on a plurality of planes; and



addition means for adding predetermined information to less than all of the plurality of planes but to a part of the plurality of the planes, wherein the added predetermined information is difficult to discriminate with human eyes when an image represented by the image data is formed.

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**5,742,409**

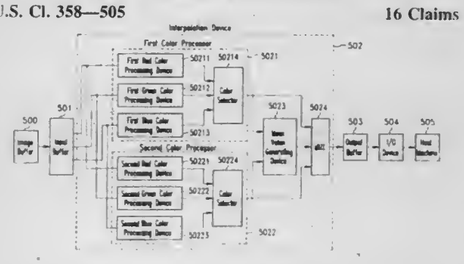
**APPARATUS FOR PIXEL INSERTION IN OPTICAL SCANNERS**

**Cha-Lin Tsai, and Aleck Hong, both of Hsinchu, Taiwan, assignors to Umax Data System Inc., Hsinchu, Taiwan**

**Filed Oct. 18, 1995, Ser. No. 544,483**

**Int. Cl.[6] H04N** *1/41;1/40;1/46;7/01*

**U.S. Cl. 358—505** **16 Claims**




**16**. An apparatus for pixel insertion which is applied in an optical scanner so as to increase the efficiency of a video buffer in said optical scanner and improve the speed of an I/O device, said apparatus comprising:

a video buffer for temporarily storing scanned image data;

an input buffer for receiving said scanned image data and outputting said scanned image data;

interpolation means for inserting pixels into said scanned image data, wherein said interpolation means comprises:

(a) first pixel processing means for generating odd numbered pixels each having a plurality of colors, said first pixel processing means comprising:

(i) first red color processing means for processing red color data for said odd numbered pixels;

(ii) first green color processing means for processing green color data for said odd numbered pixels;

(iii) first blue color processing means for processing blue color data for said odd numbered pixels; and

(iv) first color multiplexer for selecting an output of said first red color processing means, said first green color processing means, and said first blue color processing means;

(b) second pixel processing means for generating even numbered pixels each having a plurality of colors, said second pixel processing means comprises:

(i) second red color processing means for processing red color data for said even numbered pixels;

(ii) second green color processing means for processing green color data for said even numbered pixels;

(iii) second blue color processing means for processing blue color data for said even numbered pixels; and

(iv) second color multiplexer for selecting an output of said second red color processing means, said second green color processing means, and said second blue color processing means; and

(c) mean value generating means for generating the mean value of the outputs of said first pixel processing means and said second pixel processing means; and

an I/O device for transmitting the output of said interpolation means to displaying means.

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**5,742,410**

**COLOR IMAGE PROCESSING APPARATUS CAPABLE OF CORRECTING A COLOR DEVIATION BY CONVERTING ONLY CHROMA SIGNALS**

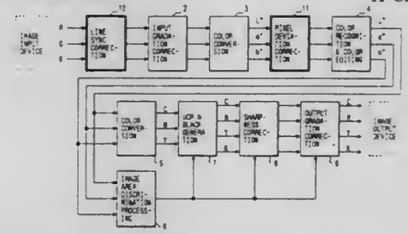
**Yuzuru Suzuki, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Filed Jun. 28, 1994, Ser. No. 266,544**

**Claims priority, application Japan, Jun. 20, 1993, 5-160924; Sep. 29, 1993, 5-242465; Jun. 15, 1994, 6-132986**

**Int. Cl.[6] G03F** *3/08;* **H04N** *1/40*

**U.S. Cl. 358—518** **11 Claims**




**1**. A color image processing apparatus comprising:

first color conversion means for reading an original image by a color sensor while separating it into primary colors and converting resulting first image signals to second image signals on a uniform perception color space or a luminance/color difference separation space;

image correcting means comprising:

means for determining an edge quantity from a lightness or luminance signal of the second image signals;

means for determining a first conversion coefficient from the edge quantity;

means for determining a chroma quantity from color difference or chroma signals of the second image signals;

means for determining a second conversion coefficient from the chroma quantity; and

means for calculating corrected color difference or chroma signals using the first and second conversion coefficients to produce third image signals; and

second color conversion means for converting the third image signals to fourth image signals that conform to colorant characteristics of a color output device.

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**5,742,411**

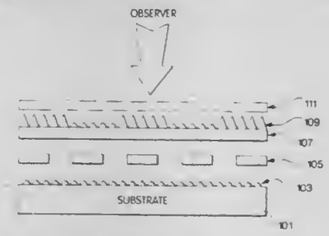
**SECURITY HOLOGRAM WITH COVERT MESSAGING**

**Glenn J. Walters, Duxbury, Mass., assignor to Advanced Deposition Technologies, Inc., Taunton, Mass.**

**Filed Apr. 23, 1996, Ser. No. 631,112**

**Int. Cl.[6] G03H** *1/00;* **B42D** *15/10*

**U.S. Cl. 359—2** **13 Claims**




**1**. A security hologram, comprising:

a first substrate;

a semi-transparent metal layer;

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a surface-relief hologram disposed on one surface of the substrate, and on which the semi-transparent metal layer is disposed;

a micro prism layer positioned for observation through the surface-relief hologram; and

an opaque patterned metal layer disposed on the micro prism layer;

whereby the surface-relief hologram is observable in ambient light and the patterned metal layer is observable in a focussed beam of bright light.

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**5,742,412**

**INK JET TYPE HEAD FOR PIGMENT TYPE INK WITH DIFFERENT PULSES APPLIED TO ELECTRODES**

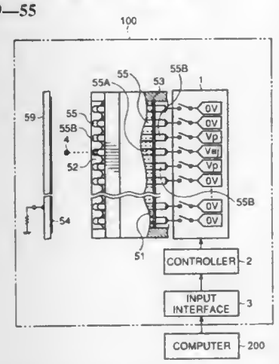
**Hitoshi Minemoto; Yoshihiro Hagiwara; Ryousuke Uematsu; Junichi Suetsugu, and Kazuo Shima, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Dec. 4, 1996, Ser. No. 760,224**

**Claims priority, application Japan, Dec. 5, 1995, 7-316665**

**Int. Cl.[6] G02F *1/1343***

**U.S. Cl. 359—55** **4 Claims**




1. An ink jet type head comprising:

a plurality of ink ejection electrodes in a form of parallel strips formed on a base;

an ink chamber for holding an ink of a pigment type on said base on which said ink ejection electrodes are provided;

an opposite electrode disposed on an imaginary extension of said ink ejection electrodes and facing said ink ejection electrodes with a sheet disposed between said opposite electrode and said ink ejection electrodes;

an ink ejection opening provided in said ink chamber and facing said opposite electrode;

an electrophoresis electrode disposed in said ink chamber and serving to cause electrophoresis of charged color particles contained in said ink towards said ink ejection opening;

a first ejection electrode included among said plurality of ink ejection electrodes;

second ejection electrodes included among said plurality of ink ejection electrodes and provided adjacent to two sides of said first ejection electrode; and

a voltage driving unit for applying an ejection voltage for ink ejection to said first ejection electrode, said voltage driving unit applying said ejection voltage effective to cause the ink to be ejected to said first ejection electrode and applying an auxiliary voltage ineffective to cause the ink to be ejected to said second ejection electrodes.

**5,742,413**

**CIRCUIT OF DUPLEXING SUPERVISORY CONTROL MODULES FOR USE IN A DATA TRANSMISSION SYSTEM**

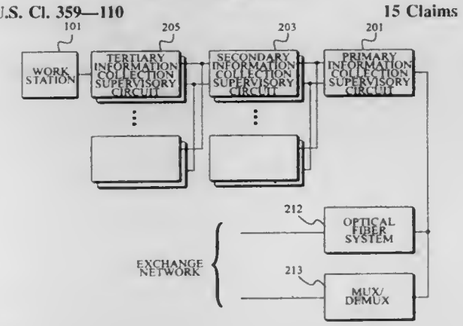
**Il-Hyunk Yun, and Jae-Joon Lee, both of Gumi, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed May 28, 1996, Ser. No. 655,194**

**Claims priority, application Rep. of Korea, May 27, 1995, 133559/1995**

**Int. Cl.[6] H04B *10/08***

**U.S. Cl. 359—110** **15 Claims**




1. A circuit for duplexing supervisory modules for use in a data transmission system, comprising:

a work station;

an optical fiber system and a multiplexer/demultiplexer system connected to an exchange network for enabling an operator to communicate from the work station with a remote data transmission system connected to the exchange network;

a primary information collection supervisory circuit connected to said optical fiber system and said multiplexer/demultiplexer system, for collecting primary information of a local site;

a secondary information collection supervisory circuit doubly connected to said primary information collection supervisory circuit, for collecting secondary information in dependence upon said first information; and

a tertiary information collection supervisory circuit connected to said work station and doubly connected to said secondary information collection supervisory circuit, for collecting tertiary information in dependence upon said secondary information and providing said tertiary information to said work station.

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**5,742,414**

**MULTIPLICITY OF SERVICES VIA A WAVELENGTH DIVISION ROUTER**

**Nicholas J. Frigo, Atlantic Highlands; Patrick P. Iannone, Edison, and Adel Abdel Moneim Saleh, Holmdel, all of N.J., assignors to AT&T Corp., Middletown, N.J.**

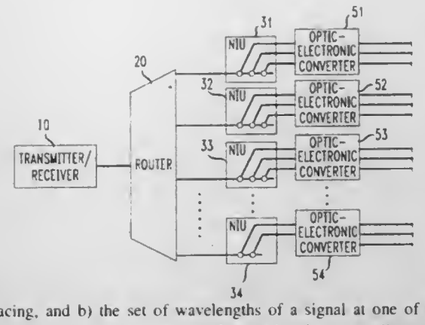
**Filed Sep. 24, 1996, Ser. No. 718,856**

**Int. Cl.[6] H04J *14/02; 14/08***

**U.S. Cl. 359—125** **40 Claims**

1. An arrangement comprising a head station and a router connected to the head station, where the router comprises an input port and a P plurality of output ports and is such that, for a broadband signal injected at the input port, a) output port j of the P output ports delivers a signal containing a set of wavelengths $f^j$, $f^{j+N}$, $f^{j+2N}$, $f^{j+3N}$, . . . , $f^{j+mN}$, the spectral interval between wavelength $f^{j+nN}$ and wavelength $f^{j+nN+N}$ being known as the free spectral range (FSR), the interval $\lambda^{j+1}-\lambda^{j}$ is the nominal channel






spacing, and b) the set of wavelengths of a signal at one of the output ports is, to a first degree of approximation, mutually exclusive from the sets of wavelengths of signals at all other output ports when only one input is illuminated, wherein the improvement comprises:

an information signal in said head station; and

a carrier signal source in said head station which develops a signal that is modulated hy the information signal and which spans not more than m FSR intervals, where m is a number, thereby forming a broadcast signal that is delivered to the router via an output port of the head station.

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**5,742,415**

**OPTICAL SWITCHING DEVICE**

**Robert J. Manning, Ipswich; David M. Spirit, Woodbridge; David M. Patrick, Colchester, and Andrew D. Ellis, Ipswich, all of Great Britain, assignors to British Telecommunications public limited company, London, England**

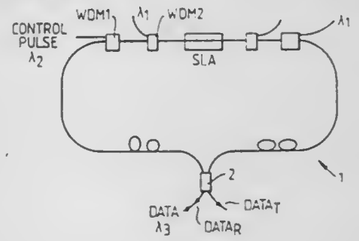
**PCT No. PCT/GB94/02240, § 371 Date May 28, 1996, § 102(e) Date May 28, 1996, PCT Pub. No. WO95/10795, PCT Pub. Date Apr. 20, 1995**

**PCT Filed Oct. 11, 1994, Ser. No. 624,523**

**Claims priority, application European Pat. Off., Oct. 11, 1993, 93308066; Oct. 11, 1993, 93308067; United Kingdom, Jan. 26, 1994, 9401463; Jan. 27, 1994, 9401558**

**Int. Cl.[6] H04J *14/02***

**U.S. Cl. 359—128** **15 Claims**




1. A non-linear optical phase switch comprising a semiconductor optical gain medium arranged to switch a signal at a first wavelength ($\lambda_3$) in response to a control signal ($\lambda_2$) at a second wavelength applied to the optical gain medium, where the gain medium has a refractive index modified in response to the control signal, and an optical holding signal at a third wavelength ($\lambda_1$) is applied to the gain medium to pump the semiconductor optical gain medium and control a Fermi level of the gain medium.

**5,742,416**

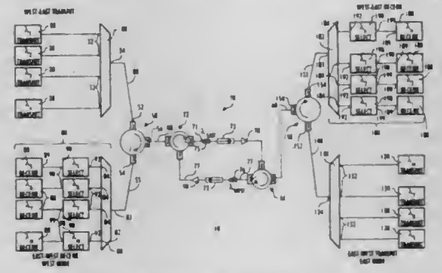
**BIDIRECTIONAL WDM OPTICAL COMMUNICATION SYSTEMS WITH BIDIRECTIONAL OPTICAL AMPLIFIERS**

**Victor Mizrahi, Columbia, Md., assignor to Ciena Corp., Linthicum, Md.**

**Filed Mar. 28, 1996, Ser. No. 623,356**

**Int. Cl.[6] H04J *14/02; H01S 3/00***

**U.S. Cl. 359—134** **13 Claims**



1. A bi-directional wavelength division multiplexed optical communication system, comprising:

a first plurality of optical transmitters for transmitting a plurality of optical communication signals in a first, nominally west-east, direction;

a first optical combiner having inputs for communicating with each of the west-east optical transmitters and an output for outputting a west-east wavelength division multiplexed optical communication signal comprised of the plurality of west-east optical communication signals;

an optical transmission path including nominally west and east access ports having a west access port optically communicating with the output port of the first optical combiner for receiving the west-east wavelength division multiplexed optical communication signal;

a second plurality of optical transmitters for transmitting a plurality of optical communication signals in a second, nominally east-west, direction;

a second optical combiner having inputs for communicating with each of the east-west optical transmitters and an output for outputting an east-west wavelength division multiplexed optical communication signal comprised of the plurality of east-west optical communication signals, the output of the second optical combiner optically communicating with the east access port of the optical transmission path;

a bi-directional optical amplifier optically communicating with the optical transmission path for optically amplifying the west-east wavelength division multiplexed optical communication signal and for optically amplifying the east-west wavelength division multiplexed optical communication signal, the bi-directional optical amplifier comprising:

a first circulator having first, second and third circulator ports, the second port of the first optical circulator optically communicating with the optical transmission path to receive the west-east wavelength division multiplexed optical communication signal;

a second circulator having first, second and third circulator ports, the second port of the second optical circulator optically communicating with the optical transmission path to receive the east-west wavelength division multiplexed optical communication signal;

a first optical path optically communicating with the third port of the first optical circulator and with the first port of the second optical circulator, the first optical path having positioned therein a first set of one or more Bragg gratings configured to reflect optical wavelengths within a first spectral region which includes the east-west wavelength division multiplexed optical communication signal and further having positioned therein a first gain block for optically amplifying the west-east wavelength division multiplexed optical signal; and

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a second optical path optically communicating with the third port of the second optical circulator and with the first port of the first optical circulator, the second optical path having positioned therein a second set of one or more Bragg gratings configured to reflect optical wavelengths within a second spectral region which includes the west-east wavelength division multiplexed optical communication signal and further having positioned therein a second gain block for optically amplifying the east-west wavelength division multiplexed optical signal; and

first and second receiving systems optically communicating with the optical transmission path for respectively receiving the west-east and east-west wavelength division multiplexed optical communication signals.

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**5,742,417**

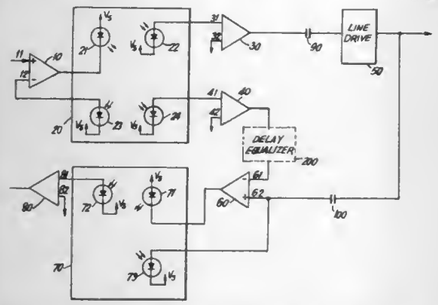
## DATA ACCESS ARRANGEMENT HAVING IMPROVED TRANSMIT-RECEIVE SEPARATION

**David Whitney, San Jose, Calif., assignor to Siemens Components, Inc., Cupertino, Calif.**

**Division of Ser. No. 497,580, Jun. 30, 1995, Pat. No. 5,579,144. This application Sep. 3, 1996, Ser. No. 706,858**

**Int. Cl.[6] H04B** *10/00*

**U.S. Cl. 359—153** **1 Claim**




1. An interface circuit having a first port and a second port, the first port having a transmit line and a separate receive line, the second port having a bidirectional line, the interface circuit electrically isolating the first port and the second port, the interface circuit comprising:

a first optical isolation circuit electrically coupled to the transmit line, the first optical isolation circuit comprising:

a first light source electrically coupled to the transmit line, the first light source generating a first illumination signal corresponding to a signal on the transmit line; and

a first light detector optically coupled to the first light source for receiving the first illumination signal and generating a corresponding electrical signal;

a line driver electrically coupled to the first light detector, the line driver driving the bidirectional line in response to the electrical signal generated by the first light detector;

a differentiator having a first input, a second input and an output, the first input of the differentiator being electrically coupled to the bidirectional line;

a second light detector optically coupled to the first light source for receiving the first illumination signal and generating a corresponding electrical signal, the second light detector being electrically coupled to the second input of the differentiator; and

a second optical isolation circuit electrically coupled to the differentiator output, the second optical isolation circuit comprising:

a second light source electrically coupled to the differentiator output, the second light source generating a second illumination signal corresponding to an electrical signal generated at the differentiator output; and

a third light detector optically coupled to the second light source for detecting the second illumination signal and generating a corresponding electrical signal, the third light detector being electrically coupled to the receive line.

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**5,742,418**

## OPTICAL COMMUNICATION SYSTEM AND METHOD USING TWO KINDS OF LIGHT DIFFERENT BOTH IN POLARIZATION DIRECTION AND WAVELENGTH

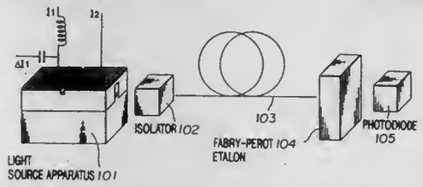
**Natsuhiko Mizutani, Yokohama, and Toshihiko Ouchi, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 404,331, Mar. 15, 1995, abandoned. This application May 19, 1997, Ser. No. 848,723**

**Claims priority, application Japan, Mar. 18, 1994, 6-074371**

**Int. Cl.[6] H04B** *10/00*

**U.S. Cl. 359—156** **36 Claims**




1. An optical communication system for communicating between a transmitter means and a receiver means, said system comprising:

transmitter means for transmitting a modulated light signal, said transmitter means comprising a polarization mode selective semiconductor laser having an oscillated state modulated between a first state having a first polarization direction and a first wavelength and a second state having a second polarization direction and a second wavelength, in accordance with a modulation signal applied to said laser; and

receiver means for demodulating said modulated light signal, said receiver means comprising filtering means including at least one optical filter which selects one of the first wavelength light and the second wavelength light.

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**5,742,419**

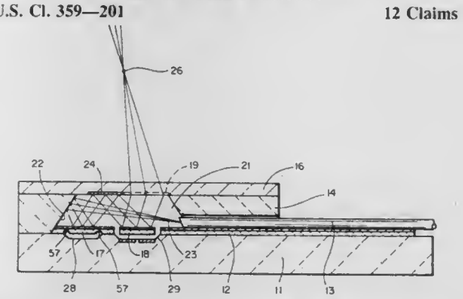
## MINIATURE SCANNING CONFOCAL MICROSCOPE

**David L. Dickensheets, and Gordon S. Kino, both of Stanford, Calif., assignors to The Board of Trustees of the Leland Stanford Junior Universtiy, Stanford, Calif.**

**Filed Dec. 19, 1995, Ser. No. 575,687**

**Int. Cl.[6] G02B** *26/08;21/00*

**U.S. Cl. 359—201** **12 Claims**



1. A scanning optical microscope of the type which includes a single mode optical fiber having one end which serves as a point source of light, and a lens for focusing the light from the end of the fiber onto a point on a focal plane, and for gathering light reflected from said point and focusing said light onto the end of the optical fiber, characterized in that it includes:

a first micro-machined scanning mirror to receive the light from the fiber and scans the light along a first direction, and



a second micro-machined scanning mirror coplanar with said first micro-machined scanning mirror to receive the light from the first mirror and scans said light in an orthogonal direction, whereby the point on the focal plane is scanned in said first and second directions.

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**5,742,420**

## OPTICAL SCANNER FOR GENERATING SCANNING LINES ON ALL SIDES OF AN OBJECT

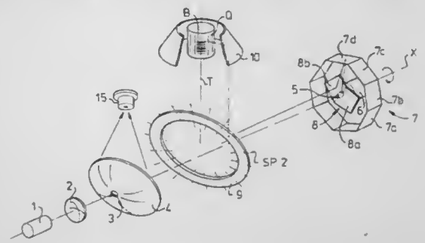
**Ke-Ou Peng, Delft, Netherlands, assignor to Opticon Sensors Europe B.V., Hoofddorp, Netherlands**

**Filed Jul. 5, 1996, Ser. No. 675,926**

**Claims priority, application European Pat. Off., Jul. 5, 1995, 95201841**

**Int. Cl.[6] G02B** *26/08*

**U.S. Cl. 359—201** **15 Claims**




1. Optical scanner comprising a light source (1) for producing a light beam (A), focusing optics (2), means for producing a predetermined first scanning pattern (SP1-SP5) of separate scanning lines, first reflecting means (9; 101-104, 201-204) arranged to receive said predetermined first scanning pattern and to reflect each of the scanning lines of said first scanning pattern in a predetermined direction, and second reflecting means (10; 20; 30; 106, 107, 206, 207) arranged about a scanning axis (T), to receive said scanning lines and reflect them towards said scanning axis from several different directions in order to produce a second scanning pattern of scanning lines on all sides of an object (Q), said scanning lines in said second scanning pattern being substantially parallel to said scanning axis (T).

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**5,742,421**

## SPLIT LENS VIDEO DISPLAY SYSTEM

**Benjamin A. Wells, Lincoln; Bruce Johnson, N. Andover, both of Mass., and Donald Dilworth, East Boothbay, Me., assignors to Reflection Technology, Inc., Waltham, Mass.**

**Filed Mar. 1, 1996, Ser. No. 609,729**

**Int. Cl.[6] G02B** *26/08*

**U.S. Cl. 359—214** **15 Claims**



1. An optical system for a display apparatus which has a size suitable for hand-held and headgear-mounted use and generates a raster image by reflecting light produced by an array of light emitting elements from an oscillating mirror to a user's eye and selectively illuminating the light-emitting elements as the mirror moves to create a substantially planar, two-dimensional enlarged virtual image, the system comprising:

a first positive power lens located between the light emitting element array and the mirror for creating a first intermediate virtual image of the light-emitting elements; the first lens having a first optical axis;

a second positive power lens located between the mirror and the user's eye for magnifying the reflection of the first intermediate virtual image; the second lens having a second optical axis; and

the light-emitting element array, the first lens, the mirror, and second lens each being positioned relative to one another and relative to the viewer's eye so that the first lens and the second lens together generate a distant, magnified, virtual image at a comfortable viewing distance.

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**5,742,422**

## ADJUSTABLE FOURIER MASK

**Steven R. Drake, Concord, Mass., assignor to Inspex, Inc., Billerica, Mass.**

**Filed Sep. 19, 1995, Ser. No. 530,051**

**Int. Cl.[6] G01N** *21/00;* **G02B** *27/46*

**U.S. Cl. 359—227** **12 Claims**



7. A Fourier mask comprising:

a. an aperture plate, said aperture plate being provided with an aperture;

b. a first pair of parallel mask bars, said first pair of parallel mask bars having a combined width substantially less than the diameter of said aperture, and

c. means for positioning said first pair of parallel mask bars over said aperture wherein the spacing between said first pair of parallel mask bars is adjustable.

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**5,742,423**

## SEMICONDUCTOR OPTICAL MODULATOR

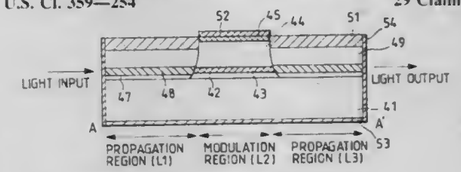
**Tatemi Ido, Hachioji, and Hirohisa Sano, Niiza, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 17, 1995, Ser. No. 390,794**

**Claims priority, application Japan, Feb. 18, 1994, 6-020876**

**Int. Cl.[6] G02F** *1/025;* **G02B** *6/13*

**U.S. Cl. 359—254** **29 Claims**




1. A semiconductor optical modulator comprising:

a semiconductor wafer; and

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an optical waveguide formed on the semiconductor wafer, said optical waveguide including a modulation region for modulating light and a passive region for propagating light on at least one side of the modulation region, said passive region containing a core layer which is discontinuous with a core layer in said modulation region,

wherein the core layer of said passive region is non-absorbent to incident light propagating through said waveguide and the core layer of said modulation region is absorbent to incident light propagating through said waveguide, with the core layers of said passive and modulation regions being made of materials selected to ensure that a low loss of light occurs in the core layer of the passive region.

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**5,742,424**

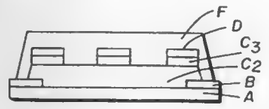
**ELECTROCHROMIC MATERIALS AND DISPLAYS**

**James P. Coleman, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Continuation of Ser. No. 435,595, May 5, 1995, abandoned, which is a division of Ser. No. 994,813, Dec. 22, 1992, Pat. No. 5,413,739. This application Jan. 3, 1997, Ser. No. 778,703**

**Int. Cl.[6] G02F *1/15*; B05D *5/12***

**U.S. Cl. 359—273** **2 Claims**




1. A method for fabricating flexible electrochromic displays comprising:

(a) forming electrodes in a pattern on a flexible substrate,

(b) coating said electrodes with electrically conductive, essentially ionically isolative material in a layer comprising one or more areas wherein said ionically isolative layer comprises a transparent or translucent matrix having dispersed electroconductive particles comprising mineral particles coated with electrically conductive metal oxide and an electrochromic material, and

(c) providing an interface by applying a layer of ionically conductive material, whereby when an electrical potential is applied across the interface, an electrochromic effect is generated.

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**5,742,425**

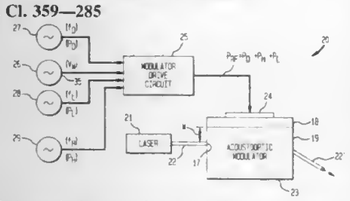
**TECHNIQUE FOR ELECTRONICALLY STABILIZING THE OUPUTS OF ACOUSTOOPTIC DEVICES**

**John Kump, Hillsborough, and Arron Campi, San Jose, both of Calif., assignors to Crystal Technology, Inc., Palo Alto, Calif.**

**Continuation of Ser. No. 709,999, Sep. 9, 1996. This application Jan. 23, 1997, Ser. No. 789,316**

**Int. Cl.[6] G02F *1/11***

**U.S. Cl. 359—285** **17 Claims**




15. An optical system for modulating a laser beam with acoustic energy comprising:

an acoustooptic modulator having an input face, an output face and a drive electrode;

a laser having an output directed at said input face;

a radio-frequency (RF) drive means for generating RF drive power at a first carrier frequency;

a modulating means for generating a modulation signal;

an RF compensation means for generating RF compensating power at a carrier frequency different from said first carrier frequency; and

an electronic driver means connected to said modulating means, said RF drive means, said RF compensation means and said drive electrode, for modulating said RF drive power with said modulation signal to form modulated RF drive power, for modulating said RF compensating power to form modulated RF compensating power such that it is the complement of said modulated RF drive power, and for driving said acoustooptic modulator with said modulated RF drive power and said modulated RF compensating power.

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**5,742,426**

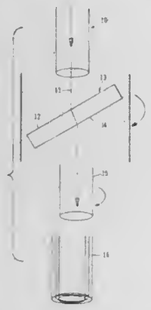
**LASER BEAM TREATMENT PATTERN SMOOTHING DEVICE AND LASER BEAM TREATMENT PATTERN MODULATOR**

**Kenneth K. York, 721 Dolo Way, Los Angeles, Calif. 90077**

**Filed May 25, 1995, Ser. No. 451,016**

**Int. Cl.[6] G02B *26/08***

**U.S. Cl. 359—298** **6 Claims**



1. A light beam modulator for use with a broad-beam excimer laser or with a varying-spot size excimer laser comprising a light-transmissive, light-refractive optical flat having a thickness of at least about 1 millimeter, said optical flat being disposed for rotation in the beam from said broad-beam excimer laser or said varying-spot size excimer laser, or disposed for angular positioning and movement of said flat in the path of said beam, said flat having the capacity to modulate the pattern of light formed after said beam passes through said modulator, and to displace the path of said beam in a desired amount for a desired period of time.

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**5,742,427**

**OPTICAL FIBER AMPLIFIER**

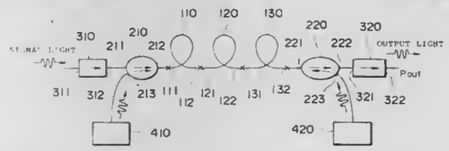
**Motoki Kakui, and Masayuki Shigematsu, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Nov. 20, 1996, Ser. No. 752,958**

**Claims priority, application Japan, Nov. 20, 1995, 7-301469**

**Int. Cl.[6] G02B *6/28***

**U.S. Cl. 359—341** **22 Claims**




1. An optical fiber amplifier comprising:

a first amplification section for amplifying signal light having a wavelength within a predetermined wavelength range and outputting the amplified signal light, said first amplification section including a first optical fiber which has a first gain in the predetermined wavelength range and is pumped by first pumping light having a first wavelength to amplify the input signal light, and said first optical fiber having a first value as a ratio of its emission cross-section to its absorption cross-section;

a second amplification section for amplifying the signal light output from said first amplification section and outputting the amplified signal light, said second amplification section including a second optical fiber which has a second gain in the predetermined wavelength range and is pumped by second pumping light having a second wavelength to amplify the signal light from said first amplification section, and said second optical fiber having a second value as a ratio of its emission cross-section to its absorption cross-section which is smaller than the first value; and

a third amplification section for amplifying the signal light output from said second amplification section and outputting the amplified signal light, said third amplification section including a third optical fiber which has a third gain in the predetermined wavelength range and is pumped by third pumping light having a third wavelength to amplify the input signal light from said second amplification section, and said third optical fiber having a third value as a ratio of its emission cross-section to its absorption cross-section which is larger than the second value,

wherein, with respect to changes in wavelength in the predetermined wavelength range, an overall gain spectrum of said optical fiber amplifier is flatter than each of the first gain spectrum, the second gain spectrum, and the third gain spectrum.



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**5,742,428**

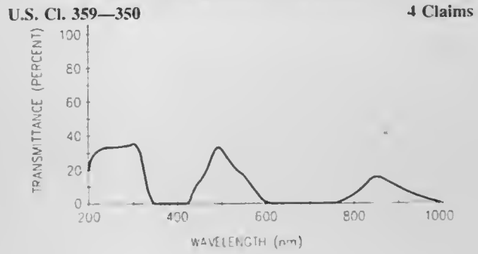
**CRYSTALS FOR ULTRAVIOLET LIGHT FILTERS**

**Narsingh B. Singh; William D. Partlow, both of Export, Pa.; Steven Strauch, Ellicott City, Md.; Albert M. Stewart, Pittsburgh; John F. Jackovitz, Monroeville, both of Pa.; David W. Coffey, Columbia, Md.; Robert Mazelsky, and James D.B. Smith, both of Monroeville, Pa., assignors to Northrop Grumman Corporation, Los Angeles, Calif.**

**Filed Sep. 30, 1996, Ser. No. 724,605**

**Int. Cl.[6] G02B *1/02;5/22*; F21V *9/06***

**U.S. Cl. 359—350** **4 Claims**




1. An ultraviolet light filter comprising a single crystal of the formula $Ni(BF_4)_26H_2O$ which is stable above 85° C. and transmits ultraviolet light in a missile warning band and blocks light at longer wavelengths.

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**5,742,429**

**DEVICE FOR STEREOSCOPIC VISUALIZATION INCLUDING A STEREOMICROSCOPE AND FIBERSCOPE**

**Takashi Tsumanuma, Sakura; Kennichi Nakatate, Yachimata, and Hiroyoshi Koyama, Tokyo, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan**

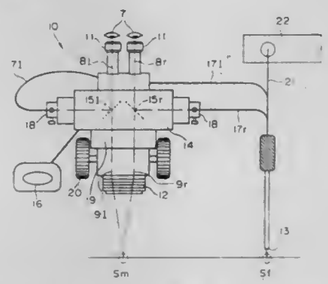
**PCT No. PCT/JP95/01389, § 371 Date Mar. 7, 1996, § 102(e) Date Mar. 7, 1996, PCT Pub. No. WO96/02863, PCT Pub. Date Mar. 1, 1996**

**PCT Filed Jul. 12, 1995, Ser. No. 596,239**

**Claims priority, application Japan, Jul. 13, 1994, 6-161580**

**Int. Cl.[6] G02B *21/22***

**U.S. Cl. 359—377** **3 Claims**



1. A device for stereoscopic visualization comprising:

an eyepiece having optical paths respectively corresponding to a left eye and a right eye of an observer;

a stereomicroscope including a stereomicroscope objective along the optical paths of the eyepiece;

a stereoscopic fiberscope including a stereoscopic fiberscope objective; and

reflecting mirrors disposed on the optical paths of the eyepiece and connecting the eyepiece to the stereoscopic fiberscope objective and

wherein the reflecting mirrors are disposed in a portion of the optical paths connecting the eyepiece to the stereomicroscope objective to reflect image beams from the stereoscopic fiberscope parallel to and inside image beams from the stereomicroscope objective to thereby form an image from the stereoscopic fiberscope in a portion of an image from the stereomicroscope.

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**5,742,430**

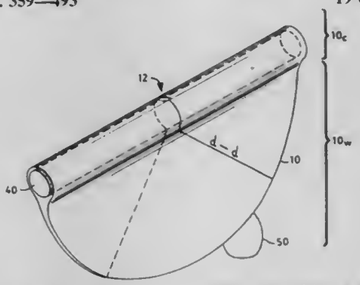
**DISPLACEABLE DOUBLED-OVER SHEET CONFIGURATION, USEFUL PARTICULARLY FOR A VARIABLE LIGHT TRANSMISSION DEVICE**

**David V. Cronin, Peabody, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Jul. 29, 1996, Ser. No. 681,900**

**Int. Cl.[6] G02B *5/30;27/28*; B60J *3/00***

**U.S. Cl. 359—493** **19 Claims**



1. A variable light transmission device comprising a flexible sheet having extents encompassing a circular area and at least one

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light-transmissive region within said circular area, said flexible sheet doubled-over upon itself along the center of said circular area such that the respective resultant halves of said circular area overlap to form a first and a second semicircular region, thereby producing a field of view; and fold-forming means for maintaining the overlapping configuration of said doubled-over flexible sheet, yet allowing said flexible sheet to be displaced arcuately about the center of said circular area within the doubled-over configuration, whereby the transmission of light through said field of view can be varied by said displacement of said doubled-over flexible sheet.

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**5,742,431**

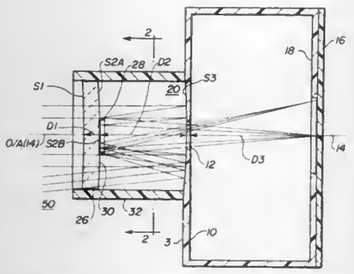
**CATADIOPTRIC LENS SYSTEM INCORPORATING DIFFRACTIVE ACHROMATIZATION**

**Mark M. Meyers, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 30, 1995, Ser. No. 414,075**

**Int. Cl.[6] G02B** *27/44;5/18;17/00;* **G03B** *17/02*

**U.S. Cl. 359—565** **13 Claims**




1. A combination of a camera body and a catadioptric lens system having an optical axis, which combination comprises from an object side: a frontmost refractive/diffractive achromat disposed along said axis and having first and second surfaces facing in first and second directions which are opposite to each other along said axis, a a reflective third surface formed on said camera body, said reflective third surface being defined by a curved section in a wall of said camera body, said curved section having a reflective coating, said reflective third surface also having a clear aperture centered on said axis, said reflective third surface facing and being spaced from said second surface, said second surface having inner and outer portions which are a light reflective and transmissive respectfully, the curvatures of (i) said reflective third surface, (ii) said inner portion, (iii) said first surface, (iv) said outer portion of said second surface, and diffraction in said achromat defining a focus of said lens system along said optical axis spaced in said second direction from said body.

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**5,742,432**

**APPARATUS FOR MANUFACTURE OF DIFFRACTION GRATINGS FOR IDENTIFICATION MEANS**

**James S. Bianco, 217 Brainard Rd., Enfield, Conn. 06082**

**Continuation-in-part of Ser. No. 957,882, Oct. 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 921,460, Jul. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 857,729, Mar. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 810,483, Dec. 19, 1991, abandoned. This application Oct. 19, 1992, Ser. No. 962,931**

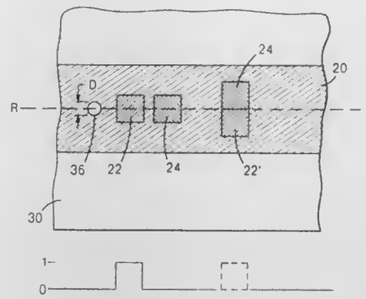
**Int. Cl.[6] G02B** *5/18;* **B29C** *43/46;* **B29D** *17/00*

**U.S. Cl. 359—566** **1 Claim**

1. An apparatus for embossing diffraction patterns on a sheet, said apparatus comprising:

(a) an elongate, rotatable, cylindrical roll;

(b) a plurality of arcuate embossing shim segments disposed on the surface of said roll to embossingly contact said sheet as said roll rotates; and




(c) in a first configuration, said embossing shim segments having corresponding ends terminating in a common plane and, in a second configuration, one of said embossing shim segments being axially displaced from the other of said embossing shim segments so as to vary the pattern embossed on said sheet.

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**5,742,433**

**DIFFRACTIVE OPTICAL DEVICE INCLUDING GRATING ELEMENTS WITH DIFFERENT GRATING PERIODS AND DUTY RATIOS**

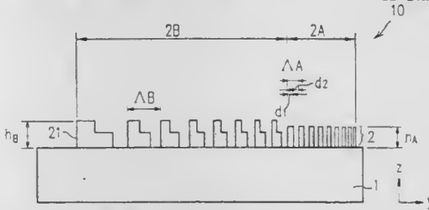
**Teruhiro Shiono, Osaka, and Hisahito Ogawa, Nara-ken, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 323,927, Oct. 17, 1994, Pat. No. 5,561,558. This application Apr. 4, 1996, Ser. No. 627,442**

**Claims priority, application Japan, Oct. 18, 1993, 5-259639; Oct. 18, 1993, 5-259640**

**Int. Cl.[6] G02B** *5/18;27/44*

**U.S. Cl. 359—575** **12 Claims**




1. A diffractive optical device, comprising:

a substrate for allowing transmission therethrough of light to be diffracted; and

a grating section located on the substrate and including a plurality of grating elements arranged in a disposition plane in a continuous grating pattern which collects light incident at an offset angle with respect to a direction normal to the disposition plane, said continous grating pattern having a plurality of grating periods within the continuous grating pattern, wherein the smallest grating period is greater than ½ n of the wavelength of said light where n is the refractive index of the substrate, said plurality of grating elements including:

a first plurality of grating elements having a first duty ratio, the first plurality of grating elements having a first grating period which results in a first diffraction efficiency with said light being incident at said offset angle, and

a second plurality of grating elements having a second duty ratio different from the first duty ratio, said second plurality of grating elements having a second grating period which results in a second diffraction efficiency with said light being incident at said offset angle,

said first plurality of grating elements arranged such that said first grating period is smaller than said second grating period.



**5,742,434**

**ADAPTER FOR EXTRACTING A PORTION OF AN IMAGE FROM AN OPTICAL SYSTEM OR DEVICE**

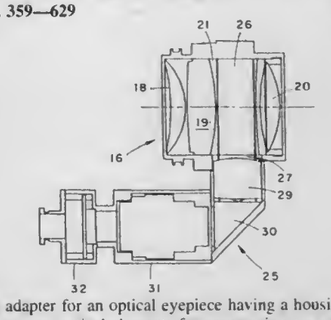
**Ran Carmeli, Petach Tiqva, Israel, assignor to Vectop Ltd., Rosh Ha'ayin, Israel**

**Filed Nov. 21, 1996, Ser. No. 754,812**

**Claims priority, application Israel, Nov. 24, 1995, 116131**

**Int. Cl.[6] G02B** *27/14*

**U.S. Cl. 359—629** **19 Claims**




1. An adapter for an optical eyepiece having a housing containing at least two optical elements for propagating a non-collimated light beam from an object along an optical axis of the eyepiece so as to present an image to an observer, said adapter comprising a beam splitter for inserting into the eyepiece between said at least two optical elements so as to intercept the light beam and direct a portion thereof outside the eyepiece through an exit aperture of the beam splitter without substantially changing said image to said observer.

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**5,742,435**

**VIDEO-CAMERA IMAGING-SYSTEM ZOOM LENS BARREL**

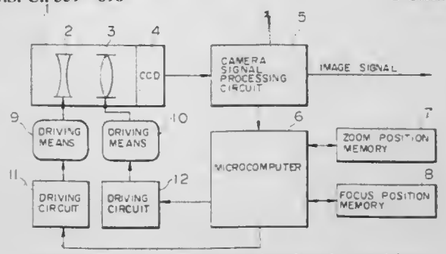
**Toshiro Nagashima, Tokyo; Kenichi Hamada; Koji Okajima, both of Kanagawa, and Kenji Hirano, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Nov. 6, 1996, Ser. No. 744,641**

**Claims priority, application Japan, Nov. 13, 1995, 7-318572**

**Int. Cl.[6] G02B** *15/14*

**U.S. Cl. 359—696** **2 Claims**




1. A video-camera imaging-system lens barrel comprising:

a first lens group supported so as to be movable along the dimension of its optical axis;

a second lens group whose optical axis coincides with that of the first lens group and which is supported so as to be movable along the dimension of the optical axis;

driving means for individually moving the first lens group and the second lens group; and

a microcomputer for outputting a control signal to said driving means,

wherein said microcomputer includes a memory which stores beforehand zoom tracking curves respectively representing the paths of movement of the respective positions of the first lens group and the second lens group, which are in focus in an imaging plane with respect to each zoom magnification at fixed subject distances, with respect to at least two different subject distances, said driving means being controlled such that the first lens group and the second lens group are respectively moved along the corresponding zoom tracking curves.

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**5,742,436**

**MAXIMUM APERTURE CATADIOPTRIC REDUCTION OBJECTIVE FOR MICROLITHOGRAPHY**

**Gerd Fürter, Ellwangen, Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Germany**

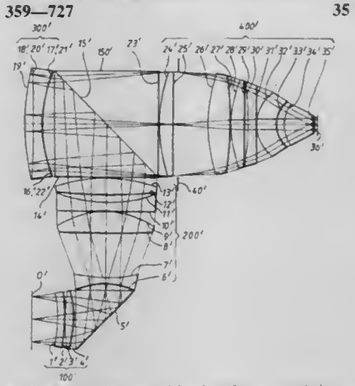
**PCT No. PCT/EP95/01719, § 371 Date Jan. 19, 1996, § 102(e) Date Jan. 19, 1996, PCT Pub. No. WO95/32446, PCT Pub. Date Nov. 30, 1995**

**PCT Filed May 5, 1995, Ser. No. 583,025**

**Claims priority, application Germany, May 19, 1994, 44 17 489.6**

**Int. Cl.[6] G02B** *17/00;27/14;13/22;9/00*

**U.S. Cl. 359—727** **35 Claims**



1. A catadioptric reduction objective for transmitting radiation from an object plane to an image plane defined by the objective, the catadioptric reduction objective defining an optical axis and comprising:

a first lens group for receiving the radiation from said object plane and transmitting the radiation along said optical axis toward said image plane;

a concave mirror;

a beam-splitter device mounted on said axis for deflecting said radiation toward said concave mirror;

a second lens group mounted between said concave mirror and said beam-splitter device for transmitting said radiation to said concave mirror and for transmitting the reflected radiation back toward said beam-splitter device and said image plane;

a third lens group having a plurality of lenses and being interposed between said image plane and said beam-splitter device for focussing said reflected radiation into said image plane; and,

a system diaphragm mounted within said third lens group so as to be disposed between two lenses of said plurality of lenses.

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**5,742,437**

**OPTICAL PICKUP DEVICE**

**Naoya Eguchi, Tokyo, and Shigeo Kubota, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Nov. 8, 1995, Ser. No. 555,339**

**Claims priority, application Japan, Nov. 11, 1994, 6-277400**

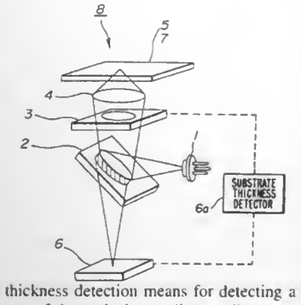
**Int. Cl.[6] G02B** *9/00*

**U.S. Cl. 359—739** **9 Claims**

1. An optical pickup device capable of recording and/or reproducing at least two different sorts of optical recording media, comprising:

a light source radiating a light beam;

an objective lens for condensing the light from said light source;




substrate thickness detection means for detecting a thickness of a substrate of the optical recording medium;

aperture varying means for varying the size of an aperture of said objective lens depending upon an output signal from said substrate thickness detection means; and

light detection means for detecting the return light from said optical recording medium.

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**5,742,438**

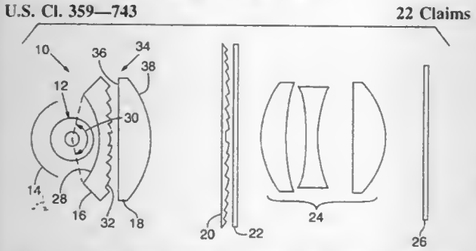
**PROJECTION ILLUMINATION SYSTEM**

**Arlie R. Conner, Tualatin; Jonathan R. Biles, Portland, and David K. Booth, Tigard, all of Oreg., assignors to In Focus Systems, Inc., Wilsonville, Oreg.**

**Filed Sep. 16, 1994, Ser. No. 307,223**

**Int. Cl.[6] G02B** *3/08*

**U.S. Cl. 359—743** **22 Claims**




1. A collection lens adapted to project light from a light source placed to the rear of the collection lens onto a projection surface placed in front of the collection lens and comprising:

a front surface, having a plurality of rotationally asymmetric substantially concentric facets and risers therein defining a Fresnel convex lens having refractive power that is rotationally asymmetric about the lens for introducing a rotational asymmetry into the projected light to effect the substantially even illumination of a predetermined rectangular area on the projection surface; and

a rear surface having a concave shape.

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**5,742,439**

**APOCHROMATIC WIDE-ANGLE OBJECTIVE**

**Karl-Heinz Schuster, Bad Wurzach, Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Germany**

**Filed Sep. 15, 1995, Ser. No. 529,069**

**Claims priority, application Germany, Sep. 15, 1994, 44 32 872.9**

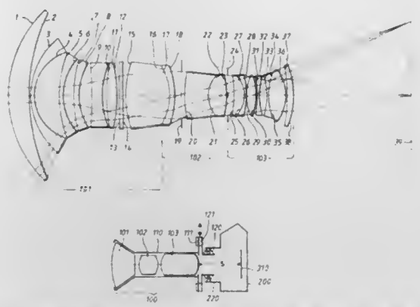
**Int. Cl.[6] G02B** *13/04*

**U.S. Cl. 359—749** **19 Claims**

19. An apochromatic wide-angle objective for viewing an object, the objective comprising:

a plurality of lenses defining an optical axis and more than half of said lenses having anomalous partial dispersion;

said plurality of lenses being subdivided into first and second groups of lenses;



a system diaphragm mounted on said axis between said first and second groups;

said first group of lenses having a front lens facing toward the object;

said front lens being a converging lens made of a long-crown type of glass;

said second group of lenses including a plurality of converging lenses and a plurality of diverging lenses; and,

more than half of said converging lenses of said second group being made of a long-crown type of glass and more than half of said diverging lenses of said second group being made of a short-flint type of glass.

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**5,742,440**

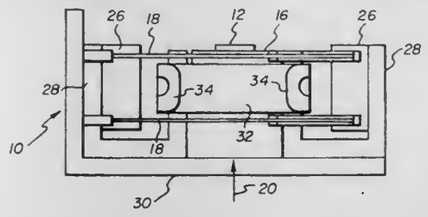
**ACTUATOR WITH REDUCED LENS TILT ERROR**

**Philip Frank Marino, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jul. 24, 1996, Ser. No. 686,161**

**Int. Cl.[6] G02B** *7/02*

**U.S. Cl. 359—814** **6 Claims**




1. An optical actuator for positioning a lens to focus a laser light beam on a surface of a member, such as an optical disk, with minimum lens tilt error, comprising:

a) a base;

b) a lens mount for supporting the lens;

c) at least two spaced-apart flexures, each fixed at one end to the lens mount and at the other end to the base, the flexures being arranged so that they are parallel when viewed from one side; and

d) means for applying a force to the lens mount along a line and between the flexures so that when viewed from the parallel flexure side the line bisects each flexure to cause the flexures to deflect such that as the lens moves to focus the light beam, lens tilt error is minimized.



**5,742,441**

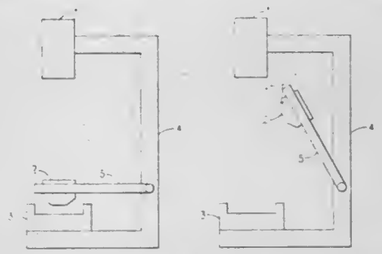
**METHOD AND APPARATUS FOR ALIGNING AN OBJECTIVE LENS**

**Leonardus I. Grassens, Monument, and Hollis O'Neal Hall, II, Colorado Springs, both of Colo., assignors to Discovision Associates, Irvine, Calif.**

**Filed Apr. 7, 1995, Ser. No. 418,698**

**Int. Cl.[6] G02B** *7/02*

**U.S. Cl. 359—822** **31 Claims**



1. An apparatus for aligning an actuator lens defining an actuator optical axis and an actuator optical center within a baseplate using a beam of radiant energy, comprising:

a frame;

a cradle assembly for holding the baseplate, said cradle assembly mounted to said frame with at least one degree of freedom of motion;

a tower assembly defining a tower axis and mounted to said frame, said cradle assembly and said tower assembly defining an assembly axis, for receiving the beam of radiant energy along said tower axis;

a lever assembly positioned in a closed position, rotatably mounted to said frame; and

a gripper assembly mounted to said lever assembly, comprising:

an objective lens defining an objective optical axis;

an objective lens assembly mounted to said objective lens, for selectively holding the actuator lens stationary relative to said objective lens;

an objective lens alignment assembly for aligning said objective lens with said tower assembly and said cradle assembly by aligning said objective optical axis laterally with respect to said assembly axis when said lever assembly is in the closed position; and

an actuator lens tilt assembly for aligning the actuator lens with said tower assembly and said cradle assembly by rotating said actuator optical axis about an axis orthogonal to said assembly axis when said lever assembly is in the closed position;

whereby when said lever assembly is in said closed position said gripper assembly, said tower assembly, said cradle assembly, said baseplate, and said actuator lens tilt assembly are positioned with respect to each other such that the beam of radiant energy can be used to align the actuator lens with said baseplate by adjusting the relative position or alignment of one or more of said objective lens assembly, said cradle assembly, and said actuator lens with respect to said tower assembly.

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**5,742,442**

**SAFETY VEHICLE MIRROR VIEWING SYSTEM**

**William Allsup, c/o Tim O'Leary, 17271 McFadden St. #C, and Joe Campbell, 14671 Raintree La., both of Tustin, Calif. 92680**

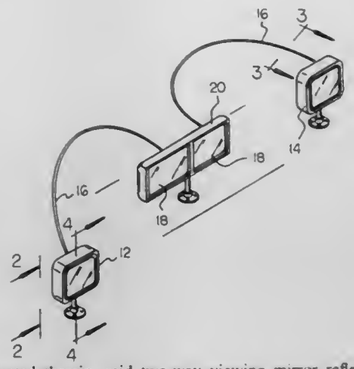
**Filed Jan. 16, 1996, Ser. No. 586,106**

**Int. Cl.[6] G02B** *5/08;7/182;6/06*

**U.S. Cl. 359—839** **1 Claim**

1. A new vehicle safety mirror system comprising:

at least one mirror support housing mounted on said vehicle, said mirror support housing having a two-way viewing mirror




mounted therein, said two-way viewing mirror reflecting a viewable image from a front surface thereof and also permitting said viewable image to pass through said mirror whereby said viewable image is visible from a rear surface thereof;

a fiber optic cable assembly for transmitting said viewable image from said rear surface of said two-way mirror to a remote location;

a remotely positioned viewing screen for receiving said viewable image which is transmitted from said two-way mirror by said fiber optic cable assembly, the viewing screen being recessed into an associated housing to reduce the amount of ambient light that enters the housing;

wherein said mirror support housing includes a first fiber optic connection transducer mounted therein, said first fiber optic connection transducer serving to support an end of said fiber optic cable assembly in an aligned and pre-designed light receiving array, thereby to facilitate a transmission of said viewable image from said rear surface of said two-way viewing mirror to said fiber optic cable assembly, the first fiber optic connection transducer having a circular configuration and a large rectangular member conformingly mounted flush with a flat surface defined hy the end of the fiber optic cable assembly;

wherein said fiber optic cable assembly includes a plurality of juxtaposed independent fiber optic cables, each of which can transmit a section of said viewable image to said viewing screen;

wherein a first convex lens is positioned interiorly of said mirror support housing between said rear surface of said two-way viewing mirror and said first fiber optic connection transducer, said convex lens serving to reduce and focus said viewable image over a flat light receiving surface of said first fiber optic connection transducer, thereby to provide each of said fiber optic cables with a section of said viewable image for transmission to said viewing screen;

a second fiber optic connection transducer mounted proximate said viewing screen, said second fiber optic connection transducer delivering said viewable image to a second convex lens mounted within a second housing containing said viewing screen, said second convex lens being positioned between said second fiber optic connection transducer and said viewing screen, said second convex lens serving to enlarge and focus said viewable image on said viewing screen; and

illumination means mounted in said mirror support housing, said illumination means providing an enhanced lighting effect to improve said transmission of said viewable image through said fiber optic cable assembly, the illumination means including an electrical supply lead extending upwardly into an interior chamber of the mirror support housing and connected to a light bulb;

wherein ends of each fiber optic cable contained in said first fiber optic connection transducer are each mounted in a small rectangularly-shaped block of opaque material, said ends being recessed in each such block so that only a pixel of said viewable image is transmitted to each fiber optic end, an end of each fiber optic cable being received within an aperture of

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the associated block and the blocks being arrayed and stacked together to form the large rectangular member;

wherein opposed ends of each fiber optic cable contained in said second fiber optic connection transducer are each mounted in a small rectangularly-shaped block of opaque material, said opposed ends being recessed in each such block so that only a pixel of said viewable image is transmitted from each fiber optic end to said second convex lens;

wherein said mirror support housing comprises a rear view mirror mounted exteriorly of said vehicle;

wherein a second housing contains at least a second viewing screen, said second viewing screen being connectible to a second two-way mirror by means of a second fiber optic cable assembly, said second two-way mirror being mounted at a different location on said vehicle.

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**5,742,443**

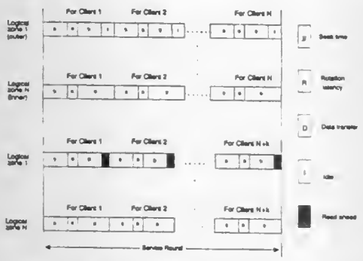
## METHOD AND APPARATUS FOR DATA PLACEMENT OF CONTINUOUS MEDIA TO UTILIZE BANDWIDTH EFFICIENCY

**Shiao-Li Tsao, Taipei; Yueh-Min Huang, Nan-Tou Hsien; Eric Lee, Pan-Ch'iao, and Yih-Woei Liang, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan**

**Filed May 31, 1996, Ser. No. 657,739**

**Int. Cl.[6] G11B *5/09***

**U.S. Cl. 360—50** **16 Claims**




1. A method for placing continuous media data in a memory storage disk, wherein said memory storage disk contains a plurality of tracks each track having at least one sector and said disk is divided into a plurality of physical zones of different sector/track density, said method comprising the steps of:

(a) dividing said disk into a plurality of logical zones of equal number of tracks, each logical zone being allowed to include tracks of different sector/track density;

(b) for each logical zone, setting the tracks contained therein to have the same number of sector/density as the track with the smallest sector/track density;

(c) assigning a constant disk access time for each logical zone; and

(d) determining a read block size for each logical zone in such a manner that:

(i) the read block size decreases from outer logical zones to inner logical zones;

(ii) assigning a first portion of said logical zones with read block sizes that are greater than a minimum read block size required for continuous media playing so as to read extra data, which will be stored in a buffer;

(iii) assigning a second portion of said logical zones with read block sizes that are smaller than said minimum read block size to thereby cause an inadequacy; and

(iv) said block sizes are structured such that said inadequacy from said second portion of logical zones will be compensated by said extra data stored in said buffer, so as to ensure a continuous media play requirement.

**5,742,444**

## RECORDING AND/OR REPRODUCING APPARATUS FOR CONTROLLING THE RUNNING SPEED OF A RECORDING TAPE

**Tadashi Ozue, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

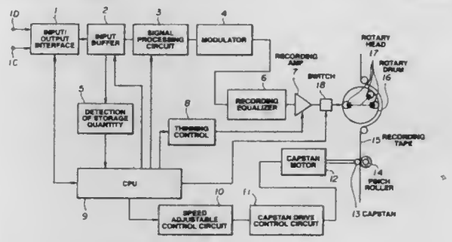
**PCT No. PCT/JP94/00969, § 371 Date Mar. 22, 1995, § 102(e) Date Mar. 22, 1995, PCT Pub. No. WO94/29858, PCT Pub. Date Dec. 22, 1994**

**PCT Filed Jun. 15, 1994, Ser. No. 379,557**

**Claims priority, application Japan, Jun. 15, 1993, 5-143307**

**Int. Cl.[6] G11B *15/04***

**U.S. Cl. 360—60** **13 Claims**




1. A recording apparatus comprising:

an input interface supplied with input data with a data rate from a device external to the apparatus;

input buffer means for temporarily storing input data inputted through the input interface;

signal processing means for converting data read out from the input buffer means into recording data;

a rotary head provided with a recording head for recording the recording data onto a recording tape;

data rate detecting means for detecting the data rate of the input data;

recording tape running drive means for carrying out running control of the recording tape;

thinning control means for thinning-controlling recording operation by the recording head of the rotary head; and

recording control means for controlling the recording tape running drive means and the thinning control means in accordance with an output from the data rate detecting means,

the recording control means being operative so that when the data rate of the input data is less than a predetermined value, the recording control means controls the recording tape running drive means to decrease running speed of the recording tape, and controls the thinning control means to perform the thinning-control recording operation by ON/OFF switching the recording data to the recording head of the rotary head.

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**5,742,445**

## MAGNETIC TAPE MACHINE USING FRICTION DATA IN CONTROLLING ACCESSOR SPEED

**Katsumi Inazawa; Hitomi Akiyama, and Yoshiki Akiyama, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Aug. 8, 1995, Ser. No. 512,571**

**Claims priority, application Japan, Dec. 22, 1994, 6-320355; Feb. 7, 1995, 7-018906**

**Int. Cl.[6] G11B *15/68***

**U.S. Cl. 360—71** **12 Claims**

1. A magnetic tape machine comprising:

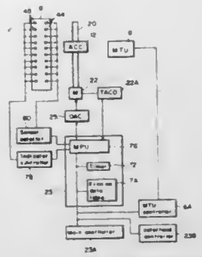
a magnetic tape unit for performing reading and writing of data on a cartridge recording medium;

a cartridge storing member having a plurality of cells each capable of storing said cartridge recording medium; and

a cartridge loader for carrying said cartridge recording medium between said cells of said cartridge storing member and said magnetic tape unit;

said cartridge loader comprising:





an accessor for holding said cartridge recording medium;

moving means for supporting said accessor and moving said accessor, relative to said cells.

friction data means for providing friction data concerning friction between said accessor and said moving means; and

speed control means for controlling a moving speed of said accessor, said speed control means deciding said moving speed according to said friction data.

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**5,742,446**

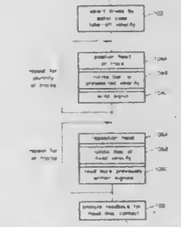
## METHOD FOR DETECTION OF SLIDER-DISK CONTACT

**Hong Tian, Milpitas, and Jia-Kuen Jerry Lee, San Jose, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.**

**Filed Nov. 8, 1995, Ser. No. 555,241**

**Int. Cl.[6] G11B *21/02*; G01R *33/12***

**U.S. Cl. 360—75** **22 Claims**



1. A method for testing slider/disk contact in a disk drive comprising a rotating disk having tracks and a head mounted by an actuator for selective positioning of the head over any one of the tracks of the disk, the head having a slider, and a flexure for attaching the head to the actuator, comprising the steps of:

positioning the head at each of a preselected set of tracks;

at each one of the preselected set of tracks, rotating the disk of the disk drive at a track-related preselected rotational velocity wherein the preselected track-related rotational velocity at each one of the preselected set of tracks is different than the preselected rotational velocity at each of the other ones of the preselected set of tracks;

at each one of the preselected set of tracks, using the head of the disk drive to write a signal having a substantially uniform pattern on the disk as it rotates;

thereafter rotating the disk at a fixed preselected rotational velocity;

while rotating at the fixed preselected rotational velocity, using the head to read back the signals written at each one of the preselected set of tracks; and

performing an FM demodulation of each of the read back signals through a frequency range corresponding to a range of natural frequencies of vibration of the flexure caused by slider/disk contact.

**5,742,447**

## AUTO-REVERSE TAPE DECK COMPRISING A SWITCHING DEVICE

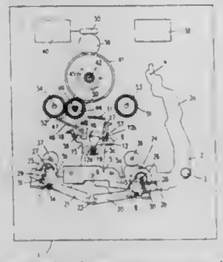
**Norbert Kunze, Diez, and Stefan Koch, Bad Endbach, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jan. 23, 1997, Ser. No. 788,720**

**Claims priority, application Germany, Jan. 26, 1996, 196 02 741.1**

**Int. Cl.[6] G11B *15/44***

**U.S. Cl. 360—96.2** **7 Claims**



1. A switching device in an auto-reverse deck for a magnetic-tape-cassette apparatus, comprising a drive mechanism which is pivotable in a pivoting range between a first and a second reel-disc wheel, by means of which drive mechanism the first reel-disc wheel is drivable in a first operating position of the switching device for a first tape-transport direction and the second reel-disc wheel is drivable in a second operating position of the switching device for a second tape-transport direction, the drive mechanism acting upon a movably supported actuating lever during the pivotal movement between the two operating positions and a pivotal lever being provided which carries a pivotal wheel, and the pivotal lever being coupled to an intermediate wheel particularly by means of a friction coupling, which intermediate wheel meshes with the pivotal wheel, in which:

the actuating lever has teeth which are engageable with the pivotal wheel mounted on the pivotal lever of the pivotable drive mechanism, a pivotably supported armature lever has been provided whose pivotal movement is controlled by the movement of the actuating lever, the pivoting pivotal lever engages against a stop edge, of the armature lever in the central part of the pivoting range, so that subsequently, owing to the engagement of the pivotal lever against the stop edge of the armature lever, meshing forces are transmitted to the teeth of the actuating lever by means of the intermediate wheel and the pivotal wheel, as a result of which said actuating lever is pivoted.

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**5,742,448**

## DEVICE USING CAM-BASED MOVEMENTS TO LOAD AND UNLOAD A TAPE CASSETTE

**Hiroshi Hamahata, and Seiji Mori, both of Osaka, Japan, assignors to Funai Electric Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 541,542, Oct. 10, 1995, abandoned, which is a continuation of Ser. No. 243,338, May 16, 1994, abandoned, which is a continuation of Ser. No. 853,630, Mar. 19, 1992, abandoned. This application Aug. 5, 1996, Ser. No. 691,721**

**Claims priority, application Japan, Dec. 11, 1991, 3-109853; Dec. 11, 1991, 3-351585**

**Int. Cl.[6] G11B *15/675***

**U.S. Cl. 360—96.5** **5 Claims**

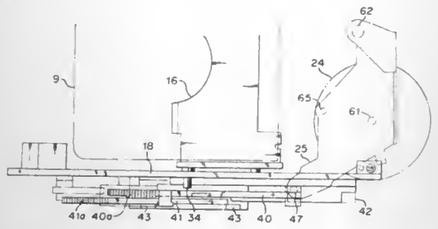
1. A device for loading a tape cassette in and unloading a tape cassette from a tape recorder comprising:

a tape deck chassis;

tape reel supporting means for engaging tape reels of the tape cassette;

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a cassette holder adapted to hold said tape cassette as it passes through an inlet port towards and away from said tape reel supporting means;

a cam disc, supported for rotation about a central rotation axis on said tape deck chassis, said cam disc including a guide route including a first section for transporting the tape cassette and a second section continuously extended from the first section for loading and unloading the tape cassette, said first section including a first portion and a second portion continuously extended from said first portion;

a swinging arm pivoted to the tape deck chassis;

a cam follow pin provided on said swinging arm and received in the guide route; and

transporting means for transporting the tape cassette together with the cassette holder from the inlet port to the tape reel supporting means and vice versa to load the tape cassette in and unload the tape cassette from the tape recorder, the transporting means including a horizontally moving member connected to the swinging arm and reciprocally moved in a horizontal direction by the swinging arm, said horizontally moving member being provided with a rack gear, a pinion rotated by the rack gear, a guide arm rotated by the pinion and having a guide slot, a pin secured to the cassette holder and engaging the guide slot of the guide arm, and a substantially L-shaped guide slit which guides the pin in the horizontal direction and a vertical direction, the tape cassette with cassette holder both moving horizontally and vertically towards and away from the tape reel supporting means with a first speed when the cam follow pin is guided by said first portion of said guide route and a second speed when the cam follow pin is guided by said second portion of said guide route.

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**5,742,449**

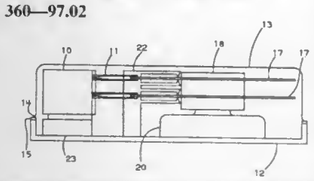
**NEAR CONTACT MAGNETIC RECORDING USING A LIQUID LUBRICANT BEARING TO SEPARATE MEDIA AND TRANSDUCER**

**Thomas Allen Gregory, Rochester; Christopher Guild Keller, Eyota, and Thomas Scott Larson, Altura, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 264,604, Oct. 31, 1988, abandoned. This application Apr. 23, 1991, Ser. No. 689,671**

**Int. Cl.[6] G11B** *5/60*

**U.S. Cl. 360—97.02** **8 Claims**



1. A rotating magnetic memory device comprising

a rotating storage medium presenting a rotating magnetic data storage surface;

a magnetic transducer;

a head-disk enclosure surrounding said rotating storage medium and said magnetic transducer and substantially sealing said rotating storage medium from the surrounding ambient atmosphere;

means for maintaining a recirculating film of liquid lubricant on said magnetic data surface, including means for recirculating said liquid lubricant over said data surface;

said liquid lubricant being a low viscosity lubricant with said lubricant film being maintained as a substantially uniform thickness not exceeding 5 microns;

said magnetic transducer being supported above said rotating magnetic surface by said liquid film when writing data to or reading data from said rotating magnetic media data surface;

a reservoir in said head-disk enclosure and

a liquid lubricant distribution system associated with the rotating assembly which supports said disk and

wherein said means for maintaining a recirculating film of lubricant comprises a distillation system wherein said reservoir is maintained at a first temperature and a location on said enclosure positioned to deliver condensed liquid to said distribution system is maintained at a second temperature which is less than said first temperature.

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**5,742,450**

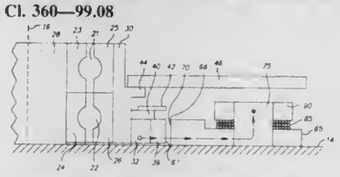
**DISK DRIVE SPINDLE MOTOR WITH RADIAL GAP AND FIELD GENERATING COILS INTERCONNECTED BY RING FLUX GUIDE**

**Michael Anthony Moser, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 8, 1995, Ser. No. 400,645**

**Int. Cl.[6] G11B** *19/20;* **H02K** *7/14;* **H07K** *1/12*

**U.S. Cl. 360—99.08** **9 Claims**



1. A brushless direct current motor comprising:

a base;

a rotor attached to the base and rotatable about a rotational axis;

a magnet attached to the rotor for generating magnetic fields in a radial direction generally perpendicular to the rotational axis;

a plurality of stator teeth attached to and located on top of the base and circumferentially spaced around the rotational axis radially outwardly from the magnet, each stator tooth having a radially inner portion with a face radially spaced from the magnet to define a radial gap and a radially outer portion with an axial thickness less than the axial thickness of the face on the inner portion;

a like plurality of conductive coils, each coil being attached to and located on top of a corresponding stator tooth's radially outer portion and generating a magnetic field in an axial direction generally parallel to said rotational axis when conducting electrical current; and

a ring flux guide of magnetically permeable material located above the coils and interconnecting the radially outer portions of the stator teeth in a generally circumferential direction; whereby magnetic flux from the magnet across the radial gap to the face on the inner portion of a first one of said stator teeth is directed radially from the inner to the outer portion of said first stator tooth, axially through the coil on the outer portion of said first stator tooth, circumferentially by the ring flux guide to the coil on the outer portion of a second one of said stator teeth circumferentially adjacent said first stator tooth, axially through the coil on the outer portion of said second stator tooth, radially from the outer to the inner portion of said second stator tooth, and radially from the face on the inner portion of said second stator tooth across the radial gap to the magnet.



**5,742,451**

**MACHINED MAGNETIC HEAD WITH CONTOURED AIR BEARING SURFACES**

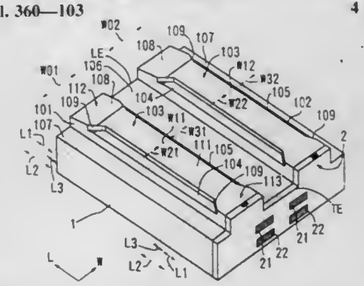
**Toshio Kubota, Komoro, and Tetsuo Miyazaki, Nagano, both of Japan, assignors to TDK Corporation, Tokyo, Japan**

**Filed Oct. 23, 1996, Ser. No. 736,329**

**Claims priority, application Japan, Oct. 24, 1995, 7-276035**

**Int. Cl.[6] G11B** *5/60*

**U.S. Cl. 360—103** **4 Claims**



1. A magnetic head comprising:

a slider, with two ends in the direction of the length thereof constituting a leading edge and a trailing edge, which is provided with at least one rail portion extending in said direction of said length at one surface; and

at least one magnetic transducer which is provided on an extension of said rail portion toward said trailing edge of said slider, wherein:

said rail portion is provided with step-like indented portions provided along two sides thereof in the direction of the width;

said indented portions are formed shorter than said rail portion, thereby forming a rear rail surface toward said trailing edge of said slider, a front rail surface toward said leading edge of said slider and a middle rail surface between said rear rail surface and said front rail surface;

the surface width of said middle rail surface is maintained almost constant;

said rear rail surface and said front rail surface each include a first surface whose surface width is determined by the entire width of said rail portion and a second surface whose surface width is gradually reduced starting from said surface width of said first surface toward said surface width of said middle rail surface; and

when the length of said first surface is designated **L1**, the length that includes said first surface and said second surface is designated **L2** and the entire length of said rail portion is designated **L0**.

**L1**≦2.5% of **L0** and **L1**<**L2**≦15% of **L0** are satisfied.

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**5,742,452**

**LOW MASS MAGNETIC RECORDING HEAD AND SUSPENSION**

**Randall G. Simmons, and Joseph J. Fatula, Jr., both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 10, 1996, Ser. No. 599,401**

**Int. Cl.[6] G11B** *5/596;5/31*

**U.S. Cl. 360—104** **55 Claims**

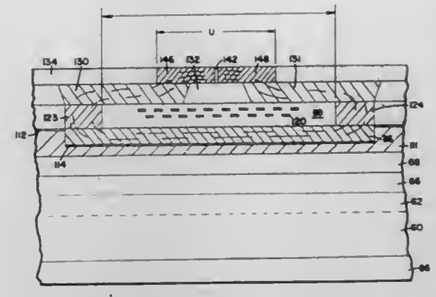
1. An integral magnetic head and suspension assembly for a magnetic storage system, comprising:

a P- silicon wafer;

a N+ silicon layer, disposed over the P- silicon wafer, the N+ silicon layer and the P- silicon wafer being thermally oxidized to generate a bottom silicon oxide layer opposite the N+ layer side of the wafer and a top silicon oxide layer on the N+ side of the wafer, the N+ silicon being driven into the P- silicon wafer;

a layer of polysilicon, disposed over the silicon oxide layer over the N+ silicon layer, the polysilicon layer being patterned to define the head structure and suspension structure as one piece and to provide contact to holes and leads; and

a magnetic head, disposed on the polysilicon, the magnetic head being separated from the wafer by removing the bottom silicon oxide layer by a chemical etchant, and the P-silicon wafer by selective etching.



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**5,742,453**

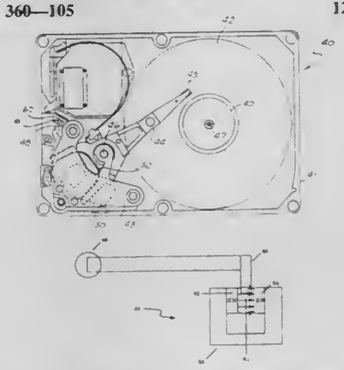
**PASSIVE NON-CONTACT MAGNETIC LATCH FOR AN ACTUATOR OF A DISK DRIVE**

**Aaron MacPherson, Fort Collins, Colo., assignor to Maxtor Corporation, Longmont, Colo.**

**Continuation of Ser. No. 237,729, May 4, 1994, abandoned, which is a continuation of Ser. No. 960,712, Oct. 14, 1992, abandoned. This application Apr. 10, 1995, Ser. No. 420,451**

**Int. Cl.[6] G11B** *5/54*

**U.S. Cl. 360—105** **12 Claims**



1. An apparatus for latching an actuator that positions a read/write head of a disk drive, comprising:

a latch arm rotatably coupled to an actuator pivot for the actuator, the latch arm rotating about the actuator pivot as the read/write head moves radially across a disk;

a latch tab coupled to the latch arm, the latch tab having a direction of movement, the latch tab for moving in the direction of movement in response to the latch arm rotating about the actuator pivot;

a U-shaped member coupled to a housing of the disk drive, the U-shaped member for conducting magnetic flux, the U-shaped member including a base, a first arm coupled to the base, and a second arm coupled to the base, the first and second arms extending outwardly from the base in a direction substantially parallel to the direction of movement of the latch tab;

a first magnet having a north pole and a south pole, the south pole of the first magnet being connected to the first arm such that the north pole of the first magnet faces the second arm;

a second magnet having a north pole and a south pole, the north pole of the second magnet being connected to the second arm such that the south pole of the second magnet faces the north

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pole of the first magnet forming an air gap therebetween wherein the first and second magnets generate a magnetic field across the air gap, substantially all magnetic flux lines of the magnetic field traversing the air gap substantially straight between the facing poles and substantially perpendicular to the direction of movement of the latch tab to minimize magnetic flux outside of said first and second arms.

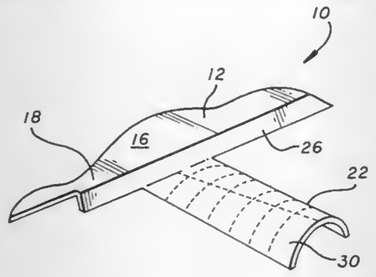
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**5,742,454**

## UNITARY LOAD BEAM AND CAM FOLLOWER

**Daniel Vera, Temecula, and David Wolf, Norco, both of Calif., assignors to Magnecomp Corp., Temecula, Calif.**

**Filed Nov. 25, 1996, Ser. No. 755,191**
**Int. Cl.[6] G11B *5/54;21/22***
**U.S. Cl. 360—105** **10 Claims**




1. Load beam for supporting a terminally disposed flexure carrying a head slider in operative association with a removable disk drive and an actuator shifting said load beam along its longitudinal axis, said lead beam having a laterally projecting cam follower symmetrical about and unitary with said load beam, said cam follower varying in radius of curvature as a function of increasing distance from said lead beam in stiffening relation.

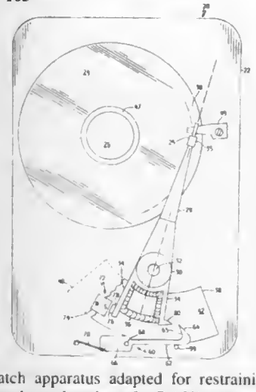
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**5,742,455**

## DUAL LATCH APPARATUS FOR RESTRAINING A DIRECT ACCESS STORAGE DEVICE ACTUATOR

**Zine-Eddine Boutaghou, Owatonna, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 473,201, Jun. 7, 1995, abandoned. This application Apr. 22, 1997, Ser. No. 837,809**
**Int. Cl.[6] G11B *5/54;21/22***
**U.S. Cl. 360—105** **15 Claims**



1. A dual latch apparatus adapted for restraining an actuator rotatably mounted to a housing of a DASD to prevent unintended contact between the actuator and a data storage disk disposed within the housing, the dual latch apparatus comprising:

a first latch assembly, comprising:

a latch body rotatably mounted to the housing;

a restraining member coupled to the latch body, the restraining member engaging the actuator for restraining the actuator at a parking location in response to an external shock force applied to the housing; and

bias means, coupled to the latch body, for biasing the restraining member in a non-engaged relationship with respect to the actuator in the absence of the external shock force; and

a second latch assembly, comprising:

a magnet assembly mounted to the housing; and

an actuator stop surface disposed on the actuator for magnetically interacting with the magnet assembly to restrain the actuator at the parking location in response to the external shock force.

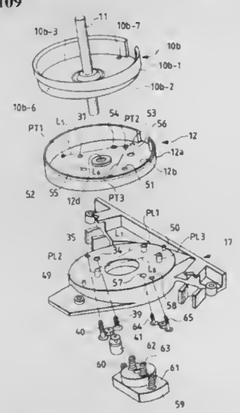
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**5,742,456**

## MAGNETIC RECORDING/REPRODUCING APPARATUS WITH A POSITIONING MECHANISM FOR A TAPE GUIDE DRUM

**Hisao Kinjo, 13-11, Makigahara, Asahi-ku, Yokohama; Hiromichi Hirayama, 1322-24, Shimo Kurata-cho, Totsuka-ku, Yokohama; Ryo Nishima, 55-502, Sawatari, Kanagawa-ku, Yokohama; Morio Miwa, 3-8-207, Nagataminamidai, Minami-ku, Yokohama; Masao Mimata, 4-18-13, Seya, Seya-ku, Yokohama, and Makoto Suzuki, 1-25-23, Shin Koyasu, Kanagawa-ku, Yokohama, all of Japan**

**Filed Feb. 28, 1996, Ser. No. 608,368**
**Claims priority, application Japan, Feb. 28, 1995, 7-066861**
**Int. Cl.[6] G11B *5/588;15/61***
**U.S. Cl. 360—109** **13 Claims**



10. A magnetic recording and/or reproducing apparatus comprising:

an upper drum rotatable about a drum shaft and having mounted thereon a magnetic head which is rotatable along a given head path to record and/or reproduce information data on and from a magnetic tape in first and second operation modes, the first operation mode being such that the information data is recorded and/or reproduced on and from the magnetic tape traveling at a normal speed, the second operation mode being such that the information data is recorded and/or reproduced on and from the magnetic tape traveling at a given speed different from the normal speed;

a lower drum including a bottom portion and an annular portion thereon a tape-wrapped surface and a lead under the tape-wrapped surface for guiding movement of a reference edge of the magnetic tape;

an intermediate member supported by the drum shaft coaxially with said upper drum and engaging an inner wall of said lower drum;

a drum base supporting said intermediate member;



head path correcting means for correcting an angle of the head path of the magnetic head relative to said lead according to the given speed of the magnetic tape in the second operation mode to have the head path coincide with the slant tracks formed on the magnetic tape; and

lead correcting means for correcting an angle of said lead relative to said drum base to bring said lead into engagement with a portion of the reference edge of the magnetic tape over the given tape-wrapped surface of said lower drum,

wherein said head path correcting means includes first, second, and third pivots formed with protrusions disposed on one of said intermediate member and said lower drum disposed between said lower drum and said intermediate member, defining first and second axes of rotation about which said intermediate member rotated relative to said lower drum, first urging means for urging said lower drum toward said intermediate member, first rotating means for rotating said intermediate member about the first axis of rotation defined by the first and second pivots against activities of said first urging means, and second rotating means for rotating said intermediate member about the second axis of rotation defined by the first and third pivots against the activities of said first urging means, and

wherein said lead correction means includes fourth, fifth, and sixth pivots formed with protrusions disposed on one of said intermediate member and said drum base disposed between said drum base and said intermediate member through the bottom portion of said lower drum, defining third and fourth axes of rotation about which the intermediate member is rotated relative to said drum base, second urging means for urging said upper drum and said intermediate member toward said drum base, a third rotating means for rotating said intermediate member about the third axis of rotation defined by the fourth and fifth pivots against activities of said second urging means, and fourth rotating means for rotating said intermediate member about the fourth axis of rotation deformed by the fourth and sixth pivots against the activities of said second urging means.

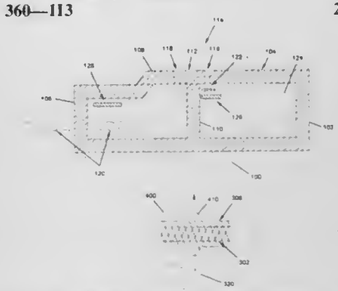
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**5,742,457**

## HORIZONTAL SHARED-POLE MAGNETIC READ/WRITE HEAD HAVING POLARIZATION CONDUCTOR DISABLING WRITE POLE

**Randall G. Simmons, San Jose, Calif., and Robert E. Jones, Jr., Pittsburgh, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 17, 1996, Ser. No. 599,431**
**Int. Cl.[6] G11B *5/127;5/33***
**U.S. Cl. 360—113** **29 Claims**



1. A horizontal magnetic read/write head having a portion of a magnetic pole structure including a read pole, a write pole, and a shared pole formed in a plane parallel to a recording media, a write gap between the write pole and the shared pole and a read gap between the read pole and the shared pole, and a magnetoresistive (MR) read sensor recessed with respect to the plane, comprising a first and second polarization conductor, the first conductor being disposed proximate the MR read sensor to provide a bias sensor field to the MR read sensor during a read process and the second conductor being disposed proximate the write pole to provide an applied field that reduces the permeability of the write pole during the read process, wherein the write pole includes a protrusion that increases the contribution of shape anisotropy to the applied field to increase the applied field during the read process.

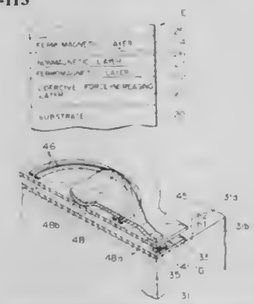
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**5,742,458**

## GIANT MAGNETORESISTIVE MATERIAL FILM WHICH INCLUDES A FREE LAYER, A PINNED LAYER AND A COERCIVE FORCE INCREASING LAYER

**Fumihito Koike, and Naoya Hasegawa, both of Niigata-ken, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan**

**Filed Apr. 3, 1996, Ser. No. 626,103**
**Claims priority, application Japan, Apr. 3, 1995, 7-078022**
**Int. Cl.[6] G11B *5/39; G01R 33/09***
**U.S. Cl. 360—113** **1 Claim**



1. A giant magnetoresistive material film comprising:

a coercive force increasing layer;

a first ferromagnetic layer formed on the coercive force increasing layer;

a nonmagnetic layer formed on the first ferromagnetic layer; and

a second ferromagnetic layer formed on the nonmagnetic layer;

wherein magnetization of the first ferromagnetic layers is pinned by the coercive force increasing layer which is provided adjacent to the first ferromagnetic layer so as to increase the coercive force of the first ferromagnetic layer,

wherein the second ferromagnetic layer has free magnetization such that a change in a magnetic resistance of the second ferromagnetic layer is produced at a low magnetic field,

wherein the coercive force increasing layer comprises $\alpha$-$Fe_2O_3$, and

wherein the first ferromagnetic layer comprises Co, and the second ferromagnetic layer comprises a two-layer structure comprising a Co layer disposed between the nonmagnetic layer and a NiFe alloy layer.

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**5,742,459**

## MAGNETIC HEAD HAVING ENCAPSULATED MAGNETORESISTIVE TRANSDUCER AND MULTILAYERED LEAD STRUCTURE

**Yong Shen, Milpitas; Chyu Jiuh Torng, Pleasanton, and Daniel A. Nepela, San Jose, all of Calif., assignors to Read-Rite Corporation, Milpitas, Calif.**

**Filed Jun. 20, 1996, Ser. No. 666,209**
**Int. Cl.[6] G11B *5/127***
**U.S. Cl. 360—113** **16 Claims**

1. A magnetic head assembly including a magnetoresistive read head disposed on a substrate comprising:

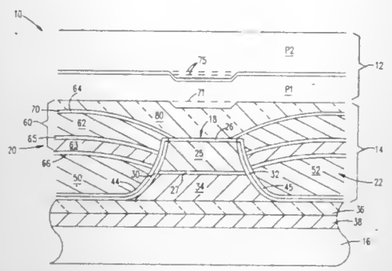
two magnetoresistively inactive side regions;

a magnetoresistivitely active central region disposed between said side regions;

a magnetoresistive element disposed within said active central region for sensing data recorded on a magnetic medium; and

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protective layers for encapsulating said magnetoresistive element and for separating said central region from said side regions, said protective layers being formed of electrically conductive material;

wherein in each of said side regions a longitudinal bias layer is formed of alternating layers of antiferromagnetic material and layers of soft magnetic material;

so that diffusion and electromigration experienced by the magnetic head assembly in operation are effectively reduced.

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**5,742,460**

**MOVABLE FULL ERASING HEAD**

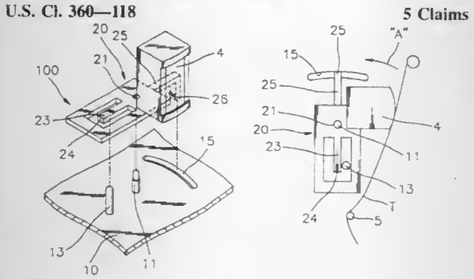
**Ki-Young Park, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea**

**Filed Nov. 26, 1996, Ser. No. 756,503**

**Claims priority, application Rep. of Korea, Nov. 28, 1995, 1995-44374**

**Int. Cl.[6] G11B** *5/58*

**U.S. Cl. 360—118** **5 Claims**



1. A video cassette recorder incorporating therein a full erasing head unit disposed on a deck chassis thereof, the full erasing head unit comprising:

a full erasing head;

a base member for mounting the full erasing head thereon in such a way that the full erasing head comes into contact with a traveling tape, the base member movably disposed on the deck chassis; and

means for pivotably moving the base member, wherein the moving means includes a resilient means for exerting an elastic force on the base member, one end thereof being fixed to the base member and the other end thereof being free, and a pin upwardly extending from the deck chassis, the pin coming into contact with the resilient means in such a way that the resilient means biased by a tape tension is allowed to return to an initial position thereof.

**5,742,461**

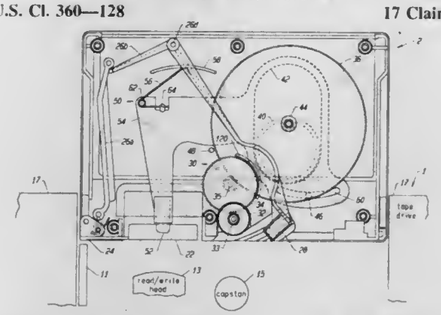
**CLEANING CARTRIDGE FOR A TAPE DRIVE**

**Michael N. Benson, San Jose, and James F. Taylor, Santa Cruz, both of Calif., assignors to Microclean, Inc., San Jose, Calif.**

**Filed Feb. 6, 1995, Ser. No. 384,104**

**Int. Cl.[6] G11B** *5/10;5/127;5/41*

**U.S. Cl. 360—128** **17 Claims**



1. An apparatus for cleaning a device which reads data from and/or writes data onto tape, said read/write device including a read/write head and a capstan, said apparatus comprising:

a first contact cleaner of said capstan;

a conveyor, attached to said first contact cleaner, said conveyor mounted at a position where said conveyor can move said first contact cleaner from a first, retracted position to a second, extended position adjacent said capstan,

wherein said read/write device further includes an engaging extension and said conveyor comprises a lever system actuated by insertion of said engaging extension into said apparatus, and wherein said lever system comprises:

a first lever;

a second lever, having first and second ends, said first end of said second lever in contact with said first lever; and

a third lever, having first and second ends, said first end of said third lever in contact with said second end of said second lever, said first contact cleaner mounted on said second end of said third lever;

wherein said first, second and third levers are mounted at positions where said engaging extension actuates said first lever, said first lever actuates said second lever, said second lever actuates said third lever, and said third lever moves said first contact cleaner from said first, retracted position to said second, extended position adjacent said capstan.

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**5,742,462**

**Patent Not Issued For This Number**

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**5,742,463**

**PROTECTION DEVICE USING FIELD EFFECT TRANSISTORS**

**Richard Allen Harris, Kawana Downs, Australia, assignor to The University of Queensland, Australia**

**Continuation of Ser. No. 578,676, Dec. 29, 1995, abandoned. This application Aug. 18, 1997, Ser. No. 912,620**

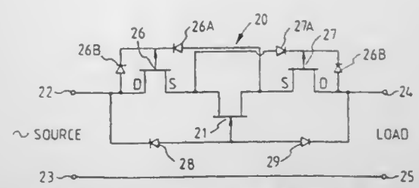
**Claims priority, application Australia, Jul. 1, 1993, PL9711**

**Int. Cl.[6] H02H** *3/14*

**U.S. Cl. 361—88** **17 Claims**

1. An isolation device connectable between a supply and a load or in a circuit, the device including a first p-channel FET, a second p-channel FET, and an n-channel FET having its conductive channel between and in series with the conductive channels of the p-channel FETs, a respective diode connected between the gate terminal of the n-channel FET and each said p-channel FET with the anode of the diodes coupled to the gate of the n-channel FET and the cathode connected to the drain of each said p-channel FET,





a respective diode connected between the source of the second p-channel FET and the gate of the first p-channel FET and between the source of the first p-channel FET and the gate of the second p-channel FET wherein the FETs are depletion mode FETs whereby the device is operative to present an effective open circuit when a threshold voltage of at least a predetermined magnitude is developed across the conductive channels of the FETs.

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**5,742,464**

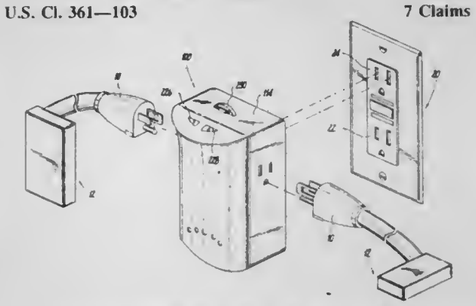
**HEAT RESPONSIVE POWER INTERRUPTING DEVICE**

**Giacomo Ceola, Via Pastro 61/G, Villorba, Italy; James K. McCusker, 12 Post La., Suffern, N.Y. 10901, and Giacomo Calzavara, 128 Surrey Ct., Ramsey, N.J. 07446**

**Continuation-in-part of Ser. No. 274,097, Jul. 12, 1994, Pat. No. 5,590,010. This application Oct. 4, 1995, Ser. No. 539,120**

**Int. Cl.[6] H02H** *5/04*

**U.S. Cl. 361—103** **7 Claims**



1. A device for interrupting power to an electrical appliance, the device comprising:

an outer housing;

a pair of input terminals configured to releasably engage a source of electrical power;

a first and a second pair of output terminals, each pair being configured to releasably engage appliance input terminals, the first pair being spaced from the second pair;

a thermal barrier member supported within the outer housing, the thermal barrier member being in thermal communication with the pair of input terminals and the first and second pairs of output terminals;

a temperature sensitive electrical switch supported on the thermal barrier member at a position substantially equidistant from the first and the second pair of output terminals and being operative to interrupt electrical power to an appliance in response to sensing a first predetermined temperature through the thermal barrier member; and

a ground conductor pivotably mounted within the outer housing, the ground conductor including a ground prong configured to releasably engage a ground terminal of an electrical power source, the ground conductor being pivotable from a first position in which the ground prong is substantially parallel to the input terminals to a second position in which the ground prong is substantially perpendicular to the input terminals.

**5,742,465**

**PROTECTION CIRCUIT FOR A CMOS INTEGRATED CIRCUIT**

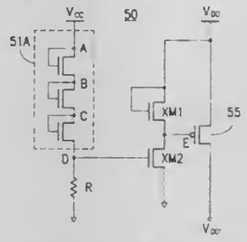
**Ta-Lee Yu, Hsinchu Hsien, Taiwan, assignor to Winbond Electronics Corporation, Hsinchu, Taiwan**

**Filed Jul. 23, 1996, Ser. No. 685,035**

**Claims priority, application Taiwan, Apr. 24, 1996, 85104894**

**Int. Cl.[6] H02H** *3/22*

**U.S. Cl. 361—111** **7 Claims**



1. A protection circuit for a CMOS integrated circuit which is biased with a first voltage and a second voltage, comprising:

a voltage divider which receives the first voltage and generates a divided first voltage;

a voltage comparator which is connected to the voltage divider and compares the divided first voltage and the second voltage; and

a switch which is controlled by the voltage comparator to isolate the CMOS integrated circuit from the second voltage when the first voltage is lower than the second voltage,

wherein the voltage divider includes:

a constant voltage subtractor which subtracts a constant voltage from the first voltage to generate the divided first voltage; and

a load, connected between the constant voltage subtractor and ground.

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**5,742,466**

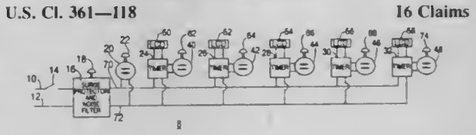
**POWER OUTLET DEVICE WITH MULTIPLE INDIVIDUAL TIMER CONTROLLED RECEPTACLES**

**Harvey Kram, Tamarac, Fla., assignor to Leviton Manufacturing Co., Inc., Little Neck, N.Y.**

**Filed Feb. 12, 1997, Ser. No. 798,009**

**Int. Cl.[6] H02H** *1/00*

**U.S. Cl. 361—118** **16 Claims**



1. A power outlet device having receptacles into which electrical devices may be plugged to receive AC current therefrom comprising:

a) a first and a second electrical conductor adapted to coupled to a source of AC current;

b) at least one first receptacle directly connected across said first and second electrical conductors to provide continuous AC current to an electrical device plugged into said first receptacle;

c) at least one second receptacle; and

d) at least one discrete timer, one for each of said at least one second receptacle, each of said at least one timer connected directly across said first and said second electrical conductors and directly to an associated at least one second receptacle to provide AC current to an electrical device plugged into said at least one second receptacle in accordance with the setting of said associated timer.

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5,742,467

## METHOD OF CONTROLLING ARMATURE MOVEMENT IN AN ELECTROMAGNETIC CIRCUIT

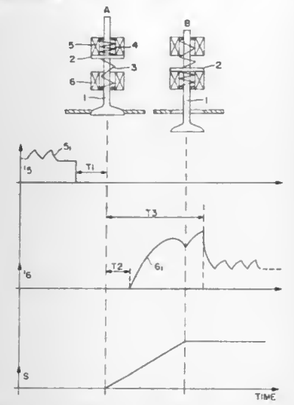
Günter Schmitz, Aachen, Germany, assignor to FEV Motorentechnik GmbH & Co. KG, Aachen, Germany

Filed Sep. 28, 1995, Ser. No. 535,931

Claims priority, application Germany, Sep. 28, 1994, 44 34 684.0

Int. Cl.[6] H01H *47/00*

U.S. Cl. 361—154 5 Claims




1. A method of generating a control signal as a function of a moment of motion start of an armature in an electromagnetic circuit including at least one holding solenoid applying magnetic forces to the armature and at least one resetting means for applying a resetting force to said armature, comprising the following cyclical steps:

(a) switching on a holding current to flow through said solenoid for holding the armature at said solenoid;

(b) after a predetermined period following step (a), switching off the holding current for causing the armature to begin a motion away from the solenoid in response to a force exerted by said resetting means;

(c) after step (b), detecting, across the solenoid, a voltage change caused by the displacement of the armature for recognizing a starting moment of armature motion from the solenoid; and

(d) deriving a control signal from signals representing the voltage change detected in step (c).

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5,742,468

## ELECTRIC CHARGE GENERATOR FOR USE IN AN APPARATUS FOR PRODUCING AN ELECTROSTATIC LATENT IMAGE

Kazuya Matsumoto; Yukiaki Minamoto; Jun Funazaki; Michitsugu Arima; Masashi Kitazawa; Fumitaka Ozeki, and Shigeru Komiyama, all of Tatsuno, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1995, Ser. No. 541,684

Claims priority, application Japan, Oct. 24, 1994, 6-282475; Oct. 31, 1994, 6-288580; Nov. 2, 1994, 6-269947; Dec. 16, 1994, 6-333598; Mar. 27, 1995, 7-091939

Int. Cl.[6] G03G *15/00*

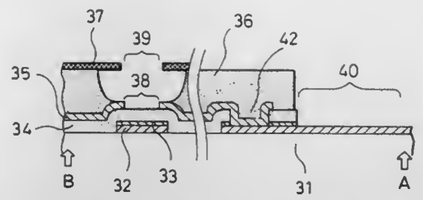
U.S. Cl. 361—229 8 Claims

1. An electric charge generator for use in an apparatus for producing an electrostatic latent image, said electric charge generator comprising a plurality of charge generation controlling devices, each said charge generation controlling device comprising:

an insulating substrate;

a line electrode formed of aluminum on said insulating substrate;

a solid dielectric film formed on the surface of said line electrode;




a thin film having greater hardness than aluminum, said thin film being disposed between said line electrode and said solid dielectric film;

a finger electrode having a hole for generating an electric charge, said hole being formed in the central part of said finger electrode, said finger electrode being formed on said solid dielectric film;

a solid insulating film having a hole for passing the electric charge, said hole being formed in the central part of said solid insulating film, said solid insulating film being formed on said finger electrode; and

a screen electrode having a hole for ejecting the electric charge, said hole being formed in the central part of said screen electrode, said screen electrode being formed on the surface of said finger electrode via said solid insulating film;

wherein said plurality of charge generation controlling devices are arranged on said insulating substrate so as to form said electric charge generator.

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5,742,469

## FENCE ELECTRIFYING DEVICE

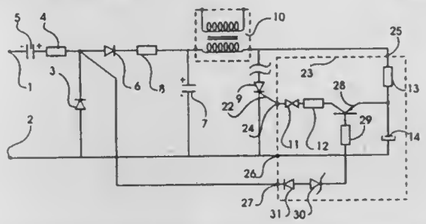
Valery Hamm, Les Pelouses, Route du Lude, 72200 La Fleche, France

Filed Mar. 26, 1996, Ser. No. 621,968

Claims priority, application France, Mar. 31, 1995, 95 03798

Int. Cl.[6] H01T *23/00*

U.S. Cl. 361—230 7 Claims



1. A fence electrifying device comprising a first terminal (**1**), a second terminal (**2**), said first terminal and said second terminal receiving an AC power supply network,

a voltage doubler for charging a storage capacitor (**7**), said voltage doubler comprising, in series form the first terminal (**1**), a first capacitor (**5**), a first resistor (**4**), a first diode (**6**) and a second resistor (**8**), and in parallel between the second terminal (**2**) and a point common to both the first resistor (**4**) and the first diode (**6**), a second diode (**3**),

the storage capacitor (**7**) being capable of abrupt discharge into a primary of a transformer (**10**), a secondary of said transformer supplying a fence through a first thyristor (**9**), a triggering circuit (**23**) controlling a gate of said first thyristor, the triggering circuit (**23**) including an input (**27**) connected to the common point of the first resistor (**4**) and the first and second diodes (**3**, **6**), a triggering of a conductive state in the first thyristor (**9**) occurring when the first terminal (**1**) is near a most negative potential in relation to a potential of the second terminal (**2**), so as not to disturb the network with a disturb signal.



5,742,470

## CIRCUIT ARRANGEMENT INCLUDING AN EHT CASCADE CIRCUIT

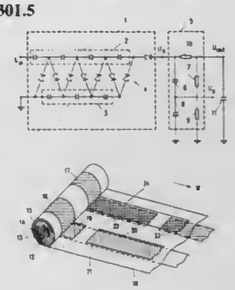
Hubert Raets, Landgraaf, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Jun. 25, 1996, Ser. No. 670,379

Claims priority, application Germany, Jul. 20, 1995, 195 26 492.4

Int. Cl.[6] H01G *4/32;4/38*

U.S. Cl. 361—301.5 6 Claims



1. A circuit arrangement including an EHT cascade circuit with at least a series arrangement of capacitors comprising staggered conductive strips provided on both sides of a dielectric layer which, together with the conductive strips, is wound about a support to constitute a winding form, characterized in that the EHT cascade circuit precedes an EHT output capacitor, and the EHT output capacitor is the support.

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5,742,471

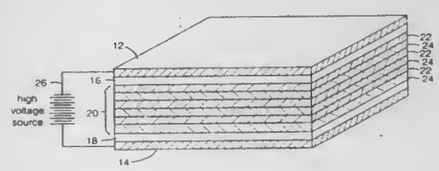
## NANOSTRUCTURE MULTILAYER DIELECTRIC MATERIALS FOR CAPACITORS AND INSULATORS

Troy W. Barbee, Jr., Palo Alto, and Gary W. Johnson, Livermore, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Nov. 25, 1996, Ser. No. 755,619

Int. Cl.[6] H01G *4/06;4/20*

U.S. Cl. 361—312 10 Claims




1. A capacitor, comprising:

at least one pair of metal conductor layers that function as capacitor electrodes;

a dielectric-conductor interface layer in between and in contact with each of the conductor layers; and

a multilayer dielectric disposed between and in contact on opposite sides with corresponding dielectric-conductor interface layers and comprising a plurality of alternating layers of oxides of at least two different metals.

5,742,472

## STACKED CAPACITORS FOR INTEGRATED CIRCUIT DEVICES AND RELATED METHODS

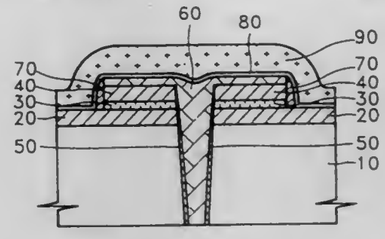
Myoung-bum Lee, and Hyeon-deok Lee, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 3, 1996, Ser. No. 674,883

Claims priority, application Rep. of Korea, Jul. 13, 1995, 95-20635

Int. Cl.[6] H01G *4/06*

U.S. Cl. 361—321.4 28 Claims




1. A method for fabricating a capacitor on a semiconductor substrate, said method comprising the steps of:

forming an insulating layer on the semiconductor substrate;

forming a first plate electrode on said insulating layer;

forming a first dielectric layer on said plate electrode;

forming a first common storage electrode on said first dielectric layer;

forming a contact hole through said insulating layer, said first plate electrode, said first dielectric layer, and said first common storage electrode thereby exposing a predetermined portion of the substrate;

forming a first spacer on a sidewall of said contact hole;

forming a conductive polysilicon plug in said contact hole extending from the substrate to said first common storage electrode;

forming a second common storage electrode on said conductive polysilicon plug and on said first common storage electrode wherein said second common storage electrode is formed from polysilicon;

patterning said first dielectric layer, said first common storage electrode, and said second common storage electrode to form a mesa structure;

forming a second spacer along a sidewall of said mesa structure;

forming a second dielectric layer extending over said second common storage electrode and said second spacer to an exposed portion of said first plate electrode; and

forming a second plate electrode on said second dielectric layer opposite said second common storage electrode.

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5,742,473

## MONOLITHIC CERAMIC CAPACITOR

Harunobu Sano, Kyoto; Hiroyuki Wada, Shiga-ken, and Yukio Hamaji, Otsu, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 20, 1996, Ser. No. 771,312

Claims priority, application Japan, Dec. 20, 1995, 7-349734; Apr. 22, 1996, 8-126405

Int. Cl.[6] H01G *4/06;4/005;4/228;2/20*

U.S. Cl. 361—321.4 16 Claims

1. A monolithic ceramic capacitor composed of:

a plurality of dielectric ceramic layers,

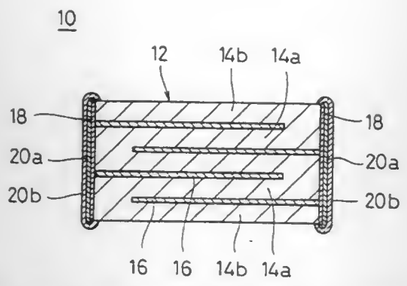
a plurality of inner electrodes as formed between the dielectric ceramic layers in such a manner that one end of an inner electrode is exposed out of an end of the dielectric ceramic layers, and

outer electrodes electrically connected with the exposed inner electrodes,

the monolithic ceramic capacitor being characterized in that

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the dielectric ceramic layers each are made of a material comprising a barium titanate having an alkali metal oxide impurity of content of about 0.02% by weight or less, of the compositional formula:

$$(1-\alpha-\beta)\{BaO\}_m TiO_2+\alpha Re_2O_3+\beta(Mn_{1-x-y}Ni_xCo_y)O$$

where $Re_2O_3$ is one or more selected from $Tb_2O_3$, $Dy_2O_3$, $Ho_2O_3$, $Er_2O_3$ and $Yb_2O_3$; and
α, β, m, x and y are as follows:

$0.0025 \leqq \alpha \leqq 0.025$

$0.0025 \leqq \beta \leqq 0.05$

$\beta/\alpha \leqq 4$

$0 \leqq x < 1.0$

$0 \leqq y < 1.0$

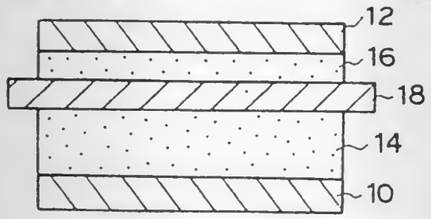
$0 \leqq x+y < 1.0$

$1.000 < m \leqq 1.035$,

magnesium oxide in an amount of from about 0.5 to 5.0 mols, in terms of MgO, relative to 100 mols of the titanate and
from about 0.2 to 3.0 parts by weight, relative to 100 parts by weight of said titanate and MgO, of a $SiO_2$—$TiO_2$—MO oxide where MO is at least one oxide selected from the group consisting of BaO, CaO, SrO, MgO, ZnO and MnO; and
the inner electrodes comprise nickel or a nickel alloy.

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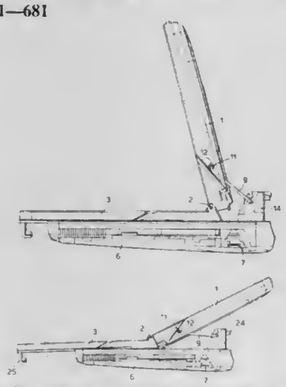
**5,742,474**
**ELECTRIC DOUBLE LAYER CAPACITOR**
**Tatsuhiko Shimizu; Hiroyuki Kimoto, and Shoji Yokoishi, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi-Ken, Japan**
**Filed Jul. 9, 1996, Ser. No. 678,459**
**Claims priority, application Japan, Jul. 17, 1995, 7-180034; May 15, 1996, 8-119882**
**Int. Cl.[6] H01G** *9/00;9/016*
**U.S. Cl. 361—502** **5 Claims**




1. An electric double layer capacitor comprising:
(a) a pair of collectors;
(b) a polarized positive electrode disposed on one of the collectors and a polarized negative electrode disposed on the other collector;
(c) a separator interposed between the polarized positive and the polarized negative electrode; and
(d) an electrolyte applied between the polarized positive and negative electrodes and the separator,
wherein a ratio of a capacitance of the polarized positive electrode to a capacitance of the polarized negative electrode is changed so as to raise the respective potentials of the positive and negative electrodes which cause an irreversible current.

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**5,742,475**
**COMPUTING EQUIPMENT CASING HAVING HINGED, SPRING LOADED AND SLIDING LEAVES**
**Martin Philip Riddiford, London, United Kingdom, assignor to Psion Computer Plc, London, United Kingdom**
**Filed Sep. 23, 1996, Ser. No. 723,882**
**Claims priority, application United Kingdom, Sep. 26, 1995, 9519556**
**Int. Cl.[6] G06F** *1/16;* **H05K** *5/02;* **E05F** *1/08;* **E05D** *7/00*
**U.S. Cl. 361—681** **21 Claims**



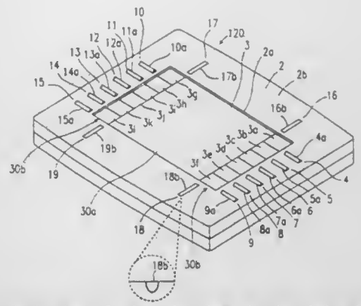
1. A casing for computing equipment, the casing comprising first and second leaves for mounting the computer equipment, said leaves being hinged together so as to be movable between a folded position in which said first leaf overlies said second leaf, and an open position, said casing further comprising an urging mechanism for urging said leaves toward at least one of said folded and open positions; and a base to which said leaves are movably secured so as to allow said second leaf to slide relative to said base whereby in the open position of said leaves part of said base extends under said first leaf so as to provide a support to resist tipping movement when pressure is applied to said first leaf.

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**5,742,476**
**INFORMATION PROCESSING APPARATUS WITH POSITIONERS CORRESPONDING TO DISPLAY INPUT REGION**
**Nobuhiko Miyazaki, Yao, and Kyoko Gamo, Ikoma-gun, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**
**Filed Apr. 24, 1996, Ser. No. 637,234**
**Claims priority, application Japan, Apr. 26, 1995, 7-102232**
**Int. Cl.[6] G06F** *1/16;* **H05K** *5/02*
**U.S. Cl. 361—683** **12 Claims**

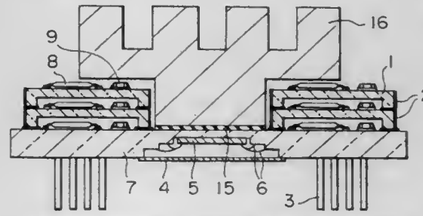
1. An information processing apparatus comprising:
a body having an opening and concave portions outside the opening;
display/input means disposed in the opening, including a display region for displaying information and an input region for displaying keys for inputting data, the data being input by touching, the keys; and
positioners received in the concave portions of the body in the vicinity of the opening corresponding to the input region, for indicating the input region.





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**5,742,477**
**MULTI-CHIP MODULE**
**Mikio Baba, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**
**Filed Jul. 8, 1996, Ser. No. 676,722**
**Claims priority, application Japan, Jul. 6, 1995, 7-192670**
**Int. Cl.[6] H05K** *7/20*
**U.S. Cl. 361—704** **20 Claims**




1. A multi-chip module comprising an insulating board which has a recess portion formed in a central portion of a lower surface and on which a wiring pattern is formed, a semiconductor chip mounted in the recess portion in said insulating board, a plurality of carriers, each mounted on an upper surface of said insulating board and having a leg portion with a side-surface electrode formed on a side surface, and a semiconductor device with accessible leads mounted on each carrier, wherein said carriers are mounted atop one another at least two carriers deep without any separate connection device.

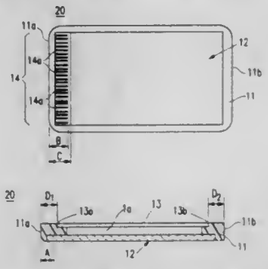
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**5,742,478**
**RADIATING STRUCTURE OF A POWER CONVERTER**
**Chih-Hsien Wu, Fl. 4, No. 59 1, Tsao Di Wei, Shen Keng Hsiang, Taipei Shien, Taiwan**
**Filed Sep. 25, 1996, Ser. No. 719,646**
**Int. Cl.[6] H05K** *7/20*
**U.S. Cl. 361—704** **8 Claims**

1. A radiating structure of a power converter comprising:
a housing;
a front cover;
a rear cover;
a printed circuit board assembly; and
a base plate;
said housing being molded to have a positioning means disposed in the top inner surface thereof, two opposed guide slots respectively provided on the inner surface of two side walls, and a plurality of slit threaded holes formed at the corners and ends of the side walls of the housing;
on said front cover there being provided receptacles and holes through which screws fasten the front cover to the front end of said housing;
on said rear cover there being provided a power cord, a fuse, a fan, and a plurality of holes through which a plurality of screws pass to attach the rear cover to the rear end of said housing;
said printed circuit board assembly including a heat conductor plate soldered on the board thereof and provided with a fixing means that cooperates with said positioning means to locate the top of the heat conductor plate;
said base plate being provided with holes at four corners thereof, by which said base plate is fastened on the bottom of said housing by a plurality of screws;
said printed circuit board assembly being held between said two guide slots with the fixing means of said heat conductor plate engaging with the positioning means of said housing, and said front cover and said rear cover being fastened to the front and rear ends of the housing respectively and said base plate being attached to the bottom of the housing.

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**5,742,479**
**CARD-TYPE ELECTRONIC DEVICE WITH PLASTIC FRAME SANDWICHED BETWEEN PRINTED CIRCUIT BOARD AND METAL PANEL**
**Tohru Asakura, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan**
**Continuation of Ser. No. 401,568, Mar. 9, 1995, abandoned. This application Feb. 14, 1996, Ser. No. 601,459**
**Claims priority, application Japan, Mar. 9, 1994, 6-038316; Feb. 3, 1995, 7-016640**
**Int. Cl.[6] H05K** *1/14;* **H01R** *9/09*
**U.S. Cl. 361—737** **6 Claims**




1. A card-type electronic device comprising: a plastic frame enclosing an in-frame opening, said frame having a front end surface and a rear end surface, said rear end surface being remote from said front end surface; a printed circuit board having an insertion end provided with a card contact edge section forming an input/output interface for connection to external contacts, said card contact edge section having a connector contact region for contacting the external contacts, said board carrying semiconductor devices and said insertion end facing toward said front end surface of said frame; and a metal panel, said plastic frame being sandwiched between said printed circuit board and said metal panel, and said metal panel having a front edge facing toward said front end surface of said frame, wherein said front end surface of said

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frame is spaced at a distance $D_1$ from said front edge of said metal panel and at a distance A from said connector contact region of said printed circuit board, and $A<D_1$.

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**5,742,480**

**OPTICAL MODULE CIRCUIT BOARD HAVING FLEXIBLE STRUCTURE**

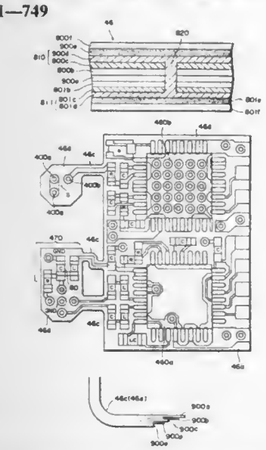
**Sosaku Sawada; Ryoji Sakamoto; Hiromi Kurashima; Daisuke Takagi; Satoshi Ohe; Takeshi Sekiguchi, and Nobuo Shiga, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Nov. 2, 1995, Ser. No. 552,351**

**Claims priority, application Japan, Nov. 2, 1994, 6-269870; Nov. 9, 1994, 6-275099**

**Int. Cl.[6] H05K** *1/00;* **H01R** *9/09*

**U.S. Cl. 361—749** **13 Claims**



1. An optical module circuit board comprising a flexible printed circuit having at least a multilayered structure in which a layer containing a conductive metal interconnection is sandwiched between insulating layers,

wherein said flexible printed circuit includes:

a main body portion having said multilayered structure, a first surface mounted which an electronic component, and a second surface opposite to said first surface;

a neck portion having said multilayered structure, extending from one end of said main body portion, and having a first surface continuously extending from said first surface of said main body portion, and a second surface continuously extending from said second surface of said main body portion; and

a head portion positioned at a distal end of said neck portion extending from said one end of said main body portion, having said multilayered structure, and mounted with an optical operation element, said head portion having a first surface continuously extending from said first surface of said neck portion, and a second surface continuously extending from said second surface of said neck portion,

said neck portion holds said head portion so as to set said first surface of said head portion on a plane different from a plane including said first surface of said main body portion, and

a barycenter in a region of said head portion for mounting an optical operation element is offset in a direction perpendicular to a direction of said neck portion extending from said main body portion and a direction to bend the neck portion.

**5,742,481**

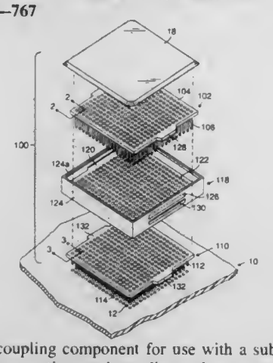
**REMOVABLE TERMINAL SUPPORT MEMBER FOR INTEGRATED CIRCUIT SOCKET/ADAPTER ASSEMBLIES**

**James V. Murphy, Warwick, and Robert N. Taylor, Coventry, both of R.I., assignors to Advanced Interconnections Corporation, West Warwick, R.I.**

**Filed Oct. 4, 1995, Ser. No. 539,052**

**Int. Cl.[6] H05K** *7/10;* **H01R** *9/09*

**U.S. Cl. 361—767** **17 Claims**



1. An intercoupling component for use with a substrate having an array of connection regions disposed on a surface of the substrate, the intercoupling component comprising:

an insulative support member having an upper surface and an opposite lower surface, the support member including an array of first holes extending transversely from the upper surface to the opposite lower surface, the array of first holes located in a pattern corresponding to the array of the connection regions, the insulative support member having a thickness between the upper and lower surfaces greater than 25% of a largest diameter of the terminal elements; and

a plurality of terminal elements, positioned within the first holes and configured to be electrically connected to corresponding connection regions, wherein the first holes are sized to allow the insulative support member to be slidably removed from and replaced on the terminal elements after the terminal elements are connected to the connection regions to allow visual inspection of connections between the terminal elements and connection regions.

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**5,742,482**

**Patent Not Issued For This Number**

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**5,742,483**

**METHOD FOR PRODUCING CIRCUIT BOARD ASSEMBLIES USING SURFACE MOUNT COMPONENTS WITH FINELY SPACED LEADS**

**Bao-Tong Ma, Queesway, Hong Kong; Amit Kumar Sarkhel, Endicott, N.Y., and Ping Kwong Seto, Madison, Ala., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 10, 1996, Ser. No. 627,806**

**Int. Cl.[6] H05K** *1/00*

**U.S. Cl. 361—777** **6 Claims**

1. A circuit board, comprising:

an interconnect structure defining a plurality of component attachment sites, including:

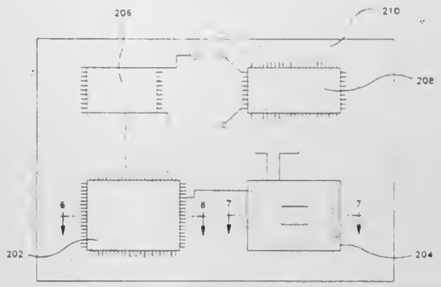
one or more attachment sites for surface mount components, each site including at least two parallel linear rows of metal interconnection pads defining a rectangle, with the pads elongated in a direction lateral to the direction of the rows, and in which the ratio of width-to-length of the pads is low so that, when no component leads is present during reflow and when solder volume is high, the solder forms bulges extending from surrounding solder;

conductor wires connected to the pads and extending between the attachment sites;

a surface mount component positioned at the surface mount attachment site with leads corresponding to the pads in the rows and positioned above the pads; and

solder joints extending between pads and corresponding leads with a high solder volume so that, when no leads are present during reflow, bulges form extending from the surrounding solder bump consistently near the center of each of the pads, and sufficiently narrow that the bulges form no solder bridges between joints.





**5,742,485**

**Patent Not Issued For This Number**

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**5,742,484**

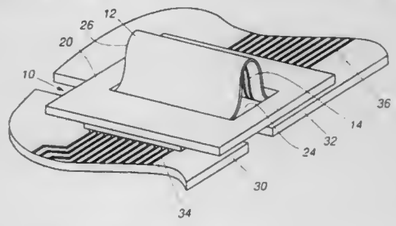
**FLEXIBLE CONNECTOR FOR CIRCUIT BOARDS**

**Joseph G. Gillette, Margate; Scott G. Potter, Coconut Creek, and Pradeep Lall, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Feb. 18, 1997, Ser. No. 801,612**

**Int. Cl.[6] H05K** *1/14*

**U.S. Cl. 361—789** **19 Claims**



1. A surface mountable flexible interconnect for connecting two circuit boards, comprising:

a flexible film having first and second opposed major surfaces, and having a plurality of electrically conductive runners formed on the first major surface, each runner having a terminal portion at each end, and each terminal portion having an electrically conductive bump affixed thereto;

a rigid member for retaining the flexible film, the rigid member having an aperture;

a central portion of the flexible film formed into a loop, said loop disposed in the aperture; and

perimeter portions of the flexible film adhesively bonded to the rigid member by means of an adhesive disposed between the rigid member and the second major surface.

**5,742,486**

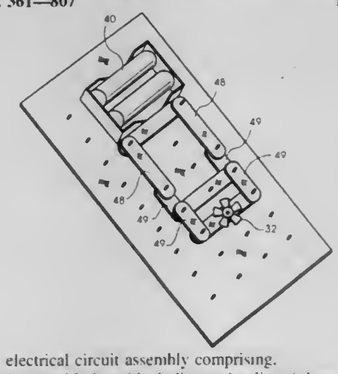
**REUSABLE ELECTRONIC CIRCUIT BUILDING SET WITH INTERCHANGEABLE MODULAR COMPONENTS**

**Li Yangkuai, Hebei, China, assignor to Xiaoli Zhou, Bellevue, Wash.**

**Filed Jan. 23, 1996, Ser. No. 590,316**

**Int. Cl.[6] G09B** *23/18;* **H05K** *7/02;7/10*

**U.S. Cl. 361—807** **16 Claims**



1. An electrical circuit assembly comprising,

a circuit assembly board including a plurality of depending pegs throughout the board mutually spaced apart equally a standard distance therein forming a coordinated orthogonal matrix for removably mounting electrical circuit components thereon selectively throughout the board,

a plurality of interconnectable electrical components, comprising a first component set adapted to mount on the board, each component thereof encased in a base uniform in size and shape so each component can be mechanically substituted for another and each component having 2 electrical terminals spaced apart on the base twice said standard distance for mounting at a selective position throughout the board,

wherein the terminals further comprise a post in size and shape equivalent to each board peg and extending vertically from a base top side and a receiving bore under each post in a base

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bottom side opposite the top side adapted to disconnectably receive a board peg or a terminal post from another component in electrical connection,

and wherein a selective portion of the plurality of electrical components, including a power source component, are all connected with said post of one said component received in said receiving bore of another component until all components are connected in a closed electrical circuit horizontally dispersed about the board.

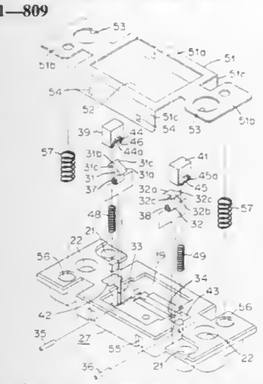
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**5,742,487**

**IC CARRIER**

**Yoshito Kobayashi, Gyoda, and Masayuki Nozawa, Ageo, both of Japan, assignors to Advantest Corporation, Tokyo, and Enplas Corporation, Saitama, both of Japan**

**Filed Oct. 11, 1995, Ser. No. 540,886**
**Claims priority, application Japan, Oct. 11, 1994, 6-245172**
**Int. Cl.[6] H05K** *7/02*
**U.S. Cl. 361—809** **38 Claims**



1. An IC carrier for removably storing an IC device in place and transporting it, said IC carrier comprising:

a body defining an IC pocket for removably storing an IC device therein;

a pair of latches pivotally mounted to said body on opposite sides of said IC device stored in said IC pocket respectively, each of said latches comprising a hold-down lug responsive to the pivotal motion of the latch to be moved between a first position facing a top surface of said IC device and a second position removed from said top surface;

a pair of actuator means each mounted for vertical movements in said body and drivingly connected with a corresponding one of said latches so as to pivot the corresponding latch between said first position and said second position; and

a pair of spring means each mounted to said body to bias an associated actuator means of the pair of actuator means upwardly to pivot an associated latch of the pair of latches to said first position.

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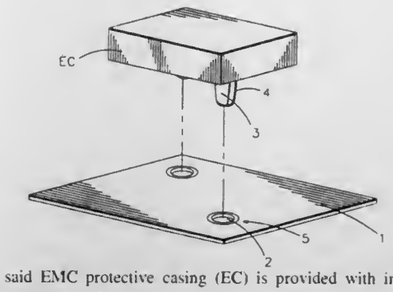
**5,742,488**

**SHIELDING DEVICE AND METHOD OF MOUNTING**

**Pekka Lonka, Salo, and Karl Aittokangas, Kaarina, both of Finland, assignors to Nokia Mobile Phones Limited, Salo, Finland**

**Filed Sep. 6, 1995, Ser. No. 524,325**
**Claims priority, application Finland, Sep. 7, 1994, 944108**
**Int. Cl.[6] H05K** *9/00*
**U.S. Cl. 361—816** **14 Claims**

1. An EMC protective assembly comprising a circuit board (1) and a casing (EC) to be attached to said circuit board (1), characterized in that said circuit board (1) is provided with conductively coated openings (2) for fastening said EMC protective casing, and



that said EMC protective casing (EC) is provided with integral attachment pins (3), to be inserted into said openings (2) in the circuit board (1), said attachment pins being conical in shape and at least one of said attachment pins comprising a protrusion (4) extending outwards from the otherwise regular surface of the pin (3), in order to produce a contact between the surface of said protrusion (4) and the inner surface of the respective opening (2) in the circuit board (1) when said EMC protective casing (EC) is attached to said circuit board (1).

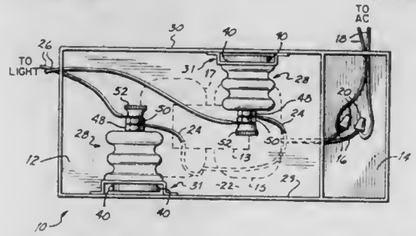
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**5,742,489**

**TRANSFORMER HOUSING AND CONNECTOR BUSHING**

**David H. Riesland, Dickson, Tenn., assignor to France/Scott Fetzer Company, West Fairview, Tenn.**

**Filed Dec. 5, 1994, Ser. No. 349,401**
**Int. Cl.[6] H05K** *7/00*
**U.S. Cl. 361—836** **19 Claims**



1. A transformer and housing structure for driving an electric load coupled between two load leads using electric power received from two power leads, comprising

a transformer comprising primary and secondary windings electrically connected between two primary and two secondary leads, respectively, said primary and secondary windings being coupled by a magnetically permeable core,

a housing including a main compartment enclosing said transformer having walls protecting said transformer, and a mount affixed to one of said walls,

at least a first insulating bushing supporting a first electrical connection, said bushing being mounted to said mount and positioned wholly inside said main compartment,

wherein one of said secondary leads is connected to one of said load leads by said electrical connection at said insulating bushing, and

said insulating bushing supports said electrical connection a sufficient distance away from said walls of said main compartment to substantially prevent electrical arcing from said connection to said walls.

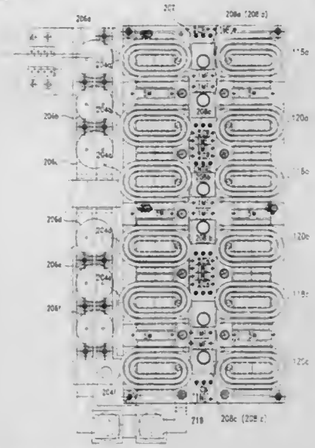


**5,742,490**

**POWER CONVERTER HAVING A CONFIGURABLE OUTPUT STAGE**

**Pradeep Madhav Bhagwat, Baltimore, Md., and Chadd Dial Justo, Jersey City, N.J., assignors to Electronic Measurements, Inc., Neptune, N.J.**

**Filed Oct. 29, 1996, Ser. No. 739,409**
**Int. Cl.[6] H02M** *3/335*
**U.S. Cl. 363—17** **15 Claims**



6. A configurable output stage kit for use with a power converter having two primary windings, the configurable output stage kit comprising:

a) a first secondary winding inductively coupled with one of the two primary windings;

b) a second secondary winding inductively coupled with another of the two primary windings;

c) a heat sink;

d) four chokes;

e) three capacitors;

f) four head-to-tail, dual diode packages, each of the four head-to-tail dual diode packages having a first diode having a cathode electrically coupled with the heat sink;

g) two common cathode dual diode packages, each of the two common cathode dual diode packages having a first diode and a second diode, each of the first and second diodes having a cathode electrically coupled with the heat sink;

h) a first printed circuit board having a conductor pattern which couples the first and second secondary windings, the heat sink, at least one of the four chokes, at least one of the three capacitors, and two of the series, head-to-tail, dual diode packages to form a full bridge output circuit with the first and second secondary windings in series;

i) a second printed circuit board having a conductor pattern which couples the first and second secondary windings, the heat sink, at least one of the four chokes, at least one of the three capacitors and the four series, head-to-tail, dual diode packages to form a full bridge output circuit with the first and second secondary windings in parallel;

j) a third printed circuit board having a conductor pattern which couples the first and second secondary windings, the heat sink, at least one of the four chokes, three capacitors and one of the four series, head-to-tail, dual diode packages to form a voltage doubler output circuit with the first and second secondary windings in series;

k) a fourth printed circuit board having a conductor pattern which couples the first and second secondary windings, the heat sink, at least one of the four chokes, the three capacitors and two of the four series, head-to-tail dual diode packages to form a voltage doubler output circuit with the first and second secondary windings in parallel;

l) a fifth printed circuit board having a conductor pattern which couples the first and second secondary windings, the heat sink, at least two of the four chokes, at least one of the three capacitors and one of the two common cathode dual diode packages to form a current doubler output circuit with the first and second secondary windings in series; and

m) a sixth printed circuit board having a conductor pattern which couples the first and second secondary windings, the heat sink, four chokes, at least one of the three capacitors and the two common cathode dual diode packages to form a current doubler output circuit with the first and second secondary windings in parallel,

wherein one of the first, second, third, fourth, fifth, or sixth printed circuit boards is used to configure the configurable output stage kit into an output circuit associated with the used one of the first, second, third, fourth, fifth, or sixth printed circuit boards.

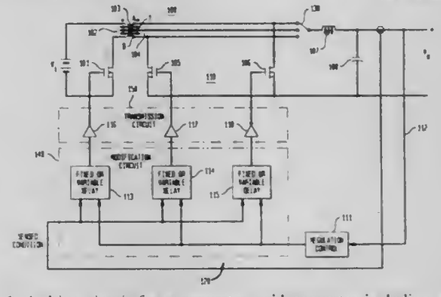
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**5,742,491**

**POWER CONVERTER ADAPTIVELY DRIVEN**

**Wayne C. Bowman, Allen, and Van A. Niemela, Dallas, both of Tex., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Aug. 9, 1995, Ser. No. 513,198**
**Int. Cl.[6] H02M** *3/335*
**U.S. Cl. 363—21** **26 Claims**



1. A drive circuit for a converter, said converter including an inverter and a synchronous rectifier, said drive circuit comprising:

a modulation circuit for generating a drive waveform for controlling said inverter and said synchronous rectifier employing a negative feedback loop;

a modification circuit, coupled to said modulation circuit, for sensing an operating condition of said converter and shifting a portion of said drive waveform as a function of said operating condition, said modification circuit thereby creating a variable drive waveform from said drive waveform without employing negative feedback; and

a transmission circuit, coupled to said modification circuit, for applying said variable drive waveform to said converter, thereby allowing a variable nonconcurrent change in state of said inverter and said synchronous rectifier according to said function of said operating condition.

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**5,742,492**

**METHOD OF DRIVING VIBRATING COMPRESSORS**

**Naoki Akazawa, and Masao Namai, both of Nitta-machi, Japan, assignors to Sawafuji Electric Co., Ltd.**

**Filed Aug. 27, 1996, Ser. No. 703,643**
**Claims priority, application Japan, Aug. 28, 1995, 7-218824**
**Int. Cl.[6] H02M** *3/335;* **F04B** *17/04*
**U.S. Cl. 363—26** **6 Claims**

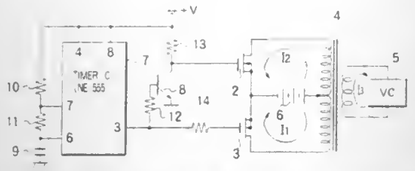
1. A method of driving a vibrating compressor, comprising:

feeding an a-c voltage to a vibrating compressor by converting d-c voltage into a-c voltage;

varying a suction time and a compression time within one cycle of said vibrating compressor;

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using two switching devices as a means for converting d-e voltage into a-c voltage;

driving said two switching devices by pulses and alternately turning said switching devices on and off; and

using a pulse generated by a timer IC and a pulse reversed in a pulse reversing circuit to drive said switching devices by pulses.

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**5,742,493**

**POWER CONVERSION APPARATUS**

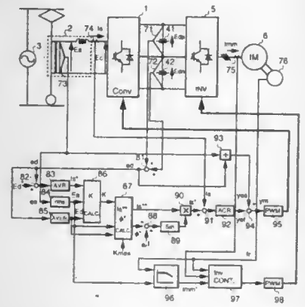
**Satoru Ito, Hitachi; Satoru Inarida, and Kiyoshi Nakamura, both of Hitachinaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 30, 1996, Ser. No. 705,655**

**Claims priority, application Japan, Sep. 8, 1995, 7-230990**

**Int. Cl.[6] H02M** *5/45*

**U.S. Cl. 363—37** **5 Claims**



1. A power conversion apparatus comprising: a PWM power converter for converting A.C. to D.C., said PWM power converter having an inductance element connected to an A.C. power supply side thereof and a capacitor or battery connected to a D.C. load side thereof; a voltage control device provided for said power converter for adjusting its D.C. output voltage; a power factor control device provided for said power converter for adjusting a power factor on the A.C. side thereof; a command device for producing command signals, including a PWM modulation factor signal and a phase signal, in response to said voltage and an output from said power factor control device; and a PWM modulation device for controlling said power converter in response to said command signals; wherein said power factor control device includes enable means for allowing said power factor to be reduced when a control parameter related to a modulation factor of said power converter approaches its limit value; and limit means for limiting the power of the D.C. load when a control parameter related to an input power of said power converter approaches its limit value.

**5,742,494**

**CIRCUIT ARRANGEMENT FOR DRIVING A CONVERTER**

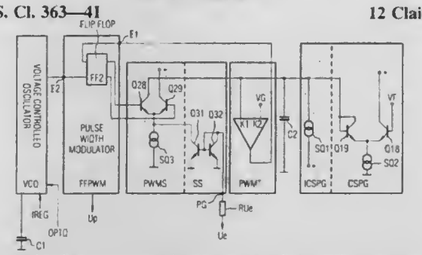
**Bogdan Brakus, Stockdorf, and Heinz-Jürgen Roth, München, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, and SGS-Thomson Microelectronics, Grasbrunn, both of Germany**

**Filed Apr. 25, 1997, Ser. No. 836,249**

**Claims priority, application Germany, Oct. 28, 1994, 44 38 671.0**

**Int. Cl.[6] H02M** *1/12*

**U.S. Cl. 363—41** **12 Claims**



1. A circuit arrangement for driving a switch-mode converter or switch-mode power supply, comprising:

an oscillator which is connected to a pulse-width modulator;

an electronic switch which is arranged in a main circuit of the converter, the electronic switch being controlled by a switch-on signal whose frequency is variable via at least one control input of the oscillator, and whose duty ratio is variable via at least one control input of the pulse-width modulator;

the pulse-width modulator having a capacitive storage unit which is connected to a discharge unit, to a charging unit and to a first input of a comparator whose second input is connected to a first reference voltage;

the charging unit connected to a further comparison unit;

a control unit having a first input connected to an output of the comparator, and having a second input connected to an output of the oscillator;

at least one output of the control unit connected to the discharge unit;

wherein, controlled by the oscillator, discharging of the storage element, originating from a defined potential, is initiated by the control unit while the switch-on signal is emitted from the control unit;

wherein, on reaching the first reference voltage which is applied to the comparator, the discharging and the switch-on signal are ended by an output signal of the comparator which is passed to the control unit; and

wherein, subsequently, the storage element is once again charged to the defined potential.

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**5,742,495**

**POWER CONVERTER WITH SOFT SWITCHING**

**Fabio Barone, Randwick NSW, Australia, assignor to Unisearch Limited, Australia**

**PCT No. PCT/AU95/00041, § 371 Date Oct. 8, 1996, § 102(e) Date Oct. 8, 1996, PCT Pub. No. WO95/21486, PCT Pub. Date Aug. 10, 1995**

**PCT Filed Feb. 1, 1995, Ser. No. 722,263**

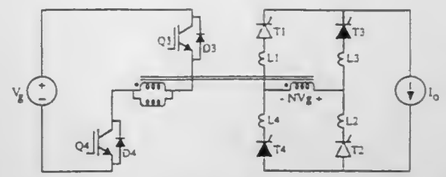
**Claims priority, application Australia, Feb. 1, 1994, PM3643**

**Int. Cl.[6] H02M** *5/45*

**U.S. Cl. 363—65** **14 Claims**

1. A power conversion apparatus, comprising first and second switching networks, the first switching network being arranged to be connected to a source of constant voltage and the second switching network being arranged to be connected to a source of constant current, a link between the first and second switching network by way of which electrical power may flow between them, and control means for controlling switches in the switching networks to control the flow of electrical power, the control means





being arranged to control the switching networks to exhibit a plurality of operating states during a single cycle of operation, the operating states including at least one forward power state, in which power flows across the link from the voltage source to the current source and at least one reverse power state in which power flows across the link from the current source to the voltage source, and at least one operating state of at least one of the switching networks is a zero power flow state, wherein there is no power flow between the link and the at least one switching network.

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**5,742,496**

**INVERTOR APPARATUS FOR CONVERTING A DC VOLTAGE TO A SINGLE-PHASE AC VOLTAGE**

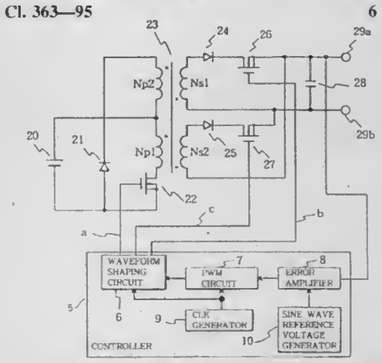
**Tsuyoshi Tsutsumi, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Oct. 24, 1996, Ser. No. 740,202**

**Claims priority, application Japan, Oct. 31, 1995, 7-283538**

**Int. Cl.[6] H02M** *3/24;3/335;1/12*

**U.S. Cl. 363—95** **6 Claims**



1. An inverter apparatus which includes a converter circuit which receives a DC voltage as an input thereto and converts the DC voltage into positive and negative half sine wave voltages of a voltage value corresponding to a width of a driving pulse and produces an AC output voltage from an output of said converter circuit, comprising:

first and second switch circuits receiving outputs of the positive and negative half sine wave voltages of said converter circuit, respectively, and

a controller for generating a plurality of pulses within a half cycle of the AC output voltage, and when the positive half sine wave voltage is to be formed, providing said second switch circuit in an off state and driving said first switch circuit and said converter circuit, but when the negative half sine wave voltage is to be formed, providing said first switch circuit in an off state and driving said second switch circuit and said converter circuit, based on the pulse signal;

said controller modulating the width of each pulse of the pulse signal so that the AC output voltage may be a sine wave AC voltage.

**5,742,497**

**COLD-CATHODE FLUORESCENT LAMP LIGHTING DEVICE**

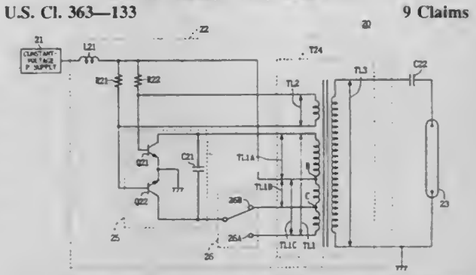
**Kazuo Hashimoto, and Hirokazu Nakayoshi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Sep. 19, 1996, Ser. No. 715,580**

**Claims priority, application Japan, Sep. 21, 1995, 7-267740**

**Int. Cl.[6] H02M** *7/538;* **H05B** *37/02*

**U.S. Cl. 363—133** **9 Claims**



1. A cold-cathode fluorescent lamp lighting device which converts a direct-current voltage into an alternating voltage and supplies it to a cold-cathode fluorescent lamp, comprising:

voltage converting means for converting said direct-current voltage into said alternating voltage;

voltage transforming means for boosting said alternating voltage into a high-tension alternating voltage; and

change-over means for adjusting a step-up transformation ratio of said voltage transforming means to change said alternating voltage into a first high-tension alternating voltage or into a second high-tension alternating voltage having a voltage value lower than that of the first high-tension alternating voltage;

wherein said change-over means changes said alternating voltage into said first high-tension alternating voltage when lighting of said cold-cathode fluorescent lamp is to be started, and changes said alternating voltage into said second high-tension alternating voltage into said second high-tension alternating voltage to maintain lighting of said cold-cathode fluorescent lamp.

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**5,742,498**

**MOTOR VEHICLE ALTERNATOR HAVING SEALED RECTIFIERS FOR EFFICIENT HIGH-TEMPERATURE OPERATION**

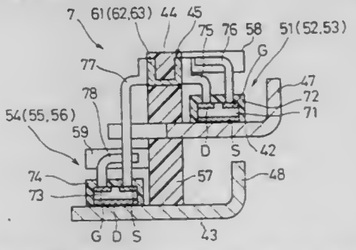
**Makoto Taniguchi, Oobu; Atsushi Umeda, Anjo, and Shin Kusase, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed May 31, 1996, Ser. No. 657,677**

**Claims priority, application Japan, Jun. 2, 1995, 7-136552**

**Int. Cl.[6] H02M** *1/00;* **H02P** *9/04*

**U.S. Cl. 363—145** **22 Claims**



1. An alternator for charging a battery, said alternator comprising:

a magnetic device for being rotatably driven by a drive source;

an armature having an armature winding for generating an AC output responsive to rotation of said magnetic device; and

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a rectifier including a rectifying device for converting said AC output to a DC output by rectifying said AC output, a radiating fin for radiating heat from said rectifying device, and a terminal plate holding a plurality of external input/output terminals electrically coupled to said rectifying device;

wherein said rectifying device includes at least one silicon carbide MOSFET and an electrically insulating sealing member for sealing said at least one MOSFET with at least one of said radiating fin and said external input/output terminals by covering said at least one of said radiating fin and said external input/output terminals.

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**5,742,499**

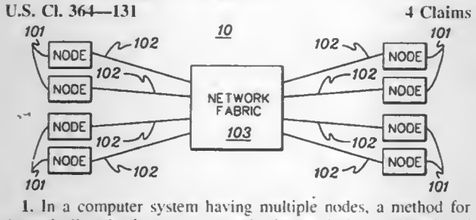
**METHOD AND SYSTEM FOR DYNAMICALLY SELECTING A COMMUNICATION MODE**

**David Corder Reynolds, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 223,339, Apr. 5, 1994, abandoned. This application Jul. 22, 1996, Ser. No. 681,200**

**Int. Cl.[6] G06F** *13/372;13/374*

**U.S. Cl. 364—131** **4 Claims**




1. In a computer system having multiple nodes, a method for dynamically selecting one communication mode from a plurality of communication modes for distributing information from an originating node of said multiple nodes to a predetermined number of other nodes of said multiple nodes, said method comprising the steps of:

(a) obtaining a run-time user parameter associated with said distributing information;

(b) obtaining a run-time hardware parameter comprising a dynamic characteristic of the computer system;

(c) selecting one communication mode from the plurality of communication modes using said associated run-time user parameter and said run-time hardware parameter so as to optimize performance of the computer system, said one communication mode determining how the information is to be distributed from the originating node of said multiple nodes to the predetermined number of other nodes of the multiple nodes, wherein said selecting includes employing said run-time user parameter and said run-time hardware parameter in a predefined decision function to select said one communication mode from said plurality of communication modes, said predefined decision function employing a plurality of predefined relationships, wherein at least some predefined relationships of said plurality of predefined relationships comprise system use relationships which project for each communication mode an anticipated resource loading within the computer system for distribution of said information using said communication mode, said selecting including employing said projections of said at least some predefined relationships within said predefined decision function to select said one communication mode from said plurality of communication modes to minimize said anticipated resource loading within the computer system due to distribution of said information from said originating node to said predetermined number of other nodes of said multiple nodes; and

(d) distributing said information from the originating node of said multiple nodes to the predetermined number of other nodes of said multiple nodes using said selected one communication mode; and

wherein said selecting includes employing a predefined time relationship within said decision function, said predefined time relationship comprising a time interval relationship for performing the particular operation using the selected one communication mode, said selected one communication mode comprising an all-to-all mode broadcast, and wherein said predefined time relationship comprises:

$$T = 3(N-1)\left(L + \frac{m}{N}x\right)$$

wherein:

T=time required to complete mode;

N=number of nodes;

L=transmission latency;

m=message length; and

x=time required to transmit one byte of data.

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**5,742,500**

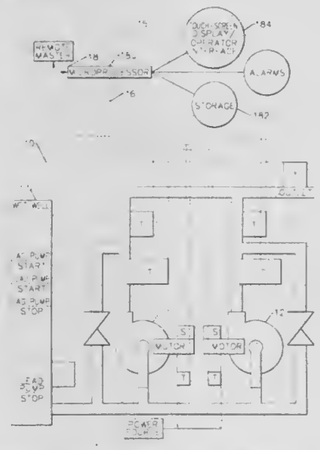
**PUMP STATION CONTROL SYSTEM AND METHOD**

**William A. Irvin, 245 Cokesbury Ct., Green Cove Springs, Fla. 32043**

**Filed Aug. 23, 1995, Ser. No. 518,190**

**Int. Cl.[6] G06F** *19/00*

**U.S. Cl. 364—138** **53 Claims**




1. A system for monitoring operating parameters of a pump station having a pump for pumping a liquid, the system comprising:

means for sensing a plurality of operating parameters of the pump station;

means for determining a flow cycle time of the pump station;

means in communication with the sensing means for transmitting the operating parameters to an operator in real time;

means in communication with the sensing means for storing the sensed operating parameters at predetermined time intervals over a predetermined period of time;

means in communication with the storing means for displaying a time history of the operating parameters; and

means in communication with the sensing means for calculating a real-time cost parameter of the system averaged over an integral number of flow cycles.

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**5,742,501**

**Patent Not Issued For This Number**



**5,742,502**

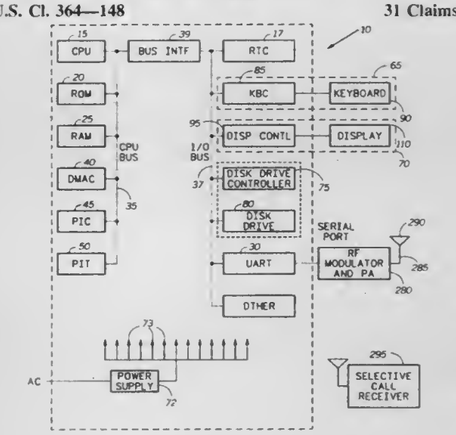
**METHOD AND APPARATUS FOR GENERATING SYNCHRONOUS DATA TRANSMISSIONS IN A DEVICE HAVING A UNIVERSAL ASYNCHRONOUS RECEIVER/TRANSMITTER**

**Gerald Robert King, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Apr. 25, 1995, Ser. No. 428,048**

**Int. Cl.[6] G05B** *13/02*

**U.S. Cl. 364—148** **31 Claims**




1. An asynchronous system for transmitting a synchronous stream of data comprising:

a universal asynchronous transmitter/receiver having means for accepting data including framing bits intended for asynchronous transmission,

timing means for generating a signal upon completion of the asynchronous transmission of the data character,

an output line controllable to go to a data state independent of the data states of the bits of the data character; and

central processing means, responsive to the timing means, for controlling the output line of the universal asynchronous transmitter/receiver to go to a series of data states corresponding to individual bits of the synchronous data stream, each individual bit having a period corresponding to the signal generated by the timing means and wherein said central processing means eliminates the framing bits from the asynchronous stream of data to accomplish synchronous data transmission.

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**5,742,503**

**USE OF SATURATION RELAY FEEDBACK IN PID CONTROLLER TUNING**

**Cheng-ching Yu, Taipei, Taiwan, assignor to National Science Council, Taipei, Taiwan**

**Filed Mar. 25, 1996, Ser. No. 622,432**

**Int. Cl.[6] G05B** *11/42;13/02*

**U.S. Cl. 364—162** **47 Claims**

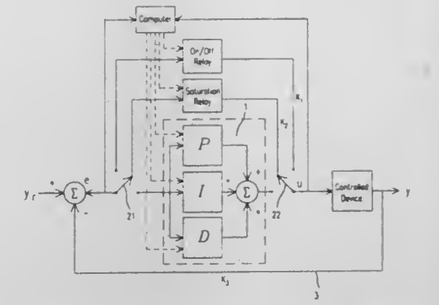
1. A method for finding the ultimate properties of a transfer function employed in the autotuning of a PID controller, comprising steps of

(a) providing a first specific value for said transfer function;

(b) computing a first ultimate parameter of said transfer function in response to said first specific value;

(c) modifying said first specific value in response to said first ultimate parameter in order to obtain a second specific value;

(d) generating a second ultimate parameter for a characteristic of said transfer function in a specified range in response to said second specific value;




(e) obtaining a precise parameter of said PID controller in response to said second ultimate parameter.

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**5,742,504**

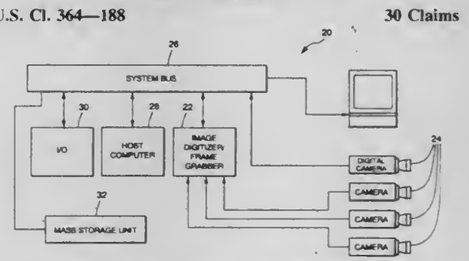
**METHOD AND SYSTEM FOR QUICKLY DEVELOPING APPLICATION SOFTWARE FOR USE IN A MACHINE VISION SYSTEM**

**Frank Meyer, Wootton; Frederico P. de Magalhaes, Bedford; Benjamin J. Chappel, Bucks, and Christopher J. Cooper, Herts, all of England, assignors to Medar, Inc., Farmington Hills, Mich.**

**Filed Nov. 6, 1995, Ser. No. 554,188**

**Int. Cl.[6] G05B** *9/02*

**U.S. Cl. 364—188** **30 Claims**




1. A method for quickly developing application software for use in a machine vision system using an open computer system operating in an open programming environment, the method comprising the steps of:

storing an application development program, including a first set of custom control programs representing possible components of a user interface for the machine vision system, the first set of custom control programs defining a first set of custom controls obeying an open standard which defines properties for programming the first set of custom controls;

storing a second set of custom control programs representing possible machine vision algorithms for the machine vision system, the second set of custom control programs defining a second set of custom controls obeying the open standard which defines properties for programming the second set of custom controls;

storing hardware operating parameters corresponding to possible hardware for use in the machine vision system, the hardware operating parameters defining a third set of custom controls obeying the open standard which defines properties for programming the third set of custom controls;

displaying graphical representations of the possible components, the possible hardware and the possible machine vision algorithms;

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receiving commands from a user of the open computer system to select a first custom control program corresponding to a desired component of the user interface, desired hardware operating parameters corresponding to desired hardware and a second custom control program corresponding to a desired machine vision algorithm; and

linking the first custom control program with the desired hardware operating parameters to the second custom control program to form the application software in response to the commands wherein the step of linking includes the step of setting the properties of the custom controls of the selected programs and hardware operating parameters.

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**5,742,505**

**ELECTRONIC TRANSLATOR WITH INSERTABLE LANGUAGE MEMORY CARDS**

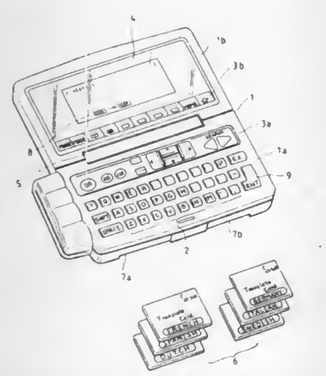
**Hideo Fushimoto, Tokyo, and Shinichi Matsumoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 640,165, Jan. 11, 1991, abandoned. This application Jun. 8, 1994, Ser. No. 257,427**

**Claims priority, application Japan, Jan. 18, 1990, 2-7245; Jan. 18, 1990, 2-7246; Jan. 18, 1990, 2-7247**

**Int. Cl.[6] G06F *17/20***

**U.S. Cl. 364—419.01** **12 Claims**



1. An electronic apparatus using an external memory device containing language information of a predetermined language and detachably mountable on a main body of said apparatus, said apparatus comprising:

display means for displaying characters specific to the predetermined language stored in the external memory device;

display control means for controlling said display means to display the characters specific to the predetermined language stored in the external memory device when the external memory device is mounted on said main body of said apparatus;

selection means for selecting a desired character from the characters displayed on said display means;

key input means for inputting at least one character; and

processing means for processing a word comprising a character selected by said selection means and at least one character input by said key input means.

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**5,742,506**

**STARTING DEVICE FOR A PASSENGER PROTECTING DEVICE**

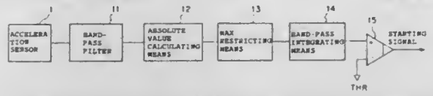
**Nobuyoshi Kura; Mitsunori Maruyama, both of Tokyo; Hidehiko Kinoshita, Hyogo; Takashi Furui, Hyogo, and Yukihiro Okimoto, Hyogo, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan**

**Filed Mar. 13, 1995, Ser. No. 402,357**

**Claims priority, application Japan, Jun. 20, 1994, 6-137377**

**Int. Cl.[6] B60R *21/32***

**U.S. Cl. 364—424.05** **14 Claims**




1. A starting device for a passenger protecting device outputting a starting signal based on an output signal of an acceleration sensor for detecting an acceleration in collision comprising:

a band-pass filter for filtering a component of the output signal of the acceleration sensor in a specified frequency domain;

an absolute value calculating means for calculating an absolute value of an output signal of the band-pass filter;

an upper limit restricting means for restricting an output signal of the absolute value calculating means by a predetermined upper limit value;

a band-pass integrating means for integrating an output signal of the upper limit restricting means; and

a comparing means for comparing an output of the band-pass integrating means with a predetermined threshold value and outputting the starting signal.

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**5,742,507**

**DRIVING STABILITY CONTROL CIRCUIT WITH SPEED-DEPENDENT CHANGE OF THE VEHICLE MODEL**

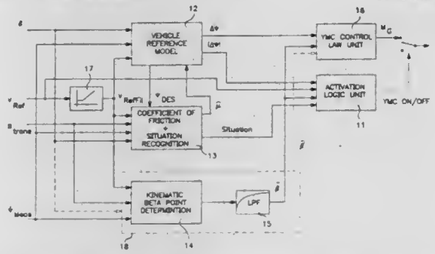
**Alfred Eckert, Bodenheim, Germany, assignor to ITT Automotive Europe GmbH, Frankfurt, Germany**

**Division of Ser. No. 475,389, Jun. 7, 1995. This application Jun. 7, 1995, Ser. No. 473,147**

**Claims priority, application Germany, Apr. 27, 1995, 44 41 959.7**

**Int. Cl.[6] B60K *31/00***

**U.S. Cl. 364—426.01** **13 Claims**




1. A control system for controlling driving stability of a vehicle which has a velocity, a steering angle, a measured yaw rate, and a plurality of brakes to which respective braking pressures are applied, individually, comprising:

means for receiving first signals representing the velocity, second signals representing the steering angle and third signals representing the measured yaw rate;

vehicle model means responsive to the first and second signals for providing one of a first desired yaw rate and a second desired yaw rate, including:

(1) first modeling means for determining the first desired yaw rate while the velocity is within a first predetermined range of values, and



(2) second modeling means for determining the second desired yaw rate while the velocity is within a second predetermined range of values, said first predetermined range including velocity values lower than said second predetermined range;

means coupled to the receiving means and the vehicle model means for comparing the measured yaw rate to the one of the first and second desired yaw rates provided by the vehicle model means, to calculate a difference therebetween;

yawing moment control means responsive to the difference for determining a moment that is applied to the vehicle, so that the measured yaw rate is adjusted towards the desired yaw rate; and

means responsive to the yawing moment control means for determining pressure adjustments that are applied to each brake, individually, to generate the moment, wherein:

the vehicle model means provide the second desired yaw rate when the velocity of the vehicle increases from a first predetermined velocity to a second predetermined velocity which is higher than the first predetermined velocity,

the vehicle model means continues to provide the second desired yaw rate while the velocity of the vehicle decreases from said second predetermined velocity to a third predetermined velocity, and

the vehicle model means provide the first desired yaw rate when the velocity of the vehicle decreases from said third predetermined velocity to a fourth predetermined velocity, said first predetermined velocity being higher than either of said third and fourth predetermined velocities, thereby providing hysteresis in switching between the first and second desired yaw rates.

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**5,742,508**

**AIR CONTROL SUPPORTING SYSTEM**

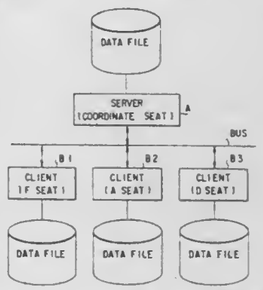
**Yoichi Kusui, Fujisawa, and Tatsuro Ito, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 444,278, May 18, 1995, abandoned. This application Dec. 30, 1996, Ser. No. 781,923**

**Claims priority, application Japan, May 18, 1994, 6-104195**

**Int. Cl.[6] G06F *15/48***

**U.S. Cl. 364—439** **13 Claims**




1. An air control supporting system for supporting air control services of a plurality of air control service staff members who carry out terminal radar control services and routing control services, previously distributed and related to each other, comprising:

a plurality of control seat terminal devices provided respectively for control seats of said plurality of control service staff members, each including an instruction input device for inputting an information request instruction for requesting information regarding an arbitrary airplane to be controlled, and an information transfer instruction for transferring information of an airplane, including information concerning a completed control service, to another seat, and an information display device for displaying said input information regarding said airplane to be controlled in a predetermined format;

information obtaining and managing means for obtaining necessary information for the control services of said plurality of control service staff members, one after another, for each airplane to be controlled, so as to form a database of information regarding each airplane to be controlled;

time schedule management means for managing a time schedule for each airplane to be controlled;

information processing means for reading out necessary information of corresponding airplanes to be controlled, from the information obtaining and managing means on the basis of a time schedule managed by said time schedule management means, and for reading out the information of a designated airplane when there is an information request instruction or an information transfer instruction from any one of said plurality of instruction input device, so as to edit the information in a predetermined format as a control service strip information; and

information output means for outputting the control service strip information on the basis of the time schedule obtained by said information processing means, to information display devices of associated ones of said plurality of control service terminal devices, outputting the control service strip information on the basis of the information request instruction to the information display device of the control seat terminal device via which that information request instruction was input, and outputting control service strip information on the basis of the information transfer instruction to the information display device of a designed control seat terminal device, and deleting the control service information of the corresponding airplanes to be controlled from the information display device of the control seat terminal device from which the information transfer instruction was input.

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**5,742,509**

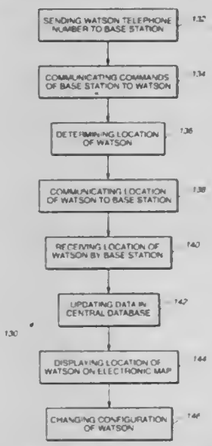
**PERSONAL TRACKING SYSTEM INTEGRATED WITH BASE STATION**

**Steven H. Goldberg, Cupertino; Greg Kremer, San Jose, and Paul M. Davis, Mountain View, all of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.**

**Filed Apr. 11, 1995, Ser. No. 420,242**

**Int. Cl.[6] G06F *165/00***

**U.S. Cl. 364—449.5** **3 Claims**




1. A method of personal tracking, said method using a personal tracking system; said system comprising at least one watson communication device and a base station; each said watson communication device having a watson ID-number; each said watson device including a position determining device, a receiver, a communication device, and a microprocessor; said base station including a computer, a modem, and a base station software (BSS); said BSS

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including a user interface, a central database, a non-volatile memory, a plurality of other applications, and a communications controller; said method comprising the steps of:

sending each said watson ID-number to said base station by each said watson device;

communicating the commands of said base station to each said watson communications device;

determining the location of each said watson device;

communicating the location of each said watson device to said base station;

receiving the location of each said watson device by said base station;

updating the data related to each said watson device in said non-volatile storage of said base station;

displaying the location of each said watson device on a electronic map; said electronic map being a part of said base station software;

changing the configuration of each said watson device by receiving commands and data from said base station by said communication means of each said watson device, by transmitting said base-station-commands and base-station-data to said microprocessor means of each said watson device, and by processing said base-station commands and base-station-data by said watson microprocessor;

updating commands and data stored in said non-volatile memory by updating vehicle commands, wherein each said watson device is installed in the vehicle; and wherein the step of updating commands and data stored in said non-volatile memory of at least one said watson device further includes the step of receiving the route and the schedule information by at least one said watson device from said base station, and wherein at least one said watson device reports its adherence to or deviation from said received route and said received schedule to said base station.

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**5,742,510**

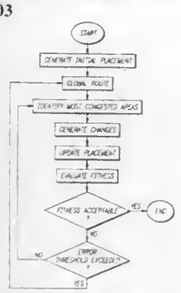
**SIMULTANEOUS PLACEMENT AND ROUTING (SPAR) METHOD FOR INTEGRATED CIRCUIT PHYSICAL DESIGN AUTOMATION SYSTEM**

**Michael D. Rostoker, Boulder Creek; James S. Koford, San Jose; Edwin R. Jones, Sunnyvale; Douglas B. Boyle, Palo Alto, and Ranko Scepanovic, Cupertino, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.**

**Continuation of Ser. No. 559,206, Nov. 13, 1995, which is a continuation of Ser. No. 229,826, Apr. 19, 1994, Pat. No. 5,495,419. This application Feb. 21, 1996, Ser. No. 604,181**

**Int. Cl.[6] G06F** *19/00*

**U.S. Cl. 364—468.03** **28 Claims**




1. A method of optimizing a cell placement for an integrated circuit chip, comprising the steps of:

(a) routing said cell placement;

(b) identifying congested areas of said routing;

(c) selectively applying a congestion reduction algorithm only within said congested areas to alter said cell placement in said congested areas;

(d) computing a cell placement fitness; and

(e) if said cell placement fitness is below a predetermined value, repeating steps (b) to (d).

**5,742,511**

**MODELS FOR COMPUTER INTEGRATED MANUFACTURING**

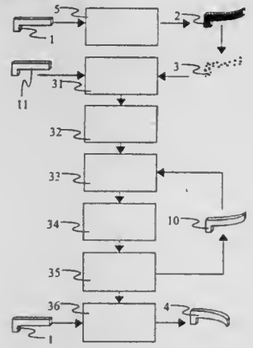
**Daniel Chassé, St. Constant, and Bert van den Berg, Gloucester, both of Canada, assignors to National Research Council of Canada, Ottawa, Canada**

**Filed Jun. 26, 1995, Ser. No. 494,526**

**Claims priority, application Canada, May 29, 1995, 2150432**

**Int. Cl.[6] G06F** *19/00;* **G06G** *7/64;7/66*

**U.S. Cl. 364—468.04** **20 Claims**




1. A method of adjusting a first electronic model of an object comprising the steps of:

a) providing the object based on the first electronic model;

b) producing an electronic facsimile of the object;

c) providing a second electronic model of an object;

d) locating at least a difference between the electronic facsimile of the object and the second electronic model by comparing the electronic facsimile of the object to the second electronic model;

e) determining at least one phenomenon that would have caused said at least a difference between the electronic facsimile of the object and the second electronic model; and

f) applying said at least one phenomenon in an inverse manner to the first electronic model of the object so as to produce an at least partially corrected electronic model for use in manufacturing.

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**5,742,512**

**ELECTRONIC ELECTRICITY METERS**

**Ellen D. Edge, Portsmouth; Roland J. Provost, Dover, both of N.H.; Thomas Maehl, Philadelphia, Pa.; Gregory P. Lavoie, Lee, N.H.; Mark J. Plis, Barrinton, N.H.; Mark E. Hoffman, Rochester, N.H., and John E. Hershey, Ballston Lake, N.Y., assignors to General Electric Company, New York, N.Y.**

**Filed Nov. 30, 1995, Ser. No. 565,464**

**Int. Cl.[6] G08B** *21/00;* **G06F** *17/00*

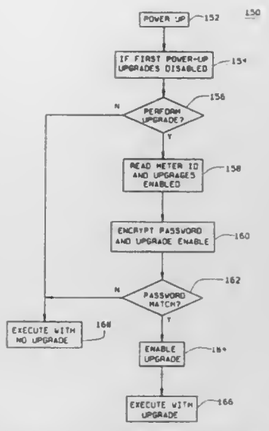
**U.S. Cl. 364—480** **19 Claims**

1. A microcomputer for an electronic electricity meter, said microcomputer configured to be electrically coupled to an option board, the option board being a high function option board, the meter further including an optical port electrically coupled to the high function option board, said microcomputer configured to:

detect whether the option board has been electrically connected thereto; and

if the option board is electrically connected thereto, execute a routine associated with the functionality of the option board, prior to executing the routine associated with the functionality






of the option board, the option board being enabled by transmitting an enable signal from an external computer via the optical port to the high function option board.

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**5,742,513**

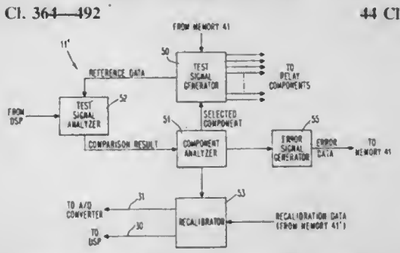
**METHODS AND SYSTEMS FOR AUTOMATIC TESTING OF A RELAY**

**Redjem Bouhenguel, North Lauderdale, and James P. Garitty, Coral Springs, both of Fla., assignors to ABB Power T&D Company Inc., Raleigh, N.C.**

**Filed May 15, 1996, Ser. No. 647,638**

**Int. Cl.[6] H02H** *3/00;7/26*

**U.S. Cl. 364—492** **44 Claims**




31. A system for automatic and continuous testing of a protective relay system comprising:

a memory means for storing a plurality of sets of reference data each set corresponding to one of a plurality of test signals;

a first processing means coupled to the memory means for generating the plurality of test signals based on corresponding sets of reference data on a continuous basis;

a selection means coupled to the test signal generation means for selecting one of the plurality of test signals and defining the same as a selected test signal;

a second processing means interfaced to accept the selected test signal and for processing the selected test signal in accordance with a predefined procedure to generate an output of selected test data; and

said first processing means being interfaced to accept the selected test data and for comparing the selected test data with the set of reference data corresponding to the selected test signal to identify a difference, if any, indicative of improper operation of the protective relay system.

**5,742,514**

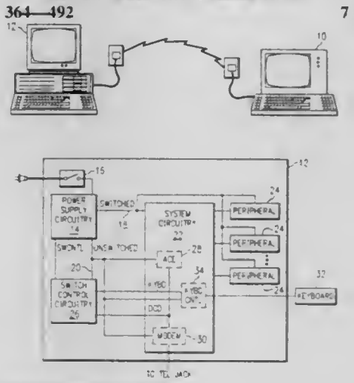
**INTEGRATED REMOTE ASYNCHRONOUS POWER SWITCH**

**Thomas Joseph Bonola, Tomball, Tex., assignor to Compaq Computer Corporation, Houston, Tex.**

**Continuation of Ser. No. 350,512, Dec. 6, 1994, abandoned, which is a continuation of Ser. No. 963,375, Oct. 20, 1992, abandoned. This application Sep. 11, 1996, Ser. No. 712,186**

**Int. Cl.[6] G06F** *11/30;* **H04M** *11/00*

**U.S. Cl. 364—492** **7 Claims**




1. A computer system comprising:

data processing circuitry;

a single power supply for receiving power from an AC power source and generating a DC power therefrom, said power supply including a switched power node that supplies DC power to said data processing circuitry responsive to a power control signal and an unswitched power node that supplies DC power independent of said power control signal;

circuitry for outputting a communications control signal indicating a request for communication from a remote computer; and

switching circuitry coupled to said unswitched power node and said outputting circuitry for generating said power control signal to said power supply responsive to said communications control signal,

wherein said switching circuitry comprises circuitry for detecting a first state of the communication control signal and disabling power through said switched power node responsive thereto,

and wherein said switching circuitry further comprises override circuitry for enabling power through said switched power node while said communication control signal is in said first state, wherein said override circuitry comprises circuitry for detecting a predetermined keyboard sequence and enabling power through the switched power node responsive thereto.

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**5,742,515**

**ASYNCHRONOUS CONVERSION METHOD AND APPARATUS FOR USE WITH VARIABLE SPEED TURBINE HYDROELECTRIC GENERATION**

**Mark A. Runkle, Schenectady, N.Y.; Donald Gordon McLaren; Glenn Henry Ardley, both of Peterborough, Canada; Einar V. Larsen, Charlton, N.Y., and Konrad Weeber, Ennismore, Canada, assignors to General Electric Co., Schenectady, N.Y.**

**Continuation-in-part of Ser. No. 426,201, Apr. 21, 1995, abandoned. This application Oct. 31, 1995, Ser. No. 550,940**

**Int. Cl.[6] F01D** *15/10*

**U.S. Cl. 364—494** **20 Claims**

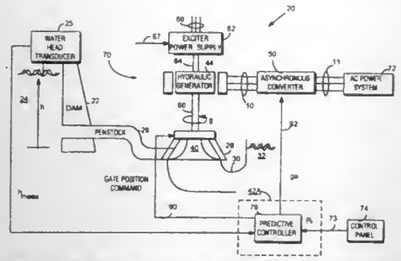
1. A method of transmitting electrical power from a hydroturbine unit to an electrical utilization system, the method comprising:

obtaining a signal indicative of water head;

using the signal indicative of water head to control (1) gate position of a variable speed hydro-turbine unit and (2) rotor

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speed of an asynchronous rotary converter connected between the hydro-turbine unit and the electrical utilization system, whereby the asynchronous rotary converter generates an output signal to the variable speed hydro-turbine unit; and

using output signal to control a rotational speed of a hydraulic generator included in the hydro-turbine unit and thereby obtain a requested power level to the electrical utilization system.

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**5,742,516**

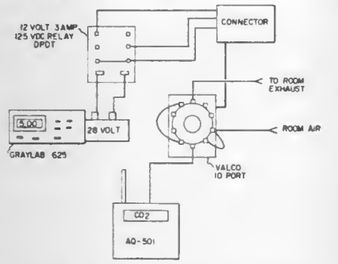
**INDOOR AIR QUALITY AND VENTILATION ASSESSMENT MONITORING DEVICE**

**Robert Olcerst, 505 Drury La., Baltimore, Md. 21229**

**Filed Mar. 17, 1994, Ser. No. 214,194**

**Int. Cl.[6] F24F** *3/16;7/00*

**U.S. Cl. 364—496** **3 Claims**




1. A method for controlling the quality of the air within a confined environment comprising:

(a) introducing air into one or more sampling ports connected to one or more detectors of toxic chemicals;

(b) introducing a known amount of a gas detectable by one or more of said detection devices into said confined environment;

(c) analyzing the output from the detectors;

(d) comparing the output from said detectors with numerical standards;

(e) controlling the functions of at least one air handling system; and

(f) monitoring the function of the at least one air handling system.

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**5,742,517**

**METHOD FOR RANDOMLY ACCESSING STORED VIDEO AND A FIELD INSPECTION SYSTEM EMPLOYING THE SAME**

**Jeffrey A. Van Den Bosch, Grand Rapids, Mich., assignor to Integrated Computer Utilities, LLC, Grand Rapids, Mich.**

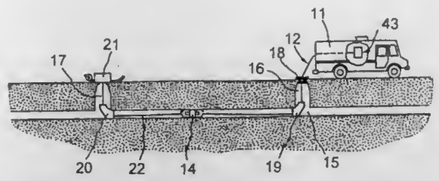
**Filed Sep. 14, 1995, Ser. No. 528,434**

**Int. Cl.[6] E02D** *29/12*

**U.S. Cl. 364—507** **30 Claims**

1. A field inspection system comprising:

receiving means for receiving video signals representing video footage of the field item under inspection;




compressing means for compressing the received video signal to provide compressed video data having a plurality of sequential frames including reference frames; and

means for creating an electronic logsheet including a table listing points of interest recorded in the video footage and, for each point of interest, a pointer identifying a reference frame of said compressed video data closest to a beginning point of the video footage showing the associated point of interest such that said electronic logsheet may subsequently be displayed to allow the user to select one of the listed points of interest using an input device and to thereby access and view the video footage showing the selected point of interest.

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**5,742,518**

**STICTION MODEL FOR A HEAD-DISC INTERFACE OF A RIGID DISC DRIVE**

**Jing Gui, Fremont, and Bruno Marchon, Palo Alto, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.**

**Filed Jul. 8, 1996, Ser. No. 676,718**

**Int. Cl.[6] G01D** *3/028*

**U.S. Cl. 364—508** **16 Claims**



1. A method of establishing an optimum stiction level on a given disc surface comprising establishing a glide height and available motor torque to a substantial approximation for a given disc drive, and thereafter establishing an optimum stiction level for the disc surface including defining a normal force on the slider; defining a total meniscus force between the disc surface and the slider; defining a quasi-equilibrium state for a disjoining pressure of the film on the surface of the disc relative to said meniscus force; describing a total volume of lubricant which is conserved during meniscus formation on the surface of the disc; and thereafter calculating the stiction force for the disc surface.

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**5,742,519**

**INTEGRATED SYSTEMS FOR TESTING AND CERTIFYING THE PHYSICAL, FUNCTIONAL, AND ELECTRICAL PERFORMANCE OF IV PUMPS**

**Robert R. McClendon, Peoria, and Aleandro DiGianfilippo, Scottsdale, both of Ariz., assignors to Spectrel Partners, L.L.C., Phoenix, Ariz.**

**Division of Ser. No. 293,537, Aug. 19, 1994. This application Sep. 28, 1995, Ser. No. 535,544**

**Int. Cl.[6] G01F** *1/00*

**U.S. Cl. 364—510** **15 Claims**

1. A system for testing an intravenous fluid pump comprising

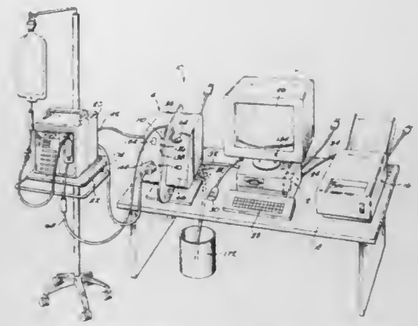
a container adapted to be coupled in liquid flow communication with the pump for receiving liquid conveyed by the pump.

a weight sensor for sensing weight of the container as the pump conveys liquid into the container.

a test controller including

a first element that commands the pump to convey liquid into the container under prescribed conditions including a prescribed test flow rate and a prescribed test period,





a second element that monitors changes in weight sensed by the weight sensor during the prescribed test period and derives therefrom a gravimetric test measurement comprising at least one of an actual flow rate of liquid into the container and an actual liquid volume delivered to the container, and

a third element for comparing the gravimetric test measurement to an outcome expected based upon the prescribed conditions, the outcome including at least one of a cumulative liquid volume delivered to the container and a range of flow rate accuracy based upon the prescribed test flow rate and for generating a test output comprising a pass mark when the comparison meets prescribed criteria and a fail mark when the comparison fails to meet prescribed criteria, and

an output device coupled to the third element for communicating the test output in alpha or numeric or alpha-numeric format.

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**5,742,520**

**COLOR PICTURE PROCESSING METHOD AND COLOR PICTURE PROCESSING APPARATUS**

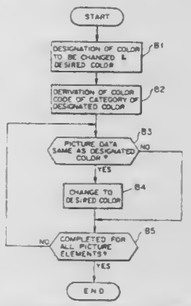
**Keiji Uchikawa, Kamakura; Shoji Suzuki, Kawasaki; Masanaga Tokuyo, Kawasaki, and Masahiro Mori, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Jul. 28, 1995, Ser. No. 508,994**

**Claims priority, application Japan, Oct. 25, 1994, 6-260716**

**Int. Cl.[6] G06F** *19/00;* **G01J** *3/46*

**U.S. Cl. 364—526** **42 Claims**




1. A color picture processing method, comprising the steps of:

discriminating which one of a plurality of categories of color information inputted color picture data belong, the categories being based on a plurality of classified colors;

converting the color picture data so as to have the thus discriminated color information to thereby reduce the amount of picture data to be reproduced in the color picture without perceptually degrading picture quality; and

performing succeeding picture processing using the color picture data after the conversion,

wherein the plurality of classified colors is information of a plurality of categories classified based on categorical perception of human beings.

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**5,742,521**

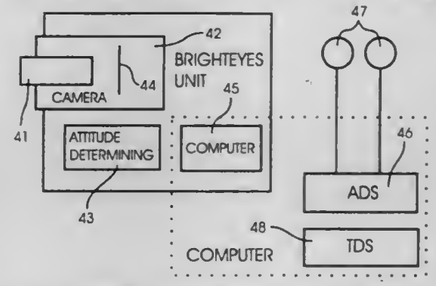
**VISION SYSTEM FOR VIEWING A SPORTING EVENT**

**John Ellenby; Thomas Ellenby, both of San Francisco, and Peter Ellenby, La Jolla, all of Calif., assignors to Criticom Corp., San Francisco, Calif.**

**Continuation-in-part of Ser. No. 119,360, Sep. 10, 1993. This application Sep. 14, 1994, Ser. No. 307,360**

**Int. Cl.[6] G06T** *15/00*

**U.S. Cl. 364—550** **10 Claims**




1. An electro-optic vision system for viewing a sporting event comprising: a camera for producing an electronic image of a scene being addressed, a position and attitude determining means for determining the position and attitude of the camera, a data store responsive to the outputs of said position and attitude determining means and having information stored therein, a computer operable for combining the stored information with the electronic image to produce an augmented image, and an electro-optic display operable for displaying the augmented image, said computer is divided into three computer sub-systems: a portable computer; a Transaction Data System (48); and an Action Data System (46), the portable computer being remotely located but in communication with the Transaction Data System (48) and in communication with the Action Data System (46).

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**5,742,522**

**ADAPTIVE, ON LINE, STATISTICAL METHOD AND APPARATUS FOR DETECTION OF BROKEN BARS IN MOTORS BY PASSIVE MOTOR CURRENT MONITORING AND DIGITAL TORQUE ESTIMATION**

**Birsen Yazici, Clifton Park, and Gerald Burt Kliman, Niskayuna, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Apr. 1, 1996, Ser. No. 627,721**

**Int. Cl.[6] G01R** *23/00;* **G05B** *13/00*

**U.S. Cl. 364—551.01** **16 Claims**

1. An adaptive, on line, statistical method for motor fault detection of broken bars by passive motor current monitoring comprising the steps of:

monitoring a motor current signal during a learning stage;

estimating motor torque to detect load changes;

transforming the current signal into time-frequency spectra;

using the load changes to divide the time-frequency spectra into a plurality of segments representative of good operating modes;

estimating a representative parameter of each segment;

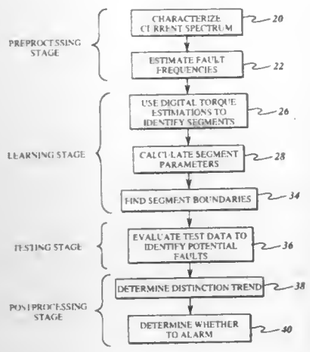
determining a respective boundary of each segment;

monitoring the motor current signal during a test stage to obtain test data, the test stage occurring after the learning stage;

comparing the test data with the representative parameter and the respective boundary of each respective segment to detect the presence of a fault in a motor.

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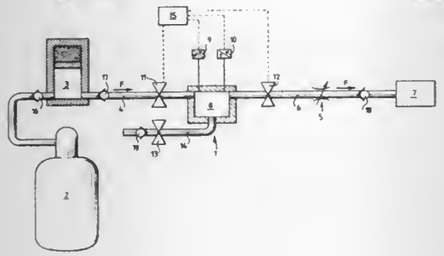



## 5,742,523

## METHOD AND DEVICE FOR SUPPLYING GAS UNDER PRESSURE

**Dominique Thomas, Le Creusot, and Olivier Benrubi, Chalon Sur Saone, both of France, assignors to Seva, Chalon sur Saone, France**

**Filed Dec. 23, 1994, Ser. No. 363,221**
**Claims priority, application France, Dec. 24, 1993, 93 15652**
**Int. Cl.[6] G01F** *3/38*
**U.S. Cl. 364—558** **14 Claims**



1. A method for delivering through a pipe a mass of a selected gas close to a selected predetermined mass value m, to a system at a predetermined working pressure P0 substantially greater than 100 bars, wherein said method comprises the following steps:

injecting a volume of said gas to be delivered into a vessel of known volume V0 until a pressure of said gas in said vessel reaches a predetermined initial high pressure P1, said initial high pressure P1 being greater than said working pressure P0, and closing said vessel, wherein said volume of said vessel is substantially greater than a volume of said mass m at said working pressure P0;

measuring a temperature T of said gas within said vessel;

storing said temperature T in memory;

calculating a final mean pressure P2 substantially greater than said working pressure P0 using a formula:

$$P2 = P1 - \frac{mRT}{V} ;$$

ejecting a said mass m of said gas by opening said vessel to said pipe until said pressure of said gas in said vessel reaches said pressure P2 while maintaining said temperature T of said gas within said vessel at a substantially constant value; and

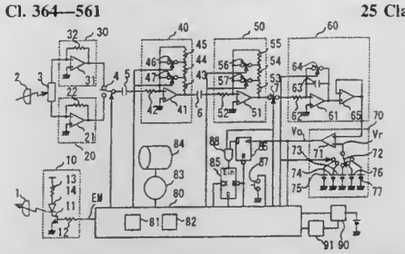
closing said vessel when said gas in said vessel has reached said calculated final mean pressure P2.

## 5,742,524

## DISTANCE MEASURING DEVICE

**Akira Ito; Hiroyuki Saito, and Teruyo Miyata, all of Yotsukaido, Japan, assignors to Seiko Precision Inc., Japan**

**Filed May 24, 1996, Ser. No. 653,431**
**Claims priority, application Japan, May 26, 1995, 7-128292**
**Int. Cl.[6] G03B** *13/36*
**U.S. Cl. 364—561** **25 Claims**



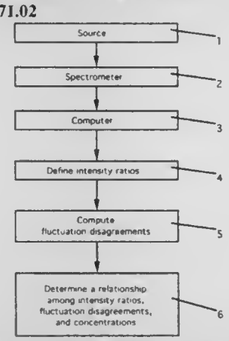
1. A distance measuring device comprising: light-projecting means for performing a light projection operation by projecting a series of light pulses toward an object; light-receiving means for receiving the light projected by said light-projecting means and reflected by the object; a current-to-voltage conversion circuit for converting a current output by said light-receiving means into a voltage; an amplifier circuit for amplifying an output signal of said current-to-voltage conversion circuit; an integration circuit for integrating an output signal of said amplifier circuit; a level judgement circuit for judging the level of an output signal of said integration circuit by comparing it with a reference voltage and for generating an output signal to stop the integration when the level of the output signal of the integration circuit reaches the reference voltage; timer means for counting a time duration during which integration is performed; control means for switching said reference voltage depending on whether said light-projecting means is projecting light or not during the light projection operation; and a calculating circuit for calculating the distance of said object based on the output of said level judgement circuit.

## 5,742,525

## METHOD FOR ELIMINATING THE FLUCTUATION AND DRIFT OF SPECTRAL LINE INTENSITIES

**Yuancai Ye, 27B Martin St., Clemson, S.C. 29631**

**Filed Jan. 10, 1995, Ser. No. 370,988**
**Int. Cl.[6] G01V** *13/00*
**U.S. Cl. 364—571.02** **4 Claims**




1. A method of eliminating the fluctuation and drift of spectral line intensities with an atomic emission spectrometer or a mass spectrometer including:

measuring the intensities of two reference lines and an analytical line for a component in a standard sample j;

correspondingly outputting a time $T_j$ indicating when said standard sample j is measured with a computer which is used to control this spectrometer and store all the measured intensities;



defining an intensity ratio $I_j$ of an analytical line intensity $i_j$ to the first reference line intensity $i_{1j}$ which can be freely set from one of intensities of two reference lines for said component in said standard sample j by the following formula:

$$I_j = i_j / i_{1j}$$

repeating the above measuring, outputting and defining steps until a sequence of standard samples known with a sequence of concentrations $C_j$ are finished to obtain correspondingly a sequence of intensity ratios and a sequence of times wherein j represents one order number of said sequence of standard samples and can be any positive whole number except for zero;

selecting one standard sample s from said sequence of standard samples;

computing a fluctuation disagreement $F_j$ of intensities between said two reference spectral lines by the following formula

$$F_j = (i_{2j} / i_{1j}) - (i_{2s} / i_{1s})$$

wherein $i_{1j}$ and $i_{2j}$ are the first and second reference spectral line intensities, respectively measured for the standard sample j, and $i_{1s}$ and $i_{2s}$ are said first and second reference line intensities, respectively obtained for said selected standard sample s;

repeating the above computing step until a sequence of fluctuation disagreements are obtained correspondingly for said sequence of standard samples; and

using one of the following three equations to regress out a relationship among said sequence of intensity ratios, said sequence of fluctuation disagreements, said sequence of concentrations and said sequence of times

$$I_j = K_{i0} + K_1 C_j + K_{f1} C_j F_j$$

$$I_j = K_{i0} + K_1 C_j + K_{f1} C_j F_j + K_{t1} C_j T_j$$

$$I_j = K_{i0} + K_1 C_j + K_{f1} C_j F_j + K_{t1} C_j T_j + K_{t2} C_j T_j^2$$

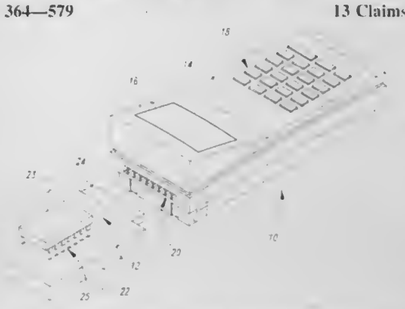
wherein the $K_{i0}$, $K_1$, $K_{f1}$, $K_{t1}$ and $K_{t2}$ are coefficients to be regressed out and stored in the computer.

## 5,742,526

## APPARATUS AND METHOD FOR IDENTIFYING AN INTEGRATED DEVICE

**Thomas W. Voshell, Boise, and Lisa J. Davis, Meridian, both of Id., assignors to Micron Technology, Inc., Boise, Id.**

**Filed Jan. 3, 1996, Ser. No. 582,581**
**Int. Cl.[6] G05B** *19/00*
**U.S. Cl. 364—579** **13 Claims**



1. A device for reading identification data stored in an integrated circuit, the device comprising:

a portable enclosure including a first wall having a first opening and including a second wall having a second opening;

a first connector mounted within said first opening and having a first side that can couple with said integrated circuit and also having a second side;

a processor mounted within said enclosure and having a data terminal coupled to said second side of said connector and having a display terminal, said processor operated under software control to retrieve said identification data from said integrated circuit; and

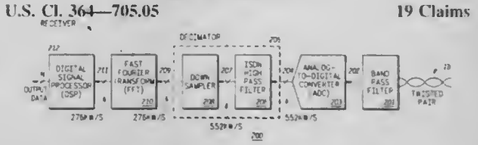
a display mounted within said second opening and having an input terminal coupled to said display terminal of said processor, said display operated to receive said identification data from said processor and to display said identification data.

## 5,742,527

## FLEXIBLE ASYMMETRICAL DIGITAL SUBSCRIBER LINE (ADSL) RECEIVER, CENTRAL OFFICE USING SAME, AND METHOD THEREFOR

**Mathew A. Rybicki; Michael R. May, both of Austin; Matthew A. Pendleton, Cedar Park; Terence L. Johnson, and Peter R. Molnar, both of Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 15, 1996, Ser. No. 616,818**
**Int. Cl.[6] H04L** *5/20*
**U.S. Cl. 364—705.05** **19 Claims**




1. An ADSL receiver, comprising:

a band pass filter having an input for receiving an analog ADSL signal, and output;

an analog-to-digital converter having an input coupled to the output of the band pass filter, and an output for providing a digital signal representative of the analog ADSL signal;

an ISDN filter having an input coupled to the output of the analog-to-digital converter, and an output; and

a down sampler having an input coupled to the output of the ISDN filter, and an output coupled to the time-to-frequency converter;

a time-to-frequency converter having an input coupled to the output of the down sampler, and an output; and

a digital signal processor having an input coupled to the output of the time-to-frequency converter, and an output for providing decoded digital data.

## 5,742,528

**Patent Not Issued For This Number**

## 5,742,529

## METHOD AND AN APPARATUS FOR PROVIDING THE ABSOLUTE DIFFERENCE OF UNSIGNED VALUES

**Larry M. Mennemeier, Boulder Creek, Calif.; Alexander D. Peleg, and Coby Gottlieb, both of Haifa, Israel, assignors to Intel Corporation, Santa Clara, Calif.**

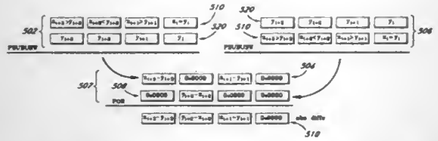
**Filed Dec. 21, 1995, Ser. No. 576,129**
**Int. Cl.[6] G06F** *7/00; 7/38*
**U.S. Cl. 364—715.012** **5 Claims**

1. A machine-readable medium having stored thereon data representing sequences of instructions, said sequences of instructions which, when executed by a processor, cause said processor to perform the steps of:

subtracting with saturation corresponding data elements in a first packed data from said corresponding data elements in a

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second packed data to generate a third packed data in response to a first instruction if said data elements in said second packed data is greater than said data elements in said first packed data, and setting said third packed data to zero if said data elements in said second packed data is not greater than said data elements in said first packed data;

subtracting with saturation said data elements in said second packed data from said corresponding data elements in said first packed data to generate a fourth packed data in response to a second instruction if said data elements in said first packed data is greater than said data elements in said second packed data, and setting said fourth packed data to zero if said data elements in said first packed data is not greater than said data elements in said second packed data; and

performing an operation to combine the data elements of said third packed data and said fourth packed data to generate a fifth packed data in response to a third instruction.

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**5,742,530**

**COMPACT MICROELECTRONIC DEVICE FOR PERFORMING MODULAR MULTIPLICATION AND EXPONENTIATION OVER LARGE NUMBERS**

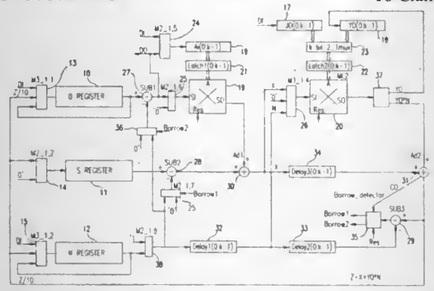
**Carmi David Gressel, Kibbutz Urim; David Hendel, Raanana; Itai Dror; Isaac Hadad, both of Beer-Sheva, and Benjamin Arazi, Omer, all of Israel, assignors to Fortress U&T Ltd., Beer-Sheva, Israel**

**Continuation of Ser. No. 154,220, Nov. 18, 1995, Pat. No. 5,513,133. This application Dec. 28, 1995, Ser. No. 579,951**

**Claims priority, application Israel, Nov. 30, 1992, 103921; Feb. 16, 1993, 104753; Sep. 6, 1993, 106923**

**Int. Cl.[6] G06F** *7/38*

**U.S. Cl. 364—746** **16 Claims**



1. Microelectronic exponentiation apparatus for performing modular squaring and modular multiplication of a multiplier by a multiplicand, the apparatus comprising:

only three main switched and clocked serial-in serial-out registers including first (B), second (S) and third (N) switched and clocked serial-in serial-out registers each of whose bit length is at least equal to a bit length of the modulus, and which are respectively operative to store the multiplier, a partial result and a modulus; and

a modular squaring and modular multiplication device operative to receive the multiplicand and to employ said only three main switched and clocked serial-in serial-out registers to perform modular squaring and modular multiplication, in the course of which at least one partial result is generated, including a subtraction device operative to compare at least one partial result to the modulus and, if the partial result is no less than the modulus, to subtract the modulus from the partial result using no more than three registers to store the multiplier the partial result and the modulus.

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**5,742,531**

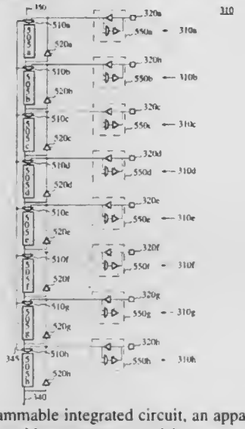
**CONFIGURABLE PARALLEL AND BIT SERIAL LOAD APPARATUS**

**Philip M. Freidin, 468 S. Frances, Sunnyvale, Calif. 94086; Stephen M. Trimberger, 1261 Chateau Dr., San Jose, Calif. 95120; John E. Mahoney, 1388 Via Del Los Grande, San Jose, Calif. 95120, and Charles R. Erickson, 3412 Atwater Ct., Fremont, Calif. 94536**

**Filed May 3, 1996, Ser. No. 642,758**

**Int. Cl.[6] G06F** *1/04;7/38*

**U.S. Cl. 364—716.03** **20 Claims**



1. In a programmable integrated circuit, an apparatus for receiving information, said apparatus comprising:

an input port having Y lines, each line supplying a bit from a data frame portion transmitted during a programming cycle, wherein a data frame comprises N bits of information and is divided into N/Y data frame portions; and

a segmented configuration register for storing N bits and comprising Y serially coupled segments, each segment of said Y segments comprising:

1) a multi-bit serial shift register; and

2) an input line coupled to one of said Y lines and said multi-bit serial shift register,

wherein said segmented configuration register receives Y bits of information per each programming cycle over said Y lines and subsequently shifts its contents downstream by one bit position per each programming cycle until said segmented configuration register fully receives each data frame.

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**5,742,532**

**SYSTEM AND METHOD FOR GENERATING FRACTIONAL LENGTH DELAY LINES IN A DIGITAL SIGNAL PROCESSING SYSTEM**

**Scott A. Van Duyne, Stanford; David A. Jaffe, Berkeley; Gregory P. Scandalis, and Timothy S. Stilson, both of Mountain View, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.**

**Filed May 9, 1996, Ser. No. 647,296**

**Int. Cl.[6] G06F** *17/17*

**U.S. Cl. 364—724.1** **15 Claims**

1. A sampled data, non-integer delay line interpolation structure, comprising:

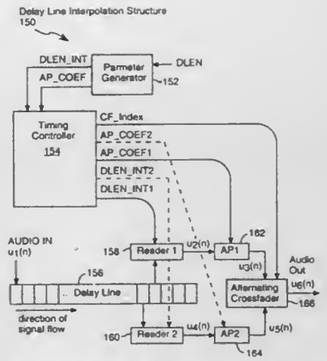
a sampled data delay line having a multiplicity of integer positions at which data is stored;

first and allpass filters, each having an associated read pointer for reading data at a corresponding integer position of the delay line, each allpass filter generating an associated output in accordance with a filter coefficient assigned thereto and the data read from the delay line;

a controller that assigns to each allpass filter's read pointer a respective delay line position and assigns to each allpass filter a respective filter coefficient value, wherein the delay line position and filter coefficient assigned to each allpass filter together corresponding to a respective effective delay line position for each allpass filter; and

a crossfader that smoothly crossfades between the outputs of the first and second allpass filters so as to generate an output signal that corresponds to a delay line read position that smoothly transitions from a first effective delay line position to a second effective delay line position.





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**5,742,533**

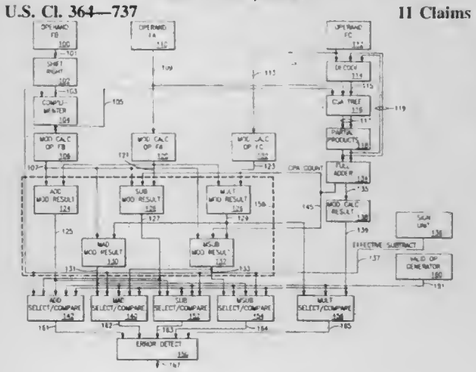
**METHOD AND APPARATUS FOR MODULUS ERROR CHECKING**

**Robert Carl Moncsko, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 21, 1996, Ser. No. 655,326**

**Int. Cl.[6] G06F** *11/00*

**U.S. Cl. 364—737** **11 Claims**



1. A computer implemented method for checking the operation of circuitry in calculating the final result of floating point arithmetic operations, including the steps of:

operating said circuitry to provide a modulus residue;

operating said circuitry to provide a modulus compliment residue;

receiving an effective subtract signal;

responsive to said effective subtract signal, selecting either said modulus residue or said modulus compliment residue; and

using the selected residue to check said circuitry.

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**5,742,534**

**ELECTRONIC CIRCUIT FOR MODULAR COMPUTATION IN A FINITE FIELD**

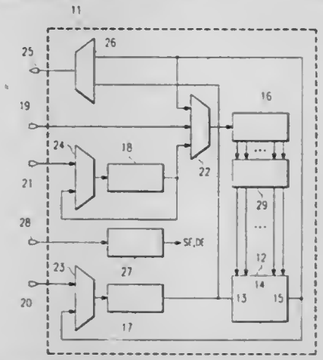
**Guy Monier, Rognac, France, assignor to SGS-Thomson Microelectronics, S.A., Gentilly, France**

**Filed Sep. 21, 1995, Ser. No. 531,952**

**Claims priority, application France, Sep. 21, 1994, 94 11420**

**Int. Cl.[6] G06F** *7/72*

**U.S. Cl. 364—746.1** **34 Claims**



1. An integrated circuit, comprising:

a multiplier having a serial input, a parallel input, and a serial output;

a first register having a serial input, and having a parallel output operatively connected to the parallel input of said multiplier,

a second register having a serial output connected to the serial input of said multiplier,

a first multiplexer which selectably connects said output of said multiplier, or a first externally received data input, to said serial input of said first register; and

a second multiplexer which selectably connects said output of said multiplier, or said serial input of said multiplier, to an external data output terminal.

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**5,742,535**

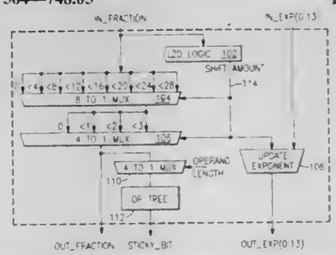
**PARALLEL CALCULATION OF EXPONENT AND STICKY BIT DURING NORMALIZATION**

**Eric Mark Schwarz, Gardiner; Robert Michael Bunce, Hopewell Junction; Leon Jacob Sigal, Monsey, and Hung Cai Ngo, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 414,072, Mar. 31, 1995. This application Jun. 5, 1995, Ser. No. 461,676**

**Int. Cl.[6] G06F** *7/38*

**U.S. Cl. 364—748.05** **19 Claims**



1. A method for generating a sticky bit in parallel with normalizing a floating point number, said floating point number having a fraction data portion having a number of digits which is greater than contained in a selected floating point format, said floating point number being normalized according to a fractional data normalization dataflow that normalizes said fraction data portion and includes a plurality of fraction data shift levels each succes-

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sively generating a respective shift amount signal which represent respective shifting amounts for shifting said fraction portion to normalize said floating point number, said method comprising the steps of:

generating possible sticky bit signals from said digits of said floating point number, said possible sticky bit signals representing possible values of said sticky bit; and

generating said sticky bit from said possible sticky bit signals in response to said shift amount signals, thereby generating the sticky bit in parallel with normalizing the floating point number.

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**5,742,536**

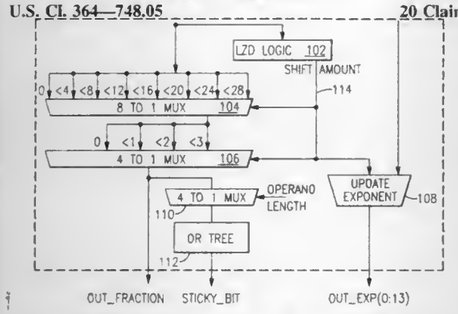
**PARALLEL CALCULATION OF EXPONENT AND STICKY BIT DURING NORMALIZATION**

**Eric Mark Schwarz, Gardiner; Robert Michael Bunce, Hopewell Junction; Leon Jacob Sigal, Monsey, and Hung Cai Ngo, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 414,072, Mar. 31, 1995. This application Jun. 7, 1995, Ser. No. 478,416**

**Int. Cl.[6] G06F** *7/38*

**U.S. Cl. 364—748.05** **20 Claims**




1. A system for generating a sticky bit in parallel with normalizing a floating point number, said floating point number having a fraction data portion having a number of digits which is greater than contained in a selected floating point format, said system comprising:

a fractional data flow circuit that normalizes said fraction data portion and includes a plurality of fraction data shift levels each successively generating a respective shift amount signal which represent respective shifting amounts for shifting said fraction portion to normalize said floating point number;

means for generating possible sticky bit signals from said digits of said floating point number, said possible sticky bit signals representing possible values of said sticky bit; and

means for generating said sticky bit from said possible sticky bit signals in response to said shift amount signals, thereby generating the sticky bit in parallel with normalizing the floating point number.

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**5,742,537**

**FAST DETERMINATION OF FLOATING POINT STICKY BIT FROM INPUT OPERANDS**

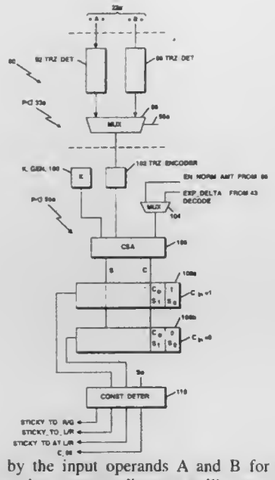
**Gilbert M. Wolrich, 4 Cider Mill Rd., Framingham, Mass. 01701; Timothy C. Fischer, 542 Swanson Ct., #32B, Boxboro, Mass. 01719; John J. Ellis, 104 Thicket St., Abington, Mass. 02351, and Patricia L. Kroesen, 62 S. Shaker Rd., Harvard, Mass. 01451**

**Continuation of Ser. No. 497,016, Jun. 30, 1995, abandoned. This application Apr. 4, 1997, Ser. No. 833,310**

**Int. Cl.[6] G06F** *7/38*

**U.S. Cl. 364—748.05** **9 Claims**

1. A circuit to determine the floating point sticky bit in response to the input operands, A and B, comprises




means, fed by the input operands A and B for providing an encoded a value corresponding to a trailing zero vector retaining a logic one in a first bit position from the LSB of a selected one of the operands and a relative size of an exponent of each of the input operands;

adder means responsive to the encoded value, and a selected one of an exponent difference between the operands and an encoded normalized shift amount, for providing a sum value corresponding to the sticky bit position and a carry bit corresponding to a sign of the result.

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**5,742,538**

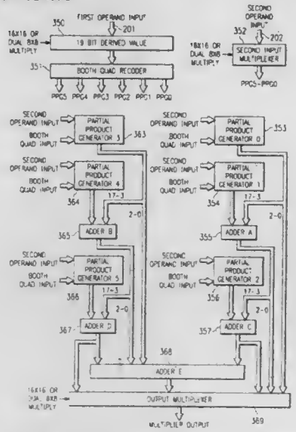
**LONG INSTRUCTION WORD CONTROLLING PLURAL INDEPENDENT PROCESSOR OPERATIONS**

**Karl M. Guttag, Missouri City; Christopher J. Read, Houston, both of Tex., and Keith Balmer, Bedford, England, assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 160,297, Nov. 30, 1993, Pat. No. 5,509,129. This application Apr. 15, 1996, Ser. No. 632,785**

**Int. Cl.[6] G06F** *7/52*

**U.S. Cl. 364—754.01** **29 Claims**




1. A method of data processing comprising the steps of:

receiving a first data word of N bits;

receiving a second data word of N bits;

multiplying a first set of L bits of said first data word by a second set of L bits of said second data word, thereby obtaining a product having 2 L bits, where N is greater than L; and



forming a resultant data word of N bits having a third set of L bits corresponding to a most significant L bits of said product and a fourth set of M bits, where said fourth set of M bits does not include a least significant set of L bits of said product, where N=L+M and M≧L.

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**5,742,539**

**INTEGRATED CIRCUIT FOR CONTENT ADDRESSABLE MEMORY**

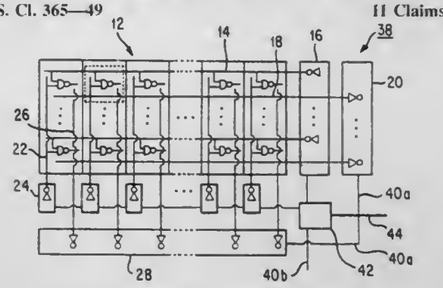
**Hajime Kinugasa, and Naoki Kanazawa, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan**

**Continuation of Ser. No. 555,840, Nov. 13, 1995, abandoned. This application Dec. 16, 1996, Ser. No. 767,294**

**Claims priority, application Japan, Nov. 16, 1994, 6-281828**

**Int. Cl.[6] G11C** *15/00*

**U.S. Cl. 365—49** **11 Claims**




1. A semiconductor integrated circuit, comprising:

a memory unit that a) receives search data b) searches for previously stored data that match the search data, and c) outputs a memory address of the data that matches the search data, the data that match the search data being matched data;

an encoder unit that receives and encodes the memory address of the matched data; and

a decoder unit that receives and decodes the encoded memory address and accesses a word of the memory unit based on the decoded memory address, the encoder and decoder units being grouped together into an encoder/decoder unit; and

wires connecting the encoder/decoder unit to the memory unit, wherein a layout of the semiconductor integrated circuit positions at least a portion of the encoder unit next to at least a portion of the decoder unit, the encoder/decoder unit being positioned next to a first side of the memory unit to minimize wire lengths of wires connecting the encoder/decoder unit and the memory unit.

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**5,742,540**

**SEMICONDUCTOR MEMORY AND LAYOUT/CIRCUIT INFORMATION GENERATING APPARATUS**

**Hirohiko Wakasugi, and Hideshi Maeno, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 15, 1997, Ser. No. 785,826**

**Claims priority, application Japan, Jan. 30, 1996, 8-014279; Sep. 5, 1996, 8-235052**

**Int. Cl.[6] G11C** *16/00*

**U.S. Cl. 365—104** **9 Claims**

1. A semiconductor memory comprising:

a bit line;

a first word line;

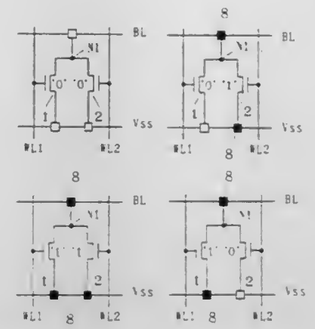
a second word line;

a power line for supplying a predetermined source voltage;

a first transistor having a control electrode connected to said first word line, a first electrode connected to a common node, and a second electrode; and

a second transistor having a control electrode connected to said second word line, a first electrode connected to said common node, and a second electrode, said first and second transistors forming a memory cell pair,

wherein 2-bit information can be written to said memory cell pair by setting connection/non-connection between said common node and said bit line, and connection/non-connection between each second electrode of said first and second transistors and said power line.




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**5,742,541**

**WRITING METHOD FOR NONVOLATILE SEMICONDUCTOR MEMORY WITH SOFT-WRITE REPAIR FOR OVER-ERASED CELLS**

**Takuji Tanigami, and Shinichi Sato, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Dec. 28, 1995, Ser. No. 580,515**

**Claims priority, application Japan, Mar. 24, 1995, 7-066384**

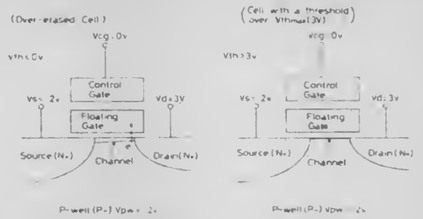
**Int. Cl.[6] G11C** *16/04*

**U.S. Cl. 365—185.3** **8 Claims**

| | Selected WL | Non-selected WL | Selected BL | Non-selected BL | SL | PW |
|---|---|---|---|---|---|---|
| Reading | 5 | 0 | 1 | open | 0 | 0 |
| Writing | 10 | 0 | 3 | open | -2 | -2 |
| Source-gate Erasing | -10 | 0 | open | open | 6 | 0 |
| Substrate Erasing | 10 | 0 | open | open | open | 6 |

(In substrate erasing, NW must be held at 0V or 3V)

The numbers in the table represent voltages.




1. A method for writing in a non-volatile semiconductor memory which includes: a plurality of memory cells, each having a source and a drain which are N-type regions formed in a P-well on a semiconductor substrate with a floating gate formed on the P-well with a tunnel oxide film therebetween and a control gate formed on the floating gate with an interpoly dielectric film therebetween, a plurality of bit lines, a plurality of word lines and a source line, the source of each memory cell being connected to the source line, the drain of each memory cell being connected to one of the bit lines, the control gate of each memory cell being connected to one of the word lines, the memory cell being written, erased or read by selectively supplying suitable voltages to the source, bit and word lines connected thereto, comprising:

writing to a selected memory cell by injecting electrons into the floating gate thereof by a channel hot electron method includ-

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ing applying a negative voltage to the P-well and the source line, a first positive voltage to the selected bit line, a second positive voltage to the selected word line, and a zero voltage to a non-selected word line;

opening a non-selected bit line so that no voltage is applied while the selected memory cell is being written; and

recovering a non-selected, over-erased cell connected to the selected bit line by weak writing the non-selected, over-erased cell to increase a threshold voltage associated with the non-selected, over-erased cell.

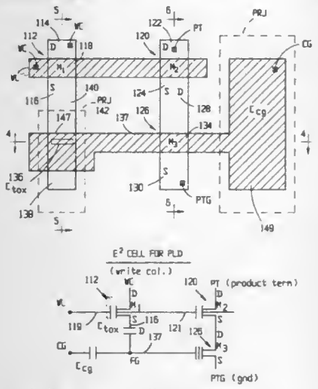
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**5,742,542**

## NON-VOLATILE MEMORY CELLS USING ONLY POSITIVE CHARGE TO STORE DATA

**Jonathan Lin, Milpitas, and Stewart Logie, Campbell, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

**Filed Jul. 3, 1995, Ser. No. 497,992**
**Int. Cl.[6] G11C *16/04*; H01L *29/78***
**U.S. Cl. 365—185.08** **16 Claims**




1. A non-volatile memory cell comprising:

a write select transistor (**112**) having a drain, a source, and a control gate;

a read select transistor (**120**) having a drain, a source, and a control gate;

a floating gate sense transistor (**126**) having a drain, a source, and a floating gate;

the drain of said write select transistor being connected to a write control line (WC), the control gate of said write select transistor being connected to the control gate of said read select transistor and to a word line (WL), the source of said write select transistor being capacitively coupled to the floating gate of said floating gate sense transistor via a tunnel oxide layer ($C_{tox}$);

the drain of said read select transistor being connected to a product term line (PT) and the source of said read select transistor being connected to the drain of said floating gate sense transistor;

the floating gate of said floating gate sense transistor being further capacitively coupled to a control gate line (CG) via a gate oxide layer ($C_{cg}$) and the source of said floating gate sense transistor being connected to a product term ground line (PTG); and

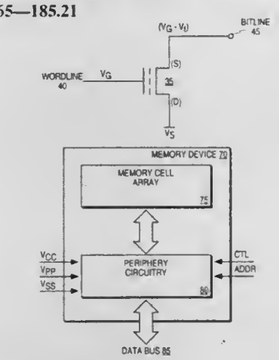
a high programming voltage being supplied to said word line (WL), a first write select voltage substantially equal to the high programming voltages being applied to said write select line (WC), and a ground potential being applied to the control gate line (CG) during a programming mode so as to discharge the floating gate of said sense transistor.

**5,742,543**

## FLASH MEMORY DEVICE HAVING A PAGE MODE OF OPERATION

**Albert Fazio, Los Gatos, Calif., assignor to Intel Corporation, Santa Clara, Calif.**

**Continuation of Ser. No. 699,490, Aug. 19, 1996, abandoned. This application Jun. 13, 1997, Ser. No. 876,117**
**Int. Cl.[6] G11C *16/06***
**U.S. Cl. 365—185.21** **18 Claims**




9. A memory device comprising:

a memory array having data stored in a memory cell, the memory cell having a select gate coupled to a wordline, a first electrode coupled to a bitline, and a second electrode coupled to a conductor; and

a periphery circuit coupled to the memory array, the periphery circuit transmitting a first voltage to the wordline and transmitting a second voltage to the conductor such that the bitline is set to a third voltage that is equal to the first voltage minus a threshold voltage of the memory cell, wherein the periphery circuit senses the third voltage to determine the data stored by the memory cell.

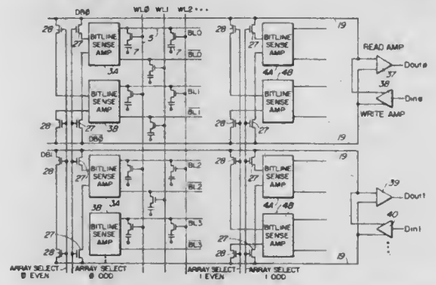
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**5,742,544**

## WIDE DATABUS ARCHITECTURE

**Richard C. Foss, Kirkcaldy Fife, United Kingdom, assignor to Mosaid Technologies Incorporated, Kanata, Canada**

**Filed Apr. 11, 1994, Ser. No. 226,034**
**Int. Cl.[6] G11C *7/00***
**U.S. Cl. 365—189.03** **6 Claims**




1. A semiconductor memory comprising bitlines and wordlines disposed orthogonally to each other, means for storing data associated with the wordlines and the bitlines, an array of bitline sense amplifiers connected to the bitlines, primary databases disposed parallel to the bitlines for connection to rows of said bitline sense amplifiers, and means for selectively connecting at least two rows of the sense amplifiers to each pair of said primary databuses.

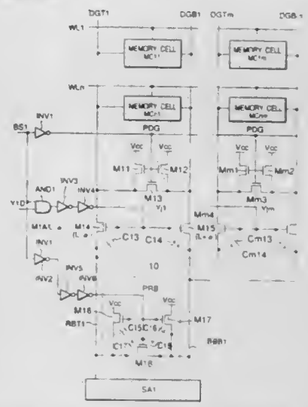


**5,742,545**

## SEMICONDUCTOR MEMORY DEVICE HAVING FUNCTION OF PREVENTING POTENTIAL VARIATION OF READ BUS DUE TO COUPLING

**Yoshiyuki Kato, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed May 14, 1997, Ser. No. 854,450**
**Claims priority, application Japan, May 17, 1996, 8-148312**
**Int. Cl.[6] G11C *7/00***
**U.S. Cl. 365—190** **9 Claims**




1. A semiconductor memory device comprising first and second bit lines, a plurality of memory cells connected between said first and second bit lines, a sense amplifier, a first and second read bus lines connected to said sense amplifier, a first transistor provided between said first read bus line and said first bit line, a second transistor provided between said second read bus line and said second bit line, means for supplying a selection signal to gates of said first and second transistors, first capacitance means having one end connected to said first read bus line and having a capacitance equal to a parasitic capacitance between said gate of said first transistor and said first read bus line, second capacitance means having one end connected to said second read bus line and having a capacitance equal to a parasitic capacitance between said gate of said second transistor and said second read bus line, and means for supplying an inversion of the selection signal to the other ends of said first and second capacitance means.

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**5,742,546**

## METHOD AND DEVICE FOR ADDRESS DECODING IN AN INTEGRATED CIRCUIT MEMORY

**Jean Devin, Allëe des Cigales, France, assignor to SGS-Thomson Microelectronics, S.A., Gentilly Cedex, France**

**Filed Sep. 11, 1995, Ser. No. 526,500**
**Claims priority, application France, Sep. 12, 1994, 94 10833**
**Int. Cl.[6] G11C *7/00***
**U.S. Cl. 365—194** **20 Claims**

1. A method for operating a low-voltage integrated circuit memory, comprising the steps of:

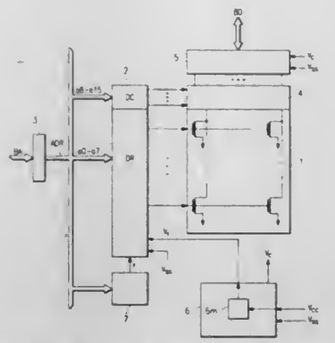
(a.) generating a boosted voltage, from a power supply voltage and ground, which is not intermediate therebetween;

(b.) decoding externally received addresses, to produce decoded addresses which each indicate at least one selected row and at least one selected column of at least one memory array of said integrated circuit;

(c.) detecting transitions of said externally received addresses, and, after each said transition, generating an inhibit signal which remains active for a substantially predetermined period of time;

(d.) after a delay which is greater than said substantially predetermined period of time, switching over said boosted voltage to said selected row of said array which corresponds to said decoded address, only if said inhibit signal is then inactive; and

(e.) accessing said selected column of said array, to provide access to a selected cell which is connected to said selected row and to said selected column.



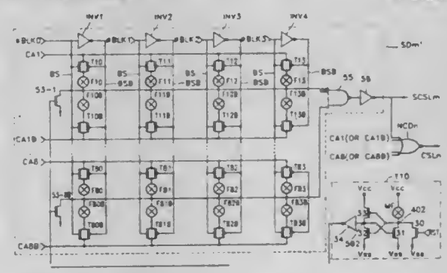
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**5,742,547**

## CIRCUITS FOR BLOCK REDUNDANCY REPAIR OF INTEGRATED CIRCUIT MEMORY DEVICES

**Seung-hun Lee, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Aug. 22, 1996, Ser. No. 701,634**
**Claims priority, application Rep. of Korea, Aug. 22, 1995, 95-25987**
**Int. Cl.[6] G11C *7/00***
**U.S. Cl. 365—200** **4 Claims**




1. An integrated circuit memory device, comprising:

a memory cell array including a plurality of memory blocks, each having normal memory cells and spare memory cells;

decoding means for producing a block select signal which selects one among said plurality of memory blocks and for producing a word line select signal which selects a word line of a normal memory cell in said selected memory block;

a plurality of defective address program means, a respective one of which programs column addresses of defective column memory cells of a respective memory block, for outputting a program address in response to input of a defective column address;

defective address transfer means for transferring a defective column address to one of said defective address program means corresponding to a memory block which is identified by the block select signal;

redundancy enable means for enabling an output of said plurality of defective address program means in response to a redundancy control signal; and

spare column selecting line activating means for decoding the program address which is output from said defective address program means in response to said block select signal and for

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activating a spare column line corresponding to the normal memory cell of the respective memory block.

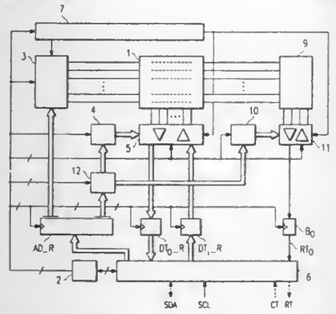
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**5,742,548**

## ELECTRICALLY MODIFIABLE NON-VOLATILE MEMORY WITH WRITE CHECKING

**Yvon Bahout, Fuveau, and François Tailliet, Epinay Sur Seine, both of France, assignors to SGS-Thomson Microelectronics, S.A., Gentilly, France**

**Filed Nov. 17, 1994, Ser. No. 340,940**
**Claims priority, application France, Nov. 23, 1993, 93 14211**
**Int. Cl.[6] G11C *7/00***
**U.S. Cl. 365—201** **20 Claims**



1. A method of monitoring write operations in an EEPROM memory, comprising the steps of:

a.) providing a plurality of memory cells connected to be programmed, wherein said plurality of memory cells are organized into one or more sets of memory cells, each set of memory cells having a test cell associated therewith;

b.) performing all write commands to said plurality of memory cells by means of first, second and third programming cycles, wherein

i.) during said first programming cycle a first value is written to a respective one of said test cells,

ii.) during said second programming cycle a data value is written to a respective memory cell which is associated with said respective test cell,

iii.) during said third programming cycle a second value is written to said respective test cell, said second value being different from said first value; and

c.) checking said test cells to determine their value, wherein if a respective one of said test cells has a value equal to said first value, the write operations performed to said respective set of memory cells associated with said test cell are regarded as invalid.

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**5,742,549**

## SENSE AMPLIFIER CIRCUIT FOR DETECTING DEGRADATION OF DIGIT LINES AND METHOD THEREOF

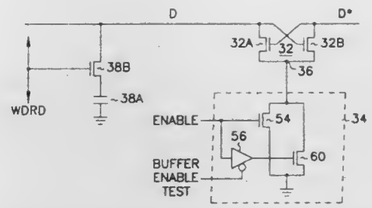
**Roland Ochoa, and Daniel R. Loughmiller, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**

**Continuation of Ser. No. 559,195, Nov. 13, 1995, Pat. No. 5,615,158. This application Mar. 24, 1997, Ser. No. 822,480**
**Int. Cl.[6] G11C *29/00***
**U.S. Cl. 365—201** **23 Claims**

21. A sense amplifier circuit suitable for use with a memory device, the sense amplifier comprising:

an amplifier circuit operably coupled to the memory device and providing a node signal at a reference node;

a first transistor having a source, a gate, and a drain, wherein the gate is responsive to an enable signal, and one of the source and the drain is connected to the reference node and the other of the source and the drain is connected to a reference voltage, and



a second transistor connected to the reference node and the reference voltage, wherein the gate is responsive to the enable signal selectively activated by a test signal.

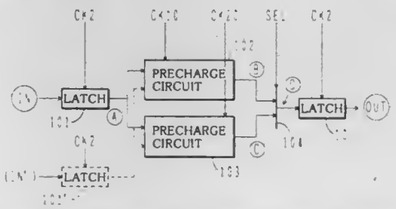
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**5,742,550**

## SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

**Tatsumi Yamauchi, Hitachiohta, and Fumio Murabayashi, Ibaraki-ken, both of Japan, assignors to Hitachi, Ltd., Japan**

**Filed Nov. 19, 1996, Ser. No. 753,019**
**Claims priority, application Japan, Nov. 20, 1995, 7-301536**
**Int. Cl.[6] G11C *7/00***
**U.S. Cl. 365—203** **17 Claims**



1. A semiconductor integrated circuit device having a precharge circuit controlled by clock signals, wherein an arbitrary node of said precharge circuit is precharged during a low level period or a high level period of an associated one of said clock signals and said precharge circuit is active during a high level period or a low level period of said associated clock signal, said semiconductor integrated circuit device comprising:

a first precharge circuit and a second precharge circuit having the same operational functions and arranged in parallel,

wherein said first precharge circuit and said second precharge circuit are controlled such that said first precharge circuit and said second precharge circuit perform complementary operations, wherein said second precharge circuit is in an active period when said first precharge circuit is in a precharge period, and said second precharge circuit is in a precharge period when said first precharge circuit is in an active period.

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**5,742,551**

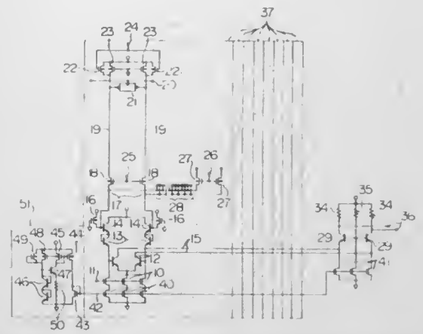
## MEMORY CIRCUIT IMPROVED IN ELECTRICAL CHARACTERISTICS

**Seigoh Yukutake, Hitachi; Yutaka Kobayashi, Katsuta; Takashi Akioka, and Masahiro Iwamura, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Division of Ser. No. 325,116, Oct. 18, 1994, abandoned, which is a continuation of Ser. No. 793,652, Nov. 18, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 463,851**
**Claims priority, application Japan, Nov. 19, 1990, 2-311502; Mar. 20, 1991, 3-057089**
**Int. Cl.[6] G11C *7/02***
**U.S. Cl. 365—207** **5 Claims**

5. A semiconductor memory circuit comprising:





a plurality of memory arrays each having a plurality of memory cells;

a plurality of pairs of first common data lines, each pair of said first common data lines being connected to a respective one of said plurality of memory arrays;

a plurality of presense amplifier circuits, each of said presense circuits being connected to a respective pair of said first common data lines and including one pair of first bipolar transistors;

a plurality of first multiplex circuits connected to said presense amplifier circuits, each of said first multiplex circuits including:

a plurality of pairs of second bipolar transistors connected between first and second power terminals, and having a plurality of pairs of base terminals for receiving therethrough a plurality of first output signals outputted from said one pair of first bipolar transistors, and a plurality of pairs of emitter terminals, one pair of the emitter terminals and other pairs of the emitter terminals being connected in common to one another in a manner to provide one pair of output terminals; and

means connected to the plurality of base terminals of said second bipolar transistors in a manner to control a base potential thereof, said means selectively making a pair of said second bipolar transistors, via a corresponding pair of the base terminals, operable by the associated first output signals outputted from said first bipolar transistors, and turning the pairs of said second bipolar transistors associated with other pairs of the base terminals into a non-selected state irrespective of potential levels of output signals of the associated pairs of second bipolar transistors; and

at least one second multiplex circuit connected to said plurality of first multiplex circuits, including:

a plurality of pairs of third bipolar transistors connected between said first and second power terminals, collector terminals of one pair of third bipolar transistors out of said plurality of pairs of third bipolar transistors being connected in common at a first common connection acting as one output terminal of one pair of output terminals, collector terminals of other pairs of the third bipolar transistors being connected in common at a second common connection acting as the other output terminal of said one pair of output terminals, and emitter terminals of said plurality of pairs of third bipolar transistors being connected in common at a third common connection;

a first resistor connected between said first power terminal and said first common connection;

a second resistor connected between said first power terminal and said second common connection;

a first current source connected between said third common connection and said second power terminal;

a plurality of signal input terminals used for receiving therethrough a plurality of pairs of output signals outputted from said first multiplex circuits, one pair of the signal input terminals of said plurality of signal input terminals being connected to respective base terminals of third bipolar transistors taken from respectively different pairs of third bipolar transistors, other pairs of the signal input terminals being connected to respective base terminals of said other pairs of third bipolar transistors;

a plurality of second current sources connected between the base terminals of said plurality of pairs of third bipolar transistors and said second power terminals, respectively; and

a common select terminal used for controlling on/off operation of said first current source and said plurality of second current sources,

wherein with the plurality of pairs of input signals inputted from said first multiplex circuits to said plurality of pairs of signal input terminals of said second multiplex circuit, one pair of the input signals which are selected are different in potential to each other, and remaining pairs of the input signals which are not selected are equal in potential to one another.

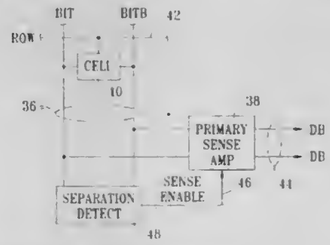
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**5,742,552**

## TIMING CONTROL FOR CLOCKED SENSE AMPLIFIERS

**Craig B. Greenberg, Rowlett, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Oct. 31, 1996, Ser. No. 740,636**
**Int. Cl.[6] G11C *7/00***
**U.S. Cl. 365—210** **11 Claims**



1. A random access memory, comprising:

a primary array of primary memory cells arranged in rows and columns, with each said primary memory cells having true and complement data stored therein, and each column of said primary memory cells having a pair of precharged true and complement bit lines associated therewith, wherein access of one of said primary memory cells in a column will cause the voltage level of said associated pair of true and complement bit lines to separate relative to each other in accordance with the true and complement data stored in the accessed one of said primary memory cells;

at least one primary sense amp associatable with each pair of said true and complement bit lines for sensing the voltage level thereon and latching a data value when said true and complement bit lines have separated by a predetermined voltage difference, said at least one primary sense amp clocked by an enable signal such that said at least one primary sense amp will operate to sense when said enable signal is true;

a separation detector for determining the separation between said true and complement bit lines associated with said at least one primary sense amp; and

an enable control for generating said enable signal when said detected bit line separation exceeds a predetermined threshold.

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**5,742,553**

**Patent Not Issued For This Number**

VOL 1209 ISS 3 AP 21 1998 UMI

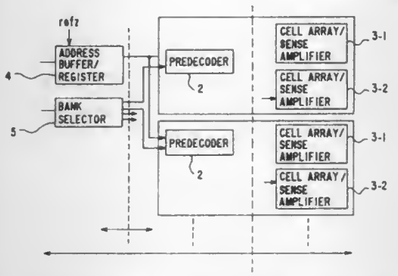


5,742,554

## VOLATILE MEMORY DEVICE AND METHOD OF REFRESHING SAME

Shinya Fujioka, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 24, 1996, Ser. No. 685,859
Claims priority, application Japan, Dec. 25, 1996, 7-336712
Int. Cl.[6] G11C *7/00;8/00*
U.S. Cl. 365—222 22 Claims




1. A volatile memory device for refreshing information stored in a plurality of memory cells, said device comprising:

a plurality of banks each having a plurality of cell array blocks each of which has a plurality of memory cells and a decoder portion for selecting the memory cells;

an address buffer being supplied with an address signal; and

a plurality of predecoders associated respectively with associated banks of said plurality of banks, for being supplied with an output signal from said address buffer and supplying predecoded signals to said associated banks;

wherein when the volatile memory device is refreshed, the predecoder associated with one of said banks which is selected is activated, and a plurality of cell array blocks in the selected bank are simultaneously selected, and the predecoders associated with the banks which are unselected are inactivated.

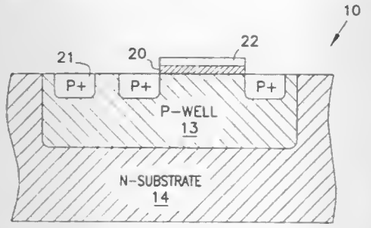
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5,742,555

## METHOD OF ANTI-FUSE REPAIR

Kenneth W. Marr, and Shubneesh Batra, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Aug. 20, 1996, Ser. No. 700,234
Int. Cl.[6] H01L *21/70*
U.S. Cl. 365—225.7 22 Claims




1. An integrated circuit comprising:

an anti-fuse having first and second plates separated by a layer of dielectric;

programming circuitry adapted to couple a first potential to the first plate; and

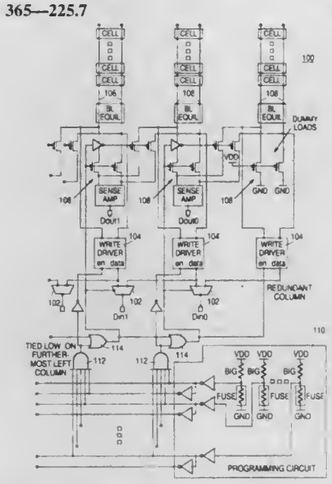
a virtual ground coupled to the second plate for providing a second potential to the second plate, such that a differential voltage between the first and second plates is sufficient to create a conductive path through the dielectric.

5,742,556

## REDUNDANCY SCHEME FOR SEMICONDUCTOR RAMS

Lee Stuart Tavrow, and Mark Ronald Santoro, both of Sunnyvale, Calif., assignors to Micro Magic, Inc., Sunnyvale, Calif.

Filed Dec. 26, 1996, Ser. No. 773,393
Int. Cl.[6] G11C *8/00*
U.S. Cl. 365—225.7 10 Claims




1. An integrated circuit memory structure comprising:

a plurality of regular columns of memory cells arranged as a sequence of said regular columns, each regular column having sense amplifier circuitry and write driver circuitry associated therewith for, respectively, reading output data from and writing input data to said regular column;

a redundant column of memory cells, the redundant column having redundant write driver circuitry associated therewith for writing input data to said redundant column;

a programmable element that responds to a programming stimulus applied to the programmable element by providing a programming signal that identifies one of the plurality of regular columns as a defective column; and

reconfiguration circuitry, connected to the programmable element, to the regular columns and to the redundant column, and that responds to the programming signal by reconfiguring the memory structure such that the sense amplifier circuitry associated with each regular column in the sequence of regular columns, beginning with the defective column, is reconfigured to be associated with the next regular column in the sequence of regular columns and the sense amplifier circuitry associated with the last regular column in the sequence of regular columns is reconfigured to be associated with the redundant column.

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5,742,557

## MULTI-PORT RANDOM ACCESS MEMORY

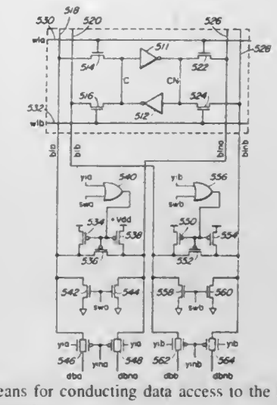
Robert George Gibbins, Ottawa; Garnet Frederick Randall Gibson, Nepean, and Steven William Wood, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 19, 1996, Ser. No. 719,306
Int. Cl.[6] G11C *8/00;7/00*
U.S. Cl. 365—230.05 4 Claims

1. A multi-port RAM comprising RAM cells of m rows by n columns, each RAM cell including storage means for storing differential binary data, the RAM cells of each column being commonly coupled to a respective set of M data paths, m, n and M being integers,

the multi-port RAM further comprising:






access means for conducting data access to the RAM cells via the data paths;

path select means for determining data paths so that data accessing is enabled via selected data paths and data accessing is disabled via non-selected data paths, the path select means comprising N groups of M switching means coupled to the respective M data paths, N being an integer;

means for selectively applying a control signal to one or more groups of M switching means; and

means for activating the M switching means of the group in response to the applied control signal, each activated switching means setting the respective data path to a predetermined voltage level.

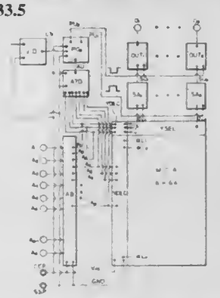
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5,742,558

## SEMICONDUCTOR MEMORY DEVICE FOR PLURALITY OF RANGES OF POWER SUPPLY VOLTAGE

Kiyokazu Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 28, 1996, Ser. No. 608,055
Claims priority, application Japan, Feb. 28, 1995, 7-040219
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—233.5 11 Claims



1. A semiconductor memory device comprising:

a power supply voltage determining circuit for determining whether or not a power supply voltage applied to said device is higher than a certain voltage;

an address transition detecting circuit for detecting a transition in at least one of address signals;

a timing pulse generating circuit, connected to said power supply voltage determining circuit and said address transtion detecting circuit, for generating a first timing pulse signal in response to the transition of said address signals, a pulse width of said first timing pulse signal being controlled in accordance with whether or not said power supply voltage is higher than said certain voltage;

a memory cell array; and

a sense amplifier, operatively connected to said memory cell array, for sensing data read from said memory cell array in accordance with said address signals,

said sense amplifier being connected to said timing pulse generating circuit and being made active by said first timing pulse signal.

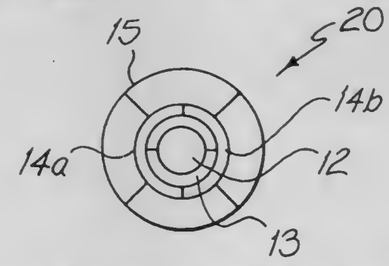
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5,742,559

## HYDROPHONE AND ARRAY THEREOF

Richard A. Marschall, and Debra L. Marschall, both of Penrith, Australia, assignors to Marschall Acoustics Instruments Pty. Ltd., New South Wales, Australia

Filed Dec. 10, 1996, Ser. No. 762,755
Claims priority, application Australia, Dec. 12, 1995, PN7109
Int. Cl.[6] H04R *23/00*
U.S. Cl. 367—20 29 Claims




1. An acoustic transducer comprising a tube having a longitudinal axis, the tube being sectioned longitudinally into longitudinal segments, means for fixing said longitudinal segments together to form said tube, and the longitudinal segments being comprised at least in part of a piezoelectric material.

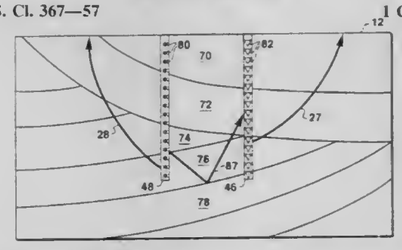
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5,742,560

## SEISMIC IMAGING USING WAVE EQUATION EXTRAPOLATION

Jerome R. Krebs, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Division of Ser. No. 241,889, May 12, 1994, Pat. No. 5,596,548. This application Sep. 4, 1996, Ser. No. 707,574
Int. Cl.[6] G01V *1/28*
U.S. Cl. 367—57 1 Claim




1. A method of imaging a geological feature, comprising the steps of:

(a) specifying two data acquisition datums, a first data acquisition datum coincident with a first borehole and a second data acquisition datum coincident with a second borehole;

(b) obtaining seismic data from a family of sources placed within said first borehole and a family of receivers placed within said second borehole;

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(c) specifying two imaging datums, a first imaging datum coincident with the surface of the earth and proximate to said first borehole and a second imaging datum coincident with said surface and proximate to said second borehole, wherein a line coincident with said second imaging datum extends substantially colinear with said first imaging datum and sequentially through said second borehole, said first borehole, and said first imaging datum;

(d) wave equation extrapolating said family of sources to said first imaging datum using traveltimes calculated from a first velocity model;

(e) wave equation extrapolating said family of receivers to said second imaging datum using traveltimes calculated from a second velocity model; and

(f) imaging said feature using said extrapolated sources and receivers.

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**5,742,561**

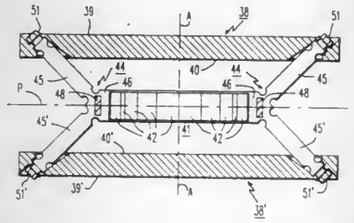
**TRANSVERSELY DRIVEN PISTON TRANSDUCER**

**Michael P. Johnson, Shaker Heights, Ohio, assignor to Northrop Grumman Corporation, Los Angeles, Calif.**

**Filed May 10, 1990, Ser. No. 521,614**

**Int. Cl.[6] H04R *17/00***

**U.S. Cl. 367—157** **26 Claims**



1. A transducer having a longitudinal axis, comprising:

a) at least one rigid, non-flexural piston mass member having a front radiating surface and a rear surface;

b) electromechanically active driver means exhibiting expansion and contraction in a plane perpendicular to said longitudinal axis;

c) said driver means and said position mass member being spaced from one another along said longitudinal axis;

d) connecting means including i) at least two lever arms having first and second ends, and ii) a coupling section, said connecting means coupling said driver means with said piston mass member and operable to translate movement of said driver means in said plane into a corresponding axial movement of said piston mass member;

e) said coupling section being disposed between said driver means and said first ends of said lever arms;

f) first hinge means for each said lever arm, having a pivot axis and connecting a first end of a respective lever arm to said coupling section;

g) second hinge means for each said lever arm, having a pivot axis and connecting a second end of a respective lever arm to said piston mass member;

h) said lever arms having a rigidity, and said hinge means being constructed and arranged such that during operation, said lever arms move with a uniform angular velocity about said pivot axis of either of said hinge means, and said radiating surface of said piston mass member moves with a uniform velocity distribution.

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**5,742,562**

**HYDROPIIONE ARRAY**

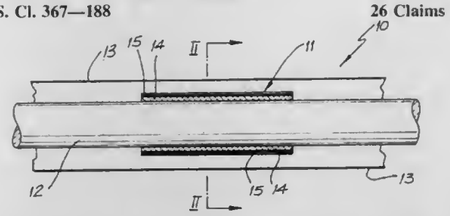
**Richard A. Marschall, and Debra L. Marschall, both of New South Wales, Australia, assignors to Marschall Acoustics Pty Ltd, New South Wales**

**Filed May 29, 1996, Ser. No. 655,031**

**Claims priority, application Australia, May 29, 1995, PN3229**

**Int. Cl.[6] H04R *11/00***

**U.S. Cl. 367—188** **26 Claims**



1. A hydrophone array comprising a cable having attached thereto a plurality of acoustic transducers mounted symmetrically on the cable, each of said acoustic transducers comprising a tube of piezoelectric material mounted on a strain shielding element which substantially shields the acoustic transducer from stresses generated in the cable, the cable and said acoustic transducers being enclosed within a sheath of substantially constant external dimensions and extending over a longitudinal length of the cable, the sheath comprising an overmold of plastic which provides a watertight enclosure for the cable.

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**5,742,563**

**ELECTRONIC DEVICE WITH CALENDAR FUNCTION INCLUDING DETERMINING THE FIRST WEEK OF THE YEAR**

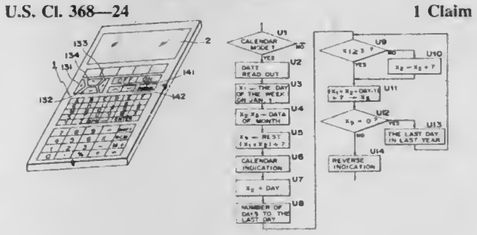
**Yoshiro Kataoka, Sakurai; Shigenobu Yanagiuchi, Tenri; Yasuharu Tanaka, Nara-ken; Yoshihiro Shintaku, Nara; Kiyoshi Matsuo, Nara-ken, and Yasuo Wada, Yamatokooriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Division of Ser. No. 360,997, Jun. 2, 1989, abandoned. This application Sep. 28, 1990, Ser. No. 589,587**

**Claims priority, application Japan, Jun. 3, 1988, 63-138089; Jun. 3, 1988, 63-138090**

**Int. Cl.[6] G04B *19/22***

**U.S. Cl. 368—24** **1 Claim**



1. An electronic device with a calendar function comprising:

input means for inputting a desired date;

first of year means for determining which day of the week that January 1st falls on in the year corresponding to said desired date;

ordinal week means, operatively connected to said input means and said first of year means, for determining an ordinal number of a week in which said desired date falls wherein if January 1st is between a first day of the week and a fourth day of the week, the week corresponding to January 1st is deemed as the first week in the year, if January 1st is between a fifth day and a seventh day of the week, the week following the week to which January 1st belongs is deemed as the first week of the year;

said ordinal week means calculating said ordinal number of the week according to the deemed first week; and

display means, operatively connected to said ordinal week means, for displaying said ordinal number of the week of the year in which said desired date falls.



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**5,742,564**

**TIMEPIECE WITH SWITCH OPERABLE BY PRESSING THE TIMEPIECE GLASS**

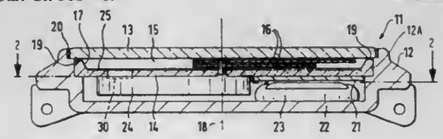
**Pieter Kuschel, Schiltach, and Andreas Müller, Sulzbach, both of Germany, assignors to Junghans Uhren GmbH, Schramberg, Germany**

**Filed Nov. 25, 1996, Ser. No. 753,431**

**Claims priority, application Germany, Nov. 29, 1995, 195 44 460.4**

**Int. Cl.[6] G04C *17/00*; G04B *19/00***

**U.S. Cl. 368—69** **9 Claims**



1. A timepiece comprising:

a casing;

a carrier disc mounted in the casing;

an electrical circuit disposed in the casing behind the carrier disc, the circuit disposed eccentrically with respect to a center axis of the carrier disc;

a glass mounted elastically to the casing in front of the carrier disc whereby an outer edge of the glass can be rearwardly depressed; and

control switches comprising piezoelectric sensors each interposed between the outer edge of the glass and a forwardly facing edge of the carrier disc, the sensors being electrically coupled to the electric circuit and being actuable in response to being compressed by a rearward pressure applied to the outer edge of the glass.

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**5,742,565**

**CROWN SETTING DEVICE FOR A TIMEPIECE**

**Jean Louis Cuinet, Chevigney sur L'Ognon, France; Michel Plancon, Watertown, Conn.; Yves Vuillame, Beurre, France, and Chan Kwong Fung, Kowloon, Hong Kong, assignors to Timex Corporation, Middlebury, Conn.**

**Filed May 21, 1996, Ser. No. 651,015**

**Int. Cl.[6] G04B *27/02***

**U.S. Cl. 368—190** **17 Claims**

1. Improved crown setting device for an analog timepiece having a case with a sidewall, a movement having settable gear means disposed inside said case, a setting stem rotatably mounted in the case sidewall in a first axial position, the setting stem being axially slidable to engage said settable gear means to perform a setting function when the setting stem is rotated in a second axial position, said crown setting device comprising:

a crown connected to said setting stem and having surface portions accessible outside of the case for enabling manual actuation in either axial direction between the first and second positions,

a top ring rotatably mounted on said case and adapted to be manually rotated,

first means including a first set of teeth disposed on the underside of said top ring, wherein said first means comprises a carrier ring having teeth formed in the underside thereof, and said top ring comprises a bezel ring attached to said carrier ring, and



second means including a second set of teeth disposed on said crown, said second set of teeth meshing with said first set of teeth in both the first and second axial positions.

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**5,742,566**

**OPTICAL RECORDING METHODS AND APPARATUS USING LIGHT MODULATION TECHNIQUE BASED ON DETECTING TEMPERATURE OF THE MEDIUM**

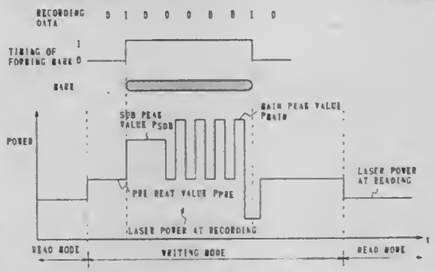
**Mitsugu Imai, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Nov. 25, 1996, Ser. No. 756,157**

**Claims priority, application Japan, Nov. 27, 1995, 7-331158**

**Int. Cl.[6] G11B *11/00***

**U.S. Cl. 369—13** **8 Claims**



1. An optical recording apparatus for recording a mark having a length determined based on recording data in an optical recording medium, said optical recording apparatus comprising:

temperature detecting means for detecting a temperature of said optical recording medium;

first laser power storing means for storing a first peak value of a first laser power at a reference temperature;

laser power adjusting means for adjusting said first peak value and a second peak value of a second laser power, said second peak value being different from said first peak value, at a same ratio on the basis of the temperature detected by said temperature detecting means; and

laser emitting means for emitting a laser beam on said optical recording medium, wherein when a mark having at least a predetermined length is recorded in said optical recording medium, said first peak value and said second peak value are adjusted by said laser power adjusting means in a predetermined order, said predetermined order being determined based on the length of the mark.

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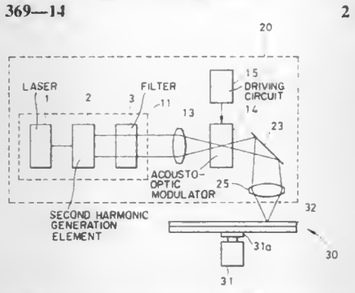


5,742,567

## MASTER OPTICAL DISK RECORDING APPARATUS

Tomoyoshi Ikeya, Yamanashi, Japan, assignor to Pioneer Electronic Corporation, Tokyo, and Pioneer Video Corporation, Yamanashi, both of Japan

Filed Aug. 28, 1996, Ser. No. 705,854
Claims priority, application Japan, Sep. 7, 1995, 7-255670
Int. Cl.[6] G11B *13/00*
U.S. Cl. 369—14 2 Claims




1. A master optical disk recording apparatus, comprising:

a laser light source; rotating means for rotating a master optical disk to record an information signal; an acousto-optic modular which modulates an incident beam thereinto in response to the information signal; a convergence lens system which converges a laser beam emitted from said laser light source to said acousto-optic modulator; an objective lens which converges the modulated laser beam emitted from said acousto-optic modulator and which irradiates the master optical disk with the modulated laser beam; a support on which said laser light source, said acousto-optic modulator and said objective lens are mounted; and means for moving said support relative to said rotating means,

wherein said laser light source includes a semiconductor laser element,

wherein said objective lens is finite conjugate, and

wherein said convergence lens system converges the laser beam from said laser light source to a convergence point positioned outside of the focal point in the incident side of said objective lens, said acousto-optic modulator being positioned at said convergence point.

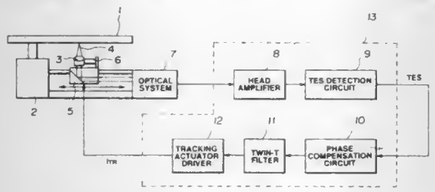
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5,742,568

## TRACKING CONTROLLER AND SEEK CONTROLLER FOR OPTICAL RECORDING DEVICE

Junichi Nakano, Hino, and Kenichi Ito, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1996, Ser. No. 659,668
Claims priority, application Japan, Jun. 9, 1995, 7-143701; Aug. 2, 1995, 7-197717
Int. Cl.[6] G11B *17/22*
U.S. Cl. 369—32 15 Claims




1. A control circuit of an optical disk apparatus, comprising:

a carriage, which is provided with a focus moving means for supporting an objective lens in such a way that the objective lens is movable in a direction of an optical axis of a light beam applied to the optical disk apparatus through the objective lens and is substantially lixed in a direction perpendicular to an information track on the optical disk, for moving the light beam in a direction substantially perpendicular to the information track in a range in which at least the information track is present;

carriage driving means for driving the carriage; and

a tracking error detecting circuit for detecting a tracking error signal which represents a displacement of the light beam from a center of the information track,

wherein a tracking control loop for performing a tracking control by feeding back a dc-component and ac-components, whose frequencies are not more than 10 kHz, of the tracking error signal to the carriage driving means is formed,

wherein a filter means for attenuating a gain of the tracking control loop correspondingly to a frequency in vicinity of a resonance frequency in a direction, in which the one of the focus moving means and the carriage crosses the information track, is provided in the tracking control loop,

wherein an open-loop gain crossover frequency of the tracking control loop is not less than 2 kHz.

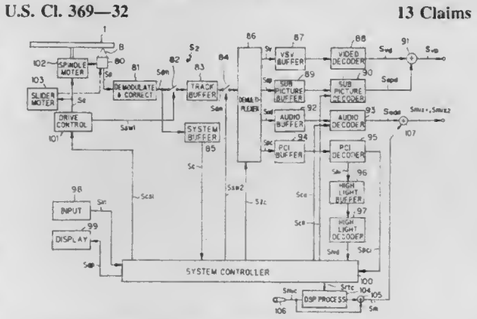
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5,742,569

## INFORMATION RECORD MEDIUM, APPARATUS FOR RECORDING THE SAME AND APPARATUS FOR REPRODUCING THE SAME

Takao Sawabe, Tokyo; Ryuichiro Yoshimura; Junichi Yoshio, both of Tokorozawa; Akihiro Tozaki, Tusurgashima; Yoshiaki Moriyama, Tsurugashima; Kaoru Yamamoto, Tsurugashima, and Hirohide Kobori, Tokorozawa, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 21, 1997, Ser. No. 821,920
Claims priority, application Japan, Mar. 22, 1996, 8-066404
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—32 13 Claims




1. An information recording apparatus comprising:

a signal process means for generating and outputting content information including (i) identification information to identify each of partial record informations constructing whole record information to be recorded onto an information record medium and to indicate content of each of said partial record informations, and (ii) start position information indicating a start position on said information record medium of each of said partial record informations corresponding to said identification information, on the basis of control information inputted from the external to control a reproduction of said record information;

a multiplex means for multiplexing said record information and said content information, to thereby generate and output multiplexed record information; and

a record means for recording said multiplexed record information onto said information record medium.

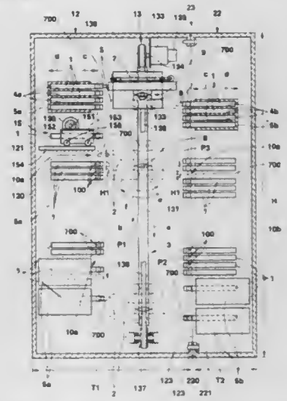


5,742,570

## CARTRIDGE AUTO-CHANGER

Yoshitsugu Taki; Takashi Otsuka, and Taketoshi Yamagishi, all of Kanagawa, Japan, assignors to Sony Corporation, Japan

Filed Aug. 8, 1996, Ser. No. 694,271
Claims priority, application Japan, Aug. 15, 1995, 7-228650
Int. Cl.[6] G11B *15/68;17/22*
U.S. Cl. 369—36 9 Claims



1. An auto-changer which has access to recording media contained within cartridges, said auto-changer comprising:

a first housing including a panel in which a first opening is defined to receive the cartridges, and a second opening formed in a side opposite to the panel;

a first stocker including a first plurality of openings formed in its one side adjacent to the second opening of said first housing and adapted to removably receive the cartridges stacked substantially in parallel in a first direction, said first plurality of openings of said first stocker spaced apart from one another by a distance H1 along the first direction;

a first drive mounted within said first housing and positioned to interfere with said first stocker in the first direction, said first drive including a port corresponding in position to said first plurality of openings and having access to said cartridges loaded and unloaded through said port;

a second housing having a third opening at its one side;

a second stocker mounted within said second housing and including a second plurality of openings formed in its one side adjacent to the third opening of said second housing and adapted to removably receive the cartridges stacked substantially in parallel in the first direction, said second plurality of openings of said second stocker spaced apart from one another by the distance H1 along the first direction and offset from said first plurality of openings by a selected integer multiple of the distance H1;

a carrier mounted within said first housing and movable in the first direction, said carrier including a loading/unloading section for loading and unloading the cartridges, and a carrier body for holding the cartridges;

means for connecting said first and second housings whereby the second opening of said first housing and the third opening of the second housing are communicated with one another to define an inner space; and

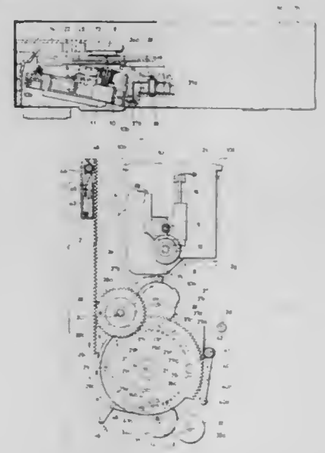
means for turning said carrier between a first position and a second position, the second position offset along said first direction by an amount equal to said integer multiple of said distance H1, the first position wherein the loading/unloading section is able to load and unload the cartridges to and from the first stocker and the first drive and the second position, wherein said loading/unloading section is able to load and unload the cartridges to and from the second stocker.

5,742,571

## DISK RECORDING AND/OR REPRODUCING APPARATUS

Masaaki Hoshino, Tokyo, and Takashi Koya, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 318,749, Oct. 21, 1994, abandoned. This application Jun. 13, 1996, Ser. No. 662,487
Claims priority, application Japan, Mar. 5, 1993, 5-045336; Mar. 2, 1994, 6-032641
Int. Cl.[6] G11B *17/22;17/26*
U.S. Cl. 369—37 21 Claims



1. A disk recording and/or reproducing apparatus comprising:

a tray supported by an apparatus body housing a disk rotating mechanism, wherein said tray is movable between a projected position projecting from said apparatus body through an opening portion provided through said apparatus body and a housing position within said apparatus body;

a turntable rotatably fitted to said tray and having a plurality of disk housing portions for housing a plurality of disks along a periphery thereof;

a first operating mechanism for permitting said disk rotating mechanism to perform an operation for chucking said disk in a ganged relation with movement of said tray from said projected position to said housing position, said first operating mechanism comprising a main gear driven by a single driving source and a rotary lifting and lowering mechanism driven by said main gear for lifting and lowering a disk driving unit of said disk rotating mechanism relative to a gripping portion of said disk rotating mechanism, said main gear forming part of a first gear train;

a second operating mechanism for moving said tray from said housing position to said projected position while said disk rotating mechanism chucks said disk, wherein said second operating mechanism is formed of a second gear train which is also driven by said single driving source, and said first gear train and said second gear train are selectively driven by changing a direction of rotation of said single driving source; and

a rotation stopping mechanism for stopping rotation of said lifting and lowering mechanism during operation of said second operating mechanism.

VOL 1209 ISS 3 APR 21 1998 UMI



## 5,742,572
## OPTICAL INFORMATION RECORDING/REPRODUCING APPARATUS WHICH DETECTS FOCAL ERROR

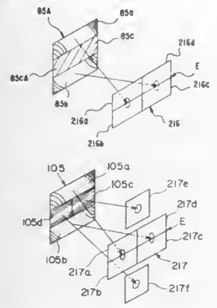
**Koichi Tezuka, and Kyoko Miyabe, both of Kanagawa, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 622,182, Mar. 25, 1996, abandoned, which is a continuation of Ser. No. 263,354, Jun. 21, 1994, abandoned, which is a continuation-in-part of Ser. No. 84,362, Jun. 30, 1993, abandoned. This application Feb. 27, 1997, Ser. No. 806,706**

**Claims priority, application Japan, Jun. 21, 1993, 5-149488; Jun. 17, 1994, 6-135791**

**Int. Cl.[6] G11B *7/135***

**U.S. Cl. 369—44.23** **3 Claims**




1. An optical information recording/reproducing apparatus which records information on and/or reproduces information from an optical recording medium and detects a focal error based on a reflected light beam from the optical recording medium, said optical information recording/reproducing apparatus comprising:

an optical element deflecting a part of the reflected light beam to at least two positions excluding a central part of the reflected light beam, wherein said optical element comprises a hologram optical element including a plurality of first deflecting parts formed with hologram patterns, the part of the reflected light beam excluding the central part of the reflected light beam being deflected to at least two positions by said first deflecting parts, and wherein said hologram optical element includes a non-deflecting part which does not deflect the central part of the reflected light beam; and

photodetector means including a plurality of photodetectors for respectively detecting the deflected parts of the reflected light beam and outputting detection outputs,

said focal error being detected based on the detection outputs of said photodetector means; and

wherein said non-deflecting part of said hologram optical element is selected from a group of parts consisting of:

a part which has a surface approximately perpendicular to an optical axis of the reflected light beam, and

a part which absorbs or blocks the central part of the reflected light beam.

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## 5,742,573
## COMPENSATION APPARATUS FOR RADIAL AND VERTICAL RUNOUT OF AN OPTICAL DISC

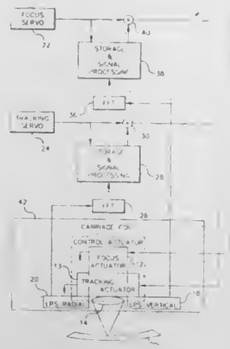
**Roger A. Hajjar, Fairport; Stuart D. Perry, and Mark A. Barton, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 3, 1996, Ser. No. 642,385**

**Int. Cl.[6] G11B *7/095***

**U.S. Cl. 369—44.32** **9 Claims**

1. Apparatus for compensating for radial and vertical runout of an optical disc using an actuator having a lens for focus of a laser beam and wherein focus and tracking currents control the position of the lens in the vertical and radial directions, respectively, comprising:




a) means for focusing the actuator lens along at least one revolution of a track on an optical disc and producing lens position signals;

b) means responsive to the lens position signals to produce the frequency content of surface height and track deviations of the optical disc using a frequency transform technique;

c) means for storing such surface height and track deviations frequency content;

d) means for storing a signal representing the focusing and tracking actuator currents; and

e) means responsive to the focusing and tracking actuator current signals and the stored surface height and track deviation frequencies to control the lens position and thereby reduce focusing and tracking errors.

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## 5,742,574
## MAGNETO-OPTIC DISK DRIVE CONTROLLING APPARATUS

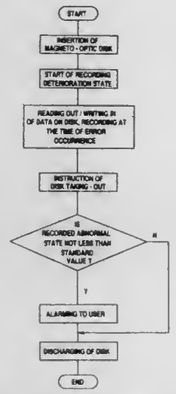
**Masuyoshi Yachida, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 249,454, May 26, 1994, abandoned. This application Jun. 2, 1997, Ser. No. 867,273**

**Claims priority, application Japan, May 26, 1993, 5-124253; Dec. 15, 1993, 5-314624**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—54** **23 Claims**




1. A magneto-optic disk drive controlling apparatus, in which a magneto-optic disk drive apparatus for removing and inserting a magneto-optic disk manually or by automatic transportation is controlled by a host computer, said magneto-optic disk drive controlling apparatus comprising:



a disk deterioration judging mechanism that determines a deterioration state of said magneto-optic disk based at least on a type of data stored on said magneto-optic disk;

disk deterioration recording means for recording a progression of said deterioration state of said magneto-optic disk; and

a disk deterioration tolerance excess alarming mechanism that provides a user a warning to stop using said magneto-optic disk or for backing-up data stored on said magneto-optic disk based on said recorded progression of said deterioration state and/or when an extent of said determined deterioration state exceeds a predetermined deterioration tolerance standard.

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## 5,742,575
## METHOD AND DEVICE FOR IDENTIFYING DISC

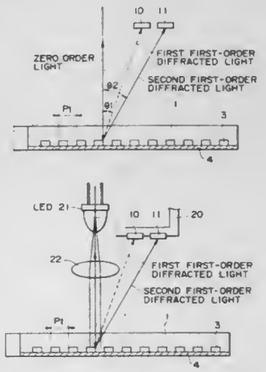
**Akio Yamakawa, Kanagawa, and Masamichi Utsumi, Chiba, both of Japan, assignors to Sony Corporation, Japan**

**Filed Aug. 9, 1996, Ser. No. 694,544**

**Claims priority, application Japan, Aug. 18, 1995, 7-232062**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—58** **6 Claims**




6. A disc identifying device provided with a light source for irradiating a light onto a disc with an angle deviated by a certain degree from the direction perpendicular to the plane of said disc, and a light receiving means provided very closely to said light source and for receiving any one of diffracted lights of the first order and higher order diffracted by the track formed on said disc of the specified type out of various disc types, wherein only when said light receiving means receives a light receiving signal, said disc is judged to be a disc of said specified type.

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## 5,742,576
## DIGITAL SIGNAL REPRODUCING APPARATUS

**Hideki Hayashi; Masaru Umezawa, and Hideki Kobayashi, all of Tsurugashima, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Jun. 14, 1996, Ser. No. 663,780**

**Claims priority, application Japan, Jun. 15, 1995, 7-148909**

**Int. Cl.[6] G11B *7/00***

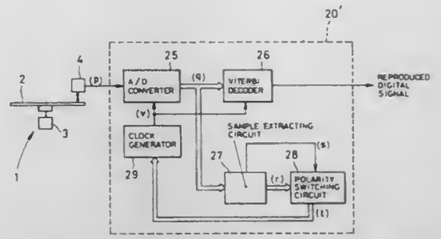
**U.S. Cl. 369—59** **4 Claims**

1. A digital signal reproducing apparatus for reproducing a digital signal from a read signal read out from a recording medium on which the digital signal is recorded, comprising:

an A/D converter for obtaining a sample value sequence by sequentially sampling said read signal by sampling clocks;

decoding means for decoding said digital signal from said sample value sequence and for generating the decoded digital signal as a reproduction digital signal;

sample extracting means for extracting a sample value near a zero level from each sample value in said sample value sequence and for obtaining it as an extracted sample value;




polarity switching means for setting one of said extracted sample value and an inversion extracted sample value obtained by inverting a polarity of said extracted sample value to a phase error signal when a sample value level of said sample value sequence has a rising tendency and for setting the other one of said extracted sample value and said inversion extracted sample value to said phase error signal when the sample value level of said sample value sequence has a falling tendency; and

clock generating means for generating, as said sampling clock, a clock signal whose phase is corrected on the basis of said phase error signal.

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## 5,742,577
## PRISM HAS A PLURALITY OF REFLECTIVE REGIONS EACH WITH A PREDETERMINED PHASE DIFFERENCE

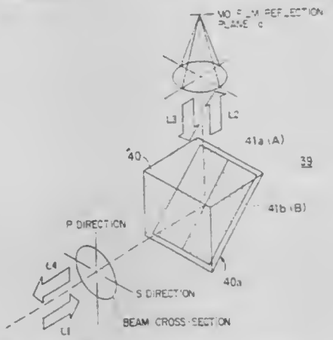
**Hideyoshi Horimai, Kawasaki; Katsuhiro Seo, Sagamihara; Kimihiro Saito, Bunkyo-ku, and Kiyoshi Toyota, Oota-ku, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 394,270, Feb. 24, 1995, Pat. No. 5,563,869, which is a division of Ser. No. 122,411, Sep. 21, 1993, Pat. No. 5,577,018. This application Jul. 24, 1996, Ser. No. 685,474**

**Claims priority, application Japan, Feb. 7, 1992, 4-56945; Apr. 30, 1992, 4-137769**

**Int. Cl.[6] G11B *11/10;7/00***

**U.S. Cl. 369—112** **9 Claims**




1. A phase difference generation device comprising:

a 45 degree prism; and

a plurality of division regions provided on a reflection plane of said 45 degree prism, obtained by dividing the plane orthogonally to a light axis thereof, said regions having mutually predetermined phase difference characteristics, and wherein

the predetermined phase difference being produced between the light incident upon one division region and the light emission from another region.

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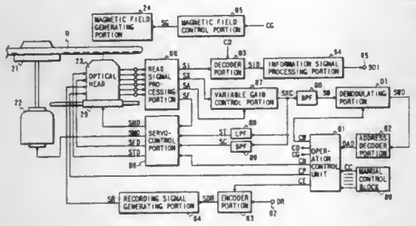


5,742,578

## INFORMATION RECORDING AND REPRODUCING APPARATUS USING LIGHT BEAM MODULATION ON A SPIRAL GUIDE GROOVE DISK

Yuji Kumai, and Kyoko Suzuki, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 17, 1995, Ser. No. 560,545
Claims priority, application Japan, Nov. 22, 1994, 6-287796
Int. Cl.[6] G11B 7/125
U.S. Cl. 369—124 5 Claims




1. An information recording and reproducing apparatus comprising:

optical means for causing a light beam to impinge upon a disc-shaped record medium, on which a spiral guide groove surrounding a central portion of the disc-shaped record medium is formed to have side-wall portions opposite to each other and meandering in response to a predetermined control signal so that the predetermined control signal is substantially recorded along the spiral guide groove, for scanning the spiral guide groove continuously;

light beam modulating means operative to intensity-modulate the light beam incident upon the disc-shaped record medium for scanning the spiral guide groove in response to an information signal so that the information signal is intermittently recorded on the disc-shaped record medium and operative further to cause the light beam to keep a relatively small intensity during a period in which the recording of the information signal is temporarily interrupted;

photo-detecting means for detecting the light beam coming from the disc-shaped record medium on which the spiral guide groove is scanned by the light beam;

read signal processing means operative to obtain a read output signal containing a read output of the predetermined control signal recorded along the spiral guide groove and a total amount signal corresponding to momentary total light amount of the light beam coming from the disc-shaped record medium to be received by said photo-detecting means on the strength of a detection output signal obtained from said photo-detecting means;

variable gain control means operative to perform a gain-control to the read output signal obtained from said read signal processing means in response to the total amount signal obtained from said read signal processing means when the light beam coming from the disc-shaped record medium is detected by said photo-detecting means, in which the gain control performed by said variable gain control means provides a gain control characteristic to said read output signal such that an amplitude of said read output signal is reduced in proportion to an increase in a level of said total amount signal so that when the level of the total amount signal increases in response to variations in a level of the information signal the amplitude of said read output signal is reduced; and

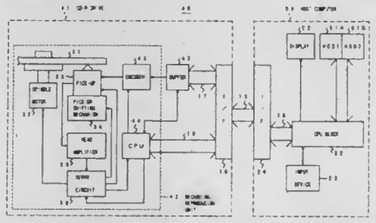
signal reproducing means for obtaining a reproduced output of the predetermined control signal recorded along the spiral guide groove on the strength of the read output signal having been subjected to the gain-control performed by said variable gain control means.

5,742,579

## OPTICAL DISK RECORDING DEVICE AND OPTICAL DISK DRIVE

Tadao Kazuno; Toshio Takeuchi; Yoshihiro Sakanushi, and Masanori Matsunaga, all of Atsugi, Japan, assignors to Mitsumi Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 412,728, Mar. 29, 1995, abandoned.
This application Mar. 11, 1997, Ser. No. 815,341
Claims priority, application Japan, Mar. 30, 1994, 6-061537; Jun. 8, 1994, 6-126599; Jun. 14, 1994, 6-132165
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—124 5 Claims




1. A compact, less expensive optical disk writing device comprising:

an optical disk drive recording data into an optical disk, wherein said data includes auxiliary data when said data is recorded; and

a host computer generating said auxiliary data including block headers and subcode data by using a general-purpose CPU of said host computer, and transferring said data including said auxiliary data to said disk drive so that said data transferred to said optical disk drive is ready to be recorded.

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5,742,580

Patent Not Issued For This Number

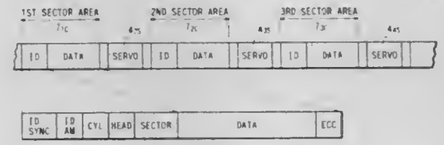


5,742,582

## DISK MEDIUM AND METHOD OF WRITING DATA ONTO THE DISK MEDIUM

Katsuji Suzuki, Fukushima-ken, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 574,529, Dec. 19, 1995, abandoned.
This application Sep. 8, 1997, Ser. No. 924,967
Claims priority, application Japan, Jan. 26, 1995, 7-010788
Int. Cl.[6] G11B 7/24
U.S. Cl. 369—275.1 5 Claims




1. A disk medium formatted to comprise:

a plurality of concentric track zones, each track zone including a plurality of tracks;

a plurality of servo areas formed along lines which are located at intervals of substantially equal angle and which extend from an innermost track located adjacent a center of the disk medium to an outermost track located adjacent an outer periphery of the disk medium;

wherein each of said plurality of tracks includes a plurality of sector areas, each sector area including a single data area;

wherein the number of bytes in the data area of each of said plurality of sector areas varies depending on the track zone's location relative to the center of the disk medium such that a first data area of a first sector area of the outermost track has a greater number of bytes than a second data area of a second sector of the innermost track; and

wherein none of the plurality of servo areas is located within said data area of any of said plurality of sector areas.

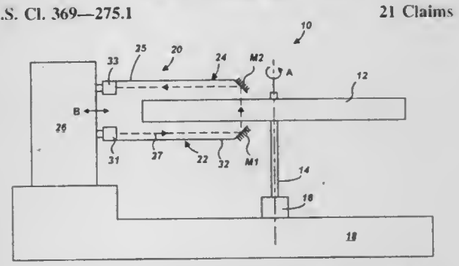
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5,742,581

## TRANSMISSIVE OPTICAL AND MAGNETO-OPTICAL DATA STORAGE MEDIA

Yu Hong Ja, San Jose, Calif., assignor to Read-Rite Corporation, Milpitas, Calif.

Filed Jan. 7, 1997, Ser. No. 779,394
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—275.1 21 Claims




1. An optical data storage medium comprising in combination:

a light transmissive substrate for providing mechanical support;

a light transmissive data substrate formed on said substrate; and

said data substrate being patterned to form block regions that block light beam from passing through, and pass regions that allow light to pass through,

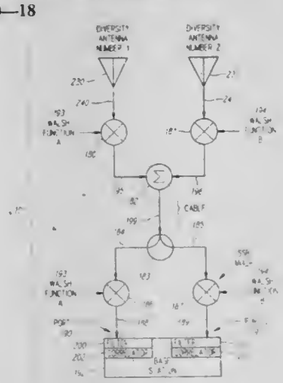
such that the blockage or passage of light through the optical storage medium reflects the type of data bits to be stored on the optical medium.

5,742,583

## ANTENNA DIVERSITY TECHNIQUES

Logan Scott, Breckenridge, Colo., assignor to Omnipoint Corporation, Colorado Springs, Colo.

Filed Nov. 3, 1994, Ser. No. 334,587
Int. Cl.[6] H04J 13/00
U.S. Cl. 370—18 21 Claims




1. A receiver system comprising:

at least two antennas each capable of generating an antenna signal in response to a transmitted signal, said transmitted signal centered at a designated frequency,

means for isolating each one of said antenna signals with a frequency offset from each of the others of said antenna signals, thereby generating a plurality of offset signals, said frequency offset being less than the bandwidth of said transmitted signal,

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means for combining said offset signals into a backhaul signal for transmission over a backhaul cable,

means, coupled to said backhaul cable, for receiving said backhaul signal and splitting said backhaul signal into a plurality of duplicate signals, one duplicate signal for each of said antennas, and

means for shifting a frequency of one or more of said duplicate signals such that each one of said frequency shifted signals comprises a different one of said antenna signals centered at said designated frequency.

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**5,742,584**

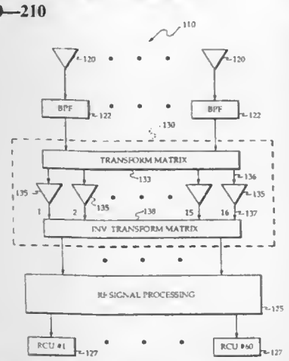
## POWER SHARING SYSTEM FOR RF AMPLIFIERS

**Sheldon Kent Meredith, Phoenix, Ariz., assignor to Radio Frequency Systems, Inc., Marlboro, N.J.**

**Continuation of Ser. No. 504,021, Jul. 19, 1995, abandoned, which is a continuation-in-part of Ser. No. 314,898, Sep. 29, 1994, abandoned. This application Jun. 12, 1997, Ser. No. 873,634**

**Int. Cl.[6] H04B** *7/00*

**U.S. Cl. 370—210** **20 Claims**




17. A power sharing system for a land mobile radio system for amplifying a plurality of mobil radio signals, each mobil radio signal received from a respective mobile

a plurality of receive antennas for receiving the mobil radio signals transmitted by the mobile radio units, each one of said mobil radio signals having a frequency associated with one of a plurality of channels of the land mobile radio system; and

a radio frequency signal amplification means for amplifying each of said radio frequency signals, said radio frequency signal amplification means including:

(a) transform matrix means connected to said plurality of receive antennas and responsive to the mobil radio signals received by said plurality of receive antennas for providing transformed mobil radio signals, each one of said transformed mobil radio signals containing an equal power portion of each one of the mobil radio signals received by said plurality of receive antennas;

(b) a plurality of amplification means connected to said transform matrix means, each one of said amplification means receiving a corresponding one of said transformed mobil radio signals for providing amplified transformed mobil radio signals, a size of each one of said amplification means being determined based on the number of said channels associated with the land mobile radio system and independent of a statistical determination of the number of said channels being simultaneously received on any one of said receive antennas; and

(c) inverse-transform matrix means responsive to said amplified transformed mobil radio signals for providing amplified mobil radio signals, each one of said amplified mobil radio signals corresponding to one of the mobil radio signals received by said plurality of receive antennas.

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**5,742,585**

## NETWORK FOR CONNECTING A PLURALITY OF NODES USING A PLURALITY OF CHANNELS

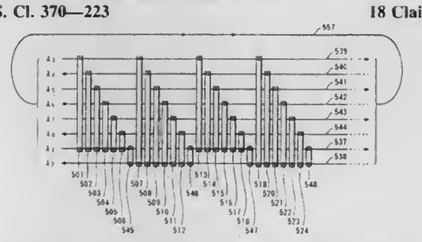
**Mitsuru Yamamoto, Yokohama, and Jun Hattori, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Japan**

**Continuation of Ser. No. 294,735, Aug. 23, 1994, abandoned. This application Jun. 4, 1996, Ser. No. 657,498**

**Claims priority, application Japan, Aug. 24, 1993, 5-209540; Oct. 21, 1993, 5-263729; Jul. 29, 1994, 6-178481; Aug. 1, 1994, 6-180128; Aug. 2, 1994, 6-181285**

**Int. Cl.[6] H04L** *12/421*

**U.S. Cl. 370—223** **18 Claims**




1. A network constituted by connecting a plurality of nodes, comprising:

a loop-shaped transmission path in which a plurality of channels forming a loop-shaped first transmission route are multiplexed;

a plurality of nodes which are connected to said transmission path; and

connection means connected to said transmission path,

wherein each of said nodes belongs to a respective one of a plurality of node groups each constituted by a plurality of said nodes, each of said node groups having two opposite ends and said connection means being arranged at both opposite ends of each of said node groups,

wherein, in each said node group, each of said nodes can access a common channel and a channel other than said common channel from among said plurality of channels as an accessed channel for outputting a signal thereto, but cannot access all of said plurality of channels,

wherein each of said nodes can output a signal inputted from an accessed channel to the same accessed channel from which the signal is input, and

wherein, in each said node group, a signal transmitted through said common channel and input to said connection means at one end of the node group is returned by said connection means and input to said connection means at the other end of the node group, and, in each said node group, each of said nodes is connected to a loop-shaped second transmission route formed of said common channel and said connection means at both ends of the node group.

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**5,742,586**

## ACCESS CONTROL DEVICE FOR RING-TYPE ATM NODE

**Ken Murakami, and Toshihiro Shikama, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 11, 1995, Ser. No. 570,322**

**Int. Cl.[6] H04J** *3/14*; **H04L** *12/56*

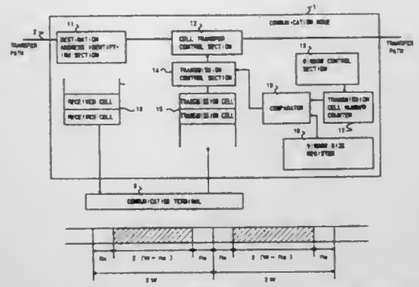
**U.S. Cl. 370—230** **16 Claims**

9. A method for transmitting data in a ring-type ATM communication network having a plurality of nodes, the method comprising steps of:

providing at a node of the network a transmission buffer capable of storing transmission cells for a time period corresponding to at least $2(W-n_u)$ cells, wherein a window size of the network is W, and a number of transmission cells allocated to the node is $n_u$;

storing a transmission cell in the transmission buffer;





counting transmission cells from the node to determine a present number of a transmission cell in a window; and

transmitting the transmission cell in the transmission buffer when the present number is a number allocated to the node.

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**5,742,587**

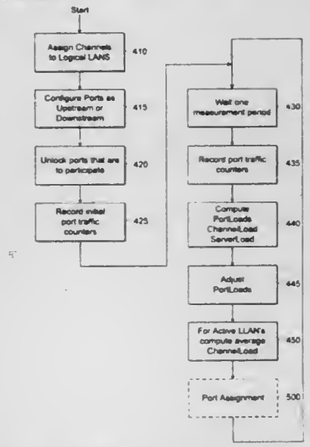
## LOAD BALANCING PORT SWITCHING HUB

**John G. Zornig, Boston; Tavit K. Ohanian, Waltham, and George A. Klarakis, Franklin, all of Mass., assignors to LANart Corporation, Needham, Mass.**

**Filed Feb. 28, 1997, Ser. No. 808,083**

**Int. Cl.[6] H04L** *12/26*; *12/56*

**U.S. Cl. 370—235** **17 Claims**




14. A method of adjusting network data flow through a port switching hub, said hub including a plurality of network ports and a plurality of interconnecting repeater channels for operatively interconnecting at least two of said network ports to permit network data units to be transferred between network devices operatively coupled to said network ports, said hub further including port switching means for selectively coupling each of said network ports to one of said repeater channels and traffic monitoring means for monitoring information characteristic of data flow through each port, said method comprising the steps of:

A) designating at least two of said repeater channels as being associated with a logical LAN (LLAN), wherein each of said network devices connect to each of the network ports connected to the repeater channels of a LLAN are connection equivalent network devices;

B) for said at least one LLAN:

1) designating each network port operatively coupled to a network device that utilizes network resources as a downstream port and designating each network port operatively coupled to a network device that provides access to a network resource as an upstream port;

2) for each network port of said LLAN, determining a PortLoad as a function of a quantity of network data units transferred through each network port over a predefined period of time;

3) for each repeater channel of said LLAN, determining a ChannelLoad as a sum of the PortLoads for all network ports operatively coupled to said repeater channel and determining a ServerLoad as a sum of the PortLoads of the upstream network ports operatively coupled to said repeater channel;

4) for each downstream network port of said LLAN, determining a portion of the ServerLoad attributable to said network port and adjusting the PortLoad of said network port by said portion;

5) determining an Average ChannelLoad as the sum of the ChannelLoads for all the repeater channels associated with said LLAN divided by the total number of repeater channels associated with said LLAN;

6) determining a first repeater channel, $C_G$ having a ChannelLoad which is greater than the Average ChannelLoad, a second repeater channel, $C_S$ having a ChannelLoad which is less than the Average ChannelLoad, and selecting a port, $P_G$, having a determined PortLoad, coupled to said first repeater channel $C_G$;

7) switching said port $P_G$ to be coupled to said second repeater channel $C_S$, if the sum of the PortLoad of the port $P_G$ and the ChannelLoad of the second repeater channel $C_S$ is less than the Average ChannelLoad.

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**5,742,588**

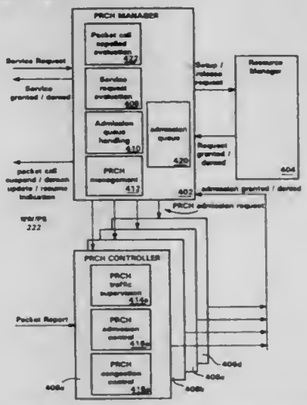
## PACKET SWITCHED TRAFFIC MANAGEMENT IN A CELLULAR TELECOMMUNICATIONS SYSTEM

**Carl Magnus Thornberg; Magnus Andersson, both of Stockholm, and Olle Erik Grimlund, Bromma, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**

**Filed Sep. 18, 1995, Ser. No. 529,559**

**Int. Cl.[6] H04Q** *11/04*

**U.S. Cl. 370—236** **24 Claims**




17. In a cellular telecommunications system comprising a plurality of transceiving stations each capable of transmitting and receiving data packets and sharing a packet radio channel, a PRCH admission queue, and a PRCH resource manager, a method of managing packet radio channels, said method comprising the steps of:

evaluating the total required traffic for all packet calls in said admission queue; and

determining if a new PRCH is needed to handle the required traffic;

sending a PRCH setup request to said resource manager if a new PRCH is required to handle the required traffic;

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determining if a packet radio channel exists with no packet calls if a new PRCH is not required to handle the required traffic; and

sending a PRCH release request to said resource manager if a packet radio channel exists with no packet calls.

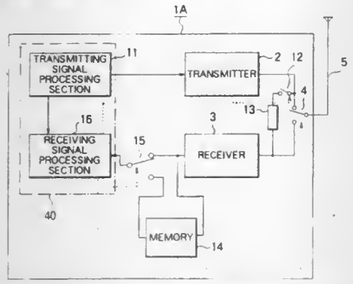
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**5,742,589**

## RADIO APPARATUS

**Takashi Murata, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Filed Jun. 28, 1995, Ser. No. 495,998**
**Claims priority, application Japan, Jul. 1, 1994, 6-151238**
**Int. Cl.[6] H04J** *3/12*
**U.S. Cl. 370—249** **7 Claims**




**1**. A radio apparatus according to a TDMA/TDD system, comprising:

a transmitter for transmitting data during a transmitting slot;

an attenuator for attenuating said data transmitted from said transmitter;

a receiver for receiving said data attenuated by said attenuator during said transmitting slot;

a memory for storing said data received by said receiver; and

a controller for comparing the data read from said memory with the data transmitted from said transmitter so as to assess normality of said apparatus during an unassigned receiving slot.

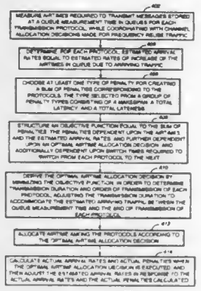
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**5,742,590**

## METHOD AND APPARATUS FOR SCHEDULING AIRTIME IN A RADIO COMMUNICATION SYSTEM

**Jyh-Han Lin, Fort Worth, and Alain Charles Louis Briancon, McKinney, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Aug. 22, 1996, Ser. No. 701,373**
**Int. Cl.[6] H04J** *3/14*
**U.S. Cl. 370—252** **16 Claims**



**1**. A stochastic method for scheduling airtime in a radio communication system having a plurality of transmission protocols, the stochastic method comprising the steps of:

measuring a plurality of airtimes required to transmit messages stored at a queue measurement time in queues corresponding to the plurality of transmission protocols;

determining a corresponding plurality of estimated arrival rates equal to estimated rates of increase of the plurality of airtimes due to arriving traffic;

structuring an objective function equal to a sum of penalties corresponding to the plurality of transmission protocols, the penalties dependent upon the plurality of airtimes and the plurality of estimated arrival rates, and further dependent upon an optimal airtime allocation decision;

deriving the optimal airtime allocation decision by minimizing the objective function; and

allocating the airtime among the plurality of transmission protocols in accordance with the optimal airtime allocation decision.

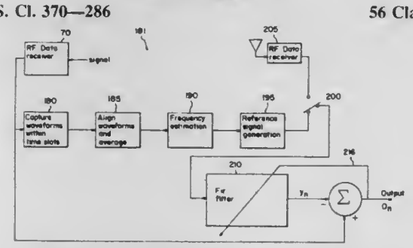
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**5,742,591**

## INTERFERENCE CANCELLATION SYSTEM FOR CATV RETURN TRANSMISSIONS

**Nageen Himayat, Huntingdon Valley, and Charles A. Eldering, Doylestown, both of Pa., assignors to General Instrument Corporation, Hatboro, Pa.**

**Filed Jun. 7, 1995, Ser. No. 473,755**
**Int. Cl.[6] H04B** *3/20*
**U.S. Cl. 370—286** **56 Claims**




**1**. A method of canceling interference in a CATV return path signal that includes a time division multiple access data stream having a plurality of time slots within which frames of data are transmitted from subscriber units comprising the step:

acquiring an interference reference signal from the CATV return path;

selecting at least one time slot for use in evaluating interference;

sampling said selected time slot when predetermined data is transmitted therein;

processing said interference reference signal to produce an interference cancellation signal; and

combining said interference cancellation signal with said CATV return path signal to cancel interference.

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**5,742,592**

## METHOD FOR COMMUNICATING DATA IN A WIRELESS COMMUNICATION SYSTEM

**Christopher Scholefield, Delta, and Ronald H. Gerhards, Vancouver, both of Canada, assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Sep. 1, 1995, Ser. No. 522,649**
**Int. Cl.[6] H04Q** *7/20;* **H04J** *3/24*
**U.S. Cl. 370—329** **12 Claims**

**1**. A method of communicating plural data packets via a wireless communications system, comprising the steps of:

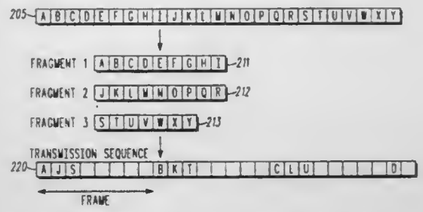
fragmenting a data packet into plural data units (PDUs);

encoding each of the PDUs into encoded PDUs (E-PDUs);

requesting plural subchannels of a communications resource for communicating the E-PDUs;

receiving an allocation of at least one designated subchannel for a first period of time;






receiving subsequent allocations of the at least one designated subchannel for subsequent periods of time, wherein all of the E-PDUs will have a period of time assigned for their communication; and

communicating each of the E-PDUs via one of the at least one designated subchannels, wherein communicating during the first period of time a first E-PDU of the first PDU via the first designated subchannel and a second E-PDU of the first PDU via the second designated subchannel, until all the E-PDUs have been communicated via the designated subchannels.

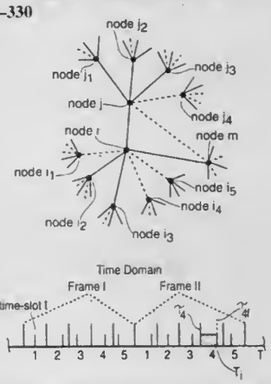
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**5,742,593**

## ON-LINE DISTRIBUTED TDMA/FDMA/CDMA LINK ASSIGNMENT IN MOBILE RADIO NETWORKS WITH FLEXIBLE DIRECTIVITY

**Jacob Sharony, Port Washington, and Alexander C. Sevdinoglou, Commack, both of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.**

**Filed Aug. 29, 1995, Ser. No. 521,101**
**Int. Cl.[6] H04J** *4/00;13/04*
**U.S. Cl. 370—330** **17 Claims**




**1**. A method of assigning transmission parameters when establishing a link (i–j) between two nodes i, j in a communications network, whereby potential conflicts and interference with other nodes of the network that neighbor the nodes i, j are avoided, the method comprising the steps of:

assigning a time slot $t_4$, and a frequency-code value $(f, c)_1$ to a link (i–j) between a pair of nodes i, j, in a communications network, by

first choosing from a set T an available time slot $t_4$ which is not in use for links established between node i and nodes neighboring node i, or for links established between node j and nodes neighboring node j, wherein k connotes a currently chosen time-slot;

second choosing from a set FC an available frequency-code value $(f, c)_1$ which is not, during the chosen available time slot $t_4$, in use by a node that neighbors node i, or by a node that neighbors node j, wherein l connotes a currently chosen frequency-code value; and

returning, if no frequency-code value $(f, c)_1$ is available during a chosen time slot $t_4$, to said first choosing step after removing $t_4$ from the set T of available time slots; wherein

T is a defined set of available time slots (t) during which links in the communications network can be activated; and

FC is a defined set of frequency-code values (f, c) each of which defines a frequency or a frequency-code pair for association with the links in the communications network.

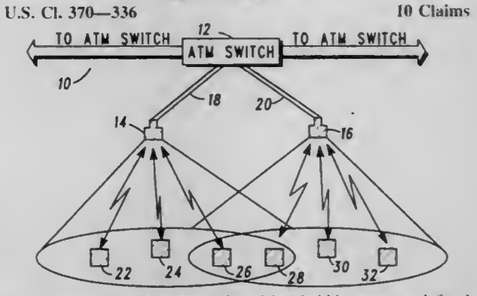
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**5,742,594**

## METHOD AND APPARATUS FOR ALLOCATING SHARED BANDWIDTH AMONG A PLURALITY OF USERS

**Kadathur Subramanya Natarajan, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Jun. 13, 1996, Ser. No. 662,592**
**Int. Cl.[6] H04J** *3/16*
**U.S. Cl. 370—336** **10 Claims**




**1**. A method for allocating shared bandwidth among a defined group of users of a communications system in which information is communicated in a sequentially repeating series of frames of information, each of the sequentially repeating series of frames being subdivided into a plurality of slots, each of the plurality of slots being capable of carrying a quantity of information, said method comprising the steps of:

determining a number of slots in a frame available for said defined group of users;

determining a number of slots requested by at least one user of said defined group of users; and

allocating a number of slots in said frame to the at least one user in accordance with a predetermined allocation scheme,

wherein the step of allocating comprises the steps of:

determining a total request value equal to a sum of the number of slots requested by the at least one user;

computing a proportion equal to the number of slots requested by the at least one user divided by the total request value; and

assigning a number of slots to each of the at least one user equal to an integer part of a product of said proportion and the number of slots in said frame available for use by said defined group of users.

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**5,742,595**

## PROCESSING CDMA SIGNALS

**Shashikant Bhagalia, London, United Kingdom, assignor to DSC Communications Corporation, Plano, Tex.**

**Filed Nov. 16, 1995, Ser. No. 558,675**
**Claims priority, application United Kingdom, Jun. 2, 1995, 9510870; Jun. 7, 1995, 9511546; Jun. 30, 1995, 9513388**
**Int. Cl.[6] H04K** *1/00*
**U.S. Cl. 370—342** **7 Claims**

**1**. A method of processing CDMA signals, comprising the steps of:

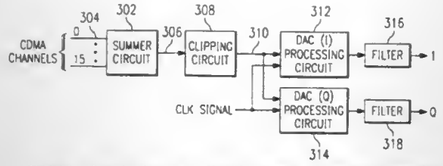
performing a spreading function on CDMA signals from a plurality of channels;

combining the CDMA signals of the plurality of channels to create a summed signal;

removing a portion of the summed signal above and below a desired threshold range to create a clipped signal wherein the

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CDMA signals have a disable value, a power magnitude value, and a power direction value used in determining the summed signal.

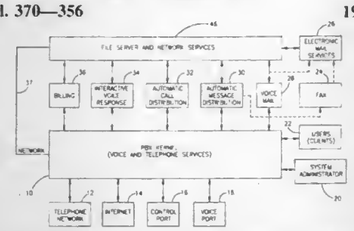
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**5,742,596**

**NETWORK BASED DISTRIBUTED PBX SYSTEM**

**Yaron Baratz, Tel Aviv; Nachum Budin, Herzlia, and Jacob Avimor, Tel Aviv, all of Israel, assignors to Phonet Communication Ltd., Herzelia, Israel**

**Filed Dec. 14, 1995, Ser. No. 572,444**
**Claims priority, application Israel, Nov. 12, 1995, 115967**
**Int. Cl.[6] H04L** *12/66*
**U.S. Cl. 370—356** **19 Claims**




**1**. A personal computer based private branch exchange system distributed across a packet based network, comprising:

a plurality of telephony clients coupled to said network, each telephone client coupled to said network via a network interface card and adapted to interface to a standard analog telephone set;

at least one telephony server coupled to said network, said telephony server for providing centralized call switching capabilities to said plurality telephony clients, communications within said system realized through the transfer of packets over said network wherein said packets contain voice data, said packets containing voice data originating within said system having a priority equal to packets containing non-voice data on said network, said at least one telephony server operative to provide call setup, status monitoring and tear down functions for calls placed by said plurality of telephony clients; and

a system administrator coupled to said network said system administrator for providing management and administration capabilities to said system.

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**5,742,597**

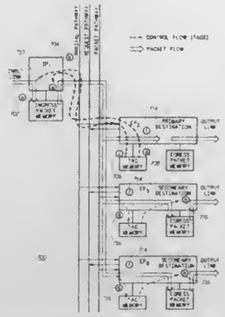
**METHOD AND DEVICE FOR MULTIPOINT SWITCHING AND ARBITRATION IN OUTPUT-REQUEST PACKET SWITCH**

**Craig Sheppard Holt, Cohasset; Richard Kline, E. Walpole, and Krishnan Ramakrishnan, Plainville, all of Mass., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 14, 1996, Ser. No. 616,029**
**Int. Cl.[6] H04L** *12/56*
**U.S. Cl. 370—390** **22 Claims**

**1**. A method for switching of multipoint packets in an output request packet switch, the multipoint packets being switched from a plurality ingress ports (IPs) of to a plurality of egress ports (EPs) where at least one packet is to be delivered to at least two destination egress ports, comprising the steps of:

A) determining, by a receiving IP, a set of destination EPs for a packet that was received on an input link in accordance with a



first predetermined scheme, generating an arrival tag for a primary destination EP, placing, by the IP, a SECONDARIES label in the packet, wherein the SECONDARIES label specifies "secondary destinations" and storing the packet in packet memory;

B) sending, by the receiving IP, to the primary destination EP, an arrival tag containing the address where the packet is stored;

C) receiving, by the primary destination EP, the arrival tag/tags and storing the arrival tag/tags in a tag memory connected to the primary destination EP;

D) selecting, by the primary destination EP, a stored tag in accordance with a second predetermined scheme, and where the tag is an arrival tag, sending the selected stored tag to the packet memory where the packet is stored to request transmission of the packet associated with the arrival tag;

E) receiving, by the packet memory, the selected arrival tag, retrieving the packet associated with the arrival tag from packet memory, and sending the packet associated with the arrival tag to the primary destination EP on a packet pathway;

F) receiving, by the primary destination EP, the packet associated with the arrival tag and dispatching the packet from the primary destination EP; and monitoring, by each EP, the packet pathway and capturing the packet by all EPs that are specified as secondary destinations in the SECONDARIES label of the packet, wherein the packets captured in secondary destinations are termed "secondary packets";

G) storing, by receiving EPs at secondary destinations, the secondary packets in egress packet memory, generating a "secondary tag" corresponding to each secondary packet and storing the secondary tag in a tag memory along with arrival tags; and

H) selecting, by a secondary destination EP, a stored tag in accordance with the second predetermined scheme, and where the tag is a secondary tag, retrieving the packet associated with the secondary tag from the egress packet memory and dispatching the secondary packet from the secondary destination EP.

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**5,742,598**

**NETWORK FOR EFFICIENTLY LOCATING RESOURCES AND ROUTING SERVICE REQUESTS RECEIVED FROM INDIVIDUAL NODE CONNECTIONS**

**James M. Dunn, OceanRidge, Fla.; Colin G. Harrison, Brookfield, Conn.; David W. Levine, Peekskill, N.Y., and Edith H. Stern, Boca Raton, Fla., assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed Oct. 19, 1995, Ser. No. 545,491**
**Int. Cl.[6] H04J** *3/24*
**U.S. Cl. 370—393** **15 Claims**

**1**. A network for establishing connections for a subscriber unit which initiates a request for access to a service available at multiple servers comprising:





(a) a plurality of nodes connected to said network which are selected one at a time for supporting radio connection to the subscriber unit, each of said nodes having the capability of accepting said request for connection from said subscriber unit when it is the selected node to support such radio connection;

(b) a plurality of servers, each server being linked via a network connection to a respective node for providing said service;

(c) means at each node which when the node is selected for connection is responsive to said request for identifying an address of a particular server preselected for providing said service;

(d) means at each node for transmitting said server address to said subscriber unit; and,

(e) means at said node for initiating a connection between said node and said service location over said network, in response to receiving said request from said subscriber unit including said server address, whereby said subscriber unit is connected through said node to said service.

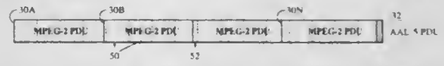
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**5,742,599**

**METHOD AND SYSTEM FOR SUPPORTING CONSTANT BIT RATE ENCODED MPEG-2 TRANSPORT OVER LOCAL ATM NETWORKS**

**Mengjou Lin, San Jose; Alagu Periyannan, Aptos, and David Singer, San Francisco, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.**

**Filed Feb. 26, 1996, Ser. No. 606,602**
**Int. Cl.[6] H04L** *12/56*
**U.S. Cl. 370—395** **19 Claims**




**1**. A method for encoding a stream of first data packets over a network, the network transmitting data in second data packets whose size is significantly larger than the first data packets, the method comprising the steps of:

(a) packing a plurality of first data packets into a single second data packet;

(b) inserting a segment trailer into the single second data packet after at least two first data packets; and

(c) inserting a trailer at the end of the single second data packet.

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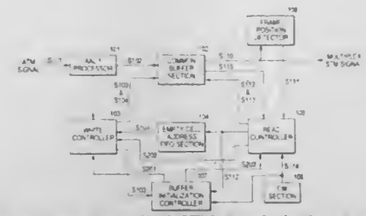
**5,742,600**

**MULTIPLEX ATM/STM CONVERTER FOR STRUCTURED DATA**

**Motoo Nishihara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jun. 5, 1996, Ser. No. 655,216**
**Claims priority, application Japan, Jun. 5, 1995, 7-138173**
**Int. Cl.[6] H04L** *12/56*
**U.S. Cl. 370—395** **7 Claims**

**1**. A multiplex ATM/STM converter for structured data which is an ATM/STM conversion circuit that converts back to original STM signals ATM cells by which information is transmitted in cell



units for each channel of STM signals having a plurality of channels time-division multiplexed into frame cycles; and comprising:

an ATM adaptation layer 1 (AAL1) processor (**101**) that inputs said ATM cells, subjects these ATM cells to SAR/CS layer processing according to structured data transmission protocol of ITU-Telecommunication Recommendation I. 363, and as one result of this processing, extracts virtual path identifiers and frame positions of STM frames and outputs said ATM cells;

cell buffer means that stores said ATM cells by each virtual path to absorb cell delay variation (CDV) of said ATM cells;

a write controller within said cell buffer means which, when establishing regions as cell blocks for storing each virtual path, controls cell block addresses for writing to said cell buffer means ATM cells having virtual path numbers extracted by said AAL1 processor;

a control memory section in which is stored the channel arrangement of virtual paths of ATM cells to STM frames, and from which is read, in accordance with frame conditions of the STM network, information designating a virtual path to be read next from said cell buffer means;

a read controller that manages read-out addresses to said cell buffer means and reads from said cell buffer means virtual paths designated by output of said control memory section; and

a buffer initialization controller that inputs signals that notify of generation of writing and readout from said write controller and read controller, respectively, and monitors the amount of information stored in said cell buffer means, and which executes buffer initialization processing when said amount of information satisfies prescribed conditions;

wherein said cell buffer means comprises a plurality of queues for storing payloads of ATM cells received from said AAL1 processor for each virtual path, and moreover, is structured as a common buffer in which buffer amounts of cell blocks making up each queue are mutually and independently set such that the sum total of buffer amounts of all queues equals a prescribed value determined depending on the transmission path capacity.

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**5,742,601**

**ATM COMMUNICATIONS EQUIPMENT**

**Michael Riedel, Dresden, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

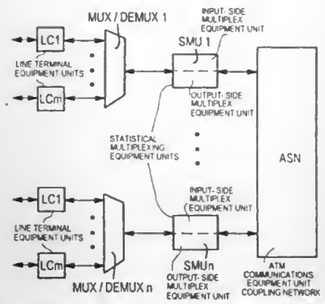
**Filed Jun. 4, 1996, Ser. No. 657,951**
**Claims priority, application Germany, Jun. 9, 1995, 195 21 069.7**
**Int. Cl.[6] H04L** *12/56*
**U.S. Cl. 370—395** **4 Claims**

**1**. A method for operating a communications system having an ATM communications equipment unit coupling network with terminals, and wherein a statistical multiplexing equipment unit is provided at each of the terminals for a statistical multiplexing of message cells, and wherein each statistical multiplexing equipment unit has an input-side multiplex equipment unit and an output-side multiplex equipment unit, comprising the steps of:

respectively controlling in the individual input-side multiplex equipment units input queues for storing of message cells to be transmitted, the queues being individually allocated to respective output-side multiplex equipment units, and respec-

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tively retaining in the input-side multiplex equipment units and the output-side multiplex equipment units indications concerning current usage of a bandwidth available at respective terminals;

for transmission of message cells by an input-side multiplex equipment unit to an output-side multiplex unit allocated thereto, carrying out a flow control such that, given an exceeding of at least one determined threshold of an occupancy level by an input queue of the respective input-side multiplex equipment unit, which queue is allocated to the respective output-side multiplex equipment unit, after an allocation of an input-side bandwidth an request message is transmitted to the respective output-side multiplex equipment unit by means of which an output-side bandwidth corresponding to the bandwidth allocated to the input-side multiplex equipment unit is requested for processing of the respective input queue;

if a free output-side bandwidth is not available, inserting the request message into a request queue controlled in the respective output-side multiplex equipment unit;

after the processing of an input queue allocated to the respective output-side multiplex equipment unit by the input-side multiplex equipment unit associated with said input queue, releasing the bandwidth previously occupied at the input-side by this input queue and transmitting a cleardown message to the respective output-side multiplex equipment unit for indicating a releasing of the bandwidth occupied for this input queue up to this point;

with the respective output-side multiplex equipment unit becoming free of an output-side bandwidth given presence of a request queue occupied by at least one request message, first sending an offer message by the respective output-side multiplex equipment unit to the input-side multiplex equipment unit that previously emitted a currently pending request message for processing; and

providing in the offer message indications concerning output-side bandwidth to be made available, and transmitting a confirmation message back by the respective input-side multiplex equipment unit providing indications concerning actually claimed output-side bandwidth.

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**5,742,602**

## ADAPTIVE REPEATER SYSTEM

**Arthur T. Bennett, Coppell, Tex., assignor to Compaq Computer Corporation, Houston, Tex.**

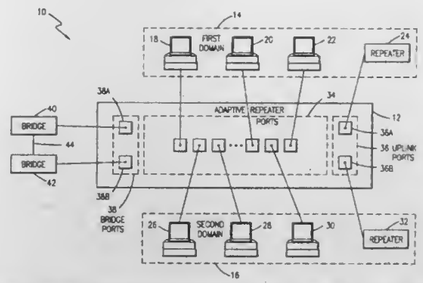
**Filed Jul. 12, 1995, Ser. No. 501,288**
**Int. Cl.[6] H04L** *12/46;* **H04Q** *1/00*
**U.S. Cl. 370—401** **25 Claims**

**1.** A system for communicating data comprising:

a plurality of data devices of a first domain, each of said data devices of said first domain operable to communicate data at a first rate;

a plurality of data devices of a second domain, each of said data devices of said second domain operable to communicate data at a second rate;

a repeater coupled to each of said data devices of said first domain and said second domain;




said repeater including a first and a second repeater module, said first repeater module operable to receive data from a first data device of said plurality of data devices of said first domain operating at said first rate and further operable to communicate said data from said first data device of said plurality of data devices of said first domain to the remaining data devices of said plurality of data devices of said first domain operating at said first rate;

said second repeater module operable to receive data from a first data device of said plurality of data devices of said second domain operating at said second rate and further operable to communicate said data from said first data device of said plurality of data devices of said second domain to the remaining data devices of said plurality of data devices of said second domain operating at said second rate; and

said repeater further including a plurality of interface circuits coupled to each of said plurality of data device in said first domain and to each of said plurality of data device is said second domain, each of said plurality of interface circuits coupled to said first repeater module and said second repeater module, each of said plurality of interface circuits operable to communicate data received at said first rate to said first repeater module, each of said plurality of interface circuits further operable to communicate data received at said second rate to said second repeater module.

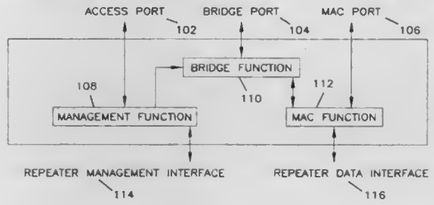
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**5,742,603**

## METHOD AND APPARATUS FOR INTEGRATING REPEATER MANAGEMENT, MEDIA ACCESS CONTROL, AND BRIDGING FUNCTIONS

**Haim Shafir, Sacramento, and Mark T. Feuerstraeter, Rancho Cordova, both of Calif., assignors to Level One Communications, Inc., Sacramento, Calif.**

**Filed Sep. 14, 1995, Ser. No. 528,205**
**Int. Cl.[6] H04L** *12/28*
**U.S. Cl. 370—401** **10 Claims**




**1.** A repeater management device for communication networks, the repeater management device controlling repeaters and routing data packets between a receiving port and a destination port, comprising:

repeater management means for controlling and monitoring repeater functions related to the retransmission of the data packets and for providing status of and control over repeater functions via an external repeater management interface;

bridging support means, coupled to the repeater management means, for receiving the data packets on the receiving port and for forwarding the received data packets to the destination port in accordance with a destination address; and

media access controller, coupled to the repeater management means, for providing signal framing of the data packets and for controlling access to a repeater data interface.



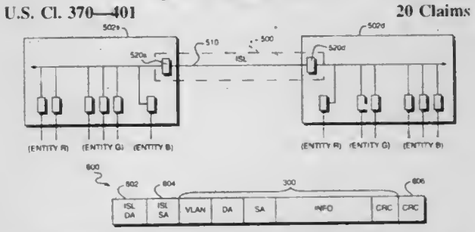
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**5,742,604**

## INTERSWITCH LINK MECHANISM FOR CONNECTING HIGH-PERFORMANCE NETWORK SWITCHES

**Tom Edsall, Mountain View, and Norman Finn, San Jose, both of Calif., assignors to Cisco Systems, Inc., San Jose, Calif.**

**Filed Mar. 28, 1996, Ser. No. 623,142**
**Int. Cl.[6] H04L** *12/66*
**U.S. Cl. 370—401** **20 Claims**




**1.** Apparatus for efficiently transporting packets between ports of different switches in a network on the basis of virtual local area network (VLAN) associations among those ports, the packet comprising a destination address field which identifies a destination network address and a source address field which identifies a source network address, the VLAN associations specified by a VLAN identifier of the packet, the apparatus comprising:

an interswitch link (ISL) connection; and

ISL source and destination port interface circuitry coupled to the ISL connection for interconnecting the different switches, the ISL source port interface circuitry encapsulating the packets by appending source and destination ISL addresses to the packets prior to transferring the encapsulated packets over the ISL link, the destination ISL address defining the ISL destination port interface circuitry for receiving the packets within a destination switch and the source ISL address defining the ISL source port interface circuitry transmitting the packets within a source switch, the ISL destination port interface circuitry decapsulating the encapsulated packets to remove the source and destination ISL addresses appended thereto, and thereafter forwarding the packets to the correct port as specified by the VLAN identifier.

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**5,742,605**

## SYNCHRONOUS OPTICAL NETWORK USING A RING ARCHITECTURE

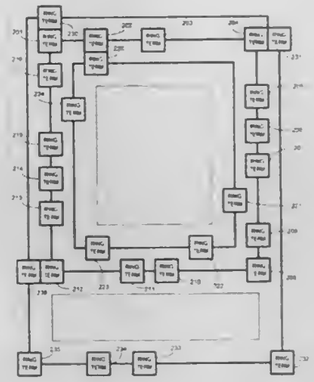
**Charles William Norman, Jr., Overland Park, Kans., assignor to Sprint Communications Co., L.P., Kansas City, Mo.**

**Filed Feb. 28, 1994, Ser. No. 203,165**
**Int. Cl.[6] H04L** *12/50;12/56*
**U.S. Cl. 370—405** **49 Claims**

**1.** A SONET system which comprises:

(a) a plurality of SONET ring terminals;

(b) a plurality of SONET spans connecting the ring terminals to form an architecture comprising a plurality of rings wherein each ring is comprised of unique ring terminals and spans and is not comprised of any ring terminals and spans of another ring, and wherein particular spans of different rings are stacked within a single fiber route; and



(c) a plurality of connections between the rings that are operational to provide interconnectivity among the rings.

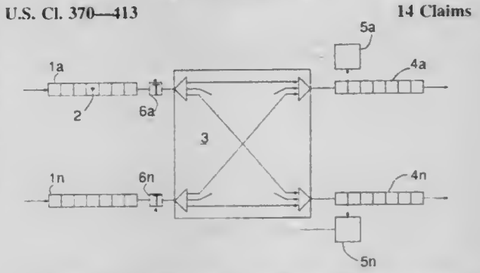
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**5,742,606**

## SWITCHING APPARATUS AND METHOD FOR MULTIPLE TRAFFIC CLASSES

**Ilias Iliadis, Rueschlikon, Greece, and Roch A. Guerin, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**PCT No. PCT/EP93/03727, § 371 Date Oct. 30, 1996, § 102(e) Date Oct. 30, 1996, PCT Pub. No. WO95/18499, PCT Pub. Date Jul. 6, 1995**
**PCT Filed Dec. 31, 1993, Ser. No. 663,091**
**Int. Cl.[6] H04L** *12/56*
**U.S. Cl. 370—413** **14 Claims**




**1.** A switch for a plurality of n different classes of data traffic, comprising input ports with input queues (**1***a*–**1***n*) for storing incoming packets of said data, output ports with output queues (**4***a*–**4***n*; **8**) for storing outgoing packets of said data, control means (**5***a*–**5***n*; **9***a*–**9***n*; **10**) for detecting an overflow state of said data packets in at least one of said output queues (**4***a*–**4***n*; **8**), backpressure means for, in case of said detected overflow state, preventing at least one of said input queues (**1***a*–**1***n*) from transmitting said data packets to said output queue (**4***a*–**4***n*; **8**) in which said overflow state is detected, characterized in that said switch further comprises timing means (**6***a*–**6***n*; **7***a*–**7***n*) for interrupting for a predetermined period of time (T) an attempt of at least one of the input queues (**1***a*–**1***n*) to transmit at least one of said classes of data traffic to said output queue (**4***a*–**4***n*; **8**) in which said overflow state is detected, said timing means (**6***a*–**6***n*; **7***a*–**7***n*) being triggered by a trigger-signal, emitted by said control means (**5***a*–**5***n*; **9***a*–**9***n*; **10**) in case of said detected overflow state.

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**5,742,607**

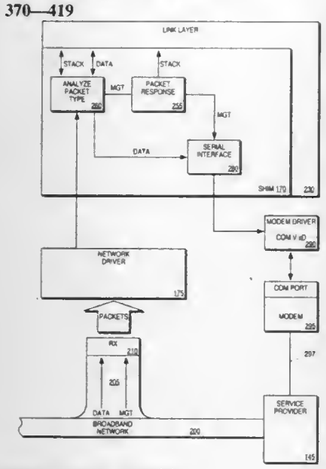
## METHOD AND APPARATUS FOR CONTROLLING TWO WAY COMMUNICATION VIA DISPARATE PHYSICAL MEDIA

**Ed Beighe, Phoenix, and Surjit Ahluwalia, Chandler, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Dec. 20, 1995, Ser. No. 575,776**

**Int. Cl.[6] H04L** *12/28*

**U.S. Cl. 370—419** **21 Claims**




1. A computer system comprising:

a central processor coupled to a bus;

a forward channel interface coupled to the bus, coupled to interrupt the central processor, and coupled to receive a packet from a forward channel which uses a first transmission media;

a return channel interface coupled to the bus, the return channel interface being adapted to transmit packets using a second transmission media different than the first transmission media;

a main memory coupled to the bus, the main memory containing a user application and an interrupt service routine, the interrupt service routine comprising a first set of code for passing the packet to a routine for decapsulating the packet, the main memory also containing a second set of code for passing a second packet to the return channel interface, and a third set of code for determining if the packet is a network management packet and calling the second set code to pass a response packet to the return channel interface if the packet is a network management packet.

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**5,742,608**

## DEVICE FOR INTERFACING BETWEEN COMMUNICATIONS MEDIA IN A HOME SYSTEMS NETWORK

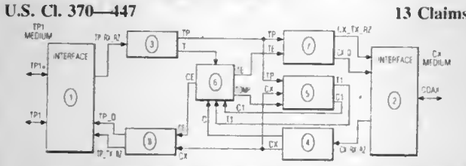
**Pax Randrianaliminana, Plobsheim, and Helmut Bürklin, Strasbourg, both of France, assignors to Thomson multimedia S.A., Courbevoie, France**

**Filed Jan. 5, 1996, Ser. No. 583,236**

**Claims priority, application France, Jan. 10, 1995, 95 00207**

**Int. Cl.[6] H04L** *5/16*

**U.S. Cl. 370—447** **13 Claims**




1. Device for interfacing between at least two communications buses comprising:

a two-way interface for each of the said communications buses,

a circuit for comparison of messages received by said interfaces,

a circuit for resolving conflicts of priority between messages overlapping in time, said circuit for resolving conflicts of priority determining among said messages overlapping in time a message having priority, said conflict-resolution circuit authorizing transmission of said message having priority, through said interface or interfaces, to the communications bus from which said message did not originate,

wherein said determination of said message having priority is made as a function of the time delay between the start of said overlapping messages and the result of the comparison between said messages.

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**5,742,609**

## SMART CANISTER SYSTEMS

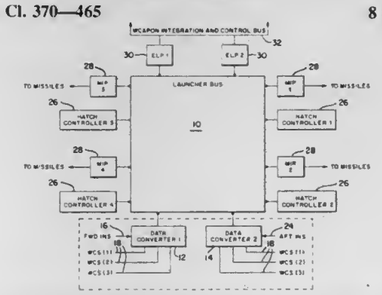
**Mark R. Kondrak, 5200 63rd Ave. North, Brooklyn Center, Minn. 55429; Pradip C. Kar, 12074 Unity St. NW., Coon Rapids, Minn. 55448; Ronald E. Hannig, 11480 Foley Blvd. NW., Coon Rapids, Minn. 55433, and Charles H. Hoke, Jr., WRAIR, DVD, Dept. of Virus Diseases, Wash, D.C. 20307**

**Continuation of Ser. No. 84,690, Jun. 29, 1993, abandoned.**

**This application Feb. 17, 1995, Ser. No. 389,854**

**Int. Cl.[6] H04J** *3/16*

**U.S. Cl. 370—465** **8 Claims**




1. A smart canister system to provide a faster response time for firing missiles and enable higher launcher possibility in a multifarious missile environment, the system comprising:

an operator interface to initiate a weapon control system;

said operator interface being linked to at least one embedded launcher processor wherein said embedded launcher processor manages a missile launch in cooperation with said weapon control system;

a launcher bus for carrying information on engagement command, status report, missile system control and related information connected to said at least one embedded launcher processor and further connected to a module interface processor, a system monitor and a hatch controller wherein said module interface processor executes commands including selection of a particular missile among a group of missiles stored in a canister, said system monitor for use in monitoring said group of missiles stored in said canister, and said hatch controller for use in operating covers of said canister to allow missile flyout;

said module interface processor connected to a missile cell via a bus;

said system monitor linked to said bus and thereby connected to said missile cell;

said hatch controller connected to a vertical launch module control; and

said operator interface, said launcher bus, said module interface processor, said system monitor and said hatch controller being in communication with said weapon control system.



**5,742,610**

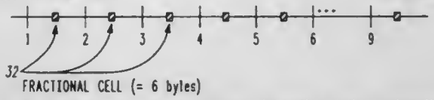
## METHOD AND APPARATUS FOR USE IN A DATA COMMUNICATIONS NETWORK SERVING SUBSCRIBERS OPERATING AT A PLURALITY OF TRANSMISSON DATA RATES

**Kadathur Subramanya Natarajan, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Feb. 6, 1996, Ser. No. 597,630**

**Int. Cl.[6] H04J** *3/22*

**U.S. Cl. 370—472** **21 Claims**




1. In a data communication system including a first subscriber unit that operates at a first transmission data rate, a method of transmitting an information stream comprising the steps of:

determining the first transmission data rate;

determining a partitioning factor based at least in part on the first transmission data rate;

gathering constituent elements of the information stream; and

using the partitioning factor to packetize the constituent elements of the information stream for transmission thereof.

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**5,742,611**

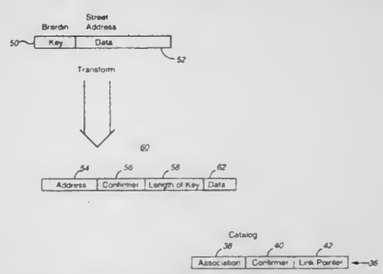
## CLIENT SERVER NETWORK AND METHOD OF OPERATION

**Christopher Lockton Brandin, Colorado Springs, Colo., assignor to NEO-Core, LLC**

**Filed Mar. 18, 1996, Ser. No. 617,135**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 370—473** **22 Claims**




1. A client server network, comprising:

a plurality of clients, transmitting a plurality of messages each containing an address and a confirmer, each of the plurality of clients having a client transform generator for generating the address and the confirmer;

a communication network coupled to each of the plurality of clients for carrying the plurality of messages; and

a server having a server transform generator and coupled to the communication network and receiving the plurality of messages containing the address and the confirmer.

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**5,742,612**

## METHOD AND DEVICE FOR INTERLEAVING A SEQUENCE OF DATA ELEMENTS

**Frédéric Gourgue, and Fabrice de Seze, both of Paris, France, assignors to Alcatel Radiotelephone, Paris, France**

**Filed Jun. 1, 1994, Ser. No. 252,313**

**Claims priority, application France, Jun. 2, 1993, 93 06574**

**Int. Cl.[6] G06F** *11/00*

**U.S. Cl. 371—2.1** **13 Claims**

1. A method of interleaving a source sequence comprising N data elements delivering an interleaved sequence corresponding to said source sequence, said method comprising at least one interleaving step associating the data element of index j of said interleaved sequence to the data element of index i of said source sequence, the value j being determined from the value i as follows:

| Index i of SOURCE sequence elements | Index j of INTERLEAVED sequence elements |
|---|---|
| 1 | 5 |
| 2 | 9 |
| 3 | 13 |
| 4 | 17 |
| 5 | 4 |
| 6 | 8 |
| 7 | 12 |
| 8 | 16 |
| 9 | 3 |
| 10 | 7 |
| 11 | 11 |
| 12 | 15 |
| 13 | 2 |
| 14 | 6 |
| 15 | 10 |
| 16 | 14 |
| 17 | 1 |

Example: N = 17, a = 4, b = 0

$$j=(a\cdot i+b) \text{ (modulo N)}+1$$

where:

$1 \leq i \leq N$ and $1 \leq j \leq N$;

a is a predetermined integer relatively prime with N and such that:

$2 \leq a \leq N-1$, and

b is a predetermined integer such that:

$0 \leq b \leq N-1$.

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**5,742,613**

## MEMORY ARRAY OF INTEGRATED CIRCUITS CAPABLE OF REPLACING FAULTY CELLS WITH A SPARE

**Neal Hugh MacDonald, Durham, England, assignor to Syntaq Limited, England**

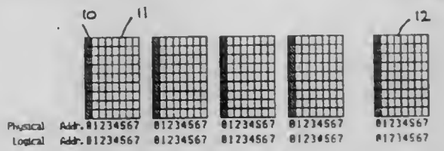
**PCT No. PCT/GB91/01929, § 371 Date Apr. 27, 1993, § 102(e) Date Apr. 27, 1993, PCT Pub. No. WO92/08193, PCT Pub. Date May 14, 1992**

**PCT Filed Nov. 4, 1991, Ser. No. 50,155**

**Claims priority, application United Kingdom, Nov. 2, 1990, 9023867**

**Int. Cl.[6] G06F** *11/20*

**U.S. Cl. 371—10.3** **11 Claims**




1. A fault tolerant random access data storage system, comprising:

a) a plurality of main memory elements, each said main memory element having an array of memory locations arranged in rows and columns with respective physical addresses;

b) a first spare memory element and a second spare memory element, each said spare memory element having an array of memory locations arranged in rows and columns with respective physical addresses;

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c) random said main and first spare memory elements having random rows which are faulty and random said main and second spare memory elements having random columns which are faulty;

d) a plurality of data lines connected to respective said main memory elements for writing data to or reading data from said main memory elements in parallel;

e) means for generating logical row addresses one-at-a-time and for generating logical column addresses one-at-a-time;

f) programmable electronic means for converting each said logical row address into a set of physical row addresses, one for each main memory element and one for said first spare memory element, with the physical row addresses of each said set being skewed relative to each other and relative to the respective logical row address such that, for each logical row address which is generated, no two memory elements of said main and first spare memory elements have faulty rows at the respective converted physical row addresses;

g) said programmable electronic means being also for converting each said logical column address into a set of physical column addresses, one for each main memory element and one for said second spare memory element, with the physical column addresses of each said set of physical column addresses being skewed relative to each other and relative to the respective logical column address such that, for each logical column address which is generated, no two memory elements of said main and second spare memory elements have faulty columns at the respective converted physical column addresses; and

h) means for recording the locations of faulty rows in said main and first spare memory elements and the locations of faulty columns in said main and second spare memory elements such that if, in response to any said logical row address, a selected row in one of said main memory elements is faulty, then a replacement row in said first spare element is selected instead and connected to the data line of said one of said main memory elements in which said selected row is faulty, and if, in response to any said logical column address, a selected column in one of said main memory elements is faulty, then a replacement column in said second spare element is selected instead and connected to the data line of said one of said main memory elements in which said selected column is faulty.

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**5,742,614**

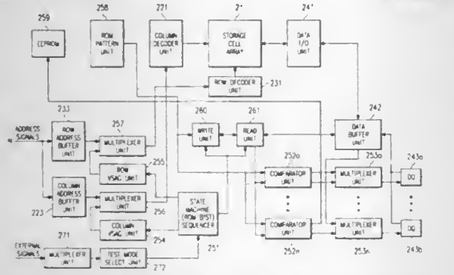
**APPARATUS AND METHOD FOR A VARIABLE STEP ADDRESS GENERATOR**

**Danny R. Cline, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Nov. 25, 1996, Ser. No. 756,313**

**Int. Cl.[6] G06F *11/00***

**U.S. Cl. 371—21.2** **18 Claims**



1. A semiconductor random access memory unit comprising:

a storage cell array having multiplicity of storage cells;

a pattern storage unit for storing data pattern groups;

a data input/output unit for exchanging data with an addressed group of storage cells;

an addressing unit for addressing groups of said storage cell, said addressing unit including apparatus for addressing at least a first non-sequential series of storage cell array groups in response to a first address control signal, wherein a first data pattern group is stored in said nonsequential series of storage cell groups in response to a first write control signal.

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**5,742,615**

**NON-VOLATILE SEMICONDUCTOR MEMORY**

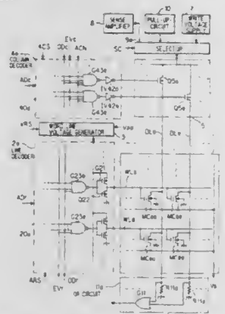
**Ichiro Kondo, and Nobuyuki Tanaka, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Jun. 20, 1996, Ser. No. 667,145**

**Claims priority, application Japan, Jun. 20, 1995, 7-152894**

**Int. Cl.[6] G01R *31/28***

**U.S. Cl. 371—21.3** **11 Claims**



1. A non-volatile semiconductor memory comprising:

a memory cell array consisting of a matrix of memory-cell-transistors arranged in lines and columns, each of said memory-cell-transistors able to be marked and erased electrically;

word lines, each of said word lines connected to control gates of memory-cell-transistors arranged in each of said lines of said matrix;

digit lines, each of said digit lines connected to drains of memory-cell-transistors arranged in each of said columns of said matrix;

a source line connected to sources of all of said matrix of memory-cell-transistors;

a word line voltage generator for generating word line voltages including a first word line voltage used in an erase pulse impression process and a second word line voltage used in a depression discrimination process;

a line decoder for selecting and supplying all of said word lines with said first word line voltage in said erase pulse impression process and said second word line voltage in said depression discrimination process, and selecting and supplying one of said word lines designated by a line address signal delivered from outside with corresponding word line voltages generated by said word line voltage generator in an ordinary readout process and an ordinary data write process respectively;

a source voltage supply for supplying said source line with an erase pulse of a predetermined voltage in said erase pulse impression process, and otherwise grounding said source line;

a column decoder and a column selector for leaving all of said digit lines floating in said erase pulse impression process, selecting all of said digit lines in said depression discrimination process, and selecting one of said digit lines designated by a column address signal delivered from outside in an ordinary readout process and an ordinary data write process;

a sense amplifier for discriminating a signal level of said all of said digit lines selected in said depression discrimination process and said one of said digit lines selected in said ordinary readout process; and

a write voltage supply for supplying said one of said digit lines selected with a predetermined voltage in said ordinary data write process.



**5,742,616**

**SYSTEM AND METHOD TESTING COMPUTER MEMORIES**

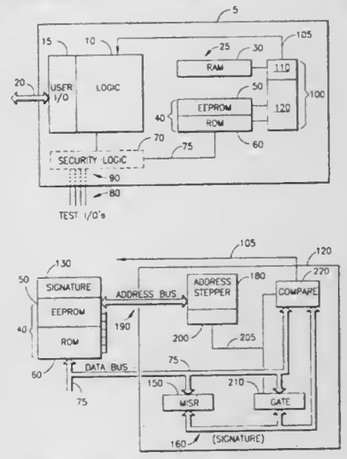
**Otto Torreiter, Leinfelden-Echterdingen; Roland Metzger, Wimsheim, and Dieter Wendel, Schonaich, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 7, 1995, Ser. No. 486,468**

**Claims priority, application European Pat. Off., Mar. 1, 1995, 95100835**

**Int. Cl.[6] G01R *31/28***

**U.S. Cl. 371—22.4** **14 Claims**



1. A self test apparatus comprising:

processor means;

a memory comprising a non-volatile memory and an erasable memory;

self test circuit means coupled to said memory and said processor means, for testing a condition of said memory and issuing to said processor means a general statement about the condition of said memory, said general statement indicating a presence of a wanted or unwanted manipulation or alteration within said memory, said general statement including insufficient information to enable contents of said memory to be derived, but stating whether a deviation has been detected in the contents of said memory with respect to a last executed test; and

the self test circuit means including a non-volatile memory tester which includes: signature generating means, operable after each authorized access to said non-volatile memory, for generating a signature from contents of the non-volatile memory, and a comparator for comparing the signature from said signature generating means with a reference value of the signature, and for issuing at least one signal indicating whether the signature and the reference value concur.

8. A method for testing a non-volatile memory, comprising the steps of:

(a) periodically generating a signature value from contents of the non-volatile memory;

(b) comparing the signature value with a reference signature value;

(c) issuing a signal when the comparing step indicates a difference between compared values;

(d) allowing an access to the non-volatile memory when the comparing step indicates no difference between the compared values;

(e) generating a new signature from the contents of the non-volatile memory; and

(f) storing the new signature of step (e) as a new signature reference value.

**5,742,617**

**CONTROLLER FOR IMPLEMENTING SCAN TESTING**

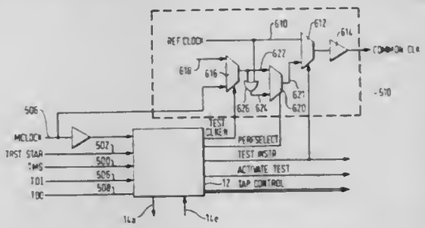
**Robert Warren, Bristol, United Kingdom, assignor to SGS-Thomson Microelectronics Limited, Almondsbury Bristol, United Kingdom**

**Filed Aug. 24, 1995, Ser. No. 518,767**

**Claims priority, application United Kingdom, Sep. 1, 1994, 9417602**

**Int. Cl.[6] G01R *31/28***

**U.S. Cl. 371—22.31** **12 Claims**



1. A test access port controller for implementing scan testing with a chain of scan latches comprising:

logic circuitry for generating a plurality of control signals to said scan latches;

a data output for outputting test data to said scan latches;

a data input for receiving resultant data from said scan latches, so that said resultant data can be compared with expected data;

a signal generator including a test clock for implementing a structural test at a predetermined frequency and for outputting timing signals to said scan latches;

a state indicator connected to said logic circuitry and to said signal generator for selecting a mode of operation of said controller from a first mode of structural test which provides resultant data dependent on a predetermined extant set of test data and a second mode of performance test which provides resultant data dependent on a change from a first set of test data to a second set of test data within a time period controllable independent of the test clock frequency for the structural test.

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**5,742,618**

**RF TRANSPONDER SYSTEM HAVING ERROR DETECTION AND CORRECTION**

**Peter R. Lowe, Colorado Springs, Colo., assignor to Palomar Technologies Corporation, Carlsbad, Calif.**

**Filed Sep. 4, 1996, Ser. No. 707,740**

**Int. Cl.[6] G06F *11/08***

**U.S. Cl. 371—36** **20 Claims**

1. A method for detecting data transmission errors in an RF transponder system comprising:

generating an RF excitation signal with an exciter;

powering a transponder with said RF excitation signal;

generating an RF response signal, including a plurality of data sets, each of said data sets comprising a plurality of bits and each of said data sets containing a common message, wherein at least one of said data sets is encoded in a manner different from the remaining data sets, and transmitting said RF response signal to a reader;

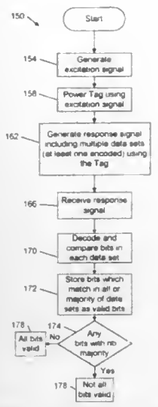
receiving said RF response signal at said reader;

decoding said at least one of said encoded data sets with said reader to provide at least one decoded data set;

comparing corresponding bits of each of said at least one decoded data set and said remaining data sets; and

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defining a selected bit of a selected decoded or remaining data set as a valid bit, if said selected bit matches a majority of said corresponding bits.

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**5,742,619**

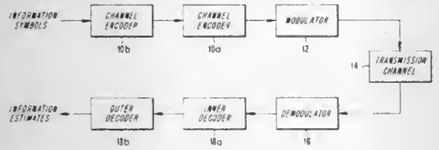
**METHOD AND APPARATUS FOR CONCATENATED CODING OF MOBILE RADIO SIGNALS**

**Amer A. Hassan, Research Triangle Park, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.**

**Filed Jul. 11, 1996, Ser. No. 678,314**

**Int. Cl.[6] H03M** *13/12*

**U.S. Cl. 371—37.4** **24 Claims**




**22**. A communication system, comprising:

means for encoding a sequence of information symbols with one or more codes to generate an encoded sequence;

modulation means for modulating the encoded sequence and transmitting the modulated sequence over a transmission channel;

demodulating means for demodulating the modulated sequence by performing a number of calculations and storing results of the calculations in a memory whenever a maximum capacity defined by a mathematical combination of the number of calculations and stored results is not exceeded; and

decoding means for performing one or more decodings to decode portions of the demodulated sequence during which the maximum capacity is exceeded.

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**5,742,620**

**GMD DECODING APPARATUS AND A METHOD THEREFOR**

**Keiichi Iwamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 19, 1996, Ser. No. 684,080**

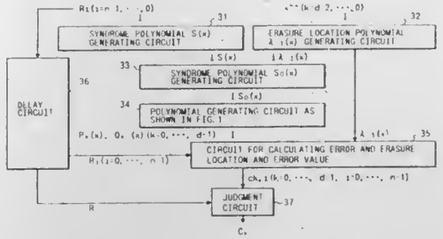
**Claims priority, application Japan, Jul. 21, 1995, 7-185448**

**Int. Cl.[6] H03M** *13/00*

**U.S. Cl. 371—37.11** **8 Claims**

**1**. A decoding apparatus comprising:

means for generating a syndrome polynomial to generate syndrome polynomials from a reception system;




means for generating an erasure location polynomial to generate erasure location polynomials in accordance with reliability of each of the symbols of said reception system;

polynomial multiplication means for multiplying the syndrome polynomial generated by said means for generating a syndrome polynomial and the erasure location polynomial generated by said means for generating an erasure location polynomial;

memory means for storing a plurality of polynomials including said polynomial having the result of multiplication of said polynomial multiplication means as the initial value;

calculating means for executing a given number of plural calculations with one or a plurality of polynomials stored in said memory means as input, and outputting a plurality of polynomials as the result of calculations;

updating means for updating the polynomials stored in said memory means by use of the output of said calculating means;

control means for deciding on the input and output relations of said calculating means in accordance with a coefficient of a given degree of a specific polynomial among the polynomials stored in said memory means;

means for generating code words to generate code words one after another by use of said reception system, said polynomials being output one after another by said calculating means, and the erasure location polynomials generated by said means for generating an erasure location polynomial; and

determination means for determining whether or not code words generated by said generating means and said reception system satisfy a given condition, and outputting the word found as satisfying said condition as the result of decoding.

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**5,742,621**

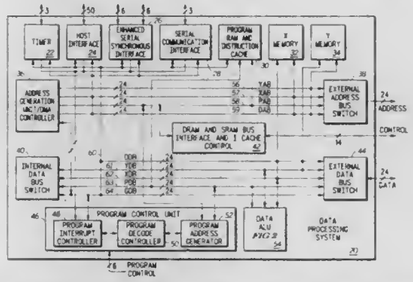
**METHOD FOR IMPLEMENTING AN ADD-COMPARE-SELECT BUTTERFLY OPERATION IN A DATA PROCESSING SYSTEM AND INSTRUCTION THEREFOR**

**Yossi Amon, Tel-Aviv, and Natan Baron, Ornit, both of Israel, assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Nov. 2, 1995, Ser. No. 554,329**

**Int. Cl.[6] G06F** *11/10*

**U.S. Cl. 371—43** **18 Claims**




**1**. A method for performing an add-compare-select butterfly operation for implementing a Viterbi decoder in a data processing system, the method comprising the steps of:



loading a branch metric into a first storage element;

loading both a first previous path metric and a first trellis value into a second storage element;

loading both a second previous path metric and a second trellis value into a third storage element;

determining which of the first previous path metric and the second previous path metric is a survivor path metric using the branch metric;

storing the survivor path metric, and a corresponding survivor trellis state in a fourth storage element; and

performing a logical left shift on either the first or second trellis values and inserting a predetermined logic bit at a least significant bit location of the first or second trellis value to identify the corresponding survivor trellis state.

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**5,742,622**

**ERROR DETECTION AND CORRECTION SYSTEM FOR A STREAM OF ENCODED DATA**

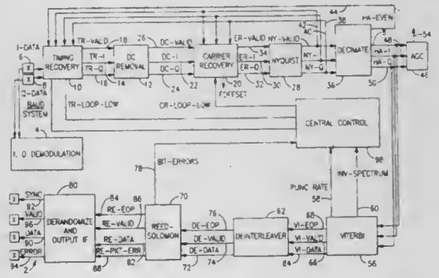
**Anthony Peter John Claydon, Bath; Richard John Gammack, Bristol; William Philip Robbins, Cam; Charles Dunlop MacFarlane, Dursley; Thomas Foxcroft; Andrew Peter Kuligowski, both of Clifton, and Richard James Thomas, Dover Place, all of United Kingdom, assignors to Discovision Associates, Irvine, Calif.**

**Filed Apr. 26, 1996, Ser. No. 638,273**

**Claims priority, application United Kingdom, Mar. 12, 1996, 9605190**

**Int. Cl.[6] H03M** *13/12*

**U.S. Cl. 371—46** **42 Claims**




**1** A decoder for received data symbols that are encoded according to a convolutional encoding scheme, the data being punctuated according to a puncturing matrix, the data having a plurality of state values and describing a sequence of state transitions from a first state to a succeeding state, wherein a path is defined by the sequence of state transitions, the decoder comprising:

a generation unit accepting said received data for calculating metrics of the transitions thereof from the first state to the succeeding state, wherein said metrics correspond to a likelihood that a measured path follows a path produced by an encoder of the data;

a selector responsive to said generation unit for selecting a path corresponding to the path produced by a transmitter of the data stream; a traceback unit for maintaining historical information representative of sequential decision operations of said selector;

a counter for counting illegal state transitions of the path selected by said selector; and

a control unit, responsive to said counter, for determining a puncture rate and adjusting a puncture phase of the received data.

**5,742,623**

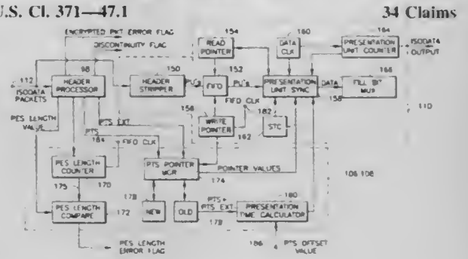
**ERROR DETECTION AND RECOVERY FOR HIGH RATE ISOCHRONOUS DATA IN MPEG-2 DATA STREAMS**

**Ray Nuber, La Jolla, and Paul Moroney, Olivenhain, both of Calif., assignors to General Instrument Corporation of Delaware, Chicago, Ill.**

**Continuation-in-part of Ser. No. 511,266, Aug. 4, 1995, Pat. No. 5,598,415. This application Jul. 11, 1996, Ser. No. 678,108**

**Int. Cl.[6] H04L** *1/00; 7/00*

**U.S. Cl. 371—47.1** **34 Claims**




**1**. A method for managing errors in isochronous data ("isodata") received in bursts from a packetized data stream carrying isodata presentation units in fixed length isodata transport packets, each of said transport packets including a packet identifier (PID) and at least some of said packets containing a presentation time stamp (PTS) indicative of a time for commencing the fixed rate presentation of isodata presentation units from a buffer into which they are temporarily stored upon receipt, said method comprising the steps of:

monitoring said data stream to detect PIDs identifying said isodata transport packets;

monitoring the isodata transport packets identified by said PIDs to locate isodata PTSs;

synchronizing the presentation of said presentation units from said buffer to a system time clock (STC) using timing information derived from the located isodata PTSs;

identifying discontinuity errors between successive ones of said isodata transport packets and, if a discontinuity of no more than one packet is identified, advancing a write pointer of said buffer by a suitable number of bits to compensate for the discontinuity, while maintaining the synchronization of said presentation with respect to said STC.

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**5,742,624**

**FAULT DETECTING APPARATUS AND METHOD**

**Atsushi Irie; Susumu Ishiguro; Hajime Nishidai; Hiroshi Soma, and Naohiro Tabata, all of Kyoto, Japan, assignors to Omron Corporation, Kyoto, Japan**

**PCT No. PCT/JP93/01173, § 371 Date Feb. 23, 1995, § 102(e) Date Feb. 23, 1995, PCT Pub. No. WO94/04969, PCT Pub. Date Mar. 3, 1994**

**PCT Filed Aug. 23, 1993, Ser. No. 387,846**

**Claims priority, application Japan, Aug. 24, 1992, 4-224118; Oct. 14, 1992, 4-275715**

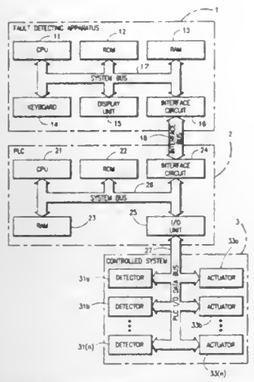
**Int. Cl.[6] G06F** *11/00;* **G08C** *25/00;* **H03M** *13/00;* **H04L** *1/00*

**U.S. Cl. 371—48** **71 Claims**

**1**. An apparatus for detecting a fault in a detector through a control apparatus, which controls a controlled system including one or two or more detectors and one or two or more actuators, having an input-signal memory for storing the state of an input signal from said detector, an auxiliary input-signal memory for storing the state of an input signal provided by an auxiliary-signal generator, an arithmetic-logic unit for generating an output signal to be applied to said actuator in accordance with predetermined logic in conformity with the states of the input signals stored in said input-signal memory, and auxiliary input-signal memory and an output-signal memory for storing the state of the output signal generated by said arithmetic-logic unit;

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wherein when there is an actuator not operating normally in said controlled system, a dector that is possibly faulty in said controlled system is detected through said control apparatus, said apparatus for detecting the fault comprising:

a designation input unit for designating an identification code of an abnormal output signal corresponding to the actuator not operating normally;

an input-signal extractor for extracting an input signal that has influenced a logical operation, performed by said arithmetic-logic unit, which gave rise to the abnormal output signal designated by said designation input unit;

a determining unit for determining whether the input signal extracted by said input-signal extractor is the signal that has been stored in said input-signal memory; and

a storage device which, if result of the determination by said determining unit is that the extracted input signal is the signal that has been stored in the input-signal memory, stores an identification code of this input signal.

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**5,742,625**

**DATA STORAGE SYSTEM AND PARITY GENERATION METHOD FOR DATA STORAGE SYSTEM**

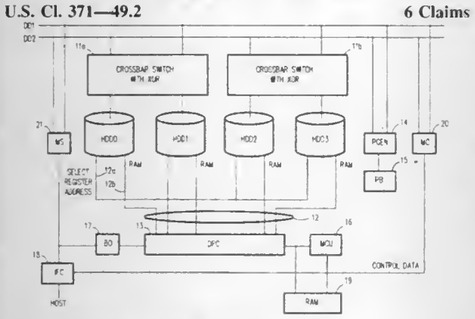
**Seiji Munetoh, Setagaya-ku; Hideto Niijima, Toshima-ku; Hiroki Murata, Suginami-ku, and Nobuaki Takahashi, Machida, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 26, 1996, Ser. No. 592,281**

**Claims priority, application Japan, Jan. 26, 1995, 7-010435**

**Int. Cl.[6] H03M *13/00*; G11C *29/00***

**U.S. Cl. 371—49.2** **6 Claims**




6. A data storage system comprising:

a plurality of storage devices for storing data;

a plurality of data buses through which data is transferred;

a selector, coupled to said plurality of storage devices and said plurality of data buses, for selectively connecting the storage devices and the data buses in a predetermined combination, the selector having a parity operation generator; and

a parity generation circuit, connected to the plurality of data buses, wherein the parity generation circuit calculates parity data based on the data obtained from said parity operation generator and data supplied to the data buses.

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**5,742,626**

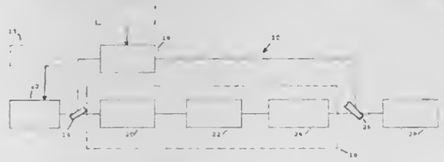
**ULTRAVIOLET SOLID STATE LASER, METHOD OF USING SAME AND LASER SURGERY APPARATUS**

**Roy D. Mead, Seattle; Charles I. Miyake, Kirkland, and Dennis D. Lowenthal, Edmonds, all of Wash., assignors to Aculight Corporation, Bellevue, Wash.**

**Filed Aug. 14, 1996, Ser. No. 689,820**

**Int. Cl.[6] H01S *3/10*; G02F *1/35*; A61B *17/36***

**U.S. Cl. 372—22** **27 Claims**



1. A laser system comprising:

a solid state laser adapted to produce a first beam having a first wavelength;

a harmonic generation stage, coupled to receive said first beam, for producing a second beam having a second wavelength;

a tunable optical parametric oscillator, coupled to receive said first beam, for producing a third beam having a third wavelength; and

a sum frequency mixer, coupled to receive said second beam and said third beam to produce a fourth beam having a fourth wavelength, said fourth wavelength between about 180–213 nm.

17. A method for generating a deep ultraviolet wavelength from an input beam having a wavelength of approximately one micron, the method comprising the steps of:

generating, in a harmonic conversion stage, a second beam having a fifth harmonic of said input beam, said harmonic conversion stage formed from at least first and second CLBO non-linear crystals oriented to compensate for walkoff;

generating, in a tunable optical parametric oscillator, a third beam having a wavelength of approximately 2 microns, said tunable optical parametric oscillator including a periodically poled non-linear crystal; and

mixing, in a sum frequency generator, said fifth harmonic of said input beam and said third beam to generate a deep ultraviolet wavelength output beam.

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**5,742,627**

**LASER OSCILLATOR USING A PLATE-TYPE HEAT EXCHANGER**

**Yasuyuki Morita; Kenji Mitsui, both of Minamitsuru-gun, and Mitsuo Manabe, Hachioji, all of Japan, assignors to Fanuc, Ltd., Yamanashi, Japan**

**PCT No. PCT/JP92/01263, § 371 Date May 17, 1993, § 102(e) Date May 17, 1993, PCT Pub. No. WO93/07663, PCT Pub. Date Apr. 15, 1993**

**PCT Filed Sep. 30, 1992, Ser. No. 50,431**

**Claims priority, application Japan, Apr. 10, 1991, 3-257734**

**Int. Cl.[6] H01S *3/04***

**U.S. Cl. 372—34** **12 Claims**

1. A laser oscillator system in which laser gas, forcibly cooled, is excited in an electric discharge tube for laser oscillation, comprising:

a plate type heat exchanger connected to a laser gas outlet of said electric discharge tube by a plurality of L-type gas passages having a first predetermined length for cooling said laser gas when output from said electric discharge tube and integrating said laser gas into a single flow, wherein each L-type gas passage has a single bend between an input and an output thereof;

a blower connected to said plate type heat exchanger for producing a current of said laser gas cooled by said plate type heat exchanger; and

a laser gas return passage having a second predetermined length greater than said first predetermined length and connected between said blower and said electric discharge tube for returning said current of cooled laser gas to said electric discharge tube.



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**5,742,628**

**SHORT WAVELENGTH LASER EMITTING DIODE WITH AN IMPROVED GAN SYSTEM DOUBLE HETEROSTRUCTURE**

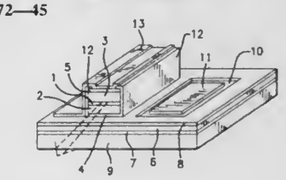
**Hiroaki Fujii, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed May 20, 1996, Ser. No. 650,439**

**Claims priority, application Japan, May 19, 1995, 7-121878**

**Int. Cl.[6] H01S *3/19***

**U.S. Cl. 372—45** **37 Claims**



1: GaInN/AlGaN MQW active layer
2: n-AlGaN cladding layer
3: p-AlGaN cladding layer
4: n-GaN layer
5: p-GaN layer
6: n-GaN layer
7: GaN buffer layer
8: $SiO_2$ mask
9: sapphire substrate

1. A GaN system compound semiconductor double heterostructure in a light emission device, said GaN system compound semiconductor double heterostructure including a resonator having a pair of opposite resonance faces perpendicular to a direction in which in which is emitted, said GaN system compound semiconductor double heterostructure comprising:

a selectively grown first cladding layer of a first conductivity type comprising a first GaN system compound semiconductor material having a first energy band gap;

a selectively grown active layer on said first cladding layer, said active layer comprising a second GaN system compound semiconductor material having a second energy band gap smaller than said first energy band gap of said first cladding layer; and

a selectively grown second cladding layer of a second conductivity type on said active layer, said second cladding layer comprising a third GaN system compound semiconductor material having a third energy band gap larger than said second energy band gap of said active layer,

wherein said first, second and third GaN system compound semiconductor materials have first, second and third hexagonal crystal structures of basal planes tilted from a (0001) plane by an angle in the range of 0 degrees to 3 degrees, each of said hexagonal crystal structures having six crystal planes, and said basal planes being substantially parallel to interfaces between said active layer and said first and second cladding layers, and

wherein, said opposite resonance faces include, for each of said first, second and third hexagonal crystal structures, a pair of opposite planes in said six crystal planes which are perpendicular to said basal planes.

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**5,742,629**

**SEMICONDUCTOR LASER AND PRODUCTION METHOD THEREOF**

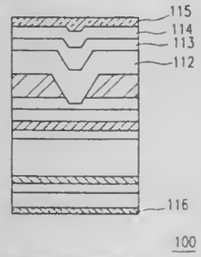
**Takashi Nishikawa, Osaka; Nobuyuki Uemura, Takatsuki, and Satoshi Kamiyama, Sanda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jul. 19, 1996, Ser. No. 684,383**

**Claims priority, application Japan, Jul. 21, 1995, 7-185212**

**Int. Cl.[6] H01S *3/19***

**U.S. Cl. 372—46** **7 Claims**




1. A semiconductor laser, comprising:

an active layer formed of a II-VI group compound semiconductor material;

a first cladding layer and a second cladding layer disposed so as to put said active layer therebetween;

a light confinement layer provided on said second cladding layer, having an opening for current flow and formed of ZnMgSSe; and

a third cladding layer provided at said opening of said light confinement layer,

wherein: said light confinement layer has high resistivity or has a conductivity type opposite to that of said third cladding layer;

said second and third cladding layers are formed of ZnMgSSe; and

a Mg content and a S content of said light confinement layer are larger than a Mg content and a S content of said second and third cladding layers.

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**5,742,630**

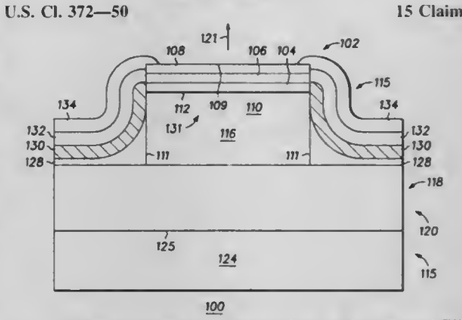
**VCSEL WITH INTEGRATED PIN DIODE**

**Wenbin Jiang, Phoenix; Chan-Long Shieh, Paradise Valley, and Michael S. Lebby, Apache Junction, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Jul. 1, 1996, Ser. No. 672,731**

**Int. Cl.[6] H01S *3/19***

**U.S. Cl. 372—50** **15 Claims**




1. A vertical cavity surface emitting laser with integrated PIN photodiode comprising:

a vertical cavity surface emitting laser having a substrate with a first surface, a first stack of distributed Bragg reflectors disposed on the first surface of the substrate, an active area disposed on the first stack of distributed Bragg reflectors, a second stack of distributed Bragg reflectors disposed on the

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active area so as to define an optical pathway through which light is generated and passes, the vertical cavity surface emitting laser further including first and second electrical contacts coupled to the first and second stacks respectively for supplying operating power thereto;

a first region of a first doped material disposed on the second stack of distributed Bragg reflectors in the optical pathway and coupled to the second electrical contact, the first region of the first doped material being lattice unmatched to the second stack of distributed Bragg reflectors;

a second region of an undoped material disposed on the first region and in the optical pathway;

a third region of a second doped material disposed on the second region and in the optical pathway; and

a third electrical contact coupled to the third region, the first, second and third regions defining a PIN photodetector in the optical pathway and integrated with the vertical cavity surface emitting laser.

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**5,742,631**

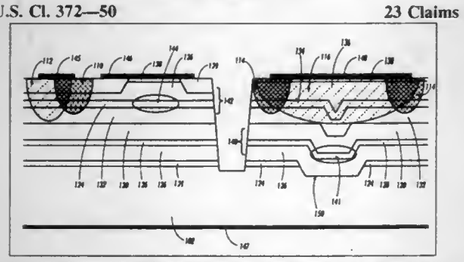
**INDEPENDENTLY-ADDRESSABLE MONOLITHIC LASER ARRAYS**

**Thomas L. Paoli, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jul. 26, 1996, Ser. No. 688,179**

**Int. Cl.[6] H01S *3/19***

**U.S. Cl. 372—50** **23 Claims**



1. An independently-addressable semiconductor laser array, comprising:

a substrate having a surface structure;

a plurality of semiconductor layers forming a first lasing element in a first optical cavity and a second lasing element in a second optical cavity, wherein said first and second optical cavities are spatially separated;

an as-grown lateral waveguiding region for said first lasing element formed by said structure, providing confinement of the optical field in said first lasing element in the lateral direction;

an isolation region formed between said first and second lasing elements to electrically isolate said first and second lasing elements; and

an electrode connected to each of said first and second lasing elements causing each of said lasing elements to independently emit radiation.

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**5,742,632**

**HO:LULF AND HO:TM:LULF LASER MATERIALS**

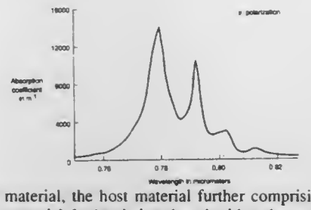
**Norman P. Barnes, Yorktown, Va.; Clyde A. Morrison, Wheaton, Md.; Elizabeth D. Filer; Mahendra G. Jani, both of Poquoson, Va.; Keith E. Murray, and George E. Lockard, both of Newport News, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Sep. 7, 1995, Ser. No. 524,861**

**Int. Cl.[6] H01S *3/14***

**U.S. Cl. 372—68** **21 Claims**

1. A laser material comprising:



a host material, the host material further comprising LuLF, the host material further being doped with a dopant, wherein the dopant is selected from the group consisting of Ho and Ho:Tm.

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**5,742,633**

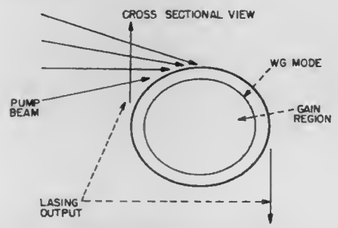
**ASYMMETRIC RESONANT OPTICAL CAVITY APPARATUS**

**Alfred Douglas Stone, North Haven; Richard Kounai Chang, Hamden, both of Conn., and Jens Uwe Noeckel, Dresden, Germany, assignors to Yale University, New Haven, Conn.**

**Filed Oct. 2, 1996, Ser. No. 725,127**

**Int. Cl.[6] H01S *3/08*; G02B *6/10***

**U.S. Cl. 372—92** **13 Claims**




1. A resonant optical apparatus, comprising:

a resonant cavity (ARC) of non-circular cross-section and having a dielectric constant n, an outer surface and an oval cross-section of area A defining a plane, having a long dimension arrayed along a major axis of said plane and a shorter dimension arrayed along a minor axis of said plane, said major axis and minor axis intersecting at a center of said ARC, said oval cross-section exhibiting mirror symmetry about both said major axis and said minor axis, said oval cross-section deformed from a circular resonator of cross-section of area A;

input means for inducing an optical signal of wavelength λ into said ARC to cause a circulation of induced optical energy of wavelength λ in said plane;

output coupling means positioned in a near field region of a surface point of said ARC for enabling a coupling thereinto of said optical energy of wavelength λ.

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**5,742,634**

**PICOSECOND LASER**

**Harry Rieger; Henry Shields, both of San Diego, and Richard M. Foster, Manhattan Beach, all of Calif., assignors to Imar Technology Co., San Diego, Calif.**

**Continuation-in-part of Ser. No. 503,373, Jul. 17, 1995, abandoned, which is a continuation-in-part of Ser. No. 295,283, Aug. 24, 1994, Pat. No. 5,434,875, Ser. No. 339,755, Nov. 15, 1994, Pat. No. 5,491,707, and Ser. No. 429,589, Apr. 27, 1995, abandoned. This application Oct. 4, 1996, Ser. No. 725,750**

**Int. Cl.[6] H01S *3/10***

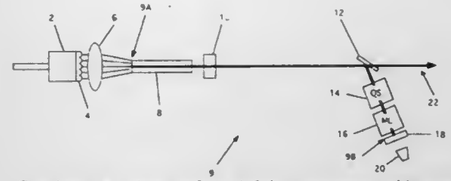
**U.S. Cl. 372—25** **30 Claims**

1. A solid state short pulse laser system comprising:

A) a laser crystal;

B) an optical pump arranged to pump said laser crystal;





C) at least two mirror surfaces defining a resonator, said resonator defining a beam path which transits said laser crystal;

D) a first optical shutter installed within said beam path for blocking passage of light in said beam path except for short periods of time, said first optical shutter defining an ON period and an OFF period;

E) a second optical shutter installed within said resonator for blocking the passage of light in said resonator except for periodic sub nanosecond intervals, said intervals being spaced such that during each ON period a light pulse traveling at the speed of light in said resonator is able to make a plurality of transits through said resonator, increasing in intensity on each transit to defined an intensified pulse;

F) an optical release mechanism for periodically releasing intensified pulses from said resonator, said periodically released intensified pulses defining an intensified pulse laser beam.

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**5,742,635**

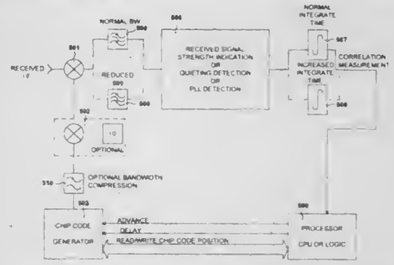
**ENHANCED TIME OF ARRIVAL METHOD**

**H. Britton Sanderford, Jr., New Orleans, La., assignor to Sanconix, Inc., New Orleans, La.**

**Filed May 5, 1994, Ser. No. 238,326**

**Int. Cl.[6] H04B *15/00*; G01S *3/02***

**U.S. Cl. 375—200** **41 Claims**



1. A method for improving accuracy of a radio location system based on time-of-arrival at a receiver using direct-sequence spread-spectrum modulation for time stamping a received radio broadcast, comprising the steps of:

determining a time position of a correlation peak of the received radio broadcast;

estimating from the correlation peak a leading edge of a correlation function;

collecting a multiplicity of correlation envelope samples of the leading edge of the correlation function, each of said multiplicity of correlation envelope samples separated by a portion of a chip time; and

calculating slope information from the leading edge of the correlation function for increasing resolution and accuracy of a time of-arrival reading..

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**5,742,636**

**SPREAD SPECTRUM RECEIVING APPARATUS WITH BATTERY SAVING FUNCTION**

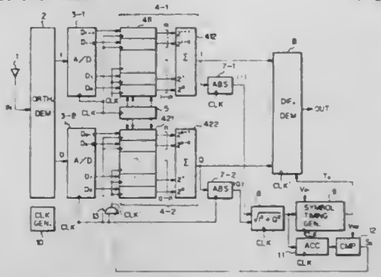
**Mikio Fukushi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Dec. 11, 1995, Ser. No. 570,691**

**Claims priority, application Japan, Dec. 9, 1994, 6-306414**

**Int. Cl.[6] H04B *15/00***

**U.S. Cl. 375—200** **9 Claims**



1. A receiving apparatus for spread spectrum communication comprising:

means for receiving a spread spectrum modulated signal to generate a plurality of bit signals;

a plurality of correlator elements each for calculating a correlation value between one of said bit signals and a spread reference code;

means for summing said correlation values to generate a sum signal;

means for detecting a carrier in said spread spectrum modulated signal in accordance with said sum signal;

means for operating all said correlator elements when said carrier is detected in said spread spectrum modulated signal; and

means for operating a portion of said correlator elements when said carrier is not found in said spread spectrum modulated signal.

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**5,742,637**

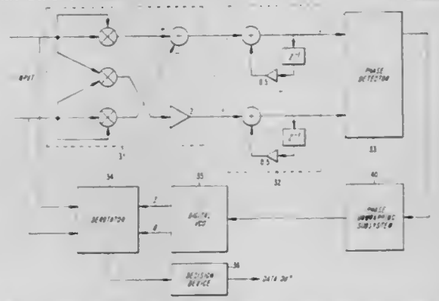
**FAST PHASE ESTIMATION IN DIGITAL COMMUNICATION SYSTEMS**

**Emmanuel Kanterakis, North Brunswick, N.J., and Sorin Davidovici, Jackson Heights, N.Y., assignors to Golden Bridge Technology, Inc., West Long Branch, N.J.**

**Filed Aug. 20, 1996, Ser. No. 700,012**

**Int. Cl.[6] H04K *1/00*; H04L *27/22*; H03D *3/22***

**U.S. Cl. 375—200** **9 Claims**



4. An improvement to synchronizing a Costas loop for demodulating an in-phase component and a quadrature-phase component of a received spread-spectrum signal modulated with phase-shift-keying (PSK) modulation and having data, d(t), and an arbitrary phase angle, φ(t), varying with time variable, t, the improvement comprising:

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means for removing the PSK modulation from the in-phase component and from the quadrature-phase component of the received spread-spectrum signal;

means for filtering the in-phase component and the quadrature-phase component of the received spread-spectrum signal and for generating an arbitrary phase angle, θ(t), proportional to the arbitrary phase angle, ϕ(t);

means for estimating a θ value proportional to the phase angle, θ(t), from the filtered in-phase component and the filtered quadrature-phase component;

means for processing the estimated θ value, thereby obtaining an estimate of the ϕ value;

means for generating a cosine of the estimated ϕ value and a sine of the estimated ϕ value;

means for derotating the in-phase component and the quadrature-phase component of the received spread-spectrum signal with the cosine of the estimated θ value and the sine of the estimated θ value, to generate a demodulated signal; and

means for deciding data from the demodulated signal.

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**5,742,638**

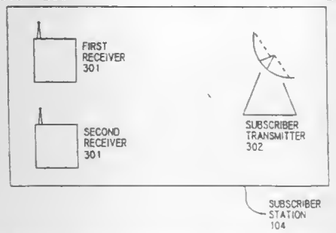
**SPREAD-SPECTRUM DATA PUBLISHING SYSTEM**

**Douglas G. Smith, Washington, D.C., assignor to Omnipoint Corporation, Colorado Springs, Colo.**

**Continuation of Ser. No. 345,532, Nov. 28, 1994, abandoned, which is a continuation of Ser. No. 208,089, Mar. 8, 1994, abandoned, which is a continuation of Ser. No. 809,194, Dec. 16, 1991, abandoned. This application May 29, 1997, Ser. No. 865,563**

**Int. Cl.[6] H04B** *1/69;* **H04L** *5/00;12/18*

**U.S. Cl. 375—200** **20 Claims**




**1.** A broadcast system comprising a subsystem and at least one subscriber station; said subsystem comprising a Subsystem spread spectrum encoder, said subsystem spread spectrum encoder having an encoder input comprising information to be broadcast to said at least one subscriber station and having an output comprising an encoder output signal including a representation of said information to be broadcast in a spread spectrum format;

said subsystem further comprising a subsystem transmitter, said subsystem transmitter coupled to said spread spectrum encoder and having a subsystem transmitter input comprising said encoder output signal, said subsystem transmitter having an output comprising a spread spectrum signal spread over the entirety of a frequency range; and,

said subscriber station comprising a subscriber station spread spectrum receiver and a subscriber station narrowband transceiver capable of transmitting narrowband signals and receiving narrowband signals, said narrowband signals having frequency ranges falling within said frequency range, said subscriber station narrowband transceiver capable of transmitting and receiving said narrowband signals and said subscriber station spread spectrum receiver capable of receiving said spread spectrum signal contemporaneously.

**5,742,639**

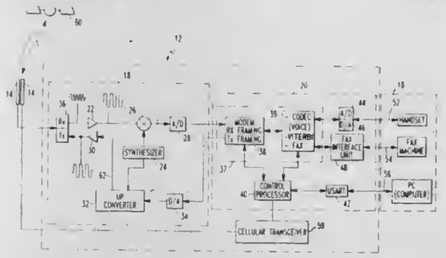
**MOBILE TERMINAL APPARATUS AND METHOD FOR A SATELLITE COMMUNICATION SYSTEM**

**Albert J. Fasulo, II, Ellicott City; Denise M. Cammarata, Owings Mills; Keith W. Janson, Ellicott City; Samuel S. Anderson, Glen Burnie; Raymond R. Cooper, Baltimore, and Roy Stehlik, Columbia, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 242,400, May 13, 1994, abandoned. This application Oct. 13, 1994, Ser. No. 322,858**

**Int. Cl.[6] H04B** *1/38*

**U.S. Cl. 375—219** **8 Claims**




**1.** A mobile terminal apparatus having a transceiver with a user interface, and an antenna for both radiating and collecting RF signals to and from a satellite, the transceiver, comprising:

an RF section coupled to the antenna and a processor board coupled to the RF section and the user interface;

the RF section including

a low noise amplifier and a high power amplifier coupled to the antenna,

a down converter coupled to the low noise amplifier for converting received RF signal waveforms to IF waveforms,

an up converter coupled to the high power amplifier for converting modulated analog waveforms from an IF to an RF frequency for amplification and transmission to the antenna;

a first analog to digital converter having an input connected to the down converter, for converting the analog IF waveform to a series of digital samples;

a first digital to analog converter connected to the up converter for converting modulated digital samples from the processor board to an IF frequency;

the processor board including

a signal processor including a digitally implemented demodulator function, a digitally implemented modulator function, a digitally implemented receive framing function coupled to the demodulator, a digitally implemented transmit framing function coupled to the modulator, and a digitally implemented coding function and decoding function coupled to the transmit and receive framing functions, respectively; and

a control processor coupled to the signal processor for controlling the digitally implemented functions;

wherein the receive framing function includes means for using unique words to frame transmitted informational data and to define data synchronization points.

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**5,742,640**

**METHOD AND APPARATUS TO IMPROVE PSTN ACCESS TO WIRELESS SUBSCRIBERS USING A LOW BIT RATE SYSTEM**

**Amine Haoui; Ayman Fawaz, both of Berkeley, and Robert Kavaler, Kensington, all of Calif., assignors to Diva Communications, Inc., Oakland, Calif.**

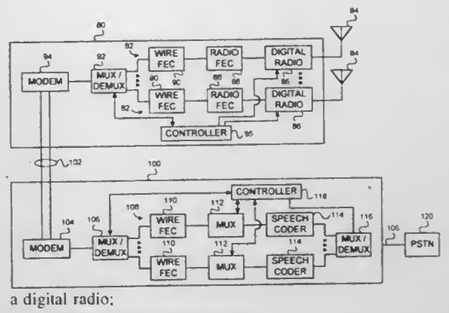
**Filed Mar. 7, 1995, Ser. No. 400,169**

**Int. Cl.[6] H04Q** *7/30*

**U.S. Cl. 375—220** **26 Claims**

**11.** A cellular telephone communications base station comprising:






a digital radio;

a switch controller interface device;

first means for decoding radio Forward Error Correction (FEC) for first communication signals received by the digital radio;

second means for encoding such first communication signals with wire FEC prior to provision to the switch controller interface device;

third means for decoding wire FEC for second communication signals received by the switch controller interface device; and

fourth means for encoding such second communication signals with radio FEC prior to provision to the digital radio.

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**5,742,641**

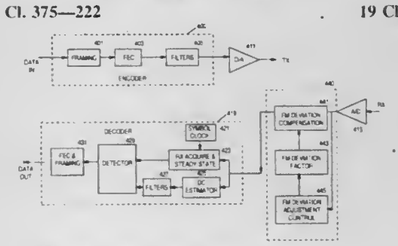
**APPARATUS, METHOD AND ARTICLE OF MANUFACTURE FOR THE DYNAMIC COMPENSATION OF FM DEVIATION IN A FM RADIO RECEIVER**

**Andrew Dwight Dingsor, Durham, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jul. 18, 1996, Ser. No. 683,478**

**Int. Cl.[6] H04B** *1/38;* **H04L** *5/16*

**U.S. Cl. 375—222** **19 Claims**




**1.** A radio data modem comprising:

a receiver for demodulating an FM signal received from an antenna, said receiver producing an analog baseband signal;

an analog to digital converter for converting the analog baseband signal into a stream of digital samples;

a compensator for scaling each sample by a deviation compensation factor;

an adjustment means for monitoring the sample stream and continuously adjusting the deviation compensation factor;

a decoder for decoding the compensated sample stream into a digital data stream;

an update means for extracting a base station identifier from the digital data stream and storing the base station identifier with the adjusted deviation compensation factor in a deviation table, said update means determining whether the extracted base station identifier is representative of an expected base station and if not updating the deviation compensation factor used by the compensator with a value associated with the expected base station identifier in the deviation table.

**5,742,642**

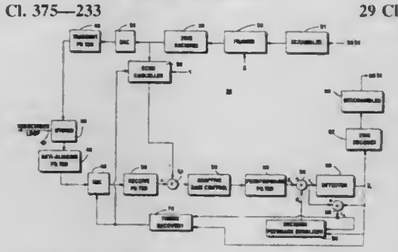
**SIGNAL PROCESSING METHOD AND APPARATUS FOR REDUCING EQUALIZER ERROR**

**Antoni Fertner, Solna, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**

**Filed Oct. 29, 1996, Ser. No. 739,752**

**Int. Cl.[6] H03H** *7/30*

**U.S. Cl. 375—233** **29 Claims**



**22.** Apparatus comprising:

a combiner combining a feedback signal and a first received signal;

a detector detecting an output signal from the combiner and deciding on a symbol value corresponding to the output signal;

a differencer determining a symbol error based on the combiner output signal and the decided symbol value;

a signal processor processing the decided symbol value based on the symbol error to generate the feedback signal, and when the symbol error exceeds an error threshold, modifying the feedback signal.

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**5,742,643**

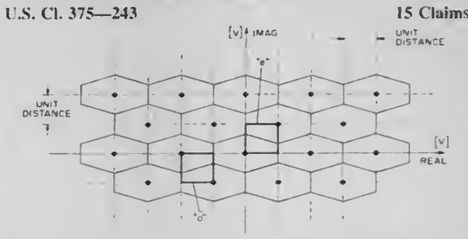
**QUANTIZING AND DECODING OF PHASE-AMPLITUDE MODULATED SIGNALS IN HEXAGONAL CODE**

**Philip J. Reeves, Burlington, and Harald A. Wougk, Franklin Park, both of N.J., assignors to Mikros Systems Corporation, Princeton, N.J.**

**Filed Nov. 22, 1994, Ser. No. 344,344**

**Int. Cl.[6] H04B** *14/04*

**U.S. Cl. 375—243** **15 Claims**




**1.** A method for quantizing signals representing symbols of a hexagonal close packed constellation, comprising:

transforming a representation of an equalized received signal, the transformation being such that, to each symbol of the constellation, there corresponds a respective point on a square grid; and

determining a symbol of the constellation as a quantized representative of the received signal, comprising selecting the quantized representative as the one or the other of two symbols of the constellation having transformed representations at opposite vertices of the square/rectangle of the square grid in which the transformed signal lies.

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**5,742,644**

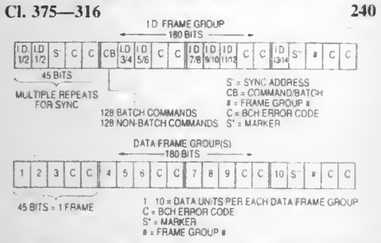
## RECEIVING CIRCUITRY FOR RECEIVING SERIALLY TRANSMITTED ENCODED INFORMATION

**Thomas J. Campana, Jr., Chicago, Ill., assignor to NTP Incorporated, Annandale, Va.**

**Continuation-in-part of Ser. No. 112,256, Aug. 26, 1993, Pat. No. 5,446,759, which is a continuation-in-part of Ser. No. 850,275, Mar. 12, 1992, abandoned, Ser. No. 850,276, Mar. 12, 1992, abandoned, and Ser. No. 850,487, Mar. 12, 1992, abandoned. This application Feb. 7, 1995, Ser. No. 385,312**

**Int. Cl.**[6] **H03K** *9/00;* **H04L** *27/06;27/14;27/22*

**U.S. Cl. 375—316** **240 Claims**




**65**. A process for resynchronizing reception of a plurality of frames of information wirelessly transmitted with a radio frequency carrier modulated with a subcarrier with the subcarrier being modulated with at least one identification frame group which identifies receiving circuitry to receive the information followed by at least one data frame group, each identification frame group comprising at least one frame containing bits identifying the receiving circuitry to receive the radio frequency carrier, a plurality of bits of error correction code in each frame, and synchronization information for originally synchronizing a clock of the receiving circuitry with each data frame group comprising a plurality of frames each including a plurality of bits of error correction code and a plurality of bits of data, and a synchronization marker comprising a plurality of bits for resynchronizing the clock of the receiving circuitry comprising:

receiving the radio frequency carrier, detecting the bits of the at least one identification frame group and the at least one data frame group modulated on the subcarrier, originally synchronizing the clock in response to the synchronization information and storing the detected bits of the at least one frame of the at least one identification frame and the frames of the at least one data frame group;

processing the stored bits of at least one frame with the error correction code therein to determine if the stored bits of the at least one frame contain at least one erroneous uncorrectable bit which cannot be corrected with the error correction code therein which is representative of the clock of the receiving circuitry requiring resynchronization; and

searching the stored bits transmitted after the stored bits of the at least one processed frame containing the at least one erroneous uncorrectable bit to detect a synchronization marker and using the detected synchronization marker to resynchronize the clock.

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**5,742,645**

## METHOD OF DIGITAL DEMODULATION OF A COMPOSITE SIGNAL

**Guy Riccardi, Sceaux; Philippe Calvano, Villejuif, and Jean-Luc Nicolas, Montrouge, all of France, assignors to Thomson - CSF, Paris, France**

**PCT No. PCT/FR92/00843, § 371 Date Mar. 29, 1994, § 102(e) Date Mar. 29, 1994, PCT Pub. No. WO93/07676, PCT Pub. Date Apr. 15, 1993**

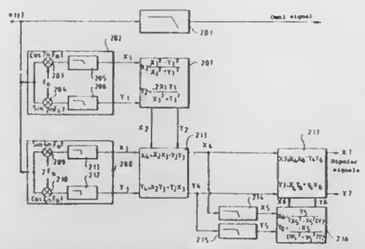
**PCT Filed Sep. 4, 1992, Ser. No. 211,237**

**Claims priority, application France, Oct. 8, 1991, 91 12350**

**Int. Cl.**[6] **H03D** *3/00;* **H04L** *27/14*

**U.S. Cl. 375—321** **5 Claims**

**2**. Method of digital demodulation of a composite signal comprising a first omnidirectional baseband signal, a first subcarrier at a first frequency Fp, a second subcarrier at a frequency 2Fp exactly equal to double the frequency Fp, a first dipolar signal modulating the second subcarrier in double sideband mode with carrier suppression, and a second dipolar signal modulating the second subcarrier in double sideband mode with carrier suppression in quadrature with the first dipolar signal, comprising the steps of:



low-pass filtering the composite signal to isolate the omnidirectional signal;

complex demodulating of the composite signal by a very stable frequency F0 which differs from Fp by a small amount to obtain an error signal of frequency difference between F0 and Fp;

complex squaring and normalizing the conjugate signal of the error signal to obtain a first frequency-correction signal;

complex demodulating of the composite signal by a stable frequency 2F0 exactly equal to twice the frequency F0 to obtain a first approximation of the two dipolar signals including a filtering over the same bandwidth as the low-pass filtering to deliver the omnidirectional signal;

complex multiplying the first approximation of the two dipolar signals by the first frequency-correction signal to obtain frequency-corrected dipolar signals;

very narrow-band, low-pass filtering of said frequency-corrected dipolar signals to isolate the DC component corresponding to the second subcarrier brought back to the frequency F0;

derivation of a phase-correction signal from said DC component at the frequency F0;

complex multiplying of the frequency-corrected dipolar signals by said phase-correction signal to obtain frequency- and phase-corrected dipolar signals.

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**5,742,646**

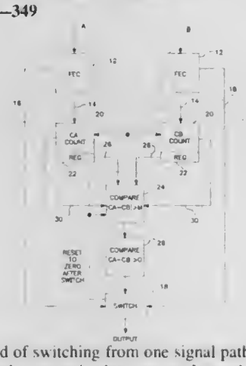
## METHOD OF SELECTING AND SWITCHING SIGNAL PATHS IN A DIGITAL COMMUNICATION SYSTEM

**Bradford Gillette Woolley, Palo Alto, and Mehrali Parkhideh, Half Moon Bay, both of Calif., assignors to Harris Corporation, Melbourne, Fla.**

**Filed May 5, 1995, Ser. No. 435,873**

**Int. Cl.**[6] **H04B** *1/10*

**U.S. Cl. 375—349** **13 Claims**




**1**. A method of switching from one signal path to another signal path in a digital communication system, the method comprising the steps of:



(a) receiving a digital signal in a first signal path in a communication system;

(b) receiving the digital signal in a second signal path in the communication system;

(c) estimating the number of bits in error in the digital signal received in each of the first signal path and the second signal path during a predetermined time period before providing the digital signal for forward error correction,

wherein at least a predetermined number of bits would be received in error in the predetermined time period if a first bit error rate were exceeded;

(d) in the event the first bit error rate is not exceeded in signals in either of the first and second signal paths in the predetermined time period, comparing the number of estimated bits in error in the two signal paths after the end of the predetermined time period, and

indicating to a switch for selecting one of the two signal paths that the signal path with the lower number of estimated bits in error is to be selected; and

(e) in the event the first bit error rate is exceeded in a signal in one of the first and second signal paths during the predetermined time period, indicating to the switch that the signal path with the signal with the lower number of bits in error is to be selected before the end of the predetermined time period.

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**5,742,647**

## METHOD AND APPARATUS FOR DETECTING A BINARY PATTERN IN A SERIAL TRANSMISSION

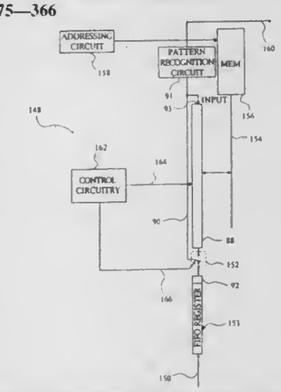
**Philippe Chaisemartin, Sainte Agnes, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France**

**Filed Apr. 12, 1995, Ser. No. 422,495**

**Claims priority, application France, Apr. 12, 1994, 94 04669**

**Int. Cl.**[6] **H04L** *7/00*

**U.S. Cl. 375—366** **11 Claims**




**1**. A method for detecting a synchronization word in frames of serially transmitted data, the synchronization word comprising l synchronization bits transmitted one bit per frame at a predetermined position in each frame, comprising the steps of:

organizing a memory to store groups of words, each group of words having at least l bits, such that each group of words contains bits from a same position in consecutive frames;

further comprising, for each incoming bit the steps of:

loading in a shift register a chosen group of words containing bits, including a predetermined bit that is to be written over by the incoming bit, from a same position in successive frames as the incoming bit;

rotating the contents of the shift register;

when the predetermined bit reaches an output of the shift register, shifting in the incoming bit instead of the predetermined bit;

rotating the contents of the shift register until they reach their initial position;

comparing the contents of the shift register to the synchronization word at each rotation; and

overwriting the chosen group of words in the memory with the contents of the shift register.

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**5,742,648**

**Patent Not Issued For This Number**

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**5,742,649**

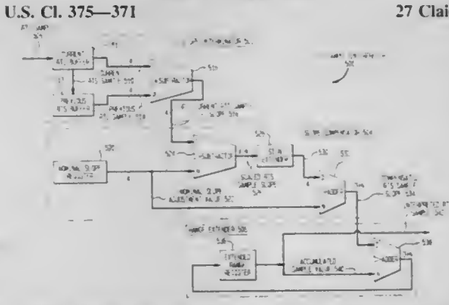
## SRTS CLOCK RECOVERY SYSTEM FOR USE IN A HIGHLY STRESSED NETWORK ENVIRONMENT

**Gary S. Muntz, Lexington, and Stanley A. Lackey, Jr., Groton, both of Mass., assignors to Cisco Technology, Inc., San Jose, Calif.**

**Filed Dec. 15, 1995, Ser. No. 573,297**

**Int. Cl.**[6] **H03D** *3/24*

**U.S. Cl. 375—371** **27 Claims**



**1**. In a synchronous residual time stamp (SRTS) clock recovery system for ensuring proper reception and transmission of an information stream transmitted by a source node over a network having a network reference clock, the information stream including data to be transmitted to a destination user process and a residual time stamp (RTS) representing a phase difference between a source node clock and a reference clock, an RTS sample interpreter for enabling the SRTS clock recovery system to operate in a high jitter network environment, the RTS sample interpreter comprising:

a slope determinator configured to determine the slopes of source RTS and destination RTS samples;

a slope compensator configured to scale the ranges of said sample slopes to compensate for the expected average slope; and

a range extender, coupled to said slope compensator, configured to increase the number of phase values of said samples to generate extended compensated samples.

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**5,742,650**

## POWER REDUCTION METHOD AND APPARATUS FOR PHASE-LOCKED LOOP BASED CLOCKS IN A DATA PROCESSING SYSTEM

**Charles E. Nuckolls, and James R. Lundberg, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 191,902, Feb. 4, 1994, abandoned. This application May 28, 1996, Ser. No. 654,465**

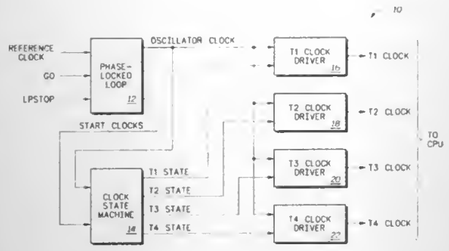
**Int. Cl.**[6] **H04L** *25/34;25/49;* **H04B** *1/06;1/16*

**U.S. Cl. 375—376** **12 Claims**

**1**. In a data processing system, including an internal clock generator for receiving an oscillator clock signal from a phase-locked loop (PLL), wherein said internal clock generator comprises a clock state machine and a predetermined number of clock drivers, a method for reducing power associated with acquiring phase-lock between a reference clock signal and an oscillator clock

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signal provided by said internal clock generator on or during each exit from a quiescent state, said method comprising the steps of:

generating, via said predetermined number of clock drivers, a set of internal clock signals phase-aligned with said oscillator clock signal, said set of internal clock signals being distributed to logic within the data processing system;

receiving, via said clock state machine, a first control signal from said PLL indicating that said PLL is re-acquiring phase-lock as a result of said data processing system entering and leaving said quiescent state; and

suppressing, via said clock state machine, a clock state enable signal, in response to receiving said first control signal from said PLL, to prevent said predetermined number of clock drivers from transitioning with said oscillator clock signal and to ensure that said set of internal clock signals do not change states until said PLL acquires phase-lock, suppression of said clock state enable signal reducing power consumption in said data processing system by eliminating the power associated with operation of the predetermined number of clock drivers and transitioning of logic being driven by said predetermined number of clock drivers, prior to and during acquisition of phase-lock.

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**5,742,651**

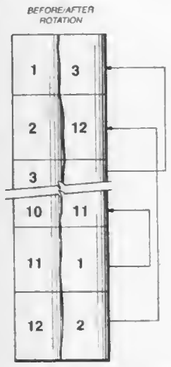
**METHOD OF INCREASING DEPLETION CAPACITY OF A CONTROL ROD FOR A NUCLEAR REACTOR**

**Michael J. Anderson, Wilmington, N.C., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Mar. 18, 1996, Ser. No. 617,065**

**Int. Cl.[6] G21C** *7/00;7/24*

**U.S. Cl. 376—260** **5 Claims**




1. A method of increasing the depletion capacity of a control rod for insertion into the core of a nuclear reactor wherein the control rod has neutron-absorbing material disposed in a plurality of discrete segments at respective discrete locations along the length of the control rod, comprising the steps of:

(a) operating the nuclear reactor with the control rod at least partially inserted into the reactor core in a vertical orientation.

(b) after step (a), rearranging the segments of neutron-absorbing material along the control rod and (c) at least partially reinserting the control rod with the rearranged segments into the reactor core with the reinserted control rod of step (c) having the same vertical orientation in the nuclear reactor as in step (a) without inverting the control rod.

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**5,742,652**

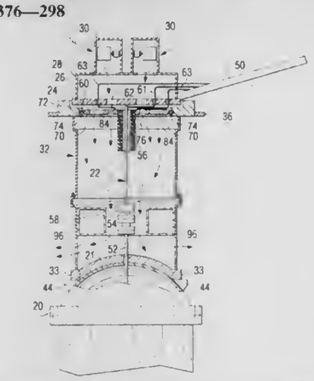
**HEAD ASSEMBLY**

**Michael F. Hankinson, Monroeville; John M. Matusz, Plum Boro, and Alan E. Taylor, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Jul. 16, 1996, Ser. No. 687,012**

**Int. Cl.[6] G21C** *11/00;15/00*

**U.S. Cl. 376—298** **15 Claims**



1. An integrated head assembly for a nuclear reactor pressure vessel, comprising:

a pressure vessel closure head;

a CRDM seismic support disposed above the closure head, the support having a plurality of air flow holes;

a plurality of CRDM assemblies extending upwardly from the closure head through the CRDM seismic support between the air flow holes;

a shroud enclosing the CRDMs and extending upwardly from the closure head to the seismic support in air flow communication with the seismic support air flow holes, the shroud having an air port in direct air flow communication with the surrounding atmosphere; whereby the closure head, shroud and seismic support define an air flow passageway directly communicating with the surrounding atmosphere via the air port; and

a ventilation fan disposed above the closure head in air flow communication with the air flow passageway.

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**5,742,653**

**VERTICAL AND LATERAL RESTRAINT STABILIZER FOR CORE SHROUD OF BOILING WATER REACTOR**

**John Geddes Erbes, Mt. View; James Edward Charnley, Nevada City, and Irvin Raymond Kobsa, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.**

**Continuation-in-part of Ser. No. 383,023, Feb. 2, 1995, abandoned, which is a continuation-in-part of Ser. No. 245,947, May 19, 1994, and a continuation-in-part of Ser. No. 260,589, Jun. 16, 1994, Pat. No. 5,538,381. This application Jun. 8. 1995, Ser. No. 488,768**

**Int. Cl.[6] G21C** *19/00*

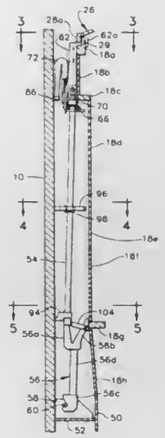
**U.S. Cl. 376—302** **16 Claims**

16. A boiling water reactor, comprising:

a reactor pressure vessel;

a core shroud;





a shroud support structure arranged to support said core shroud inside said reactor pressure so that said core shroud and said reactor pressure vessel define a downcomer annulus therebetween;

an assembly arranged in said downcomer annulus for anchoring an upper portion of said core shroud relative to said shroud support structure;

a first lateral restraint for resisting lateral deflection of said core shroud relative to said reactor pressure vessel at a first height above said shroud support structure, said first lateral restraint being supported by said anchoring assembly; and

a second lateral restraint for resisting lateral deflection of said core shroud relative to said reactor pressure vessel at a second height above said shroud support structure, said second height being less than said first height, and said second lateral restraint being supported by said anchoring assembly,

wherein said second lateral restraint comprises a first arm and a second arm of double cantilever wishbone spring.

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**5,742,654**

**METHOD AND APPARATUS FOR ENHANCING REMOVAL OF CORROSION PRODUCTS FROM A NUCLEAR REACTOR PIPING SYSTEM**

**Ronald Morris, North Huntingdon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Feb. 12, 1996, Ser. No. 599,912**

**Int. Cl.[6] G21C** *19/30*

**U.S. Cl. 376—306** **22 Claims**

6. In association with a nuclear reactor vessel having a first recirculation piping system and a second recirculation piping system attached thereto for recirculating a liquid through the vessel, the first system and the second system each having an interior wall having a radioactive corrosion product thereon; a method of removing the corrosion product from the interior walls of the first system and the second system, comprising the steps of:

(a) dissolving the corrosion product from the walls by supplying equal amounts of a reagent into the first system and the second system from a reagent supply source connected to the first system and the second system; the corrosion product dissolving into the reagent as the reagent reacts with the corrosion product to define a contaminated solution;

(b) absorbing the dissolved corrosion product from the contaminated solution to define a reagent-containing contaminant-free solution by contacting the contaminated solution with an ion exchange resin bed;

(c) pumping the contaminated solution from the first system and to the resin bed by operating a circulation pump interconnecting the first system and the resin bed and thereafter pumping the contaminant-free solution from the resin bed and to the second system, the circulation pump having a predetermined net positive suction head;

(d) pumping the contaminated solution from the second system and to the resin bed by operating the circulation pump and thereafter pumping the contaminant-free solution from the resin bed and to the first system; and

(e) simultaneously pressurizing the first system and the second system to a predetermined pressure greater than or equal to the net positive suction head as the circulation pump operates.

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**5,742,655**

**NEUTRON-ABSORBENT CONTROL CLUSTER FOR A NUCLEAR REACTOR**

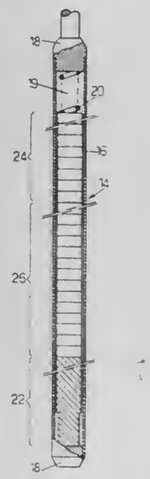
**Dominique Hertz, Sainte-Foy-les-Lyon, and Luc Pillet, Lyons, both of France, assignors to Framatome, Courbevoie, and Compagnie Generale des Matieres Nucleaires, Velizy-Villacoubly, both of France**

**Filed Dec. 12, 1995, Ser. No. 570,874**

**Claims priority, application France, Dec. 13, 1994, 94 14987**

**Int. Cl.[6] G21C** *7/24*

**U.S. Cl. 376—333** **8 Claims**



1. A control cluster for a water cooled and moderated nuclear reactor, comprising a spider and rods suspended from said spider.

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each of said rods containing neutron-absorbing material over a predetermined height, wherein said material is constituted:

in a lower portion of each said rod, by a metal neutron absorber;

in an upper portion of each said rod, by a stack of pellets of boron carbide $B_4C$; and

in a middle fraction of each said rod, occupying a height lying in the range 35% to 45% of the predetermined height, a material selected from the group consisting of zirconium diboride $ZrB_2$ isotopically enriched in boron 10 and hafnium diboride HfB2.

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**5,742,656**

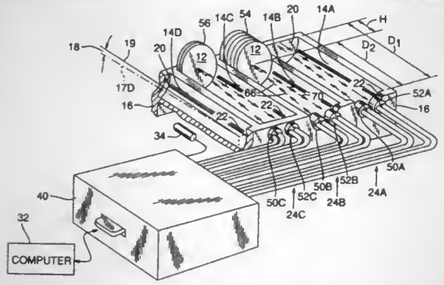
**GAMING TOKEN TRAY EMPLOYING ULTRASONIC TOKEN COUNTING**

**James K. Mikulak; Paul H. Clark, both of Austin, Tex.; Carey W. Starzinger, Salem, Oreg., and Barry H. Wong, Vancouver, Wash., assignors to The Casino Software Corporation of America, Salem, Oreg.**

**Filed Mar. 21, 1996, Ser. No. 621,186**

**Int. Cl.[6] G06M *7/00***

**U.S. Cl. 377—7** **14 Claims**




1. A method for counting a number of gaming tokens in stacks of gaming tokens, the gaming tokens having a thickness, the method comprising:

providing multiple open gaming token troughs each having a longitudinal axis and first and second ends;

mounting an ultrasonic distance measuring transducer adjacent to the first end of each trough and orienting the ultrasonic distance measuring transducers to measure distances substantially along the longitudinal axis of each trough, each transducer having a beam substantially confined within its associated trough;

connecting each ultrasonic distance measuring transducer to a distance measurement system that is connected to a computer;

measuring a first distance $D_1$ between at least one ultrasonic distance measuring transducer and the second end of the associated trough;

storing $D_1$ and the thickness in the computer;

loading the stacks of gaming tokens in the troughs and against the second ends of the troughs;

measuring second distances $D_2$ between the ultrasonic distance measuring transducer and a nearest gaming token in each of the stacks of gaming tokens; and

calculating in the computer the number of gaming tokens in each of the stacks of gaming tokens by employing data generated in the measuring and storing steps.

**5,742,657**

**FAST DIGITAL SHIFT REGISTER AND ARRANGEMENT COMPRISING SUCH A REGISTER**

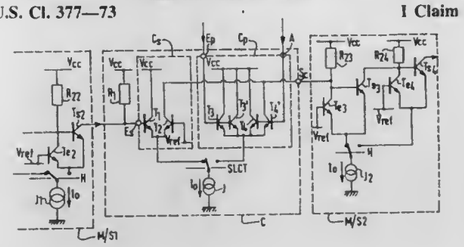
**Laurent Lepailleur, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 148,103, Nov. 3, 1993, abandoned. This application Oct. 30, 1995, Ser. No. 905,313**

**Claims priority, application France, Nov. 12, 1992, 9213613**

**Int. Cl.[6] G11C *19/00***

**U.S. Cl. 377—73** **1 Claim**




1. A digital shift register including a succession of flip-flops controlled by a clock signal for the serial loading of data present at an input of the shift register and a switching device interposed between successive flip-flops, said switching device comprising:

a differential serial stage;

a switching circuit coupled to said differential serial stage; and

a differential parallel stage coupled to said switching circuit;

said switching circuit responsive to a selection signal for enabling a current having a nominal value to be applied to one of the differential serial stage and the differential parallel stage;

said differential parallel stage including a first output transistor having a collector, base and emitter and a second output transistor having a collector, base and emitter, the emitter of the first output transistor coupled to the emitter of the second output transistor and the base of the first output transistor coupled to the base of the second output transistor and the collector of the second output transistor coupled to one of the successive flip-flops.

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**5,742,658**

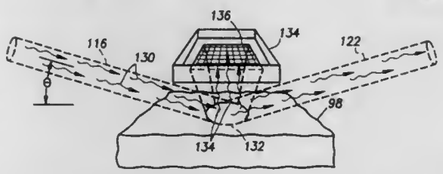
**APPARATUS AND METHOD FOR DETERMINING THE ELEMENTAL COMPOSITIONS AND RELATIVE LOCATIONS OF PARTICLES ON THE SURFACE OF A SEMICONDUCTOR WAFER**

**Donald A. Tiffin, and Tim Z. Hossain, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

**Filed May 23, 1996, Ser. No. 653,727**

**Int. Cl.[6] G01T *1/36***

**U.S. Cl. 378—44** **28 Claims**



1. An apparatus for determining the elemental composition and relative location of a particle located upon a surface of a semiconductor wafer, comprising:

an X-ray source configured to produce a plurality of primary X-ray photons, wherein said plurality of primary X-ray photons forms a primary X-ray beam, and said primary X-ray beam is incident upon the surface of the semiconductor wafer; and

a plurality of X-ray detectors laterally displaced in more than one direction, wherein each of said plurality of X-ray detectors is positioned to receive a secondary X-ray photon emitted by at least one atom present within said particle.



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**5,742,659**

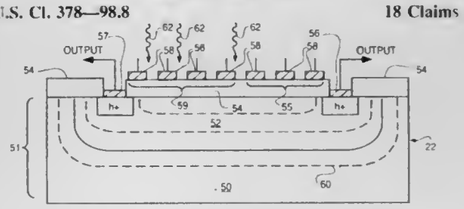
**HIGH RESOLUTION BIOMEDICAL IMAGING SYSTEM WITH DIRECT DETECTION OF X-RAYS VIA A CHARGE COUPLED DEVICE**

**Muzaffer Atac, Wheaton, Ill., and Timothy A. McKay, Ann Arbor, Mich., assignors to Universities Research Assoc., Inc., Washington, D.C.**

**Filed Aug. 26, 1996, Ser. No. 697,536**

**Int. Cl.[6] H05G *1/64***

**U.S. Cl. 378—98.8** **18 Claims**




1. A high resolution biomedical imaging system for direct detection of x-rays from an irradiated biological tissue, said system comprising:

an energy source for emitting x-rays along an irradiation trajectory toward a biological tissue to be tested;

a charge coupled device, located immediately adjacent the biological tissue and aligned traverse to said irradiation trajectory, for directly receiving and detecting said x-rays after said x-rays pass through the biological tissue, wherein said charge coupled device is divided functionally into a matrix of cells for individually storing counts of x-rays directly detected by corresponding cells, said counts representing a detected x-ray energy distribution;

a pattern generator, electrically coupled to at least one end of said charge coupled device, for reading an analog output of said counts representing a detected x-ray energy distribution from a cell at one end of said charge coupled device; and

a display device for displaying an image representative of said detected x-ray energy distribution based on said analog outputs of said counts read from said cells.

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**5,742,660**

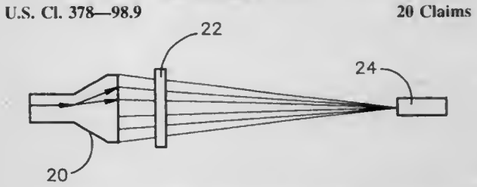
**DUAL ENERGY SCANNING BEAM LAMINOGRAPHIC X-RADIOGRAPHY**

**Stanislaw Majewski, Grafton, and Randolph F. Wojcik, Yorktown, both of Va., assignors to Southeastern Universities Research Association, Inc., Newport News, Va.**

**Filed Jan. 10, 1997, Ser. No. 781,722**

**Int. Cl.[6] H05G *1/64***

**U.S. Cl. 378—98.9** **20 Claims**



1. A multiple x-ray energy level imaging system comprising:

apparatus for providing a raster pattern scanning x-ray tube beam; and a single point detector apparatus for detecting at least two different energy level x-rays as said raster pattern is scanned.

**5,742,661**

**Patent Not Issued For This Number**

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**5,742,662**

**X-RAY TUBE**

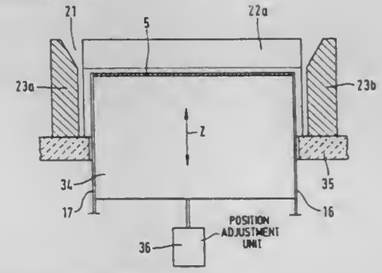
**Helmut Kuhn, Weissenbrunn; Walter Doerfler, Lonnerstadt; Gerhard Loew, Baiersdorf, and Bernhard Ciolek, Stein, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Mar. 15, 1996, Ser. No. 616,285**

**Claims priority, application Germany, Mar. 20, 1995, 195 10 048.4**

**Int. Cl.[6] H01J *35/06***

**U.S. Cl. 378—138** **1 Claim**




1. An x-ray tube comprising:

a housing;

an anode disposed in said housing and a cathode mounted in said housing at a distance from said anode;

said cathode including an electron emitter which emits an electron beam emanating from said electron emitter and being incident on said anode on a focal spot;

a focusing channel, in which said electron emitter is disposed, comprising a first pair of opposite walls and a second pair of opposite walls, said first pair of walls being insulated from said pair of walls; and

means for placing said first pair of walls at a first electrical potential and means for placing said second pair of walls at a second electrical potential with at least one of said first and second electrical potentials focusing said electron beam to a focus at a distance from said focal spot disposed between said electron emitter and said focal spot; and

means for varying a position of said electron emitter relative to said focusing channel for adjusting a depth position of said electron emitter in said focusing channel.

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**5,742,663**

**Patent Not Issued For This Number**

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**5,742,664**

**X-RAY PATIENT ASSIST HANDLE ARRANGEMENT**

**Ralph Lindel, 271-30 77th Ave., New Hyde Park, N.Y. 11040**

**Filed Aug. 26, 1996, Ser. No. 697,287**

**Int. Cl.[6] H05G *1/00***

**U.S. Cl. 378—208** **12 Claims**

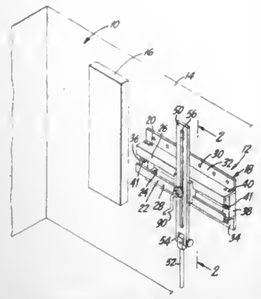
1. An adjustable handle arrangement for helping a patient to stand steady for X-ray exposure imaging, comprising:

an elongate track assembly adapted to be mounted on a wall of an X-ray examination room;

an assist handle mechanism including an elongate handle height adjustment member, and a patient assist handle fastened to the height adjustment member,

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carriage means constructed and arranged to engage the track assembly for relative sliding movement along the direction of the track assembly, the carriage means including means for guiding the height adjustment member for sliding movement along the length of the adjustment member, and means for clamping the carriage means together with the height adjustment member at a desired point along the track assembly;

wherein the patient assist handle is set at a desired position in both horizontal and vertical directions with respect to the track assembly by operation of the clamping means.

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**5,742,665**

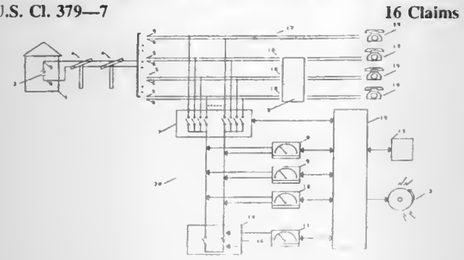
**MULTIFUNCTION ADAPTIVE TELEPHONE LINE MEASUREMENT METHOD AND SYSTEM**

**Edmond S. Chao, 12003 Landing Way, Hollywood, Fla. 33026**

**Filed Jun. 5, 1996, Ser. No. 655,213**

**Int. Cl.[6] H04M** *1/24;3/08;3/22*

**U.S. Cl. 379—7** **16 Claims**



1. A method of detecting a fault or an unauthorized device on any of a plurality of telephone lines incoming from at least one Central Office, the method comprising the steps of:

repeatedly measuring RF voltage and at least one other parameter on each of the lines successively at predetermined time intervals, the at least one other parameter selected from the group consisting of DC voltage, AC voltage, and Impedance;

storing the parameter values measured;

calculating the mean and a measure of deviation for each parameter for each line and repeatedly recalculating the mean and deviation to provide a current mean and deviation to reflect slow progressive non fault drift in values;

comparing each new parameter value to the current mean and deviation; and

providing an alarm signal whenever a new parameter value exceeds a range of values derived from the current mean and deviation to thereby indicate either that a fault or an unauthorized surveillance device is on the line.

**5,742,666**

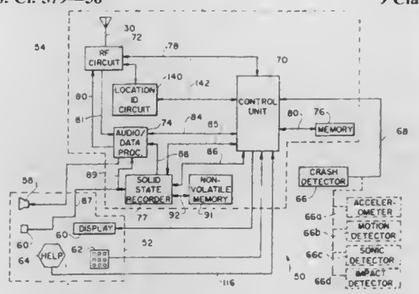
**EMERGENCY MOBILE TELEPHONE**

**Martin Alpert, Cleveland, Ohio, assignor to Tele Digital Development, Inc., St. Paul, Minn.**

**Filed Oct. 5, 1994, Ser. No. 317,663**

**Int. Cl.[6] H04Q** *7/00*

**U.S. Cl. 379—58** **9 Claims**




1. A cellular telephone, comprising:

a receiver for receiving cellular radio communications;

a transmitter for transmitting cellular radio communications;

a controller coupled to the receiver and to the transmitter;

an operator input device coupled to the controller, the operator input device receiving operator inputs and providing operator input signals to the controller indicative of the operator inputs;

an emergency input key coupled to the controller, the emergency input key receiving an operator emergency input and providing an emergency input signal to the controller indicative of the operator emergency input;

a crash detector, coupled to the controller, sensing parameters indicative of a crash and providing a crash signal to the controller indicative of the parameters sensed;

a first memory coupled to the controller and storing a pre-programmed telephone number corresponding to an emergency responder;

a second memory coupled to the controller and storing a pre-recorded emergency message including identification information associated with a user of the cellular telephone;

a microphone coupled to the controller and providing voice signals to the controller in response to the user speaking into the microphone;

wherein the controller is configured to detect a distress situation based on inputs from the emergency input key and the crash detector, and to access the first memory and initiate cellular communication using the pre-programmed telephone number and to access the second memory and play the pre-recorded message repeatedly once cellular communication has been initiated and established with the emergency responder, and wherein the controller is further configured to stop playing the pre-recorded message and transmit voice information based on inputs from the microphone and the operator input device.

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**5,742,667**

**NOTIFICATION OF TOLL FREE CALL CHARGING STATUS**

**David B. Smith, Hinsdale, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.**

**Continuation of Ser. No. 350,939, Dec. 7, 1994, abandoned. This application Jun. 5, 1996, Ser. No. 658,767**

**Int. Cl.[6] H04M** *15/08;3/00*

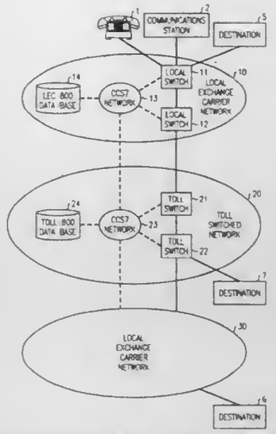
**U.S. Cl. 375—112** **11 Claims**

1. A method of establishing a toll free telecommunications call connection over a telecommunications network, comprising the steps of:

responsive to receipt from a caller station of a call service request comprising an identification of a toll flee telecommunications destination, using call service parameters established by and stored in the network to determine whether caller telephone account charges will accrue for calls to said destination; and

if said destination does not charge for said service, providing a network-formulated audible or visual indication to said caller station.






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**5,742,668**

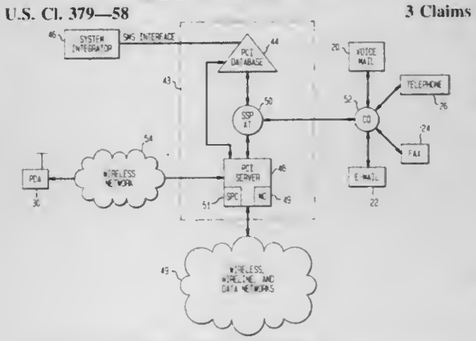
**ELECTRONIC MASSAGING NETWORK**

**David Matthew Pepe, Middletown; Lisa B. Blitzer, Manalapan; James Joseph Brockman, Perrineville; William Cruz, Eatontown; Dwight Omar Hakim, Matawan, all of N.J.; Michael Kramer, Bronx County, N.Y.; Dawn Diane Petr, Basking Ridge, N.J.; Josefa Ramarosun, Freehold, N.J.; Gerardo Ramirez, Bridgewater, N.J.; Yang-Wei Wang, Howell, N.J., and Robert G. White, Morristown, N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.**

**Continuation of Ser. No. 309,336, Sep. 14, 1994. This application Jun. 6, 1995, Ser. No. 466,623**

**Int. Cl.[6] H04M** *11/00;1/64*

**U.S. Cl. 379—58** **3 Claims**




1. A communication system comprising

a plurality of wireless subscribers each having a single address to which electronic mail messages and fax, pages, and voice communications may be sent;

means for storing a profile for each wireless subscriber, said profile containing for each of said wireless subscribers for (1) screening information for selectively screening incoming messages based on at least one of message origin, time of day, and day of week; (2) routing information for transmitting the message to the subscriber or for returning the electronic message to the sender with a short description of why delivery was unsuccessful; (3) and cross-media notification information for translating the electronic message into a paging message to be sent to a paging network and for sending a voice message notification of the electronic mail message; and

means for receiving an electronic mail message addressed to one of said subscribers and responsive to the information in said profile for said one subscriber for causing one of (1) delivering the electronic mail message to said one subscriber; (2) returning the electronic mail message to its sender with a short description of why delivery was unsuccessful if the electronic mail message cannot be delivered to said one subscriber; (3) translating the electronic mail message to a paging message and delivering the paging message to a paging network if the electronic mail message is to be delivered to a paging address; and (4) sending a voice announcement to the address specified in said one subscriber's profile.

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**5,742,669**

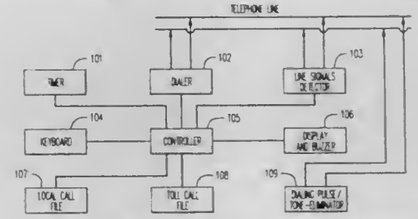
**TELEPHONE FOR STORING PARTICULARS OF OUTGOING CALLS AND/OR SPECIAL SERVICE CODES**

**Boon-Chen Lim, Flat A, 4th Floor, Flat A & B, 3rd Floor Shun Yee Industrial Bldg, 30-32 Lee Chung St., Chaiwan, Hong Kong**

**Filed Dec. 8, 1993, Ser. No. 162,910**

**Int. Cl.[6] H04M** *15/00;1/66*

**U.S. Cl. 379—130** **24 Claims**




1. A telephone or telephone add-on device which includes a recording system for recording information pertaining to outgoing telephone calls, said information including at least some of the date, time called, number and duration of the calls, a memory for storing the recorded information of a certain number of the outgoing telephone calls which is useful in assessing the cost of the telephone calls, a dynamic visual display for displaying the information, and further including toll call dialing lock means, wherein a plurality of unlock codes can be used to unlock the toll call dialing, and the assignment of an unlock code is also included in the contents of the record of each toll call, and each of the retrieved and shown records of a call also include the unlock code assignment.

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**5,742,670**

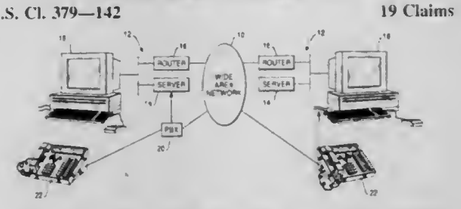
**PASSIVE TELEPHONE MONITOR TO CONTROL COLLABORATIVE SYSTEMS**

**Richard Lynn Bennett, Holmdel, N.J., assignor to NCR Corporation, Dayton, Ohio**

**Filed Jan. 9, 1995, Ser. No. 370,514**

**Int. Cl.[6] H04M** *3/42;* **H04J** *1/00*

**U.S. Cl. 379—142** **19 Claims**




1. In a collaborative system comprising one or more computers connected together in a network and a voice telephone system,

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wherein at least one of the computers is connected to a voice telephone system, a method of managing shared workspaces, comprising the steps of:

recognizing when a voice call is made from a calling party to a called party through the voice telephone system;

communicating identification information for the voice call from the voice telephone system to the computer connected to the voice telephone system, wherein the identification information identifies the calling and called parties of the voice call; and

establishing a shared workspace on the network separate from but in parallel with the voice call between the calling party's computer and the called party's computer.

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**5,742,671**

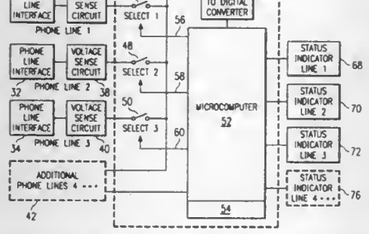
**SELF-ADJUSTING TELEPHONE LINE STATUS DETECTION INDICATION**

**Walter E. Parkerson, Fayetteville, Ark., and Roger D. Forrester, Garland, Tex., assignors to Tandy Corporation**

**Filed Oct. 22, 1992, Ser. No. 964,751**

**Int. Cl.[6] H04M** *1/24;3/22;1/00*

**U.S. Cl. 379—156** **24 Claims**




1. A method for automatically detecting and indicating a status of a telephone line, comprising the steps of:

measuring a present voltage level of a selected telephone line;

performing a condition pre-check upon said selected telephone line;

comparing, for the selected line, the present voltage level measured on said selected

telephone line with a previously measured voltage level stored in memory; and

updating the status indicated for said selected telephone line.

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**5,742,672**

**INSTALLATION OF A MULTI-TERMINAL NETWORK**

**Peter Burk, 1st Floor Sunnyside Centre, 13 Frost Avenue, Sunnyside, Johannesburg, South Africa**

**Filed Jul. 18, 1995, Ser. No. 503,800**

**Claims priority, application South Africa, Jul. 19, 1994, 94/5269; Apr. 12, 1995, 95/3015**

**Int. Cl.[6] H04M** *3/00*

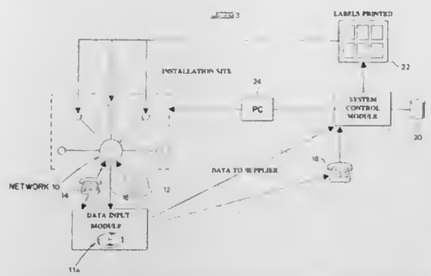
**U.S. Cl. 379—198** **13 Claims**

1. A method of installing a multi-terminal network comprising the steps of:

A) generating a plurality of predetermined prompts which prompt a user to enter relevant data relating to at least a location, identity and configuration of each terminal in the network;

B) compiling and storing the entered data corresponding to each terminal;

C) generating individual records containing the compiled data for each terminal;




D) locating the respective records at the intended location of each terminal; and

E) installing and configuring the individual terminals according to the data of each respective record.

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**5,742,673**

**GENERIC SERVICE COORDINATION MECHANISM FOR SOLVING SUPPLEMENTARY SERVICE INTERACTION PROBLEMS IN COMMUNICATION SYSTEM**

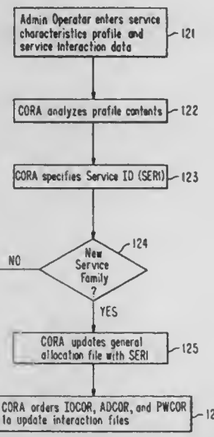
**Robert Khello, Norsborg, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**

**Division of Ser. No. 186,172, Jan. 24, 1994, Pat. No. 5,657,451.**

**This application May 9, 1997, Ser. No. 853,692**

**Int. Cl.[6] H04M** *3/42*

**U.S. Cl. 379—201** **2 Claims**




1. A generic service-coordination mechanism for solving supplementary service interaction problems in a communication system, said coordination mechanism comprising:

means for validating and distributing incoming requests from an administrative operator site;

means for validating and distributing incoming requests initiated by subscribers and traffic in said communication system;

means for storing and manipulating supplementary service profile files, subscriber profile files, general allocation files, and individual allocation files;

means for validating and coordinating supplementary service interactions during supplementary service provision and withdrawal;

means for validating and coordinating supplementary service interactions during supplementary service activation and deactivation;

means for validating and coordinating supplementary service interactions during supplementary service invocation and operation; and

means for storing and manipulating interaction files.



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**5,742,674**

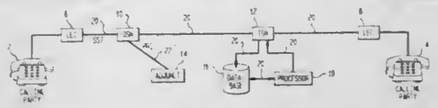
**AUTOMATIC CALL-BACK SYSTEM AND METHOD USING DATA INDICATING BEST TIME TO CALL**

**Ajay K. Jain, Holmdel, and Paramdeep S. Sahni, Marlboro, both of N.J., assignors to AT&T Corp., Middletown, N.J.**

**Filed Dec. 22, 1995, Ser. No. 577,892**

**Int. Cl.[6] H04M** *3/48;3/36*

**U.S. Cl. 379—209** **29 Claims**



1. A system for providing an automatic call-back to a caller at a calling party number that encounters a ring-no-answer condition upon calling a called party number, comprising:

a switching network having switches for routing telephone calls;

said switching network comprising a first originating switch node coupled to a first originating telephone call location corresponding to said calling party number and, a terminating switch node coupled to a destination telephone call location corresponding to said called party number;

a database coupled to said terminating switch node for storing information regarding times of calling activity of said called party number;

a processor coupled to said terminating switch node and to said database for analyzing said information to determine a best time to call said called party number and providing said terminating switch node with data indicating said best time to call said called party number;

a signaling network coupling switches in said switching network to one another for transmitting said data indicating said best time to call said called party number to said originating switch node; and

an adjunct coupled to said originating switch node for receiving an automatic call-back request from said caller at said calling party number and initiating said automatic call-back to said calling party number at said best time to call said called party number.

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**5,742,675**

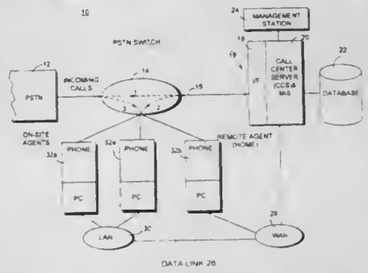
**METHOD AND APPARATUS FOR AUTOMATICALLY DISTRIBUTING CALLS TO AVAILABLE LOGGED-IN CALL HANDLING AGENTS**

**Sven G.J. Kilander, Flen, Sweden, and Christopher G. Sheahan, Victoria, Australia, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**

**Filed Sep. 26, 1995, Ser. No. 534,199**

**Int. Cl.[6] H04M** *3/00*

**U.S. Cl. 379—265** **16 Claims**




1. An automatic call distribution system, comprising:

a public telephone network including a public telephone switch;

a first set of call receiving agents associated with a first common service entity, each agent having a telephone connected to the public telephone network and a computer terminal;

a controller for initially receiving a call directed to the first common service entity and automatically establishing without using a telephone switch other than the public telephone switch a direct telephone connection between the public telephone switch and the selected agent's telephone for the call between the telephone network and one of the agents;

wherein after establishing the telephone connection, the controller is not included in the direct telephone connection; and

a data link separate from the public telephone network providing data communications between each of the agent computer terminals and with the controller;

wherein each agent that previously logged-on with the controller indicates availability to handle calls by entering an availability command on the computer terminal and sending the entered availability command over the data link to the controller.

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**5,742,676**

**CIRCUIT FOR TELEPHONE SET COMPRISING A LIGHT-EMITTING DIODE POWER SUPPLY**

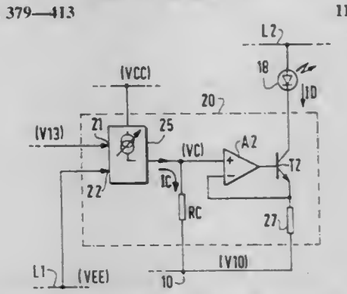
**Fernand Courtois, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 27, 1996, Ser. No. 721,913**

**Claims priority, application France, Sep. 29, 1995, 95 11498**

**Int. Cl.[6] H04M** *1/72*

**U.S. Cl. 379—413** **11 Claims**




1. A circuit in a device connected to a telephone line, comprising a power supply device for supplying power via the line of a light-emitting diode used as an operation indicator, the device also comprising a regulating transistor whose current path, connected in series to a line current measuring resistor, forms a circuit connected in parallel to the line, which regulating transistor determines a constant average value of voltage at the terminals of its main current path, characterized in that the power supply device comprises a variable current source connected in series to the light-emitting diode, the ensemble of these two elements being connected in parallel to the main current path of the regulating transistor, and in that the variable current source, receiving a monitoring signal derived from the voltage drop in the line current measuring resistor, is arranged for delivering a supply current which has a given nominal value when the average line current is equal to or higher than a current threshold, and for not delivering current when the average line current is lower than said current thresholds.

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**5,742,677**

**INFORMATION TERMINAL HAVING RECONFIGURABLE MEMORY**

**Howard G. Pinder, Atlanta, and Anthony John Wasilewski, Alpharetta, both of Ga., assignors to Scientific-Atlanta, Inc., Norcross, Ga.**

**Filed Apr. 3, 1995, Ser. No. 415,617**

**Int. Cl.[6] H04K** *1/00*

**U.S. Cl. 380—4** **24 Claims**

1. An information terminal comprising

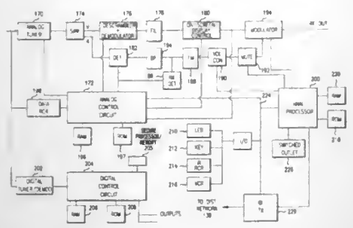
a data receiver for receiving commands and data,

a processor for interpreting the commands and data, and

reconfigurable memory, responsive to the processor, configured to store a plurality of blocks of data in memory blocks

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depending on the requirements of information providers, each said information provider being allocated at least one memory block, all unallocated memory blocks being linked in an empty, said empty list for organizing said unallocated memory blocks until they are requested by said information providers.

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**5,742,678**

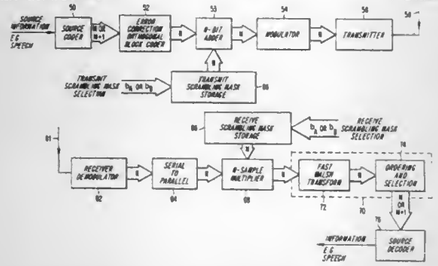
**MULTIPLE ACCESS CODING FOR RADIO COMMUNICATIONS**

**Paul W. Dent, Pittsboro, and Gregory E. Bottomley, Cary, both of N.C., assignors to Ericsson, Inc., Research Triangle Park, N.C.**

**Continuation of Ser. No. 291,693, Aug. 16, 1994, which is a continuation-in-part of Ser. No. 866,865, Apr. 10, 1992, Pat. No. 5,353,352. This application May 9, 1996, Ser. No. 647,187**

**Int. Cl.[6] H04L** *9/00*

**U.S. Cl. 380—6** **4 Claims**



1. A mobile station in a spread spectrum mobile radio communication system having at least one base station and a plurality of mobile stations, the system providing secure communications between the base station and each mobile station by using a cipher key unique to each mobile station, the mobile station comprising:

a source coder for converting speech information into digital information and for assembling the digital information into a block including M bits of the digital information;

a transmitter sequence generator for producing a unique enciphering bit sequence according to a function of the cipher key unique to the mobile station and a code key, wherein the cipher key is associated with an identification code of the mobile station that is known to both the mobile station and the at least one base station;

an adder for enciphering the block by modulo-adding the block and the unique enciphering bit sequence, whereby the adder produces an enciphered information signal;

an orthogonal block coder for converting the enciphered information signal to an encoded signal block including N bits, wherein N is greater than M;

a bit-wise XOR circuit for combining the encoded signal block with a spread spectrum mask code unique to the mobile station, whereby the bit-wise XOR circuit generates a spread-spectrum chip stream for transmission; and

a modulator for modulating a radio carrier signal with the spread-spectrum chip stream.

**5,742,679**

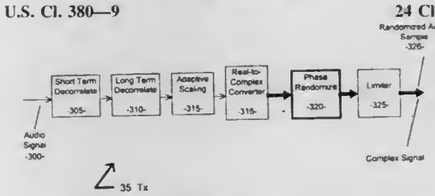
**OPTIMIZED SIMULTANEOUS AUDIO AND DATA TRANSMISSION USING QADM WITH PHASE RANDOMIZATION**

**Sverrir Olafsson, Seltjarnarnes, Iceland, assignor to Rockwell International Corporation, Newport Beach, Calif.**

**Filed Aug. 19, 1996, Ser. No. 699,269**

**Int. Cl.[6] H04K** *1/00*

**U.S. Cl. 380—9** **24 Claims**



1. A subsystem for QADM processing of QADM transmissions of audio signals for combining with data signals by a modem for communication with a remote modem, comprising:

real/complex conversion means for converting said audio signals into a complex signal;

randomizing means coupled to said real/complex conversion means for phase-randomizing said complex signal to generate a randomized complex signal, for combination with said data signals.

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**5,742,680**

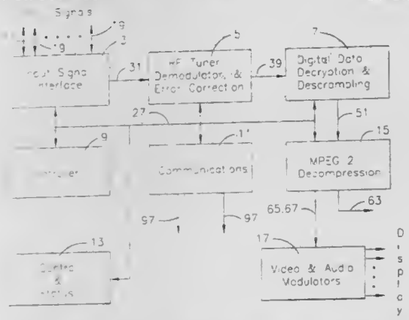
**SET TOP BOX FOR RECEIVING AND DECRYPTION AND DESCRAMBLING A PLURALITY OF SATELLITE TELEVISION SIGNALS**

**Jerrell Wilson, Los Gatos, Calif., assignor to E Star, Inc., Los Gatos, Calif.**

**Filed Nov. 13, 1995, Ser. No. 556,511**

**Int. Cl.[6] H04L** *9/32*

**U.S. Cl. 380—16** **14 Claims**



1. A home satellite television receiving system for receiving and decrypting signals transmitted from a plurality of different satellites, the system comprising:

an antenna system for simultaneously receiving first and second encrypted television signals from first and second satellites respectively, said first and second signals having different types of encryption whereby said first signal has a first encryption and said second signal has a second encryption;

a switch for allowing a user or viewer to select one of said first and second signals for viewing;

a decrypting device simultaneously housing first and second removable smart cards, said first smart card including a memory for storing a first decrypting algorithm for decrypting said received first signal having said first encryption, and said second smart card including a second decrypting algorithm for decrypting said received second signal having said second encryption whereby the signal selected for viewing by the user or viewer, whether said first signal or said second signal,



is decrypted using the appropriate smart card and thereafter forwarded for viewing.

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**5,742,681**

**PROCESS FOR THE BROADCASTING OF PROGRAMMES WITH PROGRESSIVE CONDITIONAL ACCESS AND SEPARATION OF THE INFORMATION FLOW AND THE CORRESPONDING RECEIVER**

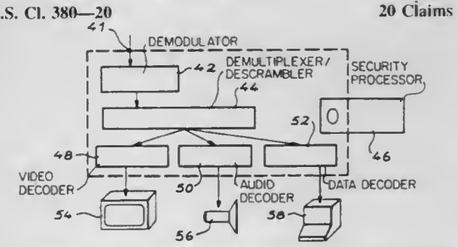
**Jean-Luc Giachetti, Betton; Louis Guillou, Bourgbaré , and Jean-Claude Pacaud, Cancale, all of France, assignors to France Telecom, and Telediffusion de France, both of Paris, France**

**Filed Apr. 4, 1995, Ser. No. 415,987**

**Claims priority, application France, Apr. 6, 1994, 94 04012**

**Int. Cl.[6] H04N** *7/167*

**U.S. Cl. 380—20** **20 Claims**



1. A method for broadcasting programs with progressive conditional access, comprising the steps of:

breaking an information flow of a program into a first flow and a second flow, said breaking step comprising,

arranging said first flow into a channel of order i in groups of m successive fixed length frames, said fixed length frames comprising variable length channels arranged in plural orders,

arranging said second flow into the channel of order i in groups of p successive fixed length frames;

scrambling the second flow with a control word; and

transmitting an entitlement checking message with said program so that a receiver equipped with an access right may descramble and restore the information flow, reception of the first flow resulting in a partially discernable program and reception of said second flow, once descrambled, resulting in complete restoration of the program, said transmitting step comprising the steps of,

transmitting said program in said channel of order i, and

multiplexing said groups of m successive fixed length frames alternately with said groups of p successive fixed length frames.

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**5,742,682**

**METHOD OF MANUFACTURING SECURE BOXES IN A KEY MANAGEMENT SYSTEM**

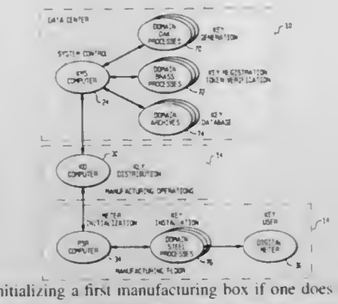
**Walter J. Baker, Stratford; Robert A. Cordery, Danbury; Frank M. D'Ippolito, Derby; Gary M. Heiden, Shelton; Kathyrn V. Lawton, Branford, and Steven J. Pauly, New Milford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.**

**Continuation of Ser. No. 414,897, Mar. 31, 1995, abandoned. This application Oct. 23, 1995, Ser. No. 551,934**

**Int. Cl.[6] H04L** *9/30*; **G07B** *17/04*

**U.S. Cl. 380—21** **8 Claims**

. 1. A method of manufacturing a secure box in a key management system that includes a plurality of functionally distinct secure boxes, the method comprising the steps of:



a) initializing a first manufacturing box if one does not exist;

b) creating in a manufacturing box at least one logical security domain including encryption keys needed to perform key management system processes within the domain;

c) providing a target secure box with the capability to perform at least one key management system function from a plurality of functions required by the key management system;

d) authenticating the target secure box to the manufacturing box;

e) installing a unique secure box identification in the target secure box;

f) creating at least one logical security domain in the target secure box corresponding to a logical security domain in the manufacturing box;

g) sending a command from a key management system computer to initialize the target secure box to perform a domain process for at least one of key management system functions provided within the target secure box; and

h) initializing the target secure box in each domain process indicated in the command from the key management system computer.

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**5,742,683**

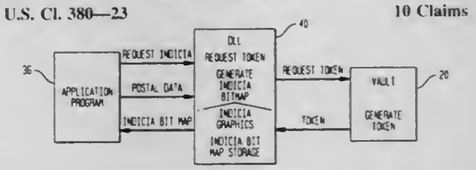
**SYSTEM AND METHOD FOR MANAGING MULTIPLE USERS WITH DIFFERENT PRIVILEGES IN AN OPEN METERING SYSTEM**

**David K. Lee, Monroe; David W. Riley, Easton, and Frederick W. Ryan, Jr., Oxford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.**

**Filed Dec. 19, 1995, Ser. No. 574,745**

**Int. Cl.[6] H04K** *1/00*

**U.S. Cl. 380—23** **10 Claims**



1. A method of managing multiple users of an open metering system, wherein the users have different access privileges, the method comprising the steps of:

providing a user password system for vault access;

programing the vault with a plurality of transition states operatively relating to the user password system;

assigning vault functional access to each user password first entered into the user password system; and

performing a requested vault function when an entered user password under which the request is made has been assigned vault functional access for the requested vault function.

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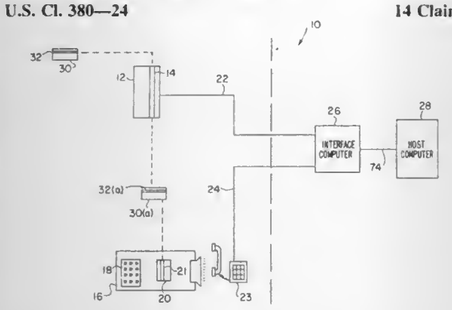


**5,742,684**

## METHOD AND APPARATUS FOR DATA ENCRYPTION AND TRANSMISSION

**Isaac Labaton, Haifa, Israel, and Michael Kevin Kelly, Phoenix, Ariz., assignors to Enco-Tone Ltd., Israel**

**Continuation of Ser. No. 244,584, Jun. 3, 1994, Pat. No. 5,524,072. This application May 20, 1996, Ser. No. 650,315**
**Claims priority, application Israel, Dec. 4, 1991, 100238**
**Int. Cl.[6] H04L** *9/00*
**U.S. Cl. 380—24** **14 Claims**




1. A remote identification system comprising at least one transmitting device and a receiving system, wherein the at least one transmitting device comprises:

a keypad for entering a PIN or password;

means for entering authentication numbers;

means for storing authentication numbers including numbers which are unique for each transmitting device;

means for determining time and date;

means for generating a message, by computing, in response to entry of the PIN or password, the result of a first reversible mathematical function on the time and date and on at least some of the authentication numbers, with the message transmitted to the receiving system;

and wherein the receiving system comprises:

means for receiving the message from the transmitting device;

means for determining time and date;

means for computing a second mathematical function which is the mathematical inverse of the first function, in order to recover from the message sent by the transmitting device the authentication numbers, and time and date of transmission of the message.

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**5,742,685**

## METHOD FOR VERIFYING AN IDENTIFICATION CARD AND RECORDING VERIFICATION OF SAME

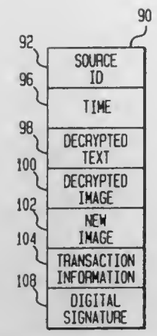
**William Berson, Weston, Conn., and Shailendra Kumar, San Diego, Calif., assignors to Pitney Bowes Inc., Stamford, Conn.**

**Filed Oct. 11, 1995, Ser. No. 541,171**
**Int. Cl.[6] H04L** *9/00*
**U.S. Cl. 380—25** **18 Claims**

1. A method for verifying an identification card and recording verification of said card, said card having a first representation of a biometric characteristic of a person to be identified on a first portion and a coded representation of an encrypted signal incorporated on a second portion of said card, said encrypted signal having a first part comprising a second representation of said biometric characteristic and a second part comprising other information about said person, said method comprising the steps of:

a) reading said coded representation from said card;

b) decoding said coded representation to obtain a decoded representation;




c) decrypting said decoded representation to obtain said second representation of said biometric characteristic and said other information;

d) verifying said card by comparing said first and second representations of said biometric characteristic;

e) creating a record of verification of said card, said record including said other information; and

f) digitally signing said record and then storing said record.

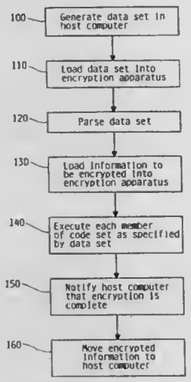
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**5,742,686**

## DEVICE AND METHOD FOR DYNAMIC ENCRYPTION

**Phillip Scott Finley, P.O. Box 40293, Eugene, Oreg. 97404**

**Filed Jun. 14, 1996, Ser. No. 662,241**
**Int. Cl.[6] H04L** *9/28;9/00*
**U.S. Cl. 380—28** **44 Claims**




1. An apparatus for dynamic encryption of information including data, voice, and graphics, comprising:

a random-access memory containing more than one distinct encryption and decryption programs and the information to be encrypted and decrypted,

a first encryption processor executing said encryption and decryption programs,

wherein said encryption and decryption programs further comprise a code set, the members of said code set being executed serially by said first encryption processor, each member partially encrypting the information, each member of said code set being optionally repetitively executed, and

a data set in said random access memory specifying the order of execution of said members of said code set and the number of times each such member is executed, the contents of said data set changing automatically on a periodic basis.

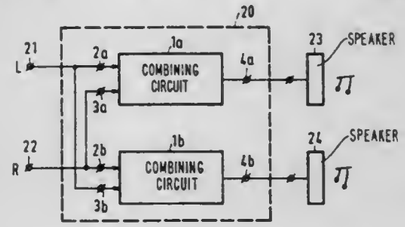


**5,742,687**

## SIGNAL PROCESSING CIRCUIT INCLUDING A SIGNAL COMBINING CIRCUIT STEREOPHONIC AUDIO REPRODUCTION SYSTEM INCLUDING THE SIGNAL PROCESSING CIRCUIT AND AN AUDIO-VISUAL REPRODUCTION SYSTEM INCLUDING THE STEREOPHONIC AUDIO REPRODUCTION SYSTEM

**Ronaldus M. Aarts, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jan. 11, 1995, Ser. No. 371,187**
**Claims priority, application Belgium, Jan. 17, 1994, 09400048**
**Int. Cl.[6] H04R** *5/00*
**U.S. Cl. 381—1** **18 Claims**




1. A signal combining circuit having a first and a second input for receiving signals which have frequencies in the audio frequency spectrum and having an output, the circuit comprising: a first signal path which has a first transfer characteristic for passing signal components of the signal received at the first input to the output, a second signal path which has a second transfer characteristic for passing signal components received at the second input to the output, the transfer characteristics showing differences which cause a phase shift to occur between signal components passed through the first signal path and signal components passed through the second signal path, wherein for frequencies below a predetermined frequency the amplitude transfer determined by the first transfer characteristic is greater than the amplitude transfer determined by the second transfer characteristic and in which, when the first and second inputs are interconnected, the amplitude transfer between the interconnected inputs and the output as a function of frequency is substantially constant.

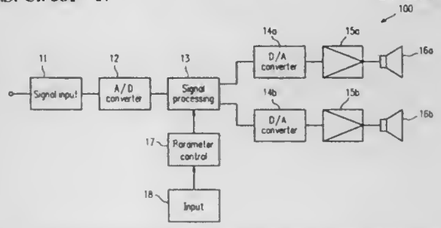
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**5,742,688**

## SOUND FIELD CONTROLLER AND CONTROL METHOD

**Michiko Ogawa, Osaka; Akihisa Kawamura, Hirakata; Masaharu Matsumoto, Katano; Toshihiko Date, Yamatokoriyama; Tadashi Tamura, Toyonaka, and Yasutoshi Nakama, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Feb. 3, 1995, Ser. No. 383,295**
**Claims priority, application Japan, Feb. 4, 1994, 6-032993; Apr. 11, 1994, 6-098040; Apr. 15, 1994, 6-102114**
**Int. Cl.[6] H04R** *5/00*
**U.S. Cl. 381—17** **24 Claims**




1. A sound field controller for reproducing a sound field, comprising:

an A/D converter for converting an input audio signal into a digital signal;

signal processing means for receiving the digital signal and processing the digital signal using predetermined parameters, thereby generating a sound signal;

input means for inputting conditions including a position of a sound image to be localized, a distance between the sound image and a listener, and a spatial size of the sound field;

parameter control means for setting the parameters used in the signal processing means based on the conditions provided from the input means, whereby the sound signal generated in the signal processing means has characteristics corresponding to the conditions;

a D/A converter for converting the sound signal output from the signal processing means into an analog signal; and

reproduction means for receiving the analog signal from the D/A converter and for amplifying and reproducing the analog signal, thereby generating a sound field providing a distance perspective in accordance with the position of the sound image with respect to the listener and a sense of expansion to the listener.

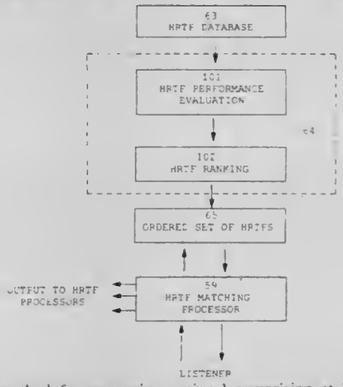
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**5,742,689**

## METHOD AND DEVICE FOR PROCESSING A MULTICHANNEL SIGNAL FOR USE WITH A HEADPHONE

**Timothy John Tucker, Gainesville, and David M. Green, East Palatka, both of Fla., assignors to Virtual Listening Systems, Inc., Gainesville, Fla.**

**Filed Jan. 4, 1996, Ser. No. 582,830**
**Int. Cl.[6] H04S** *5/00*
**U.S. Cl. 381—17** **9 Claims**




1. A method for processing a signal comprising at least one channel, wherein each channel has an audio component, wherein said method allows a user of headphones to receive at least one processed audio component and perceive that the sound associated with each of said at least one processed audio component has arrived from one of a plurality of positions, determined by said processing, wherein said method comprises the steps of:

a. receiving the audio component of each channel;

b. selecting, as a function of a user of headphones, a best-match set of head related transfer functions (HRTFs) from a database of sets of HRTFs;

c. processing the audio component of each channel via a corresponding pair of digital filters, said pairs of digital filters filtering said audio components as a function of the best-match set of HRTFs, each corresponding pair of digital filters generating a processed left audio component and a processed right audio component;

d. combining said processed left audio component from each channel of the signal to form a composite processed left audio component;

e. combining said processed right audio component from each channel of the signal to form a composite processed right audio component;

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f. applying said composite processed left and right audio components to headphones, to create a virtual listening environment wherein said user of headphones perceives that the sound associated with each audio component has arrived from one of a plurality of positions, determined by said processing,

wherein the step of selecting a best-match set of HRTFs further includes the step of matching the user to the best-match set of HRTFs from a method selected from the group consisting of listener performance and HRTF clustering,

wherein the step of matching the user to the best-match set of HRTFs via listener performance further comprises the steps of:

i. providing, to the user, a sound signal filtered by a starting set of HRTFs, and

ii. tuning the sound signal through at least one additional set of HRTFs, until the sound signal is tuned to a virtual position that approximates a predetermined virtual target position, thereby matching the user to the best-match set of HRTFs.

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**5,742,690**

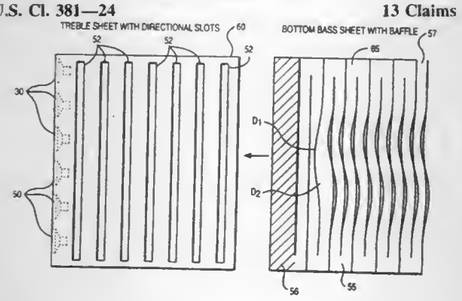
**PERSONAL MULTIMEDIA SPEAKER SYSTEM**

**Albert Durr Edgar, Austin, Tex., assignor to International Business Machine Corp., Armonk, N.Y.**

**Continuation of Ser. No. 245,519, May 18, 1994, Pat. No. 5,588,063. This application Jun. 28, 1996, Ser. No. 673,403**

**Int. Cl.[6] H04R** *5/00*

**U.S. Cl. 381—24** **13 Claims**




13. A speaker system for personal listening comprising:

two speaker units each including a least four small speakers, arranged in a vertical linear array, each speaker unit having a width dimension substantially smaller than a height dimension to minimize a total width of the speaker unit, each speaker in each respective speaker unit coupled to be driven with a substantially identical first electrical signal so that the speakers in each respective speaker unit become a phased array;

a common folded waveguide in each speaker unit coupled to the rear faces of the plurality of speakers, the waveguide having a width dimension substantially smaller than its height dimension or its depth dimension to minimize the width of the speaker unit, the width dimension sufficient to accommodate a width dimension of the small speakers, the waveguide being decreased in cross section at a distance D1 from the rear face of the speakers to correct for frequency response of the speaker unit.

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**5,742,691**

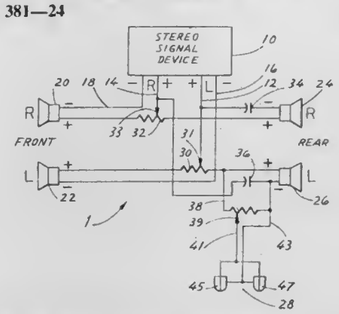
**SURROUND SOUND CONVERTER**

**Paul R. Ambourn, c/o Terry Montpetit 29 Scotch Pine Rd., North Oaks, Minn. 55127**

**Filed Feb. 21, 1997, Ser. No. 804,186**

**Int. Cl.[6] H04R** *5/02*

**U.S. Cl. 381—24** **5 Claims**




1. A surround sound converter comprising:

a right audio signal positive input;

a right audio signal negative input, said right audio signal positive input and said right audio signal negative input driving a right front speaker;

a left audio signal positive input;

a left audio signal positive input, said left audio signal positive input and said left audio signal negative input driving a left front speaker;

a left capacitor being connected to said right audio signal positive input, said left capacitor and said left audio signal positive input driving a left rear speaker; and

a right capacitor being connected to said left audio signal positive input, said right capacitor and said right audio signal positive input driving a right rear speaker.

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**5,742,692**

**IN-THE-EAR HEARING AID WITH FLEXIBLE SEAL**

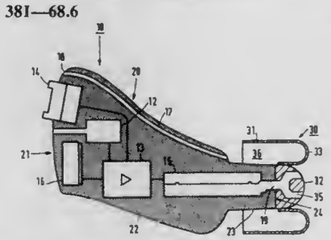
**Henri Garcia; Joseph F. J. M. Beumers, and Rudi A. M. Claes, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Mar. 17, 1995, Ser. No. 407,433**

**Claims priority, application European Pat. Off., Apr. 8, 1994, 94200961**

**Int. Cl.[6] H04R** *25/00*

**U.S. Cl. 381—68.6** **6 Claims**




1. An in-the-ear hearing aid comprising:

a housing containing an electro-acoustic transducer, wherein the housing has a comparatively wide portion situated near a first end of the housing and adjoining a comparatively narrow portion situated near a second end of the housing, the hearing aid being adapted to fit partly in a fleshy part and partly in a bony part of a user's ear canal and to form, during use, a seal for the ear canal in the bony part thereof, wherein to form the seal in the bony part of the ear canal the hearing aid includes a collar which is fixed to the housing by means of a fixing element, wherein the collar comprises;



a tubular outer portion made of a flexible material and which, at a side remote from the first end of the housings ends in a curved portion made of a flexible material which in turn ends in a tubular inner portion coaxially arranged with respect to said tubular outer portion, wherein the fixing element extends at least partly inside of the tubular inner portion and has a largest radial dimension (d1) which is substantially smaller than a corresponding inner dimension (d2) of the tubular outer portion, and wherein

the narrow portion of the housing extends at least partly inside of the tubular outer portion.

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**5,742,693**

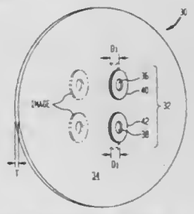
**IMAGE-DERIVED SECOND-ORDER DIRECTIONAL MICROPHONES WITH FINITE BAFFLE**

**Gary Wayne Elko, Summit, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Dec. 29, 1995, Ser. No. 580,701**

**Int. Cl.[6] H04R** *3/00*

**U.S. Cl. 381—92** **22 Claims**




1. An acoustic transducer comprising:

an acoustical reflecting surface of a finite dimension, said finite dimension being approximately one to one-half of an acoustic wavelength at a predetermined frequency; and

at least one sensor having an output which produces a first-order differential response pattern, said at least one sensor being located proximate to said reflecting surface, wherein acoustical waves propagating from said reflecting surface, acoustically interact with said at least one sensor to produce a second-order differential response at said output of said at least one sensor at said predetermined frequency and at low frequencies relative to said predetermined frequency a first-order response at said output occurs.

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**5,742,694**

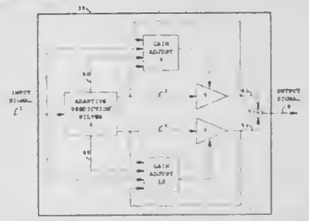
**NOISE REDUCTION FILTER**

**Graham P. Eatwell, 6395C Smithy Sq., Glen Burnie, Md. 21061**

**Filed Jul. 12, 1996, Ser. No. 679,245**

**Int. Cl.[6] H04B** *15/00*

**U.S. Cl. 381—94.2** **28 Claims**




1. A method for enhancing a noisy signal, said noisy signal including a noise element and a signal element, comprising the steps of

passing said noisy signal through a first adaptive prediction filter so as to obtain a first signal component corresponding to a predictable component of said noisy signal and a second signal component corresponding to a prediction error,

passing the first signal component through a first attenuator to obtain a first attenuated signal component,

passing the second signal component through a second attenuator to obtain a second attenuated signal component and

combining the first and second attenuated signal components to form an enhanced output signal.

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**5,742,695**

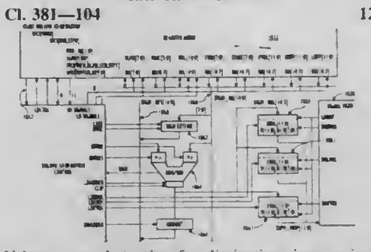
**WAVETABLE AUDIO SYNTHESIZER WITH WAVEFORM VOLUME CONTROL FOR ELIMINATING ZIPPER NOISE**

**David N. Suggs, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

**Filed Nov. 2, 1994, Ser. No. 333,562**

**Int. Cl.[6] H03G** *3/00*

**U.S. Cl. 381—104** **12 Claims**



1. Volume control circuitry for eliminating zipper noise resulting from volume incrementing in a digital wavetable audio synthesizer wherein said synthesizer is at least capable of: (i) providing a volume component to wavetable data addressed by said synthesizer; and (ii) periodically incrementing said volume component by a volume increment value, comprising:

(a) shift circuitry for storing a volume increment value in binary format, and shifting bits of said volume increment value right one or more positions, wherein the number of positions shifted is constant when said shift circuitry is enabled; and

(b) means for enabling said shift circuitry to shift said bits of said volume increment value right and thereby set a maximum volume increment value, wherein said maximum volume increment value is seven.

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**5,742,696**

**MODULAR TWEETER**

**Roger Neal Walton, Barry, England, assignor to Harman International Industries Limited, London, United Kingdom**

**PCT No. PCT/GB95/00791, § 371 Date Sep. 20, 1996, § 102(e) Date Sep. 20, 1996, PCT Pub. No. WO95/28065, PCT Pub. Date Oct. 19, 1995**

**PCT Filed Apr. 5, 1995, Ser. No. 704,603**

**Claims priority, application United Kingdom, Apr. 9, 1994, 9407101**

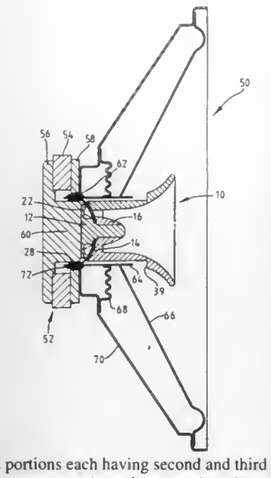
**Int. Cl.[6] H04R** *25/00*

**U.S. Cl. 381—156** **8 Claims**

1. A tweeter for mounting to a front of a center pole of a stator of a moving coil loudspeaker, the stator including the center pole and an annular outer pole defining between them an air gap, the tweeter including a support member and a skirted dome having a dome-shaped forward radiating surface and a conductive skirt, the forward radiating surface including a central opening, the skirt extending rearwardly from the forward radiating surface for extension into the air gap of an assembled loud speaker, the support member having a front portion, a back portion and a post portion extending from the back portion to the front portion, the back portion and the post portion being formed in a single unit the support member portions constituting at least two separable members, said separable members being joined together in the front portion, and the post portion having a first cross section that permits it to extend through the central opening of the dome, the

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back and front portions each having second and third cross sections respectively that prevent them from passing through the central opening of the dome, wherein when the support member has said separable members joined with the dome, the dome is positioned with the post portion extending through the central opening and between the second and third cross sections to capture the dome between the front and back portions of the tweeter.

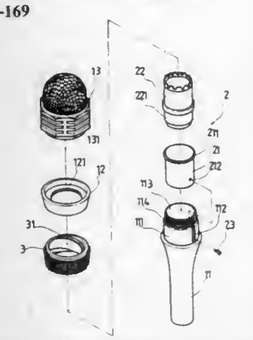
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**5,742,697**

## MICROPHONE WITH TELESCOPIC SOUND PICKUP MEANS

**Chiang Ching-Chung, Taipei Hsien, Taiwan, assignor to PAO Sung Industrial Co., Ltd., Taipei, Taiwan**

**Filed Nov. 16, 1995, Ser. No. 558,514**
**Int. Cl.[6] H04R** *25/00*
**U.S. Cl. 381—169** **2 Claims**



1. A microphone with telescopic sound pickup means, said microphone comprising:

a hollow handle having a stair-shaped shaft at an upper portion thereof, said shaft having a vertical slot in one side thereof, said handle further having a vertical slide seat with external threads at an apical end thereof;

a pickup means consisting of a pickup head which is disposed within a hollow movable sleeve by means of a soft pad provided at a bottom side thereof, said movable sleeve having a flange at an apical end thereof and a screw hole near a bottom end thereof, a pin being provided to pass through said slot in said handle to be locked in said screw hole so that said movable sleeve may be fitted into said slide seat of said handle and may displace upwardly and downwardly therein;

an adjusting knob being an annular ring provided with external vertical corrugations and having a spiral slide groove provided at an inner wall thereof, said pin being capable of sliding along said groove to enable said adjusting knob to be screwably fitted onto said shaft of said handle; and

a ring having an inner projecting ring provided with internal threads, whereby said ring may be locked onto the external threads of said slide seat to restrict displacement of said adjusting knob by means of counteractions of said pin.

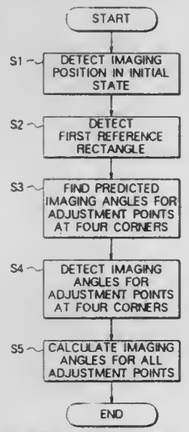
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**5,742,698**

## AUTOMATIC IMAGE ADJUSTMENT DEVICE

**Kouji Minami; Yoshiki Ono, and Takehiko Morita, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 4, 1996, Ser. No. 658,229**
**Claims priority, application Japan, Jun. 5, 1995, 7-137873**
**Int. Cl.[6] G06K** *9/00*
**U.S. Cl. 382—100** **11 Claims**




1. An automatic image adjustment device connected with an image display device for displaying an image on a screen, and used for various set-up adjustments such as the position and state of display of a test pattern displayed on the screen, through control over the image display device, said automatic image adjustment device comprising:

an imaging means for imaging an area forming a part of the screen;

an imaging position control means for controlling a position of said area in the screen;

an imaging position calculating means for calculating a driving position for imaging an arbitrary area on the screen, from driving positions of the imaging means for imaging areas respectively containing vertices of a rectangle on the screen.

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**5,742,699**

## PASSIVE VELOCITY MEASURING DEVICE

**William A. Adkins, 845 Snow Queen Dr., Chuluota, Fla. 32766, and James H. Pierce, 19029 U.S. 19 N., B2-18, Clearwater, Fla. 34624**

**Filed Aug. 31, 1995, Ser. No. 522,170**
**Int. Cl.[6] G06K** *9/00*
**U.S. Cl. 382—107** **2 Claims**

2. A method for passively measuring the velocity of a moving vehicle comprising:

acquiring images using a camera utilizing a frame transfer CCD for acquiring images, wherein said images include said moving vehicle approaching said apparatus and wherein light from said moving vehicle is passed through a near field lens, reflected by a fold mirror, reflected off a steering mirror, and finally passed to said frame transfer CCD for near field operation, and wherein light from said moving vehicle is passed through a far field lens and then passed directly to said frame transfer CCD for far field operation, and wherein said frame transfer CCD sends an image of said moving vehicle to said computer to be processed by a frame grabber which produces multiple frames each with an image of said moving vehicle to be sequentially displayed on a monitor;

initially calibrating said camera for said far field operation in a laboratory environment using known size targets at known distances and mapping CCD pixels thus producing data which is input into a software lookup table for access by said computer and further producing multiple optical calibration factors dependent on zoom characteristics of said camera, said optical calibration factors placed on said camera so as to be accessible for manual input from said computer for field calibration of said apparatus;

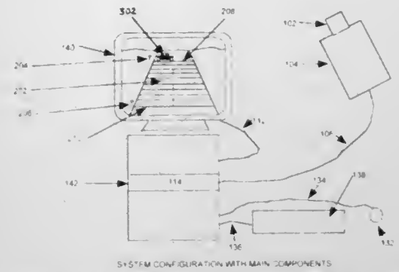
initializing said apparatus and during said initialization data regarding time, date, location, and speed limit for the site of speed measurement is input into said computer, also during said initialization, camera pointing and video contrast and brightness are set up, and wherein said camera pointing involves pointing said camera so that said CCD acquires images of a first stationary object at a known distance from said apparatus, and a second stationary object at a second distance which is closer to said apparatus than said distance of said first stationary object, said first and second stationary objects being positioned along said moving vehicle's path, and wherein said first and second stationary objects are displayed on said monitor and wherein said monitor displays parallel lines perpendicular to said moving vehicle's motion, a first parallel line to be associated with said first stationary object and a second parallel line to be associated with said second stationary object;

following said initialization, said moving vehicle is tracked using a centroid tracking algorithm associated with said frame grabber, and an initial determination is made that said moving vehicle is speeding when it is determined that said moving vehicle's speed is greater than said speed limit and wherein said moving vehicle's speed is determined by examining two frames with a two second time interval between them, calculating the difference in said vehicle's height between said two frames, using said optical calibration factors to calculate a distance traveled by said vehicle towards said apparatus during said two second time interval, and dividing said distance by said two second time interval;

after said initial determination is made that said moving vehicle is speeding a second determination of said moving vehicle's speed is made and compared to said speed limit, wherein said moving vehicle's speed is determined by said computer prompting said operator to use a pointing device to drag said first parallel line so that it is adjacent to said first stationary object and to drag said second parallel line so that it is adjacent to said second stationary object, then said computer adds nine more lines equidistant and parallel between said first and second parallel lines so as to generate a grid with known distances between grid lines to be displayed on said display, wherein said moving vehicle is tracked using a centroid tracking algorithm associated with said frame grabber as it crosses said grid, distance and time measurements are made as said moving vehicle crosses each of said grid lines and calculations of velocity are made for ten samples and an average of said ten samples is calculated;

after said second determination of said moving vehicle's speed is made, said apparatus switches to said near field operation to acquire a close up image of said moving vehicle and pertinent vehicle identification and said apparatus stores data of said moving vehicle when it is determined it has violated said speed limit, said data including time, date, location, calibration, and speeding information all superimposed on video including said close up image of said moving vehicle showing tag number and operator image.





SYSTEM CONFIGURATION WITH MAIN COMPONENTS

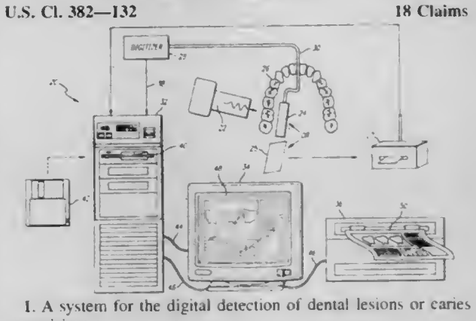
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**5,742,700**

## QUANTITATIVE DENTAL CARIES DETECTION SYSTEM AND METHOD

**Douglas C. Yoon, Beverly Hills; Gregg D. Wilensky, Venice; Joseph A. Neuhaus, Marina del Ray; Narbik Manukian, Glendale, and David C. Gakenheimer, Redondo Beach, all of Calif., assignors to Logicon, Inc., Torrance, Calif.**

**Continuation-in-part of Ser. No. 513,472, Aug. 10, 1995, abandoned. This application Oct. 13, 1995, Ser. No. 542,674**
**Int. Cl.[6] G06K** *9/00*
**U.S. Cl. 382—132** **18 Claims**



1. A system for the digital detection of dental lesions or caries comprising:

a digitized x-ray image of teeth, said image having variable image intensities;

means for identifying the outer surface of a tooth in a predetermined area, and for identifying the interface between the enamel and the dentine;

means for identifying significant changes in intensity along successive spaced lines extending substantially parallel to the tooth surface and substantially parallel to the interface between the enamel and the dentine within the enamel, and within the dentine adjacent to and parallel to the interface and for processing portions of said image to identify features within the enamel and the dentine;

means for processing said image to generate statistics pertaining to said features and to identify best linear alignments of dark features in each of said tissues, said feature statistics including:

an enamel penetration depth;

an enamel feature magnitude;

an enamel feature alignment error;

a dentine feature magnitude;

a dentinal feature alignment error; and

a degree of colinearity between enamel features and dentinal features;

means for processing said feature statistics and for comparing the variations in intensity with stored data relating to known dental lesions or caries, and for determining by such comparison probabilities of dental lesions being present and extents of such lesions; and

means for printing out the variations in intensity along said successive spaced lines, showing the presence or absence of dental lesions in the enamel and/or dentine, and the extents of such lesions if they are present.

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**5,742,701**

## ALIGNMENT DETECTION APPARATUS

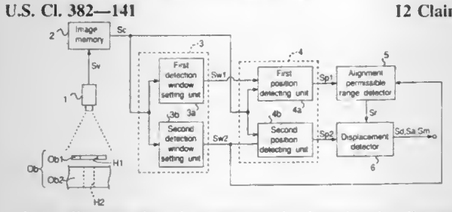
**Misuzu Takano, Hirakata; Kinji Horikami, Suita; Yoshihiro Itsuzaki, Kashihara, and Masaya Nakao, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan**

**Filed Feb. 15, 1995, Ser. No. 389,233**

**Claims priority, application Japan, Feb. 15, 1994, 6-018281; Feb. 15, 1994, 6-018282**

**Int. Cl.[6] G06K** *9/00*

**U.S. Cl. 382—141** **12 Claims**




1. An alignment detection apparatus for detecting the alignment condition of first and second objects, comprising:

a digital image signal producing means for producing a digital image signal indicative of images of the first and second objects;

a position detecting means for detecting positions of the first and second objects by scanning the digital image signal through a first detection window configured in a shape which matches at least a part of an outline of the first object and a second detection window configured in a shape which matches at least a part of an outline of the second object, to produce a position signal indicative of the detected positions; and

a displacement detection means for detecting a distance between the first and second objects based on the position signal to produce a displacement signal indicative of the detected distance;

wherein said position detecting means determines the positions of the first and second objects when a number of locations where the detection windows overlap the outlines of the first and second objects exceeds a predetermined number.

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**5,742,702**

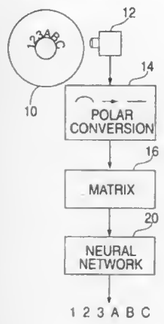
## NEURAL NETWORK FOR CHARACTER RECOGNITION AND VERIFICATION

**Toru Oki, Allendale, N.J., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., Park Ridge, N.J.**

**Continuation of Ser. No. 955,534, Oct. 1, 1992, abandoned. This application Aug. 9, 1996, Ser. No. 694,810**

**Int. Cl.[6] G06K** *9/62*

**U.S. Cl. 382—156** **4 Claims**




1. A method for verifying a plurality of groups of symbols from a symbol set of N possible symbols, comprising the steps of:

(a) providing a plurality of N verification neural networks, each associated with and trained to verify one of N possible symbols wherein each of said N verification neural networks accepts as an input a representation of a symbol associated with each respective N verification neural network and has two output nodes indicating whether the input representation of a symbol is either verified or not verified;

(b) selecting a group of verification neural networks from said plurality of N verification neural networks associated with a group of symbols;

(c) applying representations of one group of symbols as inputs to said group of verification neural networks;

(d) processing said inputs in said verification neural networks; and

(e) repeating steps (c) and (d) for each of the plurality of groups of symbols other than said one group, wherein step (e) terminates when any one of said verification neural networks indicates a verification fail.

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**5,742,703**

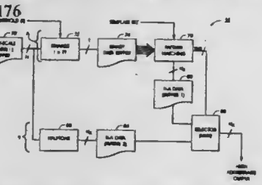
## METHOD AND APPARATUS FOR THE RESOLUTION ENHANCEMENT OF GRAY-SCALE IMAGES THAT INCLUDE TEXT AND LINE ART

**Ying-Wei Lin, Penfield; Robert P. Loce, Webster, and Michael Branciforte, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 11, 1995, Ser. No. 540,998**

**Int. Cl.[6] G06K** *9/34;9/62;* **G06T** *5/00;* **H04N** *1/40*

**U.S. Cl. 382—176** **17 Claims**



1. An image processing apparatus for resolution enhancing a gray-scale digital image input thereto, the image including text and line art represented as a plurality of digitized gray-scale values, comprising:

a first channel, including a binarization circuit to binarize the gray-scale digital image and produce a binary image, and a pattern matcher for receiving the binary image and producing both a tag signal, active only when a segment of the binary image matches one of a set of template patterns, and a first high-addressability enhanced output signal;

a second channel, parallel to the first channel, for receiving the gray-scale digital image and producing a second high-addressability enhanced output signal; and

a selector, responsive to the tag signal generated by the first channel pattern matcher, for selecting the high-addressability enhanced output signals from the first or second channels and outputting the selected output signals to a marking engine to produce a resolution enhanced output print.

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**5,742,704**

## IMAGE CODING APPARATUS CAPABLE OF CODING IN ACCORDANCE WITH AN IMAGE TYPE

**Kazuhiro Suzuki; Yutaka Koshi, and Koh Kamizawa, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 542,804, Oct. 13, 1995, abandoned, which is a continuation of Ser. No. 235,657, Apr. 29, 1994, abandoned. This application Jan. 7, 1997, Ser. No. 779,390**

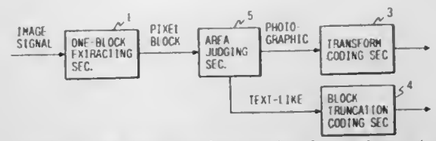
**Claims priority, application Japan, Apr. 30, 1993, 5-128297**

**Int. Cl.[6] G06K** *9/34*

**U.S. Cl. 382—176** **7 Claims**

1. An image coding apparatus comprising:






one-block extracting means for extracting, from an image signal, a pixel block containing m×n pixels, where m and n are positive integers;

a plurality of coding means for coding the pixel block;

means for adding to the pixel block information indicating a coding method; and

area judging means for analyzing a plurality of characteristic quantities of the pixel block and for supplying the pixel block to one of the plurality of coding means in accordance with a result of the analysis, the plurality of characteristic quantities being measured in statistically different aspects,

further, said area judging means comprising:

average separating means for subtracting from the pixel block, an average of values of pixels belonging to the pixel block to produce an average-separated block; and

destination determining means for classifying the pixel blocks as one of a plurality of pixel block types by analyzing a histogram of values of the pixels within the average-separated block, a variance of the values of the pixels within the average-separated block and a result of comparison between maximum and minimum values of pixels within the average-separated block, the block types including a text-like block type and a photographic block type; and

said destination determining means supplying the pixel block to one of the plurality of coding means according to a result of the classification.

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**5,742,705**

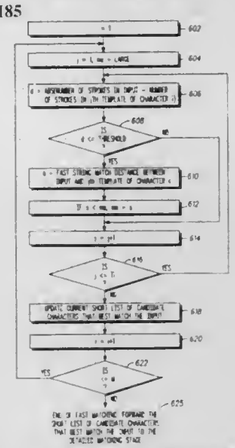
## METHOD AND APPARATUS FOR CHARACTER RECOGNITION OF HANDWRITTEN INPUT

**Kannan Parthasarathy, 3316 St. Michael Dr., Palo Alto, Calif. 94306**

**Continuation of Ser. No. 465,502, Jun. 5, 1995, abandoned. This application Aug. 28, 1997, Ser. No. 919,875**

**Int. Cl.[6] G06K** *9/18*

**U.S. Cl. 382—185** **36 Claims**



1. A method of recognizing a handwritten symbol comprising the steps of:

(A) receiving a handwritten input as a sequence of (x, y, pen-)points where x and y are coordinates in a two dimensional coordinate system and pen is a binary value indicating an associated pen-down state;

(B) converting the sequence of points into a sequence of strokes, each stroke representing a basic unit used to construct any handwritten symbol in a vocabulary;

(C) determining a shortlist of candidate symbols in the vocabulary that are likely matches for the input by finding a fast matching distance between the input sequence of strokes and the sequence of strokes for each symbol in the vocabulary, said sequence of strokes for each symbol in the vocabulary being derived from statistical analysis on samples of the handwritten symbols; and

(D) determining a final sorted list of candidate symbols in the vocabulary that are likely matches for the input by finding a minimum dynamic programming matching distance between the input sequence of strokes and the sequence of strokes for each symbol in the shortlist of candidate symbols in the vocabulary that are likely matches for the handwritten input.

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**5,742,706**

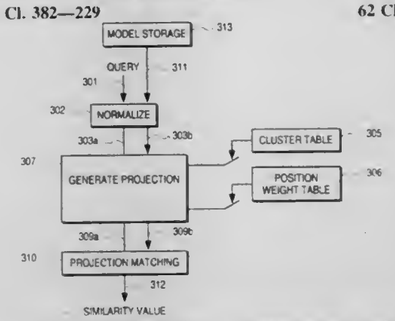
## METHOD AND APPARATUS FOR COMPARISON OF DATA STRINGS

**Francis H. Yu, Gainesville, Fla., assignor to Oracle Corporation, Redwood Shores, Calif.**

**Continuation of Ser. No. 372,804, Dec. 23, 1994, abandoned, which is a continuation of Ser. No. 848,833, Mar. 10, 1992, abandoned. This application Dec. 7, 1995, Ser. No. 568,557**

**Int. Cl.[6] G06K** *9/72*

**U.S. Cl. 382—229** **62 Claims**




1. In a computer system having a processing means coupled to a storage means and a display means, a computer-implemented method of comparing, in a database application, a first string of digitally represented characters with a second string of digitally represented characters, each character of said first and second string of digitally represented characters being a member of a set of digitally represented characters, said computer-implemented method comprising the steps of:

using said processing means, normalizing said first string of S known digitally represented characters to create a first normalized string of N normalized symbols and normalizing said second string of known digitally represented characters to create a second normalized string of N normalized symbols;

storing said first normalized string and said second normalized string in said storage means;

using said processing means, generating a first projection from said first normalized string and a second projection from said second normalized string;

storing said first projection and said second projection in said storage means; and

using said processing means, retrieving said first and second projections from said storage means and comparing said first projection and said second projection to determine a degree of similarity of said first and second projections.

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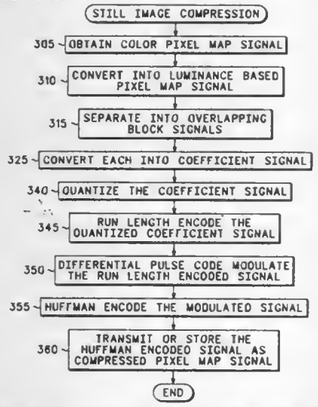


5,742,707

## METHOD AND SYSTEM FOR COMPRESSING A PIXEL MAP SIGNAL USING A HYBRID POLYNOMIAL COEFFICIENT SIGNAL

Shao Wei Pan, Schaumburg; Shay-Ping T. Wang, Long Grove, and Nicholas M. Labun, Chicago, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 27, 1995, Ser. No. 495,336
Int. Cl.[6] G06K 9/00;9/36; H04N 7/12
U.S. Cl. 382—232 41 Claims




1. A method of compressing a color pixel map signal comprising a pixel map of pixel data representing pixels in a computer implemented visual image, the method performed by a computer and comprising the steps of:

providing the color pixel map signal, the color pixel map signal comprising a red color component representing a red intensity of each pixel, a green color component representing a green intensity of each pixel and blue color component representing a blue intensity of each pixel;

converting the color pixel map signal to a luminance based pixel map signal comprising a luminance component representing a luminance of each pixel, a saturation component representing a saturation of each pixel and a hue component representing a hue of each pixel;

separating the luminance based pixel map signal into block signals representing pixel map blocks in the pixel map;

converting the block signals into a coefficient signal of block coefficient signals, each of the block coefficient signals corresponding to one of the block signals and representing, for one of the pixel map blocks in the pixel map, one or more coefficients in a single hybrid polynomial, the hybrid polynomial comprising discrete cosine terms, a constant term separated from the discrete cosine terms, and one or more polynomial terms, each of the block coefficient signals comprising a background component representing a coefficient of the constant term, a linear component representing coefficients of the polynomial terms and a nonlinear component representing coefficients of the discrete cosine terms;

quantizing the coefficient signal by dividing a coefficient value of each coefficient in the coefficient signal by a quantization factor, rounding a resulting value to a nearest integer value to produce a quantized coefficient value and replacing the coefficient value with the quantized coefficient value for each coefficient in the coefficient signal to produce a quantized coefficient signal;

run length encoding the quantized coefficient signal to produce a run length encoded signal;

differential pulse code modulation encoding the run length encoded signal to produce a modulated signal; and

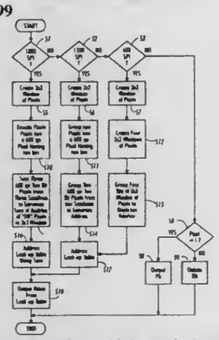
Huffman encoding the modulated signal to produce a Huffman encoded signal.

5,742,708

## METHOD AND SYSTEM FOR PERFORMING PERSPECTIVE PROJECTION CONVERSION

Thomas I. Yeh, Penfield; Francis K. Tse, Rochester, and George W. Lahue, Canandaigua, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 15, 1995, Ser. No. 558,311
Int. Cl.[6] G06K 9/32
U.S. Cl. 382—299 8 Claims



1. A method for converting a high resolution binary image to a gray scale low resolution image, comprising the steps of:

(a) receiving a first image having a first fast-scan resolution and a first pixel depth resolution; and

(b) converting the first image having a first fast-scan resolution and a first pixel depth resolution to a second image having a second fast-scan resolution and a second pixel depth resolution, the second fast-scan resolution being lower than the first fast-scan resolution and the first pixel depth resolution being lower than the second pixel depth resolution;

said step (b) including the substeps of,

(b1) counting a number of ON pixels in a predetermined number of adjacent fast-scan pixels of the first image,

(b2) generating a pixel having a pixel depth resolution of two and a value corresponding to the number of ON pixels counted in said substep (b1),

(b3) summing a predetermined number of pixels generated in said substep (b2) which are adjacent in a slow-scan direction, and

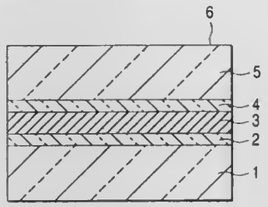
(b4) using the sum to index a look-up table which contains grayscale pixel values.

5,742,709

## DISPLAY PANEL FOR USE WITH AN IMAGE READING DEVICE

Osamu Ueno, and Naoki Hiji, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 13, 1994, Ser. No. 241,891
Claims priority, application Japan, May 14, 1993, 5-135208
Int. Cl.[6] G06K 9/00
U.S. Cl. 382—321 13 Claims




1. In an image reading device of the type in which a display panel is laid over a document table and an image on an original document laid over the display panel is input through the display panel, a display panel comprising:



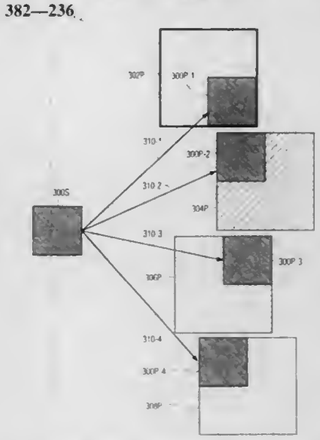
a liquid crystal panel of the transmission type in which liquid crystal/polymer composite material is sandwiched by electrodes, wherein at least one of the electrodes sandwiching the liquid crystal/polymer composite material comprises a plurality of divided electrodes, with a gap between adjacent divided electrodes said gap being less than a minimum resolution distance of the image reading device, said minimum resolution distance being the minimum distance between two points that is required for discriminately reading the two points.

5,742,710

## COMPUTATIONALLY-EFFICIENT METHOD FOR ESTIMATING IMAGE MOTION

Stephen Charles Hsu, Cranbury, and Padmanabhan Anandan, Robbinsville, both of N.J., assignors to RCA Thomson Licensing Corporation, Princeton, N.J.

Continuation of Ser. No. 200,599, Feb. 23, 1994, abandoned. This application Jul. 11, 1995, Ser. No. 500,558
Int. Cl.[6] G06K 9/36
U.S. Cl. 382—236 18 Claims




1. A video signal motion compensated coding process including a block-matching image motion estimation process for generating motion vectors representing image motion, said process comprising the steps of:

a) providing full-resolution 2-dimensional digitized video signals representing a current image frame;

b) delaying said full-resolution 2-dimensional digitized video signal to provide full-resolution 2-dimensional digitized video signals representing a previous image frame;

c) generating from said video signal representing a current image frame, N video signals each representing an image with successively lower-resolution, and generating from said video signal representing a previous image frame, N video signals each representing an image with successively lower-resolution, where N is a positive integer, and each of said full-resolution current and previous image frames constitutes a zero (0) resolution level;

d) dividing video signal representing an Mth resolution level of said current image frame into a plurality of overlapping search blocks of a first size wherein said blocks are overlapped in at least one of said 2 dimensions, where the 0th resolution level is less than the $M^{th}$ resolution level is less than or equal to the $N^{th}$ resolution level; and

e) performing a block matching search for each of said overlapped search blocks of said current image frame over a given range area of the Mth resolution level of said previous image frame to determine a motion vector to that block of said Mth resolution level of said previous image frame which exhibits a closest match value with respect to that search block;

f) using a plurality of motion vectors generated for blocks in the Mth resolution level in determining respective motion vectors for respective blocks in an (M−1)th resolution level; and

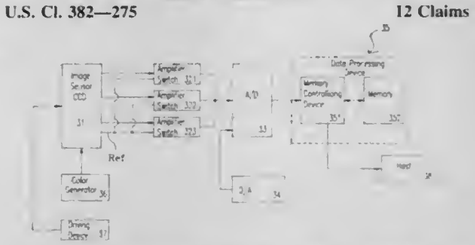
g) generating motion vectors for image blocks in successively lower resolution levels using motion vectors generated in the immediately higher resolution level, including motion vectors generated for respective blocks of the 0th resolution level as a component of a coded video signal, and transmitting said coded video signal.

5,742,711

## LOW-DISTORTION AND HIGH-SPEED COLOR IMAGE SCANNER

Chun-Chen Lin, and Ching-Fu Chung, both of Hsin-Chu, Taiwan, assignors to Mustek Systems Inc., Taiwan

Continuation-in-part of Ser. No. 368,664, Jan. 4, 1995, abandoned. This application Oct. 8, 1996, Ser. No. 726,833
Int. Cl.[6] H04N 1/56
U.S. Cl. 382—275 12 Claims




1. An image scanner adapted to be used for scanning a color image comprising:

an image sensor which converts said scanned color image into three analog voltage signals;

a clock generator which provides a clock for said image sensor, said image sensor outputting said three analog voltage signals in response to said clock;

three amplifying switches, each being electrically connected to receive a respective one of said three analog voltage signals output by said image sensor through a respective independent signal path, each of said amplifying switches having a respective output and a respective disabler, said respective disabler enabling/disabling said amplifying switch by utilizing an impedance thereof, said three respective disablers being operative to prevent two of said amplifying switches from amplifying and transmitting two respective ones of said three analog voltage signals to said respective outputs, while enabling the other one of said amplifying switches to amplify and transmit its respective one of said three analog voltage signals to its respective output;

an analog-to-digital converter electrically commonly connected to said respective output of each of said three amplifying switches which converts said amplified and transmitted three analog voltage signals into digital signals; and

a data-processing device electrically connected to said analog-to-digital converter which receives and stores said digital signals.

5,742,712

## EFFICIENT ELECTROMECHANICAL OPTICAL SWITCHES

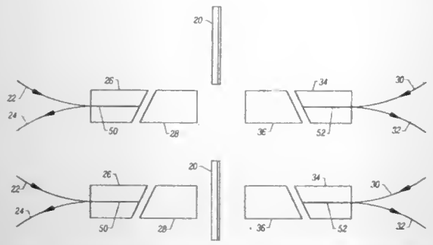
Jing-Jong Pan, Milpitas; Jing-Yu Xu, San Jose, and Charlene Jia-Ling Yang, Fremont, all of Calif., assignors to E-Tek Dynamics, Inc., San Jose, Calif.

Filed Oct. 8, 1996, Ser. No. 727,075
Int. Cl.[6] G02B 6/26
U.S. Cl. 385—18 19 Claims

13. A switch for controllably coupling two input optical fibers to two output optical fibers, said coupler comprising:

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a first sleeve having an end face, a longitudinal axis and an aperture parallel to said longitudinal axis and through said end face, said aperture matching end sections of a first input optical fiber and a first output optical fiber so that said end sections are snugly held in said aperture, said first sleeve end face co-planar with ends of said first input fiber and said first output fiber and angled with respect to a plane perpendicular to said longitudinal axis;

a first GRIN lens in front of said first sleeve end face, said first GRIN lens having an end face displaced from, and in close proximity to, said first sleeve end face and reciprocally angled thereto;

a second sleeve having an end face, a longitudinal axis and an aperture parallel to said longitudinal axis and through said end face, said aperture matching end sections of a second input optical fiber and a second output optical fiber so that said end sections are snugly held in said aperture, said second sleeve end face facing said first sleeve end face, co-planar with ends of said second input fiber and said second output fiber and angled with respect to a plane perpendicular to said longitudinal axis;

a second GRIN lens in front of said second sleeve end face, said second GRIN lens having an end face displaced from, and in close proximity to, said second sleeve end face and reciprocally angled thereto;

said first sleeve, said first GRIN lens, said second sleeve, and said second GRIN lens aligned with respect to each other such that said second GRIN lens focusses light signals from one of said input fibers into one of said output fibers, and from the other of said input fibers into the other of said output fibers;

a mirror movable between said first and second GRIN lenses to reflect said light signals from said one of said input fibers to said other of said output fibers, and from said other of said input fibers to said one of said output fibers.

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**5,742,713**

**METHODS AND FILTER FOR ISOLATING UPSTREAM INGRESS NOISE IN A BI-DIRECTIONAL CABLE SYSTEM**

**Stuart Baker Sanders, and Vivian Therese Lund, both of Lindenhurst, Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Oct. 23, 1996, Ser. No. 735,843**

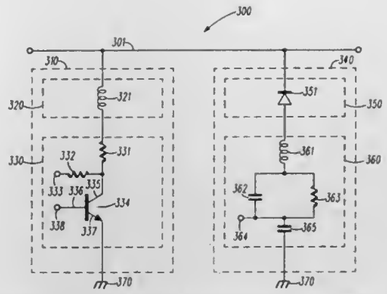
**Int. Cl.[6] G02B** *6/28;* **H04K** *3/00;* **H04H** *1/00*

**U.S. Cl. 385—24** **10 Claims**

1. An upstream ingress filter for isolating upstream ingress noise on a bi-directional cable system, said cable system comprising a cable control unit, a plurality of cables, and a plurality of cable access units, each one of said plurality of cables having an upstream band and a downstream band for carrying upstream signals and downstream signals, respectively, each one of said plurality of cable access units containing at least one upstream ingress filter, each of said upstream ingress filters comprising:

a DC switching element for changing a DC voltage on the cable system at said one of said plurality of cable access unit, said DC switching element being connected in parallel to said one of said plurality of cables; and

a switchable notch filter that switches ON and OFF in response to said DC switching element, said notch filter acting to isolate upstream ingress by attenuating upstream signals in



said upstream band when said upstream ingress filter is ON, said notch filter being connected in parallel to said one of said plurality of cables.

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**5,742,714**

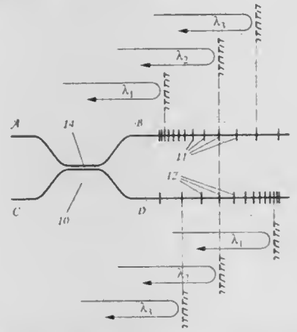
**OPTICAL FM TO AM CONVERSION**

**Kevin Christopher Byron, Bishop's Stortford, United Kingdom, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Dec. 2, 1996, Ser. No. 753,845**

**Int. Cl.[6] G02B** *6/26*

**U.S. Cl. 385—27** **8 Claims**



3. An FM to AM converter comprising a 3 dB 2×2 optical waveguide splitter/combiner having first and second ports optically coupled with third and fourth ports via an optical coupling region, wherein the third and fourth ports are optically coupled with first and second spectrally selective reflectors respectively constituted by positively and negatively monotonically chirped Bragg gratings positioned such that light of a specific wavelength is reflected by the first and second gratings at equal effective path distances from the coupling region.

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**5,742,715**

**OPTICAL FIBER STATUS ANALYZER AND RELATED METHODS**

**Bruce B. Boehlke, Cheyenne, Wyo.; Bruce Vaiden Darden, Lawrenceville, Ga.; Stephen Clement Mettler, Decatur, Ga., and George Edwin Mock, Duluth, Ga., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Dec. 21, 1995, Ser. No. 576,662**

**Int. Cl.[6] G02B** *6/26;* **G01N** *21/00;* **G01J** *1/04*

**U.S. Cl. 385—32** **25 Claims**

1. An apparatus for analyzing the status of an optical fiber, the apparatus comprising:

a macrobend/microbend unit for imposing two macrobends on the optical fiber, and a microbend on the optical fiber between the two macrobends;





first and second photodetectors arranged in a proximity to respective macrobends for generating respective signals based on light received from respective macrobends;

means for determining the necessity of splicing the optical fiber based upon the signals received from said photodetectors, said means comprising a circuit arrangement for determining the direction of light propagating in the optical fiber based on at least one of the signals; and

a display coupled to said means for indicating the direction of light propagating in the optical fiber wherein said circuit arrangement comprises a comparator unit coupled between the first and second photodetectors, and the display, for performing a first comparison between the signal from the first photodetector and a first predetermined voltage, and generating a first signal to control the display to indicate whether or not light is propagating in the optical fiber in a first direction, based on the first comparison, and for performing a second comparison between the signal from the second photodetector and a second predetermined voltage, and generating a second signal to control the display to indicate whether light is propagating in the optical fiber in a second direction opposite to the first direction, based on the second comparison.

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**5,742,716**

**LIGHT TRIGGER THYRISTOR**

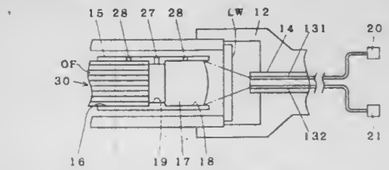
**Junichiro Yamashita; Takeshi Nakamura, both of Tokyo; Kazunori Taguchi, Fukuoka, and Katsumi Satoh, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 8, 1996, Ser. No. 745,921**

**Claims priority, application Japan, Jun. 14, 1996, 8-154014**

**Int. Cl.[6] G02B** *6/32*

**U.S. Cl. 385—33** **16 Claims**



1. A light trigger thyristor, comprising:

a light guide comprising a light receiving portion receiving a light signal serving as a trigger of thyristor operation, a light entering end for said light signal and a light emitting end facing said light receiving portion, for transmitting said light signal to said light receiving portion;

a plurality of first optical fibers for transmitting said light signal from a plurality of light signal generating sources provided outside to said light entering end of said light guide; and

a lens disposed in front of said light entering end of said light guide for making said light signal sent Out from said plurality of first optical fibers a parallel ray;

wherein said light guide is an array type light guide having a plurality of second optical fibers grouped together.

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**5,742,717**

**OPTICAL STAR COUPLER**

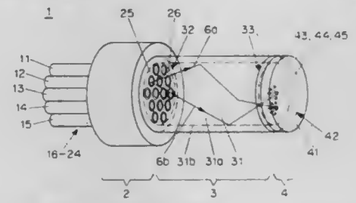
**Tetsuya Saitoh, Tokyo, Japan, assignor to Fuji Electric Co., Ltd., Tokyo, Japan**

**Filed Mar. 8, 1996, Ser. No. 613,071**

**Claims priority, application Japan, Oct. 30, 1995, 7-281941**

**Int. Cl.[6] G02B** *6/26*

**U.S. Cl. 385—46** **4 Claims**



1. An optical star coupler comprising:

a bundling portion comprising a plurality of optical fibers each including a first and second end and a core, wherein said first ends of said optical fibers are bundled and said first ends of said optical fibers' faces are formed to be a flat plane;

a mixing portion comprising a waveguide including a first and second end face, wherein said first end face of said waveguide is coupled to said flat plane of said bundling portion and covers said cores of said optical fibers; and

a diffuser-reflector portion coupled to said second end face of said waveguide, wherein said diffuser-reflector portion comprises a terminal mirror including a reflection plate and a transparent light diffusion layer formed between said second end face of the waveguide and said reflection plate of said terminal mirror.

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**5,742,718**

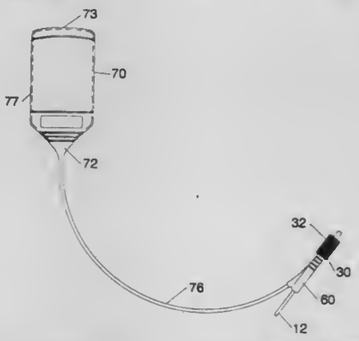
**PROPRIETARY FIBER CONNECTOR AND ELECTRONIC SECURITY SYSTEM**

**Stuart D. Harman, San Jose, and Mark Roush, Los Gatos, both of Calif., assignors to Eclipse Surgical Technologies, Inc., Sunnyvale, Calif.**

**Filed Aug. 13, 1996, Ser. No. 696,301**

**Int. Cl.[6] G02B** *6/36*

**U.S. Cl. 385—53** **24 Claims**



1. A proprietary connector and electronic security system for coupling only proprietary electromagnetic (EM) energy medical delivery device for a medical procedure to a EM energy source comprising:

a) the medical EM energy delivery device adapted to be coupled to the medical EM energy delivery device having a central processing unit (CPU).

b) a connector adapted for attaching a proximal end of one of the only proprietary EM energy delivery device to the EM energy source, and

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c) electronic memory means for storing data of at least one security code and data corresponding to usage of the connector, the memory means is attached and juxtaposed to the connector and is adapted for communication with the CPU,

whereby input of the data of at least one security code and data corresponding to usage of the connector causes the CPU to enable the EM energy source thereby ensuring reliable and safe use of the medical EM energy delivery device.

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**5,742,719**

**FASTENING DEVICE FOR LIGHT WAVEGUIDES**

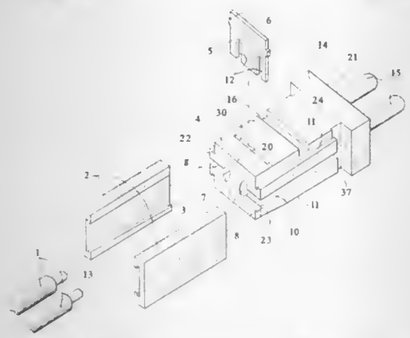
**Roland Birnbaum, Aalen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Sep. 6, 1996, Ser. No. 709,102**

**Claims priority, application Germany, Sep. 8, 1995, 195 33 296.2**

**Int. Cl.[6] G02B *6/38***

**U.S. Cl. 385—70** **10 Claims**



1. A fastening device for light waveguides, said device comprising a cuboid base member of plastic material having a pair of end faces interconnected by side walls, a retainer slot adjacent one end face extending parallel thereto, two separate bores intersecting the retainer slot and extending from one end face to the opposite end face for receiving monomode fibers, each of said bores having a transverse slot for at least a portion of the length of the bore extending to the adjacent side wall, clamp means for moving walls of each of said transverse slots toward each other to clamp a fiber in the bore by a frictional lock, and a retainer plate insertable into the retainer slot to form a positive lock on the fiber disposed in each of the bores.

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**5,742,720**

**OPTICAL COUPLING MODULE AND METHOD FOR PRODUCING THE SAME**

**Yasuhiro Kobayashi, Osaka, and Kenichi Matsuda, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Aug. 29, 1996, Ser. No. 705,428**

**Claims priority, application Japan, Aug. 30, 1995, 7-221336**

**Int. Cl.[6] G02B *6/36***

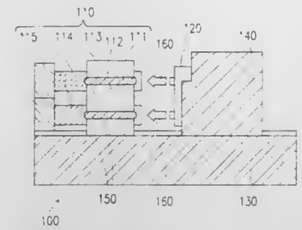
**U.S. Cl. 385—89** **17 Claims**

1. An optical coupling module comprising:

an optical fiber array ferrule comprising:

a first support member having a first lower surface and a first upper surface which are parallel to each other, at least said first upper surface being provided with a first V groove group comprising a plurality of mutually parallel V grooves;

a second support member having a second lower surface and a second upper surface which are parallel to each other, said second lower surface being provided with a second V groove group comprising a plurality of mutually parallel V



grooves, said second upper surface being provided with a third V groove group comprising a plurality of mutually parallel V grooves, and said second support member being disposed above said first support member;

a third support member having a third lower surface and a third upper surface which are parallel to each other, at least said third lower surface being provided with a fourth V groove group comprising a plurality of mutually parallel V grooves, and said third support member being disposed above said second support member; and

a plurality of optical fiber wires, each of which is disposed in one of the V grooves of said first and third groove groups,

wherein a pitch between any two neighboring V grooves of said first, second, third and fourth V groove groups is the same;

each V groove of said second V groove group corresponds to, and is in contact with, said optical fiber wire disposed in one of the V grooves of said first V groove group; and

each V groove of said fourth V groove group corresponds to, and is in contact with, said optical fiber wire disposed in one of the V grooves of said third V groove group;

a substrate; and

a surface emitting laser array including a plurality of surface emitting lasers formed on said substrate in a two-dimensional configuration,

wherein said optical fiber array ferrule is disposed on said substrate in such a manner that laser light emitted from said plurality of surface emitting lasers is optically coupled to the optical fiber wires.

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**5,742,721**

**Patent Not Issued For This Number**

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**5,742,722**

**RARE EARTH ELEMENT-DOPED MULTIPLE-CORE OPTICAL FIBER AND OPTICAL SYSTEMS USING THE SAMEFIELD OF THE INVENTION**

**Katsuyuki Imoto, Saitama, Japan, assignor to Hitachi Cable, Ltd., Tokyo, Japan**

**Division of Ser. No. 695,493, Aug. 12, 1996. This application Jan. 27, 1997, Ser. No. 791,428**

**Claims priority, application Japan, Feb. 22, 1996, 8-035262; Mar. 28, 1996, 8-074793**

**Int. Cl.[6] G02B *6/02***

**U.S. Cl. 385—126** **6 Claims**

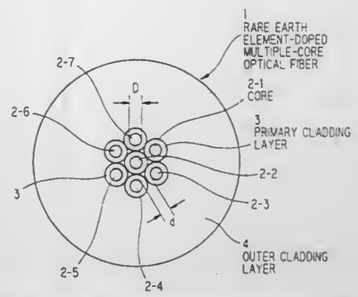
4. A rare earth element-doped multiple-core optical fiber system, comprising:

a plurality of cores each having a first refractive index doped with at least one rare earth element;

a cladding layer having a second refractive index lower than said first refractive index for surrounding said plurality of cores, said plurality of cores being positioned in a central region of said cladding layer;

at least one rare earth element-doped multiple-core optical fiber amplifier for amplifying a signal light by stimulated emission; and






at least one dispersion-shifted optical fiber connected to an input end and/or an output end of said rare earth element-doped multiple-core optical fiber amplifier,

wherein said plurality of cores comprises a first group of one or more cores, and a second group of cores, such that said second group of cores surrounds a periphery of said first group of one or more cores to equalize powers propagated through each core of said first and second groups.

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**5,742,723**

**OPTICAL TRANSMISSION SYSTEM WITH DISPERSION COMPENSATING OPTICAL FIBER**

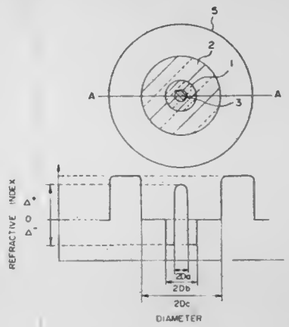
**Masashi Onishi, and Hiroo Kanamori, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Division of Ser. No. 523,750, Sep. 5, 1995, Pat. No. 5,555,340, which is a continuation of Ser. No. 408,620, Mar. 23, 1995, abandoned. This application Jun. 6, 1996, Ser. No. 659,322**

**Claims priority, application Japan, Mar. 23, 1994, 6-51680**

**Int. Cl.[6] G02B *6/22***

**U.S. Cl. 385—127** **6 Claims**




1. A dispersion compensating optical fiber, comprising:

(a) a core;

(b) a first cladding surrounding the core; and

(c) a second cladding surrounding the first cladding; and wherein said dispersion compensating fiber satisfies the following relations:

$$n1<n2<nc,$$

$$2.2\ \mu m<2Da<4\ \mu m,$$

$$0.3<(Da/Db)<0.6,$$

$$0.02<(nc-n2)/n2<0.03,$$

$$0.004<(n2-n1)/n2<0.01 L_{bend}<0.01\ dB/m,$$

where

nc is a refractive index of the core;

n1 is a refractive index of the first cladding;

n2 is a refractive index of the second cladding,

2Da is a diameter of the core; and

2Db is an outer diameter of the first cladding

$L_{bend}$ is a bending loss of the fiber where the bending diameter of the fiber is 40 mm.

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**5,742,724**

**Patent Not Issued For This Number**

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**5,742,725**

**METHOD AND APPARATUS FOR FORMING FIBRE OPTIC ATTENUATORS WITH SPECTRAL RESPONSE INDEPENDENT OF THE WAVELENGTH**

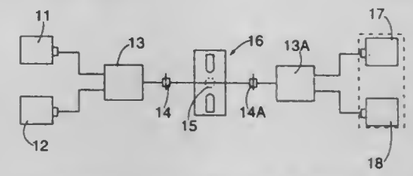
**Enzo Longobardi, Milan; Lucio Duca, Cusano Milanino, and Antonio Menzaghi, Varese, all nf Italy, assignors to Optotec S.p.A., Milan, Italy**

**Filed Dec. 16, 1996, Ser. No. 767,541**

**Claims priority, application Italy, Dec. 18, 1995, M195A2659**

**Int. Cl.[6] G02B *6/02***

**U.S. Cl. 385—140** **14 Claims**




1. A method for forming fibre optic attenuators (**201**) with spectral response independent (within a substantially narrow tolerance) of the incident radiation wavelength, which uses at least one piece of optical fibre (**30**), and comprises the following steps:

heating said optical fibre (**30**) to the softening point of silica, of which it is composed;

manipulating the piece of said optical fibre (**15**) within a system (**16**), during the heating of and subsequent to the softening of the silica;

during manipulation, verifying the progressive increase in attenuation over its initial value by an apparatus for actively monitoring the power of the optical signal transmitted at at least two wavelengths of interest in telecommunications, these being different from each other and lying within the range of values for which said utilized optical fibre (**30**) is monomodal;

inserting said piece of optical fibre (**15**) into at least one attenuating body (**20**), lapped on at least one side, for connection to optical connectors abutting against the terminal parts of said optical fibre (**30**) and assembled into the outer casing (**10**) of at least one attenuator (**201**);

by means of a test bench comprising a source (**31**) of white light radiation, reference pins (**34**, **35**), a measurement sleeve (**33**) and an optical spectrum analyzer (**32**), measuring the spectral attenuation of said attenuator (**201**) over the entire wavelength range of interest, characterised in that the piece of optical fibre (**15**) is manipulated by applying to said piece of optical fibre (**15**) compressive stresses and/or relaxation, to induce the formation of at least one region (**23**) of diameter substantially similar to or greater than the diameter of the optical fibre (**30**), which maintains rectilinear geometry.

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**5,742,726**

**Patent Not Issued For This Number**

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**5,742,727**

## APPARATUS AND METHOD FOR RECORDING AND REPRODUCING A TELEVISION SIGNAL

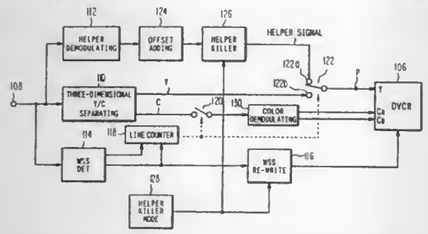
**Keiji Kanota, Kanagawa; Tadashi Ezaki, Tokyo; Masaki Oguro, Tokyo; Naofumi Yanagihara, Tokyo, and Hiroshi Fukuda, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Nov. 3, 1995, Ser. No. 552,842**

**Claims priority, application Japan, Nov. 5, 1994, 6-295579; Dec. 22, 1994, 6-336504; Jun. 1, 1995, 7-158522**

**Int. Cl.[6] H04N** *9/79*

**U.S. Cl. 386—26** **41 Claims**




1. A television signal recording apparatus for recording on a record medium a composite signal that is composed of a luminance signal, a chrominance signal, and a resolution compensation signal included in predetermined television scanning lines, comprising:

Y/C separating means for separating the luminance signal and the chrominance signal from the composite signal;

combining means for combining the resolution compensation signal and the luminance signal separated by said Y/C separating means onto a first signal line;

means for demodulating the chrominance signal and outputting a color difference signal on a second signal line;

helper killer means for killing the resolution compensation signal in response to a predetermined condition; and

digital video signal recording means for digitally processing signals on the first signal line separately from signals on the second signal line and for recording digitally processed signals onto the record medium.

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**5,742,728**

## APPARATUS AND METHOD FOR RECORDING AND/OR REPRODUCING PICTURE DATA OPERABLE TO OUTPUT ZEROS IF A PICTURE HEADER IS DETECTED DURING VARIABLE SPEED REPRODUCTION

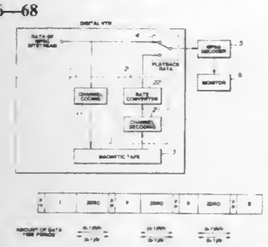
**Naofumi Yanagihara, Tokyo, and Nobuaki Izumi, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Nov. 3, 1995, Ser. No. 552,871**

**Claims priority, application Japan, Nov. 7, 1994, 6-272193**

**Int. Cl.[6] H04N** *5/783*

**U.S. Cl. 386—68** **11 Claims**



1. An apparatus for reproducing picture data representing a plurality of video frames, said apparatus comprising:

readout means for reading out picture data encoded from picture signals by a predictive encoding system and recorded on a recording medium;

storage means for storing the picture data read out by said readout means;

detection means for detecting a picture header from the picture data stored in said storage means; and

delaying means for delaying an output of the picture data stored in said storage means in response to detection results obtained by said detection means, said delaying means outputting "0"s for a predetermined time period if the picture header is detected by said detection means during varying speed reproduction.

wherein said delaying means outputs "0"s for a time period of (k−1)/fr, in which 1/k is a speed multiple during the varying speed reproduction and fr is a frame rate.

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**5,742,729**

## VIDEO STORAGE TYPE COMMUNICATION DEVICE

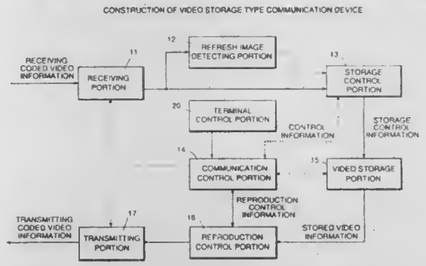
**Nobuyuki Ema, Nagareyama; Keiichi Hibi, Matsudo; Jiro Nakabayashi, Urawa; Tsuneaki Iwano, Tokyo; Osamu Nakamura, Han-no; Youji Kanada, Tokyo; Tsuneko Kura, Sagamihara, and Takashi Oshima, Tokyo, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, and Nippon Telegraph and Telepone Corporation, Tokyo, both of Japan**

**Filed Mar. 12, 1996, Ser. No. 614,306**

**Claims priority, application Japan, Apr. 7, 1995, 7-082487**

**Int. Cl.[6] H04N** *5/91;5/917*

**U.S. Cl. 386—68** **12 Claims**




1. A video storage type communication device, comprising:

a transmitting portion for transmitting first video data over a communication line to at least one of a plurality of remote terminals;

a receiving portion for receiving second video data over the communication line from at least one of the plurality of remote terminals;

a video storage portion for storing the second video data;

a communication control portion for carrying-out video-communications by controlling said transmitting, receiving and video storage portions;

a refresh image detecting portion for judging, from the second video data, whether a frame of the second video data is a refresh image;

a storage control portion for storing the second video data received by said receiving portion in said video storage portion by adding thereto inter-frame and/or intra-frame prediction coded information in accordance with the judgement by said refresh image detecting portion; and

a terminal control portion for sending at a desired interval a request for updating a display image to the at least one of the remote terminals during storage of the second video data.



**5,742,730**

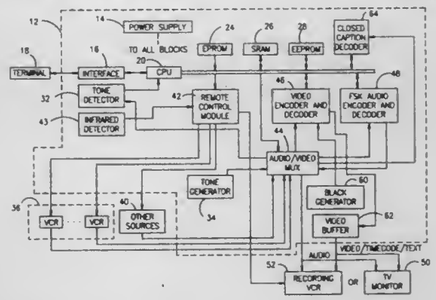
## TAPE CONTROL SYSTEM

**David A. Couts, 10116 Walker Lake Dr., Great Falls, Va. 22066; Richard B. McMurray, 3203 Plantation Pkwy., Fairfax, Va. 22030, and Xiang Mao, 2805 Strauss Ter., Silver Spring, Md. 20904**

**Filed Mar. 9, 1995, Ser. No. 401,225**

**Int. Cl.[6] H04N** *5/783*

**U.S. Cl. 386—69** **8 Claims**




1. A system for locating a point alone a recording tape from a second point along said tape;

a VCR for receiving said tape,

a controller having means to command said VCR through multiple transport modes,

a sequence of timecodes along the length of said tape,

first means to store the control signals for said VCR,

second means to store performance parameters for movement between said points by said transport modes depending on the distance between said points and their locations along the length of said tape, the length and thickness of said tape and the diameters of the payout and take-up reels, and

third means to calculate the least time necessary to move to said point from said second point utilizing said performance parameters together with said locations along the length of tape and said tape and reel dimensions.

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**5,742,731**

## MULTI-SCENE RECORDING MEDIUM FOR ALTERNATINGLY AND CONTINUOUSLY RECORDING PROGRAM INFORMATION ITEMS CORRESPONDING TO DIFFERENT VIEWS OF AN EVENT, AND A METHOD AND APPARATUS FOR REPRODUCING DATA THEREFROM

**Koichi Hirayama, Yokohama; Masatoshi Nakai, Kawasaki, and Kenji Shimoda, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

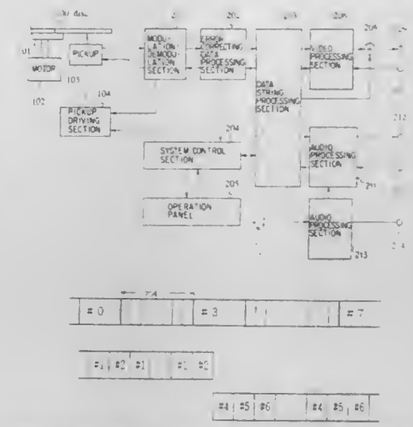
**Division of Ser. No. 454,289, Jun. 15, 1995. This application Aug. 8, 1996, Ser. No. 689,360**

**Claims priority, application Japan, Oct. 29, 1993, PCT/JP93/01570**

**Int. Cl.[6] H04N** *5/91,7/08;5/781*

**U.S. Cl. 386—95** **6 Claims**

1. A multi-scene recording medium comprising a disk having a management area and a data area, said data area recording various edited program information items representing a plurality of stories which branch from one another or which merge together, and




said management area recording multi-scene configuration information representing existence of said stories,

wherein at least two of said various edited program information items correspond to different views for an event,

and wherein said various edited program information items are alternatingly and continuously recorded on the disk.

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**5,742,732**

## DATA STREAM MULTIPLEXING APPARATUS AND METHOD AND RECORD MEDIUM THEREFOR

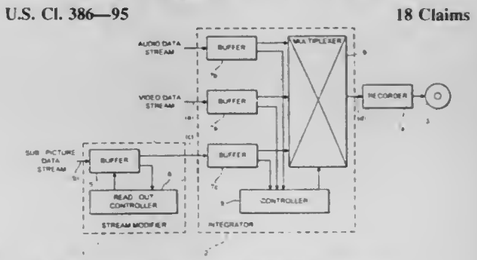
**Yumiko Kubo, and Teiichi Ichikawa, both of Kanagawa-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed May 31, 1996, Ser. No. 658,824**

**Claims priority, application Japan, May 31, 1995, 7-134176**

**Int. Cl.[6] H04N** *5/92;7/12;11/02;11/04*

**U.S. Cl. 386—95** **18 Claims**




1. A data stream multiplexing apparatus, comprising:

stream a modifying means for producing modified sub-picture data stream from a sub picture data stream where a first sub-picture data unit containing pixel data forming a sub-picture image with a preset display time period is located along a time axis by additionally locating at least one of a second sub-picture data unit having almost the same contents as the first sub-picture data unit within the display time period of the first sub-picture data unit on the sub-picture data stream; and

multiplexing means responsive to said modified sub-picture data stream produced by the stream modifying means and other data streams reproduced in synchronous with the modified sub-picture data stream, for multiplexing these streams after packetizing them by a prescribed length.

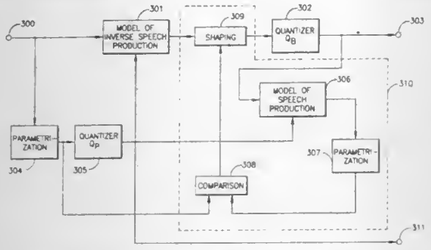
VOL 1209 ISS 3 AP 21 1998 UMI



## 5,742,733
## PARAMETRIC SPEECH CODING

**Kari Juhani Jarvinen, Tampere, Finland, assignor to Nokia Mobile Phones Ltd., Salo, and Nokia Telecommunications Oy, Espoo, both of Finland**

**Filed Feb. 3, 1995, Ser. No. 382,875**
**Claims priority, application Finland, Feb. 8, 1994, 940577**
**Int. Cl.[6] G10L** *3/02*
**U.S. Cl. 395—2.29** **17 Claims**




**1**. A speech encoder, comprising:

a first parametrization module for determining first prediction parameters corresponding to a speech signal input thereto;

an analysis filter module for determining a modeling error corresponding to the speech signal and first prediction parameters,

a synthesis filter module for forming a reconstructed speech signal corresponding to the modeling error and the first prediction parameters,

a second parametrization module for determining a second set of prediction parameters corresponding to the reconstructed speech signal,

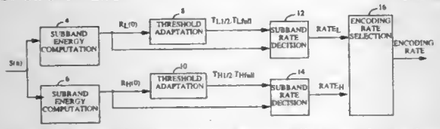
a comparison module for forming a comparison signal indicative of a difference between the first and second prediction parameters, and

a shaping module for shaping the modelling error such that the difference between the first and second prediction parameters is reduced.

## 5,742,734
## ENCODING RATE SELECTION IN A VARIABLE RATE VOCODER

**Andrew P. DeJaco, and William R. Gardner, both of San Diego, Calif., assignors to Qualcomm Incorporated, San Diego, Calif.**

**Filed Aug. 10, 1994, Ser. No. 288,413**
**Int. Cl.[6] G10L** *9/14*
**U.S. Cl. 395—2.35** **22 Claims**




**1**. An apparatus for determining an encoding rate for an input signal in a variable rate vocoder comprising:

subband energy computation means for receiving said input signal and determining a plurality of subband energy values in accordance with a predetermined subband energy computation format;

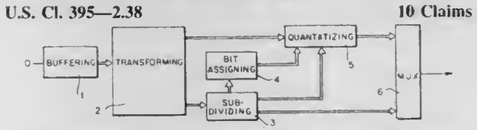
a plurality of subband rate determination means wherein each of said plurality of subband rate determination means is for receiving a corresponding one of said plurality of subband energy values and determining a subband encoding rate in accordance with said corresponding one of said plurality of subband energy values to provide a plurality of subband encoding rates; and

encoding rate selection means for receiving said plurality of said subband encoding rates and for selecting said encoding rate for said input signal in accordance with said plurality of subband encoding rates.

## 5,742,735
## DIGITAL ADAPTIVE TRANSFORMATION CODING METHOD

**Ernst Eberlein, Erlangen; Heinz Gerhäuser, Waischenfeld; Harald Popp, Erlangen; Dieter Seitzer, Erlangen; Hartmut Schott, Erlangen, and Karl Heinz Brandenburg, Erlangen, all of Germany, assignors to Fraunhofer Gesellschaft zur Forderung der Angewanten Forschung e.V., Munich, Germany**

**Continuation of Ser. No. 133,273, Oct. 7, 1993, abandoned, which is a continuation of Ser. No. 982,063, Nov. 25, 1992, abandoned, which is a continuation of Ser. No. 716,769, Jun. 19, 1991, abandoned, which is a continuation of Ser. No. 347,806, Apr. 28, 1989, abandoned. This application Aug. 25, 1994, Ser. No. 295,484**
**Claims priority, application Germany, Oct. 6, 1987, 37 33 786.6; Oct. 6, 1987, 37 33 772.6**
**Int. Cl.[6] G10L** *9/00*
**U.S. Cl. 395—2.38** **10 Claims**




**1**. Digital adaptive transformation coding method for the transmission and/or storage of audio signals, specifically music signals, wherein N scanned values of the audio signal are transformed into M spectral coefficients, wherein N and M are non zero integers, which are subdivided into frequency groups and then quantitized and coded, characterized in that:

a quantitized maximum value of the spectral coefficients of each frequency group is used to define the coarse variation of the spectrum;

the same number of bits is assigned to all spectrum values of a frequency group, wherein the number of bits depend on the quantitized maximum value of the respective spectral coefficient;

the number of bits assigned to each frequency group being adjusted to insure a minimum number of bits to each frequency group such that, in view of psycho-acoustic aspects, quantification noise is masked for that frequency group; and

if available after the preceding step, any additional number of bits are assigned to the individual frequency groups in correspondence to the quantitized maximum value occurring in the particular frequency group.

## 5,742,736
## DEVICE FOR MANAGING VOICE DATA AUTOMATICALLY LINKING MARKED MESSAGE SEGMENTS TO CORRESPONDING APPLICATIONS

**Nicholas John Haddock, Bristol, Great Britain, assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Apr. 19, 1995, Ser. No. 424,204**
**Claims priority, application United Kingdom, Apr. 22, 1994, 9408042**
**Int. Cl.[6] G01L** *3/00;* **G11C** *11/00*
**U.S. Cl. 395—2.79** **16 Claims**

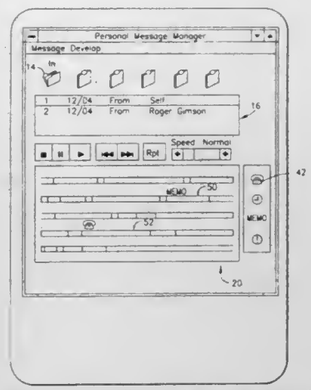
**1**. A device for storing speech input comprising:

means for specifying a marker having a particular connotation;

means for associating the marker with all or part of the speech input;

means for automatically linking the speech input associated with the marker to a storage area such that information enabling retrieval of the speech input associated with the marker is stored in the storage area; and



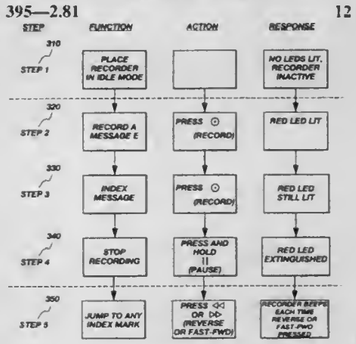



an application corresponding to the connotation of the marker which, upon execution, provides access through a user interface to the speech input associated with the marker from the information stored in said storage area in accordance with said means for automatically linking.

## 5,742,737
## METHOD FOR RECORDING VOICE MESSAGES ON FLASH MEMORY IN A HAND HELD RECORDER

**Norbert P. Daberko, Oceanside; Richard K. Davis, and Richard D. Bridgewater, both of San Diego, all of Calif., assignors to Norris Communications Corporation, San Diego, Calif.**

**Continuation of Ser. No. 339,976, Nov. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 229,570, Apr. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 229,731, Apr. 19, 1994, Pat. No. 5,491,774. This application Mar. 3, 1997, Ser. No. 810,210**
**Int. Cl.[6] G10L** *9/00;* **G11B** *27/031*
**U.S. Cl. 395—2.81** **12 Claims**




*INDEXING OF MESSAGE*

**1**. A device for enabling immediate recording of a new message on a partially recorded flash memory digital recording medium without a delay caused by searching for blank memory available for recording on the flash memory digital recording medium, said device comprising:

a solid state digital hand held recording device having a multifunctional switch assembly and a separate record switch assembly, a flash memory digital recording medium including a region forming a continuity of pre-recorded messages, a printed circuit board including a microcontroller electrically coupled to the switch assemblies and operable to control the processing of sound into electrical signals, and store said electrical signals on the flash memory digital recording medium;

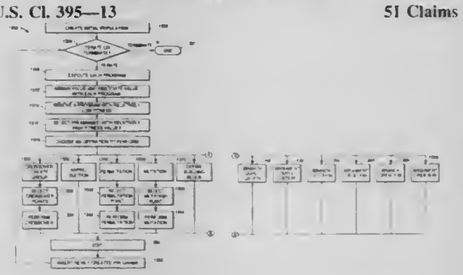
recording means coupled to the circuit board and activated by the record switch assembly and including means for (i) searching for an end of a last recorded message, (ii) identifying a point after the end of the last recorded message where the new message may begin, and (iii) beginning recording of the new message at the identified point;

sequencing playback means for playing the new message from the identified point defining the beginning of said new message with no manual involvement of the user other than activating the multifunctional switch means.

## 5,742,738
## SIMULTANEOUS EVOLUTION OF THE ARCHITECTURE OF A MULTI-PART PROGRAM TO SOLVE A PROBLEM USING ARCHITECTURE ALTERING OPERATIONS

**John R. Koza, 25372 La Rena La., Los Altos Hills, Calif. 94022; David Andre, Menlo Park, and Walter Alden Tackett, San Francisco, both of Calif., assignors to John R. Koza, Los Altos Hills, Calif.**

**Continuation-in-part of Ser. No. 881,507, May 11, 1992, Pat. No. 5,343,554, which is a continuation-in-part of Ser. No. 787,748, Nov. 5, 1991, Pat. No. 5,136,686, which is a continuation of Ser. No. 500,791, Mar. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 196,973, May 20, 1988, Pat. No. 4,935,877. This application Aug. 4, 1994, Ser. No. 286,134**
**Int. Cl.[6] G06F** *15/00; 15/18*
**U.S. Cl. 395—13** **51 Claims**



**50**. A process for solving a problem comprising the steps of:

maintaining a population of programmatic entities; and

modifying one or more programmatic entities in the population so as to evolve the population of programmatic entities to create a solution to the problem, said step of modifying including the step of altering an architecture of at least one of the population.

## 5,742,739
## METHOD OF SPEEDING UP THE EXECUTION OF NEURAL NETWORKS FOR CORRELATED SIGNAL PROCESSING

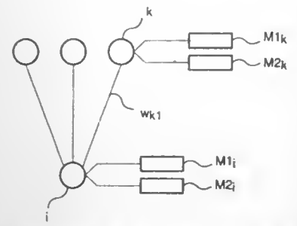
**Dario Albesano, Venaria; Roberto Gemello, and Franco Mana, both of Turin, all of Italy, assignors to Cselt - Centro Studi e Laboratori Telecomunicazioni S.P.A., Turin, Italy**

**Filed Feb. 28, 1996, Ser. No. 608,480**
**Claims priority, application Italy, Mar. 22, 1995, TO95A0216**
**Int. Cl.[6] G06F** *15/18*
**U.S. Cl. 395—22** **6 Claims**

**1**. A method of speeding up execution of a neural network for correlated signal processing, wherein the network is made of neurons arranged in a layered structure from a bottom level to a top level, said layered structure having an input level, one or more intermediate levels and an output level, the neurons in each level being connected to neurons in an immediately upper level by means of links of different intensities (synaptic weights), execution of the neural network at a generic sampling instant t comprising, at least for neurons in the intermediate level or levels, the steps of:

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computing and storing an activation value of the neuron at instant t;

comparing the activation value at instant t with the activation value at a preceding sampling instant t−1 and computing the difference between said values; and

propagating towards neurons in an immediately upper layer said difference, weighted by the synaptic weights of the links with said neurons in the upper layer, only if said difference exceeds a given threshold.

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**5,742,740**

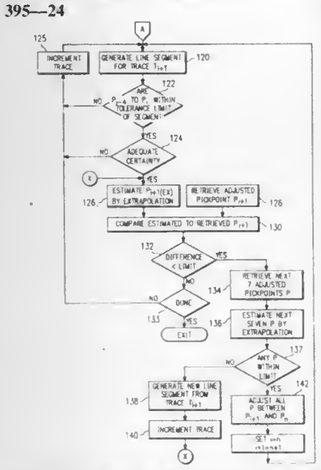
## ADAPTIVE NETWORK FOR AUTOMATED FIRST BREAK PICKING OF SEISMIC REFRACTION EVENTS AND METHOD OF OPERATING THE SAME

**Michael D. McCormack, Plano, Tex., and Alan D. Rock, Knoxville, Tenn., assignors to Atlantic Richfield Company, Los Angeles, Calif.**

**Division of Ser. No. 585,967, Sep. 20, 1990, Pat. No. 5,181,171. This application Jan. 15, 1993, Ser. No. 7,902**

**Int. Cl.[6] G06F** *15/18*

**U.S. Cl. 395—24** **24 Claims**




1. A method of operating an adaptive network to set values of a plurality of weighting factors therein, comprising:

storing data representing a sample input and a desired output in memory;

retrieving a portion of said stored data representing said sample input;

operating the adaptive network, using the data retrieved in said retrieving step representing the sample input as a data input to the adaptive network, to produce an actual output;

calculating a sample error, by determining the difference between the actual output of said adaptive network and the desired output;

comparing the sample error to a tolerance limit;

responsive to the result of the comparing step indicating that the sample error exceeds the tolerance limit, calculating a learning factor according to the value of the sample error, so that said learning factor increases as the sample error decreases;

adjusting at least one of the plurality of weighting factors in said adaptive network by backpropagation according to the generalized delta rule, using the sample error and the learning factor;

repeating the retrieving and presenting steps, and the step of calculating the sample error, until said comparing step indicates that the sample error does not exceed the tolerance limit.

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**5,742,741**

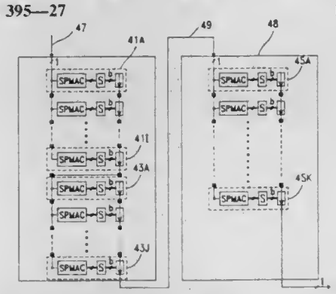
## RECONFIGURABLE NEURAL NETWORK

**Tzi-Dar Chiueh, Taipei; Hwai-Tsu Chang; Yeh-Rong Hsu, both of Hsinchu; Huang-Lin Yang, Taipei, and Chung-Chih Chang, Doou-Liou City, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan**

**Filed Jul. 18, 1996, Ser. No. 683,254**

**Int. Cl.[6] G06F** *15/18*

**U.S. Cl. 395—27** **11 Claims**




1. A neural network circuit, comprising:

first switching means having a first lead, a second lead and a third lead;

second switching means having a first lead, a second lead and a third lead, said second lead of said second switching means coupled to said second lead of said first switching means;

a first processing element (PE) having a first input lead, a second input lead and an output lead, said first input lead of said first PE coupled to said third lead of said first switching means, said second input lead coupled to said third lead of said second switching means, wherein said first PE outputting at said output lead of said first PE a serial digital output signal that is weighted sum function of a first serial digital input signal received at said first input lead of said first PE;

third switching means having a first lead, a second lead and a third lead, said first lead of said third switching means coupled to said first input lead of said first PE;

fourth switching means having a first lead, a second lead, and a third lead, said first lead of said fourth switching means coupled to said output lead of said first PE, said second lead of said fourth switching means coupled to said second lead of said third switching means; and

a second PE having a first input lead, a second input lead and an output lead, said first input lead coupled to said third lead of said fourth switching means, said second input lead of said second PE coupled to said third lead of said fourth switching means, wherein said second PE outputting at said output lead of said second PE a serial digital output signal that is a weighted sum function of a serial digital input signal received at said first input lead of said second PE, wherein:

said first switching means being selectably configured to provide a signal received on said first lead of said first switching means to said first input lead of said first PE or a signal received from said second lead of said second switching means to said first input lead of said first PE,

said second switching means being selectably configured to provide a signal received on said first lead of said second switching means to said second input lead of said first PE or to said second lead of said first switching means,



said third switching means being selectably configured to provide a signal received from said third lead of said first switching means to said first input lead of said second PE or a signal received from said second lead of said fourth switching means to said first input lead of said second PE, and

said fourth switching means being selectably configured to provide a signal received from said output lead of said first PE to said second lead of said fourth switching means or to said second input lead of said second PE.

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**5,742,742**

## PRINTING SYSTEM FOR DETERMINING IF THERE IS ENOUGH MEMORY TO STORE REVISED PROGRAM AND CONTROLLING THE SYSTEM USING CONTROL PROGRAM WITH THE REVISED PROGRAM

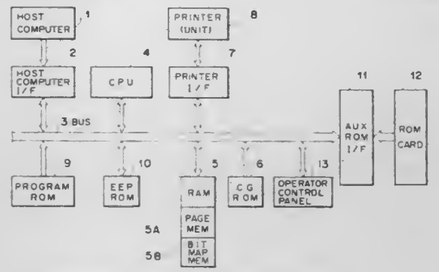
**Shigeru Ueda, Wako, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 872,149, Apr. 22, 1992, abandoned. This application May 20, 1994, Ser. No. 246,562**

**Claims priority, application Japan, Apr. 22, 1991, 3-119229; Apr. 9, 1992, 4-088846**

**Int. Cl.[6] G06F** *13/00*

**U.S. Cl. 395—109** **9 Claims**




1. An information processing apparatus comprising:

determination means for determining whether data stored in a first memory detachably connected to said apparatus comprises a revised program; and

control means for

(a) discriminating whether the revised program can be stored in a second memory if said determination means determines that the data stored in the first memory comprises the revised program,

(b-1) controlling said apparatus based on the revised program and a control program stored in a third memory without storing the revised program in the second memory if it is discriminated that the revised program cannot be stored in the second memory,

(b-2) controlling the second memory to store the revised program and controlling said apparatus based on the revised program stored in the second memory and the control program stored in the third memory if it is discriminated that the revised program can be stored in the second memory, and

(c) controlling said apparatus based on the data stored in the first memory and the control program stored in the third memory if said determination means determines that the data stored in the first memory does not comprise the revised program.

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**5,742,743**

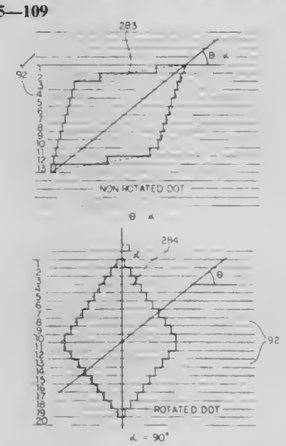
## APPARATUS AND METHOD FOR GENERATING A SCREEN REPRODUCTION OF A COLOR IMAGE INCLUDING DOT SHAPE ROTATION

**Alex Weiss, Netanya, Israel, assignor to Scitex Corporation Ltd., Herzlia, Israel**

**Continuation-in-part of Ser. No. 221,938, Apr. 1, 1994. This application Aug. 23, 1996, Ser. No. 702,221**

**Int. Cl.[6] G06K** *15/02*; **H04N** *1/405*

**U.S. Cl. 395—109** **14 Claims**




1. A method for screening an image for half-tone reproduction by image reproduction apparatus comprising a marking device which is operative to mark a medium along a multiplicity of parallel marking lines, the method comprising the steps of:

providing a digital representation of density values of an original image;

determining whether to rotate dot shape information in accordance with said dot shape symmetry and density;

rotating dot shape information if said symmetry and density criteria are met;

storing said dot shape information in its rotated on nonrotated form, said dot shape information representative of a screen function; and

extracting said dot shape information from storage for said density values in the form of information that designates on and off points for each marking line.

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**5,742,744**

## OUTPUT APPARATUS AND METHOD FOR ESTABLISHING A USING RIGHT FOR PLURAL DATA PROCESSING UNITS

**Isao Migishima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha**

**Continuation of Ser. No. 260,962, Jun. 15, 1994, abandoned. This application Feb. 24, 1997, Ser. No. 804,755**

**Claims priority, application Japan, Jun. 17, 1993, 5-169839**

**Int. Cl.[6] G06F** *13/00*

**U.S. Cl. 395—110** **13 Claims**

1. An output apparatus comprising:

a plurality of processing means for processing inputted data;

a plurality of character pattern generating means for generating a character pattern in accordance with the inputted data;

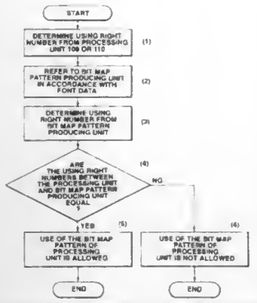
first recognizing means for recognizing information on a right to use one of said plurality of processing means;

second recognizing means for recognizing information on a right to use one of said plurality of character pattern generating means;

judging means for judging whether the information on the right to use one of said plurality of processing means recognized by said first recognizing means, and the information on the right

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to use the one of said plurality of character pattern generating means recognized by said second recognizing means are equal; and

means for allowing use of the one of said plurality of character pattern generating means by the one of said plurality of processing means when said judging means judges that equality exists, and for prohibiting use of the one of said plurality of character pattern generating means by the one of said plurality of processing means when said judging means judges that equality does not exist.

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**5,742,745**

**COMMUNICATION DEVICE**

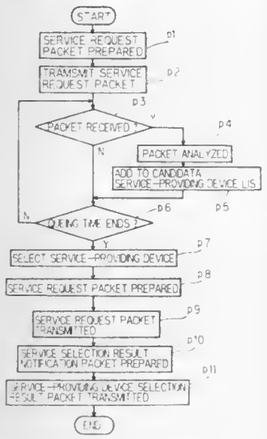
**Akihiko Sugikawa; Yasuhiro Morioka, and Teruhiko Ukita, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed May 23, 1995, Ser. No. 447,652**

**Claims priority, application Japan, May 24, 1994, 6-109915; Jan. 20, 1995, 7-007460**

**Int. Cl.[6] H04L** *12/56*

**U.S. Cl. 395—114** **12 Claims**




1. A communication device comprising:

communication means for communicating with a plurality of other communication devices,

service request data detection means for detecting a first service request data transmitted from at least one of said plurality of other communication devices through said communication means and for indicating data for requesting remaining communication devices other than the at least one communication device to perform certain processing on behalf thereof,

judging means which does, upon detection of said first service request data by said service request data detection means, judge whether conditions are met for providing a first service as indicated by said first service request data and being the service to process on behalf,

selection data communicating means which does, when said judging means has judged that the provision of said first service is possible, transmit data for selecting a communication device which is to provide said first service from among the communication devices at least satisfying the condition for providing said first service as indicated by said detected first service request data excepting the communication device which has transmitted said first service request data, and

deciding means which does, according to the data for selecting said communication device, decides the communication device which provides said first service.

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**5,742,746**

**CHARACTER OUTPUT CONTROL METHOD AND APPARATUS FOR TERMINAL**

**Hitoshi Doi, and Masayoshi Okutsu, both of Yokohama, Japan, assignors to Digital Equipment Corporation, Maynard, Mass.**

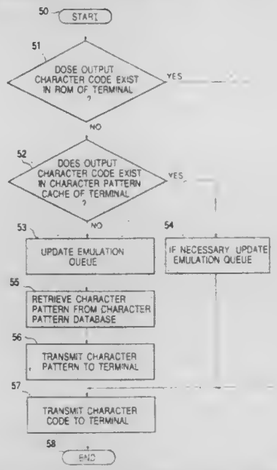
**PCT No. PCT/JP91/00708, § 371 Date Nov. 24, 1992, § 102(e) Date Nov. 24, 1992, PCT Pub. No. WO91/19275, PCT Pub. Date Dec. 12, 1991**

**PCT Filed May 28, 1991, Ser. No. 952,863**

**Claims priority, application Japan, May 30, 1990, 2-140578**

**Int. Cl.[6] G06K** *15/00*

**U.S. Cl. 395—115** **5 Claims**




1. A character output control method for controlling, from a host system, an operation of outputting a character to a terminal, such as character display unit or printer, which has a character pattern memory region for storing character patterns, said method comprising the steps of:

examining a set of data stored in said host system, said set of data emulating said character pattern memory region, to determine whether or not a character pattern corresponding to the desired character is stored in said character pattern memory in the terminal; and

loading the character pattern from said host system into said character pattern memory region when it is determined that the character pattern has not been stored in said character pattern memory region.

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**5,742,747**

**Patent Not Issued For This Number**



**5,742,748**

**VIRTUAL REALITY MENTAL CONDITIONING MEDIUM**

**Frank Sever, Jr., POB 7442, Arlington, Va. 22207**

**Filed Jul. 14, 1995, Ser. No. 502,362**

**Int. Cl.[6] A63B** *24/00*

**U.S. Cl. 395—119** **19 Claims**

1. A method comprising:

providing a virtual reality device;

providing a medium with a program imprinted thereon designed for achieving a goal desired by a subject, operable with the device for presenting to at least the visual senses of the subject, a dynamic scenario which communicates in chronological sequence: (a.) a condition which requires a remedy; (b.) a mode for effecting the remedy; (c.) the performance of the mode so as to effect the remedy; and, (d.) rectification of the condition through the performance of the mode; for causing mental visualization within the mind of the subject sufficient to enable the subject to achieve the desired goal; wherein the goal is selected from the group consisting of: physical training, mental training, physical healing, mental healing and combinations thereof;

operatively interfacing the medium with the device and mounting the device on the subject; and,

running the program.

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**5,742,749**

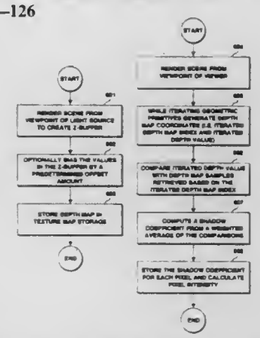
**METHOD AND APPARATUS FOR SHADOW GENERATION THROUGH DEPTH MAPPING**

**James L. Foran, Milpitas, and Rolf A. van Widenfelt, San Francisco, both of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.**

**Continuation of Ser. No. 89,799, Jul. 9, 1993, abandoned. This application Feb. 20, 1996, Ser. No. 603,691**

**Int. Cl.[6] G06T** *11/40*

**U.S. Cl. 395—126** **26 Claims**




1. In a computer controlled display system for displaying three dimensional scenes, each of said three dimensional scenes comprised of a plurality of graphical primitives, said graphical primitives represented by pixels on a display screen, a method for displaying shadows in a scene caused by a light source, said method comprising the steps of:

a) generating a depth map in a light coordinate system and storing said depth map in a texture map storage, said light coordinate system having said light source as an origin, said depth map storing in said texture map storage a plurality of depth map sample values, wherein each depth map sample value identifies a distance from a pixel location in one of said graphical primitives to said light source;

b) rendering said scene from the viewpoint of a viewer by processing each of said graphical primitives of said scene, said processing comprising the steps of:

1) identifying pixels corresponding to each of said graphical primitives;

2) for each pixel, determining if it is visible from said viewer's viewpoint;

3) ignoring pixels that are not visible;

4) for each pixel that is visible, generating a shadow coefficient, indicating the degree to which a pixel is in shadow, wherein each pixels shadow coefficient is used to shade said pixel, wherein said shadow coefficient for said pixel is generated by performing the steps of:

generating light system coordinates for said pixel using a projective texture mapping technique, said light system coordinates comprising a pixel depth map index for indexing said texture map storage and a pixel depth value;

retrieving a predetermined number of depth map sample values from said texture map storage based on said pixel depth map index;

comparing each of said predetermined number of depth map sample values to said pixel depth value; and

using results of said comparison between said predetermined number of depth map sample values, and said pixel depth value to generate said shadow coefficient for said pixel and using said shadow coefficient to generate shading values for said pixel and displaying said pixel.

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**5,742,750**

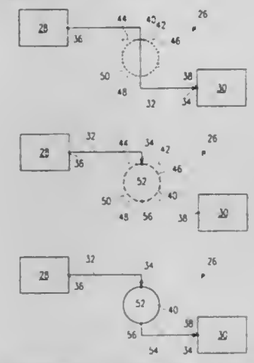
**SYSTEM AND METHOD FOR AUTOMATICALLY INSERTING AND DELETING AN OBJECT IN A GRAPHICS CHART**

**Scott J. Schanel, San Francisco, Calif., assignor to Micrografx, Inc., Richardson, Tex.**

**Filed Feb. 13, 1996, Ser. No. 600,881**

**Int. Cl.[6] G06F** *15/00*

**U.S. Cl. 395—141** **20 Claims**




1. A method for inserting an object into a computer-generated graphics chart, the method comprising the steps of:

maintaining a location for each object and line in the graphics chart including a source and destination point for each line; and

responding to a command indicating a new object is to be inserted into the chart by:

determining whether the new object is pierced by a line in the chart, each line piercing the new object having an original source point and an original destination point,

redefining the line piercing the new object into two lines, including a line entering the new object and a line exiting the new object,

defining a destination point for the line entering the new object to a destination point on the new object,

defining a source point for the line exiting the new object to a source point on the new object,

routing the line entering the new object from the original source point to the destination point on the new object, and

routing the line exiting the new object from the source point on the new object to the original destination point.

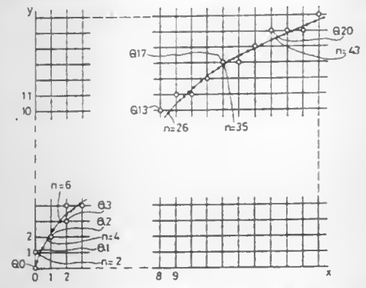
VOL 1209 ISS 3 AP 21 1998 UMI



## 5,742,751
## CURVE APPROXIMATION METHOD

**Aisaku Imanishi, and Shingo Takahashi, both of Tokyo, Japan, assignors to Seiko Precision Inc., Tokyo, Japan**

**Continuation of Ser. No. 355,416, Dec. 13, 1994, abandoned, which is a continuation of Ser. No. 935,083, Aug. 24, 1992, abandoned. This application Oct. 31, 1995, Ser. No. 538,818**
**Claims priority, application Japan, Sep. 4, 1991, 3-223835; Sep. 4, 1991, 3-223836**
**Int. Cl.[6] G06F** *15/00*
**U.S. Cl. 395—142** **6 Claims**




1. A method for producing an outline font by expressing an approximate curve of an original curve Q of an outline font represented by points "Pk" (k=1, . . . , m) which represent anchor points and control points used for determining the shape of the original curve and by parameter functions "Wk" (k=1, . . . , m) expressed by using a parameter "t" used for determining the type of original curve, as follows:

$$Q = \sum_{k=1}^{k=m} (Wk \times Pk)$$

in which the approximate curve is approximately expressed by dots in a matrix of a display medium, said method comprising the steps of:

using a program stored in a read only memory to form said approximate curve according to the following steps:

finding a coordinate of first and second dots of three consecutive dots on the approximate curve and on said matrix;

then finding a coordinate of a third dot of the three consecutive dots on the approximate curve and on said matrix on the basis of a difference between the value of said parameter "t" used for determining said coordinate of the first dot and that used for determining said coordinate of the second dot;

sequentially finding coordinates of consecutive additional dots on the approximate curve and on said matrix on the basis of a difference between the value of said parameter "t" used for determining a coordinate of a previous dot and that used for determining a coordinate of a next previous dot; and

forming said approximate curve representative of said outline font by said found coordinates of said dots; and

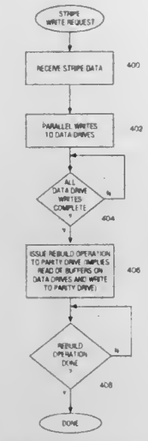
displaying said approximate curve on said dots in the matrix of the display medium.

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## 5,742,752
## METHOD FOR PERFORMING A RAID STRIPE WRITE OPERATION USING A DRIVE XOR COMMAND SET

**Rodney A. DeKoning, Wichita, Kans., assignor to Symbios Logic Inc., Fort Collins, Colo.**

**Filed Dec. 29, 1995, Ser. No. 581,153**
**Int. Cl.[6] G06F** *11/00;12/00*
**U.S. Cl. 395—182.04** **9 Claims**




1. In a RAID controller for controlling a RAID storage subsystem having at least one disk array comprising a plurality of XOR command set enabled disk drives, a method operable within said RAID controller for performing a stripe write of data to said disk array, said method comprising the steps of:

initiating write operations to all disk drives which contain data in the stripe to be written; and

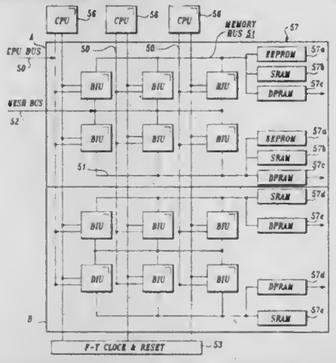
initiating, responsive to completion of said write operations, an XOR command set rebuild command to the disk drive containing parity information in the stripe.

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## 5,742,753
## MESH INTERCONNECTED ARRAY IN A FAULT-TOLERANT COMPUTER SYSTEM

**Arnold W. Nordsieck, Bellevue; Christopher A. Young, Redmond, and William M. Yost, Woodinville, all of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Jun. 6, 1996, Ser. No. 660,601**
**Int. Cl.[6] G06F** *11/00*
**U.S. Cl. 395—182.09** **19 Claims**




1. A fault-tolerant computer system, including one or more central processing units (CPUs) each connected to a CPU bus and one or more memory unit each connected to a memory bus, said CPU bus(es) intersecting said memory bus(es), said system further comprising:

bus interface units (BIUs) located at the intersections of the CPU bus(es) and the memory bus(es);

a transaction means for transmitting a transaction comprising at least one of address data, read data, write data, and control data;

a mesh bus for interconnecting predetermined BIUs;

said BIUs further comprising:



a means for storing a configuration vector representing a BIU's knowledge of the operating status of the BIUs connected to the mesh bus;

an error detecting means for detecting correctable, retryable and non-retryable errors in said data of a transaction;

an error correcting means for correcting any detected correctable errors;

an error asserting means for asserting to all the BIUs via the mesh bus if a retryable or non-retryable error(s) was detected by said error detecting means;

a retry means for sending the data back to said error detecting means a preset number of times, if a retryable error remains asserted on the mesh bus;

a fault management means for isolating and eliminating said BIU(s) with any detected error(s) remaining after said retry means by reconfiguring the configuration vector of each BIU connected on the mesh bus according to the type of remaining detected error(s) and generating a consensus configuration vector according to the reconfigured configuration vector of each BIU, said fault management means comprising:

a self-implicating error means within the fault management means of each BIU for detecting self-implicating errors, shutting down each BIU that detects self-implicating error, asserting the configuration vector of each BIU onto the mesh bus, and generating a consensus configuration vector;

a synchronization error means within the fault management means of each BIU for detecting synchronization errors, asserting a first error message to the mesh bus if a synchronization error was detected, performing a first reconfiguration algorithm if a first error message is asserted on the mesh bus and generating a consensus configuration vector according to the results of the first reconfiguration algorithm; and

memory bus error means within the fault management means of each BIU for detecting memory bus errors, asserting a second error message to the mesh bus if a memory bus error was detected, performing a second reconfiguration algorithm if a second error message is asserted on the mesh bus and generating a consensus configuration vector according to the results of the second reconfiguration algorithm; and

a continuation means for completing the transaction if no error(s) remain asserted on the mesh bus.

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## 5,742,754
## SOFTWARE TESTING APPARATUS AND METHOD

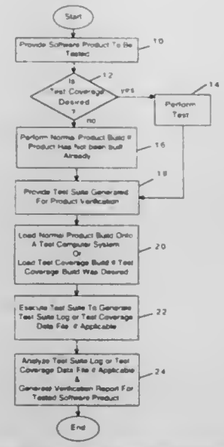
**Anna Y. Tse, Sunnyvale, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.**

**Filed Mar. 5, 1996, Ser. No. 610,832**
**Int. Cl.[6] G06F** *11/00*
**U.S. Cl. 395—183.14** **32 Claims**

1. A computer-implemented method for testing a software product through the use of a test suite designed to exercise the software product and generate a test suite log indicative of test results obtained from executing the test suite, the method being performed through the use of a server computer system and a plurality of servant computer systems, the method comprising the steps of:

transmitting the software product and the test suite to each of a plurality of selected ones of the plurality of servant computer systems and loading the software product and test suite on each of the selected servant computer systems;

executing the software product and test suite on each of the plurality of selected servant computer systems, wherein the execution of the test suite on each of the selected servant computer system causes the generation of a test suite log on each of the selected servant computer systems; and



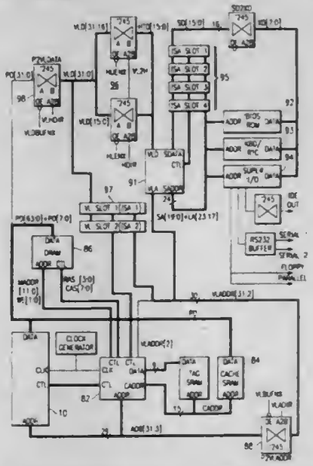

transmitting the test suite logs generated by each of the selected servant computer systems to the server computer system.

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## 5,742,755
## ERROR-HANDLING CIRCUIT AND METHOD FOR MEMORY ADDRESS ALIGNMENT DOUBLE FAULT

**Mark W. Hervin, Dallas, Tex., assignor to Cyrix Corporation, Richardson, Tex.**

**Filed Feb. 20, 1996, Ser. No. 603,999**
**Int. Cl.[6] G06F** *11/00;12/00*
**U.S. Cl. 395—185.06** **20 Claims**




1. In an χ86-compatible processor capable of operating in a protected mode of operation in which privilege levels are assigned to tasks executing therein, an application task being assigned a low privilege level and executable in said processor to cause said processor to calculate addresses corresponding to specific locations in a computer memory associated with said processor, said addresses to be in alignment with respect to said computer memory prior to said processor issuing said addresses, a circuit to handle sequential alignment faults, comprising:

an alignment detection circuit to detect an alignment fault and generate an alignment check exception in response thereto; and

an alignment fault-handling routine associated with said processor, executable in response to generation of said alignment

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check exception, operable to detect a sequential alignment fault and generate a double fault exception in response thereto, said alignment fault-handling routine thereby allowing said processor to avoid said sequential alignment fault.

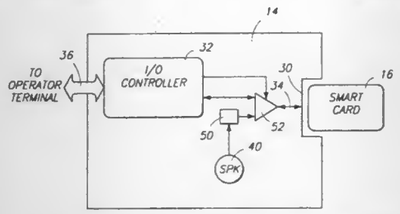
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**5,742,756**

## SYSTEM AND METHOD OF USING SMART CARDS TO PERFORM SECURITY-CRITICAL OPERATIONS REQUIRING USER AUTHORIZATION

**Blair B. Dillaway; Douglas C. Barlow, both of Redmond, and Terry M. Lipscomb, Bellevue, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.**

**Filed Feb. 12, 1996, Ser. No. 600,305**
**Int. Cl.[6] H04K** *1/00;* **H04L** *9/00*
**U.S. Cl. 395—186** **45 Claims**




**1**. A user security system for use in conjunction with an operator terminal, the user security system comprising:

an intelligent security token that is used for performing security-critical operations requiring user authorization;

a reader device providing communications between the intelligent security token and the operator terminal;

the reader device having a security actuator that requires physical operation by a person, the reader device being configured to detect such physical operation of the security actuator after a request by the operator terminal for the intelligent security token to perform a security-critical operation, wherein the security actuator does not require user identity verification;

the intelligent security token being configured to perform the security-critical operation only after the reader device detects physical operation of the security actuator.

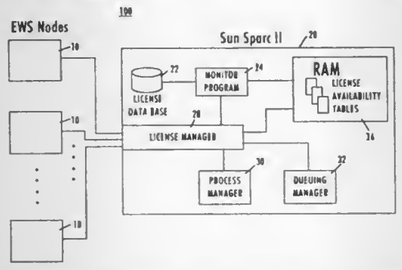
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**5,742,757**

## AUTOMATIC SOFTWARE LICENSE MANAGER

**Mehrdad Hamadani, and Ward Huffman, both of Durham, N.C., assignors to Mitsubishi Semiconductor America, Inc., Durham, N.C.**

**Filed May 30, 1996, Ser. No. 655,132**
**Int. Cl.[6] G06F** *11/00*
**U.S. Cl. 395—186** **9 Claims**




**7**. A method of software license management in a computer network having a plurality of nodes using node-locked software licenses and floating licenses for various software tools, the method comprising the steps of:

sending by a computer at one of the nodes a request for a license for a software tool,

determining whether a local node-locked license for the software tool assigned to said computer is available,

enabling said computer to run the software tool, if the local node-locked license is available,

determining whether a floating license for the software tool is available, if a local node-locked license is not available,

enabling said computer to run the software tool, if a floating license is available,

determining whether a remote node-locked license for the software tool assigned to a remote computer in the computer network is available, if a floating license is not available,

enabling said computer to run the software tool through said remote computer, if a remote node-locked license is available,

placing the request on queue of requests for the software tool, if a remote node-locked license is not available, and

notifying said computer in order of the queue when a license for the software tool becomes available.

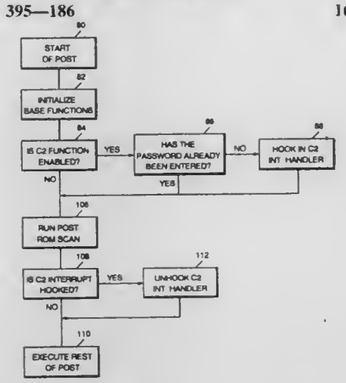
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**5,742,758**

## PASSWORD PROTECTING ROM BASED UTILITIES IN AN ADAPTER ROM

**Scott Neil Dunham, Cary; Charles Richard Dart, II, Raleigh, and Benjamin Russell Grimes, Zebulon, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jul. 29, 1996, Ser. No. 681,740**
**Int. Cl.[6] G06F** *11/00*
**U.S. Cl. 395—186** **16 Claims**




**1**. A secure information handling system operable by entering an authorization key having a central processing unit executing an initialization code, including at least one device having a device utility code capable of controlling the CPU after at least one initialization code instruction has been executed by entering an external input to execute the device utility code, comprising:

a detector for intercepting the external input;

an input handler responsive to detection of the external input for requesting entry of the authorization key before executing the device utility code; and

a verification means for verifying the authorization key upon entry.

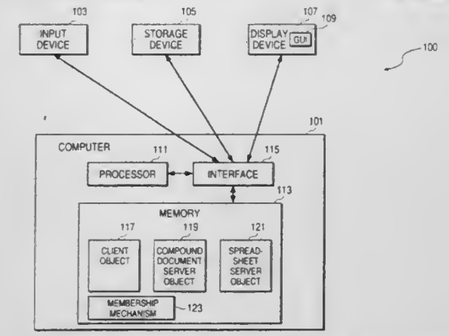


**5,742,759**

## METHOD AND SYSTEM FOR FACILITATING ACCESS CONTROL TO SYSTEM RESOURCES IN A DISTRIBUTED COMPUTER SYSTEM

**Danny M. Nessett, Fremont, and Theron D. Tock, Sunnyvale, both of Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.**

**Filed Aug. 18, 1995, Ser. No. 516,671**
**Int. Cl.[6] G06F** *15/00*
**U.S. Cl. 395—187.01** **18 Claims**




**1**. A method executed in a computer system for facilitating access control to system resource in a distributed computer system, the distributed computer system including a first server object, a target object, a client object and a second server object, each of the objects belonging to one or more specified groups of objects residing in the computer system, the method comprising the steps of:

under control of the first server object,

storing a group identifier associated with the target object in the first server object, the group identifier identifying the group of object in the computer system with access privileges to the target object;

under control of the second server object,

sending an access request to the first server object requesting access to the target object, the access request including a second server principal identifier which identifies a principal operating the second server object;

under control of the first server object,

verifying that the second server object has permission to access the target object by using the group identifier associated with the target object and the second server principal identifier included in the access request from the second server object; and

sending a target object reference to the client object when the second server object has the permission to access the target object, the target object reference indicating a location of the target object in the computer system;

under control of the client object,

locating a second server object which operates on behalf of a member of the group to which the client object belongs; and

sending and obtain request to the located second server object requesting that the second server object obtain a container object which references the target object, the obtain request including the target object reference and a group identifier which identifies the group to which the client object belongs; and

under control of the second server object,

obtaining the container object from the second server object; and

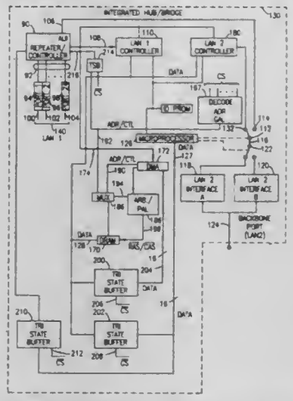
storing the target object reference and the group identifier in the container object.

**5,742,760**

## NETWORK PACKET SWITCH USING SHARED MEMORY FOR REPEATING AND BRIDGING PACKETS AT MEDIA RATE

**Jose J. Picazo, Jr., San Jose; Paul Kakui Lee, Union City, and Robert P. Zager, San Jose, all of Calif., assignors to Compaq Computer Corporation, Houston, Tex.**

**Continuation-in-part of Ser. No. 881,931, May 12, 1992, Pat. No. 5,432,907. This application Jul. 5, 1995, Ser. No. 498,116**
**Int. Cl.[6] H04J** *3/02*
**U.S. Cl. 395—200.02** **39 Claims**




**1**. A system; which system, in operation, controls communication between two networks; said system comprising:

a retransmitter;

a network connector; and

at least one support element, which at least one support element is coupled to said retransmitter and to said network connector, and which at least one support element is shared by said retransmitter and said network connector in operation.

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**5,742,761**

## APPARATUS FOR ADAPTING MESSAGE PROTOCOLS FOR A SWITCH NETWORK AND A BUS

**Howard Thomas Olnowich, Endwell; Michael Wayland Dotson, Binghamton; James William Feeney, Endicott, all of N.Y.; Michael Hans Fisher, Rochester, Minn.; John David Jabusch, Endwell, N.Y.; Robert Francis Lusch, Vestal, N.Y., and Michael Anthony Maniguet, Owego, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 381,669, Jan. 30, 1995, abandoned, which is a continuation of Ser. No. 946,506, Sep. 17, 1992, abandoned, and a continuation-in-part of Ser. No. 677,543, Mar. 29, 1991, abandoned, Ser. No. 799,497, Nov. 27, 1991, abandoned, and Ser. No. 799,602, Nov. 27, 1991, abandoned.**
**This application Feb. 12, 1997, Ser. No. 800,070**
**Int. Cl.[6] G06F** *1/00*
**U.S. Cl. 395—200.2** **28 Claims**

**1**. An adapter comprising:

means for transmitting a first data message of any finite length measured by a first word count completely in one transmission cycle from a node operating under a bus protocol to a switch network operating under a switch protocol and for transmitting a second data message of any finite length measured by a second word count completely in one transmission cycle from the switch network to the node;

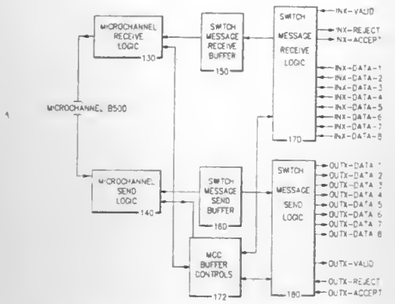
said switch network comprising:

a plurality of input ports including a first input port for receiving said first data message from a coupled adapter;

a plurality of output ports including a first output port for sending said second data message to the coupled adapter; and

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means for establishing a circuit-switched connection between said first input port and any of said output ports in response to a connection request included in said first data message, said circuit-switched connection maintained for a duration required for transmitting said first data message completely in one transmission cycle; said node comprising:

communication means for transmitting said first data message to the coupled adapter and for receiving said second data message from the coupled adapter; and

said adapter further comprising:

a switch interface for coupling the adapter to the switch network via said first input port and said first output port; and

a bus interface for coupling the adapter to the node.

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**5,742,762**

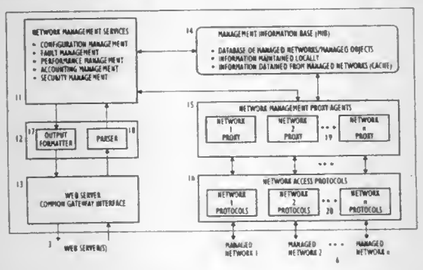
**NETWORK MANAGEMENT GATEWAY**

**Thomas H. Scholl, and William E. Witowsky, both of Gaithersburg, Md., assignors to Telogy Networks, Inc., Germantown, Md.**

**Filed May 19, 1995, Ser. No. 444,483**

**Int. Cl.[6] G06F *13/00***

**U.S. Cl. 395—200.3** **18 Claims**




I. A network management gateway device comprising:

a. means for receiving a Web client request from a Web client, through a Web server, through the Internet, using a Web server CGI, the request comprising a request selected from the group comprising: configuration management, fault management, performance management, accounting management, security management, help desk, customer service and support, software distribution, product information distribution, and trouble ticket and reporting;

b. means for parsing and translating with a programmed device or a circuit device, a Web client request into at least one network management request (NMR), electronically communicating with the means for receiving a Web client request;

c. means for processing the NMR locally to obtain information directly from a local managed information database, if the NMR is not related to a managed network, which is one of a plurality of incompatible managed networks;

d. means for forwarding the NMR to the appropriate network management proxy agent, if the NMR relates to the managed network;

e. means for processing the NMR locally to obtain information directly from the local managed information database, if the information is available from the database;

f. means for forwarding the NMR to the managed network via access protocols, if the information is not available from the database;

g. means for receiving network management information transmissions in response to NMR's;

h. storing network management information received in the local managed information database;

i. means for converting network management information transmissions, in real-time, into HTML documents, electronically communicating with the means for parsing and the means for transmitting each NMR and the means for receiving network management information; and

j. means for transmitting HTML documents to the Web client, through the Web server, through the Internet, further comprising means for formatting for output.

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**5,742,763**

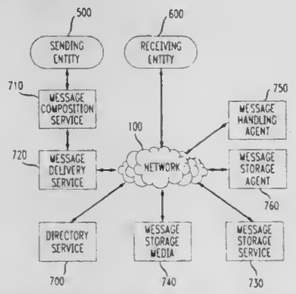
**UNIVERSAL MESSAGE DELIVERY SYSTEM FOR HANDLES IDENTIFYING NETWORK PRESENCES**

**Mark Alan Jones, New Providence, N.J., assignor to AT&T Corp., Middletown, N.J.**

**Filed Dec. 29, 1995, Ser. No. 581,141**

**Int. Cl.[6] G06F *13/00***

**U.S. Cl. 395—200.3** **6 Claims**




I. A message delivery system for use with a communication network and means for providing a network presence for an entity, said message delivery system comprising:

delivery means for delivering a message from a sender to a handle identifying said network presence, said handle not corresponding to a physical endpoint, and

means for omitting identifying information for said sender from said message.

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**5,742,764**

**COMMUNICATION SYSTEM**

**Hiroshi Asoh, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Feb. 27, 1996, Ser. No. 607,436**

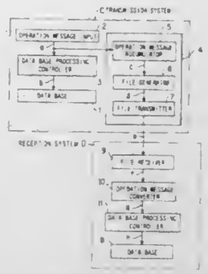
**Int. Cl.[6] G06F *15/16;15/40;13/00***

**U.S. Cl. 395—200.3** **4 Claims**

I. A communication system having a transmission system and a reception system for receiving data and a transmitter-side operation message file from said transmission system, comprising:

said transmission system including a transmitter-side data base, means for inputting an operation message signal for a data operation of registration, deletion or change to said transmitter-side data base, means for controlling transmitter-side data base processing that carries out said data operation





based on said operation message signal, and means for generating and transmitting an operation message file that receives said operation message signal from said operation message inputting means and then generates said transmitter-side operation message file to send it to said reception system; and

said reception system including a receiver-side data base, means for converting an operation message that receives said transmitter-side operation message file and converts it into a receiver-side operation message file, means for controlling receiver-side data base processing that carries out a data operation of registration, deletion or change to said receiver-side data base based on receiver-side operation message file from said operation message converting means.

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**5,742,765**

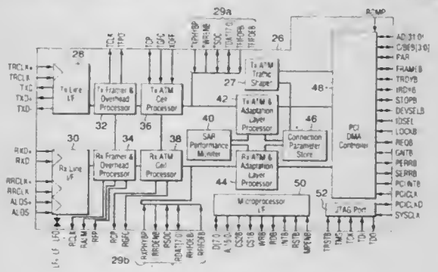
**COMBINATION LOCAL ATM SEGMENTATION AND REASSEMBLY AND PHYSICAL LAYER DEVICE**

**David Wong, Vancouver; Salman Ghufran, Burnaby, and Vernon Robert Little, Belcarra, all of Canada, assignors to PMC-Sierra, Inc., Canada**

**Filed Jun. 19, 1996, Ser. No. 666,088**

**Int. Cl.[6] G06F *17/00***

**U.S. Cl. 395—200.6** **15 Claims**




I. An ATM network interface, comprising:

(a) a physical layer interface having

(i) transmit and receive line interfaces;

(ii) transmit and receive framers and overhead processors coupled to respective ones of said transmit and receive line interfaces; and

(iii) transmit and receive cell processors coupled to respective ones of said transmit and receive framers and overhead processors;

(b) a segmentation and reassembly interface coupled to said physical layer interface having

(i) transmit and receive ATM and adaptation layer processors coupled to respective ones of said transmit and receive ATM cell processors; and

(ii) a transmit ATM Traffic Shaper coupled to said Transmit ATM and Adaptation Layer Processor; and

(c) means for coupling said segmentation and reassembly interface to a PCI bus

wherein said segmentation and reassembly interface and said physical layer interface are combined on a monolithic substrate so as to avoid the need for external connection context memory and to eliminate interfaces so as to reduce the number of chip pins.

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**5,742,766**

**PARALLEL COMPUTING SYSTEM FOR SYNCHRONIZING PROCESSORS BY USING PARTIAL SWITCH CIRCUITS FOR BROADCASTING MESSAGES AFTER RECEIVING SYNCHRONIZATION SIGNALS AND JUDGING SYNCHRONIZATION THEREOF**

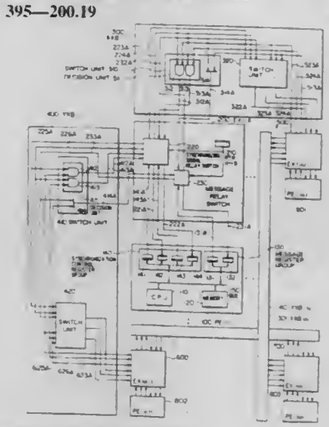
**Shigeo Takeuchi, Hanno; Hideo Wada, Hadano; Naoki Hamanaka; Junji Nakagoshi, both of Tokyo; Teruo Tanaka, Hachioji; Yasuhiro Ogata, Akishima; Taturu Toba, Kunitachi, and Mitsuyoshi Igai, Hino, all of Japan, assignors to Hitachi, Ltd., and Hitachi VLSI Engineering, Corp., both of Tokyo, Japan**

**Filed Mar. 19, 1993, Ser. No. 34,805**

**Claims priority, application Japan, Mar. 19, 1992, 4-063065**

**Int. Cl.[6] G06F *13/12***

**U.S. Cl. 395—200.19** **40 Claims**



I. A parallel computer comprising:

a plurality of processors;

a switch circuit for transferring a plurality of messages among said plurality of processors;

a signal processing circuit for applying a predetermined processing to a plurality of specific signals of a first kind respectively outputted from said plurality of processors, and outputting specific signals of a second kind each indicative of a common result of the processing to said plurality of processors in parallel;

said switch circuit comprising a plurality of partial switch circuits, each thereof having a plurality of input terminals and a plurality of output terminals and transferring a plurality of messages inputted from the plurality of input terminals to the plurality of output terminals in parallel;

said plurality of partial switch circuits being connected mutually and to said plurality of processors so as to transfer a plurality of messages respectively sent from some of said processors to others of said processors determined by respective messages;

each of said plurality of partial switch circuits including judgement means for judging whether synchronization exists between said processors based on synchronization signals sent from said processors;

said plurality of partial switch circuits transfer said messages based on an output of said judgement means;

each of said signal processing circuits comprising a plurality of partial processing circuits each thereof being provided corresponding to one of said plurality of partial switch circuits, having a plurality of input terminals and a plurality of output terminals; and

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applying said predetermined processing to a plurality of specific signals respectively inputted from the plurality of input terminals and outputting specific signals each indicative of a common result of the processing to the plurality of output terminals in parallel as specific signals;

said plurality of input terminals of each partial processing circuit being provided corresponding to a plurality of input terminals of one of said switch circuits corresponding to said each partial processing circuit and said plurality of output terminals of said each partial processing circuit being provided corresponding to a plurality of output terminals of the corresponding switch circuit;

said plurality of partial processing circuits being connected to said processors, so that at least first part of said plurality of partial processing circuits receive, in parallel, said plurality of specific signals of a first kind outputted by said processors;

said plurality of partial processing circuits being further connected to each other, so that at least a second part of said plurality of partial processing circuits receive, in parallel, results of execution of the processing by said first part of said plurality of partial processing circuits to said received plurality of specific signals of the first kind and generate said specific signals of the second kind as result of execution of said processing to said received results; and

said plurality of partial processing circuits being further connected to said processors so that said specific signals of the second kind generated by said second part of said plurality of partial processing circuits are provided to said plurality of processors in parallel.

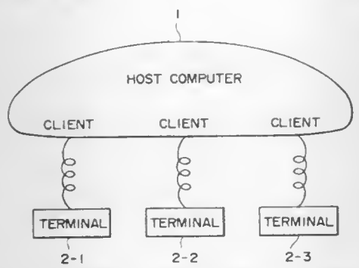
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**5,742,767**

**PROGRAM FUNCTION EXTENDING METHOD AND APPARATUS AND DATA PROCESSING METHOD**

**Yasuaki Honda, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Feb. 21, 1996, Ser. No. 604,428**
**Claims priority, application Japan, Feb. 23, 1995, 7-035153**
**Int. Cl.[6] G06F** *9/00*
**U.S. Cl. 395—200.32** **12 Claims**




1. A program function extending method for adding a new function to a program having a basic function for transmitting data and receiving predetermined incoming data wherein when a new function is added, an extended function program including said new function is newly incorporated and said extended function program includes processing, said processing comprising the steps of:

detecting specific data from said predetermined incoming data;

executing predetermined processing for said specific data if said specific data is detected in said predetermined incoming data; and

converting a result obtained from execution of said predetermined processing for said specific data into said predetermined incoming data for transmission by said basic function, wherein

said data is positional data in a cyberspace system; and

said basic function further includes a function to display a user object at a location specified by said positional data when said positional data is received.

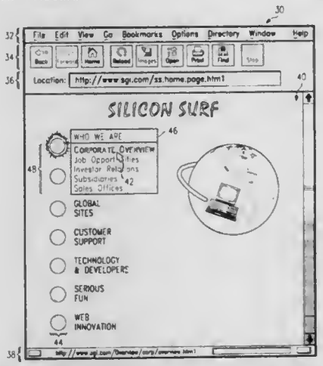
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**5,742,768**

**SYSTEM AND METHOD FOR PROVIDING AND DISPLAYING A WEB PAGE HAVING AN EMBEDDED MENU**

**Giuseppe Gennaro, Cupertino; Jake McGowan, San Jose; Anne P. Wagner, Menlo Park; Kinney Wong, San Jose, and Benjamin A. Zamora, Stanford, all of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.**

**Filed Jul. 16, 1996, Ser. No. 680,836**
**Int. Cl.[6] G06F** *13/00*
**U.S. Cl. 295—200.33** **20 Claims**




1. A method for providing a web page having an embedded menu to a web browser, the method comprising:

receiving a request for a web page from a web browser;

packaging the web page and an applet associated with the web page for transmission to the web browser; and

transmitting the web page and the applet to the web browser;

wherein the applet is operable to create and manage an embedded menu in a displayed web page when the web page is displayed and the applet is executed by the web browser, the embedded menu providing a user of the web browser with a plurality of links through one action in the displayed web page.

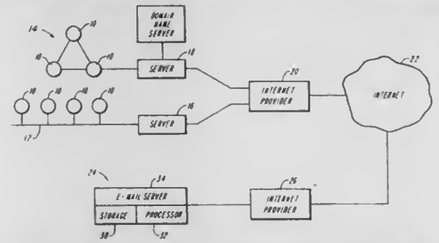
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**5,742,769**

**DIRECTORY WITH OPTIONS FOR ACCESS TO AND DISPLAY OF EMAIL ADDRESSES**

**Eugene H. Lee, Cambridge; Michael Adler, Natick, both of Mass.; Lisa A. Dalton, Johnston, R.I., and David A. Wright, Sudbury, Mass., assignors to Banyan Systems, Inc., Westboro, Mass.**

**Filed May 6, 1996, Ser. No. 643,727**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 395—200.36** **10 Claims**




1. A method for use by a directory service that includes a database with records of users including the users' respective email addresses, and a processor for retrieving and providing records, the method comprising the computer-implemented steps of:

(a) receiving from a requester a request for a record of a recipient;



(b) accessing information associated with the record to determine whether or not the email address is to be displayed; and

(c) in response to a determination that the email address is not to be displayed,

(1) receiving from the requester a message to be sent to the recipient, and

(2) sending the message to the recipient without providing the recipient's email address to the requester.

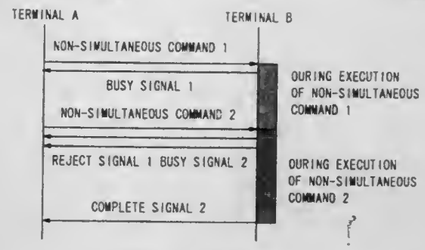
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**5,742,770**

**COMMUNICATION CONTROL METHOD AND APPARATUS**

**Junji Kato, and Susumu Nagano, both of Chiba, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Apr. 13, 1995, Ser. No. 421,943**
**Claims priority, application Japan, Apr. 22, 1994, 6-107910**
**Int. Cl.[6] G06F** *3/14;9/30;13/14*
**U.S. Cl. 395—200.47** **14 Claims**




1. A terminal apparatus comprising:

means for receiving at least one simultaneous command and at least one non-simultaneous command during a common timing period;

means for selecting one of said received non-simultaneous commands;

means for storing said selected non-simultaneous command; and

means for executing said selected non-simultaneous command and said at least one simultaneous command.

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**5,742,771**

**METHOD TO ENSURE THE CONFIDENTIALITY OF A VOCAL LINK AND TELECOMMUNICATIONS LOCAL AREA NETWORK IMPLEMENTING THE METHOD**

**Philippe Fontaine, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Jun. 26, 1995, Ser. No. 494,692**
**Claims priority, application France, Jun. 28, 1994, 94 07948**
**Int. Cl.[6] G06F** *13/374*
**U.S. Cl. 395—200.55** **24 Claims**

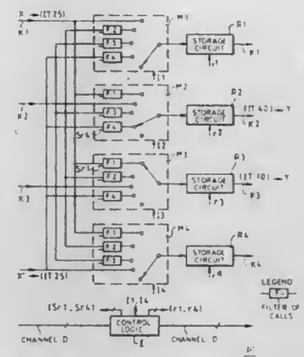
1. A system to ensure the confidentiality of a vocal link in a telecommunications local area network, comprising:

a plurality of terminals coupled to each other via voice transmission paths; and

a filter, provided for at least one path of the voice transmission paths of the plurality of terminals, other terminals, with n as an integer at least equal to one, each of the filtering means which recognizes a predetermined message distributed over a plurality of voice messages transmitted over the voice transmission path for which the filter is provided;

wherein:

the filter disconnects the at least one voice transmission path for which the filter is provided if, for a given period of time, the filter has not recognized the predetermined message distributed over the plurality of transmitted voice messages,




the filter allows at least one terminal of the plurality of terminals to store a signature in the filter as the predetermined message,

the filter extracts the signature from the plurality of transmitted voice messages, each of the plurality of transmitted voice messages comprising a portion of the signature, and

the plurality of transmitted voice messages are transmitted with a predetermined period.

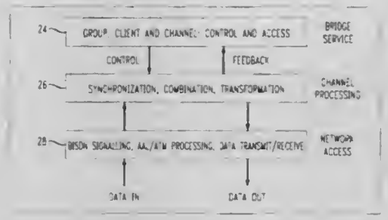
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**5,742,772**

**RESOURCE MANAGEMENT SYSTEM FOR A BROADBAND MULTIPOINT BRIDGE**

**Cormac J. Sreenan, Green Village, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.**

**Continuation of Ser. No. 560,446, Nov. 17, 1995, abandoned.**
**This application May 5, 1997, Ser. No. 851,056**
**Int. Cl.[6] G06F** *15/176*
**U.S. Cl. 395—200.56** **20 Claims**




1. An electronic multipoint bridge resource management system, comprising:

a programmatically-implemented processing system having:

a multipoint bridge service that interfaces with a plurality of clients and maintains record information about a group of said clients participating in a multi-user application, where said bridge service receives a quality of service (QOS) specification from each of said clients; and

a resource manager that receives said QOS specification from said bridge service, distributes at least one QOS constraint associated with said QOS specification across flow processing modules of a channel, determines resource requirements for each of said flow processing modules, and determines whether bridge resources can be allocated to meet said QOS specification;

wherein said clients may alter their QOS specifications and retry if said resource manager denies them admission because of a lack of available bridge resources;

wherein said flow processing modules perform application-level functions including audio and/or video combination, synchronization or transformation, and where said flow processing modules are interconnected by flows for data transport; and

wherein said resource requirements include memory, CPUs or DSPs.

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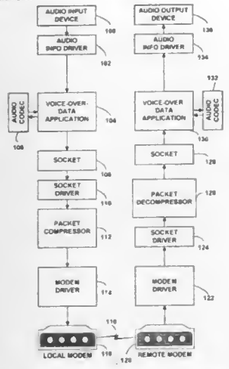


5,742,773

## METHOD AND SYSTEM FOR AUDIO COMPRESSION NEGOTIATION FOR MULTIPLE CHANNELS

Christopher Blomfield-Brown, Seattle; Robert David Donner, Redmond, and Jeffrey Eames Taylor, Bellevue, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Apr. 18, 1996, Ser. No. 634,243
Int. Cl.[6] H04L *5/00*
U.S. Cl. 395—200.58 17 Claims




1. In a computer system having a first computer in communications with a remote second computer over a data link, a method of creating a virtual two channel audio connection over the data link, the two channel connection including a higher quality audio channel, and a lower quality audio channel, the method comprising the following steps:

maintaining on the first computer a first list of available audio data compression and decompression processes, the first list including higher quality, and lower quality audio data compression and decompression processes;

maintaining on the remote second computer a second list of available audio data compression and decompression processes, the second list including higher quality, and lower quality audio data compression and decompression processes;

negotiating between the remote second computer and the first computer a high quality audio compression and decompression process to be used for the higher quality audio channel and a low quality audio compression and decompression process to be used for the lower quality audio channel;

sending higher quality audio data from the first computer to the remote second computer over the data link using the negotiated high quality audio compression process, the data link thereby serving as a high quality, virtual audio channel; and

sending lower quality audio data from the remote second computer to the first computer over the data link using the negotiated low quality audio compression process, the data link thereby also serving as a low quality virtual audio channel.

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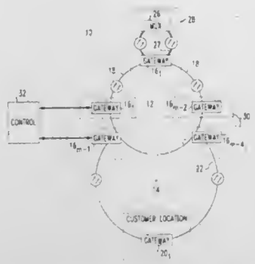
5,742,774

## MULTI-RING SONET ARCHITECTURE HAVING SHARED GATEWAYS DAISY CHAINED TO COMPLETE THE MAIN AND SUBSIDIARY RING CONTROLLED BY A COMMON MASTER CONTROLLER

Daniel Yousef Al-Salameh, 12 Susan Dr., Marlboro, N.J. 07746; Nicholas Paul DeVito, 9 Ski Hill Dr., Bedminster, N.J. 07921; Philip M. Francisco, 32 Bridge St., Groton, Mass. 01450; Steven H. Hersey, 5 Waterside La., West Newbury, Mass. 01985, and Wilhelm Kremer, 3 Sugarbush La., Andover, Mass. 01810

Continuation of Ser. No. 552,898, Nov. 3, 1995, abandoned.
This application Feb. 23, 1996, Ser. No. 605,937
Int. Cl.[6] H04L *12/42;12/46*
U.S. Cl. 395—200.81 4 Claims

1. An optical fiber transmission system comprising:




at least one main ring having m first nodes, no more than m−2 of which each contain a first gateway linked to another first gateway associated with another of said m−2 nodes via a first optical fiber link in a daisy chain configuration, each first gateway converting incoming electrical signals into a block of optical information synchronized to an interchange frame associated with the main ring so that said block resides in a time slot within the interchange frame associated with a destination within said main ring, and each first gateway being responsive to a particular time slot within said interchange frame for converting a block of information residing in said particular slot into outgoing electrical signals;

at least one subsidiary ring having n first nodes, no more than n−2 of which each contain a second gateway, each second gateway converting incoming electrical signals into a block of optical information synchronized to an interchange frame associated with said subsidiary ring so that said block resides in a time slot within the interchange frame associated with a destination within said subsidiary ring, and each second gateway being responsive to a particular time slot within said interchange frame for converting a block of information residing in said particular slot into outgoing electrical signals; wherein the improvement comprises:

at least two third gateways each shared by one of the m and n nodes lacking first and second gateways, respectively, each third gateway linked by second optical fiber links to a pair of first gateways in daisy chain fashion to complete said main ring and the third gateways linked by third optical fiber links to at least one second gateway in a daisy chain fashion to complete said subsidiary ring, each third gateway converting a block of information destined for that gateway into corresponding electrical signals, and at least one third gateway transferring a block of information for another gateway in another ring by transferring the block from its current time slot in its current interchange frame to a time slot in an interchange frame associated with the destination of said block; and

a master controller for controlling the first, second and third gateways.

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5,742,775

## METHOD AND APPARATUS OF CREATING FINANCIAL INSTRUMENT AND ADMINISTERING AN ADJUSTABLE RATE LOAN SYSTEM

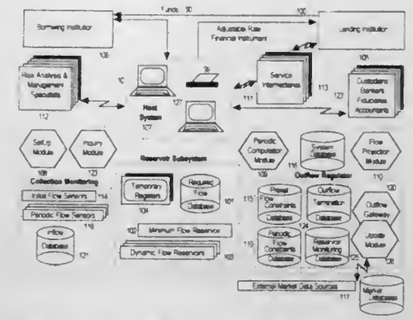
Douglas L. King, 6604 Covehollow Rd., Oklahoma City, Okla. 73123

Filed Jan. 18, 1995, Ser. No. 374,017
Int. Cl.[6] G11B *17/60*
U.S. Cl. 395—238 135 Claims

1. A system employing operatively interconnected data processing and computing means for creating, servicing and paying loan agreements between a lender and borrower providing for repayment of the loan together with interest at a periodically adjusted rate based on the terms of the agreement, said system comprising:

means for inputting and storing the negotiated terms and conditions of a loan agreement with an identified lender into a system database which include at least a principal balance of the loan and the term, an initial period interest rate, compounding and interest rate crediting dates, terms for determining a formula interest rate applicable for a given period of time based at least in part on at least one publicly available external benchmark, and at least one of a life-time maximum interest rate, a maximum periodic interest rate, a life time minimum, a periodic minimum interest which rates can include a performance-based benchmark rate;






means accessible to the system database for issuing the loan agreement with constraints comprising the agreed terms and conditions;

means accessible to the system database for creating and storing in at least one further database a loan account for each loan agreement;

means for computing, allocating and storing in at least one of said databases, initial balances relating to each loan account for at least a bálance account, a payment account, a purpose account and a computational account;

means for inputting said external benchmark into the system database;

means accessible to said databases for computing the periodically adjustable interest rate for the next ensuing interest period as a function of a calculated formula interest rate based on the external benchmark and the constraints of the loan agreement;

means accessible to the databases for periodically calculating and reallocating balances in the balance account between at least one of a number of accounts which include the payment account, each purpose account and the computational account based on the terms of each loan agreement stored in the at least one further database;

means accessible to the databases for monitoring and displaying each loan balance account based upon preestablished parameters governing the amount of the loan balance as derived from said databases;

means for inputting into one of said databases expenses related to each loan account in said at least one further databases;

means accessible to the databases for determining the amount and date for payments to be made on each loan account based on information stored in said databases as governed by the terms and conditions of the loan agreement which optionally may include means accessible to said databases for projecting the discounted value of the principal and minimum interest and comparing it with the present loan balance and means accessible to said databases for determining and displaying whether to elect acceleration of the loan repayment as a function of said comparison and other information stored in said databases within constraining limits of the terms of the loan agreement; and

means for the determination of and storage in at least one of said databases of the accreting balance of each loan account derived from information previously stored in said databases.

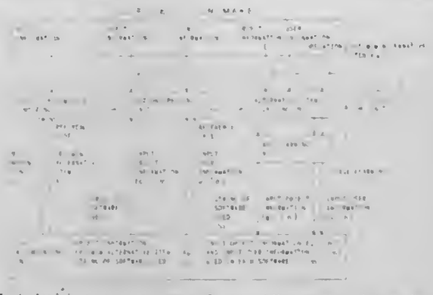
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5,742,776

## DECISION SUPPORT SYSTEM

Mitsuhiko Toda, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 12, 1995, Ser. No. 527,218
Claims priority, application Japan, Sep. 13, 1994, 6-218403
Int. Cl.[6] G06F *17/60*
U.S. Cl. 395—201 13 Claims



1. A decision support system for providing support in making a decision according to information about an object on which the decision is to be made, comprising:

alternative item selecting means for receiving object information about the object on which the decision is to be made, evaluating input object information by at least one set of specified software, and outputting an evaluation result or an alternative item based on the evaluation result;

case accumulating means for accumulating and storing the object information for each case on which the decision was made by said alternative item selecting means;

object information comparing means for receiving input information about a new object on which a decision is to be made, comparing the input information with the object information about each case accumulated in said case accumulating means, and selecting a case whose object information is similar to that of the new object; and

output means for outputting the evaluation result of a similar case as the evaluation result of the new object on which the decision is to be made.

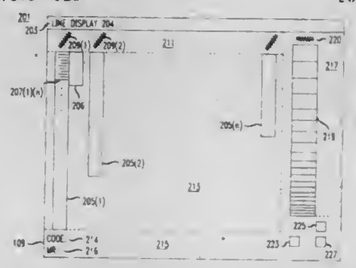
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5,742,777

## APPARATUS FOR SELECTIVE SIMULTANEOUS DISPLAY OF INFORMATION ABOUT PLURALITY OF ENTITIES

Stephen G Eick, Naperville, Ill., assignor to Lucent Technolngies Inc., Murray Hill, N.J.

Continuation of Ser. No. 802,912, Dec. 6, 1991, abandoned.
This application Aug. 26, 1994, Ser. No. 296,612
Int. Cl.[6] G06F *17/27*
U.S. Cl. 395—326 50 Claims




1. Apparatus in a system including a data processor for visibly displaying on a display information about subentities, the subentities contained in a plurality of entities, the information including non-location information and location information about a location

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of a subentity within a corresponding entity, the display driven by the data processor, the apparatus comprising:

a plurality of entity representation means, each of the entity representation means visibly representing on the display one of the plurality of entities;

a plurality of subentity representation means provided within each of the entity representation means for visibly representing the plurality of subentities, one subentity representation means provided for each of the plurality of subentities, a location of each subentity representation means within the corresponding entity representation means providing the location information, each of the plurality of subentity representation means being individually and simultaneously visible and being separately and individually selectable;

selection means for individually selecting one of the subentity representation means displayed on the display; and

information display means, which is associated with the plurality of entity representation means and which is distinct from the entity representation means, for responding to the selection means and for displaying the non-location information about the subentity whose subentity representation means is selected by the selection means.

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**5,742,778**

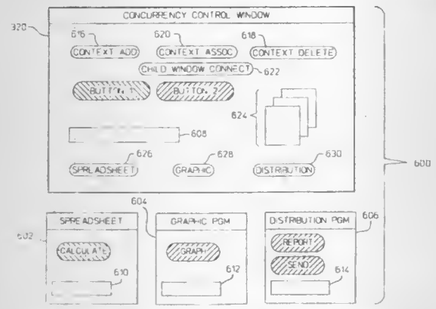
**METHOD AND APPARATUS TO SENSE AND MULTICAST WINDOW EVENTS TO A PLURALITY OF EXISTING APPLICATIONS FOR CONCURRENT EXECUTION**

**Ming C. Hao, Los Altos Hills; Alan H. Karp, Sunnyvale, and Vineet Singh, Mountain View, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 113,790, Aug. 30, 1993, abandoned. This application Feb. 16, 1996, Ser. No. 602,386**

**Int. Cl.[6] G06F** *3/14*

**U.S. Cl. 395—332** **21 Claims**




**1**. In a computer system running a plurality of mutually independent application programs each having an associated window on a display screen, each such program being unaffected by events that occur outside its associated window, an improvement that enables the computer system to multicast window events to the application programs, the improvement comprising:

a global control program running in the computer system, the global control program responsive to a command from a user of the computer system to designate a plurality of the application programs to receive incoming window events, and

a global control window on the display screen, the global control program operative only when the global control window is active to receive an incoming window event in the global control window and to multicast the incoming window event to the windows associated with the designated application programs.

**5,742,779**

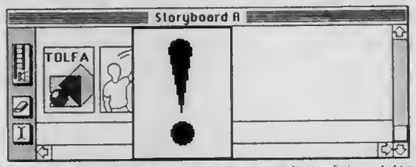
**METHOD OF COMMUNICATION USING SIZED ICONS, TEXT, AND AUDIO**

**Richard D. Steele, Palo Alto; Robert F. Gonsalves, Pleasanton, and Larry J. Leifer, Stanford, all of Calif., assignors to Tolfa Corporation, Palo Alto, Calif.**

**Continuation of Ser. No. 458,851, Jun. 2, 1995, abandoned, which is a continuation of Ser. No. 791,938, Nov. 14, 1991, abandoned. This application Apr. 3, 1996, Ser. No. 627,051**

**Int. Cl.[6] G06F** *3/00*

**U.S. Cl. 345—349** **20 Claims**




2. Cursor disappears. Icon and enclosed image both enlarge for specified period of time in our software, enlargement = 2x2, for period of ca 3 seconds

**1**. A method of communicating to a user of a computer with a display means and a pointing device for visually indicating a position, through a cursor means, on the display means, said method comprising the steps of:

generating a plurality of icons, each icon being actively manipulatable by the user;

displaying the plurality of icons on the display means;

moving the cursor means on the display means by the user through the pointing device to a desired one of said plurality of icons, said desired one icon, having a first size, and a first spatial orientation of an image, is displayed at a desired location on said display means;

actively manipulating said desired one icon;

displaying a first representation of said desired one icon in place of said desired one icon, said first representation of said desired one icon having a second size larger than said first size of said desired icon, and having said first spatial orientation of said image, and then

resuming the display of the plurality of icons, excluding said desired one icon, with a second representation of said desired one icon, having a third size which is smaller than said second size and larger than said first size, replacing said first representation of said desired one icon, on the display means.

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**5,742,780**

**DUAL PIPELINE SUPERSCALAR REDUCED INSTRUCTION SET COMPUTER SYSTEM ARCHITECTURE**

**Robert L. Caulk, Jr., Livermore, Calif., assignor to LSI Logic Corporation, Calif.**

**Continuation of Ser. No. 540,336, Oct. 6, 1995, Pat. No. 5,603,047. This application Jan. 16, 1997, Ser. No. 783,810**

**Int. Cl.[6] G06F** *9/30*

**U.S. Cl. 395—382** **12 Claims**

**1**. A microprocessor comprising

a bus interface unit for interfacing with an external memory and other system components for the flow of instructions and data,

an instruction scheduling unit coupled to said bus interface unit for receiving and decoding program instructions, said instruction unit including a queuing stage for facilitating conditional branch operations;

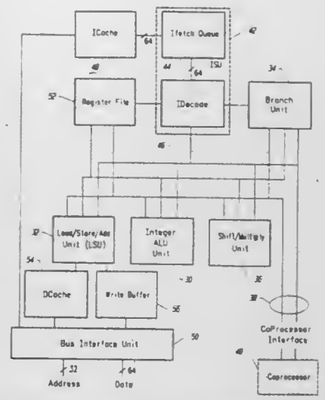
a register file including a plurality of general purpose registers for receiving operands from said instruction scheduling unit and providing operands to execution units,

a data cache,

a write buffer, and

a plurality of execution units,






all of said units operating in a dual pipeline configuration for concurrent fetching of two instructions from a single instruction stream.

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**5,742,781**

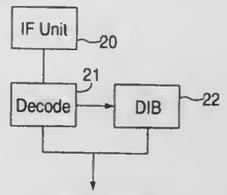
**DECODED INSTRUCTION BUFFER APPARATUS AND METHOD FOR REDUCING POWER CONSUMPTION IN A DIGITAL SIGNAL PROCESSOR**

**Raminder Singh Bajwa, Milpitas, Calif., assignor to Hitachi America, Ltd., Tarrytown, N.Y.**

**Filed Aug. 9, 1996, Ser. No. 694,669**

**Int. Cl.[6] G06F** *9/30; 1/32*

**U.S. Cl. 395—384** **17 Claims**




**1**. A low-power, integrated circuit digital signal processor comprising:

an arithmetic logic means having data inputs and data outputs, for performing decision making, arithmetic logic operations and data manipulation;

an array of data memory means having address inputs and data inputs and outputs, for storing data operands in different locations within said data memory means;

an address generation means having address outputs coupled to the address inputs of said data memory means, for generating addresses to access different storage locations within said data memory means;

an array of program memory means having address inputs and data inputs and outputs for storing instruction words in different locations within said instruction memory means; and

a program control means having address outputs coupled to address inputs of said program memory, and data inputs coupled to the data outputs of said program memory means for accessing, storing and retrieving instruction words from said program memory means;

wherein said program control means includes an instruction fetching means for retrieving the instruction words, a variable decoder means for decoding the instruction words into control signals and operands, and a decoded instruction buffer means for storing decoded instruction words therein to avoid repeatedly fetching and decoding instruction words when executing program loops; said variable decoder means selectively storing decoded instruction words in said decoded instruction buffer or selectively outputting decoded instruction words for execution of the control signals and operands.

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**5,742,782**

**PROCESSING APPARATUS FOR EXECUTING A PLURALITY OF VLIW THREADS IN PARALLEL**

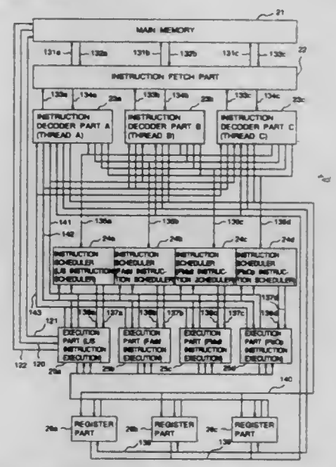
**Motohisa Ito, Kokubunji, and Eiki Kamada, Hadano, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 14, 1995, Ser. No. 422,220**

**Claims priority, application Japan, Apr. 15, 1994, 6-102275**

**Int. Cl.[6] G06F** *9/38*

**U.S. Cl. 395—386** **2 Claims**




**1**. An information processing apparatus for processing m (m being one or more) of instruction streams of long instructions each having n (n being one or more) of operational fields classified according to operation types and arranged to cause operational instructions within one of the operational fields to be independent of operational instructions within the other operational fields, comprising:

m of instruction decoders;

n of instruction schedulers provided to correspond in number to said operation types for receiving operational instructions issued from the instruction decoders;

execution parts provided to correspond to said n instruction schedulers for executing operational instructions issued from the corresponding instruction schedulers; and

register parts,

wherein each of said instruction decoders includes an instruction buffer for storing therein the long instruction, judgement means for judging a register data dependent relationship and resource competition between the long instruction in execution and the long instruction within said instruction buffer, and means for dividing the long instruction within the instruction buffer into operational instructions and for controlling issuance of the divided operational instructions to said corresponding instruction scheduler even when execution of all the operational instructions within the long instruction in execution is not completed yet,

wherein each of said instruction schedulers includes an instruction scheduler buffer for holding the operational instructions issued from said instruction decoder and means for selecting one of the operational instructions to be sent to the execution part among the operational instructions held in the instruction scheduler buffer and for controllably sending the selected operational instruction to the execution part together with the instruction stream number, and

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wherein each of said execution parts includes operational instruction execution means for executing the operational instructions received from said instruction scheduler, means for receiving and holding the instruction stream number received from the instruction scheduler, means for controlling operation of said operational instruction execution means on the basis of the received operational instruction and instruction stream number, and means for informing said instruction decoder and instruction scheduler of a state of said operational instruction execution means.

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**5,742,783**

## SYSTEM FOR GROUPING INSTRUCTIONS FOR MULTIPLE ISSUE USING PLURAL DECODERS HAVING FORWARD AND BACKWARD PROPAGATION OF DECODING INFORMATION

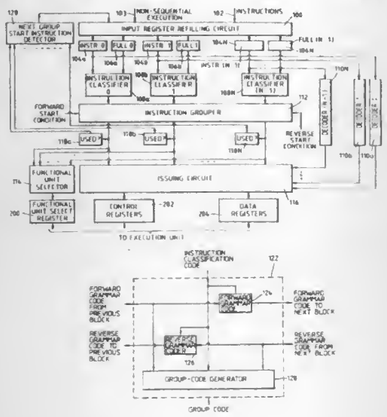
**Saeid Azmoodeh; Peter Malcolm Keith Boffey; Richard Matthew Forsyth, and Brian Jeremy Parsons, all of Bristol, England, assignors to Inmos Limited, England**

**Continuation of Ser. No. 809,966, Dec. 18, 1991, abandoned. This application Aug. 22, 1994, Ser. No. 293,574**

**Claims priority, application United Kingdom, Dec. 21, 1990, 9027853**

**Int. Cl.[6] G06F *9/30***

**U.S. Cl. 395—388** **20 Claims**



1. A method of executing a plurality of instructions in a computer system having a program formed by a plurality of said instructions, in which each instruction is executed in an execution unit having a plurality of functional units, said method comprising:

effecting a pipelined sequence of (I) fetching and issuing instructions from memory, (II) decoding said instructions and (III) executing said instructions to run the program,

said method including dynamically scheduling the instructions for execution, as said program is run, by identifying a succession of separate instructions,

classifying each instruction in said succession dependent on said functional units required for the execution of that instruction, said classifying being carried out in the pipelined sequence after the instructions have been fetched and issued,

selecting a group of instructions from a plurality of instructions in said succession which according to their classification are compatible for simultaneous issue to the execution unit without conflicting demands on any functional unit in the execution unit,

decoding said group of instructions while retaining the separate identity of each instruction, and

passing said group simultaneously to the execution unit.

**5,742,784**

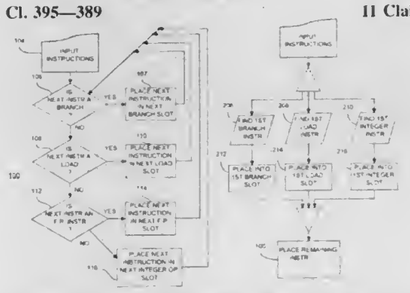
## SYSTEM FOR REORDERING OF INSTRUCTIONS BEFORE PLACEMENT INTO CACHE TO REDUCE DISPATCH LATENCY

**Terence Matthew Potter; John Stephen Muhich; Christopher Hans Olson, and Timothy Alan Elliott, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 25, 1995, Ser. No. 377,976**

**Int. Cl.[6] G06F *9/30***

**U.S. Cl. 395—389** **11 Claims**



1. A method for reducing the dispatch latency of instructions of a processor, the processor including a cache receiving the instructions and a plurality of execution units for receiving the instructions from the cache; the method consisting the steps of:

(a) reordering the instructions in a pre-dispatched format before the instructions enter the cache;

(b) storing information in the cache relating to the reordering of the instructions; and

(c) providing the reordered instructions to the appropriate execution units based upon the predetermined format.

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**5,742,785**

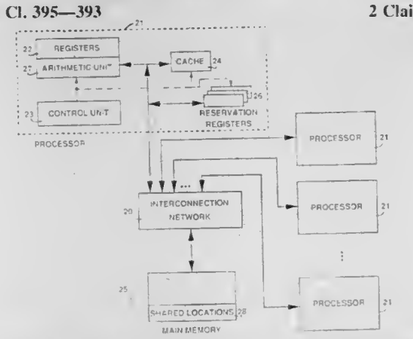
## POSTING MULTIPLE RESERVATIONS WITH A CONDITIONAL STORE ATOMIC OPERATIONS IN A MULTIPROCESSING ENVIRONMENT

**Harold Stuart Stone, and Janice Murphy Stone, both of Chappaqua, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 993,193, Dec. 18, 1992, abandoned. This application Nov. 20, 1995, Ser. No. 562,539**

**Int. Cl.[6] G06F *15/16;9/38***

**U.S. Cl. 395—393** **2 Claims**



1. A system of one or more computers in a multiprocessing environment, comprising:

one or more processors connected by an interconnection network to a main memory with one or more shared memory locations;

an arithmetic unit in each processor for calculating results;

a bank of one or more processor registers in each processor for storing calculated results;



a bank of more than one reservation register in each of one or more processors for reserving shared memory locations;

a control unit in each processor with control logic for controlling the arithmetic unit, processor registers, and reservation registers;

a cache memory for storing copies of the shared memory locations;

an address field, in each of the reservation registers, for storing the address of a shared memory location which will be reserved by the reservation register;

a validity field, in each of the reservation registers, for storing information indicating the validity of the reservation of the shared memory location;

a privilege field, in each of the reservation registers, for storing information indicating if the processor on which the reservation register resides has privilege to update the shared memory location of which the address is stored in the address field;

a data field, in each of the reservation registers, for storing modified results which are to update the shared memory location;

means for testing if each reservation in a designated set of reservations is valid during execution of a Write-if-Reserved instruction, the Write-if-Reserved instruction designating the designated set;

means for entering a commitment phase to atomically update the variables reserved by the designated set of reservations during the execution of the Write-if-Reserved instruction when all reservations are valid and the processors updating a set of two or more variables that have privilege to update those respective variables;

means for deferring the response to a request from a second processor for write privilege for access to an address of a reserved shared variable whose address is less than or equal to the last request for write privilege placed by a first processor when the first processor is executing a Write-if-Reserved instruction prior to entering the commitment phase;

means for deferring the response to a request from a second processor for write privilege for access to an address of a reserved shared variable when the first processor is executing a Write-if-Reserved instruction in its commitment phase; and

means for producing a deferred response to respond to a request, a first deferred response granting write privilege and all subsequent deferred responses associated with a same address of the first deferred response causing a receiving processor to rerequest.

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**5,742,786**

## METHOD AND APPARATUS FOR STORING VECTOR DATA IN MULTIPLE NON-CONSECUTIVE LOCATIONS IN A DATA PROCESSOR USING A MASK VALUE

**Michael G. Gallup; L. Rodney Goke; Robert W. Seaton, Jr., and Terry G. Lawell, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Division of Ser. No. 40,779, Mar. 31, 1993. This application Feb. 13, 1995, Ser. No. 389,512**

**Int. Cl.[6] G06F *12/00***

**U.S. Cl. 395—421.07** **24 Claims**

1. A data processor, comprising:

input means for receiving a first digital data value;

a memory storage circuit having a plurality of memory storage locations, each of the plurality of memory storage locations having a corresponding address and selectively storing one of a plurality of digital data values, a first memory storage location having a first address and storing the first digital data value, the memory storage circuit being coupled to the input means for receiving the first digital data value;

a pointer register for storing a first pointer value which corresponds to the first address, the pointer register being coupled to the memory storage circuit;

a mask register for storing a mask value, the mask value indicating a number of memory storage locations which receive and store the first digital data value, the mask register being coupled to the memory storage circuit; and

an increment circuit for incrementing the first pointer value by an increment value to provide an incremented pointer value, the incremented pointer value corresponding to a second address, the increment circuit being coupled to the pointer register for receiving the first pointer value;

wherein the increment value is generated using the mask value and wherein the first digital data value is stored in a second memory storage location corresponding to the second address when the mask value indicates that the number of memory storage locations which receive and store the first digital data value is greater than one, and wherein the first and second memory storage locations which store the first digital data value are non-consecutive if the increment value is greater than one.

| INPUT SEQUENCE FOR ILWR=$A | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| IDR | TIME | | | | | | | | | |
| | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_{10}$ |
| $00 | 10 | 10 | 10 | 10 | 14 | 14 | 14 | 14 | 14 | 14 |
| $01 | X | 23 | 23 | 23 | 23 | 44 | 44 | 44 | 44 | 44 |
| $02 | X | X | 57 | 57 | 57 | 57 | 89 | 89 | 89 | 89 |
| $03 | X | X | X | 128 | 128 | 128 | 128 | 87 | 87 | 67 |
| $04 | 10 | 10 | 10 | 10 | 14 | 14 | 14 | 14 | 14 | 14 |
| $05 | X | 23 | 23 | 23 | 23 | 44 | 44 | 44 | 44 | 44 |
| $06 | X | X | 57 | 57 | 57 | 57 | 89 | 89 | 89 | 89 |
| $07 | X | X | X | 128 | 128 | 128 | 128 | 87 | 87 | 67 |
| $08 | X | X | X | X | X | X | X | X | 32 | 32 |
| $09 | X | X | X | X | X | X | X | X | 17 | 17 |
| $0A | X | X | X | X | X | X | X | X | X | 11 |
| $0B | X | X | X | X | X | X | X | X | X | X |
| $0C | X | X | X | X | X | X | X | X | 32 | 32 |
| $0D | X | X | X | X | X | X | X | X | 17 | 17 |
| $0E | X | X | X | X | X | X | X | X | X | 11 |
| $0F | X | X | X | X | X | X | X | X | X | X |

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**5,742,787**

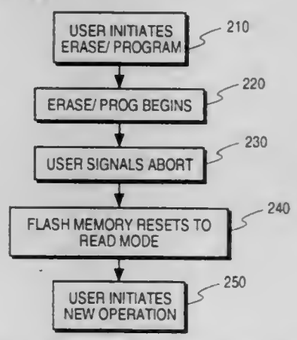
## HARDWARE RESET OF A WRITE STATE MACHINE FOR FLASH MEMORY

**Sanjay S. Talreja, Folsom, Calif., assignor to Intel Corporation, Santa Clara, Calif.**

**Filed Apr. 10, 1995, Ser. No. 419,357**

**Int. Cl.[6] G06F *12/00***

**U.S. Cl. 395—430** **17 Claims**




1. A method of aborting an automated write sequence in a memory device, the method comprising the steps of:

(A) commencing the write sequence upon receipt of a command, wherein the write sequence includes a plurality of operations being performed by a write state machine on a nonvolatile memory array of the memory device;

(B) detecting an abort signal during each operation of the write sequence, the abort signal capable of being in one of a first and second state;

(C) halting the write sequence by ramping down a write voltage supplied to the nonvolatile memory array if the write state machine detects the abort signal in the first state, and continuing with the write sequence if the write state machine detects the abort signal in the second state; and

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(D) placing the nonvolatile memory array in a read-only mode if the abort signal is in the first state.

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**5,742,788**

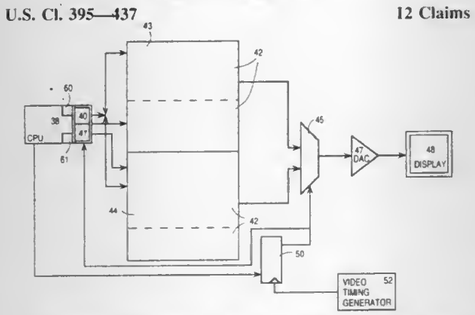
## METHOD AND APPARATUS FOR PROVIDING A CONFIGURABLE DISPLAY MEMORY FOR SINGLE BUFFERED AND DOUBLE BUFFERED APPLICATION PROGRAMS TO BE RUN SINGLY OR SIMULTANEOUSLY

**Curtis Priem, Fremont; Chris Malachowsky, Santa Clara; Bruce McIntyre, Cupertino, and Guy Moffat, Palo Alto, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.**

**Continuation of Ser. No. 736,104, Jul. 26, 1991, abandoned. This application Jun. 27, 1994, Ser. No. 266,095**

**Int. Cl.[6] G06F** *12/06*

**U.S. Cl. 395—437** **12 Claims**




1. A method for arranging a video random access memory array to provide a plurality of frame buffers for an output display by which single buffered and double buffered applications may be run singly or simultaneously, said method comprising the steps of:

configuring said memory array to form a plurality of frame buffers depending upon which applications are running, said configuring step comprising the steps of:

configuring said memory array to form a single frame buffer if only single buffer applications are running;

configuring said memory array to form a first visible frame buffer and a second visible frame buffer if one double buffered application is running;

configuring said memory array to form a receive frame buffer to receive data and a transmit frame buffer to transmit data if a plurality of double buffered applications are running;

writing data to said memory array depending upon whether said applications are single or double buffered, said writing data step comprising the steps of:

writing to said single frame buffer if only single buffer applications are running;

simultaneously writing single buffered application data to both of said frame buffers when double buffered applications are running;

selecting data to be furnished to said output display from said frame buffers, said selecting data step comprising the steps of:

selecting data from said single frame buffer when only single buffer applications are running;

selecting data from the frame buffer, of said first and second visible frame buffers, to which no data is being written when one double buffered application is running;

selecting data from said transmit frame buffer when a plurality of double buffered applications are running.

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**5,742,789**

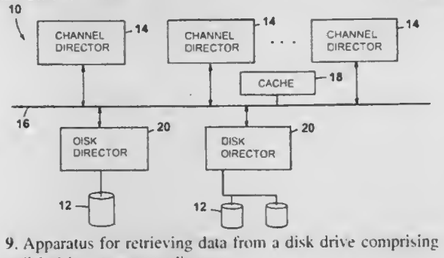
## DYNAMICALLY ADAPTIVE DATA RETRIEVAL FOR A DISK DRIVE STORAGE SYSTEM

**Erez Ofer; Natan Vishlitzky, both of Brookline, and John Fitzgerald, Mansfield, all of Mass., assignors to EMC Corporation, Hopkinton, Mass.**

**Filed Dec. 28, 1995, Ser. No. 579,811**

**Int. Cl.[6] G06F** *12/00*

**U.S. Cl. 395—438** **18 Claims**




9. Apparatus for retrieving data from a disk drive comprising

a disk drive storage medium,

a data cache,

a disk director for responding to a request in said data cache for retrieving data from the disk drive and delivering the data to the data cache,

a host processor for initiating a read request to a channel director,

a channel director for responding to the read request for sending a data request to said data cache, said data request including a start parameter value, the location of the requested data file and the length of the data file, and responding to a start data read message in said data cache for initiating the reading of said data file from said data cache,

said disk director responding to said start parameter value and the length of the data file for placing said start data read message in said data cache when an amount of the data file corresponding to said parameter value and said data file length has been placed in said data cache, and

said channel director adaptively changing said start parameter value in response to a determined "success" rate.

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**5,742,790**

## DETECTION CIRCUIT FOR IDENTICAL AND SIMULTANEOUS ACCESS IN A PARALLEL PROCESSOR SYSTEM WITH A MULTI-WAY MULTI-PORT CACHE

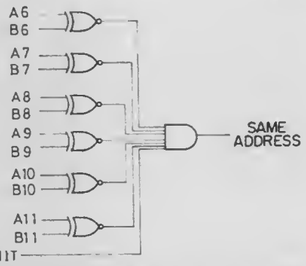
**Takashi Kawasaki, Machida, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 873,127, Apr. 24, 1992, abandoned. This application Apr. 4, 1995, Ser. No. 416,475**

**Claims priority, application Japan, Apr. 24, 1991, 3-094068**

**Int. Cl.[6] G06F** *12/08*

**U.S. Cl. 395—455** **4 Claims**




1. A detection circuit for identical and simultaneous access in a parallel processor system having a plural set of WAYs, comprising:

a cache memory having multiple ports and a plurality of storage locations for storing data, said cache memory generating a SAME WAY HIT signal indicating that an access on one of said multiple ports of said cache memory and a simultaneous access on another of said multiple ports of said cache memory are made to a same one of said plural set of WAYs in said cache memory;

address supply means for sending memory address signals to said cache memory through each of said multiple ports, each of said memory address signals including a tag address signal, a set address signal, and an in-block address signal;

means for retrieving corresponding set address signals from each of said memory address signals provided by said address supply means; and

a control signal generating circuit configured to receive said corresponding set address signals from said retrieving means and said SAME WAY HIT signal from said cache memory, said control signal generating circuit including a logic circuit for comparing said corresponding set address signals to obtain comparison signals, and an AND gate for taking a logical product of said comparison signals and said SAME WAY HIT signal so as to create a control signal that is output to said cache memory and which indicates whether or not one of said plurality of storage locations in said cache memory is accessed through at least two of said multiple ports.



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**5,742,791**

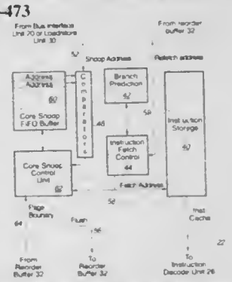
## APPARATUS FOR DETECTING UPDATES TO INSTRUCTIONS WHICH ARE WITHIN AN INSTRUCTION PROCESSING PIPELINE OF A MICROPROCESSOR

**Rupaka Mahalingaiah, and Gerald D. Zuraski, Jr., both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

**Filed Feb. 14, 1996, Ser. No. 601,618**

**Int. Cl.[6] G06F** *12/08;9/38*

**U.S. Cl. 395—473** **12 Claims**




1. An apparatus for snooping updates to instructions which are within an instruction processing pipeline of a microprocessor, comprising:

a first bus configured to convey a first address indicative of a first memory location which is being updated;

an instruction storage for storing a plurality of instructions, wherein said instruction storage is divided into a plurality of cache lines into which said plurality of instructions are stored, and wherein a cache line comprises a particular number of consecutive instruction bytes;

a buffer configured to store a plurality of addresses, wherein each one of said plurality of addresses identifies at least two consecutive cache lines of instructions, and wherein said plurality of addresses encompasses memory locations corresponding to a second plurality of instructions which are within said instruction processing pipeline;

a plurality of comparators coupled to said first bus and to said buffer such that each one of said plurality of comparators receives one of said plurality of addresses, wherein said plurality of comparators are configured to compare a subset of said first address to said plurality of addresses, and wherein said plurality of comparators are configured to assert signals indicating that the comparison indicates equality; and

a control unit coupled to said buffer, and to said plurality of comparators, wherein said control unit is configured to store each one of said plurality of addresses into said buffer when at least one instruction encompassed by said one of said plurality of addresses is dispatched into said instruction processing pipeline.

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**5,742,792**

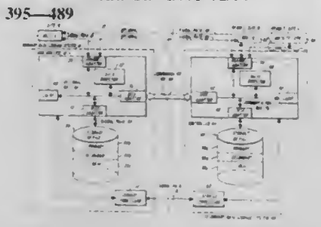
## REMOTE DATA MIRRORING

**Moshe Yanai; Natan Vishlitzky, both of Brookline; Bruno Alterescu, Newton; Daniel D. C. Castel, Framingham; Gadi G. Shklarsky, Brookline, and Yuval Y. O. Ofek, Hopkinton, all of Mass., assignors to EMC Corporation, Hopkinton, Mass.**

**Continuation-in-part of Ser. No. 52,039, Apr. 23, 1993, Pat. No. 5,544,347. This application May 28, 1996, Ser. No. 654,511**

**Int. Cl.[6] G06F** *12/16*

**U.S. Cl. 395—489** **38 Claims**



1. A system for automatically providing remote copy data storage, said system comprising:

a host computer;

a first data storage system including at least a first data storage system controller and at least one data storage device, said first data storage system being coupled to said host computer for storing data to be accessed by at least said host computer;

a second data storage system including at least a second data storage system controller and at least one data storage device, said second data storage system being remotely coupled to said first data storage system for copying of said data to said second data storage system controller; and

said first data storage system controller coordinating and controlling the copying of said data to said second data storage system controller wherein said first data storage system maintains an index, said index including at least a first indicator providing an indication of whether a predetermined data element stored on said first data storage system is valid, a second indicator providing an indication of whether said predetermined data element stored on said second data storage system is valid, a third indicator providing an indication of whether a write is pending to said predetermined data element stored on said first data storage system, and at least a fourth indicator providing an indication of whether a write is pending to said predetermined data element stored in said second data storage system.

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**5,742,793**

## METHOD AND APPARATUS FOR DYNAMIC MEMORY MANAGEMENT BY ASSOCIATION OF FREE MEMORY BLOCKS USING A BINARY TREE ORGANIZED IN AN ADDRESS AND SIZE DEPENDENT MANNER

**Jay Sturges, Orangevale, and Greg Hibdon, Folsom, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.**

**Continuation of Ser. No. 809,784, Dec. 18, 1991, abandoned. This application Jul. 11, 1994, Ser. No. 273,367**

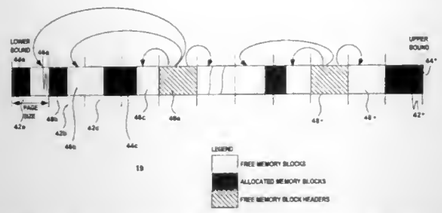
**Int. Cl.[6] G06F** *12/06*

**U.S. Cl. 395—497.01** **18 Claims**

1. In a computer system comprising a memory having a plurality of memory words, a memory addressing mode independent

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method for allocating and deallocating portions of said memory, said method comprising the steps of:

a) building a free memory block header binary tree consisting a plurality of free memory block headers corresponding to free memory blocks of a pool of memory words,

each of said free memory block headers comprising a starting address and a block size of the corresponding free memory block,

said free memory block headers being logically organized into node and leaf free memory block headers of the free memory block header binary tree in accordance with the free memory block headers' starting addresses and block sizes, wherein if a free memory block header is a predecessor free memory block header to a descendant free memory block header,

the block size of the predecessor free memory block header greater than the block size of the descendant free memory block header,

the starting address of the predecessor free memory block header is higher than the starting address of the descendant free memory block header if the descendant free memory block header is a left branch descendant free memory block header, and

the starting address of the predecessor free memory block header is lower than the starting address of the descendant free memory block header if the descendant free memory block header is a right branch descendant free memory block header;

b) allocating free memory blocks of said pool of memory words for memory requests using said free memory block header binary tree; and

c) deallocating said allocated memory blocks of said pool of memory words using said memory block header binary tree when said allocated memory blocks are no longer needed by said allocated memory blocks' allocated requestors.

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**5,742,794**

**EMULATION TECHNIQUES FOR COMPUTER SYSTEMS HAVING MIXED PROCESSOR/SOFTWARE CONFIGURATIONS**

**Bruce Potter, Austin, Tex., assignor to Dell USA, L.P., Austin, Tex.**

**Filed Oct. 13, 1995, Ser. No. 542,936**

**Int. Cl.[6] G06F *9/455***

**U.S. Cl. 395—500** **30 Claims**

**6**. A computer system, comprising:

a processor subsystem configured to recognize a first set of instructions;

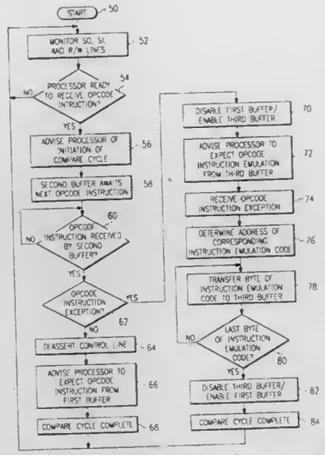
a software application comprised of a series of instructions, said series of instructions including at least one instruction which cannot be recognized by said processor subsystem;

means for propagating said series of instructions comprising said software application to said processor subsystem for execution;

a first memory device coupled to said processor subsystem;

a circuit, coupled to said processor subsystem, for propagating emulation code, recognizable by said processor subsystem and stored in said first memory device, in place of said at least one instruction;

wherein said circuit further comprises:




a second memory device in which first, second and third blocks of data are stored for each of said at least one instruction which cannot be recognized by said processor subsystem;

wherein said first data block uniquely identifies an instruction which cannot be recognized by said processor subsystem, said second data block provides a location within said first memory device and said third data block provides a data length.

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**5,742,795**

**METHOD OF INITIALIZING AND UPDATING A NETWORK MODEL**

**Reinhard Küssel, Schriesheim, Germany, assignor to ABB Patent GmbH, Mannheim, Germany**

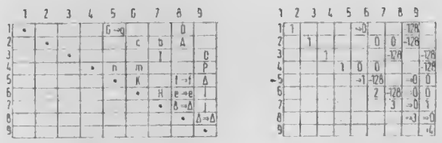
**Filed Dec. 4, 1995, Ser. No. 567,097**

**Claims priority, application Germany, Dec. 2, 1994, 44 42 963.0**

**Int. Cl.[6] G06F *7/52***

**U.S. Cl. 395—500** **4 Claims**

11



**1**. A method for initializing and updating a network model of an electrical energy power network processed in a data processing system, which comprises:

a) supplying a data processing system with static information in a form of topology data and dynamic data in a form of power and voltage measurement values as well as switch reports resulting in a network topology for illustrating a current network status in graph form and for latching purposes;

b) forming the network topology in the form of a network graph by applying and extending sparse vector methods and sparse matrix methods;

c) preparing captured network topology data of an electrical energy power network in the form of a terminal adjacence matrix and entering the network topology in the data processing system;

d) transforming the terminal adjacence matrix into an upper triangular matrix, with additional fictitious connecting branches being produced;



e) initializing the upper triangular matrix, with each element of the upper triangular matrix being initialized on a basis of an associated branch status; and

e1) initializing each element belonging to a switched-on branch, with a negative integer constant K not being able to become greater than zero through further processing steps; and

e2) initializing each element belonging to a switched-off or fictitious branch, with zero;

f) forming matrix products for all rows i (i=1 up to a maximum number of rows) of the upper triangular matrix from and excluding a diagonal according to the following rule: if elements i, j and i, k are not equal to zero, incrementing elements of points of intersection of a row and column fraction of the upper triangular matrix by 1, with the elements j and k being loop indices for all of the elements of the row concerned;

g) forming a path table from the upper triangular matrix, with the path table indicating an incident terminal index of a first element of a row differing from zero, for each row or each terminal of the upper triangular matrix;

h) updating the upper triangular matrix in the case of a change of the captured network topology data, being a change in status of a network branch, by the following measures:

h1) in the case of switching off a network branch:subtracting the constant K from the corresponding current (=previous) value of the matrix element;

h1.1) if this element becomes zero as a result, decrementing by 1 the elements of all of the points of intersection of the upper triangular matrix of this row and column element with all of the other elements not equal to zero of the associated row or column, to the right of or beneath the diagonal;

repeating the step h1.1) for further elements if they become zero as a result;

h2) in the case of switching on a network branch: adding the constant K to the current value of the matrix element;

h2.1) if this element becomes K or, for further repetitions, becomes 1 as a result, incrementing by 1 the elements of all of the points of intersection of the upper triangular matrix of this row and column element with all of the other elements not equal to zero of the associated row or column, to the right of or beneath the diagonal;

repeating the step h2.1) for elements if they become 1 as a result;

i) updating the path table in accordance with step g);

j) identifying components of the network graph using the path table, with the first terminal index of the table being taken as a basis for assigning the same component identification to all of the terminals of an associated subpath; if an already allocated identification occurs when running through further subpaths (due to encountering a component which has already been assigned an identification), assigning the identification to the subpath being run through at that time; and breaking down the network graph into subgraphs in a manner corresponding to the number of the identifications allocated for assisting in trouble shooting the electrical energy power network.

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**5,742,796**

**GRAPHICS SYSTEM WITH COLOR SPACE DOUBLE BUFFERING**

**Philip Huxley, Chessington, England, assignor to 3Dlabs Inc. Ltd., Hamilton, Bermuda**

**Filed Mar. 24, 1995, Ser. No. 409,748**

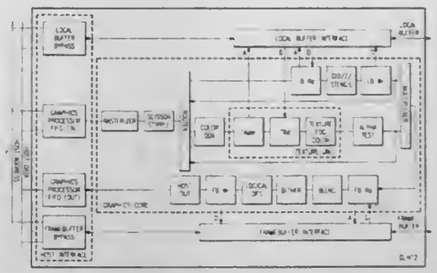
**Int Cl.[6] G06F *15/16***

**U.S. Cl. 395—502** **23 Claims**

**1**. A graphics system, comprising:

one or more processor units connected to receive commands from an input, to perform graphics computations, and to write pixel data into a frame buffer;

said frame buffer having a predetermined number of data bits per pixel;



wherein said processor units are programmable to selectably perform operations which include

writing pixel data with said predetermined number of bits into pixel locations of said frame buffer, or

writing pixel data with half or fewer of said predetermined number of bits into a moiety of the bits of pixel locations of said frame buffer, or

writing pixel data with half or fewer of said predetermined number of bits identically into two moieties of the bits of pixel locations of said frame buffer.

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**5,742,797**

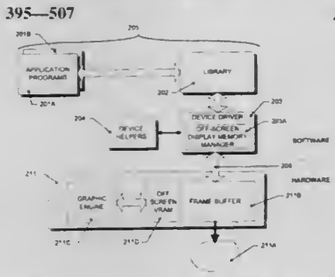
**DYNAMIC OFF-SCREEN DISPLAY MEMORY MANAGER**

**Joseph Celi, Jr., Boynton Beach; Roger Louie, Deerfield Beach, and Jonathan Mark Wagner, Coral Springs, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 11, 1995, Ser. No. 513,710**

**Int. Cl.[6] G06T *1/60***

**U.S. Cl. 395—507** **21 Claims**




**1**. A method of allocating and deallocating off-screen display memory in a computer system, comprising the steps of:

A. receiving a request for a region of off-screen display memory to store a digitized image data;

B. traversing a linked list data structure of off-screen display memory regions organized from a smallest-sized region to a largest-sized region to select a region of unallocated off-screen display memory large enough to store the digitized image data;

C. storing the digitized image data in the selected region;

D. updating the linked list data structure to indicate that the selected region of off-screen display memory is now allocated; and

E. recomputing the various combinations for the remaining unallocated regions of the off-screen display memory and storing the new combinations in the linked list data structure and reorganizing the linked list data structure from a smallest-sized region to a largest-sized region.

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## 5,742,798

### COMPENSATION OF CHIP TO CHIP CLOCK SKEW

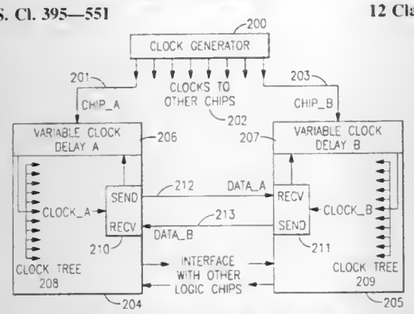
**Gottfried Andreas Goldrian, Boeblingen, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 12, 1996, Ser. No. 695,465**

**Claims priority, application European Pat. Off., Aug. 9, 1996, 96112880**

**Int. Cl.[6] G06F 1/12**

**U.S. Cl. 395—551** **12 Claims**




1. A method for synchronizing clocks of at least two chips in an information handling system, said clocks being accessible on each chip and delayable by variable clock delays,

where at least two of said chips are connected with inter-chip connections, and

wherein the method comprises the following steps:

a) choosing two chips A and B whose chip clocks are to be synchronized;

b) systematically varying said variable clock delays of chip A and/or chip B while repeating the following six steps:

b1) sending a signal from chip A to chip B;

b2) receiving the signal at chip B according to chip B's clock;

b3) sending back the received signal to chip A;

b4) receiving the signal at chip A according to chip A's clock;

b5) in case the number of clock cycles n(real) the signal needs for travelling from chip A to chip B and back to chip A undergoes a transition from a number, that is different from n(ideal), to a given number n(ideal): storing the delay where said transition has occurred as a first transition delay;

b6) in case the number of clock cycles n(real) the signal needs for travelling from chip A to chip B and back to chip A undergoes a transition from said given number n(ideal) to a number, that is different from n(ideal): storing the delay where said transition has occurred as a second transition delay; and

c) setting said variable clock delay of chip A and/or chip B to a delay value which is determined as a function of said first and said second transition delay.

## 5,742,799

### METHOD AND APPARATUS FOR SYNCHRONIZING MULTIPLE CLOCKS

**Michael Alexander; Carmine Nicoletta, and Arthur R. Piejko, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Feb. 18, 1997, Ser. No. 801,648**

**Int. Cl.[6] G06F 1/12**

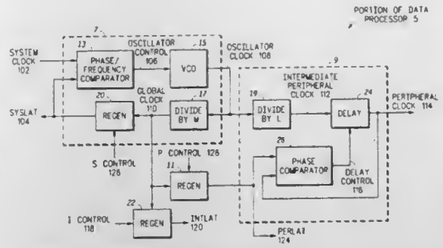
**U.S. Cl. 395—552** **20 Claims**

1. An apparatus for synchronizing multiple clocks, the apparatus comprising:

a voltage controlled oscillator that receives an oscillator control signal and generates an oscillator clock signal having frequency based on the oscillator control signal;

a first dividing block operably coupled to the voltage controlled oscillator, the first dividing block dividing the oscillator clock signal by a first integer to produce a global clock signal;

a first clock regeneration block operably coupled to the first dividing block, the first clock regeneration block receiving a system control signal, the first clock regeneration block producing a system clock latch signal based on the global clock signal and the system control signal;




a phase/frequency comparator operably coupled to the first clock regeneration block and the voltage controlled oscillator, the phase/frequency comparator receiving a system clock signal and comparing frequency and phase of the system clock signal with frequency and phase of the system clock latch signal to produce the oscillator control signal;

a second dividing block operably coupled to the voltage controlled oscillator, the second dividing block dividing the oscillator clock signal by a second integer to produce an intermediate peripheral clock signal;

a second clock regeneration block operably coupled to the first dividing block, the second clock regeneration block receiving a peripheral control signal and producing a peripheral clock latch signal based on the global clock signal and the peripheral control signal;

a phase comparator operably coupled to the second clock regeneration block, the phase comparator receiving a peripheral clock signal and comparing phase of the peripheral clock signal with phase of the peripheral clock latch signal to produce a delay control signal; and

a delay block operably coupled to the second dividing block and the phase comparator, the delay block delaying the intermediate peripheral clock signal based on the delay control signal to produce the peripheral clock signal such that the peripheral clock signal tracks phase of the global clock signal and phase of the system clock signal.

## 5,742,800

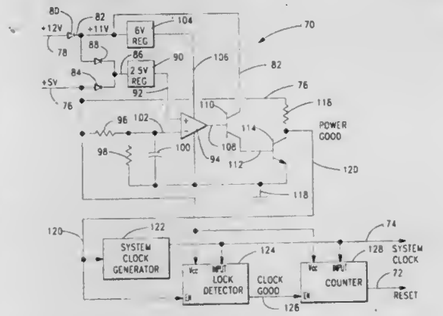
### DISC DRIVE RESET USING POWER VALID, CLOCKS VALID AND DELAY CRITERIA

**Monty A. Forehand, Yukon, Okla., assignor to Seagate Technology, Inc., Scotts Valley, Calif.**

**Filed Oct. 31, 1995, Ser. No. 550,714**

**Int. Cl.[6] G06F 1/04; 1/24**

**U.S. Cl. 395—555** **21 Claims**




1. An apparatus for providing a disc drive reset sequence, comprising:

detection means for detecting the presence of input voltage and providing a power good signal indicative of the input voltage attaining an acceptable voltage level;



system clock signal generation means, responsive to the power good signal, for generating a system clock signal comprising a series of clock pulses at a selected frequency;

system clock signal monitor means, responsive to the power good signal and the system clock signal, for monitoring the system clock signal and for providing a clock good signal to indicate that the system clock signal has achieved stable frequency operation within predetermined acceptance limits; and

timing means, responsive to the system clock signal and the clock good signal, for providing a timed delay by counting a predetermined number of clock pulses from the system clock signal in response to receipt of the clock good signal, the timing means further asserting a reset signal at the completion of the timed delay, the assertion of the reset signal indicative of a ready condition for the disc drive, wherein subsequent loss of an acceptable voltage level for the input voltage level results in deassertion of the reset signal and a suspension of normal disc drive operation, and wherein subsequent loss of stable frequency operation of the system clock signal results in deassertion of the reset signal and a suspension of normal disc drive operation.

## 5,742,801

### MICROPROCESSOR TO WHICH ADDITIONAL INSTRUCTIONS ARE ADDED AND INSTRUCTIONS ADDITION METHOD THEREOF

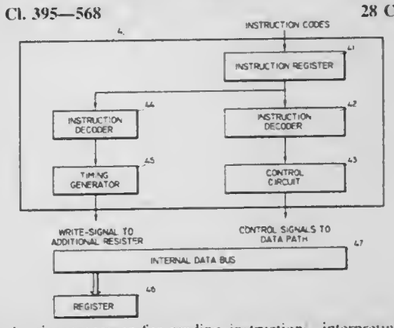
**Masanobu Fukushima, Sanda; Yukio Kadowaki, Nara, and Masanori Itoh, Osaka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Feb. 2, 1996, Ser. No. 595,765**

**Claims priority, application Japan, Feb. 2, 1995, 7-016274; Apr. 14, 1995, 7-089253; Jun. 7, 1995, 7-140540**

**Int. Cl.[6] G06F 11/00**

**U.S. Cl. 395—568** **28 Claims**




1. A microprocessor for reading instructions, interpreting said instructions, and executing said instructions, including an unrewritable register and an instruction generation unit, wherein said instruction generation unit comprises:

an instruction register for receiving additional instruction codes, which express additional instructions, from outside of said microprocessor and storing said additional instruction codes;

a first instruction decoder connected to said instruction register for decoding at least a part of said additional instruction codes and for generating decoded signals;

a control circuit connected to said instruction decoder for receiving said decoded signals and generating signals on the basis of said decoded signals for executing said additional instructions;

a second instruction decoder connected to said instruction register for decoding other parts of said additional instruction codes, for determining whether said additional instructions are load instructions and whether said additional instructions designate said unrewritable register as a destination register, and for generating an active signal if said second instruction decoder determines that said additional instructions are load instructions and designates said unrewritable register as a destination register;

a timing generator connected to said second instruction decoder for receiving said active signal and for generating a write-signal by a cycle of writing data into a destination register; and

an additional register connected to said timing generator through a data bus for storing said signals generated by said control circuit, on the basis of said write-signal.

## 5,742,802

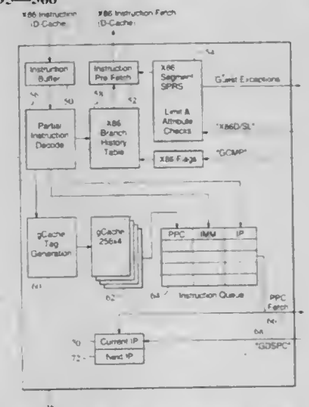
### METHOD AND SYSTEM FOR EFFICIENTLY MAPPING GUEST INSTRUCTION IN AN EMULATION ASSIST UNIT

**Ronald S. Harter; Gary Douglas Huber; Arturo Martin-de-Nicolas, all of Austin, Tex., and Seungyoon Peter Song, Los Altos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Feb. 16, 1996, Ser. No. 602,653**

**Int. Cl.[6] G06F 9/455**

**U.S. Cl. 395—568** **43 Claims**




1. An emulation assist unit for assisting a host processor in emulating a set of guest instructions using semantic routines, each of the semantic routines being stored at a specific address in memory, the emulation assist unit comprising:

a decoder for translating each of the guest instructions;

a tag generator coupled to the decoder for mapping each of the translated guest instructions to a tag; and

a cache coupled to the tag generator for storing the tag and the associated specific address; wherein the emulation assist unit causes the processor to execute the semantic routine located at the specific address.

## 5,742,803

### METHOD OF PERFORMING A COMPILATION PROCESS FOR DETERMINING A BRANCH PROBABILITY AND AN APPARATUS FOR PERFORMING THE COMPILATION PROCESS

**Yutaka Igarashi; Kohichiro Hotta; Masakazu Hayashi, and Manabu Matsuyama, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 396,590, Mar. 1, 1995, abandoned, which is a continuation of Ser. No. 113,907, Aug. 31, 1993, abandoned. This application Feb. 20, 1997, Ser. No. 803,376**

**Claims priority, application Japan, Mar. 8, 1993, 5-045609**

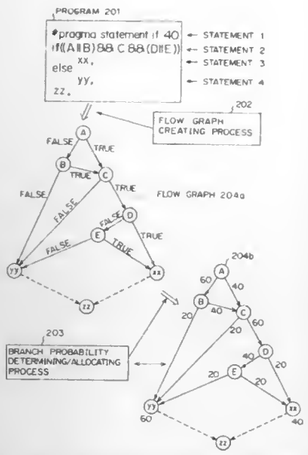
**Int. Cl.[6] G06F 9/00**

**U.S. Cl. 395—580** **13 Claims**

10. A compilation processing method for performing a translation process for a program including at least one branch statement,

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using initial branch probability information for the at least one branch statement, the at least one branch statement defining a plurality of conditional decisions, said compilation processing method comprising the steps of:

creating a flow graph by resolving the plurality of conditional decisions defined by the at least one branch statement into respective conditional decisions; and

determining branch probability information for each respective conditional decision in the flow graph based on the flow graph and the initial branch probability information to to obtain final branch probability information for the at least one branch statement.

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**5,742,804**

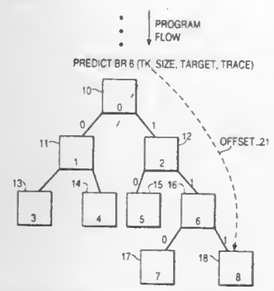
**INSTRUCTION PREFETCH MECHANISM UTILIZING A BRANCH PREDICT INSTRUCTION**

**Tse-Yu Yeh, Milpitas; Mircea Poplingher, Campbell; Kent G. Fielden, Sunnyvale; Hans Mulder, San Francisco; Rajiv Gupta, Los Altos; Dale Morris, Menlo Park, and Michael Schlansker, Los Altos, all of Calif., assignors to Institute for the Development of Emerging Architectures, L.L.C., Cupertino, Calif.**

**Filed Jul. 24, 1996, Ser. No. 685,607**

**Int. Cl.[6] G06F** *9/38*

**U.S. Cl. 395—584** **12 Claims**




1. A method of reducing instruction fetch penalty in the execution of a programmed sequence of instructions which includes branches, the method comprising the steps of:

(a) inserting at a location in the programmed sequence a branch predict instruction having an opcode that specifies a branch as taken or not taken, and a target address of the branch, and a trace vector of a path in the programmed sequence that leads to the target address from the branch predict instruction, the branch predict instruction ótherwise not affecting an architectural state of the microprocessor, and wherein the location precedes the branch by a predetermined number of instructions;

(b) prefetching a block of target instructions, starting at the target address of the branch, into an instruction cache of the microprocessor before the branch is encountered in the programmed sequence.

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**5,742,805**

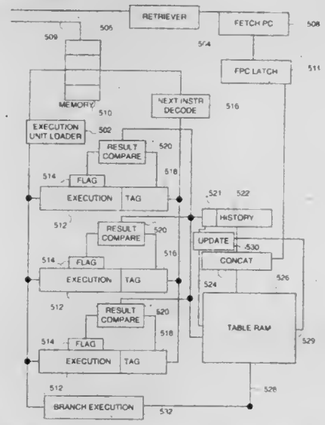
**METHOD AND APPARATUS FOR A SINGLE HISTORY REGISTER BASED BRANCH PREDICTOR IN A SUPERSCALAR MICROPROCESSOR**

**Paritosh M. Kulkarni, Campbell; Richard Reeve, Los Gatos, and Nirmal R. Saxena, Los Altos Hills, all of Calif., assignors to Fujitsu Ltd., Kawasaki, Japan**

**Filed Feb. 15, 1996, Ser. No. 601,744**

**Int. Cl.[6] G06F** *9/38*

**U.S. Cl. 395—586** **9 Claims**




1. An apparatus using one history register for a bunch of instructions, for predicting the direction of at least one conditional branch instruction in a bunch of a plurality of conditional branch instructions having at least one branch criteria and non-conditional branch instructions in a plurality of bunches of instructions, each bunch of instructions having a unique identifier, the apparatus having an output for indicating the direction predicted, the apparatus comprising:

a fetch program counter latch having an output, the fetch program counter latch for storing at least a portion of a unique identifier for the bunch of instructions;

a concatenator having a first input coupled to the fetch program counter latch and an output, the one history register comprising a shift register and having an output comprising a most-recently-shifted-in bit of the shift register and at least one additional bit of the shift register, the concatenator additionally comprising a second input coupled to the history register output;

an addressable storage device having a dam input, an address input coupled to the concatenator output and a data output coupled to the apparatus output, the addressable storage device containing at least one prediction indicator in at least one addressable storage location;

at least one register unit having an output and an input coupled to receive at least one instruction of the bunch of instructions and comprising an execution unit and at least one result compare, the result compare coupled to the execution unit and having an output coupled to the register unit output and being state selectable from a first state responsive to said instructions preceding a conditional branch instruction and having at least one branch criteria of said conditional branch instruction and a second state responsive to said instructions not preceding a conditional branch instruction or not having at least one branch criteria of a conditional branch instruction following said instruction;

a result compare latch coupled to the one history register for providing a state value to the one history register and having at least one input coupled to at least one register unit output, and an output being state selectable from a first state responsive to at least one of the result compare latch inputs being in the first state and a second state responsive to none of the result compare latch inputs being in the first state; and

an update unit having a first input coupled to the result compare latch output, a bunch of second inputs coupled to at least one of the addressable storage device data outputs and an output coupled to the addressable storage device data input and having a plurality of selectable states responsive to the first input and the second set of second inputs.

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**5,742,806**

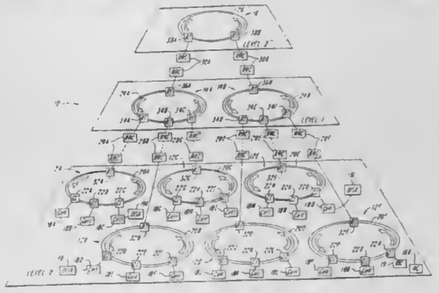
**APPARATUS AND METHOD FOR DECOMPOSING DATABASE QUERIES FOR DATABASE MANAGEMENT SYSTEM INCLUDING MULTIPROCESSOR DIGITAL DATA PROCESSING SYSTEM**

**David Reiner; Jeffrey M. Miller, both of Lexington, and David C. Wheat, Grafton, all of Mass., assignors to Sun Microsystems, Inc., Mountain View, Calif.**

**Filed Jan. 31, 1994, Ser. No. 189,497**

**Int. Cl.[6] G06F** *15/00;17/30*

**U.S. Cl. 395—600** **71 Claims**



1. A digital data processing system comprising:

A. a database table for storing data records in a plurality of independently accessible partitions, and a database management system (DBMS) coupled to said database table for accessing data records stored therein by any of a direct reference to said database table and to views thereof, said DBMS including a standard interface for receiving a query signal representative of a request for access to one or more selected data records and for applying that request to said stored data records to generate a result signal representative of the result thereof,

B. a parallel interface for intercepting, from an application, a selected query signal representative of a request for access to selected data records in said database table, said parallel interface including

i. a query decomposer for generating, from said intercepted query signal, a plurality of subquery signals, each representative of a request for access to data records stored in one or more respective partitions of said database table,

ii. a subquery processor coupled to said query decomposer for applying in parallel to said standard interface said plural subquery signals, and

iii. a result assembler, coupled to said standard interface, for responding to result signals generated thereby in response to application of said subquery signals for generating an assembled result signal representative of a response to said query signal.

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**5,742,807**

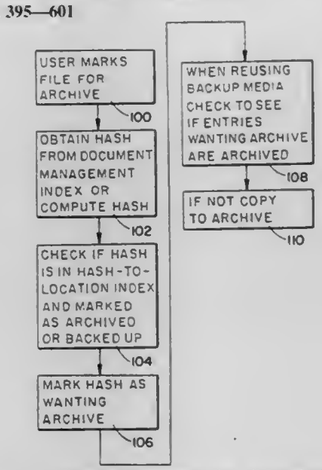
**INDEXING SYSTEM USING ONE-WAY HASH FOR DOCUMENT SERVICE**

**Larry M. Masinter, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.**

**Filed May 31, 1995, Ser. No. 455,605**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 395—601** **23 Claims**




1. An open document repository for electronically storing a plurality of documents comprising:

a file system for electronically storing an original document at an address location;

a document management index comprising a mapping between an attribute of the original document stored in the repository and a hash computed from the original document; and

a hash-to-location index interposed as a key link between the document management index and the file system comprising a mapping between the hash and the address location of the original document in the file system whereby the attribute points to the hash which points to the location for linking the attribute to the location for the documents stored in the repository.

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**5,742,808**

**ELECTRONIC FILING APPARATUS FOR RETRIEVING IMAGE INFORMATION FROM A STORAGE MEDIUM**

**Kamon Hasuo, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 307,034, Sep. 16, 1994, Pat. No. 5,572,726, which is a continuation of Ser. No. 76,684, Jun. 15, 1993, abandoned, which is a continuation of Ser. No. 477,470, Feb. 9, 1990, abandoned. This application Aug. 2, 1996, Ser. No. 691,589**

**Claims priority, application Japan, Feb. 9, 1987, 1-30794; Mar. 7, 1989, 1-54557; Mar. 7, 1989, 1-54558**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 395—601** **8 Claims**

1. A memory medium storing a program which, when loaded into a programmable apparatus, will cause the apparatus to perform an electronic filing method for retrieving desired image information from a storage medium storing a plurality of image information, said method comprising the steps of:

storing, in a storage medium, a plurality of index images and relation data representative of a relation between each of the plurality of index images and each of the plurality of image information, the index image being an image of a predetermined size, representative of an index for retrieving the image information stored in the storage medium, each of the index images being able to be used as the index of the plurality of

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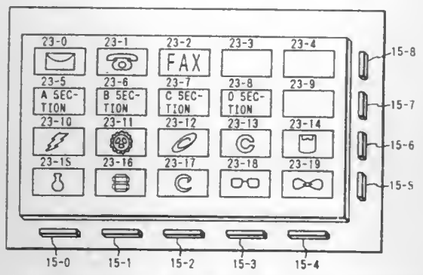



image information, and each of the index images being formed from an original image for formation of the index;

displaying, on a display means having a plurality of display locations, the index image read out from the storage means, at each of the display locations;

selecting at least one of the plurality of index images displayed at the display locations; and

retrieving more than one of the information stored in the storage medium based on the at least one of the index images selected in said selecting step and the relation data stored in the storage means.

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**5,742,809**

**DATABASE GENERIC COMPOSITE STRUCTURE PROCESSING SYSTEM**

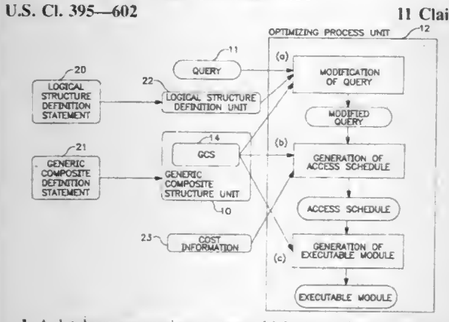
**Katsumi Hayashi, Mishima; Kazuhiko Saitou, Numazu; Hiroshi Ohsato, Numazu; Masaaki Mitani, Numazu; Tomohiro Hayashi; Takashi Obata, both of Mishima; Yutaka Sekine, Numazu; Mitsuhiro Ura, Suntou-gun, and Takuji Ishii, Numazu, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 427,713, Apr. 21, 1995, abandoned. This application Jul. 23, 1997, Ser. No. 899,150**

**Claims priority, application Japan, Aug. 31, 1990, 2-231448; Aug. 31, 1990, 2-231450**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 395—602** **11 Claims**




1. A database processing system which stores data expressed by a logical structure and generates an access schedule in response to a query expressed in said logical structure, said system comprising:

generic composite structure definition means for generating a corresponding generic composite structure definition between a plurality of logical structures and a plurality of composite structures using one of a simple mapping by making a logical structure correspond one-by-one to a composite structure, a multiple mapping by making a plurality of logical structures correspond to a composite structure, a column selection mapping by making a logical structure correspond to a plurality of composite structures, and an overlapping mapping by making a part of a logical structure correspond to a plurality of composite structures in common, or one of combinations of said simple mapping, said multiple mapping, said column selection mapping and said overlapping mapping; and

optimizing process means for modifying a query written in said logical structure according to said generic composite structure, generating an access schedule based on said modified query, and generating an executable module based on said access schedule.

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**5,742,810**

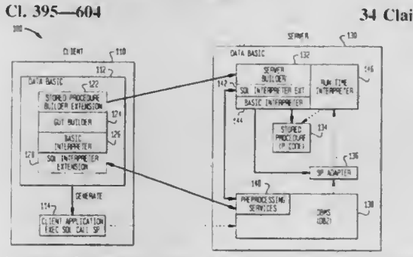
**SYSTEM, METHOD AND COMPUTER PROGRAM PRODUCT FOR PASSING HOST VARIABLES TO A DATABASE MANAGEMENT SYSTEM**

**John Shek-Luen Ng, San Jose; Frederick Thomas Sharp, Menlo Park; Mir Hamid Pirahesh, San Jose; I-Shin Andy Wang, San Jose; Gerald Herman Roth, San Jose, and Tak Ming Lo, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 31, 1995, Ser. No. 521,710**

**Int. Cl.[6] G06F** *17/00*

**U.S. Cl. 395—604** **34 Claims**




1. A system for passing arrays or structures as host variables to a stored procedure, comprising:

means for packing an array or structure into a large object;

means for sending said large object to a database management system, wherein said large object comprises a descriptor area and a data area; and

an adaptor, coupled to said database management system, for passing a reference to said data area to the stored procedure.

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**5,742,811**

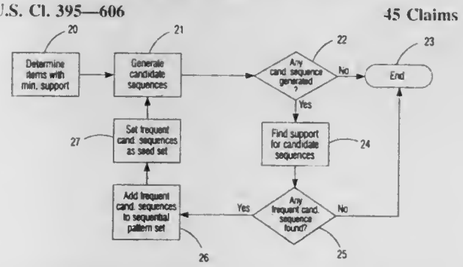
**METHOD AND SYSTEM FOR MINING GENERALIZED SEQUENTIAL PATTERNS IN A LARGE DATABASE**

**Rakesh Agrawal, and Ramakrishnan Srikant, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 10, 1995, Ser. No. 541,665**

**Int. Cl.[6] S06F** *17/30*

**U.S. Cl. 395—606** **45 Claims**




1. A method for identifying sequential patterns in data sequences stored in a database, each data sequence having a plurality of temporally-spaced transactions, each transaction being characterized by one or more items, the items having a taxonomy which defines descendant and ancestor relationships between the items, the method comprising the steps of:



determining the items having at least a minimum support, the support of an item being a number of data sequences that contain the item, the determined items initially making up a seed set;

generating candidate sequences, if any, from the seed set;

counting the support for the candidate sequences;

identifying those candidate sequences which are frequent, if any, a candidate sequence being frequent if it has at least the minimum support;

adding the frequent candidate sequences to an output set of sequential patterns; and

repeating the method steps starting with the generating step, using the just identified frequent candidate sequences as the seed set, until no candidate sequences are generated or no frequent candidate sequences are identified.

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**5,742,812**

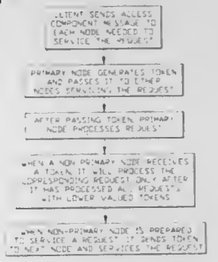
**PARALLEL NETWORK COMMUNICATIONS PROTOCOL USING TOKEN PASSING**

**Sandra Johnson Baylor, Ossining; Peter Frank Corbett, Scarsdale, both of N.Y., and Dror Gershon Feitelson, Jerusalem, Israel, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 28, 1995, Ser. No. 520,346**

**Int. Cl.[6] G06F** *13/00; 13/14*

**U.S. Cl. 395—608** **33 Claims**




1. A method for achieving atomic multicasting in a computer having a plurality of system nodes, comprising:

sending a first message from a first node to a first plurality of nodes that will receive the multicast message;

in a logical first of the first plurality of nodes that receive the message:

generating a token;

delivering the first message to an application; and

passing the token to a next system node;

in each node that is not the logical first of the first plurality of nodes that receive the message, delivering the first message to the application after such node has received the token, and if it is not the logical last of the first plurality of nodes, passing the token to a next system node.

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**5,742,813**

**METHOD AND APPARATUS FOR CONCURRENCY IN AN OBJECT ORIENTED DATABASE USING LOCK INHERITANCE BASED ON CLASS OBJECTS**

**Thomas S. Kavanagh; Christopher W. Beall, both of Boulder; William C. Heiny, Arvada; John D. Motycka, Evergreen; Samuel S. Pendleton, Louisville; Brooke E. Terpening, Golden, and Kenneth A. Traut, Boulder, all of Colo., assignors to CADIS, Inc., Boulder, Colo.**

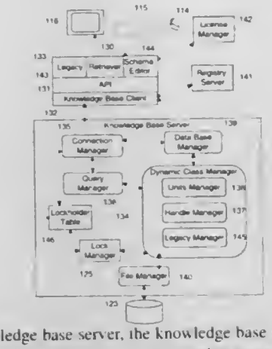
**Continuation-in-part of Ser. No. 339,481, Nov. 10, 1994. This application Sep. 12, 1995, Ser. No. 527,161**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 395—608** **2 Claims**

1. A network having a client/server architecture comprising:

a plurality of client applications;




a knowledge base server, the knowledge base server including a dynamic class manager, a connection manager, a query manager, a handle manager, a units manager, a database manager, and a file manager;

an object oriented hierarchical schema representing classes of instances as objects arranged in a hierarchy, said schema being fully connected with each class object including information as to any class object that is a parent in the hierarchy, and class objects that are descendants in the hierarchy, said class objects being managed by said dynamic class manager;

a concurrency control system for controlling access by said plurality of client applications by providing class share locks and not using instance locks, the concurrency control system including an object oriented lock manager, and a lock holder table, the lock manager being operative to control concurrent access by said client applications by granting class share locks for navigation of the schema, the lock manager being operative to control concurrent access by said client applications by granting tree exclusive locks for certain editing functions, and the lock manager being operative to control concurrent access by said client applications by granting tree update locks for certain limited functions as to which more concurrency may be provided as compared to functions as to which a tree exclusive lock is required; and,

the object oriented lock manager obtaining from the dynamic class manager information concerning the relationship between classes in determining whether locks requested by said client applications may be granted.

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**5,742,814**

**BACKGROUND MEMORY ALLOCATION FOR MULTI-DIMENSIONAL SIGNAL PROCESSING**

**Florin Balasa, Tustin Ranch, Calif.; Francky Catthoor, Temse, and Hugo De Man, Kessel-lo, both of Belgium, assignors to IMEC vzw, Leuven, Belgium**

**Filed May 15, 1996, Ser. No. 649,903**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 395—613** **46 Claims**

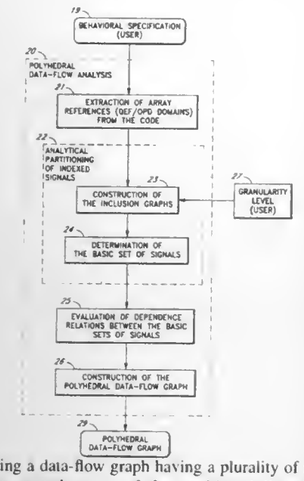
1. A method of generating a data-flow graph representative of data to be stored in a data-dominated processing system, comprising the steps of:

partitioning a plurality of linearly bounded lattices representative of data into partitioned linearly bounded lattices comprising basic sets and disjoint linearly bounded lattices;

deriving a plurality of dependency relations between the partitioned linearly bounded lattices; and

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constructing a data-flow graph having a plurality of nodes, each node representing one of the partitioned linearly bounded lattices, and a plurality of arcs, each arc representing one of the dependency relations.

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**5,742,815**

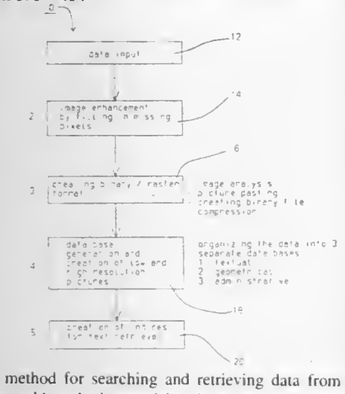
**METHOD FOR STORING AND RETRIEVING IMAGES IN/FROM A DATABASE**

**Yonatan Pesach Stern, 113/9 Haroeh Street, Ramat-Gan, Israel**

**Filed Oct. 4, 1994, Ser. No. 318,044**

**Int. Cl.[6] G06F** *17/30; 12/00*

**U.S. Cl. 395—414** **2 Claims**




1. A method for searching and retrieving data from a graphic database, said method comprising the steps of:

providing a graphic database having an electronic raster file of a converted image or document, an electronic binary file having pointers to the electronic raster file, an electronic administrative database having records corresponding to the format of the image or document, an electronic textual database having records corresponding to text in the image or document, an electronic geometrical database having records corresponding to specific geometrical locations of elements in the image or document, and a plurality of electronic indices files corresponding to the geometrical, textual, and administrative databases for accessing data therewithin;

identifying data in the image or document to be searched;

searching for the data in the textual database;

searching for the format of the data in the administrative database;

searching for the geometrical location of the data in the geometrical database;

displaying the data in the context of the original image or document.

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**5,742,816**

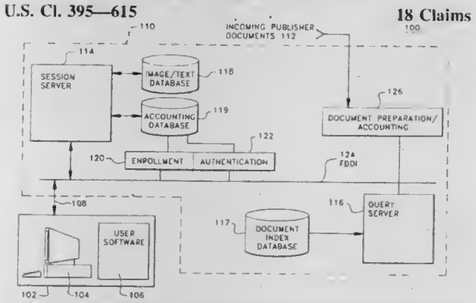
**METHOD AND APPARATUS FOR IDENTIFYING TEXTUAL DOCUMENTS AND MULTI-MEDIAFILES CORRESPONDING TO A SEARCH TOPIC**

**Thomas Barr, Ft. Wash, Md.; Lawrence A. Husick, Wayne, Pa.; Michael S. Krupit, Newtown, Pa.; Howard Morgan, Villanova, Pa., and Marvin I. Weinberger, Havertown, Pa., assignors to Infonautics Corporation, Wayne, Pa.**

**Filed Sep. 15, 1995, Ser. No. 529,250**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 395—615** **18 Claims**




10. An apparatus for identifying textual documents and multi-media files corresponding to a search topic, comprising:

(A) means for storing document records each of which is representative of one of a plurality of textual documents and multi-media records each of which is representative of one of a plurality of multi-media fries, said document records having text information fields associated therewith, each of said text information fields representing text from one of said plurality of textual documents, said multi-media records having multi-media information fields for representing only digital video or audio information and associated text fields, each of said associated text fields representing text associated with one of said multi-media information fields;

(B) means for receiving a single search query corresponding to said search topic;

(C) searching means, coupled to an index database and said means for receiving said single query, for searching said database in accordance with said single search query to simultaneously identify document records and multi-media records related to said single search query, said index database having a plurality of search terms corresponding to terms represented by said text information fields and said associated text fields, said index database including a table for associating each of said document and multi-media records with one or more of said search terms;

(D) search result list generation means, coupled to said searching means, for generating a search result list having entries representative of both textual documents and multi-media files related to said single search query in accordance with said document records and said multi-media records identified by said searching means;

(E) means for receiving signals representing selected document records and selected multi-media records identified on said search results list;

(F) first means for retrieving, from said means for storing, text represented by text information fields associated with said selected document records; and

(G) second means for retrieving, from said means for storing, digital video or audio information represented by multi-media information fields associated with said selected multi-media records.



**5,742,817**

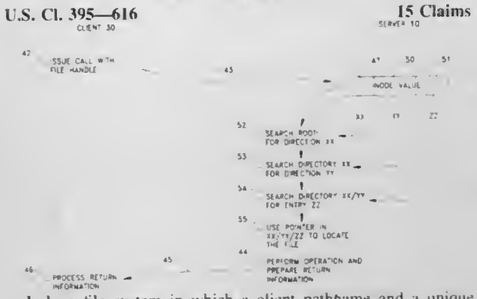
**METHOD AND APPARATUS FOR FILE SERVER ADDRESSING**

**Aiko M. Pinkoski, Sudbury, Mass., assignor to EMC Corporation, Hupkinton, Mass.**

**Filed Dec. 8, 1995, Ser. No. 569,745**

**Int. Cl.[6] G06F** *17/00*

**U.S. Cl. 395—616** **15 Claims**




1. In a file system in which a client pathname and a unique numerical value identify each file and in which certain operations return to the client a file handle including the unique numerical value and other operations transfer the file handle back to the file system and wherein the file system includes a first set of links for establishing correspondences between the client pathnames and unique numerical values, the improvement of alternate path addressing means for facilitating the location of a file in the file system in response to all other operations subsequent to the return of the file handle, said alternate path addressing means comprising:

(A) means for converting the unique numerical value in the returned file handle into an alternate pathname,

(B) a second set of links for establishing correspondences between the alternate pathnames and the locations of files in the file system identified by each unique numerical value; and

(C) means for obtaining the location of a file by selecting a corresponding link in said second set of links as determined by the alternate path name.

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**5,742,818**

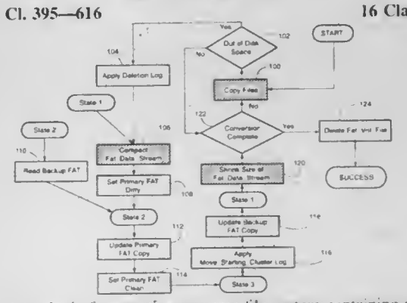
**METHOD AND SYSTEM OF CONVERTING DATA FROM A SOURCE FILE SYSTEM TO A TARGET FILE SYSTEM**

**Srikanth Shoroff, Issaquah, and Bartosz Boleslaw Milewski, Seattle, both of Wash., assignors to Microsoft Corporation, Redmond, Calif.**

**Filed Dec. 15, 1995, Ser. No. 573,479**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 395—616** **16 Claims**




1. A method of converting a source file system containing meta data and data files to a target file system while maintaining the data integrity of the data files, comprising the steps of:

creating target file system meta information;

saving the data files and meta data of the source file system in one or more target files in the target file system;

parsing data associated with files of the source file system out of the one or more target files; and

providing the parsed data to the target file system with instructions to the target file system to save the parsed data as files in the target file system.

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**5,742,819**

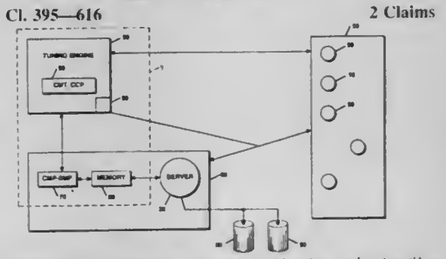
**SYSTEM AND METHOD FOR DYNAMICALLY ANALYZING AND IMPROVING THE PERFORMANCE OF A NETWORK**

**Frank Samuel Caccavale, Holliston, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Division of Ser. No. 72,613, Jun. 4, 1993, abandoned. This application Nov. 27, 1996, Ser. No. 757,393**

**Int. Cl.[6] G06F** *17/00*

**U.S. Cl. 395—616** **2 Claims**




1. A method of operating an open file cache that maintains files open after their closing has been requested, each file being so maintained for an open file close delay $W_d$ after its closing has been requested, the method comprising the steps of:

periodically determining (1) a number $F_n$ of open files, (2) a number $F_i$ of idle files, (3) a number $F_a$ of active files, and (4) a number $F_m$ of files that have changed from idle to active during the most recent period; and

for the following cases of the set of numbers $\{F_n, F_i, F_a, F_m\}$, performing the corresponding steps as follows:

{0, 0, 0, 0}: setting the value of $W_d$ to be a default value $W_{d0}$;

{>0, 0, >0, 0}: setting the value of $W_d$ to be $W_{d0}$;

{>0, >0, >0, 0}: if the set of numbers $\{F_n, F_i, F_a, F_m\}$ has equaled {>0, >0, >0, 0} for at least a first number of preceding periods, then increasing the value of $W_d$ to be a random number greater than the current value of $W_d$ and less than $(5*W_{d0})$, and if the value of $W_d$ has been so increased for at least a second number of preceding periods, then setting the value of $W_d$ to $W_{d0}$;

{>0, >0, >0, >0}: if the value of $W_d$ was not increased in the most recent interval, then increasing the value of $W_d$ to be a random number greater than the current value of $W_d$ and less than $(5*W_{d0})$; and

{else}: leaving $W_d$ at its current value.

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**5,742,820**

**MECHANISM FOR EFFICIENTLY SYNCHRONIZING INFORMATION OVER A NETWORK**

**Radia J. Perlman, Acton, Mass., and Neal D. Castagnoli, Morgan Hill, Calif., assignors to Novell, Inc., Orem, Utah**

**Filed Jul. 6, 1995, Ser. No. 499,029**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 395—617** **18 Claims**

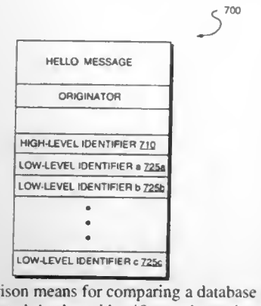
1. A mechanism for efficiently synchronizing the contents of databases stored on nodes of a computer network, the mechanism comprising:

a database identifier generated by each node of the computer network from the contents of a database associated with each node;

node distribution means for distributing a database identifier to a receiving node of the network; and

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node comparison means for comparing a database identifier with the distributed database identifier to determine if the identifiers, and thus the databases, are synchronized.

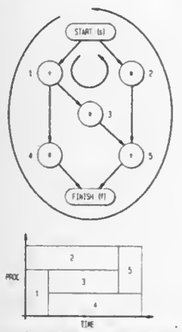
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**5,742,821**

**MULTIPROCESSOR SCHEDULING AND EXECUTION**

**G.N. Srinivasa Prasanna, Clinton, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Nov. 8, 1995, Ser. No. 555,051**
**Int. Cl.[6] G06F 9/00**
**U.S. Cl. 395—672** **17 Claims**




1. A method of executing signal processing tasks on P processors using a computer to schedule the execution, said method comprising the steps of:

representing the signal processing tasks in a manner stored within said computer so as to determine flow equations and timing constraints for the processor scheduling;

performing corrected gradient descents on the stored representation of the signal processing tasks using said flow equations and determined timing constraints and an error criterion until substantial convergence to a processor schedule occurs; and

executing the signal processing tasks on said P processors substantially in accordance with said processor schedule.

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**5,742,822**

**MULTITHREADED PROCESSOR WHICH DYNAMICALLY DISCRIMINATES A PARALLEL EXECUTION AND A SEQUENTIAL EXECUTION OF THREADS**

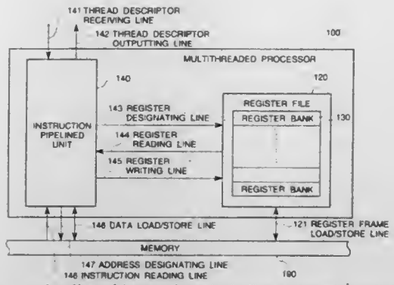
**Masato Motomura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Dec. 19, 1995, Ser. No. 575,145**
**Claims priority, application Japan, Dec. 19, 1994, 6-315241**
**Int. Cl.[6] G06F 9/40**
**U.S. Cl. 395—672** **9 Claims**

1. A multithreaded processor including an instruction pipelined unit and a register file having of a plurality of register banks, a content stored in each of said register banks corresponding to a register frame, the multithreaded processor being configured to process a plurality of instructions including a thread parallel start instruction, a thread end instruction, a thread sequential start instruction and a thread return instruction, the multithreaded processor being capable of sequentially executing a plurality of threads generated from one program, the multithreaded processor further comprising:

means for saving a register frame from said register file to a memory, the memory being coupled to the multithreaded processor, in accordance with and at a time of executing one of a thread parallel start instruction and a thread sequential start instruction corresponding to one of said plurality of threads; and

means for restoring the register frame from said memory to said register file in accordance with and at a time of executing one of a thread end instruction and a thread return instruction corresponding to said one of said plurality of threads, wherein said plurality of register banks includes a link register bank, and a link pointer is defined as a pointer indicating a memory location where a corresponding register frame stored in said link register bank is to be stored into said memory, and further including means for writing, when the multithreaded processor outputs a thread descriptor to another multithreaded processor in order to execute said thread parallel start instruction, said link pointer in said thread descriptor, and wherein said means for saving saves the corresponding register frame stored in said link register bank to the memory location of said memory designated by said link pointer.



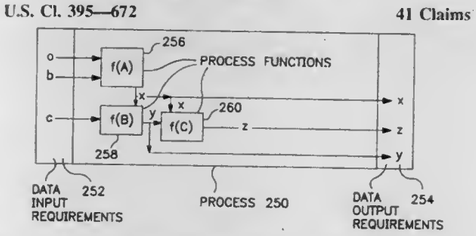

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**5,742,823**

**TOTAL OBJECT PROCESSING SYSTEM AND METHOD WITH ASSEMBLY LINE FEATURES AND CERTIFICATION OF RESULTS**

**Nathen P. Edwards, 54 Holly La., Darien, Conn. 06820; Estol C. Lamb, 3333 Linda Ct., Rock Hill, S.C. 29732, and Campbell L. Stubbs, 145 W. Woods Rd., Hamden, Conn. 06517, assignors to Nathen P. Edwards, Darien, Conn.; Estol C. Lamb, Rock Hill, S.C., and Campbell L. Stubbs, Hamden, Conn.**

**Filed Jan. 17, 1996, Ser. No. 587,586**
**Int. Cl.[6] G06F 9/00**
**U.S. Cl. 395—672** **41 Claims**




1. A processor system for executing a process, comprising:

a plurality of discrete processing elements;

information storage means for storing data;

means for generating queues for delivering and receiving data;



control means for controlling execution of said process and for managing said plurality of discrete processing elements; and

means for communicating said plurality of discrete processing elements, said information storage means, said means for generating queues, and said control means;

wherein said control means comprises:

i) application setup means for reading said process and identifying a number of process functions of said process, and for assigning said number of process functions to a number of discrete processing elements of said plurality of discrete processing elements;

ii) data queue assembly means for extracting data input and data output requirements from said process and signalling said means for generating queues to generate queues to deliver said data input requirements and to receive said data output requirements; and

iii) wherein each of said processing elements, said information storage means, said means for generating queues, said control means and said process has a specification including at least a reliability factor, an accuracy factor and an account identifying instance of use.

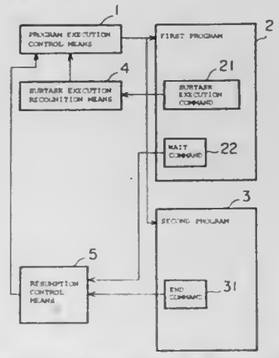
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**5,742,824**

**PROGRAM CONTROL SYSTEM IN MULTITASK ENVIRONMENT**

**Tetsuya Kosaka, Yamanashi, Japan, assignor to Fanuc Ltd., Yamanashi, Japan**

**Continuation of Ser. No. 330,818, Oct. 24, 1994, abandoned.**
**This application Oct. 7, 1996, Ser. No. 720,917**
**Claims priority, application Japan, Nov. 8, 1993, 5-277985**
**Int. Cl.[6] G06F 9/40**
**U.S. Cl. 395—676** **2 Claims**




1. A program control system in a multitask environment wherein operational programs respective for machine tools or industrial robots are allowed to be executed in parallel in an environment where a plurality of programs can be executed, comprising:

program execution control means for controlling an execution of a plurality of programs;

a first program of said plurality of programs which is activated for execution as an originating task by said program execution control means and includes a subtask execution command indicating an activation of another of said plurality of programs and a wait command indicating a temporary stop of execution of said first program;

subtask execution recognition means for recognizing said subtask execution command in said first program during the execution of the first program;

a second program of said plurality of programs which is activated for parallel execution as a subtask by said program execution control means in response to the recognition of said subtask execution command in said first program by said subtask execution recognition means, and includes an end command indicating a completion of a task in said second program associated with a task in said first program; and

resumption control means for recognizing said wait command in said first program during the execution of said first program and for recognizing said end command in said second program during the execution of said second program,

said program execution control means for temporarily stopping the execution of said first program in response to the recognition of said wait command in the first program by said resumption control means and for resuming the execution of said first program in response to the recognition of the end command in said second program by said resumption control means.

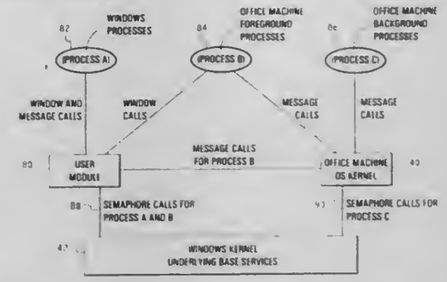
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**5,742,825**

**OPERATING SYSTEM FOR OFFICE MACHINES**

**Sharad Mathur, Redmond; Franklin D. Fite, Jr.; Arul Menezes, both of Bellevue, and Kim Stebbens, Redmond, all of Wash., assignors to Microsoft Corporation**

**Continuation of Ser. No. 316,026, Sep. 30, 1994, abandoned.**
**This application Feb. 28, 1997, Ser. No. 803,845**
**Int. Cl.[6] G06F 9/40**
**U.S. Cl. 395—680** **13 Claims**




1. A method for supporting real time processing in a graphical windowing operating system for an office machine, the graphical windowing operating system having a non-preemptive scheduler for scheduling windowing applications, a preemptive scheduler for preemptively scheduling the windowing applications and real time applications, a first messaging subsystem for processing messages for the windowing applications, and a second messaging subsystem for processing messages for the real time applications, the office machine having a processor and memory, the method comprising:

separately controlling communication among the windowing applications with the first messaging subsystem, including posting messages and getting messages for each of the windowing applications in message queues allocated for the windowing applications;

controlling whether the windowing applications are in a blocked or ready state for scheduling in response to message calls to the first messaging subsystem from the windowing applications;

allocating message queues corresponding to the real time applications with the second messaging subsystem;

separately processing messages for the real time applications with the second messaging subsystem including posting and getting messages for each of the real time application in the message queues allocated for the real time applications;

controlling whether the real time applications are in a blocked or ready state for scheduling in response to message calls to the second messaging subsystem from the real time applications;

allocating message queues for office machine foreground applications in the first messaging subsystem;

receiving message calls from office machine foreground applications in the second messaging subsystem to enable the office machine foreground applications to communicate with the real time applications;

determining whether any of the message calls received in the second messaging subsystem correspond to the message

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queues allocated for the windowing applications and the office machine foreground applications maintained by the first message subsystem;

making message calls on behalf of a first office machine foreground application in response to receiving a first message call in the second messaging subsystem that corresponds to one of the message queues allocated by the first messaging subsystem for either one of the windowing applications or one of the office machine foreground applications;

scheduling the windowing applications non-preemptively in a system process with the non-preemptive scheduler;

scheduling a first real time application and the system process preemptively by the following steps:

transferring control to the preemptive scheduler upon an interrupt generated by an interrupt module;

determining whether a currently running process can be preempted;

identifying whether the currently running process is in the system process;

determining whether the real time application is ready to be scheduled by the preemptive scheduler; and

if the currently running process is in the system process and the real time application is ready to be scheduled, then preempting the currently running process by performing a context switch between the currently running process and the first real time application.

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**5,742,826**

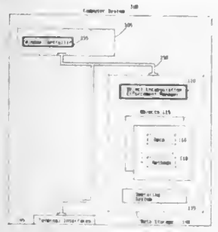
**OBJECT ENCAPSULATION PROTECTION APPARATUS**

**John Clarence Erdicott; Steven Lester Halter; Steven Jay Munroe; Erik Edward Voldal, and Xin Xu, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 9, 1994, Ser. No. 336,581**

**Int. Cl.[6] G06F *9/44***

**U.S. Cl. 395—683** **11 Claims**



1. A data protection apparatus, said data protection apparatus comprising:

at least one multidrop bus;

data storage, said data storage being comprised of random access storage and magnetic storage, said data storage being connected to said multidrop bus; and

a Window Storage Protection Controller connected to said multidrop bus, said Window Storage Protection Controller comprising:

at least one window storage protection register pair, said at least one window storage protection register pair comprising a low order register and a high order register, said low order register containing an object ID, said high order register containing a merged mask, said object D being a starting address of an object stored in said data storage, said merged mask being access permissions combined with a binary representation of said object's length;

address input means for accepting a presented address, said presented address being a memory location within said data storage where access is requested;

instruction input means for accepting an operation to be performed upon said access;

a comparator for comparing a product of said presented address and said mask with said object ID, said comparator generating a first output when said presented address is within a range of memory corresponding to said object and a second output when said presented address is not within said range of memory corresponding to said object; and

a storage protection mechanism for generating a storage protection violation indication when said comparator generates said second output.

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**5,742,827**

**METHOD OF AUTOMATICALLY FORMING PROGRAM SPECIFICATIONS AND APPARATUS THEREFOR**

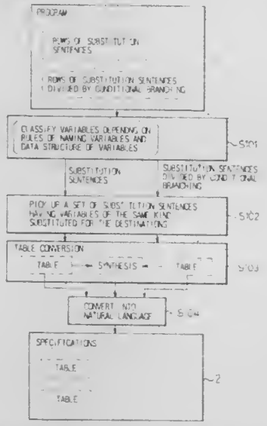
**Takao Ohkubo; Toshiaki Yoshino; Shigeki Suguta, and Masaaki Noro, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 144,538, Nov. 2, 1993, abandoned. This application Nov. 9, 1995, Ser. No. 556,122**

**Claims priority, application Japan, Nov. 2, 1992, 4-294244; Nov. 6, 1992, 4-297022**

**Int. Cl.[6] G06F *15/00***

**U.S. Cl. 395—701** **19 Claims**




1. A method, implemented by a computer, of automatically forming program specifications by converting a program into a natural language, the program including sentences and variables, the sentences having destinations with variables of the program substituted for the destinations, the substituted variables being referred to as destination variables, and the method comprising:

classifying the variables of the program into different categories based upon rules for classifying variables;

grouping, into a set, sentences having destination variables classified into the same category;

converting the set of sentences into a table; and

converting the table into a natural language.

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**5,742,828**

**COMPILER AND METHOD FOR EVALUATION OF FOREIGN SYNTAX EXPRESSIONS IN SOURCE CODE**

**Dennis Mark Canady, Redmond; Alan Carter, Bellevue; Ilan Gabriel Caron, Redmond; Mark Leslie Roberts, Bellevue; David Gordon Bradlee, and Steven E. Lees, both of Seattle, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.**

**Filed Aug. 3, 1994, Ser. No. 285,400**

**Int. Cl.[6] G06F *9/45***

**U.S. Cl. 395—708** **20 Claims**

1. A method for compiling source code containing one or more application defined expressions, the source code conforming to a first syntax of a high level programming language and the application defined expressions conforming to a second syntax associated with an application program, the method comprising:

providing a library associated with the application program, the library defining an evaluator for evaluating expressions according to the second syntax;

compiling the source code according to the first syntax into object code for executing on a computer;

interpreting a syntax structure in the source code consisting of a character string enclosed between a predefined pair of separators as an application defined expression; and

converting said syntax structure to coded instructions in the object code of a function call for invoking the evaluator with the character string as a parameter whereby the evaluator is invoked to evaluate the character string according to the second syntax on execution of the object code.






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**5,742,829**

**AUTOMATIC SOFTWARE INSTALLATION ON HETEROGENEOUS NETWORKED CLIENT COMPUTER SYSTEMS**

**Michael L. Davis; Or Ben-Natan, both of Bellevue, and Bruce W. Copeland, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.**

**Filed Mar. 10, 1995, Ser. No. 403,246**

**Int. Cl.[6] G06F *9/45***

**U.S. Cl. 395—712** **29 Claims**



1. A data processing system having network services and software for installation, comprising:

a client computer for utilizing the network services and for receiving the software; and

a server computer communicatively linked to the client computer via a communication mechanism for providing the network services to the client computer, itself comprising:

a sender services component for receiving the software for installation,

an inventory processor component for receiving inventory information from the client computer via the communications mechanism,

an inventory loader component for storing the inventory information received by the inventory processor component for retrieval by the server computer,

a determination component using a scheduler subcomponent to automatically determine when to install the software onto the client computer, and

an installation component using a despooler subcomponent to install the software onto the client computer from the server computer via the communication mechanism when it is determined to install the software onto the client computer and in response to the client computer logging onto the server computer,

wherein the server computer is heterogeneous with respect to the client computer.

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**5,742,830**

**METHOD AND APPARATUS FOR PERFORMING CONDITIONAL OPERATIONS ON EXTERNALLY SHARED DATA**

**David Arlen Elko, Poughkeepsie; Jeffrey Alan Frey, Fishkill; Audrey Ann Helffrich; John Franklin Isenberg, Jr., both of Poughkeepsie; Jeffrey Mark Nick, Fishkill, all of N.Y.; Jimmy Paul Strickland, Saratoga, Calif.; Michael Dustin Swanson, and Brian Barry Moore, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuatinn of Ser. No. 860,655, Mar. 30, 1992, abandoned. This application Feb. 1, 1995, Ser. No. 383,532**

**Int. Cl.[6] G06F *13/16***

**U.S. Cl. 395—728** **24 Claims**

1. An apparatus for providing conditional operations on shared data objects shared among two or more applications operating in a system comprising one or more general purpose processors on which said applications execute, each of said one or more general purpose processors being coupled to a structured external storage (SES) facility that is distinct from said one or more general purpose processors, said apparatus comprising:

a) means for creating a data structure comprising said shared data objects within said SES facility;

b) communication means for communicating a function request message between one of said two or more applications and said SES facility, said function request message specifying an operation on a target data object selected from said shared data objects, said operation being contingent on a presumed state of said target data object; and

c) a message processor within said SES facility, responsive to said function request message and operating on said data structure, said message processor comprising a predicate function means for executing a predicate function within said SES facility, independently of srid one or more general purpose processors, for verifying said presumed state of said target data object and a data function means for executing a data function within said SES facility, independently of said one or more general purpose processors, for performing said operation on said target data object, said predicate function executing unconditionally and producing either a "successful" or an "unsuccessful" condition, said data function executing conditionally and atomically with respect to said predicate function, following a "successful" condition produced by said predicate function.

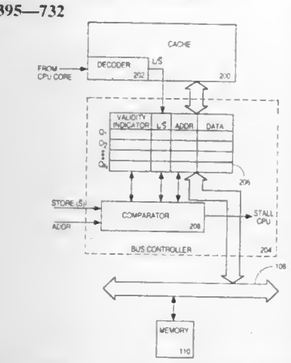
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### 5,742,831
### METHODS AND APPARATUS FOR MAINTAINING CACHE COHERENCY DURING COPENDENCY OF LOAD AND STORE OPERATIONS

**Kenneth Creta, Mesa, Ariz., assignor to Intel Corporation, Santa Clara, Calif.**

**Filed Jun. 30, 1994, Ser. No. 268,338**
**Int. Cl.[6] G06F *13/16***
**U.S. Cl. 395—732** **39 Claims**




**1**. In a computer system including a cache and a bus controller queue for storing pending cacheable load instructions, wherein each load instruction specifies an address, a method for maintaining cache coherency for copending load and store instructions, the method comprising the steps of:

comparing an address specified by a store instruction with all the addresses specified by the pending load instructions that are stored in the bus queue; and

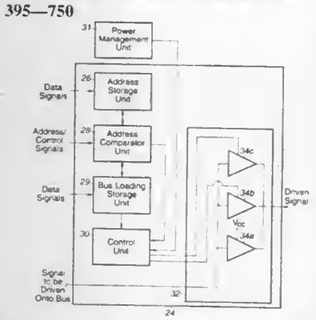
stalling instruction issue and execution of the store instruction if the comparing step results in a match of the store instruction address with any of the addresses of the pending load instructions.

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### 5,742,832
### COMPUTER SYSTEM WITH PROGRAMMABLE DRIVER OUTPUT'S STRENGTHS RESPONSIVE TO CONTROL SIGNAL MATCHING PREASSIGNED ADDRESS RANGE

**Clark L. Buxton, Austin, and Keith G. Hawkins, Dripping Springs, both of Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.**

**Filed Feb. 9, 1996, Ser. No. 599,615**
**Int. Cl.[6] G06F *1/32*; H03K *17/04***
**U.S. Cl. 395—750** **20 Claims**




**14**. A computer system comprising an output driver circuit, wherein said output driver circuit comprises:

an address comparator unit coupled to receive an address signal from a first bus and configured to produce an address match signal if said address signal is within a range of addresses associated with a peripheral device;

a control unit coupled to receive the address match signal produced by the address comparator unit and configured to produce a control signal dependent upon said address match signal; and

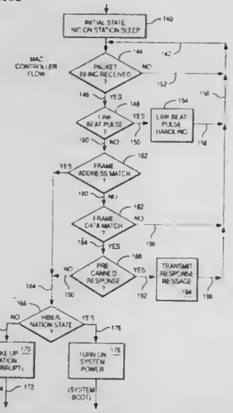
an adjustable drive circuit including a control line coupled to receive said control signal from said control unit, wherein the drive strength of said adjustable drive circuit is dependent upon said control signal.

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### 5,742,833
### PROGRAMMABLE POWER MANAGEMENT SYSTEM AND METHOD FOR NETWORK COMPUTER STATIONS

**Frank Dea; Son Hung Lam; Spencer Shepler, and Gary Yuh Tsao, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 30, 1995, Ser. No. 565,375**
**Int. Cl.[6] G06F *1/00;1/18***
**U.S. Cl. 395—750.05** **3 Claims**




**1**. A method for power management in a network of computer stations each of said stations including a network interface controller, comprising:

storing in one of said controllers corresponding to one of said stations

at least one programmed protocol dependent pattern within a frame data; and

a corresponding predetermined response message;

said storing including

storing a response buffer of each said predetermined response message, and wherein each said predetermined response message comprises a corresponding message length and message pointer in pair, each said pairs of which identifies a different said predetermined response messages and corresponds to a different frame data mask;

monitoring with said one of said controllers for said frame data on said network;

detecting in said one of said controllers from said monitored frame data whether a match occurs of said stored pattern with a pattern within said monitored frame data;

determining, in response to said detecting of said match, if said corresponding predetermined response message is stored;

transmitting said predetermined response message onto said network in response to said determining that said corresponding predetermined response message is stored;

determining with said controller, in response to determining said predetermined response message is not stored, whether said station is in a hibernation state;

said at least one programmed protocol dependent pattern and corresponding response message comprise a plurality of pairs comprised of a said pattern and a said corresponding response message, each said response message in said pairs corresponding to a different network protocol;

placing one of said stations in a low-power state;

wherein said storing, monitoring, detecting, determining, and transmitting steps are executed by one of said controllers corresponding to said one of said stations while said one of said stations is in said low-power state; and

transmitting said frame data from a different said one of said controllers to said one of said controllers.

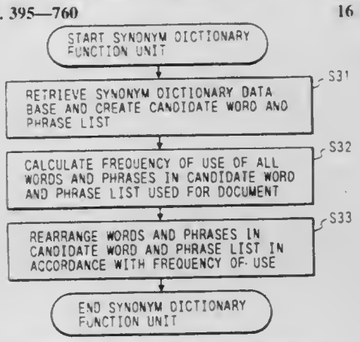


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### 5,742,834
### DOCUMENT PROCESSING APPARATUS USING A SYNONYM DICTIONARY

**Nobutsune Kobayashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 80,625, Jun. 24, 1993, abandoned. This application Aug. 2, 1996, Ser. No. 691,433**
**Claims priority, application Japan, Jun. 24, 1992, 4-165780; Jul. 9, 1992, 4-182344; Jul. 10, 1992, 4-206176**
**Int. Cl.[6] G06F *17/27***
**U.S. Cl. 395—760** **16 Claims**




**1**. A document processing apparatus comprising:

document storing means for storing documents;

a dictionary for storing synonyms of words;

designating means for designating a desired word in a document stored in said document storing means;

retrieving means for retrieving the synonyms of the word designated by said designating means from said dictionary;

substitutional candidate storing means for storing the retrieved synonyms;

counting means for counting the frequency of use of the retrieved synonyms in the document stored in said document storing means;

rearranging means for rearranging the retrieved synonyms in said substitutional candidate storing means in order of the lower values of counts by said counting means;

substitutional candidate displaying means for displaying the synonyms rearranged by said rearranging means as substitutional candidates;

selecting means for selecting one candidate from the substitutional candidates displayed by said substitutional candidate displaying means; and

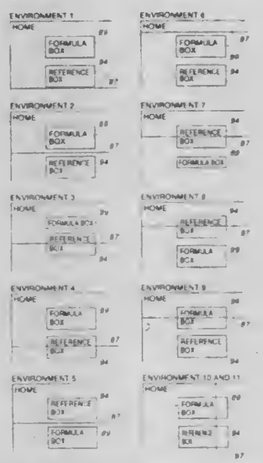
substituting means for substituting the word designated by said designating means by the candidate selected by said selecting means.

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### 5,742,835
### METHOD AND SYSTEM OF SHARING COMMON FORMULAS IN A SPREADSHEET PROGRAM AND OF ADJUSTING THE SAME TO CONFORM WITH EDITING OPERATIONS

**Richard Lawrence Kaethler, Belleuve, Wash., assignor to Microsoft Corporation, Redmond, Wash.**

**Continuation of Ser. No. 310,248, Sep. 21, 1994, Pat. No. 5,553,215. This application May 23, 1996, Ser. No. 652,314**
**Int. Cl.[6] G06T *11/00***
**U.S. Cl. 395—764** **36 Claims**




**30**. A method for sharing and adjusting a shared formula associated with a cell group in a worksheet, comprising the steps of:

identifying a rectangular area comprising the cells containing said common formula;

determining the number of rows and columns included in said rectangular area;

partitioning said plurality of cells into a plurality of formula boxes in response to the number of rows and columns exceeding predetermined boundaries;

determining a shared formula for each of said formula boxes, said shared formula corresponding to said common formula associated with said plurality of cells;

storing said shared formula for each of said formula boxes;

receiving a cell shift along an edit line;

for each formula box, defining an associated reference box containing cells referenced by said formula box;

for each formula box, determining the location of said formula box and said associated reference box with respect to the location of said edit line; and

for each formula box, adjusting said shared formula on the basis of the location of said formula box and said associated reference box with respect to the location of said edit line.

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### 5,742,836
### GRAPHICAL PROGRAMMING SYSTEM AND METHODS WITH USER INTERFACE

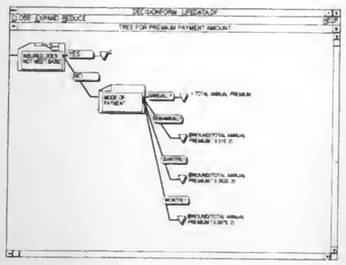
**William Monroe Turpin, Santa Cruz; Kevin Lane Brown, Scotts Valley, and Steven Ward Bogrett, Campbell, all of Calif., assignors to Borland International, Inc., Scotts Valley, Calif.**

**Division of Ser. No. 975,302, Nov. 12, 1992, which is a continuation-in-part of Ser. No. 606,537, Oct. 31, 1990, abandoned. This application Dec. 28, 1995, Ser. No. 579,899**
**Int. Cl.[6] G06F *17/30***
**U.S. Cl. 395—768** **26 Claims**

**1**. A development system for creating application software, the system comprising:

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a computer having a processor and a memory;

a screen display for displaying a form for presenting screen objects on a screen display;

input means for placing selected ones of the objects at desired positions on the form, said objects being responsive to events occurring in the system, said objects including at least one field for receiving information;

means for displaying at least one visual image graphically representing program logic to be followed in response to occurrence of particular ones of said events, said at least one visual image including an image of at least one decision tree displayed on the screen display in response to at least one event relating to said field; and

means for inputting by a user the program logic to be followed by the application software by modifying said at least one visual image.

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**5,742,837**

**METHOD AND APPARATUS FOR DOCUMENT FORMATTING WITH EFFICIENT FIGURE ELEMENT LAYOUT MANIPULATION**

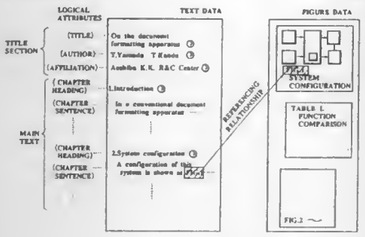
**Mika Fukui; Isamu Iwai, both of Kanagawa-ken; Koji Yamaguchi, Tiba-ken, and Miwako Doi, Kanagawa-ken, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

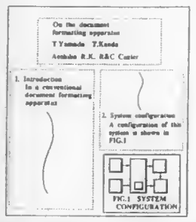
**Continuation of Ser. No. 623,552, Dec. 7, 1990, Pat. No. 5,517,621. This application Aug. 26, 1994, Ser. No. 296,465**

**Claims priority, application Japan, Dec. 7, 1989, 1-316481**

**Int. Cl.[6] G06F** *17/00*

**U.S. Cl. 395—779** **10 Claims**




1. An apparatus for formatting a document including text data representing text elements of the document and non-text data representing non-text elements of the document, comprising:

means for setting up layout data indicating a layout frame for laying out the document; and

means for automatically formatting the document by consecutively laying out the text data in the layout frame according to a prescribed procedure for formatting the text elements, while laying out the non-text data in the layout frame in relation to the text data by monitoring a current status of an overall spatial layout of the text data which indicates how the text data is currently laid out in the layout frame, and determining a layout position for each non-text element in view of an overall balance of the text data and the non-text data based on mutual relationships among the text data and the non-text data, according to said current status of said overall spatial layout of the text data.

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**5,742,838**

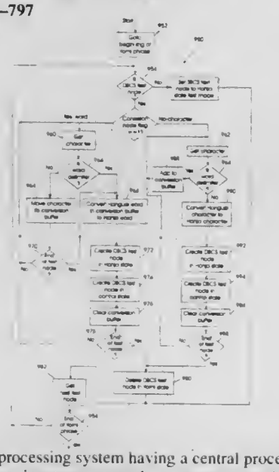
**METHOD FOR CONVERSION MODE SELECTION IN HANGEUL TO HANJA CHARACTER CONVERSION**

**Chan S. Lim, Potomac; Victor Wu, Bethesda, both of Md., and Kyu Y. Rho, Seoul, Rep. of Korea, assignors to International Business Machines Corp, Armonk, N.Y.**

**Filed Oct. 13, 1993, Ser. No. 136,431**

**Int. Cl.[6] G06F** *17/21*

**U.S. Cl. 395—797** **4 Claims**



1. In a data processing system having a central processor (CPU), a display means, input means, and a memory, a method of steps, effective in said data processing system, for selected conversion of Hangeul characters to Hanja characters found in a structured document which includes Hangeul phrases and Hanja phrases comprising steps for:

inputting and accumulating multiple Hangeul characters from said structured document into said memory of said data processing system;

selecting a conversion mode for converting Hangeul characters to Hanja characters, said conversion mode being chosen from word conversion and character conversion in said data processing system;

responsive to said selecting step, if said selected conversion mode is said character mode, performing in said CPU a table lookup operation in a conversion table in said memory of said data processing system for converting from Hangeul characters to Hanja characters, said table lookup being performed for each consecutive Hangeul character inputted to said data processing system, and retrieving by said CPU for use or display a corresponding Hanja character from said conversion table; and

responsive to said selecting step, if said selected conversion mode is said word conversion mode, then locating with said CPU a first delimiter and a second delimiter in said input of Hangeul characters, and performing by said CPU a table lookup in said conversion table in said memory for converting Hangeul words to Hanja characters using, for said conversion, the said Hangeul characters located between said first and said second delimiter, and retrieving by said CPU for use or display the corresponding Hanja characters from said conversion table, constructing in said memory of said data processing system, a text node which includes an indication of the conversion mode selected.



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**5,742,839**

**COPROCESSOR FOR PERFORMING AN ARITHMETIC OPERATION BY AUTOMATICALLY READING DATA FROM AN EXTERNAL MEMORY**

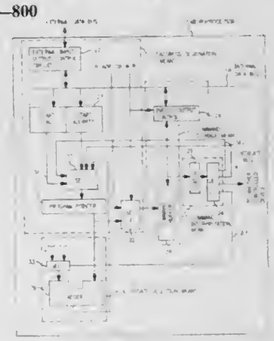
**Seiji Suetake; Koichi Hatta; Hideyuki Iino, and Tatsuya Nagasawa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Feb. 1, 1993, Ser. No. 11,762**

**Claims priority, application Japan, Jan. 30, 1992, 4-015566; Jan. 30, 1992, 4-015571**

**Int. Cl.[6] G06F** *15/00*

**U.S. Cl. 395—800** **14 Claims**



1. A coprocessor, connected to a host processor and an external memory, the coprocessor comprising:

buffer means for storing at one time a plurality of commands and data read from the external memory according to a series of memory addresses obtained by decoding a specific instruction, which includes a code portion containing a code sequence for causing said coprocessor to load a plurality of predetermined commands and data from the external memory and an address portion containing information representing a storage location of the predetermined commands and data in the external memory;

command interpretation means for interpreting the plurality of predetermined commands and data stored in said buffer means;

address designation means for designating a particular execution addresses according to the predetermined commands interpreted by said command interpretation means or to an operation start command;

operation means for performing an operation according to the predetermined commands interpreted by said command interpretation means or to the operation start command; and

update selection means for selectively updating the value of the execution addresses designated by said address designation means according to the predetermined commands interpreted by said command interpretation means.

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**5,742,840**

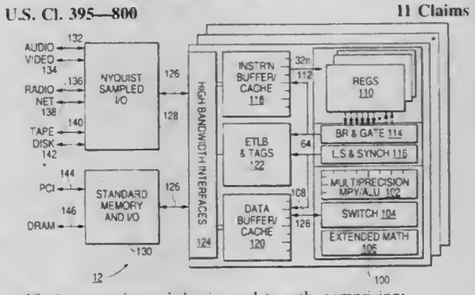
**GENERAL PURPOSE, MULTIPLE PRECISION PARALLEL OPERATION, PROGRAMMABLE MEDIA PROCESSOR**

**Craig Hansen, Los Altos, and John Moussouris, Palo Alto, both of Calif., assignors to Microunity Systems Engineering, Inc., Sunnyvale, Calif.**

**Filed Aug. 16, 1995, Ser. No. 516,036**

**Int. Cl.[6] G06F** *7/38*

**U.S. Cl. 395—800** **11 Claims**




10. An execution unit having a data path, comprising:

at least one register file coupled to the data path;

a multi-precision arithmetic unit coupled to the data path, the multi-precision arithmetic unit capable of dynamic partitioning based on the elemental width of data received from the data path, the elemental width of the data being equal to or narrower than the data path;

a switch coupled to the data path and programmable to manipulate data received from the data path, the switch providing data streams to the data path; and

an extended mathematical element coupled to the data path and programmable to implement additional mathematical operations at substantially peak data throughput.

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**5,742,841**

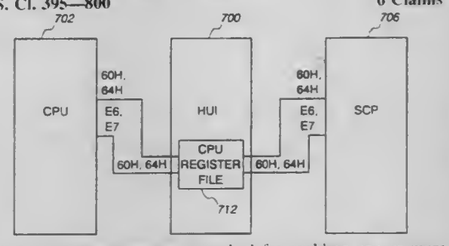
**ALTERNATE I/O PORT ACCESS TO STANDARD REGISTER SET**

**David T. DeRoo, St. Joseph; Mark D. Nicol, Stevensville, and Michael P. Krau, Benton Harbor, all of Mich., assignors to Packard Bell NEC, Sacramento, Calif.**

**Continuation of Ser. No. 217,795, Mar. 25, 1994, which is a continuation-in-part of Ser. No. 139,946, Dec. 8, 1993, abandoned. This application Dec. 19, 1995, Ser. No. 579,037**

**Int. Cl.[6] G06F** *13/10*

**U.S. Cl. 395—800** **6 Claims**




1. In a computer system, a method for enabling one or more predetermined commands that are inexecutable at one or more predetermined port addresses to be executed at one or more alternate predetermined port addresses, wherein predetermined software running on the computer system comprises an operating environment wherein the predetermined inexecutable commands are precluded from being executed at such predetermined port addresses, the method comprising the steps of:

(a) receiving said predetermined inexecutable commands at said one or more predetermined port addresses;

(b) providing one or more alternate predetermined port addresses for said predetermined inexecutable commands; and

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(c) directing access to said one or more predetermined port addresses for said predetermined inexecutable commands to said one or more alternate predetermined port addresses to enable said predetermined inexecutable commands to be executed.

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**5,742,842**

## DATA PROCESSING APPARATUS FOR EXECUTING A VECTOR OPERATION UNDER CONTROL OF A MASTER PROCESSOR

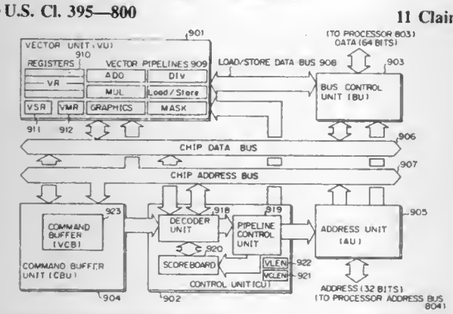
**Seiji Suetake; Hideyuki Iino; Koichi Hatta; Tatsuya Nagasawa; Koichi Kuroiwa; Hiroyuki Fujiyama; Kenji Shirasawa; Noriko Kadomaru; Shinichi Utsunomiya, and Makoto Miyagawa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 27,234, Jan. 28, 1993, abandoned. This application Feb. 15, 1996, Ser. No. 601,704**

**Claims priority, application Japan, Jan. 28, 1992, 4-013107; Jan. 28, 1992, 4-016927; Jan. 31, 1992, 4-016928; Dec. 26, 1992, 4-359457**

**Int. Cl.**[6] **G06F** *9/38*

**U.S. Cl. 395—800** **11 Claims**




**11**. A data processing apparatus, connected to a central processing unit via an internal bus, for executing vector operations and scalar operations under control of the central processing unit, said data processing apparatus comprising:

a vector unit to perform scalar operations and vector operations in parallel, including

vector registers to store vector data,

vector pipelines to execute instructions controlling the vector operations, and

a scalar register to store operands and addresses for the scalar operations performed on the vector data in said vector registers, including vector length data generated by one of the scalar operations;

an interface, coupled to said vector registers, said vector pipelines, said scalar register, and the internal bus, to transfer data therebetween, including directly transmitting the vector data and contents of said scalar register to and from the internal bus; and

a control unit to control operation of said data processing apparatus, including

a vector length register, coupled to said interface, to store the vector length data representing a number of vector data elements used in at least one of the vector operations,

a scoreboard defining states of the control unit, and

a pipeline control unit to set the states of the control unit in said scoreboard and to control timing of said vector pipelines and access of the vector data in said vector registers based on the states of the control unit,

said control unit controlling movement of the vector length data from said scalar register to said vector length register via said interface, the data being moved during at least one vector operation and without returning control to the central processing unit.

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**5,742,843**

## CONTROL SYSTEM FOR ACCESS BETWEEN PROCESSING ELEMENTS IN A PARALLEL COMPUTER

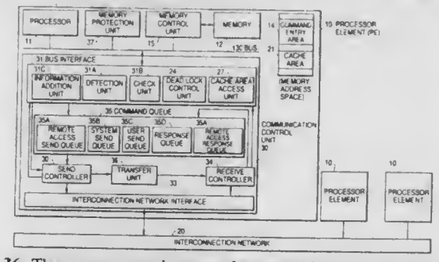
**Yoichi Koyanagi; Osamu Shiraki; Takeshi Horie; Toshiyuki Shimizu, and Hiroaki Ishihata, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Jul. 19, 1995, Ser. No. 503,916**

**Claims priority, application Japan, Jul. 20, 1994, 6-167903; Jul. 20, 1994, 6-167904; Jul. 20, 1994, 6-168483**

**Int. Cl.**[6] **G06F** *15/80*

**U.S. Cl. 395—800.14** **39 Claims**




**36**. The access control system for controlling access among a plurality of processor elements in a parallel computer that are linked through an interconnection network, each of said plurality of processor elements comprising:

a memory having a command entry area in a first memory area and a cache area in a second memory area that is different from said command entry area;

processor means for outputting at least an address of an access destination, and for writing a command data string into the command entry area when the address indicates the command entry area;

bus interface means for monitoring the addresses output by said processor means, for creating a command from the command data string when the address indicates the command entry area, for creating a command for remote access based on the data output by said processor means when the address indicates an area other than the command entry area and the cache area, for accessing the cache area in accordance with a content of the address in a case of the remote access, and for controlling said processor means to process an interrupt request to said processor means with priority on a waiting state for a response message to the remote access when said processor means is on standby waiting for the response message to the remote access;

send controller means for interpreting the command created by said bus interface means, and constructing a send message;

interconnection network interface means for sending send messages constructed by said send controller means to the interconnection network, and receiving messages from the interconnection network; and

receive controller means for interpreting messages received by said interconnection network interface means, and storing data transferred by the messages in a specified area in said memory through said bus interface means.

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**5,742,844**

## IBM PC COMPATIBLE MULTI-CHIP MODULE

**David L. Feldman, Menlo Park, Calif., assignor to ZF Microsystems, Inc., Palo Alto, Calif.**

**Filed Nov. 29, 1995, Ser. No. 564,688**

**Int. Cl.**[6] **G06F** *15/16;* **H01L** *23/48;23/50*

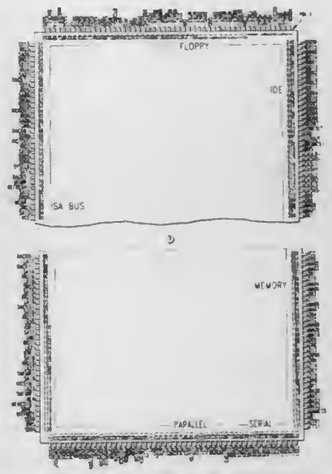
**U.S. Cl. 395—800.32** **2 Claims**

**1**. A multi-chip module comprising

a plurality of functional circuits provided on a substrate, the circuits defining a plurality of signal inputs and outputs, and

a plurality of module pins secured in a single row along the periphery of the substrate and connected to the inputs and outputs, the module pins including a set of 91 signal pins, two






ground pins and a power pin, defining an ISA bus means, the signal pins having a configuration complying in number and signal type with the IEEE-P996 requirements,

wherein the module is rectangular in shape, having a first side, a second side opposite the first side, a third side, and a fourth side, and is defined by an upper surface, a lower surface, and a peripheral wall, and wherein the plurality of pins extend from the peripheral wall,

wherein the pins of the ISA bus means comprise

pin **38** corresponding to signal SA**0**;
pin **39** corresponding to signal OSC;
pin **40** corresponding to signal SA1;
pin **41** corresponding signal SA2;
pin **42** corresponding to signal BALE;
pin **43** corresponding to signal SA3;
pin **44** corresponding to signal SD15;
pin **45** corresponding to signal TC;
pin **46** corresponding to signal SA4;
pin **47** corresponding to signal MASTER-;
pin **48** corresponding to signal SD14;
pin **49** corresponding to signal DACK2-;
pin **50** corresponding to signal SA5;
pin **51** corresponding to signal SD13;
pin **52** corresponding to signal IRQ3;
pin **53** corresponding to signal SA6;
pin **54** corresponding to signal DRQ7;
pin **55** corresponding to signal SD12;
pin **56** corresponding to signal IRQ4;
pin **57** corresponding to signal SA7;
pin **58** corresponding to signal DACK7-;
pin **59** corresponding to signal SD11;
pin **60** corresponding to signal IRQ5;
pin **61** corresponding to signal SA8;
pin **62** corresponding to signal DRQ6;
pin **63** corresponding to signal SD10;
pin **64** corresponding to signal IRQ6OUT;
pin **65** corresponding to signal IRQ6;
pin **66** corresponding to signal SA9;
pin **67** corresponding to GND;
pin **68** corresponding to signal DACK6-;
pin **69** corresponding to signal SD9;
pin **70** corresponding to signal IRQ7OUT;
pin **71** corresponding to signal IRQ7;
pin **72** corresponding to signal SA10;
pin **73** corresponding to signal DRQ5;
pin **74** corresponding to signal SD8;
pin **75** corresponding to signal SYSCLK;
pin **76** corresponding to signal SA11;
pin **77** corresponding to signal DACK5-;
pin **78** corresponding to signal MEMW-;
pin **79** corresponding to signal REFRESH-;
pin **80** corresponding to signal SA12;
pin **81** corresponding to signal DRQ0;
pin **82** corresponding to signal MEMR-;
pin **83** corresponding to signal DRQ1;
pin **84** corresponding to signal SA13;
pin **85** corresponding to VCC;
pin **86** corresponding to signal DACK0-;
pin **87** corresponding to signal LA17;
pin **88** corresponding to signal DACK1-;
pin **89** corresponding to signal SA14;
pin **90** corresponding to signal IRQ14;
pin **91** corresponding to signal LA18;
pin **92** corresponding to signal DRQ3;
pin **93** corresponding to signal SA15;
pin **94** corresponding to signal IRQ15;
pin **95** corresponding to signal LA19;
pin **96** corresponding to signal DACK3-;
pin **97** corresponding to signal SA16;
pin **98** corresponding to signal IRQ12;
pin **99** corresponding to signal LA20;
pin **100** corresponding to signal IOR-;
pin **101** corresponding to signal SA17;
pin **102** corresponding to GND;
pin **103** corresponding to signal IRQ11;
pin **104** corresponding to signal LA21;
pin **105** corresponding to signal IOW-;
pin **106** corresponding to signal SA18;
pin **107** corresponding to signal IRQ10;
pin **108** corresponding to signal LA22;
pin **109** corresponding to signal SMEMR-;
pin **110** corresponding to signal SA19;
pin **111** corresponding to signal IOCS16-;
pin **112** corresponding to signal LA23;
pin **113** corresponding to signal SMEMW-;
pin **114** corresponding to signal AEN;
pin **115** corresponding to signal MEMCS16-;
pin **116** corresponding to signal SBHE-;
pin **117** corresponding to signal IOCHRDY;
pin **118** corresponding to signal SD**00**;
pin **119** corresponding to signal (0WS-);
pin **120** corresponding to signal SD1;
pin **121** corresponding to signal SD2;
pin **122** corresponding to signal DRQ2OUT;
pin **123** corresponding to signal DRQ2;
pin **124** corresponding to signal SD3;
pin **125** corresponding to signal SD4;
pin **126** corresponding to signal IRQ9;
pin **127** corresponding to signal SD5;
pin **128** corresponding to signal SD6;
pin **129** corresponding to signal RESETDRV;
pin **130** corresponding to signal SD7; and
pin **131** corresponding to signal IOCHCK.

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**5,742,845**

## SYSTEM FOR EXTENDING PRESENT OPEN NETWORK COMMUNICATION PROTOCOLS TO COMMUNICATE WITH NON-STANDARD I/O DEVICES DIRECTLY COUPLED TO AN OPEN NETWORK

**Richard Hiers Wagner, Dunwoody, Ga., assignor to Datascape, Inc., Atlanta, Ga.**

**Filed Jun. 22, 1995, Ser. No. 493,772**

**Int. Cl.**[6] **G06F** *13/14;13/42*

**U.S. Cl. 395—831** **33 Claims**

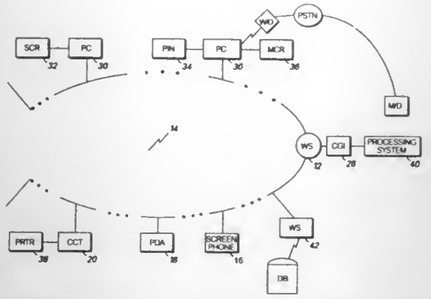
**1**. An open network processing system comprising:

a server for communicating in an extended open network protocol; and

a plurality of input/output (I/O) devices coupled to said server through an open network, said I/O devices communicating with said server in said extended open network protocol that supports communication with non-standard I/O devices;

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wherein said extended open network protocol further comprising:

tags for identifying one of said I/O devices and input operation to be performed with said one of said I/O devices;

action attributes for defining said identified device operation to be performed with a local resource for one of said I/O devices; and

method attributes for defining a data transfer method for providing data between said server and said I/O devices.

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**5,742,846**

**MULTIFUNCTIONAL INFORMATION PROCESSING APPARATUS**

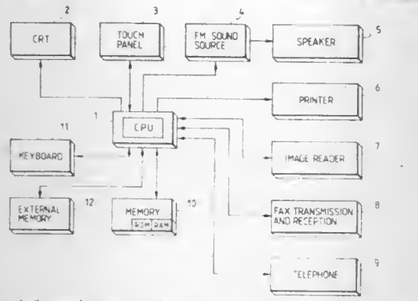
**Yoji Furuya, Inagi; Kenichiro Sugiura, Funabashi; Toshio Sugino; Hideyuki Kobayashi, both of Tokyo; Michihei Murayama, Tachikawa; Shigehiro Kadota, Kawasaki; Hiroo Teraichi, Fujisawa; Naoshi Inoue, and Masanao Yasuda, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan**

**Continuation of Ser. No. 127,479, Sep. 28, 1994, abandoned, which is a continuation of Ser. No. 834,984, Feb. 14, 1992, abandoned, which is a continuation of Ser. No. 269,733, Nov. 10, 1988, abandoned. This application Jun. 6, 1995, Ser. No. 468,520**

**Claims priority, application Japan, Nov. 11, 1987, 62-283171**

**Int. Cl.[6] G06F** *13/00*

**U.S. Cl. 395—840** **8 Claims**




*1. An information processing apparatus, connected to a printing apparatus and an external apparatus, which has a plurality of functions independent of each other and selectively executes the plurality of functions, said apparatus comprising:

execution means for executing any of the plurality of functions;

determination means for determining whether a request for output to the printing apparatus has been entered from the external apparatus;

reception means for receiving information from the external apparatus;

print control means for controlling output of the information received by said reception means to the printing apparatus; and

control means for, in the event that said determination means determines that the request has been entered from the external apparatus during execution of a desired one of the plurality of functions by said execution means, controlling (a) output of information obtained by execution of the desired function and (b) storage of the information received by said reception means such that the obtained information is continuously outputted to the printing apparatus and the received information is stored in a memory, if the obtained information is being outputted to the printing apparatus when the determination is made by said determination means, and controlling said print control means to output the received information to the printing apparatus, if the obtained information is not being outputted to the printing apparatus when the determination is made by said determination means.

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**5,742,847**

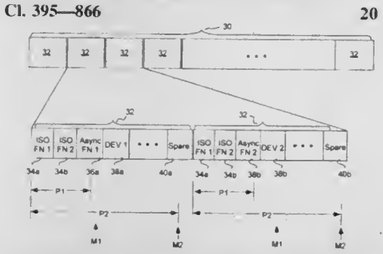
**M&A FOR DYNAMICALLY GENERATING AND MAINTAINING FRAME BASED POLLING SCHEDULES FOR POLLING ISOCHRONOUS AND ASYNCHRONOUS FUNCTIONS THAT GUARANTY LATENCIES AND BANDWIDTHS TO THE ISOCHRONOUS FUNCTIONS**

**Shaun Knoll, Portland, Oreg.; Jeff Charles Morriss, Boulder Creek, Calif.; Ajay V. Bhatt, El Dorado Hills, Calif.; Puthiya Kottal Nizar, El Dorado Hills, Calif.; Richard M. Haslam, Hillsboro, and Sudarshan Bala Cadambi, Portland, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Oct. 31, 1994, Ser. No. 331,727**

**Int. Cl.[6] G06F** *13/14;13/20;13/22*

**U.S. Cl. 395—866** **20 Claims**




1. An apparatus for generating and maintaining frame based polling schedules that guaranty latencies and bandwidths to isochronous functions of isochronous peripherals coupled to a system unit of a computer system, along with asynchronous peripherals, said apparatus comprising:

first means for conducting a plurality of configuration management transactions between the system unit and the peripherals, isochronous as well as asynchronous, to dynamically determine a plurality of operating characteristics for each of the peripherals, including latency requirement of the isochronous functions and transmit times of isochronous data, as well as transactional requirements of the asynchronous peripherals and transmit times of transactions;

second means for generating and maintaining a polling schedule for the system unit to poll the peripherals, the polling schedule being generated and maintained in accordance with the determined operating characteristics, and consisting of a superframe having a plurality of soft frames that are replications of one or more base frames, wherein polling of each of the isochronous functions is scheduled in multiple ones of the soft frames by virtue of said replications and scheduling polling of the isochronous function in at least one of the one or more base frames, and polling of each of the asynchronous peripherals is scheduled in at most one of the soft frames.



**5,742,848**

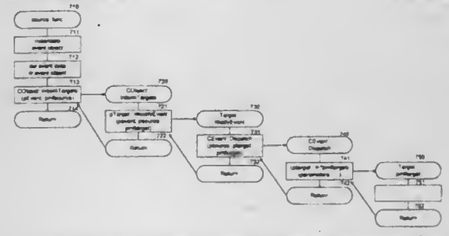
**SYSTEM FOR PASSING MESSAGES BETWEEN SOURCE OBJECT AND TARGET OBJECT UTILIZING GENERIC CODE IN SOURCE OBJECT TO INVOKE ANY MEMBER FUNCTION OF TARGET OBJECT BY EXECUTING THE SAME INSTRUCTIONS**

**Henry W. Burgess, Woodinville, Wash., assignor to Microsoft Corp., Redmond, Wash.**

**Filed Nov. 16, 1993, Ser. No. 153,362**

**Int. Cl.[6] G06F** *9/40;15/16*

**U.S. Cl. 395—856** **8 Claims**



1. A method in a computer system for sending a message from a source object to a target object, the method comprising the steps of:

instantiating an event object, the event object having message information describing the message and having a dispatching member function for invoking a member function of the target object passing the message information;

invoking the dispatching member function of the event object passing an identifier of the target object and an identifier of a member function of the target object; and

under control of the dispatching member function, invoking the identified member function of the target object passing the message information of the event object;

wherein said dispatching member function of each type of event object is developed specifically to invoke member functions with a certain number and type of parameters; and

wherein the source object having generic code that can be used to invoke any member function of any target object by executing the same instructions without regard to the number and type of parameters of the member function.

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**5,742,849**

**HIGH-PERFORMANCE COMPUTER SYSTEM OF A PARALLEL WRITE-BUFFERING TYPE**

**Nobutaka Nakamura, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 330,679, Oct. 28, 1994, abandoned. This application Feb. 7, 1997, Ser. No. 796,955**

**Claims priority, application Japan, Oct. 28, 1993, 5-270963**

**Int. Cl.[6] G06F** *13/00*

**U.S. Cl. 395—872** **18 Claims**

18. A computer system, comprising:

a CPU including a write-through-cache memory for executing a predetermined number of CPU bus cycles each having at least a preparation and data transfer state;

processor bus including at least a data bus and an address bus coupled to said CPU;

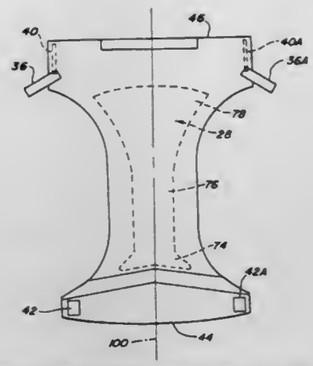
a main memory comprising a plurality of DRAM chips for storing data and coupled to said data bus; and

a system control means comprising a single gate array LSI and including at least a timing control circuit, a write buffer means, an address buffer means and a DRAM control circuit,

wherein said timing control circuit comprises,

a monitor circuit for receiving a plurality of status signals from said CPU, and

a judgement circuit coupled to said processor bus for detecting a present CPU bus cycle, said monitor and judgment circuits generating timing signals,




wherein said write buffer means is coupled to said data bus in parallel to said main memory so as to receive write data from said CPU during a memory write cycle and during said data transfer state of said CPU bus cycle,

wherein said address buffer means, is coupled in series between said address bus and said main memory, for decoding address data from said processor bus to row and column addresses to said main memory, and

wherein said DRAM control circuit generates a CPU control signal when said write buffer means latches a predetermined number of write data and generates a plurality of DRAM access control signals in response to said timing signals from said monitor circuit and said judgement circuit,

wherein said CPU control signal suspends a present memory write cycle from said CPU to said main memory, and

wherein said plurality of DRAM access control signals control a transfer of said latched write data in said write buffer means to said main memory in order to complete said suspended memory write cycle during said data transfer state of said CPU bus cycle.

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**5,742,850**

**LENS SHUTTER TYPE OF CAMERA**

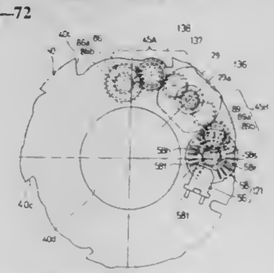
**Hiroshi Nomura; Kazuyoshi Azegami, and Takamitsu Sasaki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 9, 1997, Ser. No. 781,602**

**Claims priority, application Japan, Jan. 26, 1996, 8-012317; Feb. 22, 1996, 8-034824**

**Int. Cl.[6] G03B** *17/00*

**U.S. Cl. 396—72** **19 Claims**



1. A lens drive mechanism, comprising:

a shutter block which supports a lens shutter including a plurality of shutter, said shutter block blades;

a lens group guided along an optical axis relative to said shutter block;

a first motor secured to said shutter block for opening and closing said lens shutter;

a second motor secured to said shutter block for moving said lens group along said optical axis;

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a first encoder for detecting a size of a diaphragm formed by said lens shutter;

a second encoder for detecting an axial position of said lens group;

a shutter driving gear train which connects said lens shutter with said first motor;

a first encoder gear train which connects said first encoder with said first motor, said shutter driving gear train and said first encoder gear train being supported on said shutter block and arranged along a circumferential direction of said shutter block with a driving pinion of said first motor being positioned between said shutter driving gear train and said first encoder gear train;

a lens driving gear train which connects said lens group with said second motor; and

a second encoder gear train which connects said second encoder with said second motor, said lens driving gear train and said second encoder gear train being supported on said shutter block and arranged along said circumferential direction of said shutter block with a driving pinion of said second motor being positioned between said lens driving gear train and said second encoder gear train.

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**5,742,851**

## INFORMATION PROCESSING SYSTEM HAVING FUNCTION TO DETECT FAULT IN EXTERNAL BUS

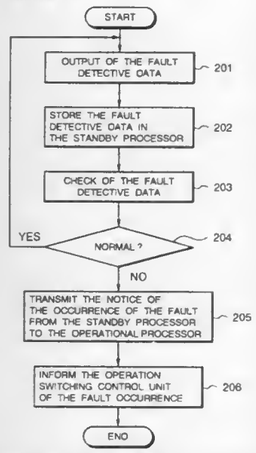
**Yasuharu Sekine, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed May 23, 1996, Ser. No. 652,010**

**Claims priority, application Japan, May 24, 1995, 7-124959**

**Int. Cl.[6] G06F *13/00***

**U.S. Cl. 395—183.19** **11 Claims**




1. An information processing system having such a redundancy constitution as including a plurality of processors, some of which are used as operational processors and others are used as standby processors, and an operation switching control unit for switching operations between the operational processors and the standby processors, in order to detect some fault in external buses connecting said processors, wherein

said processor operating as the operational processor comprising a fault detective data transmitting means for transmitting a fault detective data to each processor operating as the standby processor through said external bus;

said processor operating as the standby processor comprising a fault checking means for checking whether a fault exists or not, in said external bus or in an interface corresponding to said external bus, on the basis of the fault detective data received from said fault detective data transmitting means of said processor operating as the operational processor through said external bus; and

after a fault has been detected in said external bus or in the interface corresponding to said external bus by said processor operating as the standby processor, said operation switching control unit does not switch the operation between the operational and standby processors, even if detecting a fault in said processor operating as the operational processor.

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**5,742,852**

## PHOTOMETRY SYSTEM

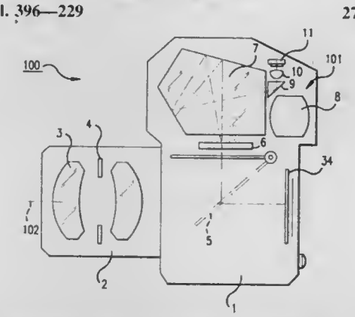
**Tadao Takagi; Masaru Muramatsu, and Hiroyuki Iwasaki, all of Kanagawa-ken, Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 366,772, Dec. 30, 1994, abandoned. This application Sep. 17, 1996, Ser. No. 713,438**

**Claims priority, application Japan, Apr. 25, 1994, 6-086768**

**Int. Cl.[6] G03B *7/08***

**U.S. Cl. 396—229** **27 Claims**




1. A photometry system for a camera, comprising:

a photometric element having a plurality of photometric regions, each photometric region measuring a brightness of a corresponding portion of a subject field;

a plurality of addition units, each addition unit adding together the brightness outputs of a selected group of the plurality of photometric regions;

a logarithmic conversion unit which converts output values of the plurality of addition units into logarithmic values; and

a user operable photometric mode selection switch that selects among a plurality of different modes based on operation by a user, wherein each mode corresponds to a different one of the plurality of addition units.

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**5,742,853**

## INFORMATION SETTING AND DISPLAY DEVICE FOR A CAMERA

**Masaaki Haga; Katsuki Machida, and Hideaki Tsuji, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 486,252, Jun. 7, 1995, abandoned. This application Feb. 18, 1997, Ser. No. 801,182**

**Claims priority, application Japan, Jun. 9, 1994, 6-151488**

**Int. Cl.[6] G03B *17/18*; G09G *3/00***

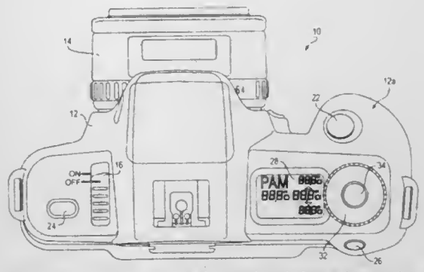
**U.S. Cl. 396—292** **31 Claims**

1. An information setting and displaying device for a camera, comprising:

a rotary dial stepwise rotatably mounted on a camera body;

a display member, provided adjacent said rotary dial, and including at least first and second display sub-areas fixedly positioned and arranged along a direction in which said rotary dial rotates;






information setting means for setting information to be displayed by operating said rotary dial, said information comprising a plurality of discrete values in a sequence; and,

display control means for electronically displaying a currently set one of said plurality of discrete values in said first display sub-area and for displaying another of said plurality of discrete values, sequentially adjacent said one of said plurality of discrete values, in said second display sub-area;

wherein said another of said plurality of discrete values is displayed in said first display sub-area in response to rotation of said rotary dial in the direction from said second display sub-area toward said first display sub-area by at least one step.

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**5,742,854**

## PHOTOGRAPHIC CAMERA

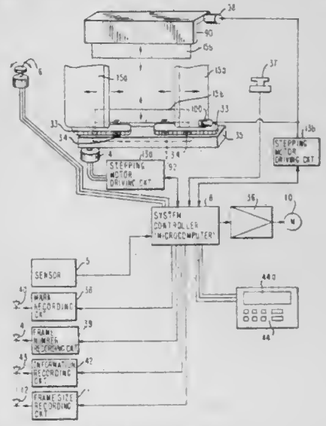
**Takahiko Saito, Kanagawa; Akira Nakanishi, Tokyo; Shunzi Obayashi, Tokyo, and Hideki Toshikage, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Continuation-in-part of Ser. No. 329,546, Oct. 26, 1994, Pat. No. 5,583,591, which is a continuation-in-part of Ser. No. 26,415, Mar. 4, 1993, abandoned. This application Apr. 25, 1995, Ser. No. 429,225**

**Claims priority, application Japan, Mar. 17, 1992, 4-060684; Mar. 23, 1992, 4-065304**

**Int. Cl.[6] G03B *17/02***

**U.S. Cl. 396—311** **19 Claims**




1. A photographic camera comprising:

a camera body,

a first housing disposed in said camera body for housing unexposed photographic film in a photographic film cartridge,

a second housing disposed in said camera body for housing the photographic film drawn from said photographic film cartridge,

film drive means disposed in said camera body for driving the photographic film between said first and second housings,

means for varying the length and width of an exposure opening in said camera body in a film-feed direction and a film width direction, whereby a size of an effective area of the photographic film drawn from said photographic film cartridge available to an image of a subject to be recorded on the photographic film is changed,

exposure area control means disposed in said camera body for changeably controlling said means for varying, and

recording means disposed in said camera body for recording at least a signal that indicates the size of the effective exposure area on the photographic film controlled by said means for varying.

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**5,742,855**

## PHOTOGRAPHIC AND VIDEO IMAGE SYSTEM

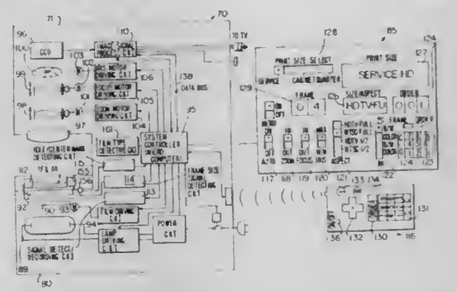
**Takahiko Saito, Kanagawa; Akira Nakanishi; Shunzi Obayashi, both of Tokyo, and Hideki Toshikage, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 445,772, May 22, 1995, Pat. No. 5,652,643, which is a continuation-in-part of Ser. No. 329,546, Oct. 26, 1994, Pat. No. 5,583,591, which is a continuation-in-part of Ser. No. 26,415, Mar. 4, 1993, abandoned. This application Oct. 7, 1996, Ser. No. 726,581**

**Claims priority, application Japan, Mar. 17, 1992, 4-060684; Mar. 23, 1992, 4-065304**

**Int. Cl.[6] G03B *17/24***

**U.S. Cl. 396—311** **15 Claims**




1. A photographic image apparatus for transforming an image on a frame of a photographic film into an electrical image signal of said image, said apparatus comprising:

a body;

film feed means disposed in said body for feeding a photographic film;

image transforming means disposed in said body for transforming an image on a frame of said photographic film into an electrical image signal of said image;

first means disposed in said body for detecting a frame position signal on said photographic film and generating a position control signal;

second means disposed on said body for detecting aspect information non-mechanically recorded in a marginal area along an edge of said photographic film and generating an aspect control signal, said aspect information indicating an aspect of an area on said photographic film to be printed on a photographic paper; and

control means for controlling said film feed means in response to said position control signal and for controlling said image transforming means to control an aspect of said electrical image signal depending on said aspect control signal.

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5,742,856

**CAMERA HAVING MAGNETIC RECORDING HEAD**

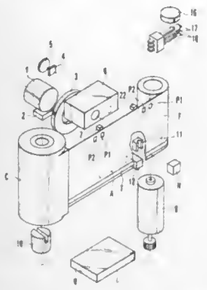
**Kazuhiro Izukawa, Saitama-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 420,497, Apr. 12, 1995, abandoned. This application Oct. 22, 1996, Ser. No. 731,996**

**Claims priority, application Japan, Apr. 28, 1994, 6-111740**

**Int. Cl.[6] G03B** *17/24;1/04*

**U.S. Cl. 396—319** **28 Claims**



1. A camera arranged to record data in a magnetic recording part provided for each frame part of a film by supplying a data signal to a magnetic head, comprising:

a) a data recording control circuit arranged to supply a predetermined signal and the data signal to the magnetic head;

b) a film transport circuit for transporting the film; and

c) a control circuit for starting an operation of said data recording control circuit prior to a start of transport of the film by said film transport circuit.

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5,742,857

**SYSTEM FOR REPRODUCING FILM IMAGE**

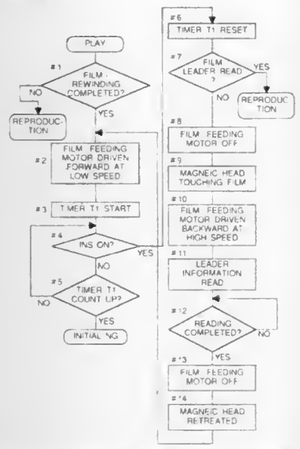
**Katsuyuki Nanba, Osakasayama, and Hirokazu Yagura, Sakai, both of Japan, assignors to Minolta Co, Ltd., Osaka, Japan**

**Continuation of Ser. No. 294,649, Aug. 23, 1994, abandoned. This application Jun. 5, 1997, Ser. No. 869,988**

**Claims priority, application Japan, Aug. 25, 1993, 5-210274**

**Int. Cl.[6] G03B** *17/24;1/00*

**U.S. Cl. 396—319** **38 Claims**




1. A system for reproducing a film image comprising:

a film cartridge which has a length of film which is housed inside the film cartridge, with a tip of a leader of the film being housed therein, the leader having a recording area for recording film information,

a film-feeder which feeds the film from the film cartridge to a film-winding spool so as to wind the film around the film-winding spool and which feeds the film from the film-winding spool to the film cartridge,

a reader which reads the film information of the leader, and

a controller which controls said film feeder and said reader to partially feed film out of the cartridge by an amount such that the leader is fed out of the film cartridge without reading the information recorded on the leader portion of the film and to subsequently rewind the film into the cartridge and read the information recorded on the leader portion of the film as the film is being rewound into the film cartridge.

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5,742,858

**CAMERA HAVING MAGNETIC HEAD**

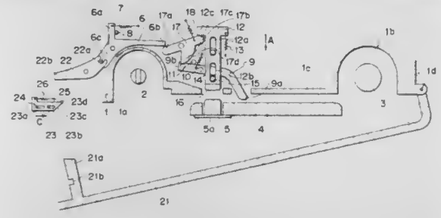
**Chikara Aoshima, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 781,887, Oct. 24, 1991, abandoned. This application Apr. 15, 1994, Ser. No. 227,994**

**Claims priority, application Japan, Oct. 25, 1990, 2-285956; Oct. 25, 1990, 2-285957; Nov. 14, 1990, 2-306000; Nov. 14, 1990, 2-306001**

**Int. Cl.[6] G03B** *17/24*

**U.S. Cl. 396—320** **59 Claims**



1. A camera having a film cartridge chamber, and an information processing unit for performing at least one of (i) writing information to a recording medium provided as a film, and (ii) reading information from the recording medium, said camera comprising:

(a) a movable member movable between a first position and a second position, said movable member urging the film against the information processing unit when said movable member is located at the second position, and the information processing unit being separated from the film when said movable member is located at the first position;

(b) a drive source for applying a drive force to said movable member to move said movable member from the first position to the second position;

(c) holding means for applying a holding force to hold said movable member at the first position; and

(d) allowing means for allowing said movable member to be released to move to the second position, said allowing means having a member which is directly contacted to a member provided in a door of said film cartridge chamber during a closing operation of the door of said film cartridge chamber and thereby allowing said holding means to release a holding state of said movable member to allow said movable member to move to the second position.

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5,742,859

**CAMERA SUPPORT AND STABILIZING DEVICE**

**Heinz Acker, 18926 S. Broadway, Gardena, Calif. 90248**

**Filed Jun. 7, 1995, Ser. No. 473,142**

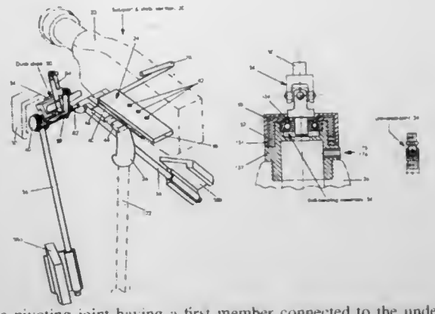
**Int. Cl.[6] G03B** *29/00*

**U.S. Cl. 396—419** **5 Claims**

1. A support for a camera, comprising:

a platform having an underside and a topside adapted to support a camera mounted thereon,





a pivoting joint having a first member connected to the underside of the platform and a second member connected to the first member, said first and second members being coupled together to provide a pivot point about which the platform freely tilts forward and backward and from side to side,

a bearing member coupled to the second member that allows said pivoting joint to rotate as a unit about an axis which intersects the pivot point, said bearing member comprising a pair of inner and outer concentric members, each with aligned races that carry ball bearings, said second member of said pivoting joint being fixedly attached to the inner member,

a manually operable panning control coupled to the bearing member that enables the pivoting joint to be manually rotated, rotating said platform at the same time, said panning control being a member concentric with and attached to the inner member of said bearing member,

a balancing assembly attached to the platform that is manually adjustable to bring the center of gravity of an assembly of the platform with a camera mounted thereon into coincidence with the pivoting point, and

a handle to be grasped by an operator that is connected to the pivoting joint, said handle having a central axis which runs lengthwise through the handle and intersects the pivoting point.

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5,742,860

**INSTANT CAMERA**

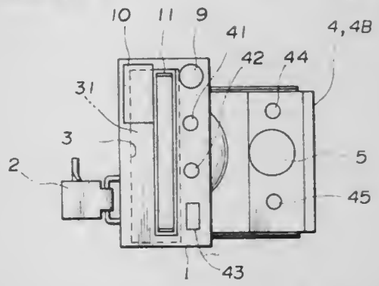
**Minoru Matsuzaki; Kazunori Mizokami, both of Hachioji; Yuta Sato, Hino; Yoshitaka Naito, Ome; Fumio Tomikawa, Chofu, and Masaharu Hamada, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd, Tokyo, Japan**

**Filed Nov. 3, 1994, Ser. No. 334,547**

**Claims priority, application Japan, Nov. 4, 1993, 5-275592; Nov. 26, 1993, 5-297060**

**Int. Cl.[6] G03B** *17/02;17/50;29/00;15/03*

**U.S. Cl. 396—420** **60 Claims**




1. An instant camera having an arrangement that a film is discharged to a side of the camera facing toward a subject after a picture has been taken, said instant camera comprising:

a holding means formed on a right portion of a camera body when viewed in a normal photography state and from a position of a photographer operating the camera;

an optical system disposed on a left portion of said camera body when viewed from the said photographer's position and including at least a photographing lens foldable into said camera body for storage;

a film cartridge loading portion for loading a film cartridge into a position between said holding means of said camera body and said optical system in such a manner that an exposure surface of the film accommodated in said film cartridge faces said optical system; and

a holding strap mounted and overlying said holding means on said camera for receiving an operator's hand between said strap and said holding means, a release button positioned on the camera body for operation by a finger of the operator's hand that is positioned between said grip portion and said strap to permit both operation and holding of the camera by one hand.

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5,742,861

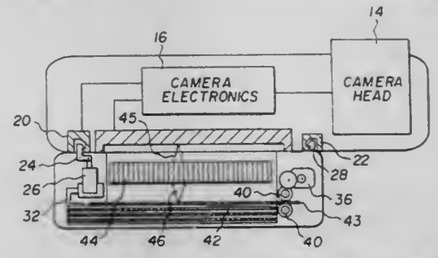
**ELECTRONIC CAMERA AND ASSOCIATED PRINTER WHICH USES A DISPLAY IMAGE**

**Stanley W. Stephenson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jan. 8, 1997, Ser. No. 778,231**

**Int. Cl.[6] G03B** *29/00;17/50;* **H04N** *5/30*

**U.S. Cl. 396—429** **6 Claims**




1. Apparatus for capturing and printing images on a photosensitive sheet, comprising:

(a) a camera for electronically storing an image of a subject and having a display for displaying such stored image;

(b) a printer including means for receiving a stack of photosensitive sheets and interleave cover sheets, with each cover sheet preventing exposure of an underlying photosensitive sheet;

(c) means for imaging the display image onto photosensitive sheets including:

(d) means effective after an image is formed on the display for deactivating the display image and including drive means for causing a cover sheet to be removed from the stack and then reactivating the display image, such deactivating means including:

(i) optical means for focusing the display area onto said photosensitive sheet; and

(ii) means for activating and deactivating the display image on the electronic camera to provide selective exposure of a media sheet.

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5,742,862

**PHOTOGRAPHIC CASSETTE AND CAMERA EQUIPPED WITH A CASSETTE ACCORDING TO THE INVENTION**

**Alexandre Francois Martenne, Chalon Sur Saone, France, assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jan. 24, 1996, Ser. No. 590,718**

**Claims priority, application France, Feb. 2, 1995, 9501404**

**Int. Cl.[6] G03B** *1/24;17/26*

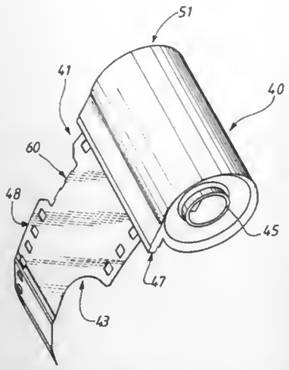
**U.S. Cl. 396—512** **4 Claims**

1. A cassette for photographic film (**40**) comprising:

a) a winding spool (**45**) provided with flanges at each of its ends;

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b) a photographic film (**41**) designed to be wound on said winding spool, means being provided for fixing one end of the film to the spool, said film being provided with perforations (**48**) formed at intervals along at least one of its longitudinal edges, and designed to cooperate with drive means (**46**) provided on a camera (**42**) adapted to receive said cassette (**40**), a perforated leader (**43**) enabling the film to be engaged with said drive means (**46**) of said camera for the purpose of its winding onto a receiving spool (**44**); and

c) a cylindrical shell (**51**) inside which said spool (**45**) is mounted so as to rotate in a lightproof way, said shell having (**51**) a narrow lightproof opening (**47**) formed over substantially the whole of its length in order to allow the passage of the film;

said cassette being characterised in that at least one of the perforations (**60**) of the leader intended for the initial engagement of the film (**41**) with the drive means (**46**) is longer along the longitudinal axis of the film than the other perforations (**48**), and the leader (**43**) has a row of perforations (**48**) arranged along at least one of its longitudinal edges, each of the perforations of the row being disposed at a given distance from the corresponding edge of the film, the material situated between said longer perforation (**60**) and the corresponding edge of the film being removed by cutting or punching.

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**5,742,863**

**FILM HOLDER**

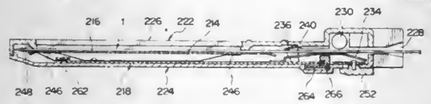
**Yoshibumi Udagawa; Yoichi Hamada; Takeshi Okano, all of Hyogo, and Tokuji Sato, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 536,840, Sep. 28, 1995, which is a continuation-in-part of Ser. No. 186,569, Jan. 26, 1994, abandoned, which is a continuation-in-part of Ser. No. 107,601, Aug. 18, 1993, abandoned. This application Nov. 15, 1995, Ser. No. 558,849**

**Claims priority, application Japan, Aug. 24, 1992, 4-224074; Aug. 26, 1992, 4-226910; Aug. 26, 1992, 4-226911; Aug. 26, 1992, 4-226912**

**Int. Cl.[6] G03B** *17/26*

**U.S. Cl. 396—517** **9 Claims**




**1**. A film holder for housing a photo film package including a film unit secured at the forward end edge portion of a photo film thereof with a clip (**5**), and a light-shielding envelope (**3**) provided with an insert opening to be closed by the clip and a dislodging preventing member (**7**) secured in the vicinity of the insert opening, for light-shieldingly housing the photo film, comprising:

a film holder body (**12**) formed therein with an inlet/outlet opening (**34**) for the photo film package and an exposure opening portion (**32**) for exposing the photo film;

a movable member (**14**; **116**) slidably provided in the film holder body, urged in a direction of taking out the photo film package and abutted against the clip of the film unit to be moved together with the photo film package against the urging force in a direction of inserting the photo film package;

a first engageable member (**64**, **66**; **140**) provided in the film holder and engaged with the clip to hold the film unit in the film holder body when the photo film package is inserted into the final position;

a slidable member (**16**; **118**) slidably mounted in the film holder body and urged in a direction of inserting the photo film package;

a second engageable member (**53**) provided on the slidable member, for interlocking with the movement of the movable member in the direction of inserting the photo film package, to be projected into an area through which the photo film package passes, and to be engaged with the dislodging preventing member of the light-shielding envelope, and, for interlocking with the movement of the movable member in the direction of taking out the photo film package to be retracted from the area, through which the photo film package passes;

a releasing means (**38**; **186**) for interlocking with movement of the slidable member in the direction of taking out the photo film package to retract the first engageable member from the position of being engaged with the clip, to thereby release the engagement with the clip;

a push member (**22**; **120**) for interlocking with the movement of the slidable member in the direction of taking out the photo film package to push the film unit toward the exposure opening portion and for interlocking with the movement of the slidable member in the direction of inserting the photo film package to be retracted from the area, through which the photo film package passes; and

a returning means (**44**; **116**, **118**, **186**) for interlocking with the movement of the movable member in the direction of taking out the photo film package to return the first engageable member to the position of being engaged with the clip; wherein:

during the operation of inserting the photo film package into the film holder body, the clip abuts against the movable member to move the movable member in the direction of inserting the photo film package, whereby the second engageable member is projected into the area, through which the photo film package passes, and the clip is engaged with the first engageable member when the photo film package is inserted into the final position;

during the operation of pulling out the light shielding envelope, the dislodging preventing member of the light-shielding envelope abuts against the second engageable member, whereby the slidable member is moved in the direction of taking out the light-shielding envelope, the releasing means releases the engagement of the first engageable member with the clip and the push member pushes the film unit toward the exposure opening portion;

during the operation of inserting the light-shielding envelope, the slidable member returns to the initial position through its urging force, whereby the push member returns to the initial position, from which the push member has been retracted from the film unit; and

during the operation of taking out the light-shielding envelope together with the film unit, the movable member returns to the initial position through its urging force, whereby the second engageable member returns to the initial position, from which the second engageable member has been retracted from the passing area of the light-shielding envelope, and the returning means returns the first engageable member to the position of being engaged with the clip.



**5,742,864**

**EXPOSURE APPARATUS FOR USE IN THE MANUFACTURE OF COLOR CRTS**

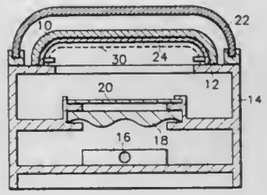
**Jongseop Kwack, Kyungju-si, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea**

**Filed Jul. 3, 1996, Ser. No. 675,716**

**Claims priority, application Rep. of Korea, Sep. 25, 1995, 95-25999**

**Int. Cl.[6] G03B** *41/00*

**U.S. Cl. 396—546** **4 Claims**




**1**. An exposure apparatus for use in the manufacture of color CRTs, comprising:

a light source; a range gauge, which refracts the light emitted from the light source at a fixed angle;

a filter gauge that projects the light, emitted from the range gauge, toward the center and circumference of a panel in different amounts; and

a reflection member placed outside the panel which allows the light passing through the panel to be used again for exposure.

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**5,742,865**

**APPARATUS FOR CONTROLLING TEMPERATURE OF FIXING DEVICE BY INCREASING THE TEMPERATURE FOR EACH SIIEET OF A CONTINUOUS FIXING OPERATION**

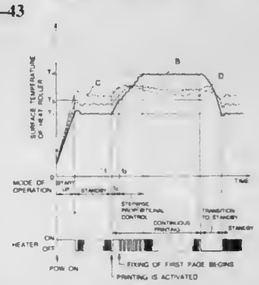
**Hiroyuki Yajima, and Zenji Takahashi, both of Tokyo, Japan, assignors to Oki Data Corporation, Tokyo, Japan**

**Filed Jul. 26, 1996, Ser. No. 686,944**

**Claims priority, application Japan, Jul. 28, 1995, 7-192985**

**Int. Cl.[6] G03G** *15/00*

**U.S. Cl. 399—43** **8 Claims**




**1**. An apparatus for controlling a temperature of a heat roller for fixing a developer material transferred on a print medium, comprising:

a dimension detector for detecting a dimension of a print medium, up to a maximum size greater than A3 size, fed to the heat roller in a laterally centered position; and

a controller for increasing a surface temperature of the heat roller by a predetermined amount, after each page of the print medium is printed and fixed, in a continued printing operation, so that a middle portion of the heat roller is maintained substantially at a temperature of a first predetermined value during the continued printing operation.

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**5,742,866**

**Patent Not Issued For This Number**

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**5,742,867**

**IMAGE FORMING APPARATUS FOR CONTROLLING A SHEET CONVEYING SPEED ACCORDING TO A DETECTED IMAGE MISREGISTER IN A REFERENCE PATTERN**

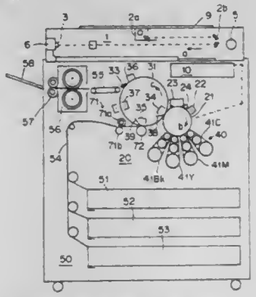
**Hideaki Kodama, Okazaki, Japan, assignor to Minolta Co., Ltd., Osaka, Japan**

**Filed Apr. 3, 1997, Ser. No. 826,583**

**Claims priority, application Japan, Apr. 5, 1996, 8-083731**

**Int. Cl.[6] G03G** *15/00*

**U.S. Cl. 399—49** **18 Claims**



**1**. An image forming apparatus comprising:

an image forming unit which sequentially forms a plurality of images and superimposes the images on a sheet;

a sheet conveyor which conveys a sheet to the image forming unit; and

a controller which commands the image forming unit to form a reference pattern and controls a sheet conveying speed of the sheet conveyor in accordance with a quantity of image misregister detected in the reference pattern.

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**5,742,868**

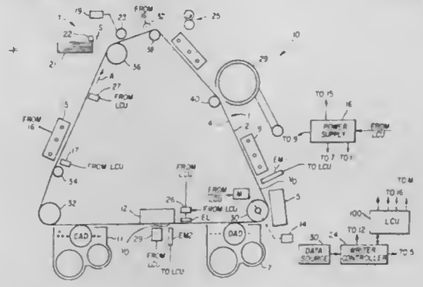
**METHOD AND APPARATUS OF ADJUSTING OF CHARGE LEVEL ON AN ELECTORSTATOGRAPHIC RECORDING MEDIUM**

**Allen Joseph Rushing, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 11, 1996, Ser. No. 661,527**

**Int. Cl.[6] G03G** *15/045*

**U.S. Cl. 399—50** **15 Claims**



**1**. A method of producing images, comprising:

(a) depositing a primary electrostatic charge on an electrostatographic recording member;

(b) sensing the level of the primary electrostatic charge;

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(c) enabling a light source to reduce the level of the primary electrostatic charge to provide a reduced voltage level suited for recording;
(d) imagewise modulating the reduced voltage level on an image frame of the recording member;
(e) developing the imagewise modulated image frame with toner; and
(f) adjusting the output of the light source in response to a first factor related to the sensed level of the primary electrostatic charge and a set point value for the level of the reduced voltage level and a second factor related to error in the level of the reduced voltage level from the set point value for the reduced voltage level.

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**5,742,869**

**Patent Not Issued For This Number**

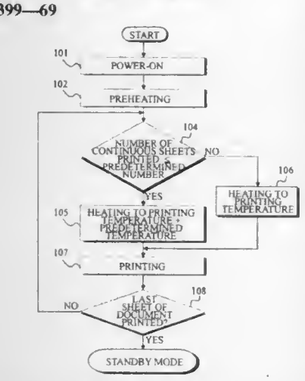
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**5,742,870**

## METHOD FOR REGULATING TEMPERATURE OF A FIXING UNIT IN AN ELECTROPHOTOGRAPHIC SYSTEM

**Tae-Heum Hwang, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Jul. 12, 1996, Ser. No. 679,440**
**Claims priority, application Rep. of Korea, Jul. 13, 1995, 1995/20601**
**Int. Cl.[6] G03G *15/20***
**U.S. Cl. 399—69** **15 Claims**




1. A method for regulating a temperature of a fixing unit in an electrophotographic system, comprising the steps of:
preheating said fixing unit in response to application of electrical power to said fixing unit;
heating a surface of a heating roller of said fixing unit to a heightened temperature that is greater than a printing temperature during an initial printing stage of a printing operation when a number of sheets that have been printed in said printing operation is less than or equal to a predetermined number, and heating said surface of said heating roller to said printing temperature when said number of sheets that have been printed in said printing operation is greater than said predetermined number;
printing one of said sheets after said heating step;
determining whether a last one of said sheets has been printed; and
returning to said heating step when said last one of said sheets has not been printed, and terminating said printing operation and activating a standby mode when said last one of said sheets has been printed.

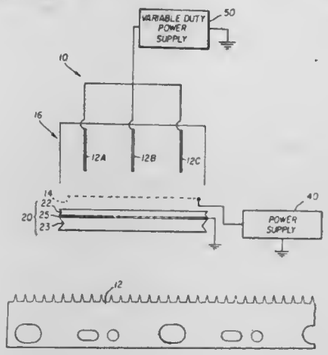
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**5,742,871**

## HIGH DUTY CYCLE SAWTOOTH AC CHARGER

**John W. May, Rochester, and Martin J. Pernesky, Hornell, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 30, 1996, Ser. No. 706,097**
**Int. Cl.[6] G03G *15/02***
**U.S. Cl. 399—89** **13 Claims**




2. A sawtooth AC corona charger for charging a photoconductor, said charger comprising:
at least one sawtooth blade;
an AC voltage source connected to said sawtooth blade, said AC voltage source having a duty cycle greater than 50% wherein said duty cycle is approximately 70%.

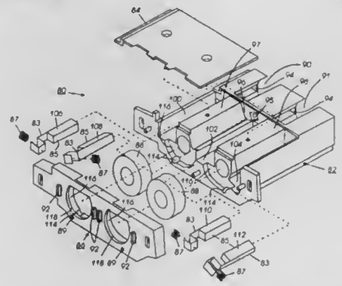
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**5,742,872**

## HIGH VOLTAGE COMMUTATING CONNECTOR FOR A ROTATING SEGMENTED ELECTRODE DONOR ROLL

**Jon F. Copperwheat, Fairport; Jonathan T. Abbe, Webster, and Sam E. Stewart, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Sep. 24, 1996, Ser. No. 719,270**
**Int. Cl.[6] G03G *21/20***
**U.S. Cl. 399—92** **18 Claims**



1. A commutating connector for electrically connecting conductive paths of a rotating electroded donor roll to a voltage source, including:
an electrically insulating housing defining a chamber to receive the donor roll; and
an electrically conductive brush member disposed in said chamber, said brush member being mounted in pressing engagement against the conductive paths on the electroded donor roll to electrically connect the voltage source to the conductive paths on the electroded donor roll, said housing defining ports for receiving air thereat to circulate through said brush to prevent particulate matter from accumulating in the gaps formed between said brush and the donor roll.



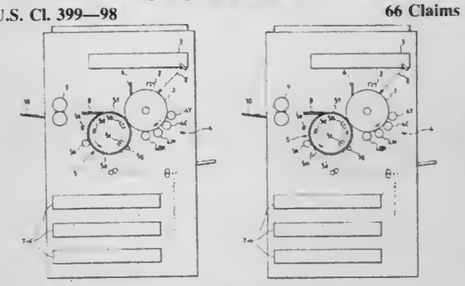
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**5,742,873**

## IMAGE FORMING APPARATUS AND OIL CLEANING MEMBER

**Takahiro Kubo; Takeshi Menjo, both of Tokyo; Takashi Hasegawa, Ageo; Yoichi Kimura, Kawaguchi; Kazuo Suzuki, and Satoshi Tamura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 24, 1994, Ser. No. 327,800**
**Claims priority, application Japan, Oct. 30, 1993, 5-294304; Jan. 12, 1994, 6-014801; Oct. 19, 1994, 6-253479**
**Int. Cl.[6] G03G *21/00***
**U.S. Cl. 399—98** **66 Claims**



1. An image forming apparatus, comprising:
a recording material supporting member for supporting and transporting a recording material;
image forming means for forming an image on the recording material supported by said recording material supporting member;
polishing means, having polishing particles provided on a surface thereof and a holding portion for holding said polishing particles, for polishing said recording material supporting member; and
memory means for memorizing a number of the recording materials subjected to image formation,
wherein said polishing means polishes said recording material supporting member when the number memorized by said memory means reaches a predetermined value.

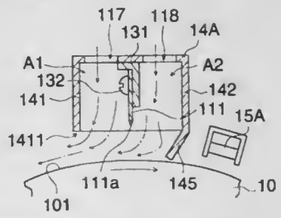
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**5,742,874**

## CHARGING DEVICE

**Yasushi Koshimura; Kiyohari Nakagama; Atsushi Ogane, and Mitsugu Nemoto, all of Hachioji, Japan, assignors to Konica Corporation, Japan**

**Filed Dec. 5, 1996, Ser. No. 760,844**
**Claims priority, application Japan, Dec. 7, 1995, 7-319215; Jan. 24, 1996, 8-009739; Feb. 20, 1996, 8-032046**
**Int. Cl.[6] G03G *15/02***
**U.S. Cl. 399—100** **18 Claims**




1. An apparatus for charging a photoreceptor which moves in a predetermined moving direction comprising:
a housing having, at a charging side, a first opening adapted to face said photoreceptor;
an electrode charging member in said housing including a plurality of sharp-edged electrodes aligned in a direction perpendicular to said moving direction of said photoreceptor;
said electrode charging member adapted to receive an electric voltage from a power source and to apply the electric voltage to the plurality of sharp edged electrodes so that said photoreceptor is charged through a first opening at said charging side by corona discharge from the plurality of sharp edged electrodes;
an air introducing device at a rear side of said housing, opposite said charging side, for introducing air into said housing, wherein said air introducing device comprises a second opening at said rear side, wherein said second opening is divided into an upstream opening, positioned upstream of said electrode charging member in terms of said moving direction, and a downstream opening, an opening area of the downstream opening being smaller than that of said upstream opening.

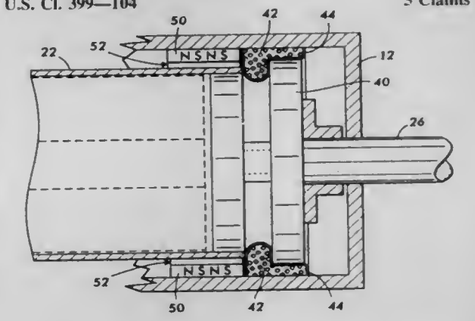
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**5,742,875**

## ROLL SEAL BLADE SUPPORT FOR A XEROGRAPHIC DEVELOPMENT UNIT USING MAGNETIC TONER

**Gregory V. Bogoshian, Rochester, and Raphael F. Bov, Jr., Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Feb. 10, 1997, Ser. No. 797,071**
**Int. Cl.[6] G03G *15/08***
**U.S. Cl. 399—104** **5 Claims**




1. An apparatus for applying toner particles to a charge-retentive surface, comprising:
a housing for retaining toner particles;
a roll, defining a main surface having a length and a circumference; rotatably mounted relative to the housing, a first portion of the length of the main surface of the roll being disposed to convey toner particles to the charge-retentive surface; and
a seal member fixedly mounted relative to the housing, the seal member extending around at least a portion of the circumference over at least a second portion of the length of the main surface of the roll, the seal member being spaced a substantially even predetermined distance relative to the main surface of the roll, the seal member defining a plurality of magnetic poles therein, wherein the seal member defines a surface which is diagonal relative to a direction of rotation of the roll.

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**5,742,876**

## DONOR ROLL CONFIGURATION OF A XEROGRAPHIC DEVELOPMENT UNIT USING MAGNETIC TONER

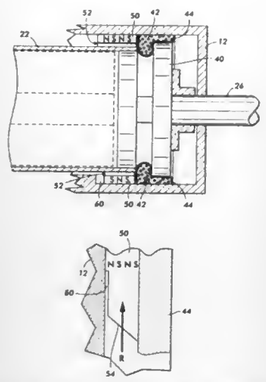
**Gregory V. Bogoshian, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Mar. 3, 1997, Ser. No. 808,756**
**Int. Cl.[6] G03G *15/08***
**U.S. Cl. 399—104** **17 Claims**

1. An apparatus for applying toner particles to a charge-retentive surface, comprising:
a housing for retaining toner particles, said housing defining an interior surface;
a roll, defining a main surface having a length and a circumference, the roll being disposed to convey toner particles from

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the main surface thereof to the charge-retentive surface, the roll being rotatably mounted relative to the housing and a first portion of the interior surface of the housing being substantially evenly spaced from a portion of the main surface of the roll;

a groove defined relative to said first portion of the interior surface of the housing, said groove extending along at least one-quarter of the circumference of the main surface of the roll; and

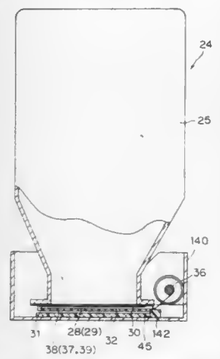
a magnetic member, said magnetic member effectively defining at least one magnetic pole on the interior surface of the housing adjacent the groove.

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**5,742,877**
**TONER CARTRIDGE SEALING FILM RETAINING CONFIGURATION**

**Mitsuharu Okada, and Toshinori Nishimura, both of Osaka, Japan, assignors to Mita Industrial Co.,Ltd., Osaka, Japan**

**Filed Mar. 1, 1996, Ser. No. 609,311**
**Claims priority, application Japan, Mar. 7, 1995, 7-047473; Jul. 31, 1995, 7-195076**
**Int. Cl.[6] G03G *15/08***
**U.S. Cl. 399—106** **18 Claims**



1. A toner cartridge for a developing unit in a xerographic image forming apparatus, comprising:

a casing having at least one toner discharge opening, the discharge opening being defined by a rim of said casing; and

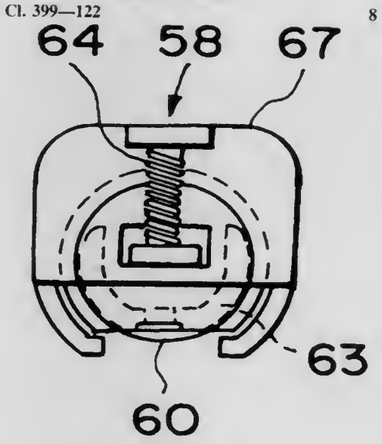
retaining elements each partially affixed to said rim edgewise leaving a clearance from said rim, said retaining elements therein for covering open opposite lateral edges of an overlapped sealing film.

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**5,742,878**
**DETACHABLY MOUNTED IMAGE HEATING APPARATUS HAVING HEATER, FILM GUIDING MEMBER AND COVER**

**Akira Kuroda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 77,541, Jun. 17, 1993, abandoned. This application Aug. 2, 1995, Ser. No. 510,289**
**Claims priority, application Japan, Jun. 17, 1992, 4-157905**
**Int. Cl.[6] G03G *15/20***
**U.S. Cl. 399—122** **8 Claims**



1. An image heating apparatus comprising:

a heater;

an endless film extended around said heater;

a guiding member for guiding an internal surface of said film;

a cover for covering said film; and

a driving rotatable member for driving an outer surface of said film, wherein said film is driven only by said driving rotatable member;

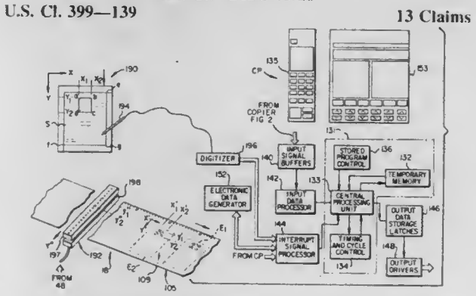
wherein said heater, said film, said guiding member and said cover form a unit which is detachably mountable to a main assembly of an image forming apparatus while said driving rotatable member remains in the image forming apparatus.

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**5,742,879**
**METHOD AND APPARATUS FOR REPRODUCING DOCUMENTS WITH VARIABLE INFORMATION**

**Frederick E. Altrieth, III, Scottsville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Nov. 16, 1992, Ser. No. 976,913**
**Int. Cl.[6] G03G *15/22***
**U.S. Cl. 399—139** **13 Claims**



1. A method for producing a master from which a set of copies may be made that are a composite of constant information from an original document and a set of additional variable information data items, which, when printed, occupy variable spatial areas, the method comprising the steps of:

processing in a control unit the set of variable information data items comprising a plurality of lines of character information that vary in numbers of characters and print length so that said control unit identifies in response to said character information a spatial area in which the set of information data items to be printed may be printed;

operation, in response to identification by said control unit of the spatial area, said control unit to format a patch corresponding to the spatial area sufficient to accommodate the set of additional variable information data items to be printed; and

printing a master having the patch superimposed on a reproduction of the constant information on the original document.

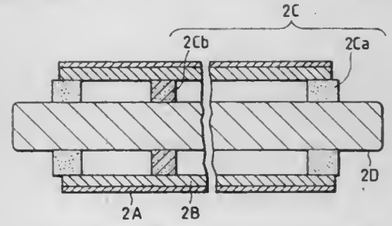


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**5,742,880**
**CHARGING MEMBER, AND PROCESS CARTRIDGE AND ELECTROPHOTOGRAPHIC APPARATUS HAVING THE CHARGING MEMBER**

**Masaaki Takenaka, Kashiwa; Takashi Yamashita, Nagareyama, and Yoshihiro Hirai, Ibaraki-ken, all of Japan, assignors to Canon Kasei Kabushiki Kaisha, Ibaraki-ken, and Canon Kabushiki Kaisha, Tokyo, both of Japan**

**Filed Apr. 9, 1996, Ser. No. 629,749**
**Claims priority, application Japan, Apr. 11, 1995, 7-085209**
**Int. Cl.[6] G03G *15/02***
**U.S. Cl. 399—176** **22 Claims**



1. A charging member which is to be provided in contact with an object member and to which a voltage is to be applied to electrostatically charge the object member:

said charging member comprising a substrate, and a metal layer and a surface layer comprising a seamless tube which are formed on the substrate in this order.

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**5,742,881**
**OCCLUDER WITH INTEGRAL ILLUMINATION SOURCE**

**Daniel J. McTigue, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Sep. 24, 1996, Ser. No. 719,054**
**Int. Cl.[6] G03G *15/36***
**U.S. Cl. 399—194** **6 Claims**

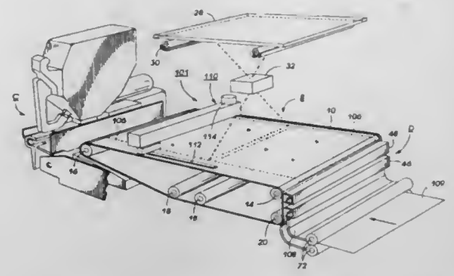
1. An annotation system for automatically recording additional image information on an image bearing member, comprising:

a drive apparatus;

a housing slidably attached to said drive apparatus;

a light emitting source for producing a light image of the additional image information mounted in said housing; and

an occluder bar for masking the image bearing member in a predetermined region to allow for the additional image information to be recorded thereon, said occluder bar mounted to said housing and extending therefrom, the light image passing directly from said light emitting source to the image bearing member, said drive apparatus simultaneously selectively positioning said occluder bar and said light emitting source with respect to an image area on the image bearing member, wherein said housing defines an aperture in the lower portion thereof, said occluder bar defining an opening therethrough, said light emitting source being positioned with respect to the aperture and the opening so that the light image passes through the aperture and the opening directly from said light emitting source to the image bearing member.

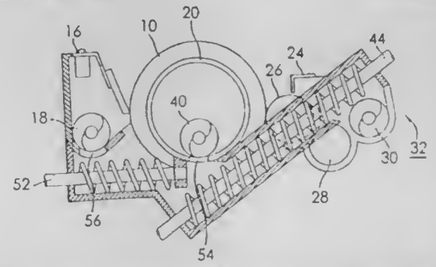


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**5,742,882**
**ELECTROPHOTOGRAPHIC IMAGE FORMING DEVICE WITH AUGERS FOR TRANSFERRING TONER**

**Man-Woo Lee, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Jul. 26, 1996, Ser. No. 686,963**
**Claims priority, application Rep. of Korea, Jul. 29, 1995, 23095**
**Int. Cl.[6] G03G *15/08:21/12***
**U.S. Cl. 399—258** **14 Claims**



1. An electrophotographic image forming device, comprising:

a photoconductive drum;

a charging unit for electrically charging an outer surface of said photoconductive drum;

an exposing unit for forming an electrostatic latent image on the outer surface of said photoconductive drum;

a developing unit for providing toner to the outer surface of said photoconductive drum to form a toner image;

a copying roller for copying the toner image from the outer surface of said photoconductive drum to a recording sheet;

a toner container installed within said photoconductive drum for storing the toner, said toner container having a first hole formed in a lower portion thereof,

a cleaning unit for removing and collecting the toner remaining on the outer surface of said photoconductive drum after an image forming operation is performed, said cleaning unit having a second hole formed in a lower portion thereof;

a first auger installed within said toner container for transferring the toner in a first direction;

a first driving gear installed at an end of said first auger for rotating said first auger;

a second auger installed below said first hole for receiving the toner from said toner container via said first auger, and transferring the toner to said developing unit;

a third auger installed within an interior of said developing unit for transferring the toner received from said second auger to a supply roller of said developing unit;

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a second driving gear installed at an end of said third auger for rotating said third auger;

a fourth auger installed within said cleaning unit for transferring the toner in said first direction;

a third driving gear installed at an end of said fourth auger for rotating said fourth auger; and

a fifth auger installed below said second hole for receiving the toner from said cleaning unit via said fourth auger, and transferring the toner to said second auger, said second auger transferring the toner received via said fifth auger to said developing unit.

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5,742,883

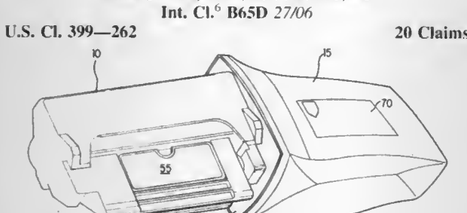
**PRODUCT INTEGRATED RETURN MAILER**

**James J. Girard, Boise, and Darius Boockholdt, Meridian, both of Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jul. 31, 1996, Ser. No. 691,076**

**Int. Cl.[6] B65D** *27/06*

**U.S. Cl. 399—262** **20 Claims**




1. A product mailing system comprising:

(a) a product to be mailed, wherein the product is a toner cartridge; and,

(b) a mailer enclosure secured to the product for use as a mailer for the product in the event of mailing the product.

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5,742,884

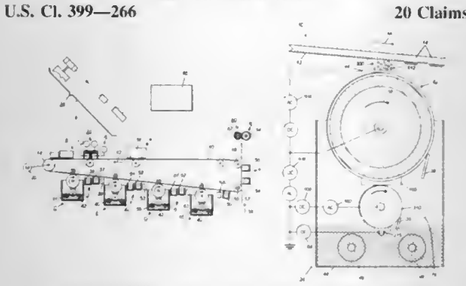
**HYBRID SCAVENGELESS DEVELOPMENT USING A RIGID POROUS PLANAR ELECTRODE MEMBER**

**Richard P. Germain, Webster; Mark J. Hirsch, Fairport, and Steven C. Hart, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed May 15, 1996, Ser. No. 647,783**

**Int. Cl.[6] G03G** *15/08*

**U.S. Cl. 399—266** **20 Claims**



1. An apparatus for developing a latent image recorded on a surface, comprising:

a housing defining a chamber storing a supply of developer material comprising toner;

a toner donor member spaced from the surface and being adapted to transport toner to a region opposed from the surface;

means for conveying said developer material in the chamber of said housing onto said donor member; and

a rigid planar porous electrode member spaced near the surface of said donor member, said rigid planar porous electrode member comprises a grid having a plurality of apertures having an open area coverage ranging from 30 to 95%, said electrode member being electrically biased to detach toner from said donor member as to form a toner cloud for developing the latent image.

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5,742,885

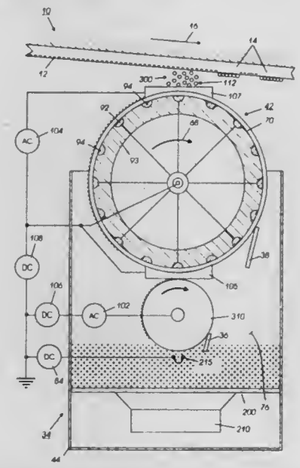
**DEVELOPMENT SYSTEM EMPLOYING ACOUSTIC TONER FLUIDIZATION FOR DONOR ROLL**

**William H. Wayman, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 24, 1996, Ser. No. 669,063**

**Int. Cl.[6] G03G** *15/08*

**U.S. Cl. 399—293** **6 Claims**




1. An apparatus for developing a latent image recorded on a surface, comprising:

a housing defining a chamber storing a supply of developer material comprising toner;

a toner donor member spaced from the surface and being adapted to transport toner to a region opposed from the surface;

means for vibrationally fluidizing said developer material in the chamber of said housing,

a charging device disposed in said chamber and immersed in said fluidized developer material for ion charging said developer material; and

a transport member partially immersed in said fluidized developer material, said transport transporting a substantially constant quantity of toner having a substantially constant ion charge to said doner member.

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5,742,886

**METHOD AND APPARATUS FOR REMOVING EDGE RAGGEDNESS FROM IMAGES**

**Christopher Snelling, Penfield, and Dale R. Mashtare, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 24, 1996, Ser. No. 671,774**

**Int. Cl.[6] G03G** *15/16*

**U.S. Cl. 399—296** **10 Claims**

1. A method of enhancing image quality and removing edge raggedness from tri-level images, said method including the steps of:

providing a charge retentive surface;

forming a tri-level latent electrostatic image on said charge retentive surface, said image comprising a first image area at a relatively high voltage level, a second image area at a relatively low voltage level and a background area half way between the voltage levels of said relatively high and low voltage levels;

electrically biasing a first developer member to a voltage level that is offset from said background area, in the direction of said first image area;

electrically biasing a second developer member to a voltage level that is offset from said background area, in the direction of said second image area;

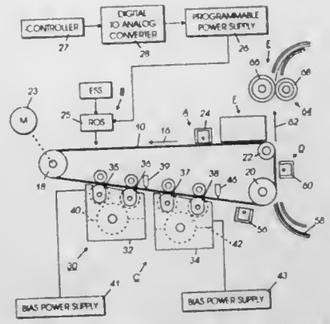
using said first developer member to develop said first image area;

vibrating said charge retentive surface with a first transducer;

using said second developer member to develop said second image area in a color different from said first image area; and then

vibrating said charge retentive surface with a second transducer to thereby fill in solid area toner void lines and improve image edge sharpness.






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5,742,887

**COLOR IMAGE OUTPUT APPARATUS FOR RECORDING A COLOR IMAGE HAVING INDEPENDENTLY MOVABLE COLOR IMAGE FORMING UNITS**

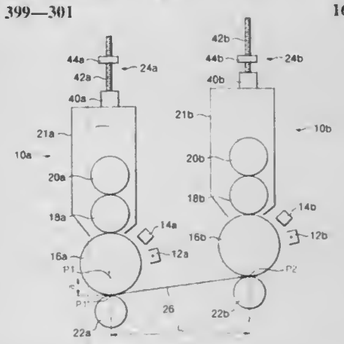
**Makoto Suzuki, Nagoya; Masaki Takatsugi, Toyohashi, and Naoto Iwao, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi-ken, Japan**

**Filed Oct. 31, 1996, Ser. No. 742,829**

**Claims priority, application Japan, Nov. 15, 1995, 7-296787**

**Int. Cl.[6] G03G** *15/01;15/16*

**U.S. Cl. 399—301** **16 Claims**




1. A color image output apparatus for recording a color image on an image receiving surface of an image receiving medium running in a feeding passage in a feeding direction, the apparatus comprising:

a plurality of single color image forming units arrayed along the feeding passage and each provided with an image transfer portion in confrontation with the image receiving surface, the single color image forming units providing single color images of different colors on the image receiving surface, and a combination of the single color images providing a resultant color image; and,

the plurality of single color image forming units being movable independently of each other toward and away from the image receiving medium, difference in moving amount of neighboring single color image forming units providing a change in a length of a feeding passage between the image transfer portions of the neighboring single color image forming units.

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5,742,888

**TRANSFER APPARATUS FOR AN IMAGE FORMING APPARATUS**

**Takashi Fuchiwaki; Kouji Hamabe, and Osamu Handa, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Filed Sep. 27, 1996, Ser. No. 722,564**

**Claims priority, application Japan, Sep. 27, 1995, 7-273517**

**Int. Cl.[6] G03G** *15/16*

**U.S. Cl. 399—308** **3 Claims**



1. A transfer apparatus for an image forming apparatus for primarily transferring a toner image formed on an image holding member to an intermediate transfer belt and then secondarily transferring the toner image, which has been primarily transferred onto the intermediate transfer belt, to a transfer member, said transfer apparatus comprising:

a transfer unit for secondarily transferring the image including a transfer roll separably disposed on an outer surface of said intermediate transfer belt which holds the toner image and an opposite roll disposed to be in contact with an inner surface of said intermediate transfer belt at a position at which said opposite roll is opposite to said transfer roll,

wherein, when said transfer roll has been brought into contact with said intermediate transfer belt, a central position of said transfer roll is disposed upstream with respect to a central position of said opposite roll in a direction in which said intermediate transfer belt is moved, and an angle made between a line connecting a center of said transfer roll and a center of said opposite roll to each other and said intermediate transfer belt is smaller than 90°.

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5,742,889

## IMAGE FORMING APPARATUS COMPRISING AN INTERMEDIATE TRANSFER MEDIUM HAVING A PERFLUOROPOLYETHER TOP LAYER

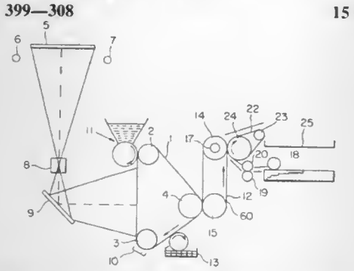
**Frans Willem Tazelaar, Venlo; Peter Richard Markies, Grubbenvorst; Johannes Adrianus Van Den Reek, Eindhoven, and Cornelius J. M. Van Der Stappen, Nijmegen, all of Netherlands, assignors to OCE-Nederland B.V., Ma Venlo, Netherlands**

**Filed Oct. 22, 1996, Ser. No. 735,339**

**Claims priority, application Netherlands, Oct. 23, 1995, 1001471; Oct. 23, 1995, 1001472**

**Int. Cl.[6] G03G** *15/16*

**U.S. Cl. 399—308** **15 Claims**



1. Apparatus for transferring a toner image from an image-forming medium to a receiving medium comprising:

an endless movable intermediate medium including a support provided with a top layer secured to the support via a rear surface, the intermediate medium being in contact with the image-forming medium in a first transfer zone;

heating means for heating the toner image on the top layer of the intermediate medium;

a biasing means for contacting the intermediate medium in a second transfer zone; and

transport means for transporting the receiving medium through the second transfer zone, wherein the top layer contains a perfluoropolyether rubber.

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5,742,890

## DISCHARGED SHEET STACKING APPARATUS HAVING A PLURALITY OF TRAYS WITH SPACING MEMBERS THEREBETWEEN

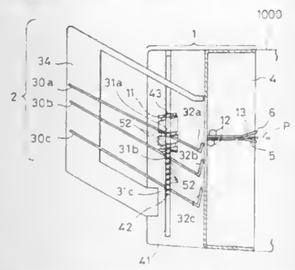
**Katsuhito Kato, Kawasaki, and Noriyoshi Ueda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 363,033, Dec. 23, 1994, abandoned. This application Nov. 8, 1996, Ser. No. 745,871**

**Claims priority, application Japan, Dec. 27, 1993, 5-354388**

**Int. Cl.[6] G03G** *15/00*

**U.S. Cl. 399—403** **24 Claims**



1. A discharged sheet stacking apparatus for sorting and stacking discharged sheets, comprising:

a plurality of trays, each of said trays having a trunnion and being aligned in an alignment direction to stack thereon the discharged sheets;

rotation means, said rotation means having a spiral cam to be engaged with said trunnions and rotating to move each of said trays in the alignment direction through said trunnions; and

a dummy trunnion, said dummy trunnion being interposed between at least two of said trunnions to widen the space between at least two of said trays more than spaces between other trays and engaging with said spiral cam of said rotation means to move in the alignment direction in the same manner as said trunnions.

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5,742,891

## TUNGSTEN-LANTHANA ALLOY WIRE FOR A VIBRATION RESISTANT LAMP FILAMENT

**Thomas J. Patrician, Monroeton, and Harry D. Martin, III, Troy, both of Pa., assignors to Osram Sylvania Inc., Danvers, Mass.**

**Division of Ser. No. 507,184, Jul. 26, 1995, Pat. No. 5,604,321. This application Apr. 4, 1996, Ser. No. 628,221**

**Int. Cl.[6] B22F** *1/00;3/12;3/24;5/00*

**U.S. Cl. 419—4** **3 Claims**



1. A method for producing a vibration resistant filament for an incandescent lamp, said method comprising the steps of:

preparing a tungsten-based powder containing particles of a lanthanum compound reducible to lanthanum oxide;

producing a sintered ingot from said tungsten-based powder such that said lanthanum compound particles are converted to lanthanum oxide particles, the amount of said lanthanum compound particles in said tungsten-based powder being selected to produce about 0.05–1.00 weight percent lanthanum oxide particles in said sintered ingot;

drawing a wire from said ingot, said lanthanum oxide particles being broken up during said drawing step to form stringers of smaller particles of said lanthanum oxide extending parallel to the axis of said wire;

shaping a filament from said wire; and

heating said filament to the primary recrystallization temperature of said wire to produce a vibration resistant microstructure in said filament.

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5,742,892

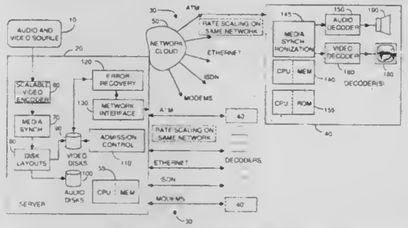
## DECODER FOR A SOFTWARE-IMPLEMENTED END-TO-END SCALABLE VIDEO DELIVERY SYSTEM

**Navin Chaddha, Stanford, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.**

**Filed Apr. 18, 1995, Ser. No. 424,703**

**Int. Cl.[6] H04N** *7/12;11/02;11/04*

**U.S. Cl. 455—5.1** **18 Claims**



1. A decoder for use with a video delivery system whose server provides an embedded bit stream in pixel blocks including information for at least two spatial resolutions and transmittable over at least one network, the decoder including:

a central processor unit coupled to a memory unit;



a look-up table, stored in said memory unit, including preprocessed decoded versions of quantized indexable representations of inverse discrete cosine transforms of image data used by said server in creating codewords present in said embedded bit stream; and

means, operating under control of said central processor unit, for processing said information contained in said embedded bit stream;

said means for processing decoding a first spatial resolution image by decompressing base layer data contained within said embedded bit stream;

said means for processing further decoding a second, higher, spatial resolution image by decompressing said base layer data to obtain a first intermediate image that is up-sampled to yield a first up-sampled image to which is added decompressed error data in a first enhancement layer contained in said embedded bit stream;

wherein said server encodes said embedded bit stream by performing a discrete cosine transform followed by tree-structured quantization, and

wherein said decoder can decode a viewable image from data in said embedded bit stream from received codewords containing less than a number of bits representing a full-length codeword.

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5,742,893

## MUSIC-PLAYING SYSTEM FOR A MOTOR VEHICLE

**Armin Frank, Gutenberg, Germany, assignor to NSM Aktiengesellschaft, Bingen, Germany**

**PCT No. PCT/DE94/01319, § 371 Date Jun. 27, 1996, § 102(e) Date Jun. 27, 1996, PCT Pub. No. WO95/12929, PCT Pub. Date May 11, 1995**

**PCT Filed Nov. 4, 1994, Ser. No. 640,809**

**Claims priority, application Germany, Nov. 5, 1993, 43 37 726.2**

**Int. Cl.[6] H04B** *7/00*

**U.S. Cl. 455—66** **11 Claims**



1. A music-playing system for use with a motor vehicle having an antenna, comprising:

music storage means for storing musical pieces that can be individually selected, the music storage means being located outside the motor vehicle;

first radio communications means for conducting communications by radio, the first radio communications means being disposed outside the motor vehicle;

means for connecting the music storage means to the first radio communications means, the means for connecting including a data transmission line;

second radio communications means for conducting communications by radio, the second radio communications means being carried by the vehicle and being connected to the antenna for communicating with the first radio communications means;

input means, carried by the vehicle and connected to the second radio communications means, for receiving a music selection command from an occupant of the vehicle, the music selection command being conveyed to the music storage means via the second radio communications means, the first radio communication means, and the means for connecting; and

music reproduction means, carried by the vehicle and connected to the second radio communications means, for playing back a musical piece that has been retrieved from the music storage means in response to the music selection command, the retrieved musical piece being conveyed to the music reproduction means via the means for connecting, the first radio communications means, and the second radio communications means.

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5,742,894

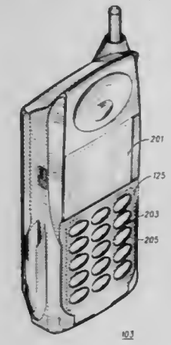
## RADIO COMMUNICATION DEVICE HAVING A MOVEABLE HOUSING ELEMENT AND KEYPAD DISPOSED THEREIN

**Shiriang Jambhekar, Schaumburg; Daniel L. Williams, Vernon Hills, and Albert Leo Nagele, Wilmette, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation-in-part of Ser. No. 384,182, Feb. 6, 1995, Pat. No. 5,584,054. This application Apr. 13, 1995, Ser. No. 421,273**

**Int. Cl.[6] H04B** *1/38*

**U.S. Cl. 455—90** **25 Claims**



1. A portable communication device, comprising:

a body housing element defining a front surface, a left side, a right side, a top end, and a bottom end, the front surface positioned in between the left and the right sides, the left and the right sides distanced to fit within a hand of a user;

a moveable housing element having a first surface and a second surface, said moveable housing element rotatably coupled to the bottom end of said body housing element and moveable between an open position and a closed position;

a speaker disposed in said body housing element and outwardly directed from the front surface of said body housing element, said speaker providing audio for telephone communication when said moveable housing element is in the closed position;

a touch screen display outwardly directed from the front surface of said body housing element and positioned below said speaker, said touch screen display partially covered when said moveable housing element is in the closed position and fully exposed when said moveable housing element is in the open position, said touch screen display providing a plurality of contact areas for activation;

a keypad including a plurality of telephone keys carried on said moveable housing element, each of the plurality of telephone keys having a first portion outwardly exposed on the first surface of said moveable housing element and viewable when said moveable housing element is in the closed position; and

an antenna carried on said body housing element and outwardly extending from the top end thereof.

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**5,742,895**

## DEVICE FOR TRANSMITTING AND RECEIVING INFORMATION SIGNAL IN MULTIMEDIA COMMUNICATION SYSTEM

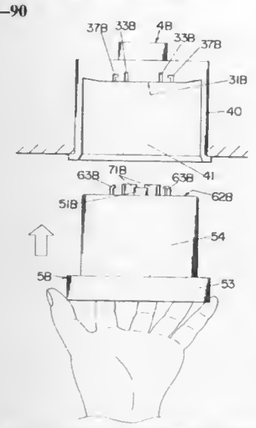
**Yoshihiro Tanigawa, Kyoto; Shinji Morino, Moriguchi; Isao Shimada, Takarazuka; Masafumi Morimoto, Toyonaka; Koji Ikeda, Kyoto; Sadaaki Kondo, and Kimitake Okugawa, both of Moriguchi, all of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan**

**Filed Jun. 21, 1996, Ser. No. 667,636**

**Claims priority, application Japan, Jan. 26, 1996, 8-012167**

**Int. Cl.[6] H04B** *1/38*

**U.S. Cl. 455—90** **10 Claims**




1. A device for receiving and transmitting information signal in a multimedia communication system including a transceiver unit for transmitting and receiving the information signal to and from the inside of a room, said device comprising:

a base unit adapted to be mounted to a wall of the room to detachably support said transceiver unit, said base unit having a receptacle electrically connected to an information transmission line routed within the wall;

said transceiver unit comprising circuit means for transmitting and receiving the information signal and a housing with a plug and hooks, said plug being electrically connected to said circuit means and projecting on a plug surface defined on said housing to be detachably connected to said receptacle for establishing a signal communication between said circuit means and said information transmission line, said hooks projecting on said plug surface to detachably engage into corresponding grooves formed in said base unit for supporting said transceiver unit to said base unit; wherein the present invention is characterized in that:

said base unit comprising a disk member which is provided with said receptacle and said grooves exposed in a receptacle surface defined on said disk member;

said housing is formed with a circular wall projecting on said plug surface to surround said plug and hooks, and a guide wall projecting on said plug surface inside said circular wall and around said plug;

said disk member has a diameter slightly smaller than an inner diameter of said circular wall so that said disk member can fit within said circular wall when said transceiver unit is attached to said base; and that

said disk member is formed in said receptacle surface with a guide groove of such a configuration that said guide wall is allowed to be inserted into said guide groove only when said guide wall opposes to said guide groove at a particular angular orientation where said plug comes to be connectable with said receptacle.

**5,742,896**

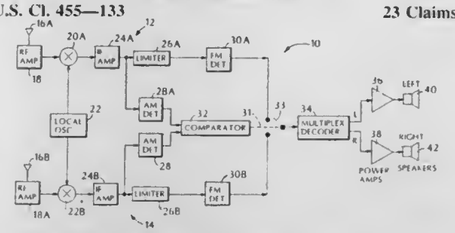
## DIVERSITY RECEPTION WITH SELECTOR SWITCHING AT SUPERAUDIBLE RATE

**Amar G. Bose, Wayland, and William R. Short, Ashland, both of Mass., assignors to Bose Corporation, Framingham, Mass.**

**Filed Nov. 9, 1990, Ser. No. 612,181**

**Int. Cl.[6] H04B** *17/02*

**U.S. Cl. 455—133** **23 Claims**




1. Diversity reception apparatus comprising,

at least first and second receivers each having a distortion detector with each detector capable of detecting an indication of audible distortion in an input to the detector,

a comparator having a plurality of inputs each coupled to a respective one of said detectors and having an output for providing a control signal representative of which of said receivers then carries the preferred received signal,

a common output channel,

and a selector intercoupling said receivers and said common output channel and coupled to the output of said comparator arranged to couple that one of said receivers then carrying the preferred received signal to said common output channel in response to said control signal,

said selector capable of switching at a superaudible rate from one receiver to another,

wherein each of said receivers includes a frequency modulation detector,

each of said receivers further comprising,

a multipath sensor having an input coupled to an associated frequency modulation detector and an output coupled to said selector,

whereby said selector may weigh signals from each distortion detector and each multipath sensor in arranging to couple that one of said receivers then carrying the preferred received signal to said common output channel.

**5,742,897**

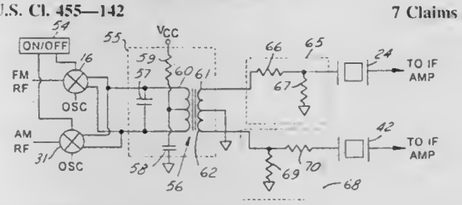
## MATCHING TRANSFORMER FOR DUAL-BAND RADIO RECEIVER

**Robert Donald Plowdrey, Dearborn; Robert Carl Beier, Chesterfield, both of Mich., and Yao Hsien Kuo, Brentwood, England, assignors to Ford Global Technologies, Inc., Dearborn, Mich.**

**Filed Nov. 6, 1995, Ser. No. 554,335**

**Int. Cl.[6] H04B** *1/18*

**U.S. Cl. 455—142** **7 Claims**




1. A dual-band radio receiver comprising:

a first RF signal section outputting a first RF signal in a first broadcast band;

a first mixer coupled to said first RF signal section outputting a first IF signal having a first intermediate frequency;

a second RF signal section outputting a second RF signal in a second broadcast band;



a second mixer coupled to said second RF signal section outputting a second IF signal having a second intermediate frequency substantially equal to said first intermediate frequency;

means for activating only one of said first or second mixers at a time;

a resonant circuit including a single impedance matching transformer receiving both of said first and second IF signals, said transformer including a primary winding coupled to said first and second mixers in parallel and including a transformer secondary circuit inductively coupled to said primary winding;

a first IF filter coupled to said secondary circuit and adapted to filter said first IF signal when said receiver is receiving in said first broadcast band;

a second IF filter coupled to said secondary circuit and adapted to filter said second IF signal when said receiver is receiving in said second broadcast band; and

an isolation circuit coupled between said first IF filter and said second IF filter;

whereby said single impedance matching transformer provides impedance matching between said first mixer and said first IF filter and between said second mixer and said second IF filter.

**5,742,898**

## TUNING SYSTEM WITH DC-DC CONVERTER

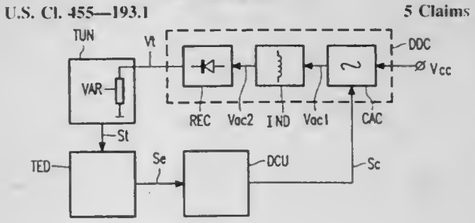
**Johannes H. A. Brekelmans, Singapore, Singapore, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 14, 1995, Ser. No. 557,446**

**Claims priority, application European Pat. Off., Nov. 15, 1994, 94203329**

**Int. Cl.[6] H04B** *1/18*

**U.S. Cl. 455—193.1** **5 Claims**




1. A tuning system comprising:

a tuner;

a tuning detector for providing a tuning-error signal which depends on the tuning state of said tuner;

a controllable DC-DC converter whose output voltage depends on the tuning-error signal;

a feedback circuit for deriving a feedback signal from the output voltage of the controllable DC-DC converter;

a difference detector for controlling the controllable DC-DC converter in response to the difference between said feedback signal and said tuning error signal; and

tuning means for varying the tuning state of said tuner in response to the output voltage of the controllable DC-DC converter.

**5,742,899**

## FAST ATTACK AUTOMATIC GAIN CONTROL (AGC) LOOP FOR NARROW BAND RECEIVERS

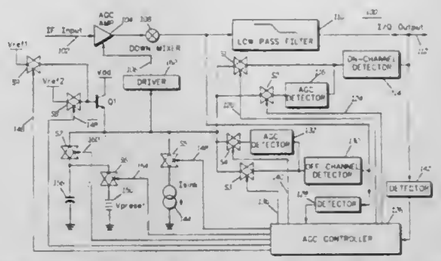
**Dane E. Blackburn, Sunrise, and David J. Graham, Davie, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Oct. 24, 1996, Ser. No. 735,926**

**Int. Cl.[6] H04B** *1/16*

**U.S. Cl. 455—234.2** **20 Claims**

1. A fast attack Automatic Gain Control (AGC) loop having a forward transmission path with an amplifier stage responsive to receipt of a control signal that alters the amplifier stage gain component and a low pass filter that receives an input and provides a filtered output, the AGC loop comprising:




a first feedback loop at the input of the low pass filter having selectable response shapes;

a second feedback loop at the output of the low pass filter having selectable response shapes;

a control signal generator, coupled to the amplifier stage, for providing the control signal;

a preset circuit, coupled to the control signal generator for setting the control signal amplitude to a known value; and

a current device, coupled to the control signal generator, for altering the amplitude of the control signal.

**5,742,900**

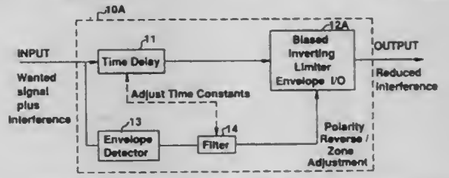
## VOLTAGE-VARIABLE BIASED INVERTING LIMITER FOR RFI SUPPRESSION OVERVIEW

**Donald S. Arnstein, Fairfax, Va., and Todd R. Czerner, Frederick, Md., assignors to Comsat Corporation, Bethesda, Md.**

**Continuation-in-part of Ser. No. 316,298, Sep. 30, 1994, abandoned. This application Sep. 29, 1995, Ser. No. 536,199**

**Int. Cl.[6] H04B** *1/16*

**U.S. Cl. 455—296** **20 Claims**




1. A signal processor for Radio Frequency Interference (RFI) suppression comprising:

an input for a signal comprising a wanted signal plus interference;

time delay means for receiving said input signal;

voltage variable biased inverting limiter means for receiving the output of said time delayed signal;

means for providing an adjustment of said limiter means based on the envelope of said input signal; and

filter means for receiving the output of said limiter means and providing an output with reduced interference.

**5,742,901**

## BALANCED MODULATOR

**Masakazu Nishida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Oct. 16, 1996, Ser. No. 733,111**

**Claims priority, application Japan, Oct. 17, 1995, 7-268630**

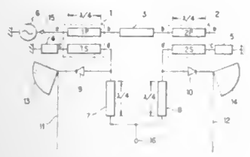
**Int. Cl.[6] H04B** *1/26*

**U.S. Cl. 455—326** **2 Claims**

1. A balanced modulator for outputting a modulated signal by multiplying a first input signal and a second input signal, the second input signal having a frequency different from a frequency of the first input signal, comprising:

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a first coupler having a first conductive pattern and a second conductive pattern electromagnetically coupled to said first conductive pattern, an outer end of said first conductive pattern of said first coupler being supplied with the first input signal;

a second coupler equivalent to said first coupler having a first conductive pattern and a second conductive pattern electromagnetically coupled to said first conductive pattern;

a first effective grounding pattern for grounding an outer end of said second conductive pattern of said first coupler;

a second effective grounding pattern for grounding an outer end of said second conductive pattern of said second coupler;

a first diode connected between an inner end of said second conductive pattern of said first coupler and one of a pair of input lines, between which the second input signal is supplied;

a second diode connected equivalently to said first diode between an inner end of said second conductive pattern of said second coupler and the other of said pair of input lines;

a first output pattern connected between said inner end of said second conductive pattern of said first coupler and an output terminal for outputting said modulated signal;

a second output pattern connected between said inner end of said second conductive pattern of said second coupler and said output terminal; and

a compensation pattern connected between an inner end of said first conductive pattern of said first coupler and an inner end of said first conductive pattern of said second coupler for compensating electrical imbalance caused by impedance difference between said first effective grounding pattern and said second effective grounding pattern.

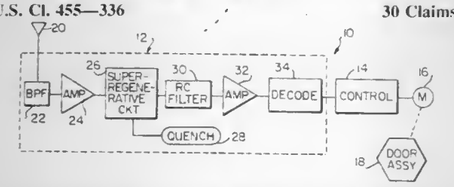
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**5,742,902**

**SUPER-REGENERATIVE CIRCUIT APPARATUS FOR A DOOR OPERATOR RECEIVER AND DOOR OPERATOR INCORPORATING THE SAME**

**Jerry Lynn Shore, Alliance, Ohio, assignor to GMI Holdings, Inc., Alliance, Ohio**

**Filed Mar. 29, 1996, Ser. No. 622,853**
**Int. Cl.[6] H04B 1/16**
**U.S. Cl. 455—336** **30 Claims**




1. A super-regenerative circuit apparatus for a radio frequency (RF) controlled electrical garage door opener with a RF receiver, said apparatus comprising:

a super-regenerative circuit including a tuned circuit tuned to an operational frequency and a quench oscillator that periodically enables and inhibits said super-regenerative circuit according to a quench frequency, said super-regenerative circuit producing an output signal with said operational frequency and said quench frequency superimposed; and

a cascode circuit connected to an input of said super-regenerative circuit as a preamplifier stage therefor, said cascode circuit including a field effect transistor (FET) and a bipolar transistor connecting said FET to said super-regenerative circuit, said FET and said bipolar transistor cooperating to produce very low gain in a direction from said input of said super-regenerative circuit to an input of said cascode circuit to thereby decrease RF radiation emitted from said super-regenerative circuit.

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**5,742,903**

**Patent Not Issued For This Number**

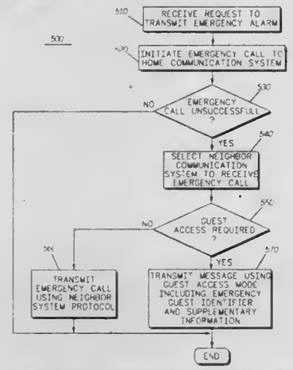
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**5,742,904**

**METHOD OF PROVIDING EMERGENCY ALARM SUPPORT VIA AN ALTERNATIVE RADIO COMMUNICATION SYSTEM**

**Ellis A. Pinder, Davie, and Charles P. Schultz, Hialeah, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Jul. 8, 1996, Ser. No. 676,784**
**Int. Cl.[6] H04B 7/00**
**U.S. Cl. 455—404** **20 Claims**




1. In a communication environment having a subscriber unit operating within a first communication system that provides emergency alarm support, the subscriber unit being within communication range of a second communication system that provides emergency alarm support, the second communication system operating independently of the first communication system, a method comprising the steps of:

at the subscriber unit:

selecting the second communication system as a target recipient of an emergency alarm call, as a backup to communicating the emergency alarm call to the first communication system;

determining that the second communication system provides support for emergency alarm calls through a guest access mode; and

transmitting a message to the second communication system, including the emergency alarm call, using the guest access mode, and supplementary information provides source identification information for the emergency alarm call;



at the second communication system:

receiving the message from the subscriber unit, including the emergency alarm call in guest access mode, and the supplementary information;

determining source identification information for the emergency alarm call; and

communicating the emergency alarm call to the first communication system based on the source identification information.

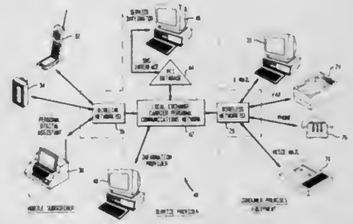
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**5,742,905**

**PERSONAL COMMUNICATIONS INTERNETWORKING**

**David Matthew Pepe, Middletown; Lisa B. Blitzer, Manalapan; James Joseph Brockman, Perrineville; William Cruz, Eatontown; Dwight Omar Hakim, Matawan, all of N.J.; Michael Kramer, Bronx County, N.Y.; Dawn Diane Petr, Basking Ridge, N.J.; Josefa Ramaroson, Freehold, N.J.; Gerardo Ramirez, Bridgewater, N.J.; Yang-Wei Wang, Howell, N.J., and Robert G. White, Morristown, N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.**

**Filed Sep. 19, 1994, Ser. No. 309,336**
**Int. Cl.[6] H04Q 7/20**
**U.S. Cl. 455—461** **11 Claims**



1. A personal communication internetwork for sending and receiving wireless and wireline messages, said internetwork comprising

(1) a server, including:

(a) a message transfer agent interfaced with at least one wireline data network;

(b) a wireless data network protocol handler connected to the message transfer agent and interfacing with at least one wireless data network;

(c) a mobility controller, including

i. a subscriber profile cache;

ii. a message router responsive to message routing parameters in the subscriber profile;

iii. an interface connected to exchange message routing parameters between the subscriber profile and the at least one wireless network;

iv. an interface connected to exchange message routing parameters between the subscriber profile and a personal communication control point; and

v. an interface with at least one of a telephone network, an alphanumeric pager network, and a voice peripheral; and

a personal communication control point connected to the server, including:

(a) a first interface connected to exchange message routing parameter signals with the server;

(b) a second interface connected to exchange generic data message routing parameter signals with the server;

(c) a subscriber profile connected to receive and maintain message routing parameters; and

(d) a call processor connected between the subscriber profile and the first and second interfaces.

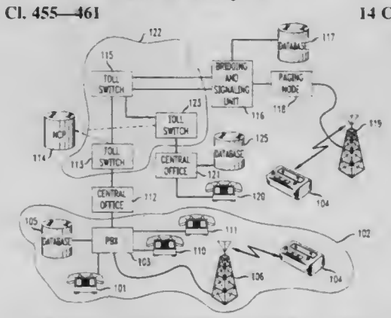
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**5,742,906**

**INTELLIGENT PBX IN-BUILDING AND OUT-OF-BUILDING PERSONAL REACH COMMUNICATIONS SYSTEM**

**Mark Jeffrey Foladare, Kendall Park; Shelley B. Goldman, East Brunswick; David Phillip Silverman, Somerville, and Roy Philip Weber, Bridgewater, all of N.J., assignors to AT&T Corp, Middletown, N.J.**

**Filed Jun. 25, 1996, Ser. No. 668,659**
**Int. Cl.[6] H04Q 7/20**
**U.S. Cl. 455—461** **14 Claims**




1. A method for use in completing a telephone call to a called party/subscriber to a personal reach telephone service placed by a calling party who is local to a home PBX associated with that called party/subscriber, the method comprising the steps of:

receiving the calling party's call at the home PBX;

determining whether the called party/subscriber is within an area local to the home PBX at the time the calling party's call is received at the home PBX;

if the called party/subscriber is determined to be within the area local to the home PBX and the calling party has dialed a personal reach telephone number associated with the called party/subscriber on the personal reach telephone service, converting the personal reach telephone number to a local extension number on the home PBX and initiating connection of the call from the PBX to the local extension number; and

if the called party/subscriber is determined to be outside the area local to the home PBX and the calling party has dialed a local extension number associated with the called party/subscriber on the home PBX, converting the dialed local extension number to the personal reach telephone number associated with the called party/subscriber and initiating connection of the call from the PBX to the personal reach telephone number.

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**5,742,907**

**AUTOMATIC CLEAR VOICE AND LAND-LINE BACKUP ALIGNMENT FOR SIMULCAST SYSTEM**

**Thomas A. Brown, Lynchburg, Va., assignor to Ericsson Inc., Research Triangle Park, N.C.**

**Filed Jul. 19, 1995, Ser. No. 504,390**
**Int. Cl.[6] H04B 1/00; 7/00**
**U.S. Cl. 455—503** **12 Claims**

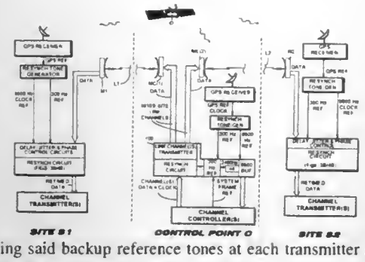
1. In a radio frequency (RF) simulcasting system of the type having a control point connected by land-line communication links to plural RF transmitter sites, said communication links exhibiting time delay ambiguities, and each of said RF transmitter sites including an associated global positioning satellite (GPS) receiver for providing access to a common timing reference, a method for maintaining simulcast system synchronization in the event of GPS receiver failure or loss of GPS signal lock, comprising the steps of:

generating a pair of backup simulcast system timing reference signal tones at said control point;

continuously transmitting said backup reference signal tones over said communication links to said transmitter sites; and

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using said backup reference tones at each transmitter site as an alternate common timing reference in the event of GPS receiver failure or loss of GPS signal lock.

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**5,742,908**

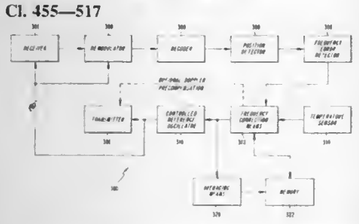
**FREQUENCY ERROR CORRECTION IN A SATELLITE-MOBILE COMMUNICATIONS SYSTEM**

**Paul W. Dent, Stehags, Sweden, assignor to Ericsson Inc., Research Triangle Park, N.C.**

**Filed Sep. 14, 1994, Ser. No. 305,784**

**Int. Cl.[6] H04B** *7/185*

**U.S. Cl. 455—517** **4 Claims**



1. A mobile station for use in a satellite communication system with at least one moving relay station, comprising:

receiver means for receiving a paging channel signal broadcast by said relay station;

means for demodulating said paging channel signal to produce a demodulated signal;

means for decoding said demodulated signal to produce a decoded signal;

means for determining a position estimate of said mobile station;

means for determining a frequency error and a Doppler shift using said decoded signal and said position estimate;

temperature sensor means for making temperature measurements;

memory means for storing average frequency control signal values for each of a plurality of temperatures;

frequency correcting means for determining a frequency correcting signal based on said determined frequency error and Doppler shift or based on said stored values and said temperature measurement;

averaging means for averaging said stored average values with frequency-correcting signal values and storing said average values in said memory means in positions determined by said temperature measurements;

controlled oscillator means having a control input for a frequency-correcting signal; and

transmitter means for generating a transmit signal using said controlled oscillator means as a reference.

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**5,742,909**

**TRANSMISSION OF DATA INDICATING DYNAMIC TRANSMISSION/RECEPTION PERIODS**

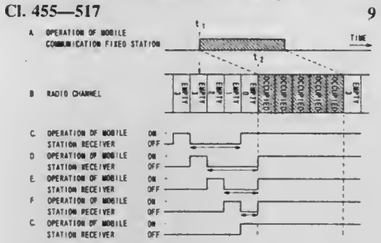
**Noriko Uchida; Akihiro Maebara; Ichiro Okajima; Katsumi Kobayashi, and Masumi Kitagawa, all of Kanagawa, Japan, assignors to NTT Mobile Communications Network, Inc., Japan**

**Filed Mar. 8, 1996, Ser. No. 612,564**

**Claims priority, application Japan, Mar. 8, 1996, 7-048809**

**Int. Cl.[6] H04B** *7/00;* **H04Q** *7/00*

**U.S. Cl. 455—517** **9 Claims**




1. A data transmission method for indicating dynamic transmission/reception periods in a data transmission from a fixed station to a mobile station through a radio channel comprised of a sequence of slots, comprising:

said fixed station performing the steps of:

(a) transmitting significant data to said mobile station after delaying by a number of slots once such significant data to be transmitted has occurred; and

(b) also transmitting remaining time data, which indicate at least how many slots are remaining until the time significant data are transmitted, in each slot from the time the significant data to be transmitted occurs until the time the significant data are transmitted, and;

said mobile station performing the steps of:

(c) receiving the remaining time data at a frequency of once for the number of slots equal to or less than a predetermined number of slots, and

(d) also receiving the remaining time data or significant data in the slot which comes after the passage of a the number of slots indicated by the received remaining time data.

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**5,742,910**

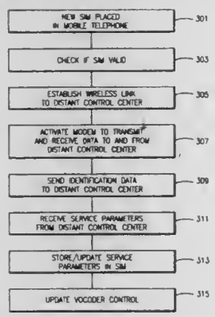
**TELEADMINISTRATION OF SUBSCRIBER ID MODULES**

**John Kenneth Gallant, and Tom Wrappe, both of Plano, Tex., assignors to MCI Corporation, Washington, D.C.**

**Filed May 23, 1995, Ser. No. 447,719**

**Int. Cl.[6] H04Q** *7/20;7/32*

**U.S. Cl. 455—550** **5 Claims**




1. A mobile telephone comprising:

a vocoder with changeable control parameters;

automatic dialing means responsive to stored digital information;



a subscriber ID module removably mated to a slot of said telephone having storage space to hold subscriber pertinent data including at least data for controlling said vocoder and for actuation of voice message retrieval;

means for receiving digital programming data through a radio communication channel;

means for programming the storage space in said subscriber ID module according to the received digital programming data;

means for modifying the changeable control parameters of the vocoder according to the data of vocoder parameters stored in said storage space; and

means using said voice message retrieval data stored in said storage space for automatically dialing a telephone number and retrieving voice message.

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**5,742,911**

**SECTORIZED CELLULAR RADIO BASE STATION ANTENNA**

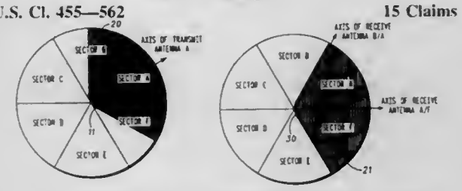
**Michael James Dumbrill, Swindon, and Idris John Mark Rees, Hungerford, both of United Kingdom, assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 130,603, Oct. 1, 1993, abandoned. This application Jun. 4, 1996, Ser. No. 658,985**

**Claims priority, application United Kingdom, Oct. 3, 1992, 9220823**

**Int. Cl.[6] H04Q** *7/30*

**U.S. Cl. 455—562** **15 Claims**




1. A sectorized cellular radio base station antenna comprising:

a plurality of angularly separated directional transmit antennas, each transmit antenna providing a transmit coverage sector having a central axis of transmission, for transmitting signals to mobile units located in said transmit coverage sector;

a plurality of angularly separated directional receive antennas, each receive antenna providing a receive coverage sector having a central axis of reception, for receiving signals from mobile units located in said receive coverage area; and

diversity combining means for combining signals from adjacent receive antennas; wherein

said central axes of said receive antennas are angularly offset to said central axes of said transmit antennas, and said transmit coverage sectors and said receive coverage sectors have substantially similar angular coverage but are angularly offset, so that, for a mobile in a given transmit coverage sector, said diversity combining means is arranged to diversity combine said received signals from two of said receive antennas the axes of which lie on either side of that transmit antenna axis.

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**5,742,912**

**PORTABLE RADIO TELEPHONE SET**

**Takanori Nishiyama, Mitaka; Kazunori Yanagisawa, Higashiyamato, and Sakae Itakura, Ayase, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 117,326, Sep. 7, 1993, Pat. No. 5,436,954. This application Jan. 18, 1995, Ser. No. 375,409**

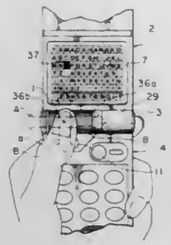
**Claims priority, application Japan, Sep. 8, 1992, 4-239735**

**Int. Cl.[6] H04Q** *7/32*

**U.S. Cl. 455—566** **7 Claims**

1. A portable radio telephone set comprising:

an operation member having a plurality of button keys thereon and a microphone therein;




a display and receiver member having a display section for displaying a menu of telephone functions and having an output section for outputting received voice messages;

a hinge member hingedly joining said operation member and said display and receiver member to form a telephone case having a front side with said button keys, said display section, and said output section thereon, and having a rear side, said hinge member permitting hinged movement of said operation member and said display and receiver member between a folded and housed position and an open operating position;

a rotary selector member having a longitudinal axis, and mounted on said telephone case for longitudinal movement along said longitudinal axis between a first position, in which a first menu of functions is displayed on said display section, and a second position, in which a second menu of functions is displayed on said display section, and protruding both to the front side and to the rear side of said telephone case for operation from either said front side or said rear side to select telephone functions from the menu displayed on said display and receiver member and to adjust sound volume of said telephone set;

said button keys and said rotary selector being positioned to permit operation thereof by a user's thumb.

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**5,742,913**

**Patent Not Issued For This Number**

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**5,742,914**

**APPARATUS AND METHOD RESPONSIVE TO THE ON-BOARD MEASURING OF HAULAGE PARAMETERS OF A VEHICLE**

**LeRoy G. Hagenbuch, 502 W. Northgate Rd., Peoria, Ill. 61614**

**Continuation of Ser. No. 206,531, Mar. 4, 1994, Pat. No. 5,416,706, which is a continuation of Ser. No. 102,531, Aug. 4, 1993, Pat. No. 5,327,347, which is a continuation of Ser. No. 964,126, Oct. 20, 1992, abandoned, which is a continuation of Ser. No. 351,179, May 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 874,273, Jun. 13, 1986, Pat. No. 4,831,539, and Ser. No. 717,042, Apr. 1, 1985, Pat. No. 4,839,835, which is a continuation-in-part of Ser. No. 604,739, Apr. 27, 1984, Pat. No. 4,630,227. This application Mar. 13, 1995, Ser. No. 403,069**

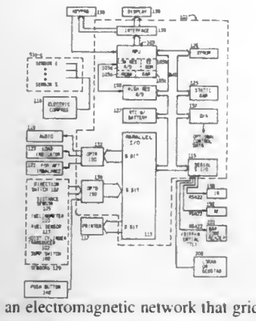
**Int. Cl.[6] G01C** *21/00;* **G06F** *17/00*

**U.S. Cl. 701—35** **19 Claims**

1. An apparatus for determining and recording a location of a vehicle and a hauling status of a load carried by the vehicle, the apparatus comprising: a device mounted to the vehicle for providing a signal whose value is indicative of the hauling status of the load carried by the vehicle; a source of a signal whose value is indicative of the location of the vehicle, where the source is

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responsive to an electromagnetic network that grids a work area of the vehicle; a processor responsive to the signals from the device and the network for processing the signals to determine the status of the vehicle's load at a particular location in the work area with respect to time information provided by the processor; and, a memory for receiving from the processor as historical information the status of the load, the particular location and the time information and storing the historical information in a format correlating the status of the load, the particular location and the time information.

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**5,742,915**

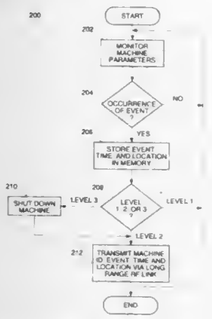
**POSITION REFERENCED DATA FOR MONITORING AND CONTROLLING**

**Darrell E. Stafford, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.**

**Filed Dec. 13, 1995, Ser. No. 573,216**

**Int. Cl.[6] G06F** *19/00*

**U.S. Cl. 701—35** **24 Claims**




1. A system for recording the time and position of a machine during an occurrence of an event, comprising:

means for sensing operating characteristics of said machine;

means for receiving said operating characteristics, responsively determining a set of operating parameters, and detecting a deviation in said operating parameters of said machine;

means for determining a time of occurrence of said deviation;

means for determining a geographic location of said machine at said time of occurrence;

means for determining a level of significance of said deviation from one of three levels of significance, including a level one event, a level two event, and a level three event;

means for storing said deviation, said time of occurrence, said geographic location, and said level of significance in memory; and

means for transmitting said deviation, said time of occurrence, and said geographic location to a remote location.

**5,742,916**

**PROCESS AND CIRCUIT FOR CONTROLLING THE CONTROL UNIT OF A SYSTEM FOR PROTECTING VEHICLE OCCUPANTS**

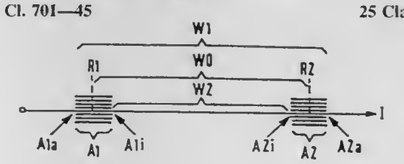
**Michael Bischoff, Karlstein; Johann Guggenberger, Mintraching, and Oskar Leirich, Neutraubling, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Continuation of Ser. No. 494,054, Jun. 23, 1995, abandoned. This application Jan. 17, 1997, Ser. No. 784,477**

**Claims priority, application European Pat. Off., Dec. 23, 1992, 92121842; Sep. 23, 1993, 93115391**

**Int. Cl.[6] B60R** *21/32;22/46*

**U.S. Cl. 701—45** **25 Claims**




1. A process for controlling and adjusting a control unit of a vehicle-occupant protection system by triggering the protection system if an accident is sufficiently serious, wherein the control unit includes:

at least one sensor for supplying at least one sensor signal during the accident, and a computing unit for computing ACTUAL values characterizing a course of the accident on the basis of the sensor signal, for independently and continuously redefining a time-variable triggering threshold value, the triggering threshold value being at least indirectly dependent on the momentary sensor signal value of the sensor signal during the course of the accident, the process comprising the steps of:

a) computing with the computing unit the triggering threshold value on the basis of the progression of at least one ACTUAL value, which is determined by means of an average deceleration value,

b) increasing the triggering threshold value with an increasing amount of the average deceleration;

c) comparing with the computing unit the triggering threshold value with another ACTUAL value; and

d) triggering the protection system if the other ACTUAL value exceeds the triggering threshold value.

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**5,742,917**

**DRIVING TORQUE DISTRIBUTION CONTROL SYSTEM FOR VEHICLE AND THE METHOD THEREOF**

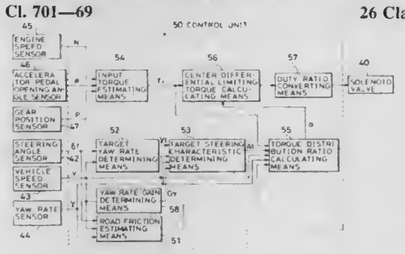
**Koji Matsuno, Gunma, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 13, 1995, Ser. No. 489,785**

**Claims priority, application Japan, Jun. 27, 1994, 6-144656**

**Int. Cl.[6] B60K** *17/34*

**U.S. Cl. 701—69** **26 Claims**




1. A torque distribution control system of a vehicle for distributing an input torque to wheels, comprising:



a yaw rate sensor for detecting a yaw rate;

a steering angle sensor for detecting a steering angle;

a vehicle speed sensor for detecting a vehicle speed; and

road friction estimating means for estimating a friction coefficient of road surface based on said yaw rate, said steering angle and said vehicle speed;

torque distribution ratio calculating means for calculating a torque distribution ratio by using said friction coefficient; and

a torque distributing mechanism for distributing said input torque to said wheels based on said torque distribution ratio.

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**5,742,918**

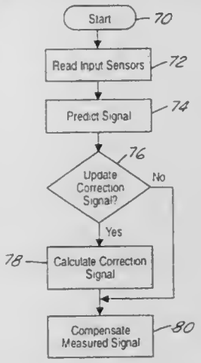
**METHOD AND APPARATUS FOR DYNAMICALLY COMPENSATING A LATERAL ACCELERATION OF A MOTOR VEHICLE**

**Behrouz Ashrafi, Dearborn, and Darrel Alan Recker, Belleville, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.**

**Filed Apr. 26, 1996, Ser. No. 638,629**

**Int. Cl.[6] B60G** *17/15;* **G06F** *17/10*

**U.S. Cl. 701—70** **10 Claims**




1. A system for dynamically determining a lateral acceleration of a motor vehicle for input to a controller employed to control dynamics of the motor vehicle, said system comprising:

yaw rate measuring means for producing a yaw rate signal corresponding to a yaw rate of said motor vehicle;

vehicle speed measuring means for producing a vehicle speed signal corresponding to a longitudinal velocity of said motor vehicle;

lateral acceleration measuring means comprising means for producing a first signal corresponding to a measured lateral acceleration of said motor vehicle;

lateral acceleration predictor means comprising means for producing a second signal using said yaw rate signal and said vehicle speed signal, said second signal thereby representing a predicted lateral acceleration of said motor vehicle;

correction means comprising means for producing a third signal representing an erroneous component of said first signal; and

compensator means for removing said third signal from said first signal to obtain a fourth signal which accurately represents said lateral acceleration and providing said fourth signal to said controller.

**5,742,919**

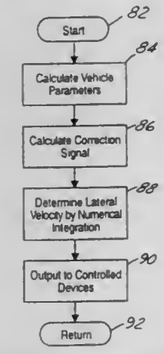
**METHOD AND APPARATUS FOR DYNAMICALLY DETERMINING A LATERAL VELOCITY OF A MOTOR VEHICLE**

**Behrouz Ashrafi, Dearborn, and Darrel Alan Recker, Belleville, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.**

**Filed Apr. 26, 1996, Ser. No. 638,630**

**Int. Cl.[6] B60G** *17/15;* **G06F** *17/10*

**U.S. Cl. 701—70** **14 Claims**




1. A system for dynamically estimating a lateral velocity of a motor vehicle for input to a controller employed to control dynamics of the motor vehicle, said system comprising:

vehicle speed measuring means for producing a vehicle speed signal corresponding to a longitudinal velocity of said motor vehicle;

yaw rate measuring means for producing a yaw rate signal corresponding to a yaw rate of said motor vehicle;

lateral acceleration measuring means for producing a lateral acceleration signal corresponding to a lateral acceleration of said motor vehicle;

tire lateral force estimating means comprising means for producing a tire lateral force signal for each tire;

correction means comprising means for producing a corrector signal from said lateral acceleration signal and said tire lateral force signal; and

processor means for integrating a predetermined combination of said vehicle speed signal, said yaw rate signal, said correction signal and said tire lateral force signal for each tire and generating a lateral velocity signal therefrom.

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**5,742,920**

**DISPLAY FOR A TEMPERATURE CONTROL SYSTEM**

**Robert E. Cannuscio, North Wales, Pa., and Thomas J. Hollis, 5 Roxbury Dr., Medford, N.J. 08055, assignors to Thomas J. Hollis, Medford, N.J.**

**Filed Jul. 26, 1995, Ser. No. 507,100**

**Int. Cl.[6] G06F** *7/70*

**U.S. Cl. 701—102** **35 Claims**

1. A system for displaying engine temperature information for a temperature control system in an internal combustion engine, the system comprising:

a first temperature sensor for sensing an ambient air temperature and providing a signal indicative thereof;

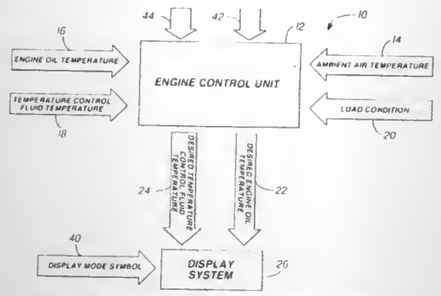
a second temperature sensor for sensing an engine oil temperature and providing a signal indicative thereof;

a third temperature sensor for sensing a temperature of the temperature control fluid and providing a signal indicative thereof;

an engine computer for receiving the sensed temperature signals of the ambient air, the engine oil and the temperature control fluid, the engine computer comparing the sensed ambient air temperature to a first set of predetermined values having an ambient air temperature component and an engine oil tem-

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perature component, the engine computer determining a desired engine oil temperature based on the comparison of the sensed ambient air temperature to the set of predetermined values, the engine computer providing a signal indicative of the desired engine oil temperature;

a display system for receiving and displaying the desired engine oil temperature signal and the sensed engine oil temperature signal.

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**5,742,921**

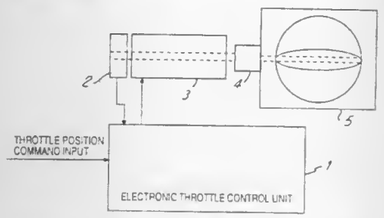
**AUTOMATIC SELF-CALIBRATION METHOD FOR POSITION ENCODER**

**Kah Seng Oo, Farmington Hills, and Paul Michael Suzio, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed May 6, 1996, Ser. No. 642,986**

**Int. Cl.[6] F02D *41/04*; G01B *7/30***

**U.S. Cl. 701—102** **5 Claims**




1. A method of auto-calibrating an inductance position encoder for an associated motor having a rotor with poles and a cooperating stator with poles, thus forming an encoder/motor combination, the method including the steps of:

selecting a motor phase in the motor of the encoder/motor combination by initializing a pointer to a motor phase table;

energizing the selected phase of the motor so as to move a first rotor pole of the motor into alignment with a first stator pole;

reading the electrical degree value of each of the three phases of the electrical wave functions of the encoder;

selecting two motor phases;

energizing the selected two motor phases so that the first rotor pole and a second rotor pole, adjacent to the first rotor pole, are rotated into an intermediate position between the first stator pole and a second stator pole, adjacent to the first stator pole;

reading the electrical degree value of each of the three phases of the encoder, thereby establishing two points for each of the three phases of the electrical wave functions of the encoder;

calculating the slope and offset for each of the three electrical wave functions of the encoder;

repeating this process until the electrical wave functions of the encoder are fully defined; and

storing such electrical wave functions and using them as a calibration reference for the encoder.

**5,742,922**

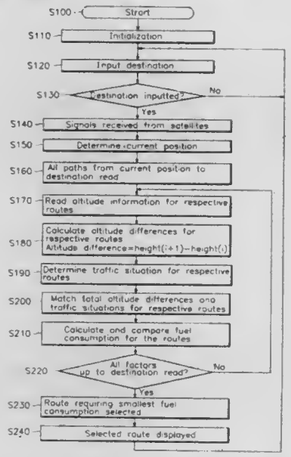
**VEHICLE NAVIGATION SYSTEM AND METHOD FOR SELECTING A ROUTE ACCORDING TO FUEL CONSUMPTION**

**Hyun-Chul Kim, Seoul, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea**

**Filed Feb. 12, 1996, Ser. No. 600,167**

**Int. Cl.[6] G01C *21/00*; G06F *165/00***

**U.S. Cl. 701—201** **20 Claims**




9. A ground vehicle navigation method for selecting a route according to fuel consumption, comprising the steps of:

selecting a destination;

receiving signals from GPS satellites;

determining a current vehicle position based on the signals received from the satellites;

determining alternative routes from the current vehicle position to the destination;

calculating fuel consumption required for each of the alternative routes based upon change of altitude of each of the alternative routes;

selecting from the alternative routes a preferred route requiring the least amount of fuel consumption; and

displaying the preferred route.

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**5,742,923**

**METHOD OF CORRECTING DISTANCE ERROR OF NAVIGATION APPARATUS AND NAVIGATION APPARATUS**

**Satoshi Odagawa, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo-to, Japan**

**Filed Oct. 18, 1993, Ser. No. 137,267**

**Claims priority, application Japan, Oct. 20, 1992, 4-281252**

**Int. Cl.[6] G06G *7/78***

**U.S. Cl. 701—207** **10 Claims**

1. A method of correcting a distance error of a navigation apparatus for displaying at least a present position and an advance direction of a movable body on map information including road position information, said apparatus including a measuring means for detecting a travelling distance and the advance direction and periodically measuring an advanced position, to which the movable body is assumed to have advanced from the present position, to update the present position by the advanced position,

said method comprising the steps of:

setting the present position as a first present position candidacy;

positioning a plurality of second present position candidacies on positions corresponding to the road forward and backward of the first present position candidacy;





measuring the advanced position with respect to each of the first and second present position candidacies as a standard position, on the basis of the detected travelling distance and advance direction;

calculating a correction amount of each measured advanced position, to correct each measured advanced position onto a position corresponding to the road according to the road position information;

selecting one of the first and second present position candidacies, which calculated correction amount is the minimum; and

updating the present position by the corrected advanced position of the selected one candidacy.

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**5,742,924**

**APPARATUS AND METHOD FOR NAVIGATING MOBILE BODY USING ROAD MAP DISPLAYED IN FORM OF BIRD'S EYE VIEW**

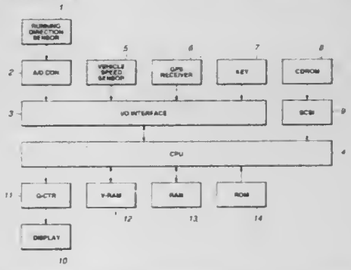
**Okihiko Nakayama, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan**

**Filed Dec. 1, 1995, Ser. No. 566,290**

**Claims priority, application Japan, Dec. 2, 1994, 6-299662; Dec. 12, 1994, 6-307612; Feb. 24, 1995, 7-037054**

**Int. Cl.[6] G01C *21/20*; G09B *29/00*; G06F *165/00***

**U.S. Cl. 701—208** **31 Claims**




1. An apparatus for navigating a mobile body, comprising:

a) storing means for storing a plurality of road map data, each road map data stored therein being formed on a two-dimensional plane and having a predetermined level of detail;

b) graphical drawing means for graphically drawing at least any one of the road map data stored in said storing means which is related to a present position of the mobile body and a destination which the mobile body is finally to reach on a display image screen in a form of a bird's eye view,

said graphical drawing means varying the level of detail of the road map data graphically drawn thereby according to a display position for said road map data on the display image screen; and

c) a display unit, having the display image screen, to operatively display the graphically drawn road map data in the form of the bird's eye view on the display image screen so that the graphically drawn road map data is viewed approximately three-dimensionally with an appearance of depth given to a viewer of the display image screen.

**5,742,925**

**AUTOMOTIVE NAVIGATION SYSTEM**

**Toshiharu Baba, Saitama-ken, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed May 6, 1996, Ser. No. 642,870**

**Claims priority, application Japan, May 8, 1995, 7-109795; May 22, 1995, 7-122870**

**Int. Cl.[6] G06F *165/00***

**U.S. Cl. 701—221** **3 Claims**



1. An automotive navigation system comprising:

an angular velocity sensor for detecting an angular velocity of a motor vehicle;

first determining means for determining a right turn of the motor vehicle and for producing a right turn signal when determined;

second determining means for determining a left turn of the motor vehicle and for producing a left turn signal when determined;

first adjusting means responsive to the right turn signal for producing a positive correction coefficient for correcting the angular velocity detected by the angular velocity sensor at the right turn;

second adjusting means responsive to the left turn signal for producing a negative correction coefficient for correcting the angular velocity detected by the angular velocity sensor at the left turn;

selecting means for selecting either of the positive correction coefficient or the negative correction coefficient;

correcting means for correcting the detected angular velocity with the selected correction coefficient;

calculator means for calculating a bearing of the motor vehicle with the corrected angular velocity.

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**5,742,926**

**METHOD OF UPDATING INFORMATION RELATING TO PRIORITIES ASSIGNED TO CONVERSION CANDIDATES**

**Takeshi Yumura, Neyagawa, and Takaaki Ueyama, Gobo, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan**

**Filed Feb. 13, 1996, Ser. No. 600,374**

**Claims priority, application Japan, Oct. 20, 1995, 7-272912**

**Int. Cl.[6] G06F *17/28***

**U.S. Cl. 704—2** **8 Claims**

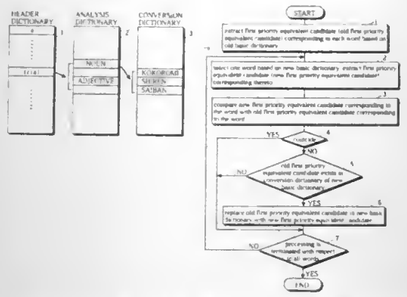
1. A method of updating information relating to priorities assigned to conversion candidates, comprising the steps of:

comparing for each word to be converted a conversion candidate assigned the first priority corresponding to the word to be converted which is held in an old basic dictionary with a conversion candidate assigned the first priority corresponding to the word to be converted which is held in a new basic dictionary when an updated version of a document conversion application is installed; and

changing, when the conversion candidates assigned the first priority corresponding to the word to be converted differ from each other, priorities assigned to conversion candidates corresponding to the word to be converted in the new basic dictionary so that the conversion candidate assigned the first priority corresponding to the word to be converted which is

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held in the old basic dictionary also becomes the conversion candidate assigned the first priority corresponding to the word to be converted in the new basic dictionary.

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**5,742,927**

## NOISE REDUCTION APPARATUS USING SPECTRAL SUBTRACTION OR SCALING AND SIGNAL ATTENUATION BETWEEN FORMANT REGIONS

**Philip Mark Crozier, Lancashire, and Barry Michael George Cheetham, Liverpool, both of United Kingdom, assignors to British Telecommunications Public Limited Company, England**

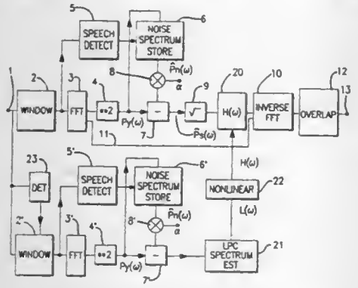
**PCT No. PCT/GB94/00278, § 371 Date Oct. 11, 1995, § 102(e) Date Oct. 11, 1995, PCT Pub. No. WO94/18666, PCT Pub. Date Aug. 18, 1994**

**PCT Filed Feb. 11, 1994, Ser. No. 501,055**

**Claims priority, application Austria, Feb. 12, 1993, 93301024.1**

**Int. Cl.[6] G10L** *9/04*

**U.S. Cl. 704—226** **49 Claims**




13. A noise reduction apparatus comprising:

conversion means for converting a time-varying input signal into signals representing the magnitudes of spectral components of the input signals;

processing means operable to effect a reduction in the magnitude of low-magnitude ones of the said spectral component signals relative to that of higher magnitude ones of the said spectral component signals;

reconversion means to convert the said spectral component signals into a time-varying signal;

means to identify format regions of the speech spectrum;

means to attenuate those frequency components lying outside the formant regions;

the means to identify formant regions being responsive to the input signal or a derivative of the input signal to produce frequency response signals, and the attenuation means being operable to multiply the power spectrum of the signal by the frequency response signals;

the means to identify the formant regions being further responsive to the spectral signals following processing by auxiliary processing means operable to effect a reduction in the magnitude of low magnitude ones of the said spectral component signals relative to that of higher magnitude ones of the said spectral component signals.

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**5,742,928**

## APPARATUS AND METHOD FOR SPEECH RECOGNITION IN THE PRESENCE OF UNNATURAL SPEECH EFFECTS

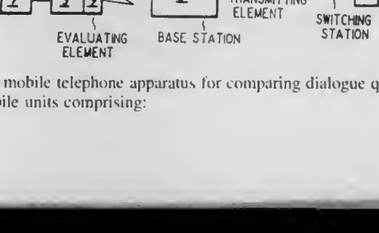
**Tadashi Suzuki, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 26, 1995, Ser. No. 548,702**

**Claims priority, application Japan, Oct. 28, 1994, 6-265280**

**Int. Cl.[6] G10L** *9/06*

**U.S. Cl. 704—239** **40 Claims**




1. A speech recognition apparatus comprising:

an acoustic analyzer for analyzing an input speech signal of unnatural speech and extracting a time-series feature vector from said input speech signal;

a normal speech model memory for storing a normal speech model learned based on normal speech data;

an acoustic-phonetic variability model memory for storing a plurality of acoustic-phonetic variability models, each representing an acoustic-phonetic change of spectrum caused by unnatural speech; and speech recognition means for generating an unnatural speech model based on said normal speech model and at least one of said plurality of acoustic-phonetic variability models corresponding to another of said normal speech models, for recognizing said input speech signal of unnatural speech based on said time-series feature vector and said unnatural speech model, and for outputting a recognition result.

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**5,742,929**

## ARRANGEMENT FOR COMPARING SUBJECTIVE DIALOGUE QUALITY IN MOBILE TELEPHONE SYSTEMS

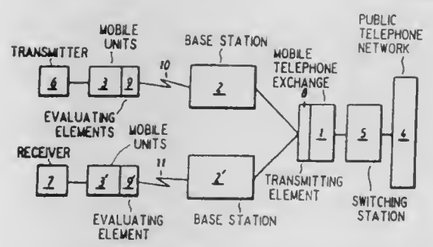
**Robert Källman, Bandhagen, and Stefan Lidbrink, Stockholm, both of Sweden, assignors to Televerket, Farsta, Sweden**

**Continuation of Ser. No. 34,907, Mar. 19, 1993, abandoned. This application May 28, 1996, Ser. No. 654,753**

**Claims priority, application Sweden, Apr. 21, 1992, 9201236**

**Int. Cl.[6] G10L** *5/00*

**U.S. Cl. 704—251** **10 Claims**




1. A mobile telephone apparatus for comparing dialogue quality in mobile units comprising:



at least one mobile telephone system, each including a mobile telephone exchange, a plurality of base stations and a plurality of mobile radio units which communicate with the said base stations;

first means for transmitting at least one predetermined stored analogue speech message that constitutes a correct representation;

second means, including speech recognition means, for receiving said at least one analogue speech message transmitted by said first means which constitutes a received representation;

said second means evaluating a dialogue quality by comparing said received representation with a stored version of said correct representation and for producing a comparison representation therefrom depending on the recognized parts of said received message.; and

said second means producing the comparison representations for at least two mobile radio units so that the dialogue quality between the two units can be compared.

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**5,742,930**

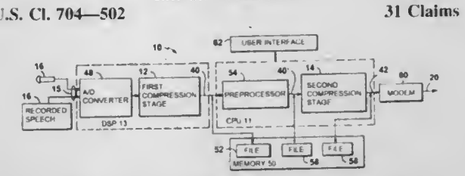
## SYSTEM AND METHOD FOR PERFORMING VOICE COMPRESSION

**Andrew Wilson Howitt, Cambridge, Mass., assignor to Voice Compression Technologies, Inc., Boston, Mass.**

**Continuation of Ser. No. 168,815, Dec. 16, 1993, abandoned. This application Sep. 28, 1995, Ser. No. 535,586**

**Int. Cl.[6] G10L** *3/02*

**U.S. Cl. 704—502** **31 Claims**




1. A method of voice compression comprising the steps of:

performing a first type of compression on a voice signal to produce an intermediate signal that is compressed with respect to the voice signal in accordance with a speech compression procedure;

storing the intermediate signal;

performing a second type of compression different from the first type on said stored intermediate signal to produce an output signal that is compressed with respect to the intermediate signal; and

wherein said first type of compression is of a kind that causes loss of a portion of the information contained in the intermediate signal with respect to the voice signal, and said second type of compression is of a kind that causes no loss of information contained in the output signal with respect to the intermediate signal.

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**5,742,931**

## SYSTEM AND METHOD FOR ALLOCATING RESOURCES OF A RETAILER AMONG MULTIPLE WHOLESALERS

**Steven P. Spiegelhoff, Mukwonago, and Joseph Kraetz, Milwaukee, both of Wis., assignors to SS&D Corporation, Mukwonago, Wis.**

**Continuation of Ser. No. 5,248, Jan. 15, 1993, Pat. No. 5,402,336. This application Dec. 27, 1994, Ser. No. 364,826**

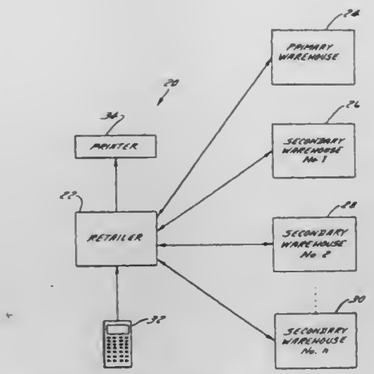
**The portion of the term of this patent subsequent to Dec. 27, 2014, has been disclaimed.**

**Int. Cl.[6] G06F** *17/60*

**U.S. Cl. 705—8** **4 Claims**

1. A method comprising:

(A) automatically obtaining, via operation of a first computer operated by an orderer for a retailer and electronically linked to further computers of remote warehouses, price information about each of a plurality of distinct items from the further computers of at least two of said warehouses, wherein each of said warehouses has available each of said items;




(B) automatically evaluating, via said first computer, on an item-by-item basis, and based on a predetermined price-based criterion, said price information received from said further computers;

(C) automatically selecting, via said first computer, and on an item-by-item basis, one of said at least two warehouses to deliver each of said items based on said evaluating step; and

(D) transmitting, via said first computer, an order for each of said items to the further computer of the warehouse selected for the delivery of that item, wherein said step (C) further comprises determining an initial allocation of monetary resources as a result of said automatic selection, and wherein said warehouses comprise a primary warehouse and at least one secondary warehouse, further comprising the steps of determining whether a designated ordering criterion for said primary warehouse is met and, if said designated ordering criterion is not met, determining a revised allocation of monetary resources which meets said designated ordering criterion for said primary warehouse.

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**5,742,932**

## METHOD AND SYSTEM OF ACCOUNTING FOR TRANSACTION COSTS AND CURRENCY EXCHANGE IN A HYBRID MAIL SYSTEM

**Paul A. Levitsky, Bridgeport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.**

**Filed Dec. 24, 1996, Ser. No. 772,790**

**Int. Cl.[6] G07B** *17/00*

**U.S. Cl. 705—410** **14 Claims**

1. A method of accounting for a transaction cost and currency exchange relative to a customer accounts in a hybrid mail system, comprising the steps of:

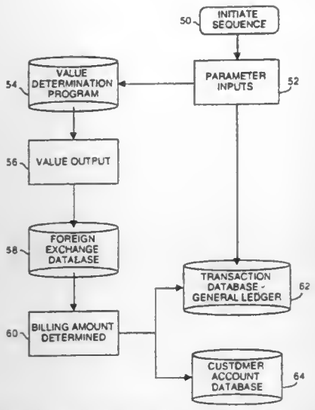
(a) establishing a data center;

(b) establishing a first remote data entry point comprising a first data entry program;

(c) establishing a second remote data entry point comprising a second data entry program and a mail piece production means;

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(d) selecting, in said first data entry program, a set of parameters and a unit cost for each parameter of said set of parameters which together define a mailpiece, a destination for said mailpiece wherein said destination is designated as said second remote data entry point, and a choice of debiting or crediting a customer account wherein said account is maintained at said data center;

(e) transmitting said set of selected parameters, and a unit cost associated with a predetermined subset of parameters wherein said predetermined subset comprises costs known to said first remote data entry point, to said data center and to said second remote data entry point;

(f) producing said mailpiece at said second remote data entry point wherein said mailpiece is comprised of a first set of elements determined by said selected set of parameters;

(g) calculating, at said second remote data entry point, an unit cost for each of said mailpiece production and delivery elements;

(h) transmitting said calculated unit cost from said second remote data entry point to said data center;

(I) calculating, at said data center, a total unit cost of said transaction;

(j) converting said total unit cost to a transaction cost by multiplying said total unit cost by a currency conversion factor and wherein said factor is selected from a set of factors predetermined by currency type;

(k) transmitting said transaction cost to said customer account database, to said transaction database, and to said first remote data entry point; and

(l) accounting for said transaction cost by storing said transaction cost in said customer account database, said transaction database and at said first remote data entry point for use in accounting records.

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**5,742,933**

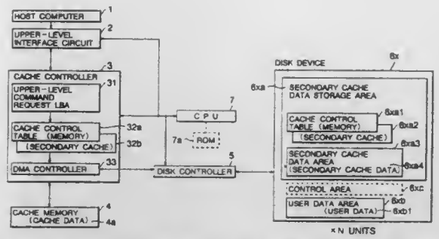
## ROTARY MEMORY STORAGE DEVICE WITH CACHE CONTROL METHOD AND APPARATUS

**Akira Kojima; Tsuneo Hirose; Masahiko Sato; Toshiyuki Haruna, and Tetsuzo Kobashi, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 255,942, Jun. 7, 1994, Pat. No. 5,584,012. This application Oct. 10, 1996, Ser. No. 728,791**
**Claims priority, application Japan, Jun. 8, 1993, 5-136320**
**Int. Cl.[6] G06F** *13/00*
**U.S. Cl. 711—113** **18 Claims**

1. A rotary storage device comprising:

a rotary storage medium;




a cache memory provided on a data transfer path between said rotary storage medium and an upper-level apparatus and for temporarily storing data transferred between said rotary storage device and said upper-level apparatus; and

a controller for controlling data transfer between said rotary storage device and said upper-level apparatus through said cache memory, said controller performing:

a process of partitioning a storage area of said rotary storage medium into a first user area for storing user data and a second user area for storing data transferred between said first user area and said upper-level apparatus,

a process of copying data of said second user area into said first user area, and

a process of, in response to a data readout request from said upper-level apparatus to read out data from said rotary storage medium, transferring the requested data from said cache memory to said upper-level apparatus when the requested data is present in said cache memory, and transferring the requested data from said second user area to said upper-level apparatus through said cache memory when the requested data is absent in said cache memory and is present in said second user area.

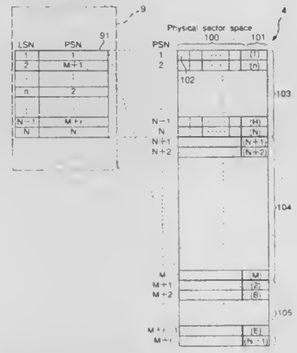
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**5,742,934**

## FLASH SOLID STATE DISK CARD WITH SELECTIVE USE OF AN ADDRESS CONVERSION TABLE DEPENDING ON LOGICAL AND PHYSICAL SECTOR NUMBERS

**Takayuki Shinohara, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 11, 1996, Ser. No. 613,670**
**Claims priority, application Japan, Sep. 13, 1995, 7-235229**
**Int. Cl.[6] G06F** *12/10;12/00*
**U.S. Cl. 711—103** **7 Claims**




1. A flash solid state disk card comprising:



a flash memory having M blocks having physical sector numbers between 1 and M, the M blocks including N blocks for sector management, where N is smaller than M;

a random access memory storing an address conversion table which outputs a physical sector number for one of the N blocks in correspondence to an input of a logical sector number between 1 and N;

data write processing means for writing data to a block for a logical sector number L, said data write processing means including means for, if L satisfies a relationship of $1 \leqq L \leqq N$, erasing another data in a block having a physical sector number determined by the address conversion table stored in said random access memory according to the logical sector number L, writing the data to be written to a free block among the N blocks, and changing a physical sector number in correspondence to the logical sector number L in the address conversion table to a physical sector number of the block to which the data are written, and for, if the logical sector number L is larger than N, writing data to be written to a block having a physical sector number equal to the logical sector number L; and

data read processing means for reading data from a block in said flash memory for a physical sector number in correspondence to the logical sector number L in the address conversion table in said random access memory if the logical sector number L is equal to or less than N, and for reading data from a block for a physical sector number L in said flash memory if the logical sector number L is larger than N.

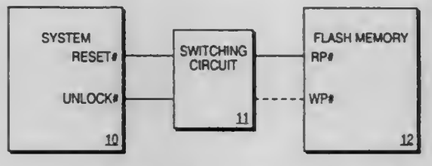
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**5,742,935**

## METHOD AND APPARATUS FOR CONTROLLING THE PROTECTION MODE OF FLASH MEMORY

**Peter K. Hazen, Auburn, Calif., and Michael J. Castillo, Provo, Utah, assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Dec. 29, 1995, Ser. No. 581,049**
**Int. Cl.[6] G06F** *12/14*
**U.S. Cl. 711—152** **15 Claims**




1. A switching circuit (1) for receiving (A) a resetting signal having two logic levels and (B) an unlocking signal having two logic levels and (2) for converting the resetting and unlocking signals to an output signal having first, second, and third logic levels for application to a memory in connection with a write protection scheme, wherein the first logic level of the output signal is for locking all blocks of the memory, wherein the second logic level of output signal is for locking a particular block of the memory, and wherein the third logic level of output signal is for unlocking all blocks of the memory.

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# DESIGNS

## GRANTED April 21, 1998

### ERRATA

| For CLASS | See PATENT NO. |
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| D08–333 | D393,544 |

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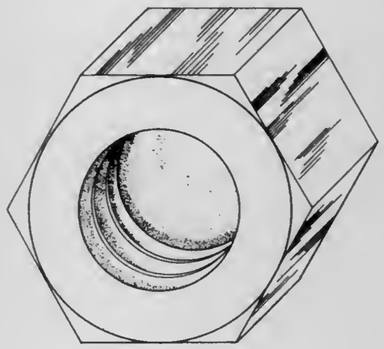
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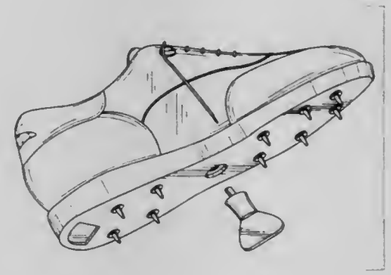
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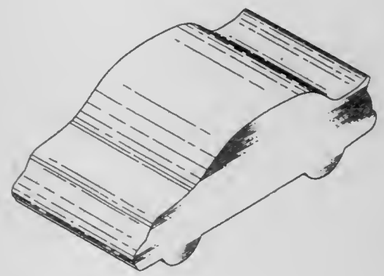
393,535
**HAT**
Tom Burkhart Farber, 26623 240th St., Holcombe, Wis. 54745
Filed Jan. 28, 1997, Ser. No. 65,530
Term of patent 14 years
LOC (6) Cl. 02 - *03*
U.S. Cl. D2—869



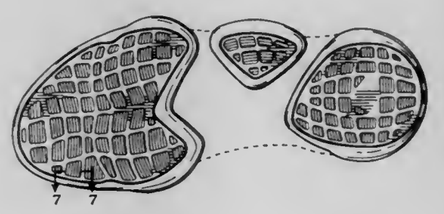
393,537
**COMBINED RETRACTABLE SPIKE SHOE WITH KEY**
Timothy Johnson, 50 Academy La., Southington, Conn. 06489
Filed Nov. 27, 1995, Ser. No. 47,027
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—906



393,536
**RACE CAR HAT**
Dwayne Buffer, and Deborah Buffer, both of 27 S. 6th St., Youngwood, Pa. 15697
Filed Mar. 31, 1997, Ser. No. 69,658
Term of patent 14 years
LOC (6) Cl. 02 - *03*
U.S. Cl. D2—869



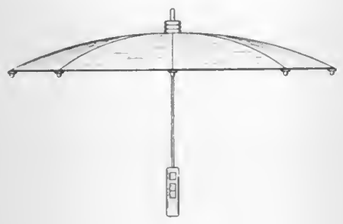
393,538
**SHOE OUTSOLE**
Guy A. Marshall, West Orange, N.J., assignor to Adidas AG, Herzogenaurach, Germany
Division of Ser. No. 50,839, Feb. 27, 1996. This application Jun. 6, 1996, Ser. No. 55,511
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—947



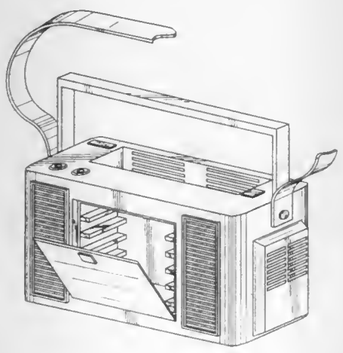
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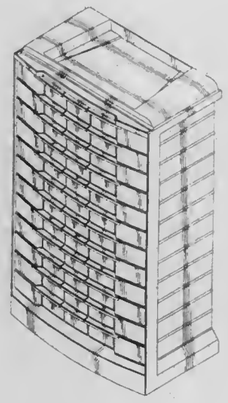
393,539
ILLUMINATED UMBRELLA WITH SAFETY ALARM
Stanley S. Bridgen, 335 West Hirst Avenue Parksville, Vancouver Island, Canada, V9P 1K4
Filed Jan. 30, 1997, Ser. No. 65,605
Term of patent 14 years
LOC (6) Cl. 03 - *04*
U.S. Cl. D3—5



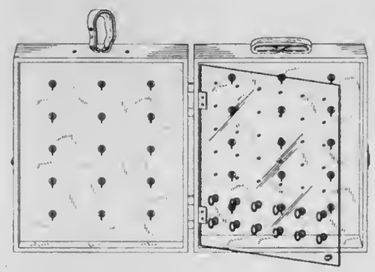
393,540
CARRYING CABINET FOR REMOVABLE RADIO OR CD PLAYER
William Davila, 2241 Batchelder St., #4E, Brooklyn, N.Y. 11229
Filed Apr. 12, 1996, Ser. No. 53,000
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—218



393,541
CHEST OF PARTS DRAWERS
Randall W. Calmeise, Oakwood Village, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jun. 2, 1995, Ser. No. 39,694
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—297

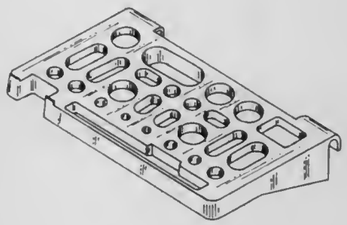


393,542
JEWELRY ACCESSORY CABINET
La Verne Thompson, 4407 Francis Ave. #103, Los Angeles, Calif. 90005
Filed Aug. 16, 1994, Ser. No. 27,254
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—294





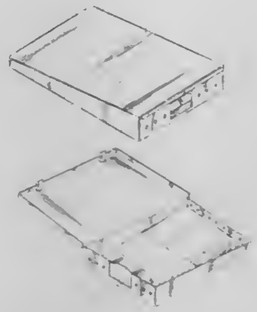
393,543
TOOL HOLDER
Steven R. Wilkening, Grandville, Mich.; Walter B. Herbst, Lake Forest, Ill.; Kurt T. Peterson, Mt. Prospect, Ill., and Aaron B. Eiger, Evanston, Ill., assignors to ODL, Incorporated, Zeeland, Mich.
Filed Jul. 15, 1996, Ser. No. 57,011
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—313



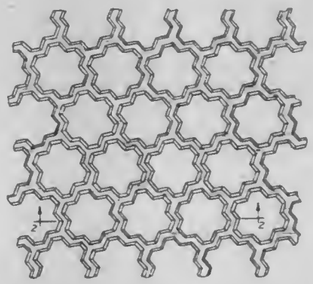
393,544
ENCODED WIRE LOCK
Chong-Kuan Ling, C/O Percy International Patent Corp. P.O. Box 1-79, Taipei, Taiwan
Filed Jul. 11, 1997, Ser. No. 73,604
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—333



393,545
BRUSH PROTECTOR
Joseph Fernandes, 13440 SW. 5th St., Davie, Fla. 33325
Filed Dec. 14, 1995, Ser. No. 47,877
Term of patent 14 years
LOC (6) Cl. 04 - *99*
U.S. Cl. D4—199



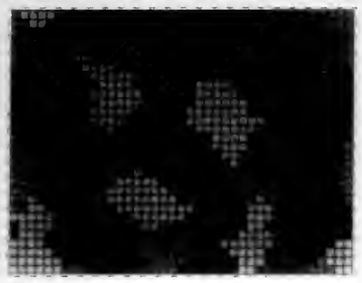
393,546
PORTION OF A PATTERNED FILM
Robert K. McBride, Jasonville, and Gregory M. Rieker, Clinton, both of Ind., assignors to Tredegar Industries, Inc., Richmond, Va.
Filed Dec. 2, 1996, Ser. No. 63,209
Term of patent 14 years
LOC (6) Cl. 05 - *06*
U.S. Cl. D5—53



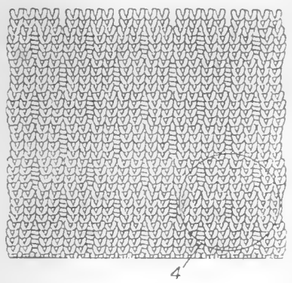
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393,547
CAMOUFLAGE PATTERN APPLIED TO SHEET MATERIAL
Ira A. Josephs, 415 Grand St. #1307, New York, N.Y. 10002
Filed Feb. 11, 1997, Ser. No. 66,345
Term of patent 14 years
LOC (6) Cl. 05 - *05*
U.S. Cl. D5—58



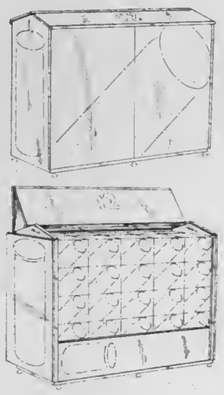
393,548
TWO PLY KNITTED FABRIC
Louis Garneau, Quebec, Canada, assignor to Louis Garneau Sports Inc., St-Augustin-de-Desmaures, Canada
Filed Jul. 15, 1996, Ser. No. 57,117
Term of patent 14 years
LOC (6) Cl. 05 - *05*
U.S. Cl. D5—47



393,549
PLANT STAND
Thomas Marinos, Glenview, Ill., assignor to Bel-Mar Wire Products, Inc., Chicago, Ill.
Filed May 20, 1997, Ser. No. 71,492
Term of patent 14 years
LOC (6) Cl. 11 - *02*
U.S. Cl. D6—403

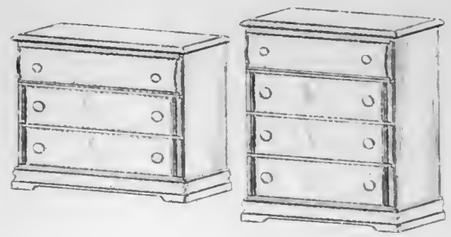


393,550
OUTDOOR BEVERAGE DISPLAY STAND
Richard Jay, Westport, Conn., assignor to Display Technologies, Inc., Whitestone, N.Y.
Filed Nov. 27, 1996, Ser. No. 63,132
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—434

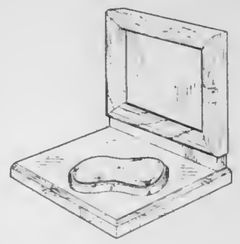




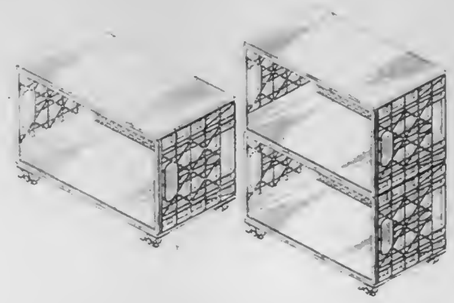
393,551
CHEST OF DRAWERS
Harvey J. Draheim, Weyauwega, Wis., assignor to Simmons Juvenile Products Company, Inc., New London, Wis.
Filed Jan. 16, 1997, Ser. No. 64,964
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—441



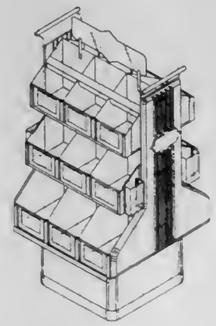
393,552
GOLF CART DISPLAY STAND
Fred W. Goodman, 515 Burrage Rd., Concord, N.C. 28025
Filed Aug. 26, 1996, Ser. No. 58,831
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—450



393,553
MODULAR CRATE FURNITURE
Christopher J. Beggs, 10431 El Rancho Dr., Whittier, Calif. 90606
Filed Jan. 27, 1997, Ser. No. 65,509
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—476



393,554
DOUBLE-SIDED THREE-TIER BULK FOOD DISPLAY STAND
Raymond Baluk; Freddie Chu, both of 4620 W. 19th St., Chicago, Ill. 60650; James Murray, and George Mullinix, both of 4120 Jersey Pike, Chattanooga, Tenn. 37421
Filed Apr. 6, 1996, Ser. No. 63,392
Term of patent 14 years
LOC (6) Cl. 20 - *02*
U.S. Cl. D6—470



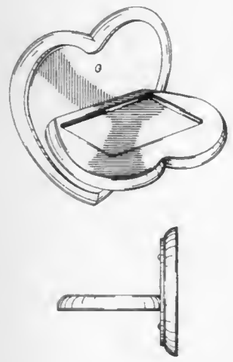
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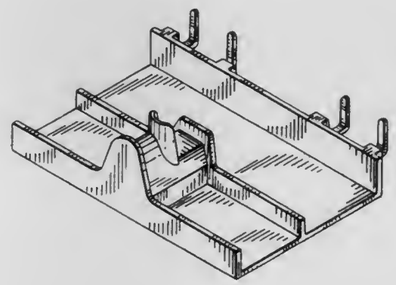
393,555
UPRIGHT FREE-STANDING SHELF UNIT
Clarkson S. Thorp, Wayland, and Paul A. Glashouwer, Byron Center, both of Mich., assignors to Haworth, Inc., Holland, Mich.
Division of Ser. No. 39,979, Jun. 7, 1995, abandoned. This application Feb. 5, 1997, Ser. No. 66,126
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—478



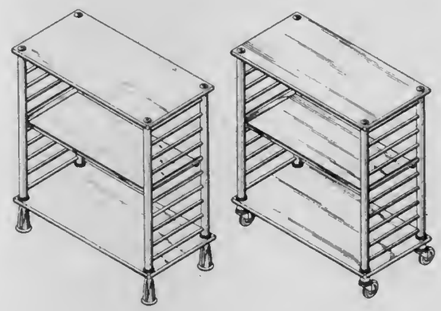
393,556
SOAP DISH
Gary L. Jordan, Feathers Creek Rd., Belmont, N.Y. 14813
Division of Ser. No. 38,608, May 9, 1995, Pat. No. Des. 371,709. This application Apr. 9, 1996, Ser. No. 52,725
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D6—540



393,557
EYEGLASS DISPLAY STAND UNIT
Michael J. Guccione, Sarasota, Fla., assignor to Serengeti Eyewear, Inc., Sarasota, Fla.
Filed Jul. 15, 1997, Ser. No. 74,060
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—553

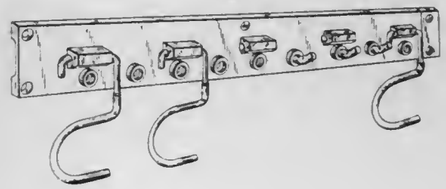


393,558
UPRIGHT FREE-STANDING SHELF UNIT
Clarkson S. Thorp, Wayland, and Paul A. Glashouwer, Byron Center, both of Mich., assignors to Haworth, Inc., Holland, Mich.
Continuation of Ser. No. 39,979, Jun. 7, 1995, abandoned. This application Feb. 5, 1997, Ser. No. 66,129
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—479

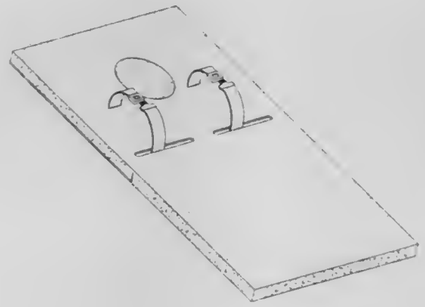




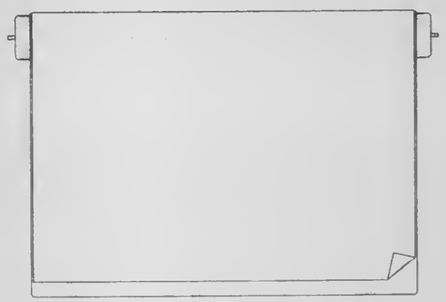
393,559
ADJUSTABLE STORAGE SYSTEM
Kenneth Laga, Franklin, Mass., assignor to The Lehigh Group, Macungie, Pa.
Filed Jun. 9, 1997, Ser. No. 71,954
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D6—569



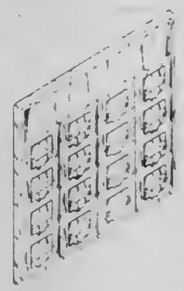
393,561
SAFETY BABY CHANGING HARNESS
Finbar Hayes, 72 Rippowam Rd., Stamford, Conn. 06902
Filed Dec. 20, 1996, Ser. No. 64,026
Term of patent 14 years
LOC (6) Cl. 06 - *06*
U.S. Cl. D6—596



393,560
WINDOW SHADE
Lynda C. Adams, 314 Path of Prey, Broxton, Ga. 31519
Filed Aug. 1, 1996, Ser. No. 57,846
Term of patent 14 years
LOC (6) Cl. 06 - *10*
U.S. Cl. D6—575



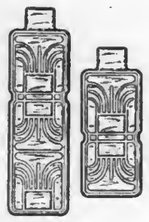
393,562
DISPLAY CASE
Thomas R. Connly, Mooresville, N.C., assignor to C.K.K. Marketing, Inc., Mooresville, N.C.
Filed Mar. 26, 1997, Ser. No. 69,298
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D6—571



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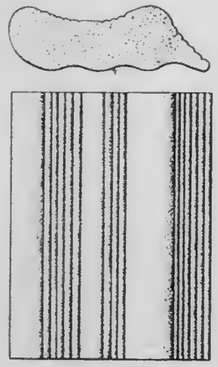
393,563
MASSAGING SYSTEM SEAT CUSHION
Craig M. Loud, Whittier, Calif., assignor to JB Research, Inc., Bellflower, Calif.
Filed Mar. 13, 1996, Ser. No. 51,537
Term of patent 14 years
LOC (6) Cl. 06 - *09*
U.S. Cl. D6—601



393,564
PILLOW
Hsin-Cheng Liu, No. 10-2, Wu Lin St., Shu Lin Chen, Taipei Hsien, Taiwan
Filed Apr. 18, 1997, Ser. No. 69,844
Term of patent 14 years
LOC (6) Cl. 06 - *09*
U.S. Cl. D6—601



393,565
CONTOURED PILLOW
Jose D. M. Contreras, Boothwyn, Pa., assignor to Foamex L.P., Linwood, Pa.
Filed Apr. 16, 1997, Ser. No. 70,252
Term of patent 14 years
LOC (6) Cl. 06 - *09*
U.S. Cl. D6—601

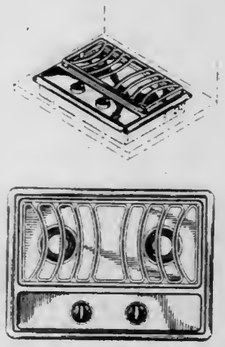


393,566
BEVERAGE FLAVORER STIRRING STICK
David J. Buehner, 5502 W. 54th St., Cleveland, Ohio 44129
Filed Jul. 23, 1997, Ser. No. 74,055
Term of patent 14 years
LOC (6) Cl. 07 - *06*
U.S. Cl. D7—300.2

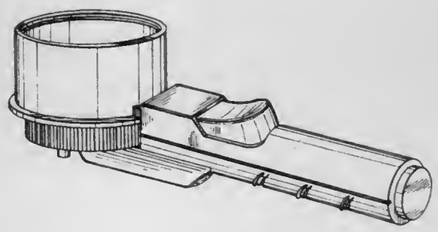




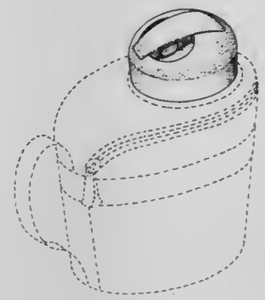
393,567
COMBINED TWO BURNER COOK TOP WITH SEALED BURNERS
Walter M. Ashcraft, Schaumburg, Ill., and David Steele, Beloit, Wis., assignors to Atwood Mobile Products, Rockford, Ill.
Filed Jan. 9, 1997, Ser. No. 64,728
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—346



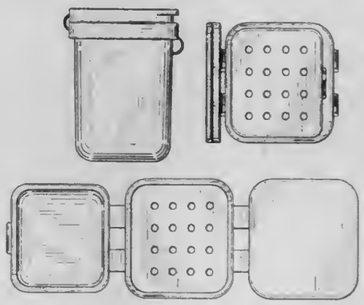
393,568
ESPRESSO FILTER HOLDER
Gunter Storsberg, Solingen, Germany, assignor to Robert Krups GmbH & Co. KG, Solingen, Germany
Filed Jul. 26, 1996, Ser. No. 57,511
Claims priority, application France, Jan. 26, 1996, 96 0521
Term of patent 14 years
LOC (6) Cl. 07 - *99*
U.S. Cl. D7—400



393,569
DISPENSING LID
John W. Lai, San Francisco, Calif.; Peter C. Simpson, Glencoe, and Thomas J. Melk, Chicago, both of Ill., assignors to Outer Circle Products, Ltd., Chicago, Ill.
Continuation of Ser. No. 61,525, Oct. 25, 1996, abandoned.
This application May 20, 1997, Ser. No. 70,966
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—392



393,570
CONDIMENT SHAKER
Nicole A. Zeller, Harrison, N.Y., assignor to Zelco Industries, Inc., Mount Vernon, N.Y.
Filed Mar. 5, 1997, Ser. No. 67,152
Term of patent 14 years
LOC (6) Cl. 07 - *06*
U.S. Cl. D7—591



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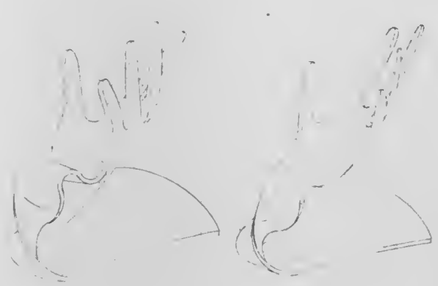
393,571
ADJUSTABLE BEVERAGE INSULATOR WRAP
Gregory Allen Gardner, 618 S. Pacific, Oceanside, Calif. 92054
Filed Jul. 7, 1997, Ser. No. 73,338
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—607



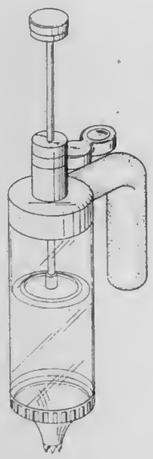
393,572
INSULATED VESSEL COVER
Thomas J. Melk, Chicago, Ill., assignor to Outer Circle Products, Ltd., Chicago, Ill.
Continuation-in-part of Ser. No. 57,249, Jul. 22, 1996, Pat. No. Des. 383,361. This application Dec. 13, 1996, Ser. No. 63,723
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—608



393,573
WINE BOTTLE HOLDER
Charles Howell Caldwell, 1619 ½ Castle Hayne Rd., Wilmington, N.C. 28401
Filed Mar. 6, 1997, Ser. No. 67,672
Term of patent 14 years
LOC (6) Cl. 07 - *06*
U.S. Cl. D7—619

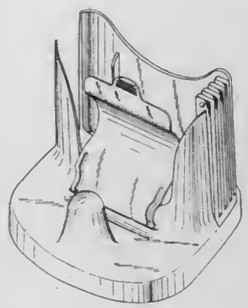


393,574
PASTRY EXTRUDER
Nancy Perkins, and Karen Wolters, both of Chicago, Ill., assignors to The Pampered Chef, Ltd., Addison, Ill.
Filed Feb. 15, 1996, Ser. No. 50,347
Term of patent 14 years
LOC (6) Cl. 07 - *04*
U.S. Cl. D7—669

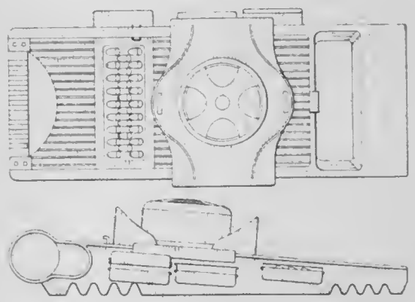




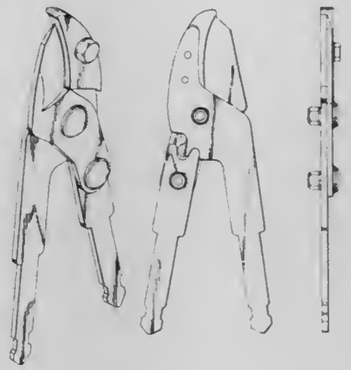
393,575
BAGEL SLICER
Jimmy W. Davidson, 6660 Upper Afton Rd., Woodbury, Minn. 55125
Filed Mar. 14, 1997, Ser. No. 68,013
Term of patent 14 years
LOC (6) Cl. 07 - *04*
U.S. Cl. D7—673



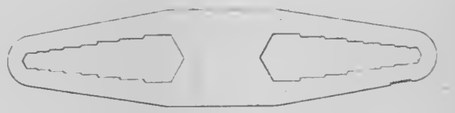
393,576
GRATER
Yan Kwong Wong, Unit 17, 10/F Metro Centre 11, 21 Lam Hing Street, Kowloon Bay, Kowloon, Hong Kong
Filed Mar. 4, 1997, Ser. No. 67,350
Term of patent 14 years
LOC (6) Cl. 07 - *04*
U.S. Cl. D7—678



393,577
GARDEN SHEARS
Shoei-Shin Huang, No. 668, Sec. 4, Yen Haird., Fu Shing Hsiang, Chang Hua Hsien, Taiwan
Filed Apr. 16, 1997, Ser. No. 67,972
Term of patent 14 years
LOC (6) Cl. 08 - *01*
U.S. Cl. D8—5



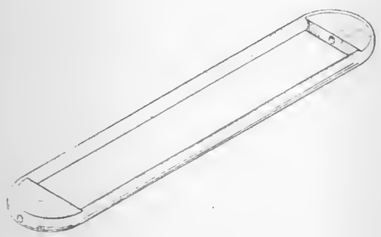
393,578
COMPOUND WRENCH WITH NUT SPINNER
David P. Keddie, Brookfield, Wis., assignor to Hempe Manufacturing Co., Inc., New Berlin, Wis.
Filed Apr. 19, 1996, Ser. No. 53,386
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—17



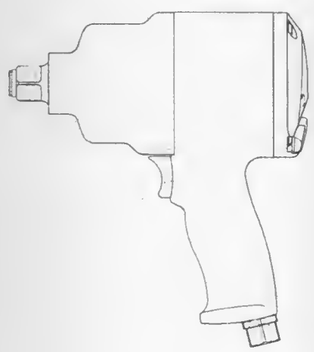
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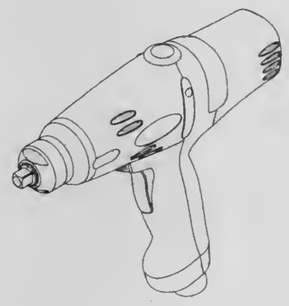
393,579
PULLING ANVIL
Corwin J. Bryant, P.O. Box 405, Fairplay, Colo. 80440, assignor to Corwin J. Bryant, and James Gardner, both of Fairplay, Colo.
Filed Sep. 28, 1995, Ser. No. 44,807
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—46



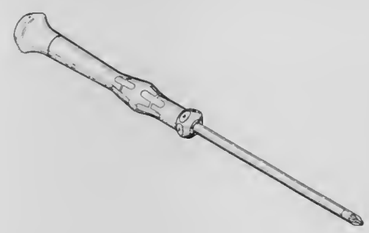
393,580
IMPACT WRENCH
Matthew D. Bantly, Granby, Conn.; George W. Opdyke, Troy, Pa.; Keith A. Saylor, Clinton Township, N.J., and Earl A. Guinter, Sayre, Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Dec. 18, 1996, Ser. No. 63,904
The portion of the term of this patent subsequent to Jan. 6, 2012, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 08 - *01*
U.S. Cl. D8—68



393,581
ELECTRIC POWER DRIVEN WRENCH
John A. McCallops, Sayre; Donald R. Warner, Columbia Cross Roads, both of Pa.; Paul K. Metaxatos, Collinsville, and Robert H. Bruno, Avon, both of Conn., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Mar. 25, 1997, Ser. No. 69,296
Term of patent 14 years
LOC (6) Cl. 08 - *03*
U.S. Cl. D8—68

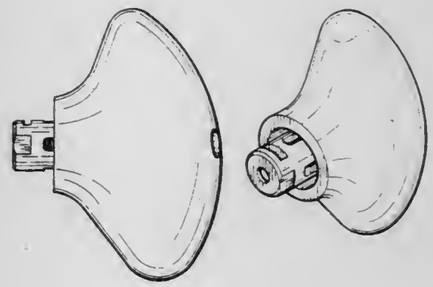


393,582
SCREWDRIVER
Klaus Amtenbrink, and Martin Strauch, both of Wuppertal, Germany, assignors to Wera Werk Hermann Werner GmbH & Co., Wuppertal, Germany
Filed Nov. 1, 1996, Ser. No. 61,880
Claims priority, application Germany, May 3, 1996, M 96 03 947.7
Term of patent 14 years
LOC (6) Cl. 08 - *04*
U.S. Cl. D8—82

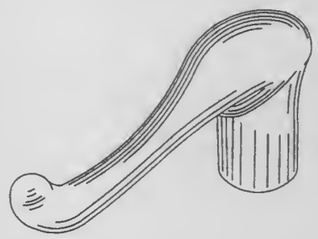




393,583
HANDLE GRIP FOR A BICYCLE
Toshiyuki Nagano, Takarazuka, Japan, assignor to Cateye Co., Ltd., Osaka, Japan
Filed Aug. 8, 1996, Ser. No. 58,117
Claims priority, application Japan, Feb. 16, 1996, 8-3955
Term of patent 14 years
LOC (6) Cl. 08 - *06*
U.S. Cl. D8—303

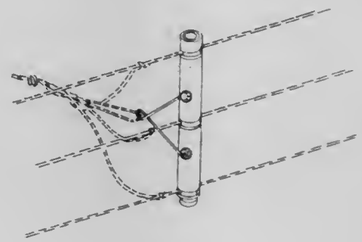


393,584
DOOR LEVER
Dominic M. D'Andrea, Cincinnati, Ohio, and Thomas S. Klinker, San Francisco, Calif., assignors to Emhart Inc., Newark, Del.
Filed May 7, 1997, Ser. No. 69,619
Term of patent 14 years
LOC (6) Cl. 08 - *06*
U.S. Cl. D8—308



393,585
Patent Not Issued For This Number

393,586
ELECTRIC UTILITY WIRE SPREADER
Ronald G. Mowery, 7104 Hollymont Dr., St. Louis, Mo. 63123
Filed Jan. 17, 1997, Ser. No. 65,420
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—356



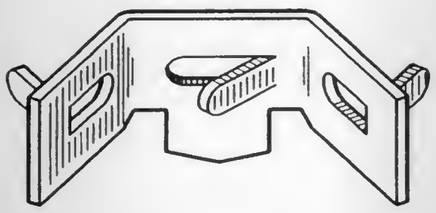
393,587
HANGER FOR A DRAINAGE DEVICE
Michael A. Valerio, Wrentham; Trinh Phung, Attleboro, both of Mass., and Anthony R. Carlone, Bristol, R.I., assignors to Deknatel Technology Corporation, Wilmington, Del.
Filed Jan. 13, 1997, Ser. No. 64,870
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—373



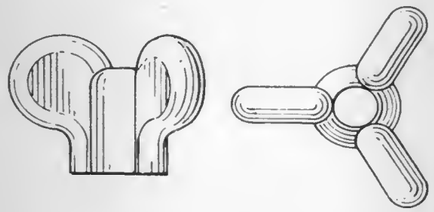
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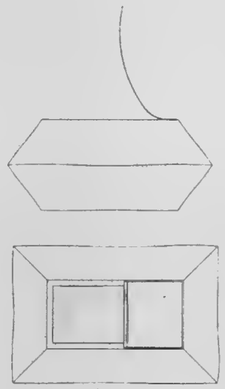
393,588
STUD-WELD HALF-HEX ANCHOR
Bartley F. Tuthill, P.O. Box 70529, Houston, Tex. 77270-0529
Filed Sep. 19, 1996, Ser. No. 59,971
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D8—384



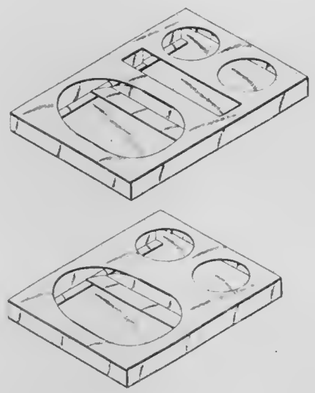
393,589
WING NUT
Enzo Berti, Venice, Italy, assignor to The Libman Company, Arcola, Ill.
Filed Sep. 22, 1995, Ser. No. 44,353
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D8—398



393,590
MICROWAVE POPCORN BAG WITH OPENING HANDLE
Derrick T. Roney, 10921 Inwood Ave. Apt #401, Silver Spring, Md. 20902
Filed May 8, 1997, Ser. No. 70,485
Term of patent 14 years
LOC (6) Cl. 09 - *05*
U.S. Cl. D9—305

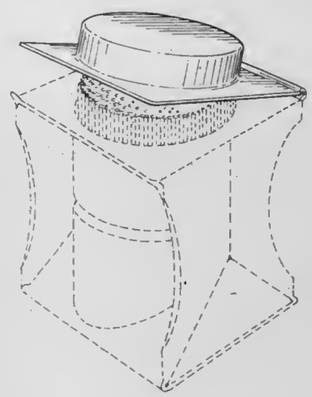


393,591
ROTISSERIE BOX
Matthew A. Baryshyan, Stormville, N.Y., assignor to Mafcote Industries, Inc., Norwalk, Conn.
Filed Jun. 6, 1997, Ser. No. 72,059
Term of patent 14 years
LOC (6) Cl. 09 - *03*
U.S. Cl. D9—347

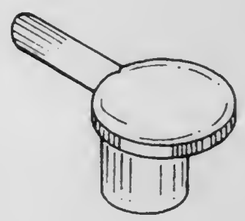




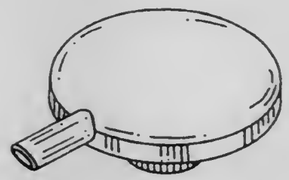
393,592
CLOSURE FOR A BOX FOR STRAWS
Ron Robinson, Bridgeton; Terrance J. McMichael, Kirkwood, both of Mo.; Brian Flynn, Glendale Hts., Ill.; John Hoffman, Chicago, Ill.; Richard B. Partlow, Naperville, Ill., and David Rosten, Cambridge, Minn., assignors to bioMérieux Vitek, Inc., Hazelwood, Mo.
Filed Oct. 31, 1996, Ser. No. 61,824
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—435



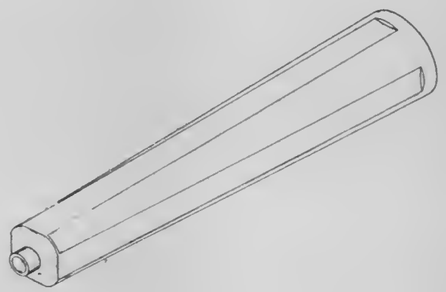
393,593
DISPENSER CAP FOR BOTTLES
Francesco Mascitelli, Pescara, Italy, assignor to SAR S.p.A., San Giovanni Teatino, Italy
Filed Jun. 12, 1997, Ser. No. 72,034
Claims priority, application Italy, Dec. 13, 1996, RM9600243
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—448



393,594
DISPENSER CAP FOR BOTTLES
Francesco Mascitelli, Pescara, Italy, assignor to SAR S.p.A., San Giovanni Teatino, Italy
Filed Jun. 12, 1997, Ser. No. 72,035
Claims priority, application Italy, Dec. 13, 1996, ITRM96243
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—448



393,595
MILK METER FLASK
Bruce Warwick Richards, Auckland, New Zealand, assignor to Tru-Test Limited, Auckland, New Zealand
Filed Nov. 18, 1996, Ser. No. 62,529
Term of patent 14 years
LOC (6) Cl. 09 - *03*
U.S. Cl. D9—500



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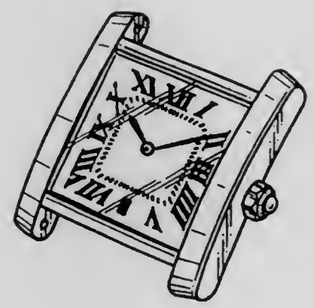
393,596
COMBINED FRAGRANCE BOTTLE AND CAP
Bernard Kotyuk, Westbrookville, N.Y., assignor to Amway Corporation, Ada, Mich.
Filed Feb. 4, 1997, Ser. No. 66,249
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—558



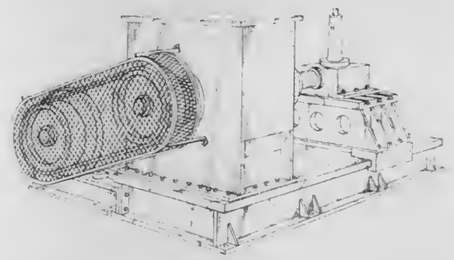
393,597
PULSE DETECTOR STOPWATCH
Opher Pail, 625 Main St., New York, N.Y. 10044
Filed May 2, 1997, Ser. No. 70,225
Term of patent 14 years
LOC (6) Cl. 10 - *03*
U.S. Cl. D10—30



393,598
WATCH
Alain-Dominique Perrin, Rueil-Malmaison, and Jacques Diltoer, Villeneuve-La-Garenne, both of France, assignors to Cartier International B.V., Amsterdam-C, Netherlands
Filed Jan. 3, 1996, Ser. No. 48,972
Claims priority, application France, Jul. 4, 1995, 953689
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—39

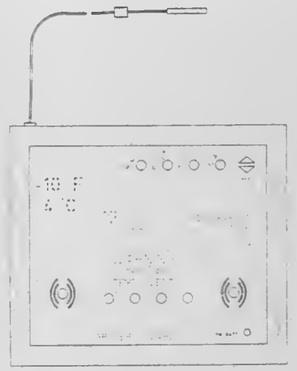


393,599
DIESEL PUMP TEST BED
Stephen Floyd Bailey, New South Wales, Australia, assignor to Bailey's Diesel Service Pty. Ltd., New South Wales, Australia
Filed May 8, 1996, Ser. No. 54,183
Claims priority, application Austria, Nov. 8, 1995, 3558/95
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—46

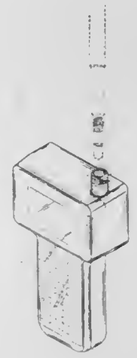




393,600
TEMPERATURE FLUCUATOR ALERT SYSTEM
Lawrence O. Keller, 14 Nevills La., Elma, Wash. 98541
Filed Jun. 5, 1997, Ser. No. 71,667
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—52



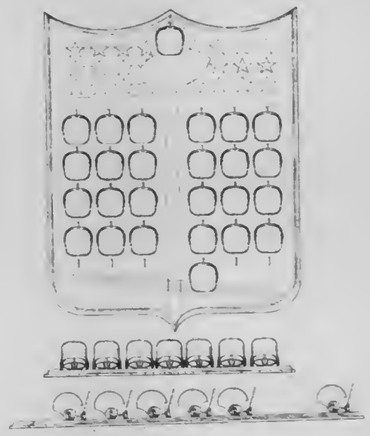
393,601
PHOTOMETER FOR USE WITH A TEST SAMPLE HOLDER
Richard Skiffington, North Reading, Mass., assignor to Charm Sciences, Inc., Malden, Mass.
Filed Jan. 21, 1997, Ser. No. 65,079
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—78



393,602
WATCH STRAP
Daniel Lai Kong Sang, Flat C, 28/F, Ma On Shan Centre, Tower 1, 1 On Chun Street, Ma On Shan, N.T., Hong Kong
Filed Jul. 23, 1997, Ser. No. 74,030
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—3



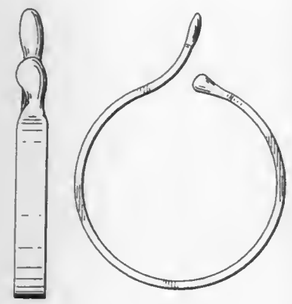
393,603
FOOTBALL PLAQUE
John E. Cerisano, 1903 Alto Ct., Vienna, Va. 22182
Filed Mar. 11, 1997, Ser. No. 67,538
Term of patent 14 years
LOC (6) Cl. 11 - *02*
U.S. Cl. D11—133



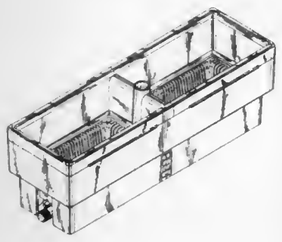
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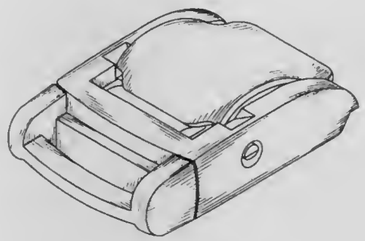
393,604
HOOP EARRING
Meridyth Mischel Webber, Teaneck, N.J., assignor to Khreativity Unlimited, Inc., Teaneck, N.J.
Filed Sep. 17, 1996, Ser. No. 59,818
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—40



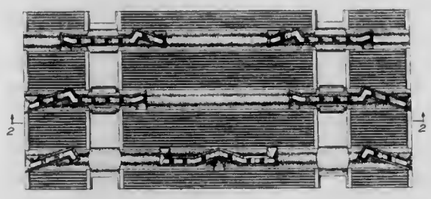
393,605
PLANTER
Michel Dallaire, Montréal, Canada, assignor to Plastique DCN Inc., Warwick; Biotop Technologies Inc., and Michel Dallaire Design Industriel Inc., both of Montreal, all of Canada
Filed Mar. 14, 1997, Ser. No. 67,823
Claims priority, application Canada, Dec. 12, 1996, 1996-2881
Term of patent 14 years
LOC (6) Cl. 11 - *02*
U.S. Cl. D11—156



393,606
FASTENER
Chih-Jay Lin, Tao-Yuan, Taiwan, assignor to Taiwan Industrial Fastener Corporation, Taipei, Taiwan
Filed May 8, 1997, Ser. No. 70,930
Term of patent 14 years
LOC (6) Cl. 02 - *07*
U.S. Cl. D11—216

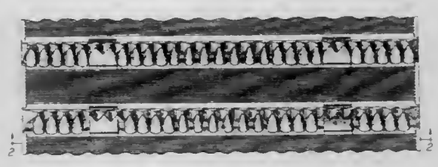


393,607
SEGMENT OF A SNOWMOBILE TRACK
Jules Dandurand, Valcourt, Canada, assignor to Camoplast Inc., Sherbrooke, Canada
Filed Oct. 28, 1996, Ser. No. 61,667
Term of patent 14 years
LOC (6) Cl. 12 - *14*
U.S. Cl. D12—7

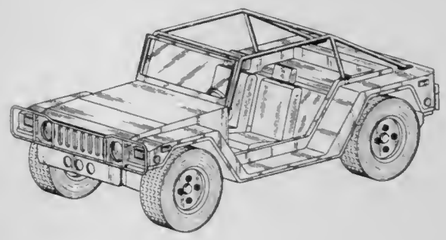




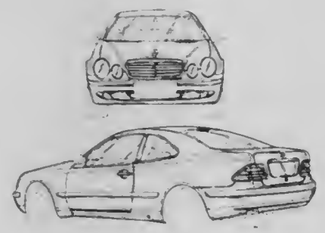
393,608
SEGMENT OF A SNOWMOBILE TRACK
Jules Dandurand, Valcourt, Canada, assignor to Camoplast Inc., Sherbrooke, Canada
Filed Oct. 28, 1996, Ser. No. 61,673
Term of patent 14 years
LOC (6) Cl. 12 - *14*
U.S. Cl. D12—7



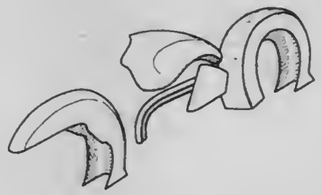
393,609
VEHICLE
Karl E. Kanthak, 107 NW. 82nd St., Vancouver, Wash. 98665, and James C. Duncan, 12301 SE. 11th St., Vancouver, Wash. 98684
Filed Feb. 26, 1997, Ser. No. 67,040
Term of patent 14 years
LOC (6) Cl. 12 - *08*
U.S. Cl. D12—91



393,610
EXTERIOR BODY OF A MOTOR VEHICLE
Bruno Sacco, Sindelfingen, and Peter Pfeiffer, Boeblingen, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany
Filed Aug. 1, 1996, Ser. No. 57,856
Claims priority, application Germany, Feb. 10, 1996, M 96 01 258.7
Term of patent 14 years
LOC (6) Cl. 12 - *08*
U.S. Cl. D12—92



393,611
BICYCLE BODY
Jeffrey A. Solak, 924 W. Balboa, Apartment A, Newport Beach, Calif. 92661
Filed Jul. 2, 1996, Ser. No. 56,590
Term of patent 14 years
LOC (6) Cl. 12 - *11*
U.S. Cl. D12—111



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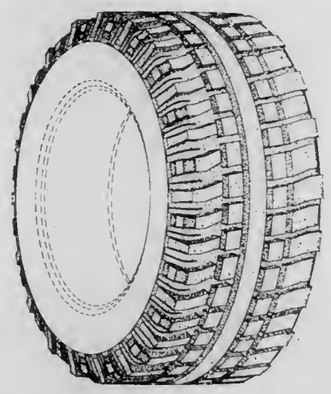
393,612
AUTOMOBILE TIRE
Hidehiko Hino, Amagasaki, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Mar. 11, 1997, Ser. No. 67,537
Claims priority, application Japan, Sep. 12, 1996, 8-27405
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—146



393,613
TIRE TREAD
Randall Raymond Brayer, North Canton, and Christopher Paul Johenning, Wadsworth, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 7, 1997, Ser. No. 66,233
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147



393,614
TIRE TREAD
Jason Christian Morgan, Greenville, S.C., assignor to Michelin Recherche et Technique S.A., Granges-Paccot, Switzerland
Filed Mar. 21, 1997, Ser. No. 68,539
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147

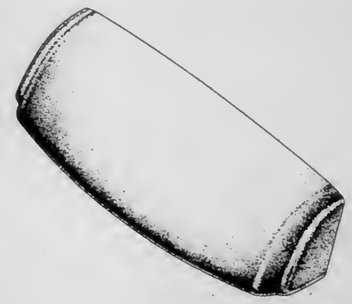


393,615
SNOWMOBILE SUSPENSION ARM
Martin Aubé , and Jérôme Foy, both of Quebec, Canada, assignors to Bombardier, Inc., Canada
Filed Jan. 23, 1997, Ser. No. 65,483
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—159





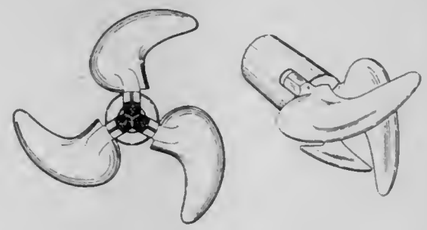
393,616
COVER FOR A TRANSPORT REFRIGERATION SYSTEM
Thomas A. Flanagan, Minneapolis, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.
Filed Sep. 16, 1996, Ser. No. 59,806
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—181



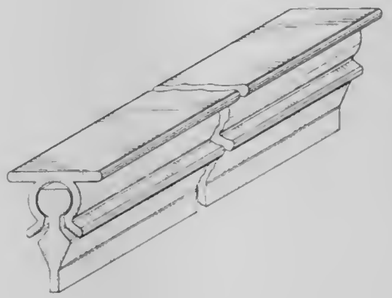
393,617
VEHICLE ORNAMENT
David Smith, Royal Oak; Darrel L. Morley, Birmingham, and William A. Dayton, Northville, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.
Filed Dec. 19, 1996, Ser. No. 63,946
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—197



393,618
FOLDABLE PROPELLER
Bror Gustavsson, Lödöse, and Christer Jonsson, Väse, both of Sweden, assignors to AB Volvo Penta, Sweden
Filed May 24, 1996, Ser. No. 54,923
Claims priority, application Sweden, Nov. 28, 1995, 95-2234
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—214



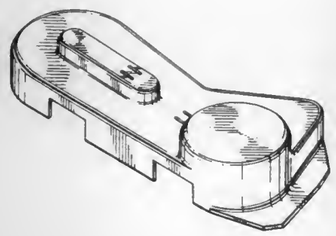
393,619
ARTICULATED WINDSHIELD WIPER BLADE ASSEMBLY
Peter H. Jeffer, New York, N.Y., and Michel Fernandes, E. Freetown, Mass., assignors to New-View Windshield Wiper, L.P., New York, N.Y.
Continuation of Ser. No. 708,669, Sep. 5, 1996, Pat. No. 5,644,814. This application Jan. 10, 1997, Ser. No. 64,765
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D12—220



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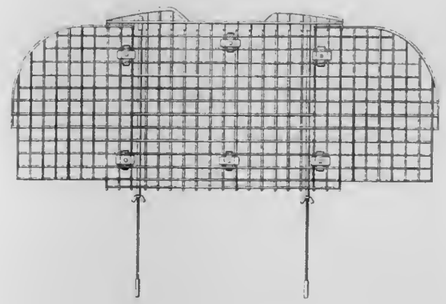
393,620
**BICYCLE PORTER**
Greg Remillard, 27777 Quinton Ave., Abbotsford B.C., Canada, V4X 1J7
Filed May 24, 1996, Ser. No. 54,890
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—402



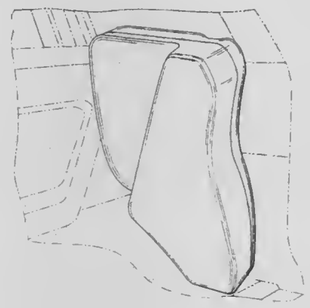
393,621
**ADUSTABLE SPACER/STABILIZER FOR A BIKE RACK**
John K. Gregory, 8465 Ramsey Rd., Gold Hill, Oreg. 97525
Filed Apr. 8, 1997, Ser. No. 70,750
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—408



393,622
**VEHICLE SAFETY BARRIER FOR PETS**
Myron Goertzen, Brooklyn Park, Minn., assignor to Kennel-Aire, Inc., St. Louis Park, Minn.
Filed May 30, 1996, Ser. No. 55,135
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—426

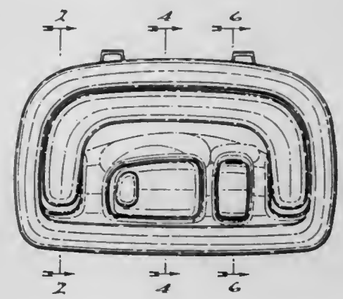


393,623
**REMOVABLE STORAGE CONTAINER FOR MOTOR VEHICLE**
Dan Bernard Malski, Royal Oak, Mich., assignor to Lear Corporation, Southfield, Mich.
Filed Feb. 18, 1997, Ser. No. 66,605
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—423

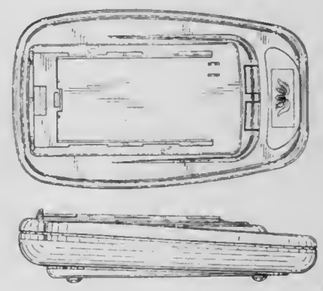




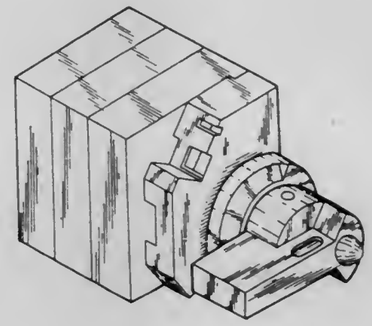
393,624
**BATTERY CASE**
Jae Hoon Shim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea
Filed Jul. 22, 1996, Ser. No. 57,257
Claims priority, application Rep. of Korea, Apr. 29, 1996, 96-8111
Term of patent 14 years
LOC (6) Cl. 13 - *02*
U.S. Cl. D13—103



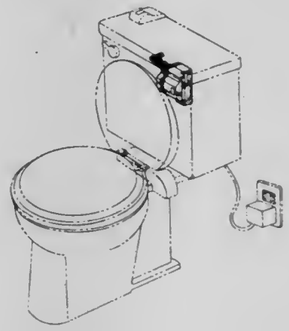

393,625
**CELLULAR BATTERY CHARGER**
Gustavo F. Riccobon, 8339 NW. 66th St., Miami, Fla. 33166
Filed Dec. 2, 1996, Ser. No. 63,579
Term of patent 14 years
LOC (6) Cl. 13 - *02*
U.S. Cl. D13—107



393,626
**HANDLE AND FUSE SWITCH**
Benoit Siat, Benfeld, France, assignor to Socomec (Societe Anonyme), Benfeld, France
Filed Jan. 26, 1996, Ser. No. 49,491
Claims priority, application France, Jul. 28, 1995, 954245
Term of patent 14 years
LOC (6) Cl. 13 - *03*
U.S. Cl. D13—158



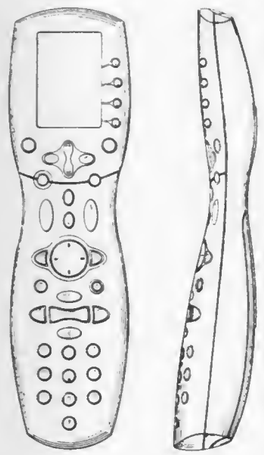
393,627
**HOUSING AND LIFT ARM FOR AUTOMATIC FLUSH CONTROL DEVICE**
Bennie N. Veal, 6621 Park Valley Dr., Clarkston, Mich. 48348
Filed Jan. 26, 1996, Ser. No. 49,527
Term of patent 14 years
LOC (6) Cl. 13 - *03*
U.S. Cl. D13—162



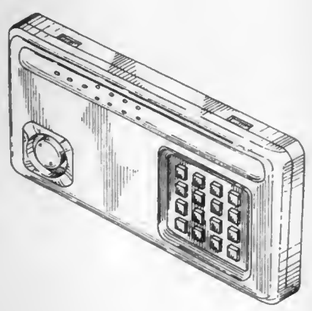
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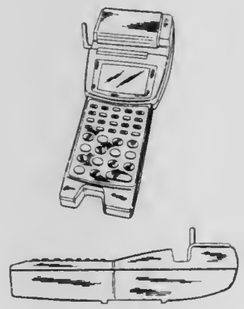
393,628
HAND-HELD REMOTE CONTROL UNIT
Carl J. Ledbetter, Lynwood, Wash.; Charles Richard Lewis, Jr., Palo Alto, and Marcus Peter Diebel, San Francisco, both of Calif., assignors to Microsoft Corporation, Redmond, Wash.
Filed Aug. 19, 1996, Ser. No. 58,599
Term of patent 14 years
LOC (6) Cl. 13 - *03*
U.S. Cl. D13—168



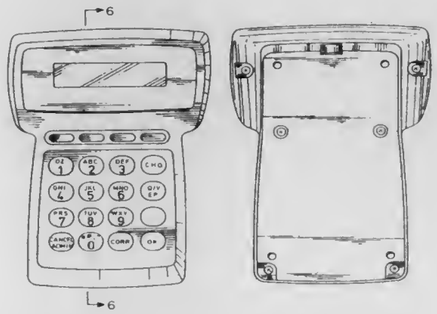
393,629
REMOTE CONTROL UNIT
Philip Y. W. Tsui, Mississauga, Canada, assignor to Capital Prospect Ltd., Hong Kong, Hong Kong
Filed Jan. 16, 1997, Ser. No. 64,997
Term of patent 14 years
LOC (6) Cl. 13 - *03*
U.S. Cl. D13—168



393,630
REMOTE HAND-HELD TERMINAL
Michael Coveley, Thornhill, Canada, assignor to Omega Digital Data Inc., Concord, Canada
Filed May 2, 1997, Ser. No. 70,251
Claims priority, application Canada, Nov. 5, 1996, 1996-2520
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—100

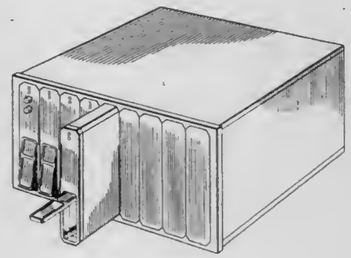


393,631
PORTABLE AUTOMATIC TELLER MACHINE
Masakatsu Yotukura, Kanagawa-ken, Japan, assignor to Kanda Tsushin Kogyo Co., Ltd., Tokyo, Japan
Filed Aug. 14, 1996, Ser. No. 58,397
Claims priority, application Japan, Feb. 21, 1996, 8-4418
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—105

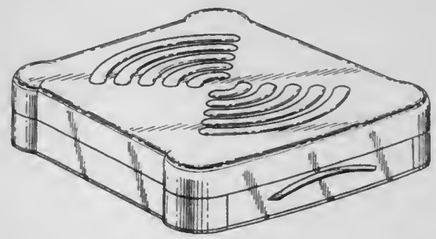




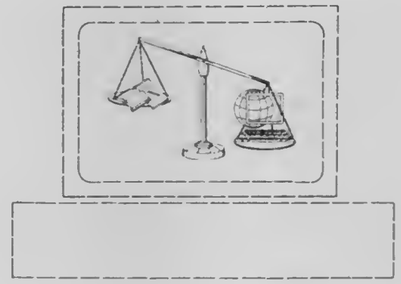

393,632
COMBINED CHASSIS AND MODULES THEREFOR
Raymond C. Sherry, 4221 Saint Leger Dr., Cleburne, Tex. 76031
Filed Apr. 19, 1996, Ser. No. 53,381
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—107



393,633
MONITOR SUPPORT STAND
Jason R. Jacobson, St. Paul, Minn.; Andrew C. Lamberson, Hudson, Wis., and James A. Wilson, North St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 21, 1996, Ser. No. 61,294
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114



393,634
ICON FOR A DISPLAY SCREEN
Kent D. Stuckey, Columbus, Ohio, assignor to CompuServe Incorporated, Columbus, Ohio
Filed Sep. 19, 1995, Ser. No. 44,141
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114.5



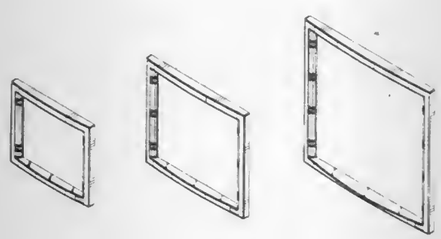
393,635
MODAL WINDOW FOR A COMPUTER DISPLAY SCREEN
Patricia J. Coleman, P.O. Box 370238, Montara, Calif. 94037-0238
Filed May 5, 1995, Ser. No. 38,433
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114.2



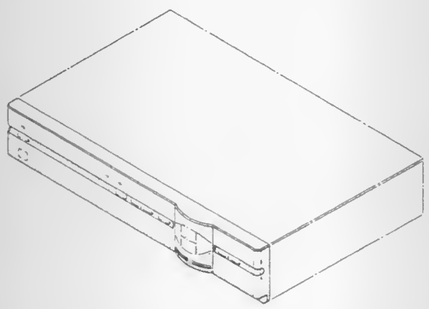
VOL 1209 ISS 3 APR 21 1998 UMI



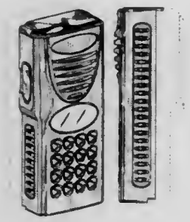
393,636
BEZEL
Trent T. Jones, White Bear Lake; Scott D. Bucll, Andover, and Jeffrey A. Earles, Shoreview, all of Minn., assignors to Federal-Hoffman, Inc., Anoka, Minn.
Filed Mar. 3, 1995, Ser. No. 35,635
Term of patent 14 years
LOC (6) Cl. 13 - *02*
U.S. Cl. D14—115



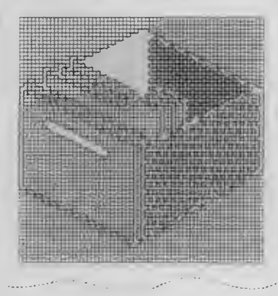
393,637
TELEVISION SET TOP DECODER BOX
Wayne J. Franek, Palatine, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.
Filed Mar. 5, 1997, Ser. No. 67,161
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—125



393,638
PORTABLE RADIO HOUSING
Michael J. Page, Ft. Lauderdale, Fla., and Ram Levinson, Holon, Israel, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 8, 1996, Ser. No. 51,380
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—137



393,639
DRAWER ICON FOR A DISPLAY SCREEN
Makoto Wanishi, Tokyo; Masato Ikemori, Kawasaki; Kaeko Kariya, Inagi; Hiroshi Matsuda, Yokohama; Makoto Morioka, Kawasaki; Kazuo Hattori, Yokohama; Hiroshi Suzuki, Kawasaki, and Daisaburo Murai, Tokyo, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan
Division of Ser. No. 592,317, Oct. 1, 1990. This application May 27, 1997, Ser. No. 71,299
Term of patent 14 years
LOC (6) Cl. 14 - *99*
U.S. Cl. D14—114.3

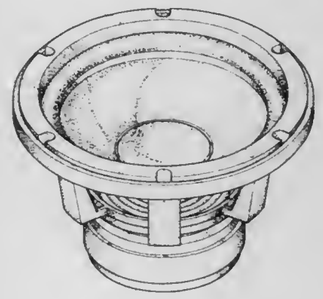




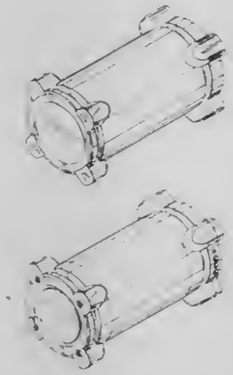
393,640
PAGER
Katsumi Nagano; Hiroki Nishii; Masao Tamura, and Toshiro Iizuka, all of Kanagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Mar. 7, 1997, Ser. No. 67,565
Claims priority, application Japan, Sep. 12, 1996, 8-27421
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—191



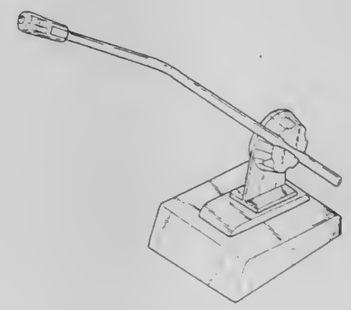
393,641
SPEAKER
Wu Hai-Fu, No. 31, Whynin Load, Taipei, Taiwan
Filed Dec. 31, 1996, Ser. No. 64,413
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—216



393,642
SPEAKER BOX
Yasuo Yuyama, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 31, 1996, Ser. No. 64,436
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—216



393,643
COMBINED MICROPHONE AND STAND
Chun-Lung Chiang, P.O. Box 82-144, Taipei, Taiwan
Filed Aug. 27, 1996, Ser. No. 58,867
The portion of the term of this patent subsequent to Nov. 19, 2010, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—227



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393,644

**HOUSING FOR A WIRELESS BASE STATION**

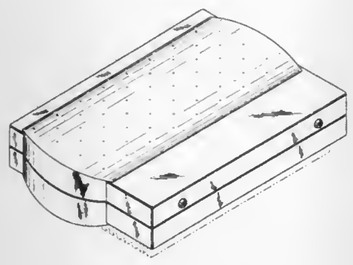
Gihyun Cho, Franklin Lakes; Richard Sander Costa, Piscataway; Frank Vernon Gates, Roxbury Township, Morris County; Behzad Davachi Mottahed, Upper Montclair, all of N.J., and Daniella Ruth Rubinovitz, New York, N.Y., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 25, 1996, Ser. No. 63,049

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—240



393,645

**TELEPHONE HANDSET**

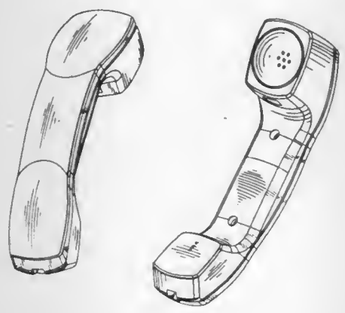
Michael Langlois, Almonte, and David A. Nogas, Ottawa, both of Canada, assignors to Mitel Corporation, Kanata, Canada

Filed Sep. 26, 1996, Ser. No. 60,318

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—248



393,646

**RADIO DIAL WITH STEERING WHEEL DESIGN**

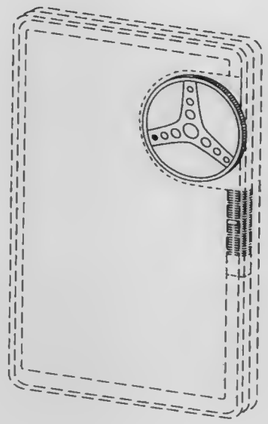
Robert C. Bentley, Aurora; William P. Wanker, Denver; James A. Mauro, Fort Collins; Ellen A. Bruss, Denver, and Harold D. Morgan, Fort Collins, all of Colo., assignors to Sportronics Radios, Inc., Fort Collins, Colo.

Division of Ser. No. 19,714, Mar. 8, 1994, Pat. No. Des. 382,275. This application Feb. 24, 1997, Ser. No. 68,080

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—265



393,647

**PRESSURE REGULATOR**

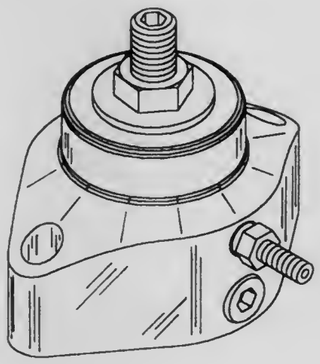
James H. Garrard, 2008 Brookcreek La., Kirkwood, Mo. 63122-2255, and Steven M. Matusek, 9800 W. 121st Ter., Overland Park, Kans. 66213

Filed Nov. 7, 1995, Ser. No. 46,089

Term of patent 14 years

LOC (6) Cl. 15 - *02*

U.S. Cl. D15—5





393,648

**DRILL PRESS**

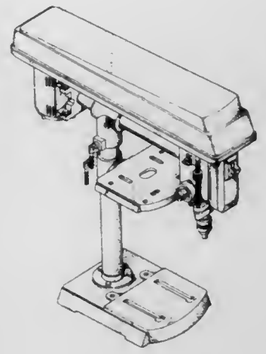
Rey Zon Chen, Taichung, Taiwan, assignor to Rexon Industrial Corp., Ltd., Taichung, Taiwan

Filed Jul. 2, 1996, Ser. No. 56,582

Term of patent 14 years

LOC (6) Cl. 15 - *03*

U.S. Cl. D15—132



393,649

**FRONTPIECE FOR SWIM GOGGLES**

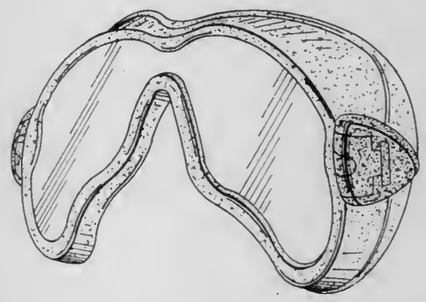
Stephen John Hall, Surrey, Canada; Aidan Petrie, Providence, R.I.; Stephen Lane, Jamestown, R.I., and John Mathews, Providence, R.I., assignors to Authentic Fitness Products, Inc., Van Nuys, Calif.

Filed Oct. 3, 1996, Ser. No. 60,657

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—312



393,650

**PROTECTIVE EYEWEAR**

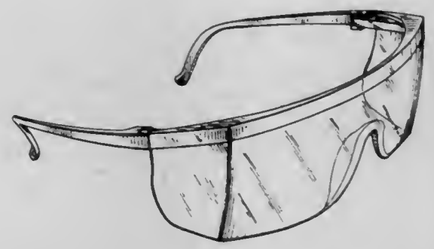
Arthur J. Salce, Southbridge, Mass., assignor to Cabot Safety Intermediate Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 12,825, Sep. 10, 1993, abandoned. This application Apr. 18, 1996, Ser. No. 53,242

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—314



393,651

**COMBINED VIDEO CAMERA AND VIDEO TAPE RECORDER**

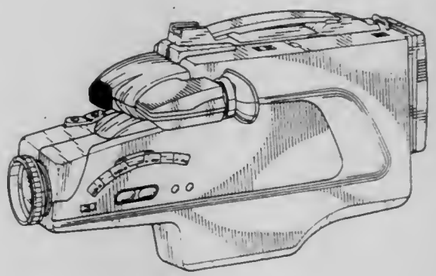
Kang Hee Cha, Incheon-si, Rep. of Korea, assignor to Goldstar Co., Ltd., Seol, Rep. of Korea

Filed Jan. 17, 1995, Ser. No. 33,556

Term of patent 14 years

LOC (6) Cl. 16 - *01*

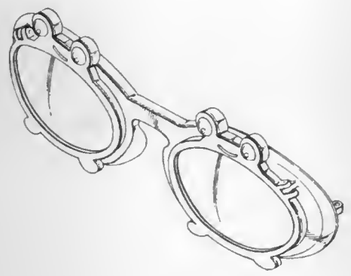
U.S. Cl. D16—202



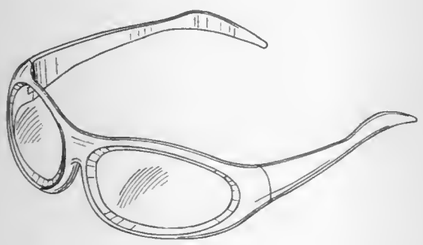
VOL 1209 ISS 3 APR 21 1998 UMI



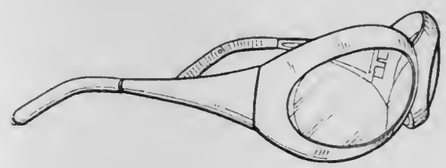
393,652
SPECTACLES FRAME
Ching-Jin Wang, 58, Ma Yuan West St., Taichung, Taiwan
Filed Jun. 1, 1997, Ser. No. 71,869
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—307



393,653
EYEGLASSES
William H. Howard, IV, Carlsbad, Calif., assignor to Dragon Optical, Inc., Carlsbad, Calif.
Filed Sep. 19, 1996, Ser. No. 60,019
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—326



393,654
SUNGLASSES
Luciano Simioni, Montebelluna, Italy, assignor to Killer Loop S.p.A., Pederobba, Italy
Filed Nov. 13, 1996, Ser. No. 62,333
Claims priority, application Italy, May 17, 1996, TV9600003
The portion of the term of this patent subsequent to Mar. 3, 2012, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—326

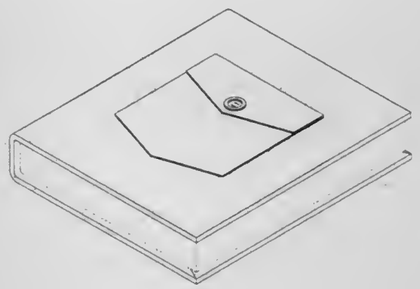


393,655
ELECTRONIC CALCULATOR HAVING THE FUNCTIONS OF TELEPHONE BOOK, ADDRESS BOOK, CALENDAR, SCHEDULE BOOK AND MEMO BOOK
Yuiti Kurabuti, Kawaguchi, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Apr. 16, 1997, Ser. No. 70,861
Term of patent 14 years
LOC (6) Cl. 18 - *01*
U.S. Cl. D14—100

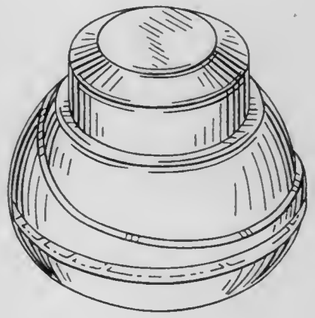




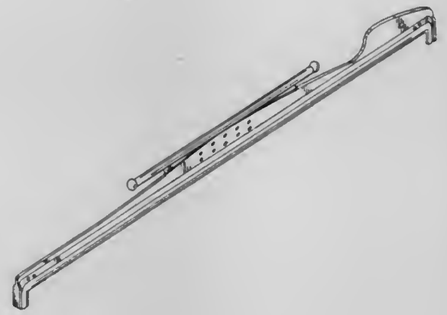
393,656
BOOK COVER
Vickie L. Bear, and Deneen Riccio, both of 20 Red Fox La., Mechanicsburg, Pa. 17055
Filed Mar. 20, 1997, Ser. No. 68,208
Term of patent 14 years
LOC (6) Cl. 19 - *04*
U.S. Cl. D19—26



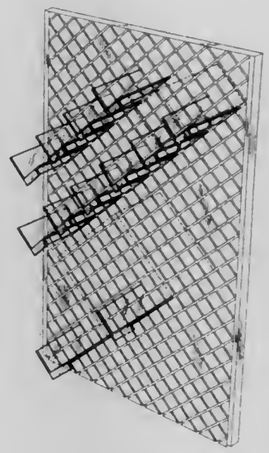
393,657
PUNCH TOOL
Kyle M. Bennett, Wausau, Wis., assignor to Fiskars Inc., Madison, Wis.
Filed Nov. 26, 1996, Ser. No. 63,090
Term of patent 14 years
LOC (6) Cl. 19 - *02*
U.S. Cl. D19—72



393,658
POSITIONING BAR FOR A FOLDER
Jean-Marc Barthel, Strasbourg, France, assignor to Tarifold, Geispolsheim, France
Filed May 23, 1997, Ser. No. 71,862
Claims priority, application France, Nov. 25, 1996, 966644
Term of patent 14 years
LOC (6) Cl. 19 - *02*
U.S. Cl. D19—90



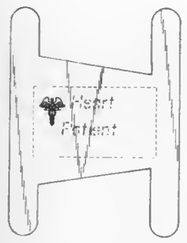
393,659
COMBINED DETACHABLE SHELVING AND DISPLAY WALL
Horst Muhlack, Kiel, Germany, assignor to Muhlack Kiehl GmbH, Kiel, Germany
Filed Sep. 6, 1995, Ser. No. 43,577
Term of patent 14 years
LOC (6) Cl. 20 - *03*
U.S. Cl. D20—10



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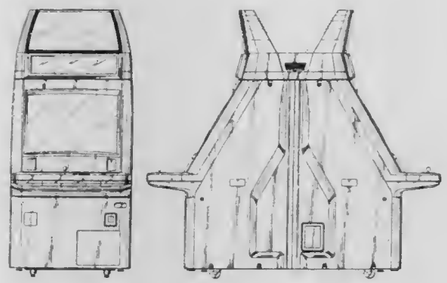
393,660
MEDICAL IDENTIFICATION TAG
Judy Gibson, 3111 N. Ocean Dr., #1601, Hollywood, Fla. 33019
Filed Mar. 24, 1997, Ser. No. 69,279
Term of patent 14 years
LOC (6) Cl. 19 - *08*
U.S. Cl. D20—22



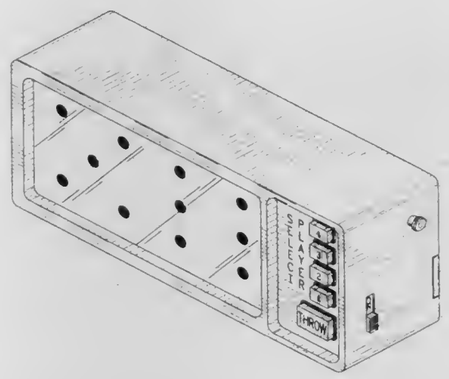

393,661
GAME APPARATUS
Karl R. Meyer, Hampden, Mass., and Bruce E. Foster, Enfield, Conn., assignors to Hasbro, Inc., Pawtucket, R.I.
Filed May 29, 1997, Ser. No. 71,389
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—5



393,662
VIDEO GAME MACHINE
Kimio Tsuda, Tokyo, Japan, assignor to Sega Enterprises, Ltd., Japan
Filed Apr. 11, 1997, Ser. No. 69,406
Claims priority, application Japan, Oct. 16, 1996, 8-31021
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—13

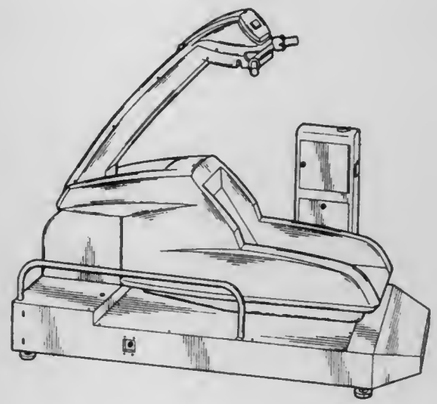


393,663
DIGITAL DICE SYSTEM
Andrew Gerace, 333 Avenue E, Bayonne, N.J. 07002
Filed May 14, 1997, Ser. No. 70,715
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—41





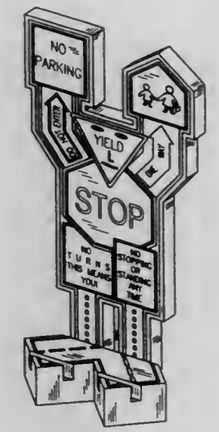

393,664
OPERATING APPARATUS FOR A WATERCRAFT SIMULATION GAME MACHINE
Yoshitsugu Isetani, Sakai, and Yuuji Tamura, Kobe, both of Japan, assignors to Konami Co., Ltd., Hyogo-ken
Filed Aug. 6, 1996, Ser. No. 58,013
Claims priority, application Japan, Feb. 19, 1996, 8-004255
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—48



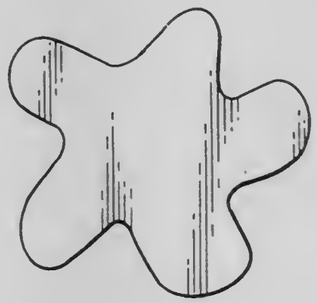
393,665
DART
William A. Smith, Greenfield, Wis., assignor to Great Lakes Dart Distributors, Inc., Muskego, Wis.
Filed Apr. 25, 1997, Ser. No. 70,011
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—49



393,666
BOARD GAME STATUE
Erik Wrobel, 125 Hillcrest Rd., Warren, N.J. 07059, and John Barry, No. 7 Rte. 31 N., Hampton, N.J. 08827
Filed Nov. 29, 1996, Ser. No. 63,175
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—184



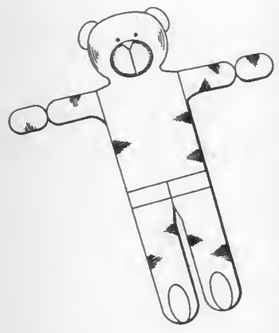

393,667
MAGNETIC GAME PIECE
Michael C. Perry, 1011 N. Hayes, Oak Park, Ill. 60302
Filed Feb. 13, 1997, Ser. No. 66,671
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—51



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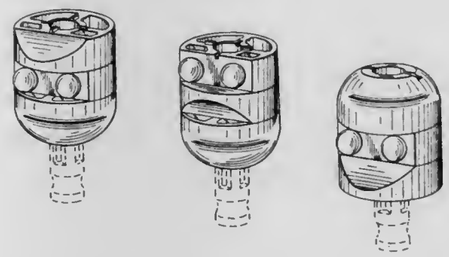
393,668
STUFFED ANIMAL
Jean M. Fitzgerald, 46 Algin Dr., Middlebury, Conn. 06762
Filed Jun. 13, 1996, Ser. No. 55,783
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—159



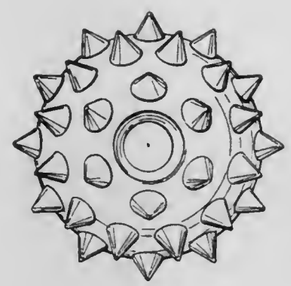
393,669
FEMALE DOLL
Ruby Lee Thomas, 115 E. 11th St., Salisbury, N.C. 28144
Filed Apr. 14, 1997, Ser. No. 68,167
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—171



393,670
HEAD ASSEMBLY FOR ROBOTIC TOY FIGURE
Joel I. Glickman, Huntingdon Valley; Matthew Dickinson, Hatfield; Robert Gleim, Royersford, and John Zimmer, Lansdale, all of Pa., assignors to Connector Set Limited Partnership, Hatfield, Pa.
Filed Jan. 3, 1997, Ser. No. 64,498
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—190

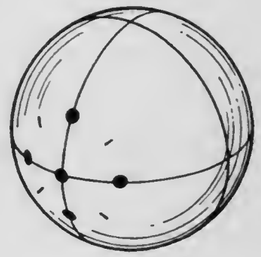


393,671
FLEXIBLE BALL WITH SPIKES
William L. Honaker, 5730 W. Milan Pl., Denver, Colo. 80235
Filed Sep. 13, 1996, Ser. No. 59,602
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—204





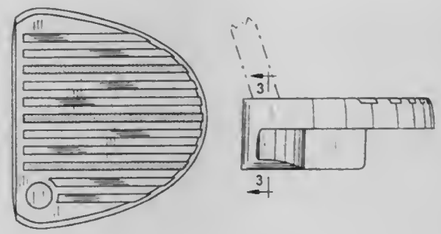
393,672
CUE BALL
David Anthony Clay, St. Agnes, Australia, assignor to Q-Tru Pty Ltd., Wayville, Australia
Filed Nov. 19, 1996, Ser. No. 62,617
Claims priority, application Australia, May 21, 1996. 1584/96
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. 21—204



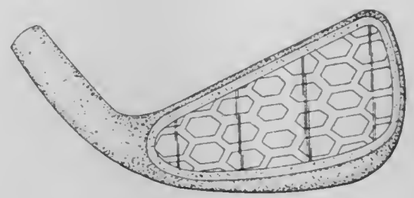
393,673
GOLF CLUB
James Robert Cope, Louisville, and Christian Paul Marlowe, Nederland, both of Colo., assignors to Copex Corporation, Boulder, Colo.
Filed Jun. 5, 1996, Ser. No. 55,455
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—214



393,674
PUTTER HEAD
Edward Rhee, 721 Cambridge Ct., Downers Grove, Ill. 60516
Filed Nov. 20, 1996, Ser. No. 62,622
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—217



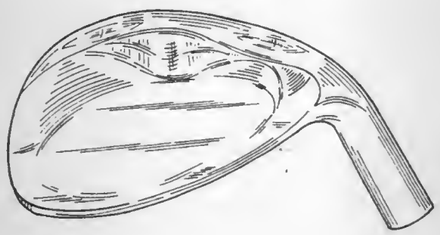

393,675
CLUB HEAD
John B. Hoeflich, Lafayette, Colo., assignor to HD Golf Development, Inc., Denver, Colo.
Filed Apr. 10, 1996, Ser. No. 53,052
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—220



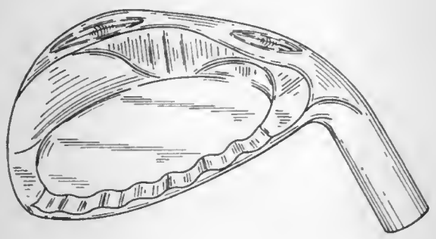
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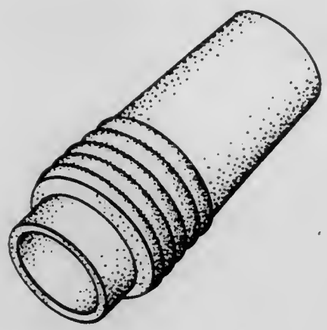
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GOLF CLUB HEAD
Frank Frazetta, East Stroudsburg, Pa., assignor to Crunch Golf Company, East Stroudsburg, Pa.
Filed Apr. 4, 1997, Ser. No. 68,427
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—220



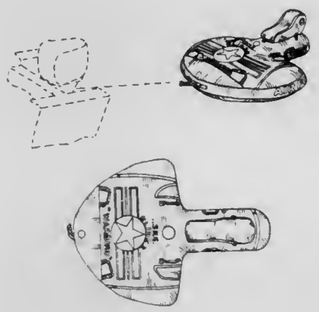
393,677
GOLF CLUB HEAD
Frank Frazetta, East Stroudsburg, Pa., assignor to Crunch Golf Company, East Stroudsburg, Pa.
Filed Apr. 4, 1997, Ser. No. 69,704
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—220



393,678
GOLF CLUB HOSEL SLEEVE
John H. Jones, and Edwin L. Snider, both of Louisville, Ky., assignors to Striker Golf Company, Jeffersontown, Ky.
Filed Feb. 18, 1997, Ser. No. 67,056
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—221

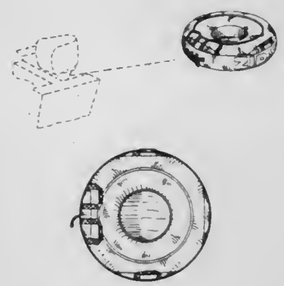


393,679
AQUATIC VEHICLE
LeRoy L. Peterson, Omaha, Nebr., assignor to Sportsstuff, Inc., Omaha, Nebr.
Filed Feb. 20, 1997, Ser. No. 66,820
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D21—237

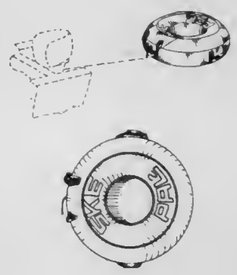




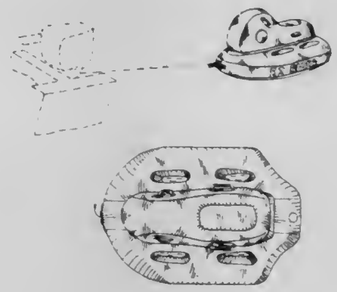
393,680
AQUATIC VEHICLE
LeRoy L. Peterson, Omaha, Nebr., assignor to Sportsstuff, Inc., Omaha, Nebr.
Filed Feb. 20, 1997, Ser. No. 68,108
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D21—237



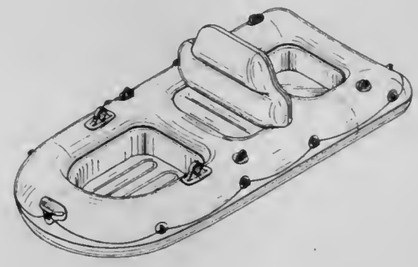
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AQUATIC VEHICLE
Leroy L. Peterson, Omaha, Nebr., assignor to Sportsstuff, Inc., Omaha, Nebr.
Filed Feb. 20, 1997, Ser. No. 68,109
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D21—237



393,682
AQUATIC VEHICLE
Leroy L. Peterson, Omaha, Nebr., assignor to Sportsstuff, Inc., Omaha, Nebr.
Filed Feb. 20, 1997, Ser. No. 68,110
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D21—237



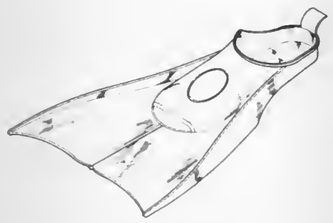
393,683
INFLATABLE RAFT
Rong-Jyh Song, Miao-Li Hsien; Tsung-Ping Yen, Taipei; Jui-Yi Weng, and Yuan-Chen Chen, both of Taoyuan Hsien, all of Taiwan, assignors to Aqua-Marine International, Inc., Taipei Hsien, Taiwan
Filed Mar. 27, 1997, Ser. No. 68,810
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D21—237



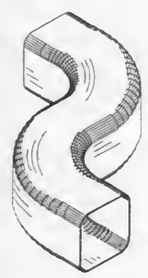
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393,684
FIN
Tien-Lung Lin, 4th Fl., No. 24, Lane 50, Mu Hsin Road, Sec. 3, Taipei, Taiwan
Filed Aug. 7, 1997, Ser. No. 74,553
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—239



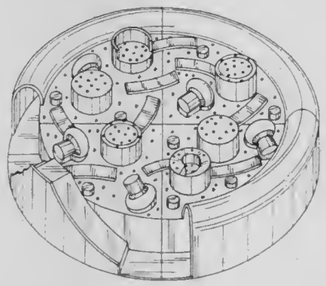
393,685
PLAY TUNNEL
Melanie L. Peritz, 104 Forest Ave., Andalusia, Ala. 36420
Filed Feb. 7, 1996, Ser. No. 50,047
Term of patent 14 years
LOC (6) Cl. 21 - *03*
U.S. Cl. D21—240



393,686
CHILDREN'S PLAY ENCLOSURE WITH BALLS
Russell J. Coddington, Jr., Imperial, Pa., and Paul Calabro, East Chester, N.Y., assignors to Hedstrom Corporation, Bedford, Pa.
Filed May 6, 1996, Ser. No. 54,059
Term of patent 14 years
LOC (6) Cl. 21 - *03*
U.S. Cl. D21—240



393,687
ACTIVITY PLAYGROUND SIMULATING A PIZZA
Jennifer D. Griger, 1270 Emerald Creek Dr., Broadview Heights, Ohio 44147-2575; Sarah A. Stowell, Omaha, Nebr.; Tiffany Townsend, 12255 - 24th Ave. N., Plymouth, Minn. 55441, and Alyssa Van Blaricom, Ankeny, Iowa, assignors to Jennifer D. Griger, Broadview Hts., Ohio; Tiffany Townsend, Plymouth, Minn., and Sarah J. Stowell, Omaha, Nebr.
Filed Sep. 27, 1996, Ser. No. 60,426
Term of patent 14 years
LOC (6) Cl. 21 - *03*
U.S. Cl. D21—242

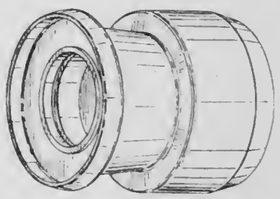




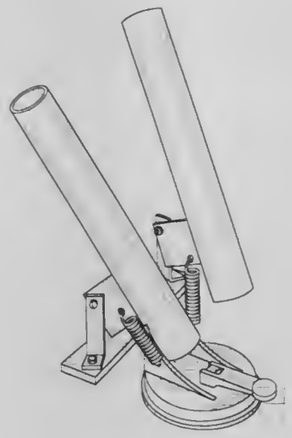
393,688
FISHING LINE AND LURE CLIP
Lawrence Essad, Brainerd, Minn., assignor to Normark Corporation, Minnetonka, Minn.
Filed Apr. 29, 1997, Ser. No. 70,375
Term of patent 14 years
LOC (6) Cl. 22 - *05*
U.S. Cl. D22—134



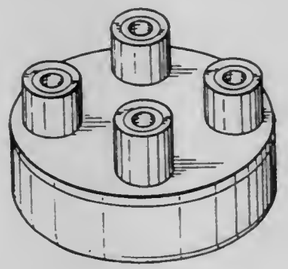
393,689
SPOOL FOR A FISHING SPINNING REEL
Kyouichi Kaneko; Eiji Shinohara; Akira Yamaguchi, and Wataru Tsutsumi, all of Higashikurume, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Nov. 27, 1996, Ser. No. 62,850
Claims priority, application Japan, May 31, 1996, 8-16122; Jun. 13, 1996, 8-17505
Term of patent 14 years
LOC (6) Cl. 22 - *05*
U.S. Cl. D22—137



393,690
ROD AND REEL HOLDER FOR BOAT DECKS
Hubert G. Lovelady, 4352 Wildt Rd., San Antonio, Tex. 78222, and Sydney K. Appling, Rt. 1 P.O. Box 103, Lincoln, Tex. 78948
Filed May 21, 1996, Ser. No. 54,772
Term of patent 14 years
LOC (6) Cl. 22 - *05*
U.S. Cl. D22—147



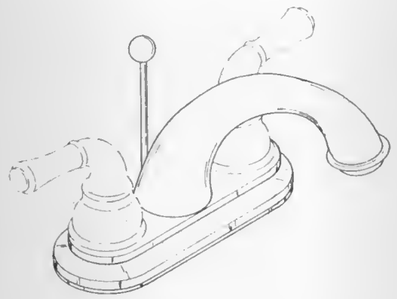
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FLUID DIVIDER
Donald L. Evans, 1405 Huntington Cir., Reno, Nev. 89509
Filed Apr. 9, 1997, Ser. No. 68,453
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—200



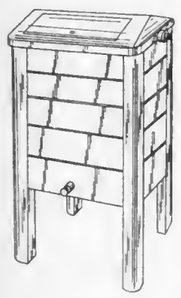
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FAUCET
Hsi-Chia Ko, Changhua Hsien, Taiwan, assignor to Chung Cheng Faucet Co., Ltd., Changhua Hsien, Taiwan
Filed Apr. 23, 1997, Ser. No. 69,766
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—238



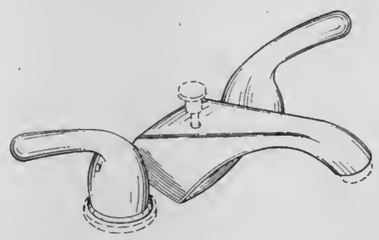
393,693
KNOCK DOWN RAINWATER STORAGE CONTAINER
Adrian T. Schollen, Scarborough; Richard M. Schollen, Markham, and Gerald Adamson, Toronto, all of Canada, assignors to 805004 Ontario Inc., Ontario, Canada
Filed Aug. 6, 1996, Ser. No. 58,032
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—202



393,694
WATERING DEVICE FOR HANGING PLANTS
Rene Arcos, and Martha Arcos, both of P.O. Box 1184, French Camp, Calif. 95231
Filed Sep. 5, 1996, Ser. No. 59,230
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—213

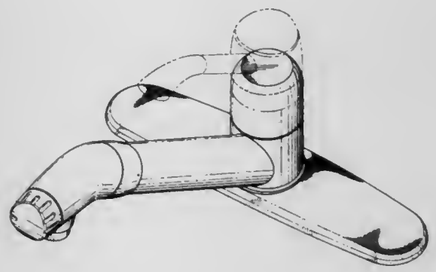


393,695
FAUCET SET
Chen-Fa Ku, Tanzu, Taiwan, assignor to Globe-Union Industrial Corporation, Tantzu, Taiwan
Filed Jun. 4, 1996, Ser. No. 55,429
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—242

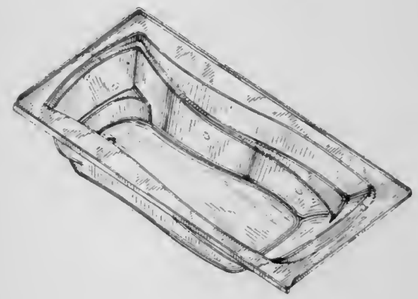




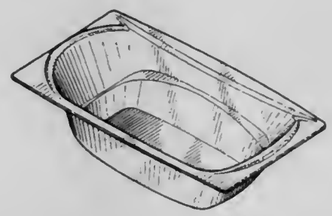
393,696
FAUCET BODY AND SPOUT
Frederic C. Doughty, South Pasadena; Darren M. Mark, Valencia, and Alvin Tolosa, Ventura City, all of Calif., assignors to Emhart Inc., Newark, Del.
Filed Aug. 8, 1997, Ser. No. 74,625
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—243



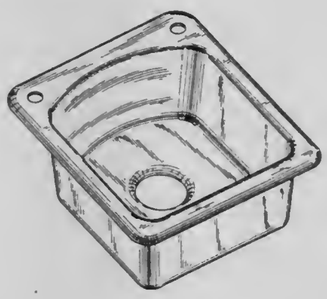
393,697
TUB FOR BATHING
Jill E. Hundley, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 25, 1996, Ser. No. 49,465
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—277



393,698
BATHTUB
Jaime Singla Palacin, Gava, Spain, assignor to Compania Roca Radiadores, S.A., Gava, Spain
Filed Nov. 22, 1996, Ser. No. 62,753
Claims priority, application Spain, May 23, 1996, 137556D
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—277



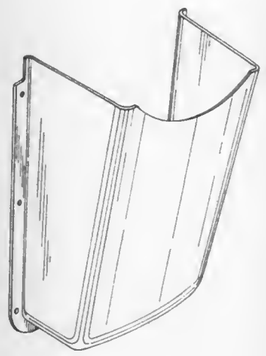
393,699
SINK
Thomas A. Bonnell, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 22, 1997, Ser. No. 65,155
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—284



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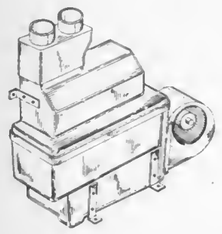
393,700
PROTECTIVE UNDERSINK ENCLOSURE
Thomas W. Trueb, and Steven R. Trueb, both of Ellington, Conn., assignors to Truebro, Inc., Ellington, Conn.
Continuation-in-part of Ser. No. 43,128, Aug. 25, 1995, Pat. No. Des. 384,732, Ser. No. 40,563, Jun. 21, 1995, Pat. No. Des. 373,412, and Ser. No. 40,564, Jun. 21, 1995, Pat. No. Des. 372,077. This application May 13, 1996, Ser. No. 54,347
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—308



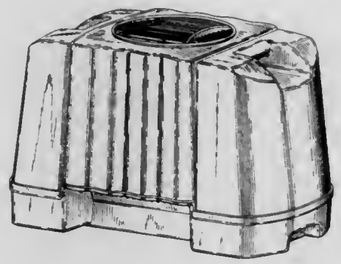
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Patent Not Issued For This Number

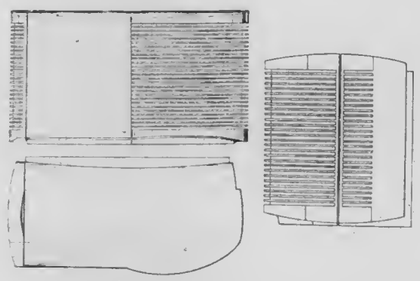
393,702
COMBINED AIR CONDITIONING AND HEATING UNIT HOUSING
Dennis Leon Haeck, Union, Mich., assignor to Pro Air, Inc., Elkhart, Ind.
Filed Mar. 31, 1997, Ser. No. 68,771
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—328



393,703
PORTABLE AIR TREATMENT DEVICE
Mark A. Gilbertson, Sauk City, Wis., assignor to Bemis Manufacturing Company, Sheboygan Falls, Wis.
Filed May 2, 1997, Ser. No. 70,234
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—355

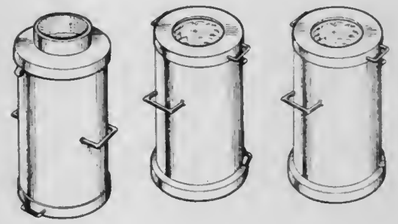


393,704
AIR CLEANER
Bernard Chiu, Wellesley; Roy D. Heinz, Newton, both of Mass., and Robert Marvin, Farmington, Conn., assignors to Duracraft Corp., Southbrough, Mass.
Filed Aug. 15, 1995, Ser. No. 42,634
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—364

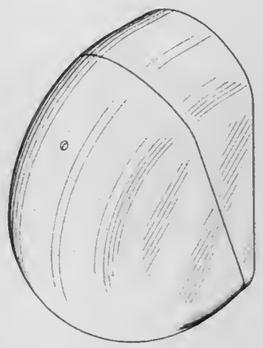




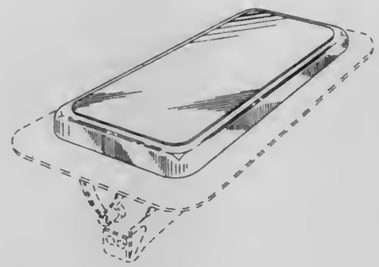
393,705
CONTAINER FOR PLASTIC FOIL FOR THE HANDLING OF FILTER BAGS
Jan B. Dure, Växjö , Sweden, assignor to ABB Fläkt AB, Stockholm, Sweden
Filed Nov. 22, 1995, Ser. No. 46,969
Claims priority, application Sweden, May 24, 1995, 95-1084
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—365



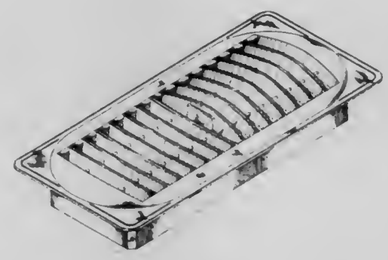
393,706
AEROSOL SPRAY DISPENSER
John R. Kauzlarich, Clarendon Hills; Brian K. Phillips, Joliet, and Charles R. Holzner, Sr., Chicago, all of Ill., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Continuation-in-part of Ser. No. 49,049, Oct. 6, 1995. This application Jul. 11, 1996, Ser. No. 56,933
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—369



393,707
TRIM PLATE COVER FOR VENTILATION UNITS
Timothy A. Kelly, 801 Virginia Ave., Salem, Va. 24153
Filed Jun. 11, 1996, Ser. No. 55,691
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—373



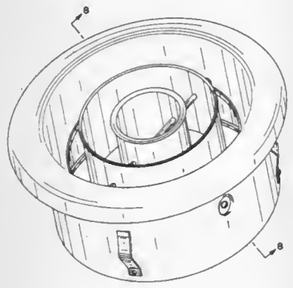
393,708
HEAT REGISTER
Masoud Assadi, 102-36611 Grand River, Farmington Hills, Mich. 48335
Filed Apr. 9, 1997, Ser. No. 68,226
Term of patent 14 years
LOC (6) Cl. 23 - *03*
U.S. Cl. D23—388



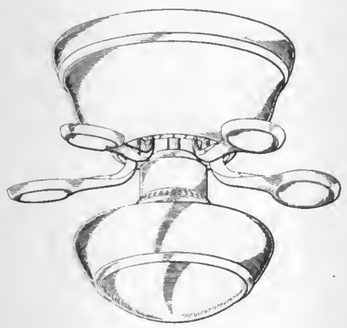
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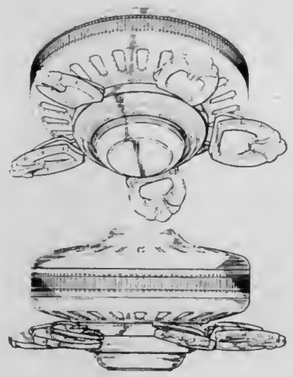
393,709
AIR DUCT
Keisuke Nishizawa, San Marino, Calif., assignor to Seiho International, Inc., Pasadena, Calif.
Filed May 10, 1996, Ser. No. 54,235
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—390



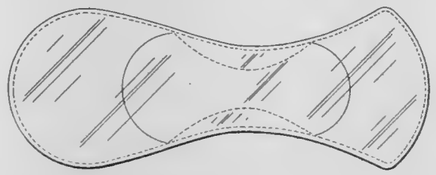
393,710
COMBINED HOUSING, GLOBE AND BLADE IRONS UNIT FOR A CEILING FAN
Jack Warren Gee, II, Memphis, Tenn., assignor to Hunter Fan Company, Memphis, Tenn.
Filed Mar. 26, 1996, Ser. No. 52,252
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—411



393,711
COMBINED CEILING FAN MOTOR HOUSING, SWITCH HOUSING, AND BLADE IRONS UNIT
Jack W. Gee, II, Memphis, and Masao Tsuji, Germantown, both of Tenn., assignors to Hunter Fan Company, Memphis, Tenn.
Filed Aug. 9, 1996, Ser. No. 58,261
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—411

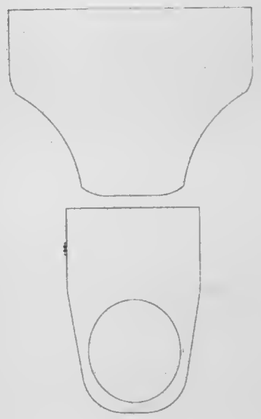


393,712
SANITARY NAPKIN
Leslie C. Clay, 919 Evangeline Pl., Shreveport, La. 71106
Filed Jan. 31, 1997, Ser. No. 65,621
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—125

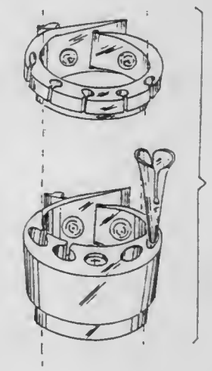




393,713
DIAPER WITH DISPOSAL BAG
Karen L. Gubbiotti, 25 Noel La., Bristol, Conn. 06010
Filed Jul. 10, 1997, Ser. No. 73,395
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—126



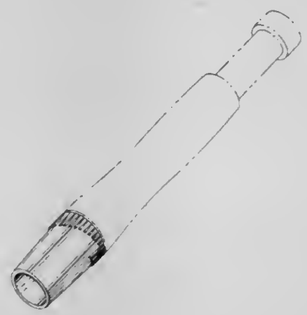
393,714
COMBINED I.V. POLE TUBING ANCHOR/NEEDLE RE-SHEATHER FOR WINGED NEEDLES
Annabelle D. Tucker, 4480 Sherman Oaks Cir., Sherman Oaks, Calif. 91403
Continuation-in-part of Ser. No. 34,725, Feb. 10, 1995, which is a continuation-in-part of Ser. No. 2,706, Dec. 17, 1992, which is a continuation-in-part of Ser. No. 695,535, May 3, 1991, Pat. No. 5,171,224, which is a continuation-in-part of Ser. No. 556,205, Jul. 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 556,204, Jul. 23, 1990, abandoned. This application Mar. 30, 1995, Ser. No. 36,917
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D24—130



393,715
OPTICAL FIBER HANDPIECE
Richard D. Strickland, Sandy, Utah, assignor to HGM, Inc., Salt Lake City, Utah
Filed Sep. 13, 1996, Ser. No. 59,577
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—133



393,716
LANCET ENDCAP
Allen Brenneman, Goshen; Gregory Lorch, South Bend, both of Ind., and D. Glenn Purcell, Edwardsburg, Mich., assignors to Bayer Corporation, Pittsburgh, Pa.
Filed Mar. 24, 1997, Ser. No. 68,264
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—147



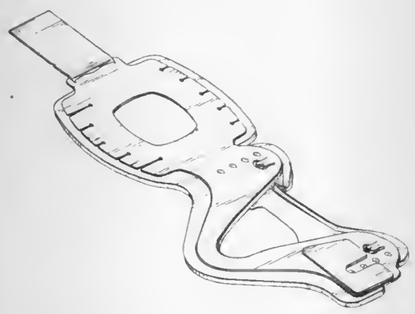
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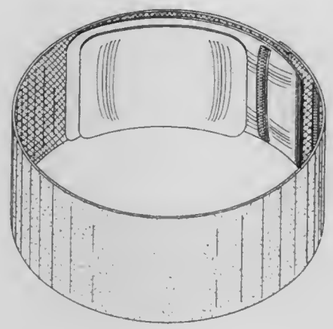
393,717
LANCET ENDCAP POINTER
Allen Brenneman, Goshen; Gregory Lorch, South Bend, both of Ind., and D. Glenn Purcell, Edwardsburg, Mich., assignors to Bayer Corporation, Pittsburgh, Pa.
Filed Mar. 21, 1997, Ser. No. 68,537
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—147



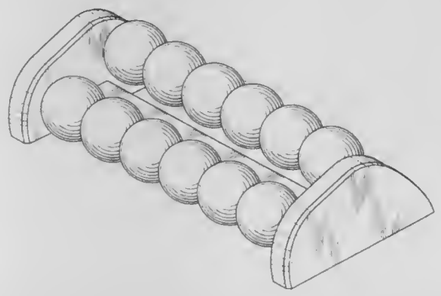
393,718
CERVICAL COLLAR
James R. Traut; Sean L. Phillips, both of Poughkeepsie; Larry McKinney, Katonah, all of N.Y., and Gordon D. Row, Lexington, Mass., assignors to Laerdal Medical Corporation, Wappingers Falls, N.Y.
Filed Dec. 23, 1996, Ser. No. 64,105
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—191



393,719
ICE PACK WRAP FOR TREATMENT OF INJURIES
Douglas F. Nichols, 5705 N. Delaware Ave., Portland, Oreg. 97217
Filed Jun. 6, 1994, Ser. No. 23,995
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—207

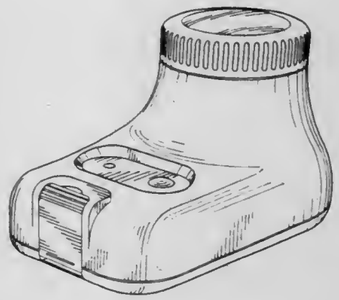


393,720
FOOT MASSAGER
Kuo-Ching Chien, No. 7 Lane 74 Gong 5 Road, Lung Tan Hsiang, Taoyuan Hsien, Taiwan
Filed Mar. 11, 1997, Ser. No. 68,587
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—212

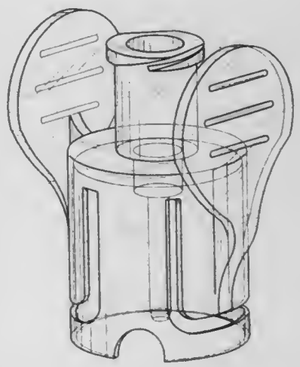




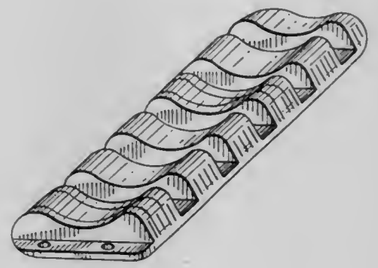
393,721
CLEANING DEVICE FOR CONTACT LENS
Etsurou Okada, Tokyo, Japan, assignor to M&M Corporation, Tokyo, Japan
Filed Oct. 11, 1996, Ser. No. 60,933
Claims priority, application United Kingdom, Apr. 15, 1996, 2055533
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D24—218



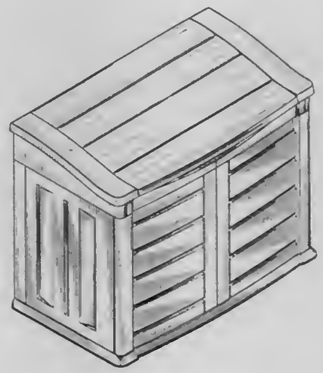
393,722
LOCKING BLUNT CANNULA
Thomas F. Fangrow, Jr., Mission Viejo; Daniel J. Wait, Santa Ana; George A. Lopez, Laguna Beach; David Charles Arnold, Mission Viejo; Dennis M. Bui, Alta Loma, and Kevin Barry Hanly, Mission Viejo, all of Calif., assignors to ICU Medical, Inc., San Clemente, Calif.
Filed Apr. 4, 1996, Ser. No. 52,594
Term of patent 14 years
LOC (6) Cl. 13 - *03*
U.S. Cl. D24—112



393,723
DEVICE FOR THE RELIEF OF MENSTRUAL DISCOMFORTS AND FOR THE RELIEF OF CHRONIC INFLAMMATION OF PROSTATE GLAND
Branislav Stojanovic, Dragoslava Stojanoviea 6, 21000 Novi Sad, Yugoslavia
Filed Jan. 18, 1995, Ser. No. 33,704
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—200



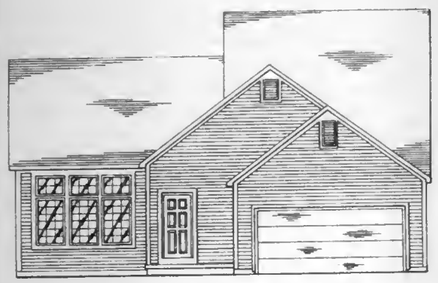
393,724
GARDEN SHED
Sami Sagol, Ramat Hasharon, Israel, assignor to Keter Plastic Ltd., Herzlia, Israel
Filed Oct. 17, 1996, Ser. No. 61,374
Claims priority, application Israel, Apr. 17, 1996, 26134
Term of patent 14 years
LOC (6) Cl. 25 - *03*
U.S. Cl. D25—16



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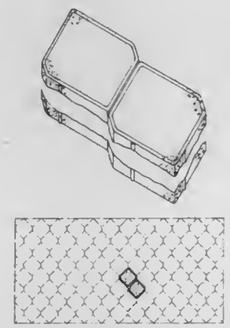
393,725
HOUSE FACADE
William J. Riat, Dublin, Ohio, assignor to Dominion Homes, Inc., Dublin, Ohio
Filed Jun. 30, 1995, Ser. No. 40,973
Term of patent 14 years
LOC (6) Cl. 25 - *03*
U.S. Cl. D25—17



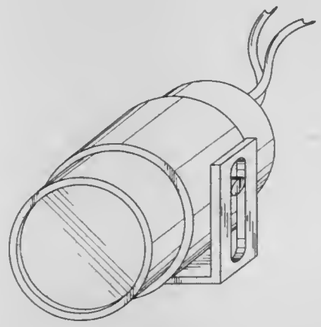
393,726
SET OF DECORATIVE STEPPING MEMBERS
Judith Sweeney, 182 Sippewissett Rd., Falmouth, Mass. 02540
Filed Sep. 9, 1996, Ser. No. 59,347
Term of patent 14 years
LOC (6) Cl. 25 - *01*
U.S. Cl. D25—113



393,727
INTERLOCKING PAVING STONE
William A. Wiegand, Jr., 2301 Circle Dr., O'Fallon, Mo. 63366
Filed May 15, 1997, Ser. No. 71,015
Term of patent 14 years
LOC (6) Cl. 25 - *01*
U.S. Cl. D25—113

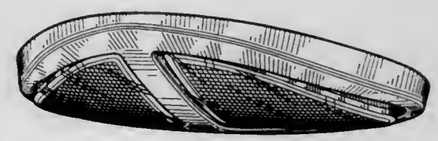


393,728
AUTOMATIC HEADLIGHT DIMMER
Wanda Porter, RR 1, Woodstock, NB, Canada, E0J 2B0
Filed Dec. 8, 1995, Ser. No. 47,612
Term of patent 14 years
LOC (6) Cl. 26 - *06*
U.S. Cl. D26—28

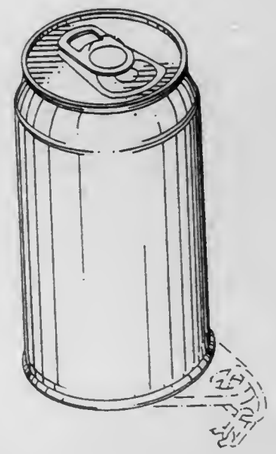




393,729
VEHICLE LAMP
Troy A. Tuttle, Rockford, Mich., assignor to Ramco Industries, Inc., Elkhart, Ind.
Filed May 16, 1997, Ser. No. 70,836
Term of patent 14 years
LOC (6) Cl. 26 - *06*
U.S. Cl. D26—28



393,730
FLASHLIGHT
Thomas G. Petruzzi, 5118 Belleville Ave., Orlando, Fla. 32812
Filed Nov. 13, 1996, Ser. No. 62,322
Term of patent 14 years
LOC (6) Cl. 26 - *02*
U.S. Cl. D26—38



393,731
COMBINED TORCHIERE LAMP, TABLE, AND TASK LIGHTS
Dennis K. Swanson, Woodland Hills, Calif., assignor to Lamps Plus, Inc., Chatsworth, Calif.
Filed Apr. 7, 1995, Ser. No. 37,261
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—65



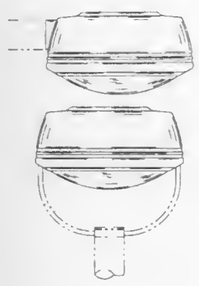
393,732
ADJUSTABLE LAMP
Peter J. Rubenzer, PO Box 460, Newcastle, Calif. 95658
Filed Feb. 19, 1997, Ser. No. 66,712
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—65



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393,733
LIGHTING FIXTURE
Robert J. Gaskins, Pleasanton, and Katsuhiro Unoki, El Sobrante, both of Calif., assignors to Thomas Industries, Inc., San Leandro, Calif.
Filed May 8, 1997, Ser. No. 70,478
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—67



393,734
LIGHTING FIXTURE
Joseph M. Casteel, 255 Lylton Rd., Moon Township, Pa. 15108
Filed Feb. 25, 1997, Ser. No. 66,982
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—76



# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 21st DAY OF APRIL, 1998

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & D Company Limited: *See*—
Nozoe, Yoshiteru; and Murata, Kazuharu, 5,741,634, Cl. 435-4.000.

A. Natterman & Cie. GmbH: *See*—
Ghyczy, Miklos; Roding, Joachim; Lautenschläger, Hans; Hameister, Walter; and Hager, Jörg, 5,741,513, Cl. 424-450.000.

A. Nattermann & Cie GmbH: *See*—
Hager, Jörg; Dürr, Manfred; and Lünebach, Ernst, 5,741,517, Cl. 424-450.000.

A/S GEA Farmaceutisk Fabrik: *See*—
Pedersen, Søren Bols; Gebhard-Hansen, Knud Erik; and Kann, Helle, 5,741,507, Cl. 424-439.000.

Aagaard, Jesper: *See*—
Oxenbøll, Karen M.; Si, Joan Qi; and Aagaard, Jesper, 5,741,688, Cl. 435-190.000.

Aaronson, Stuart A.: *See*—
Rubin, Jeffrey S.; Finch, Paul W.; and Aaronson, Stuart A., 5,741,642, Cl. 435-6.000.

Aarts, Ronaldus M., to U.S. Philips Corporation. Signal processing circuit including a signal combining circuit stereophonic audio reproduction system including the signal processing circuit and an audio-visual reproduction system including the stereophonic audio reproduction system. 5,742,687, Cl. 381-1.000.

Aasgaard, A. L. Pepper, to ASAR Group, Inc. Self tapping blind setting rivet assembly. 5,741,099, Cl. 411-29.000.

Aaslyng, Dorrit: *See*—
Hastrup, Sven; Branner, Sven; Norris, Fanny; Petersen, Steffen Bjørn; Nørskov-Lauridsen, Leif; Jensen, Villy Johannes; and Aaslyng, Dorrit, 5,741,694, Cl. 435-227.000.

Abate, John: *See*—
Badesha, Santokh S.; Heeks, George J.; Henry, Arnold W.; Asfaw, Biritawit; Saban, Marko D.; Abate, John; Carlston, Richard L.; and Ro, Nam S., 5,741,841, Cl. 524-379.000.

ABB Air Preheater Inc.: *See*—
Ritter, Kent E., 5,740,856, Cl. 165-10.000.

ABB Patent GmbH: *See*—
Küssel, Reinhard, 5,742,795, Cl. 395-500.000.

ABB Power T&D Company Inc.: *See*—
Bouhenguel, Redjem; and Garitty, James P., 5,742,513, Cl. 364-492.000.

Abbe, Jonathan T.: *See*—
Copperwheat, Jon F.; Abbe, Jonathan T.; and Stewart, Sam E., 5,742,872, Cl. 399-92.000.

Abbott Biotech, Inc.: *See*—
Lo, Kin-Ming; and Gillies, Stephen D., 5,741,682, Cl. 435-172.300.

Abbott Laboratories: *See*—
Geckle, Ronita Kay; Mazer, Terrence Bruce; Walton, Joseph Edward; Piontek, Carl Joseph; Duel, Susan Beth; Daab-Krzykowski, Andre; McCamish, Mark Anthony; Joseph, Robert Louis; and Pierson, William Guy, 5,741,243, Cl. 604-890.100.
Johnson, Robert H.; and Reynolds, Gordon S., 5,740,810, Cl. 128 673.000.
Michel, Gerd; Braun, Hans-Bertram; Röhrig, Kay; and Thome-Kromer, Birgit, 5,741,654, Cl. 435-7.900.

Abe, Akira: *See*—
Saito, Mika; Yoshida, Kiyohide; Irie, Naoko; He, Hong; Abe, Akira; and Nishiya, Akira, 5,741,468, Cl. 423-239.100.

Abe Kogyo Co., Ltd.: *See*—
Mori, Toshiaki, 5,740,631, Cl. 49-380.000.

Abe, Tsutomu: *See*—
Koitahashi, Noribumi; Ikeda, Masami; Suganta, Sadayuki, Asai, Naohito; Hirabayashi, Hiromitsu; Abe, Tsutomu; Sato, Hiroshi; Nagoshi, Shigeyasu; Shimizu, Eiichiro; Higuma, Masahiko; Akiyama, Yuji; Sugimoto, Hitoshi; Matsubara, Miyuki; Sato, Shinichi; Gotoh, Fumihiro; and Uetsuki, Masaya, 5,742,311, Cl. 347-86.000.
Tajima, Hiroki; Ikeda, Masami; Abe, Tsutomu; Kashino, Toshio; Higuma, Masahiko; and Okazaki, Takeshi, 5,742,309, Cl. 347-86.000.

Aben, Gerardus V. A.; and Krings, Leo H. M., to U.S. Philips Corporation Cathode ray tube comprising a display screen having an electroconductive coating. 5,742,119, Cl. 313-479.000.

Aboul-Hosn, Walid Nagib. Anatomical cavity access sealing condit 5,741,234, Cl. 604-174.000.

Acco-Rexel Group Services plc.: *See*—
Watkins, Stephen Christopher; and Felton, Geoffrey, 5,740,712, Cl. 83-549.000.

Acharya, Ramesh N., to OraMed, Inc. Controlled release pilocarpine delivery system. 5,741,805, Cl. 514-397.000.

Acker, Heinz. Camera support and stabilizing device. 5,742,859, Cl. 396-419.000.

Acres Gaming Inc.: *See*—
Acres, John F.; Ginsburg, Alec; and Wiebenson, David, 5,741,183, Cl. 463-42.000.

Acres, John F.; Ginsburg, Alec; and Wiebenson, David, to Acres Gaming Inc. Method and apparatus for operating networked gaming devices. 5,741,183, Cl. 463-42.000.

AcroMed Corporation: *See*—
Krag, Martin H.; and Glascott, Craig, 5,741,255, Cl. 606-61.000.

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Yeung, Peter Kwan Wah. Wrap-around light fixture frame with pivoting end flange. 5,741,063, Cl. 362-217.000.

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5 A 5,742,012
6 R 5,742,013
61.27 5,742,014
293 5,740,904

**CLASS 204**

192.11 5,741,404
192.14 5,741,405
192.15 5,741,406
192.2 5,741,403
206 5,741,407
252 5,741,408
296 5,741,409
297 M 5,741,410
452 5,741,411
602 5,741,412

**CLASS 205**

783 5,741,413

**CLASS 206**

87 5,740,905
214 5,740,906
307 5,740,907
362.3 5,740,908
366 5,740,909
373 5,740,910
378 5,740,911
457 5,740,912
494 5,740,913
501 5,740,914
555 5,740,915

**CLASS 208**

89 5,741,414
195 5,741,415

**CLASS 209**

156 5,740,917
173 5,740,918
223.1 5,740,919
455 5,740,920
584 5,740,921
668 5,740,922

**CLASS 210**

90 5,741,416
202 5,741,417
225 5,741,418
227 5,741,419
232 5,741,420
450 5,741,421
516.1 5,741,422
634 5,741,423
644 5,741,424
707 5,741,426
747 5,741,427
749 5,741,428

**CLASS 211**

10 5,740,923
40 5,740,924
43 5,740,925
5,740,926
70.6 5,740,927
71.01 5,740,928
5,740,929

**CLASS 213**

75 R 5,740,930

**CLASS 215**

50 5,740,931
252 5,740,932
256 5,740,933
381 5,740,934

**CLASS 216**

8 5,741,429
34 5,741,430
65 5,741,431
108 5,741,432

**CLASS 217**

110 5,740,935

**CLASS 218**

1 5,742,015
61 5,742,016
143 5,742,017

**CLASS 219**

69.13 5,742,018
69.17 5,742,019
78.01 5,742,020
85.22 5,742,021
86.25 5,742,022
109 5,742,023
121.64 5,742,025
121.69 5,742,026
121.82 5,742,028
137 PS 5,742,029
158 5,742,030
460 5,742,031
681 5,742,032
746 5,742,033

**CLASS 220**

3.3 5,740,936
23.83 5,740,937
324 5,740,938
404 5,740,939
412 5,740,940
454 5,740,941
666 5,740,942

**CLASS 221**

33 5,740,943
134 5,740,944

**CLASS 222**

1 5,740,945
129.1 5,740,946
135 5,740,947
175 5,740,948
209 5,740,949
238 5,740,950

**CLASS 224**

148.3 5,740,951
271 5,740,952

**CLASS 225**

2 5,740,953

**CLASS 228**

40 5,740,954
122.1 5,740,955
180.22 5,740,956

**CLASS 229**

92.8 5,740,957
103.1 5,740,958
103.3 5,740,959
198 B1 295,632

**CLASS 235**

375 5,742,034
380 5,742,035
449 5,742,036
454 5,742,037
462 5,742,038
5,742,039
5,742,040
5,742,041
467 5,742,042
472 5,742,043

**CLASS 238**

1 5,740,960
8 5,740,961

**CLASS 239**

77 5,740,962
299 5,740,963
333 5,740,964
423 5,740,965
424.5 5,740,966
494 5,740,967
526 5,740,968
533.2 5,740,969
551 5,740,970

**CLASS 241**

56 5,740,971
298 5,740,972

**CLASS 242**

43.2 5,740,973
47.01 5,740,974
244 5,740,975
311 5,740,976
348.3 5,740,977
375.3 5,740,978
382 5,740,979
384.4 5,740,980
413.5 5,740,981
555.3 5,740,982
556 5,740,983

**CLASS 244**

1 N 5,740,984
2 5,740,985
3.15 5,740,986
17.25 5,740,987
52 5,740,988
118.6 5,740,989
203 5,740,991

**CLASS 246**

122 R 5,740,992

**CLASS 248**

68.1 5,740,994
220.21 5,740,995
237 5,740,996
404 5,740,997
407 5,740,998
429 5,740,999
430 5,741,000
634 5,741,001

**CLASS 250**

208.1 5,742,044
214 A 5,742,045
5,742,046
214 R 5,742,047
222.1 5,742,048
282 5,742,049
288 5,742,050
326 5,742,051
338.1 5,742,052
338.5 5,742,053
339.13 5,742,054
353 5,742,055
363.03 5,742,056
368 5,742,057
370.08 5,742,058
370.09 5,742,059
5,742,060
385.1 5,742,061
396 R 5,742,062
455.11 5,742,063
458.1 5,742,064
492.23 5,742,065
504 R 5,742,066
548 5,742,067
559.19 5,742,068
559.29 5,742,069

**CLASS 251**

30.04 5,741,002
95 5,741,003
129.07 5,741,004
208 5,741,005
305 5,741,006

**CLASS 252**

8.57 5,741,434
62.55 5,741,435
74 5,741,433
76 5,741,436
78.3 RE. 35,773
182.1 5,742,070
186.39 5,741,437
299.66 5,741,438
312 5,741,439
373 5,741,440
408.1 5,741,441
582 5,741,442

**CLASS 257**

17 5,742,071
5,742,072
34 5,742,073
59 5,742,074
5,742,075
77 5,742,076
194 5,742,077
202 5,742,078
203 5,742,079
207 5,742,080
232 5,742,081
280 5,742,082
300 5,742,086
342 5,742,087
355 5,742,083
356 5,742,084
360 5,742,085
382 5,742,088
442 5,742,089
510 5,742,090
531 5,742,091
610 5,742,092
5,742,093
620 5,742,094
647 5,742,095
666 5,742,096
686 5,742,097
730 5,742,098
758 5,742,099
778 5,742,100
786 5,742,101

**CLASS 261**

77 5,741,443
128 5,741,444

**CLASS 264**

1.21 5,741,445
1.9 5,741,446
4 5,741,447
28 5,741,448
40.4 5,741,457
40.6 5,741,449
45.1 5,741,454
102 5,741,450
103 5,741,451
209.5 5,741,452
237 5,741,453
293 5,741,459
319 5,741,455
409 5,741,456
494 5,741,458

**CLASS 267**

64.12 5,741,007

**CLASS 271**

127 5,741,008
182 5,741,009

**CLASS 273**

119 A 5,741,010
292 5,741,011
5,741,012
447 5,741,013

**CLASS 277**

1 5,741,014
9.5 5,741,015

**CLASS 279**

62 5,741,016

**CLASS 280**

11.2 5,741,017
11.22 5,741,019
11.3 5,741,018
42 5,741,020
47.38 5,741,021
507 5,741,022
607 5,741,023
728.3 5,741,024
731 5,741,025
781 5,741,026
5,741,027

**CLASS 281**

45 5,741,028

**CLASS 285**

23 5,741,030
114 5,741,029

**CLASS 292**

139 5,741,031
202 5,741,032
289 5,741,033
338 5,741,034

**CLASS 294**

1.1 5,741,035
1.3 5,741,036
149 5,741,037

**CLASS 295**

200.33 5,742,768

**CLASS 296**

3 5,741,038
57.1 5,741,039
97.2 5,741,040
100 5,741,041
146.6 5,740,993
187 5,741,042
201 5,741,043
203 5,741,044
5,741,045

**CLASS 297**

378.13 5,741,046

**CLASS 299**

37.1 5,741,047

**CLASS 303**

7 5,741,048
9.75 5,741,049
10 5,741,050
141 5,741,051

**CLASS 305**

170 5,741,052

**CLASS 307**

105 5,742,103
108 5,742,104
125 5,742,105

**CLASS 310**

36 5,742,106
62 5,742,107
89 5,742,108
5,742,109
154 5,742,110
236 5,742,111
328 5,742,113

**CLASS 312**

194 5,741,053
228 5,741,054
348.6 5,741,055

**CLASS 313**

318.01 5,742,114
365 5,742,115
402 5,742,116
422 5,742,117
479 5,742,118
5,742,119
512 5,742,120
5,742,121
582 5,742,122
623 5,742,123
625 5,742,124
628 5,742,125
635 5,742,126

**CLASS 315**

8 5,742,127
5,742,128
77 5,742,130
157 5,742,131
167 5,742,129
209 R 5,742,132
291 5,742,133
307 5,742,134

**CLASS 318**

135 5,742,136
139 5,742,137
254 5,742,139
568.18 5,742,138
568.22 5,742,140
587 5,742,141
599 5,742,142
625 5,742,143
630 5,742,144
632 5,742,145
701 5,742,146

**CLASS 320**

7 5,742,147
14 5,742,148
113 5,742,149
116 5,742,150

**CLASS 323**

222 5,742,151
273 5,742,152
282 5,742,153
313 5,742,154
901 5,742,155

**CLASS 324**

76.24 5,742,156
96 5,742,157
158.1 5,742,158
173 5,742,159
207.16 5,742,161
207.25 5,742,160
252 5,742,162
309 5,742,163
318 5,742,164
5,742,165
5,742,166
671 5,742,167
753 5,742,173
754 5,742,168
5,742,172
755 5,742,169
5,742,170
5,742,171
762 5,742,174
765 5,742,175
5,742,176
5,742,177

**CLASS 326**

33 5,742,178
39 5,742,179
40 5,742,180
41 5,742,181
49 5,742,182
81 5,742,183
83 5,742,184
86 5,742,185
90 5,742,186
106 5,742,187

**CLASS 327**

99 5,742,188
113 5,742,189
152 5,742,190
156 5,742,191
166 5,742,192
170 5,742,193
298 5,742,194
362 5,742,195
382 5,742,196
537 5,742,197
551 5,742,198
552 5,742,199



**CLASS 329**

320 5,742,200

**CLASS 330**

2 5,742,201
52 5,742,202
254 5,742,203
258 5,742,204
269 5,742,205
284 5,742,206

**CLASS 331**

11 5,742,207
23 5,742,208
82 5,742,209

**CLASS 333**

22 R 5,742,211
104 5,742,212
116 5,742,210
131 5,742,213
202 5,742,214
204 5,742,215

**CLASS 335**

151 5,742,216
216 5,742,217

**CLASS 336**

192 5,742,218

**CLASS 337**

68 5,742,219
171 5,742,220
196 5,742,221

**CLASS 338**

2 5,742,222
21 5,742,223

**CLASS 340**

146.2 5,742,224
310.02 5,742,225
425.5 5,742,226
426 5,742,227
429 5,742,228
438 5,742,229
439 5,742,230
541 5,742,231
550 5,742,232
573 5,742,233
631 5,742,234
690 5,742,235
825.31 5,742,236
825.49 5,742,237
5,742,238
825.5 5,742,239
995 5,742,240

**CLASS 341**

22 5,742,241
5,742,242
59 5,742,243
5,742,244
143 5,742,246
144 5,742,245
5,742,247
156 5,742,248
164 5,742,249

**CLASS 342**

25 5,742,250
45 5,742,251
156 5,742,252
372 5,742,253

**CLASS 343**

700 MS 5,742,254
713 5,742,255
718 5,742,256
767 5,742,257
795 5,742,258
895 5,742,259

**CLASS 345**

2 5,742,260
3 5,742,261
8 5,742,262
5,742,263
5,742,264
60 5,742,265
74 5,742,266
77 5,742,267
84 5,742,268
87 5,742,269
100 5,742,270
116 5,742,271
127 5,742,272
132 5,742,273
5,742,274
134 5,742,275
5,742,276
136 5,742,277
156 5,742,278
173 5,742,279
5,742,280
191 5,742,281
193 5,742,282
302 5,742,283
335 5,742,284
342 5,742,285
349 5,742,286
5,742,779
355 5,742,287
418 5,742,288
419 5,742,289
5,742,290
420 5,742,291
421 5,742,293
425 5,742,294
426 5,742,292
427 5,742,295
431 5,742,296
438 5,742,297
501 5,742,298
5,742,299

**CLASS 347**

9 5,742,300
5,742,301
23 5,742,302
36 5,742,303
40 5,742,304
42 5,742,305
43 5,742,306
62 5,742,307
85 5,742,308
86 5,742,309
5,742,310
5,742,311
87 5,742,312
92 5,742,313
93 5,742,314
102 5,742,315
104 5,742,316
131 5,742,317
134 5,742,318
138 5,742,319
153 5,742,320
211 5,742,321
238 5,742,322
246 5,742,323
247 5,742,324
251 5,742,325
257 5,742,326
262 5,742,327

**CLASS 348**

12 RE. 35,774
15 5,742,329
47 5,742,330
51 5,742,331
5,742,332
60 5,742,333
96 5,742,334
135 5,742,335
144 5,742,336
190 5,742,338
233 5,742,339
255 5,742,340
373 5,742,341
405 5,742,342
415 5,742,343
416 5,742,344
420 5,742,345
5,742,346
426 5,742,347
441 5,742,348
443 5,742,349
453 5,742,350
459 5,742,351
468 5,742,352
578 5,742,353
586 5,742,354
607 5,742,355
5,742,356
731 5,742,357
789 5,742,358
836 5,742,359
839 5,742,360
845 5,742,361

**CLASS 349**

2 5,742,362
38 5,742,363
43 5,742,365
62 5,742,366
64 5,742,367
117 5,742,368
123 5,742,369
124 5,742,370
139 5,742,371
187 5,742,372
204 5,742,373
218 5,742,460
128 5,742,461

**CLASS 351**

206 5,742,374
229 5,742,375

**CLASS 353**

56 5,741,056
74 5,741,057

**CLASS 355**

53 5,742,376
71 5,742,377

**CLASS 356**

4.08 5,742,378
5.07 5,742,379
39 5,742,380
124 5,742,381
136 5,742,382
138 5,742,383
141.4 5,742,384
5,742,385
5,742,386
237 5,742,387
247 5,742,388
312 5,742,389
326 5,742,390
350 5,742,391
356 5,742,392
364 5,742,393
375 5,742,394
394 5,742,395
5,742,396
399 5,742,397
429 5,742,398
437 5,742,399

**CLASS 358**

262 5,742,400
297 5,742,401
404 5,742,402
406 5,742,403
448 5,742,404
456 5,742,405
468 5,742,406
496 5,742,407
501 5,742,408
505 5,742,409
518 5,742,410

**CLASS 359**

2 5,742,411
55 5,742,412
110 5,742,413
125 5,742,414
128 5,742,415
134 5,742,416
153 5,742,417
156 5,742,418
201 5,742,419
5,742,420
5,742,421
214 5,742,422
227 5,742,423
254 5,742,424
273 5,742,425
285 5,742,426
298 5,742,427
341 5,742,428
350 5,742,429
377 5,742,430
493 5,742,431
565 5,742,432
566 5,742,433
575 5,742,434
629 RE. 35,775
692 5,742,435
696 5,742,436
727 5,742,437
739 5,742,438
743 5,742,439
749 5,742,440
814 5,742,441
822 5,742,442
839 5,742,442

**CLASS 360**

50 5,742,443
60 5,742,444
71 5,742,445
75 5,742,446
96.2 5,742,447
96.5 5,742,448
97.02 5,742,449
99.08 5,742,450
103 5,742,451
104 5,742,452
105 5,742,453
5,742,454
5,742,455
109 5,742,456
113 5,742,457
5,742,458
5,742,459
118 5,742,460
128 5,742,461

**CLASS 361**

88 5,742,463
103 5,742,464
111 5,742,465
118 5,742,466
154 5,742,467
229 5,742,468
230 5,742,469
301.5 5,742,470
312 5,742,471
321.4 5,742,472
5,742,473
502 5,742,474
681 5,742,475
683 5,742,476
704 5,742,477
5,742,478
737 5,742,479
749 5,742,480
767 5,742,481
777 5,742,483
789 5,742,484
800 5,742,485
807 5,742,486
809 5,742,487
816 5,742,488
836 5,742,489

**CLASS 362**

27 5,741,058
66 5,741,059
106 5,741,060
154 5,741,061
208 5,741,062
217 5,741,063
448 5,741,064

**CLASS 363**

17 5,742,490
21 5,742,491
26 5,742,492
37 5,742,493
41 5,742,494
65 5,742,495
95 5,742,496
133 5,742,497
145 5,742,498

**CLASS 364**

131 5,742,499
138 5,742,500
148 5,742,502
162 5,742,503
188 5,742,504
419.01 5,742,505
424.05 5,742,506
426.01 5,742,507
439 5,742,508
449.5 5,742,509
468.03 5,742,510
468.04 5,742,511
480 5,742,512
492 5,742,513
5,742,514
494 5,742,515
496 5,742,516
507 5,742,517
508 5,742,518
510 5,742,519
526 5,742,520
550 5,742,521
551.01 5,742,522
558 5,742,523
561 5,742,524
571.02 5,742,525
579 5,742,526
705.05 5,742,527
715.012 5,742,529
716.03 5,742,531
724.1 5,742,532
737 5,742,533
746 5,742,530
746.1 5,742,534
748.05 5,742,535
5,742,536
5,742,537
754.01 5,742,538

**CLASS 365**

49 5,742,539
104 5,742,540
185.08 5,742,542
185.21 5,742,543
185.3 5,742,541
189.03 5,742,544
190 5,742,545
194 5,742,546
200 5,742,547
201 5,742,548
5,742,549
203 5,742,550
207 5,742,551
210 5,742,552
222 5,742,554
225.7 5,742,555
5,742,556
230.05 5,742,557
230.06 B1 723,228
233.5 5,742,558

**CLASS 366**

320 5,741,066
541 5,741,065

**CLASS 367**

20 5,742,559
57 5,742,560
157 5,742,561
188 5,742,562

**CLASS 368**

24 5,742,563
69 5,742,564
190 5,742,565

**CLASS 369**

13 5,742,566
14 5,742,567
32 5,742,568
5,742,569
36 5,742,570
37 5,742,571
44.23 5,742,572
44.32 5,742,573
54 5,742,574
58 5,742,575
59 5,742,576
112 5,742,577
124 5,742,578
5,742,579
178 5,742,580
275.1 5,742,581
5,742,582

**CLASS 370**

18 5,742,583
210 5,742,584
223 5,742,585
230 5,742,586
235 5,742,587
236 5,742,588
249 5,742,589
252 5,742,590
286 5,742,591
329 5,742,592
330 5,742,593
336 5,742,594
342 5,742,595
356 5,742,596
390 5,742,597
393 5,742,598
395 5,742,599
5,742,600
5,742,601
401 5,742,602
5,742,603
5,742,604
405 5,742,605
413 5,742,606
419 5,742,607
447 5,742,608
465 5,742,609
472 5,742,610
473 5,742,611

**CLASS 371**

2.1 5,742,612
10.3 5,742,613
21.2 5,742,614
21.3 5,742,615
22.31 5,742,617
22.4 5,742,616
36 5,742,618
37.11 5,742,620
37.4 5,742,619
43 5,742,621
46 5,742,622
47.1 5,742,623
48 5,742,624
49.2 5,742,625

**CLASS 372**

22 5,742,626
25 5,742,634
34 5,742,627
45 5,742,628
46 5,742,629
50 5,742,630
5,742,631
68 5,742,632
92 5,742,633

**CLASS 374**

16 5,741,067
31 5,741,068
146 5,741,069
161 5,741,070
175 5,741,071
179 5,741,072
182 5,741,073
185 5,741,074

**CLASS 375**

112 5,742,667
200 5,742,635
5,742,636
5,742,637
5,742,638
219 5,742,639
220 5,742,640
222 5,742,641
233 5,742,642
243 5,742,643
316 5,742,644
321 5,742,645
349 5,742,646
354 5,742,135
366 5,742,647
371 5,742,649
376 5,742,650

**CLASS 376**

260 5,742,651
298 5,742,652
302 5,742,653
306 5,742,654
333 5,742,655

**CLASS 377**

7 5,742,656
73 5,742,657

**CLASS 378**

44 5,742,658
98.8 5,742,659
98.9 5,742,660
138 5,742,662
208 5,742,664

**CLASS 379**

7 5,742,665
58 5,742,666
5,742,668
130 5,742,669
142 5,742,670
156 5,742,671
198 5,742,672
201 5,742,673
209 5,742,674
265 5,742,675
413 5,742,676

**CLASS 380**

4 5,742,677
6 5,742,678
9 5,742,679
16 5,742,680
20 5,742,681
21 5,742,682
23 5,742,683
24 5,742,684
25 5,742,685
28 5,742,686

**CLASS 381**

1 5,742,687
17 5,742,688
5,742,689
24 5,742,690
5,742,691
68.6 5,742,692
92 5,742,693
94.2 5,742,694
104 5,742,695
156 5,742,696
169 5,742,697

**CLASS 382**

100 5,742,698
107 5,742,699
132 5,742,700
141 5,742,701
156 5,742,702
176 5,742,703
5,742,704
185 5,742,705
229 5,742,706
232 5,742,707
236 5,742,710
275 5,742,711
299 5,742,708
321 5,742,709

**CLASS 383**

5 5,741,075
9 5,741,076
10 5,741,077

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**CLASS 384**

43 5,741,078

**CLASS 385**

18 5,742,712
24 5,742,713
27 5,742,714
32 5,742,715
33 5,742,716
46 5,742,717
53 5,742,718
70 5,742,719
89 5,742,720
126 5,742,722
127 5,742,723
140 5,742,725

**CLASS 386**

26 5,742,727
68 5,742,728
5,742,729
69 5,742,730
95 5,742,731
5,742,732

**CLASS 395**

2.29 5,742,733
2.35 5,742,734
2.38 5,742,735
2.79 5,742,736
2.81 5,742,737
13 5,742,738
22 5,742,739
24 5,742,740
27 5,742,741
109 5,742,742
5,742,743
110 5,742,744
114 5,742,745
115 5,742,746
119 5,742,748
126 5,742,749
141 5,742,750
142 5,742,751
182.04 5,742,752
182.09 5,742,753
183.14 5,742,754
183.19 5,742,851
185.06 5,742,755
186 5,742,756
5,742,757
5,742,758
187.01 5,742,759
200.02 5,742,760
200.19 5,742,766
200.2 5,742,761
200.3 5,742,762
5,742,763
5,742,764
200.32 5,742,767
200.36 5,742,769
200.47 5,742,770
200.55 5,742,771
200.56 5,742,772
200.58 5,742,773
200.6 5,742,765
200.81 5,742,774
201 5,742,776
238 5,742,775
326 5,742,777
332 5,742,778
382 5,742,780
384 5,742,781
386 5,742,782
388 5,742,783
389 5,742,784
393 5,742,785
414 5,742,815
421.07 5,742,786
430 5,742,787
437 5,742,788
438 5,742,789
455 5,742,790
473 5,742,791
489 5,742,792
497.01 5,742,793
500 5,742,794
5,742,795
502 5,742,796
507 5,742,797
551 5,742,798
552 5,742,799
555 5,742,800
568 5,742,801
5,742,802
580 5,742,803
584 5,742,804
586 5,742,805
600 5,742,806
601 5,742,807
5,742,808
602 5,742,809
604 5,742,810
606 5,742,811
608 5,742,812
5,742,813
613 5,742,814
615 5,742,816
616 5,742,817
5,742,818
5,742,819
617 5,742,820
672 5,742,821
5,742,822
5,742,823
676 5,742,824
680 5,742,825
683 5,742,826
701 5,742,827
708 5,742,828
712 5,742,829
728 5,742,830
732 5,742,831
750 5,742,832
750.05 5,742,833
760 5,742,834
764 5,742,835
768 5,742,836
779 5,742,837
797 5,742,838
800 5,742,839
5,742,840
5,742,841
5,742,842
800.14 5,742,843
800.32 5,742,844
831 5,742,845
840 5,742,846
856 5,742,848
866 5,742,847
872 5,742,849

**CLASS 396**

72 5,742,850
229 5,742,852
292 5,742,853
311 5,742,854
5,742,855
319 5,742,856
5,742,857
320 5,742,858
419 5,742,859
420 5,742,860
429 5,742,861
512 5,742,862
517 5,742,863
546 5,742,864

**CLASS 399**

43 5,742,865
49 5,742,867
50 5,742,868
69 5,742,870
89 5,742,871
92 5,742,872
100 5,742,874
104 5,742,875
5,742,876
106 5,742,877
122 5,742,878
139 5,742,879
176 5,742,880
194 5,742,881
258 5,742,882
262 5,742,883
266 5,742,884
293 5,742,885
296 5,742,886
301 5,742,887
308 5,742,888
5,742,889
403 5,742,890

**CLASS 400**

120.14 5,741,079
208 5,741,080
234 5,741,081
615.2 5,741,082

**CLASS 403**

297 5,741,083
349 5,741,084

**CLASS 404**

75 5,741,085

**CLASS 405**

30 5,741,086
179 5,741,087
181 5,741,088
196 5,741,089
263 5,741,090
283 5,741,091
302 5,741,092

**CLASS 406**

153 5,741,093
182 5,741,094

**CLASS 407**

42 5,741,095

**CLASS 408**

1 R 5,741,096

**CLASS 409**

180 5,741,097

**CLASS 410**

47 5,741,098

**CLASS 411**

29 5,741,099
79 5,741,100
107 5,741,101
339 5,741,102
366 5,741,103
453 5,741,104

**CLASS 413**

25 5,741,105
115 5,741,117

**CLASS 414**

142.3 5,741,106
408 5,741,107
416 5,741,108
5,741,109
462 5,741,110
676 5,741,111
722 5,741,112
744.5 5,741,113
783 5,741,114
797.9 5,741,115

**CLASS 415**

104 5,741,116

**CLASS 416**

186 R 5,741,118
219 R 5,741,119

**CLASS 417**

44.2 5,741,120
53 5,741,121
222.2 5,741,122
407 5,741,123
415 5,741,124
477.7 5,741,125
490 5,741,126

**CLASS 418**

178 5,741,127

**CLASS 419**

4 5,742,891

**CLASS 422**

22 5,741,460
67 5,741,461
68.1 5,741,462
101 5,741,463
103 5,741,464
189 5,741,465
228 5,741,466

**CLASS 423**

213.5 5,741,467
239.1 5,741,468
244.01 5,741,469
245.2 5,741,470
432 5,741,471
460 5,741,472
559 5,741,475
648.1 5,741,474

**CLASS 424**

1.73 5,741,476
9.31 5,741,477
9.52 5,741,478
49 5,741,479
59 5,741,480
74 5,741,481
76.3 5,741,482
78.09 5,741,483
85.1 5,741,484
85.7 5,741,485
93.21 5,741,486
94.61 5,741,487
154.1 5,741,488
157.1 5,741,489
189.1 5,741,490
195.1 5,741,491
B1 401,564 5,741,492
208.1 5,741,492
209.1 5,741,493
246.1 5,741,494
278.1 5,741,495
401 5,741,496
5,741,497
5,741,499
404 5,741,500
405 5,741,501
5,741,502
423 5,741,503
439 5,741,505
1 R 5,741,506
5,741,507
442 5,741,508
443 5,741,509
448 5,741,510
449 5,741,511
450 5,741,512
5,741,513
5,741,514
5,741,515
5,741,516
5,741,517
5,741,518
464 5,741,519
466 5,741,520
488 5,741,521
489 5,741,522
5,741,523
5,741,524
616 5,741,525
635 5,741,526
645 5,741,527

**CLASS 425**

29 5,741,528
71 5,741,529
116 5,741,530
144 5,741,531
197 5,741,532

**CLASS 426**

112 5,741,533
120 5,741,534
124 5,741,535
520 5,741,536
548 5,741,537
594 5,741,538
614 5,741,539

**CLASS 427**

126.3 5,741,540
130 5,741,541
208.4 5,741,542
5,741,543
236 5,741,544
248.1 5,741,545
255.1 5,741,546
255.2 5,741,547
261 5,741,548
294 5,741,549
348 5,741,550
407.1 5,741,551
5,741,552
421 5,741,553
424 5,741,554
437 5,741,555
453 5,741,556
469 5,741,557
5,741,558
554 5,741,559
555 5,741,560

**CLASS 428**

13 5,741,561
24 5,741,562
35.1 5,741,563
35.2 5,741,564
5,741,565
5,741,566
36.5 5,741,567
69 5,741,568
83 5,741,573
119 5,741,574
131 5,741,569
167 5,741,570
178 5,741,571
195 5,741,572
209 5,741,575
212 5,741,576
5,741,577
5,741,578
215 5,741,579
221 5,741,580
284 5,741,581
317.5 5,741,582
327 5,741,583
329 5,741,584
357 5,741,585
364 5,741,586
365 5,741,587
367 5,741,588
370 5,741,589
373 5,741,590
402.24 5,741,591
5,741,592
422 5,741,593
424.2 5,741,594
426 5,741,595
457 5,741,596
5,741,597
458 5,741,598
5,741,599
474.4 5,741,600
5,741,601
482 5,741,602
641 5,741,603
660 5,741,604

**CLASS 429**

31 5,741,605
53 5,741,606
94 5,741,607
5,741,608
192 5,741,609
5,741,610
5,741,611
235 5,741,612

**CLASS 430**

5 5,741,613
30 5,741,614
57 5,741,615
101 5,741,616
110 5,741,617
137 5,741,618
175 5,741,619
253 5,741,620
5,741,621
270.1 5,741,622
270.19 5,741,623
312 5,741,624
5,741,625
314 5,741,626
321 5,741,627
323 5,741,628
326 5,741,629
337 5,741,630
399 5,741,631
522 5,741,632
531 5,741,633

**CLASS 431**

255 5,741,128
264 5,741,129

**CLASS 432**

2 5,741,130
258 5,741,131

**CLASS 433**

30 5,741,132
76 5,741,133
91 5,741,134
216 5,741,138
220 5,741,139

**CLASS 434**

82 5,741,140
118 5,741,135
169 5,741,136
236 5,741,137

**CLASS 435**

4 5,741,634
5,741,635
6 5,741,637
5,741,638
5,741,639
5,741,640
5,741,641
5,741,642
5,741,643
5,741,644
5,741,645
5,741,646
5,741,647
5,741,648
5,741,649
5,741,650
7.1 5,741,651
5,741,652
5,741,653
5,741,656
7.9 5,741,654
18 5,741,657
23 5,741,658
5,741,659
5,741,660
29 5,741,661
34 5,741,662
5,741,663
68.1 5,741,664
69.1 5,741,665
5,741,666
5,741,667
5,741,668
5,741,669
5,741,670
5,741,671
5,741,672
5,741,673
5,741,674
5,741,675
91.1 5,741,676
91.2 5,741,677
5,741,678
91.31 5,741,679
99 5,741,680
109 5,741,681
172.3 5,741,682
5,741,683
5,741,684
182 5,741,685
188 5,741,686
189 5,741,687
190 5,741,688
194 5,741,689
5,741,690
197 5,741,691
200 5,741,692
221 5,741,693
227 5,741,694
235.1 5,741,696
5,741,697
252.3 5,741,698
255.2 5,741,695
255.4 5,741,699
287.1 5,741,700
292.1 5,741,702
297.1 5,741,701
325 5,741,704
348 5,741,705
372 5,741,706

**CLASS 436**

25 5,741,707
49 5,741,708
52 5,741,709
73 5,741,710
154 5,741,711
501 5,741,712
518 5,741,713
526 5,741,714
537 5,741,715

**CLASS 437**

21 5,741,716
24 5,741,717
41 5,741,718
43 5,741,719
60 5,741,720
5,741,721
5,741,722
63 5,741,723
128 5,741,724
200 5,741,725
216 5,741,726

**CLASS 438**

4 5,741,727
75 5,741,728
125 5,741,729
130 5,741,730
132 5,741,731
149 5,741,732
152 5,741,733
235 5,741,734
279 5,741,735
286 5,741,736
5,741,737
296 5,741,738
387 5,741,739
435 5,741,740
637 5,741,741
653 5,741,742

**CLASS 439**

73 5,741,141
76.1 5,741,142
86 5,741,143
101 5,741,144
164 5,741,145
188 5,741,146
189 5,741,147
284 5,741,148
333 5,741,149
358 5,741,150
489 5,741,151
490 5,741,152
491 5,741,153
495 5,741,154
502 5,741,155
521 5,741,156
532 5,741,157
536 5,741,158
668 5,741,159
701 5,741,160
709 5,741,161
748 5,741,162
852 5,741,163
889 5,741,164



**CLASS 440**

57 5,741,165
84 5,741,166

**CLASS 441**

13 5,741,167

**CLASS 442**

16 5,741,744

**CLASS 446**

66 5,741,168
441 5,741,169

**CLASS 449**

7 5,741,170

**CLASS 451**

6 5,741,171
21 5,741,172
56 5,741,173
307 5,741,174
455 5,741,175

**CLASS 452**

122 5,741,176
198 5,741,177

**CLASS 454**

54 5,741,178
155 5,741,179
327 5,741,180

**CLASS 455**

51 5,742,892
66 5,742,893
90 5,742,894
5,742,895
133 5,742,896
142 5,742,897
193.1 5,742,898
234.2 5,742,899
296 5,742,900
326 5,742,901
336 5,742,902
404 5,742,903
461 5,742,905
5,742,906
503 5,742,907
517 5,742,908
5,742,909
550 5,742,910
562 5,742,911
566 5,742,912

**CLASS 463**

6 5,741,181
36 5,741,182
42 5,741,183
43 5,741,184
51 5,741,185

**CLASS 464**

25 5,741,186
55 5,741,187

**CLASS 472**

128 5,741,188
5,741,189

**CLASS 473**

457 5,741,193
490 5,741,194
570 5,741,195

**CLASS 474**

226 5,741,196
268 5,741,197
271 5,741,198

**CLASS 475**

235 5,741,199

**CLASS 477**

93 5,741,200
116 5,741,201
124 5,741,202
154 5,741,203

**CLASS 482**

51 5,741,204
52 5,741,205
105 5,741,206
124 5,741,207

**CLASS 493**

195 5,741,208
424 5,741,209

**CLASS 501**

69 5,741,745
70 5,741,746
135 5,741,747

**CLASS 502**

25 5,741,748
56 5,741,749
200 5,741,750
208 5,741,751
226 5,741,753

**CLASS 503**

221 5,741,752
227 5,741,754

**CLASS 504**

135 5,741,755
149 5,741,756
153 5,741,757

**CLASS 507**

90 5,741,758
103 5,741,759
225 5,741,761

**CLASS 508**

108 5,741,762
413 5,741,763
459 5,741,764

**CLASS 510**

123 5,741,765
130 5,741,766
220 5,741,767
339 5,741,768
365 5,741,760
417 5,741,769
426 5,741,770

**CLASS 514**

2 5,741,771
5,741,772
8 5,741,773
5,741,774
5,741,775
11 5,741,776
12 5,741,777
5,741,778
5,741,779
19 5,741,781
31 5,741,782
55 5,741,783
80 5,741,784
81 5,741,785
173 5,741,786
177 5,741,787
183 5,741,788
210 5,741,789
5,741,790
5,741,791
212 5,741,792
237.2 5,741,793
247 5,741,794
261 5,741,795
284 5,741,796
300 5,741,797
305 5,741,798
309 5,741,799
316 5,741,800
322 5,741,801
323 5,741,802
334 5,741,803
342 5,741,804
394 5,741,805
397 5,741,806
5,741,807
399 5,741,808
410 5,741,809
438 5,741,810
444 5,741,811
450 5,741,812
455 5,741,813
468 5,741,814
492 5,741,815
547 5,741,816
561 5,741,817
590 5,741,818
602 5,741,819
734 5,741,821
784 5,741,822

**CLASS 521**

70 5,741,823
73 5,741,824
88 5,741,825
121 5,741,827

**CLASS 522**

35 5,741,829

**CLASS 523**

106 5,741,830
5,741,831
132 5,741,832
205 5,741,833
213 5,741,834
403 5,741,835

**CLASS 524**

44 5,741,836
87 5,741,837
127 5,741,838
188 5,741,839
271 5,741,840
379 5,741,841
500 5,741,842
501 5,741,828
505 5,741,843
523 5,741,844
533 5,741,845
538 5,741,846
551 5,741,847
587 5,741,848
591 5,741,849
837 5,741,850

**CLASS 525**

28 5,741,851
54.3 5,741,852
71 5,741,853
72 5,741,854
88 5,741,855
92 B 5,741,856
97 5,741,857
101 5,741,858
106 5,741,859
230 5,741,860
240 5,741,861
323 5,741,862
333.3 5,741,864
394 5,741,865
414 5,741,866
453 5,741,867

**CLASS 526**

127 5,741,868
171 5,741,869
198 5,741,870
202 5,741,871
301 5,741,872
313 5,741,873
344.2 5,741,874

**CLASS 527**

400 5,741,875

**CLASS 528**

10 5,741,876
15 5,741,877
25 5,741,878
48 5,741,879
74 5,741,880
75 5,741,881
279 5,741,882
353 5,741,883
375 5,741,884
422 5,741,886
494 5,741,887
935 5,741,885

**CLASS 530**

210 5,741,889
300 5,741,890
326 5,741,891
330 5,741,892
385 5,741,893
5,741,894
399 5,741,895

**CLASS 534**

860 5,741,896

**CLASS 536**

18.5 5,741,897
23.2 5,741,898
23.4 5,741,899
25.31 5,741,900
76 5,741,901

**CLASS 540**

222 5,741,902
349 5,741,903
536 5,741,904

**CLASS 544**

194 5,741,905
352 5,741,906
366 5,741,907

**CLASS 546**

81 5,741,908
82 5,741,909
193 5,741,910

**CLASS 548**

305.1 5,741,911
341.1 5,741,912
548 5,741,913

**CLASS 549**

497 5,741,914

**CLASS 554**

52 5,741,915
66 5,741,916
92 5,741,917
224 5,741,919

**CLASS 556**

45 5,741,920
406 5,741,921
445 5,741,922

**CLASS 558**

131 5,741,923

**CLASS 560**

43 5,741,924
116 5,741,925

**CLASS 562**

457 5,741,926
486 5,741,927

**CLASS 564**

449 5,741,928
450 5,741,929
490 5,741,930

**CLASS 568**

9 5,741,931
21 5,741,932
65 5,741,933
73 5,741,934
74 5,741,935
306 5,741,936
312 5,741,937
322 5,741,938
367 5,741,939
410 5,741,940
451 5,741,941
454 5,741,942
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617 5,741,946
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698 5,741,951
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795 5,741,954
842 5,741,955
853 5,741,956

**CLASS 600**

227 5,741,210
300 5,741,211
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310 5,741,213
374 5,741,214
407 5,741,215
488 5,741,216
547 5,741,217

**CLASS 601**

90 5,741,218
119 5,741,219

**CLASS 602**

14 5,741,220
26 5,741,221
27 5,741,222,
5,741,223

**CLASS 604**

15 5,741,224
20 5,741,225
22 5,741,226
35 5,741,227
49 5,741,228
93 5,741,229
110 5,741,230
143 5,741,275
154 5,741,232
160 5,741,284
165 5,741,233
174 5,741,234
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192 5,741,236
317 5,741,237
322 5,741,238
328 5,741,239
353 5,741,240
368 5,741,241
403 5,741,242
890.1 5,741,243

**CLASS 606**

4 5,741,244
5 5,741,245
7 5,741,246
10 5,741,247
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213 5,741,298
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224 5,741,300
232 5,741,301

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5,741,315
61 5,741,316
85 5,741,317
108 5,741,318
118 5,741,319
122 5,741,320
127 5,741,321
129 5,741,322

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2 5,741,328
11 5,741,329
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12 5,741,332
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15 5,741,336
19 5,741,335

**CLASS 701**

35 5,742,914
5,742,915
45 5,742,916
69 5,742,917
70 5,742,918
5,742,919
102 5,742,920
5,742,921
5,742,922
201 5,742,923
207 5,742,924
208 5,742,925
221 5,742,925

**CLASS 704**

2 5,742,926
226 5,742,927
239 5,742,928
251 5,742,929
502 5,742,930

**CLASS 705**

8 5,742,931
40 B1 465,206
410 5,742,932

**CLASS 711**

103 5,742,934
113 5,742,933
152 5,742,935

**CLASS 800**

2 5,741,957

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## CLASSIFICATION OF DESIGNS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D2— | 869 | 393,535 | | 591 | 393,570 | | 133 | 393,603 | | 115 | 393,636 | | 214 | 393,673 | | 388 | 393,708 |
| | | 393,536 | | 607 | 393,571 | | 156 | 393,605 | | 125 | 393,637 | | 217 | 393,674 | | 390 | 393,709 |
| | 906 | 393,537 | | 608 | 393,572 | | 216 | 393,606 | | 137 | 393,638 | | 220 | 393,675 | | 411 | 393,710 |
| | 947 | 393,538 | | 619 | 393,573 | D12— | 7 | 393,607 | | 191 | 393,640 | | | 393,676 | | | 393,711 |
| D3— | 5 | 393,539 | | 669 | 393,574 | | | 393,608 | | 216 | 393,641 | | | 393,677 | D24— | 112 | 393,722 |
| | 218 | 393,540 | | 673 | 393,575 | | 91 | 393,609 | | | 393,642 | | 221 | 393,678 | | 125 | 393,712 |
| | 294 | 393,542 | | 678 | 393,576 | | 92 | 393,610 | | 227 | 393,643 | | 237 | 393,679 | | 126 | 393,713 |
| | 297 | 393,541 | D8— | 5 | 393,577 | | 111 | 393,611 | | 240 | 393,644 | | | 393,680 | | 130 | 393,714 |
| | 313 | 393,543 | | 17 | 393,578 | | 146 | 393,612 | | 248 | 393,645 | | | 393,681 | | 133 | 393,715 |
| D4— | 199 | 393,545 | | 46 | 393,579 | | 147 | 393,613 | | 265 | 393,646 | | | 393,682 | | 147 | 393,716 |
| D5— | 47 | 393,548 | | 68 | 393,580 | | | 393,614 | D15— | 5 | 393,647 | | | 393,683 | | | 393,717 |
| | 53 | 393,546 | | | 393,581 | | 159 | 393,615 | | 132 | 393,648 | | 239 | 393,684 | | 191 | 393,718 |
| | 58 | 393,547 | | 82 | 393,582 | | 181 | 393,616 | D16— | 202 | 393,651 | | 240 | 393,685 | | 200 | 393,723 |
| D6— | 403 | 393,549 | | 303 | 393,583 | | 197 | 393,617 | | 307 | 393,652 | | | 393,686 | | 207 | 393,719 |
| | 434 | 393,550 | | 308 | 393,584 | | 214 | 393,618 | | 312 | 393,649 | | 242 | 393,687 | | 212 | 393,720 |
| | 441 | 393,551 | | 333 | 393,544 | | 220 | 393,619 | | 314 | 393,650 | D22— | 134 | 393,688 | | 218 | 393,721 |
| | 450 | 393,552 | | 356 | 393,586 | | 402 | 393,620 | | 326 | 393,653 | | 137 | 393,689 | D25— | 16 | 393,724 |
| | 470 | 393,554 | | 373 | 393,587 | | 408 | 393,621 | | | 393,654 | | 147 | 393,690 | | 17 | 393,725 |
| | 476 | 393,553 | | 384 | 393,588 | | 423 | 393,623 | D19— | 26 | 393,656 | D23— | 200 | 393,691 | | 113 | 393,726 |
| | 478 | 393,555 | | 398 | 393,589 | | 426 | 393,622 | | 72 | 393,657 | | 202 | 393,693 | | | 393,727 |
| | 479 | 393,558 | D9— | 305 | 393,590 | D13— | 103 | 393,624 | D20— | 10 | 393,659 | | 213 | 393,694 | D26— | 28 | 393,728 |
| | 540 | 393,556 | | 347 | 393,591 | | 107 | 393,625 | | 22 | 393,660 | | 238 | 393,692 | | | 393,729 |
| | 553 | 393,557 | | 435 | 393,592 | | 158 | 393,626 | D21— | 5 | 393,661 | | 242 | 393,695 | | 38 | 393,730 |
| | 569 | 393,559 | | 448 | 393,593 | | 162 | 393,627 | | 13 | 393,662 | | 243 | 393,696 | | 65 | 393,731 |
| | 571 | 393,562 | | | 393,594 | | 168 | 393,628 | | 41 | 393,663 | | 277 | 393,697 | | | 393,732 |
| | 575 | 393,560 | | 500 | 393,595 | | | 393,629 | | 48 | 393,664 | | | 393,698 | | 67 | 393,733 |
| | 596 | 393,561 | | 558 | 393,596 | D14— | 100 | 393,630 | | 49 | 393,665 | | 284 | 393,699 | | 76 | 393,734 |
| | 601 | 393,563 | D10— | 30 | 393,597 | | | 393,655 | | 51 | 393,667 | | 308 | 393,700 | 21— | 204 | 393,672 |
| | | 393,564 | | 39 | 393,598 | | 105 | 393,631 | | 159 | 393,668 | | 328 | 393,702 | | | |
| | | 393,565 | | 46 | 393,599 | | 107 | 393,632 | | 171 | 393,669 | | 355 | 393,703 | | | |
| D7— | 300.2 | 393,566 | | 52 | 393,600 | | 114 | 393,633 | | 184 | 393,666 | | 364 | 393,704 | | | |
| | 346 | 393,567 | | 78 | 393,601 | | 114.2 | 393,635 | | 190 | 393,670 | | 365 | 393,705 | | | |
| | 392 | 393,569 | D11— | 3 | 393,602 | | 114.3 | 393,639 | | 204 | 393,671 | | 369 | 393,706 | | | |
| | 400 | 393,568 | | 40 | 393,604 | | 114.5 | 393,634 | | | | | 373 | 393,707 | | | |

## CLASSIFICATION OF PLANTS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P.— | 7.1 | 10,333 | | 10,337 | | 10,341 | | 87.1 | 10,346 | | 10,350 |
| | 22 | 10,334 | | 10,338 | | 10,342 | | | 10,347 | 87.6 | 10,345 |
| | 50.3 | 10,335 | | 10,339 | | 10,343 | | | 10,348 | 88.8 | 10,351 |
| | 68.1 | 10,336 | | 10,340 | 70.2 | 10,344 | | 87.12 | 10,349 | | |

# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

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## PATENTS

| | | | | | | |
|---|---|---|---|---|---|---|
| 01 | 5,740,763 | 5,740,782 | 5,741,277 | 5,741,756 | 5,742,222 | 5,742,623 |
| | 5,742,057 | 5,740,788 | 5,741,279 | 5,741,772 | 5,742,227 | 5,742,631 |
| 04 | 5,740,556 | 5,740,794 | 5,741,287 | 5,741,774 | 5,742,235 | 5,742,634 |
| | 5,740,711 | 5,740,808 | 5,741,288 | 5,741,776 | 5,742,239 | 5,742,640 |
| | 5,740,849 | 5,740,814 | 5,741,303 | 5,741,779 | 5,742,244 | 5,742,646 |
| | 5,740,925 | 5,740,820 | 5,741,307 | 5,741,810 | 5,742,250 | 5,742,653 |
| | 5,741,047 | 5,740,822 | 5,741,308 | 5,741,812 | 5,742,252 | 5,742,680 |
| | 5,741,087 | 5,740,830 | 5,741,313 | 5,741,855 | 5,742,253 | 5,742,700 |
| | 5,741,091 | 5,740,845 | 5,741,320 | 5,741,877 | 5,742,257 | 5,742,705 |
| | 5,741,170 | 5,740,848 | 5,741,327 | 5,741,885 | 5,742,277 | 5,742,712 |
| | 5,741,562 | 5,740,863 | 5,741,339 | 5,741,893 | 5,742,291 | 5,742,718 |
| | 5,741,724 | 5,740,884 | 5,741,344 | 5,741,895 | 5,742,295 | 5,742,734 |
| | 5,741,975 | 5,740,886 | 5,741,368 | 5,741,896 | 5,742,298 | 5,742,737 |
| | 5,742,054 | 5,740,909 | 5,741,424 | 5,741,899 | 5,742,303 | 5,742,738 |
| | 5,742,082 | 5,740,917 | 5,741,437 | 5,741,924 | 5,742,325 | 5,742,749 |
| | 5,742,100 | 5,740,924 | 5,741,441 | 5,741,926 | 5,742,330 | 5,742,750 |
| | 5,742,155 | 5,740,939 | 5,741,462 | 5,741,957 | 5,742,349 | 5,742,754 |
| | 5,742,177 | 5,740,942 | 5,741,465 | 5,742,009 | 5,742,354 | 5,742,759 |
| | 5,742,249 | 5,740,943 | 5,741,490 | 5,742,010 | 5,742,373 | 5,742,760 |
| | 5,742,340 | 5,740,948 | 5,741,509 | 5,742,019 | 5,742,384 | 5,742,768 |
| | 5,742,357 | 5,740,952 | 5,741,535 | 5,742,034 | 5,742,390 | 5,742,778 |
| | 5,742,519 | 5,740,959 | 5,741,554 | 5,742,035 | 5,742,393 | 5,742,779 |
| | 5,742,584 | 5,740,964 | 5,741,560 | 5,742,047 | 5,742,417 | 5,742,780 |
| | 5,742,607 | 5,740,984 | 5,741,568 | 5,742,060 | 5,742,419 | 5,742,781 |
| | 5,742,630 | 5,740,985 | 5,741,569 | 5,742,071 | 5,742,425 | 5,742,787 |
| | 5,742,684 | 5,740,987 | 5,741,576 | 5,742,079 | 5,742,426 | 5,742,788 |
| | 5,742,831 | 5,741,003 | 5,741,596 | 5,742,086 | 5,742,442 | 5,742,793 |
| 05 | 5,740,851 | 5,741,011 | 5,741,606 | 5,742,087 | 5,742,446 | 5,742,804 |
| | 5,740,899 | 5,741,012 | 5,741,614 | 5,742,088 | 5,742,450 | 5,742,805 |
| | 5,742,671 | 5,741,032 | 5,741,627 | 5,742,089 | 5,742,452 | 5,742,807 |
| 06 | RE. 35,774 | 5,741,036 | 5,741,635 | 5,742,090 | 5,742,454 | 5,742,810 |
| | 5,740,553 | 5,741,053 | 5,741,643 | 5,742,091 | 5,742,457 | 5,742,811 |
| | 5,740,557 | 5,741,060 | 5,741,651 | 5,742,094 | 5,742,459 | 5,742,814 |
| | 5,740,568 | 5,741,101 | 5,741,653 | 5,742,113 | 5,742,461 | 5,742,836 |
| | 5,740,577 | 5,741,113 | 5,741,657 | 5,742,117 | 5,742,471 | 5,742,840 |
| | 5,740,584 | 5,741,121 | 5,741,662 | 5,742,131 | 5,742,509 | 5,742,844 |
| | 5,740,591 | 5,741,155 | 5,741,664 | 5,742,135 | 5,742,510 | 5,742,859 |
| | 5,740,596 | 5,741,175 | 5,741,667 | 5,742,147 | 5,742,518 | 5,742,892 |
| | 5,740,623 | 5,741,206 | 5,741,673 | 5,742,151 | 5,742,521 | 5,742,935 |
| | 5,740,650 | 5,741,217 | 5,741,677 | 5,742,153 | 5,742,529 | B1 465,206 |
| | 5,740,653 | 5,741,225 | 5,741,690 | 5,742,154 | 5,742,531 | 08 5,740,558 |
| | 5,740,671 | 5,741,234 | 5,741,691 | 5,742,162 | 5,742,532 | 5,740,593 |
| | 5,740,684 | 5,741,245 | 5,741,696 | 5,742,170 | 5,742,542 | 5,740,620 |
| | 5,740,698 | 5,741,246 | 5,741,706 | 5,742,174 | 5,742,543 | 5,740,687 |
| | 5,740,716 | 5,741,247 | 5,741,720 | 5,742,178 | 5,742,556 | 5,740,718 |
| | 5,740,723 | 5,741,249 | 5,741,726 | 5,742,179 | 5,742,581 | 5,740,727 |
| | 5,740,752 | 5,741,253 | 5,741,729 | 5,742,182 | 5,742,599 | 5,741,151 |
| | 5,740,761 | 5,741,270 | 5,741,744 | 5,742,193 | 5,742,603 | 5,741,280 |
| | 5,740,779 | 5,741,274 | 5,741,751 | 5,742,201 | 5,742,604 | 5,741,721 |

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William Daley, *Secretary*
PATENT AND TRADEMARK OFFICE
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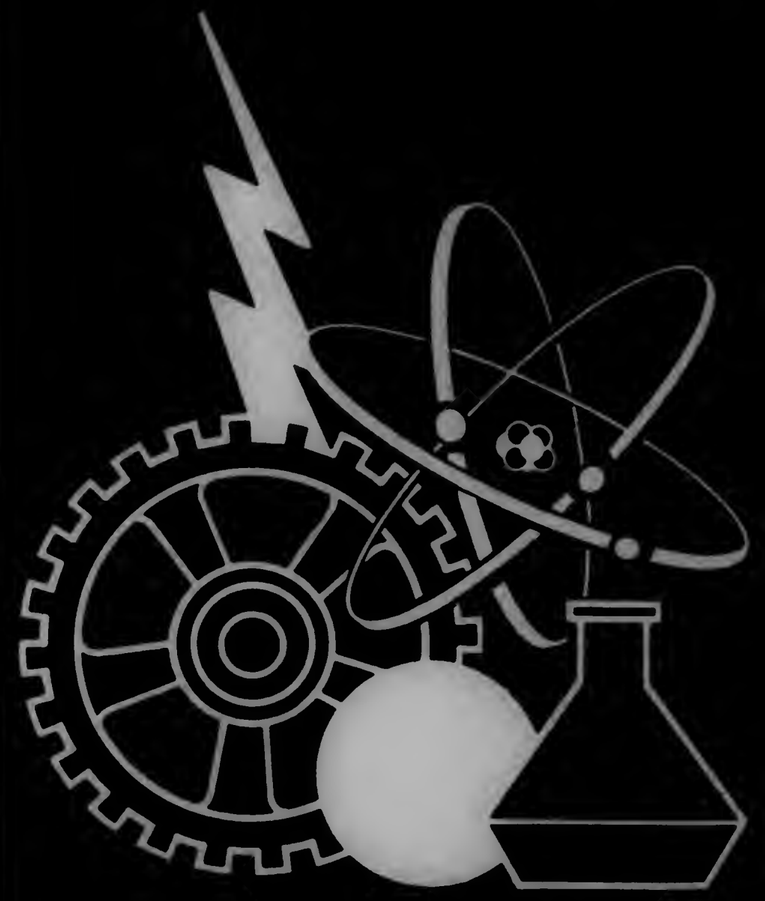
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# OFFICIAL GAZETTE

of the
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

April 28, 1998



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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**Patent Cooperation Treaty (PCT) Information**

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1205 O.G. 4, on December 2, 1997.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was increased, effective January 1, 1998, and was announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

International fees were changed, effective on May 1, 1997, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1197 O.G. 69, on April 22, 1997. The basic fee and the designation fee were further changed effective January 1, 1998 and were announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1997, and were announced in the *Official Gazette* at 1201 O.G. 63, on August 19, 1997.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1998, is as follows:

| | |
|---|---|
| International Application (PCT Chapter I) fees: | |
| Transmittal fee | 240.00 |
| Search Fee | |
| U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA) | |
| — No corresponding prior U.S. national application filed under 35 U.S.C. 111(a) | 700.00 |
| — Corresponding prior U.S. national application filed under 35 U.S.C. 111(a) | 450.00 |
| — Supplemental search fee, per additional invention (payable only upon invitation) | 210.00 |
| European Patent Office as ISA | 1250.00 |
| International fees | |
| Basic fee | 455.00 |
| Basic supplemental fee (for each page over 30) | 10.00 |
| Designation fee per country or region | |
| — For the first 11 national or regional offices designated | 105.00 |
| — For each designation in excess of 11 offices | No Charge |
| Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5) | |
| — Designation fee | 105.00 |
| — Confirmation fee | 52.50 |
| International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination: | |
| Handling fee | 162.00 |
| Preliminary examination fee | |
| USPTO as International Preliminary Examining Authority (IPEA) | |
| — USPTO was ISA in PCT Chapter I | 490.00 |
| — Additional examination fee, per additional invention (payable only upon invitation) | 140.00 |
| — USPTO was not ISA in PCT Chapter I | 750.00 |
| — Additional examination fee, per additional invention (payable only upon invitation) | 270.00 |

| U.S. National Stage Fees | Small Entity | Regular |
|---|---|---|
| Basic National fee | | |
| USPTO was IPEA | | |
| — All claims presented satisfied provisions of PCT Article 33(2) to (4) | 49.00 | 98.00 |
| — All claims presented did not satisfy provisions of PCT Article 33(2) to (4) | 360.00 | 720.00 |
| USPTO was ISA but not IPEA | 395.00 | 790.00 |
| USPTO was neither ISA nor IPEA | | |
| — Search report has not been prepared by the European Patent Office or the Japanese Patent Office | 535.00 | 1070.00 |
| — Search report has been prepared by the European Patent Office or the Japanese Patent Office | 465.00 | 930.00 |
| Other National fees | | |
| — For each independent claim in excess of 3 | 41.00 | 82.00 |
| — For each claim in excess of 20 | 11.00 | 22.00 |
| — For each application containing a multiple dependent claim | 135.00 | 270.00 |
| — Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1) | 65.00 | 130.00 |
| — Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1) | 130.00 | 130.00 |

Nov. 10, 1997

BRUCE A. LEHMAN
*Assistant Secretary of Commerce and Commissioner of Patents and Trademarks*

---

**Notice of Maintenance Fees Payable**

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on April 25, 1995 for which maintenance fees due at 3 years and six

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months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,498,700 through 5,410,754
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 23, 1991 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,008,959 through 5,010,588
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 21, 1987 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,658,441 through 4,660,222
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1997, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $525.00
By other than a small entity ..... $1,050.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $1,050.00
By other than a small entity ..... $2,100.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $1,580.00
By other than a small entity ..... $3,160.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) ..... $65.00
By other than a small entity ..... $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable ..... $700.00
(2) unintentional ..... $1,640.00

## Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

*PATENTS WHICH EXPIRED February 18, 1998*
*DUE TO FAILURE TO PAY MAINTENANCE FEES*

| Patent Number | Serial Number | Issue Date |
|---|---|---|
| Re. 33,208 | 07/156,905 | 05/01/90 |
| Re. 34,370 | 07/652,752 | 09/07/93 |
| 4,570,268 | 06/558,799 | 02/18/86 |
| 4,570,286 | 06/631,756 | 02/18/86 |
| 4,570,287 | 06/613,601 | 02/18/86 |
| 4,570,291 | 06/631,246 | 02/18/86 |
| 4,570,309 | 06/479,973 | 02/18/86 |
| 4,570,327 | 06/618,207 | 02/18/86 |
| 4,570,330 | 06/625,390 | 02/18/86 |
| 4,570,339 | 06/625,699 | 02/18/86 |
| 4,570,346 | 06/601,864 | 02/18/86 |
| 4,570,347 | 06/688,607 | 02/18/86 |
| 4,570,352 | 06/767,710 | 02/18/86 |
| 4,570,359 | 06/638,385 | 02/18/86 |
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| 4,570,367 | 06/694,158 | 02/18/86 |
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| 4,570,381 | 06/601,955 | 02/18/86 |
| 4,570,382 | 06/565,465 | 02/18/86 |
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| 4,570,591 | 06/689,373 | 02/18/86 |
| 4,570,595 | 06/596,944 | 02/18/86 |



| Patent Number | Serial Number | Issue Date |
|---|---|---|
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| 4,570,598 | 06/723,604 | 02/18/86 |
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**Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 02/27/98**

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## Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

**4,769,328**, Re. S.N. 08/919,569, Aug. 29, 1997, Cl. 435/172.3, EXPRESSION OF BIOLOGICALLY ACTIVE PDGF ANALOG IN YEAST, Mark J. Murray, et. al., Owner of Record: *Zymogenetics Inc., Seattle, Wash.,* Attorney or Agent: Gary E. Parker, Ex. Gp.: 1805

**5,125,926**, Re. S.N. 09/021,101, Feb. 9, 1998, Cl. 606/19, HEART SYNCHRONIZED PULSED LASER SYTEM, Robert I. Rudko, et. al., Owner of Record: *Medical Systems, Inc., Milford, Mass.,* Attorney or Agent: Jonathan J. Wainer, Ex. Gp.: 3309

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**5,423,320**, Re. S.N. 08/874,377, Jun. 13, 1997, Cl. 128/664, AIR TONOMETRY METHOD AND APPARATUS FOR MEASURING INTRALUMINAL GASTRO-INTESTINAL $PCO_2$ AND $PO_2$, Andrew L. Salzman, et. al., Owner of Record: *Argus Critical Care, Inc., Boston, Mass.,* Attorney or Agent: Jay P. Kesan, Ex. Gp.: 3305

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**5,461,930**, Re. S.N. 08/969,169, Sept. 25, 1997, Cl. 073/861.040, APPARATUS AND METHOD FOR MEASURING TWO- OR THREE-PHASE FLUID FLOW UTILIZING ONE OR MORE MOMENTUM FLOW METERS AND A VOLUMETRIC FLOW METER, Joram Agar, et. al., Owner of Record: *Agar Corp. Inc., Houston, Tex.,* Attorney or Agent: Richard T. Redano, Ex. Gp.: 2214

**5,466,425**, Re. S.N. 08/970,919, Nov. 14, 1997, Cl. 422, BIOLOGICAL DECONTAMINATION SYSTEM, Billy J. Adams, Owner of Record: *Amphion International Ltd., Dublin, Ireland,* Attorney or Agent: Adda C. Gagoris, Ex. Gp.: 2204

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**5,480,112**, Re. S.N. 08/999,673, Aug. 27, 1997, Cl. 246/410, RAILROAD SWITCH STAND HAVING IMPROVED HANDLE MEANS, Thomas P. Painter, et. al., Owner of Record: *Norfolk Southern Corp., Norfolk, Va.,* Attorney or Agent: Lawrence R. Radanovic, Ex. Gp.: 3613

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**5,496,846**, Re. S.N. 09/035,702, Mar. 5, 1998, Cl. 514/449, TAXOL TREATMENT OF BREAST CANCER, Wyndham H. Wilson, et. al., Owner of Record: *The Government of the United States of America as Represented by the Secretary Dept. of Health and Human Services, Washington, D.C.,* Attorney or Agent: Israel Fuentes, Ex. Gp.: 1205

**5,497,427**, Re. S.N. 09/033,837, Mar. 3, 1998, Cl. 381/183, HEADPHONE, Koji Nageno, Owner of Record: *Sony Corp., Tokyo, Japan,* Attorney or Agent: Jay H. Maioli, Ex. Gp.: 2608

**5,497,444**, Re. S.N. 09/035,377, Mar. 5, 1998, Cl. 385/135, HIGH-DENSITY FIBER DISTRIBUTION FRAME, Todd A. Wheeler, Owner of Record: *ADC Telecommunications Inc., Minneapolis, Minn.,* Attorney or Agent: Steven C. Bruess, Ex. Gp.: 2501

**5,498,657**, Re. S.N. 09/037,887, Mar. 1, 1998, Cl. 524/463, FLUORINE-CONTAINING POLYMER COMPOSITION, Norihide Sugiyama, et. al., Owner of Record: *Asahi Glass Co. & Iwak Glass Co. Ltd., Funabashi, Japan,* Attorney or Agent: Norman F. Oblon, Ex. Gp.: 1511

**5,499,039**, Re. S.N. 09/037,607, Mar. 10, 1998, Cl. 345/115, MICROKEYE: A MICROCOMPUTER BROADCAST VIDEO OVERLAY DEVICE AND METHOD, Henry Mistrot, Owner of Record: *Inventor,* Attorney or Agent: Matthew J. Booth, Ex. Gp.: 2615

**5,581,623**, Re. S.N. 09/035,342, Mar. 5, 1998, Cl. 381/192, ELECTROACOUSTIC TRANSDUCER AND METHOD OF FABRICATING THE SAME, Fumihito Ishimura, et. al., Owner of Record: *Star Micronics Co., Ltd., Shizuoka-shi, Japan,* Attorney or Agent: Morris Liss, Ex. Gp.: 2608

**5,598,874**, Re. S.N. 09/032,344, Feb. 27, 1998, Cl. 139/1, LOOM PROCESSING OF HOLLOW FIBER MEMBRANES, Philip E. Alei, et. al., Owner of Record: *MG Generon Inc., Malvern, Pa.,* Attorney or Agent: William H. Eilberg, Ex. Gp.: 3408



**5,610,782**, Re. S.N. 09/045,901, Mar. 23, 1998, Cl. 360/099.4, FLOPPY DISK DRIVE DEVICE, Hideya Yokouchi, Owner of Record: *Seiko Epson Corp., Tokyo-to, Japan,* Attorney or Agent: Paul T. Bowen, Ex. Gp.: 2511

**5,610,782**, Re. S.N. 09/045,931, Mar. 23, 1998, Cl. 360/099.04, FLOPPY DISK DRIVE DEVICE, Kazuyoshi Fujimori, Owner of Record: *Seiko Epson Corp., Tokyo-to, Japan,* Attorney or Agent: Paul T. Bowen, Ex. Gp.: 2511

**5,610,782**, Re. S.N. 09/045,932, Mar. 23, 1998, Cl. 360/099.04, FLOPPY DISK DRIVE DEVICE, Kazuyoshi Fujimori, Owner of Record: *Seiko Epson Corp., Tokyo-to, Japan,* Attorney or Agent: Paul T. Bowen, Ex. Gp.: 2511

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**5,612,545**, Re. S.N. 09/035,881, Mar. 6, 1998, Cl. 257/31, SUPERCONDUCTING QUANTUM INTERFERENCE DEVICE FORMED OF OXIDE SUPERCONDUCTOR THIN FILM, Takashi Matsuura, et. al., Owner of Record: *Sumitomo Electric Industries, Ltd., Osaka, Japan,* Attorney or Agent: John C. Kerins, Ex. Gp.: 2508

**5,632,791**, Re. S.N. 09/036,889, Mar. 6, 1998, Cl. 055/486, UNITARY FILTER CARTRIDGE, Relnout G. Oussoren, et. al., Owner of Record: *BHA Group Holdings, Inc., Kansas City, Mo.,* Attorney or Agent: Joseph B. Bowman, Ex. Gp.: 1505

**5,640,696**, Re. S.N. 09/035,013, Mar. 5, 1998, Cl. 455/186.200, AUTOMATIC STATION SELECTING AND RECEIVING APPARATUS AND AUTOMATIC SELECTING AND RECEIVING METHOD, Yutaro Ishikawa, et. al., Owner of Record: *Inventors,* Attorney or Agent: Andrew J. Patch, Ex. Gp.: 2611

**5,643,391**, Re. S.N. 09/033,398, Mar. 2, 1998, Cl. 156/324, METHOD AND APPARATUS FOR AN IMPROVED ROLLER SYSTEM FOR CALENDAR MACHINES, Cal L. Couillard, et. al., Owner of Record: *Hunt Holdings Inc., Wilmington, Del.,* Attorney or Agent: John T. Synnestvedt, Ex. Gp.: 1304

**5,652,470**, Re. S.N. 09/045,852, Mar. 23, 1998, Cl. 310/067.00R, BRUSHLESS DC DRIVE MOTOR WITH EXTERNAL ROTOR FOR USE IN DISC DRIVES AND LIKE DEVICES, Johann von der Heide, Owner of Record: *Papst Licensing GmbH, Spaichingen, Germany,* Attorney or Agent: Jeffrey W. Salmon, Ex. Gp.: 2102

## Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**4,363,877**, Reexam. No. 90/004,928, Feb. 26, 1998, Cl. 435/320.1, RECOMBINANT DNA TRANFER VECTORS, Howard M. Goodman, et. al., Owner of Record: *The Regents of the University of California, Berkeley, Calif.,* Attorney or Agent: Gary J. Sertich, Arnold White and Durkee, Houston, Tex., Ex. Gp.: 1801, Requester: Genentech, Inc., c/o Donald L. Rhoads, Rogers and Wells, New York, N.Y.

**4,966,552**, Reexam. No. 90/004,926, Feb. 24, 1998, Cl. 433/132, STERILIZABLE NON-LUBRICATED ROTARY INSTRUMENT FOR DENTAL AND MEDICAL USE, Donald I. Gonser, Owner of Record: *Den-Tal-Ez, Inc., Philadelphia, Pa.* Attorney or Agent: Vickie J. Waitsman, Den Tal Ez Inc., Valley Forge, Pa., Ex. Gp.: 3616, Requester: New Hampshire Ball Bearings, Inc., Chatsworth, Calif., c/o Joel E. Lutzker, Amster Rothstein and Ebenstein, New York, N.Y.

**5,011,515**, Reexam. No. 90/004,930, Feb. 27, 1998, Cl. 051/307, COMPOSITE POLYCRYSTALLINE DIAMOND COMPACT WITH IMPROVED IMPACT RESISTANCE, Robert H. Frushour, Owner of Record: *Inventor,* Attorney or Agent: William H. Hanlon, Jr., Young and Basile, Troy, Mich., Ex. Gp.: 1108, Requester: Gary L. Loser, GE Plastics, Pittsfield, Mass.

**5,111,291**, Reexam. No. 90/004,924, Feb. 23, 1998, Cl. 348/152, AUTO FREEZE DISPLAY FOR INTRUSION MONITORING SYSTEM, Charles H. Erickson, et. al., Owner of Record: *Commonwealth Edison Company, Chicago, Ill.,* Attorney or Agent: William A. Webb, Brinks Hofer Gilson and Lione, Chicago, Ill., Ex. Gp.: 2713, Requester: Owner

**5,338,157**, Reexam. No. 90/004,929, Feb. 26, 1998, Cl. 417/002, SYSTEMS AND METHODS FOR COMMUNICATING WITH AMBULATORY MEDICAL DEVICES SUCH AS DRUG DELIVERY DEVICES, Michael L. Blomquist, Owner of Record: *Sims Deltec, Inc., St. Paul, Minn.,* Attorney or Agent: Merchant Gould Smith Edell Welter and Schmidt, Minneapolis, Minn., Ex. Gp.: 3403, Requester: Owner

**5,344,568**, Reexam. No. 90/004,927, Feb. 25, 1998, Cl. 210/645, HEMOFILTRATION SYSTEM AND METHOD, Yuli Kitaevich, et. al., Owner of Record: *Children's Hospital Medical Center, Cincinnati, Ohio,* Attorney or Agent: Wood Herron and Evans, Cincinnati, Ohio, Ex. Gp.: 1306, Requester: Owner

**5,522,993**, Reexam. No. 90/004,931, Mar. 2, 1998, Cl. 210/635, PROCESS AND MEANS FOR DOWN STREAM PROCESSING, Mats Carlsson, et. al., Owner of Record: *Pharmacia Biotech AB, Uppsala, Sweden,* Attorney or Agent: Donald E. Egan, Oakbrook Terrace, Ill., Ex. Gp.: 1306, Requester: Owner

**5,618,002**, Reexam. No. 90/004,925, Feb. 23, 1998 Cl. 239/657, TRUCK WITH RETRACTABLE SPREADER MECHANISM, Gary Cervelli, et. al., Owner of Record: *Trius, Inc., Bohemia N.Y.,* Attorney or Agent: Dilworth and Barrese, Uniondale, N.Y., Ex. Gp.: 3613, Requester: Owner

## Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration maybe renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew inaccordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED MARCH 2, 1998
DUE TO FAILURE TO RENEW

| Reg. Number | Serial Number | Reg. Date |
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**Notice Regarding Technical Center Box Issue Fee Mailings**

The Office will begin mailing address labels with the PTOL-85, "Notice of Allowance and Issue Fee Due" for patent applications allowed in all Technology Centers. These address labels should be used to ensure proper routing of post-allowance correspondence. This directive supersedes the "Special Boxes for Patent Mail" instruction. Any Notice of Allowance and Issue Fee Due received without the accompanying address labels should continue to be addressed to Box Issue Fee.

March 11, 1998

NICHOLAS P. GODICI
*Deputy Assistant Commissioner for Patents (Acting)*

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**Service by Publication**

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

R.J. Enterprises, Inc. dba Cupid's Pizza & Pasta, Little Rock, Ark., Reg. Nos. 1,480,106 and 1,480,108 for the marks "Cupid's (stylized)" and "Cupid's Pizza & Pasta and design", Canc. 26,678.

Kangaroos U.S.A., Inc., Maryland Heights, Mo., Reg. No. 1,378,166 for the mark "Koala", Canc. 26,528.

Eileen Giadone, Wakefield, Mass., Reg. No. 1,659,150 for the mark "Daisy Chain", Canc. 26,615.

Lifestyle Nutrition, Inc., Costa Mesa, Calif., Reg. No. 1,826,066 for the mark "Life Style", Canc. 26,218.

Pacific Freight Supply, Inc., North Hollywood, Calif., Reg. No. 1,279,353 for the mark "Presto", Canc. 26,927.

Bioferm International, Medford, N.J., Reg. No. 1,063,033 for the mark "PROMASE", Canc. 26,180.

Washington Forge, Inc., Skokie, Ill., Reg. No. 1,709,727 for the mark "RANCH HOUSE", Canc. 26,429.

Marathon Manufacturing Co., Houston, Tex., Reg. No. 1,330,727 for the mark "MARATHON", Canc. 26,837.

Certified Creation's Inc., New York, N.Y., Reg. No. 1,096,825 for the mark "CASUAL CONCEPTS", Canc. 26,718.

Bascom Food Products Corp., substituted for the improperly identified party defendant World Marketing Corp., Paterson, N.J., Reg. No. 1,247,819 for the mark "QUEEN'S GATE", Canc. 26,996.

Foundry Technology Inc., Waverly, Tenn., Reg. No. 1,133,018 for the mark "THERMATRAK 600", Canc. 27,303.

Maptech, Inc., Loveland, Colo., Reg. No. 1,862,337 for the mark "MAPTECH AND DESIGN", Canc. 26,977.

Positive Corp., Chatsworth, Calif., Reg. No. 1,662,257 for the mark "POSITIVE", Canc. 25,786.

JEAN BROWN
*Technical Support Manager,*
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
*Deputy Assistant Commissioner for Trademarks*

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### Disclaimers

4,588,483—Kenneth E. Woodard, Jr.; David D. Justice; Garland E. Hilliard, all of Cleveland, Tenn. HIGH CURRENT DENSITY CELL. Patent dated May 13, 1986. Disclaimer filed Jan. 23, 1998, by the assignee, Olin Corporation.

Hereby enters this disclaimer to claim 27 of said patent.

5,073,900—Albert J. Mallinckrodt, Santa Ana, California. INTERGRATED CELLULAR COMMUNICATIONS SYSTEMS. Patent dated Dec. 17, 1991. Disclaimer filed Jan. 21, 1998, by the assignee, Celsat America, Inc.

Hereby enters this disclaimer to the remaining term of said patent.

5,261,643—Kirk Wurdack, Landing, N.J. APPARATUS FOR LIFTING MODULAR FURNITURE. Patent dated Nov. 16, 1993. Disclaimer filed January 28, 1998, by the assignee, Renovisions, Inc.

Hereby enters this disclaimer to claims 11 and 13 of said patent.

5,310,178—Alan D. Walker, Somers, Conn.; Joseph F. Baltronis, Agawam, Mass. BASKETBALL WITH POLYURETHANE COVER. Patent dated May 10, 1994. Disclaimer filed Dec. 4, 1997, by the assignee, Lisco, Inc.

Hereby enters this disclaimer to claim 2 of said patent.

5,338,553—David A. Johnson; Jeffrey D. Lorch, both of Hudson, Wis. PROCESS OF TREATING WATER CONTAINING EFFLUENT FROM CHEESE-MAKING OPERATIONS. Patent dated Aug. 16, 1994. Disclaimer filed March 6, 1998, by the assignee, Niro Holding A/S.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

5,681,556—Howard L. Weiner, Brookline; David Allen Hafler, West Newton; Charles B. Carpenter, Weston; Mohamed Sayegh, Brookline; Zhengyi Zhang, Malden, all of Mass. METHOD AND COMPOSITIONS FOR SUPPRESSING ALLOGRAFT REJECTION IN MAMMALS. Patent dated Oct. 28, 1997. Disclaimer filed Feb. 27, 1998, by the assignee, Autoimmune Inc.

The term of this patent shall not extend beyond the expiration date of Pat. No. 5,593,698.

5,682,818—Paul-Wilhelm Braun, Troisdord; Herbert Lehmann, Berlin, both of Germany. ARRANGEMENT FOR AND METHOD OF REGULATING A PRINTING ROLLER. Patent dated November 4, 1997. Disclaimer file Dec. 23, 1997, by the assignee, Ruhlatec Industrieprodukte GmbH.

Hereby enters this disclaimer to claims 1-17 and 19 of said patent.

### Dedication

5,414,202—Scott A. Berger, Horsham; Richard B. Wuchter, Huntington Valley, both of Pa.; Pietro A. Stefanelli, Albano, S.A., Italy. METHOD FOR RAPID DECOMPOSITION OF METHYL CHLOROMETHYL AND BIS(CHLOROMETHYL) ETHERS. Patent dated May 9, 1995. Dedication filed February 9, 1998, by the assignee, Rohm and Haas Company.

Hereby dedicates to the public the entire term of said patent.

### Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office who have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before June 12, 1998.

Bartoszewicz, Lola A., 295 Empress Ave., N. York, Ont., M2N 3V2, Canada

Greer, David J., 27 Cameron Ave., Toronto, Ont., M2N 1C9, Canada

McMillan, Ian C., 206-3680 W. 7th, Vancouver, B.C., V6R 1W4, Canada

April 2, 1998 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

### Registration to Practice

The following person successfully passed the registration examination that was held April 13, 1994, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before June 12, 1998.

Mee, Brendan S., 1128 South 28th St., Arlington, Va. 22206

April 2, 1998 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

### Registration to Practice

The following list contains the names of persons who successfully passed the registration examination that was held August 27, 1997 and have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before June 12, 1998.

Miyagawa, Yoshio, 11208 Lund Court, Kensington, Md. 20895

Sorensen, Kenneth A., 2853 Ontario Rd., N.W., #420, Washington, D.C. 20009

April 2, 1998 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

### Errata

"All reference to Patent No. 5,733,746 to Douglas A. Treco, et al., of Mass., for PROTEIN PRODUCTION AND DELIVERY appearing in the Official Gazette of March 31, 1998, should be deleted since no patent was granted."



"All reference to Patent No. 5,735,836 to Christina Steger, et al., of Sweden, for ABSORBENT ARTICLES CONTAINING SUPERABSORBENT MATERIAL WHICH HAS A DELAYED ACTIVATION TIME appearing in the Official Gazette of April 7, 1998, should be deleted since no patent was granted."

"All reference to Patent No. 5,735,886 to Vincent Chow, et al., of Ill., for MULTI-PHASIC MICROPHOTODIODE RETINAL IMPLANT AND ADAPTIVE IMAGING RETINAL STIMULATION SYSTEM appearing in the Official Gazette of April 7, 1998, should be deleted since no patent was granted."

"All reference to Patent No. 5,736,140 to Richard S. Blumberg, et al., of Mass., for RECEPTOR SPECIFIC TRANSEPITHELIAL TRANSPORT OF IMMUNOGENS appearing in the Official Gazette of April 7, 1998, should be deleted since no patent was granted."

### Certificates of Correction for April 28, 1998

| | | | |
|---|---|---|---|
| B1-5,044,091 | 5,593,335 | 5,651,484 | 5,678,609 |
| D. 384,017 | 5,593,625 | 5,651,856 | 5,678,946 |
| D. 385,986 | 5,594,501 | 5,652,363 | 5,679,203 |
| D. 387,693 | 5,595,887 | 5,652,647 | 5,679,632 |
| D. 388,676 | 5,597,617 | 5,653,079 | 5,679,636 |
| D. 389,605 | 5,599,533 | 5,653,709 | 5,679,962 |
| D. 390,023 | 5,600,168 | 5,654,155 | 5,680,131 |
| D. 391,224 | 5,602,572 | 5,654,615 | 5,681,036 |
| Re. 35,715 | 5,605,729 | 5,654,965 | 5,681,598 |
| 4,699,905 | 5,608,872 | 5,656,187 | 5,681,685 |
| 5,023,321 | 5,610,094 | 5,657,402 | 5,681,714 |
| 5,055,523 | 5,614,361 | 5,658,116 | 5,681,744 |
| 5,096,912 | 5,614,623 | 5,658,291 | 5,682,239 |
| 5,216,257 | 5,617,064 | 5,659,745 | 5,682,246 |
| 5,270,866 | 5,618,377 | 5,659,792 | 5,682,497 |
| 5,278,141 | 5,619,356 | 5,659,840 | 5,682,978 |
| 5,344,311 | 5,619,521 | 5,659,870 | 5,684,277 |
| 5,365,455 | 5,624,646 | 5,660,645 | 5,684,325 |
| 5,366,724 | 5,624,745 | 5,660,656 | 5,684,689 |
| 5,387,207 | 5,624,950 | 5,661,129 | 5,684,698 |
| 5,405,759 | 5,625,541 | 5,661,574 | 5,684,891 |
| 5,415,629 | 5,625,551 | 5,661,576 | 5,684,942 |
| 5,436,238 | 5,626,300 | 5,661,612 | 5,685,224 |
| 5,451,670 | 5,628,159 | 5,662,667 | 5,685,533 |
| 5,489,512 | 5,629,004 | 5,662,971 | 5,686,747 |
| 5,499,867 | 5,629,430 | 5,663,278 | 5,687,088 |
| 5,506,838 | 5,629,727 | 5,663,407 | 5,687,259 |
| 5,508,293 | 5,629,976 | 5,663,637 | 5,687,488 |
| 5,509,446 | 5,631,930 | 5,664,120 | 5,688,700 |
| 5,514,534 | 5,634,178 | 5,664,246 | 5,689,452 |
| 5,525,633 | 5,634,875 | 5,664,249 | 5,689,673 |
| 5,526,840 | 5,636,033 | 5,665,839 | 5,689,731 |
| 5,527,884 | 5,636,731 | 5,666,419 | 5,689,755 |
| 5,532,252 | 5,636,831 | 5,666,562 | 5,689,846 |
| 5,540,982 | 5,637,375 | 5,666,984 | 5,690,459 |
| 5,543,403 | 5,637,489 | 5,667,686 | 5,691,322 |
| 5,546,404 | 5,638,216 | 5,668,734 | 5,691,730 |
| 5,548,626 | 5,638,217 | 5,669,050 | 5,691,878 |
| 5,549,111 | 5,639,014 | 5,669,362 | 5,692,219 |
| 5,550,293 | 5,639,210 | 5,670,525 | 5,693,057 |
| 5,552,451 | 5,639,774 | 5,671,045 | 5,694,077 |
| 5,555,474 | 5,639,907 | 5,671,455 | 5,694,599 |
| 5,557,606 | 5,639,909 | 5,671,661 | 5,694,838 |
| 5,563,949 | 5,639,950 | 5,671,777 | 5,695,294 |
| 5,565,531 | 5,640,028 | 5,672,145 | 5,695,351 |
| 5,565,568 | 5,640,316 | 5,672,548 | 5,695,858 |
| 5,573,188 | 5,644,348 | 5,673,714 | 5,696,008 |
| 5,582,945 | 5,646,290 | 5,674,307 | 5,696,275 |
| 5,583,121 | 5,649,765 | 5,674,366 | 5,696,555 |
| 5,586,121 | 5,649,938 | 5,674,432 | 5,696,756 |
| 5,587,491 | 5,650,022 | 5,674,908 | 5,697,217 |
| 5,587,807 | 5,650,431 | 5,676,534 | 5,697,917 |
| 5,590,374 | 5,650,954 | 5,676,942 | 5,698,973 |
| 5,591,388 | 5,651,433 | 5,678,127 | 5,699,027 |
| 5,699,684 | 5,704,733 | 5,711,964 | 5,716,091 |
| 5,699,688 | 5,705,141 | 5,712,298 | 5,716,183 |
| 5,699,782 | 5,705,386 | 5,712,428 | 5,717,070 |
| 5,700,454 | 5,705,530 | 5,713,015 | 5,717,149 |
| 5,700,462 | 5,705,573 | 5,713,103 | 5,717,242 |
| 5,700,690 | 5,706,436 | 5,713,409 | 5,718,154 |
| 5,701,153 | 5,706,490 | 5,713,450 | 5,718,161 |
| 5,701,906 | 5,706,493 | 5,713,533 | 5,718,340 |
| 5,702,268 | 5,707,162 | 5,713,894 | 5,718,978 |
| 5,702,486 | 5,707,558 | 5,713,925 | 5,719,178 |
| 5,702,721 | 5,707,903 | 5,714,083 | 5,719,559 |
| 5,702,985 | 5,708,588 | 5,714,167 | 5,720,462 |
| 5,703,019 | 5,709,016 | 5,714,192 | 5,720,973 |
| 5,703,269 | 5,709,272 | 5,714,659 | 5,721,227 |
| 5,703,366 | 5,709,342 | 5,714,666 | 5,721,304 |
| 5,703,456 | 5,709,393 | 5,714,724 | 5,721,723 |
| 5,703,650 | 5,709,714 | 5,714,776 | 5,721,839 |
| 5,703,710 | 5,710,102 | 5,714,893 | 5,722,337 |
| 5,704,175 | 5,710,950 | 5,714,970 | 5,723,133 |
| 5,704,300 | 5,711,012 | 5,715,479 | 5,723,421 |
| 5,704,653 | 5,711,359 | 5,715,591 | 5,723,609 |
| 5,704,708 | 5,711,482 | 5,716,034 | |

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**Summary of Final Decisions**

**Issued by the**

**Trademark Trial and Appeal Board**

**March 9-13, 1998**

| Date Issued | Type of Case(1) | Proceeding or App'n No. | Party/Parties | Issue | TTAB Decision | Opposer's/ Petitioner's Mark and Goods/Services | Applicant's/ Respondent's Mark and Goods/Services | Mark and Goods Cited by Examining Attorney | Citable as Precedent of TTAB |
|---|---|---|---|---|---|---|---|---|---|
| 3-12 | EX | 74/653,638 | American Urban Radio Networks | Section 6(a) disclaimer requirement (of the words "MUSIC MAGAZINE") | Refusal Affirmed | | "USA MUSIC MAGAZINE" [raidio broadcasting services and entertainment services in the nature of radio programs in the field of news, sports, and entertainment] | | No |
| 3-12 | EX | 74/735,962 | Pierre Fabre Sante | 2(d) | Refusal Reversed | | "PHYTAROMA" [medicated preparations for skin care, hygiene and diseases, for the prevention and treatment of respiratory and digestive problems and diseases, antalgic preparations, digestive and circulatory tonics, dietary food supplements] | "PHYTAROMES" (and design) [essential oils for personal use] | No |
| 3-12 | EX | 74/591,655 | A.P.S., Inc. | 2(d); Section 6 disclaimer requirement (of words "AMERICA'S PARTS") | Refusal Affirmed (but only as to Sec. 6 disclaimer requirement) | | "AMERICA'S PARTS PROS" [retail auto parts store services] | "THE PARTS PROS" [distributorship services in the field of replacement parts for vehicles] | No |
| 3-12 | EX | 74/707,015 | Sage Mfg. Corp. | 2(d) | Refusal Affirmed | | design mark [luggage and carrying bags; clothing, namely, shirts, hats and gloves, and outerwear, namely, jackets and vests] | design mark [men's and women's clothing, namey, t-shirts, sweat shirts, skirts, pants, sweat pants, jackets, blouses, dresses, polo shirts, socks, tunics, belts, sweaters, and capes] | No |

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN



| Date Issued | Type of Case(1) | Proceeding or App'n No. | Party/Parties | Issue | TTAB Decision | Opposer's/ Petitioner's Mark and Goods/Services | Applicant's/ Respondent's Mark and Goods/Services | Mark and Goods Cited by Examining Attorney | Citable as Precedent of TTAB |
|---|---|---|---|---|---|---|---|---|---|
| 3-12 | EX | 74/651,844 | Valley Dental, Inc. | whether, as evidenced by the specimens of record, the matter sought to be registered is being used as a service mark for the services recited in the application; whether a more definite recitation of services is required | Refusal Reversed | | "TOOTH TOTS" [promoting dental health to children] | | No |
| 3-12 | EX | 74/681,948 | Faygo Beverages, Inc. | 2(d) | Refusal Affirmed | | "MORNING MIST" [fruit-flavored soft drinks] | "MORNING MIST" [milk] | No |
| 3-12 | EX | 74/654,722 | Casino Data Systems | 2(e)(1) | Refusal Affirmed | | "MAINTENANCE MONITOR" [computer programs, namely, software for use in tracking the performance of gaming equipment and gaming personnel in a gaming environment] | | No |

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

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| Box Missing Parts | Response to the Notice to File Missing Parts of Application and associated papers and fees. |
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| Box TTAB FEE | Oppositions, cancellation petitions, and ex parte appeals. |
| Box TTAB NO FEE | Interferences, motions, and extension requests. |
| Box STATUS NO FEE | Written status inquiries. |
| Box POST REG FEE | Affidavits, renewals, corrections and amendments. |
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Each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials.

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Partnership PTDLs provide enhanced and expanded services for which fees are charged. They offer on-line patent text and image searching, on-line trademark searching, and videoconferencing for examiner interviews and workshops. They accept disclosure documents on site, order file wrappers, assignment documents and certified copies for their customers, and host a variety of seminars aimed at specific audiences, including practitioners, paralegals, and independent inventors. Currently, partnerships are located at the Great Lakes Patent and Trademark Center (GLPTC) at the Detroit Public Library in Detroit, Michigan and the Sunnyvale Center for Innovation, Invention and Ideas (SCI³) in Sunnyvale, California.

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| West Virginia | Morgantown: Evansdale Library, West Virginia University | (304) 293-2510 Ext. 113 |
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| Wyoming | Casper: Natrona County Public Library | (307) 237-4935 |

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## PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
NICHOLAS P. GODICI, (Acting) Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

| PATENT EXAMINING GROUPS | Phone number Area Code 703 | New Case Date* |
|---|---|---|
| **CHEMICAL EXAMINING GROUPS** | | |
| GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—THEODORE MORRIS, Director | 308-0661 | 01/05/96 |
| ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200/2900—JOHN E. KITTLE, Director | 308-1235 | 05/28/96 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—RICHARD V. FISHER, Director | 308-0651 | 06/03/96 |
| HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—MARY LEE, Acting Director | 308-2351 | 04/28/96 |
| BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director | 308-0196 | 09/28/95 |
| **ELECTRICAL EXAMINING GROUPS** | | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director | 308-1782 | 10/19/95 |
| SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director | 308-0511 | 03/01/96 |
| COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director | 305-3900 | 03/01/96 |
| SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director | 305-3900 | 11/29/95 |
| ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director | 308-0956 | 07/22/96 |
| TELECOMMUNICATIONS, GROUP 2600—JIN F. NG, Director | 305-3900 | 06/08/95 |
| DESIGN, GROUP 2900—JOHN E. KITTLE, Director | 305-3293 | 04/05/96 |
| **MECHANICAL EXAMINING GROUPS** | | |
| HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—JOHN F. TERAPANE, JR., Director | 308-1113 | 11/22/95 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director | 308-1148 | 10/22/96 |
| MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director | 308-0858 | 01/10/96 |
| SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director | 308-0861 | 01/16/96 |
| GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director | 308-2168 | 11/12/96 |

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.



## TRADEMARK OPERATION

**Bruce A. Lehman, Commissioner**
**Philip G. Hampton, II, Assistant Commissioner**
**Robert M. Anderson, Deputy Assistant Commissioner**
**David E. Bucher, Director, Trademark Examining Office**
**Condition of Trademark Applications as of March 1, 1998**

| Law Office | Oldest Date New* | Oldest Date Amendment Filed |
|---|---|---|
| Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 09/19/97 | 12/29/97 |
| Law Office 102—Thomas Shaw, Acting Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/22/97 | 01/05/98 |
| Law Office 103—Michael A. Szoke, Acting Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/17/97 | 03/06/98 |
| Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 06/09/97 | 12/15/97 |
| Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/24/97 | 12/10/97 |
| Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/22/97 | 11/06/97 |
| Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 10/09/97 | 12/09/97 |
| Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 06/16/97 | 11/14/97 |
| Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 06/30/97 | 01/05/98 |
| **Collective Marks—Class 200 | | |
| **Certification Marks—Classes A & B | | |
| Office of Trademark Services—Terron Simms, Director, (703) 308-9100 | | |
| Trademark Assistance Center—(703) 308-9000 | | |
| Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 | | |
| Intent-To-Use—(ITU)—(703) 308-9500 | | |
| Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126 | | |
| Affidavits Under Sections 8 & 15 (All Classes) | 01/16/98 | —0— |
| Renewals (All Classes) | 01/16/98 | —0— |
| Section 12(c) Publications (All Classes) | 12/31/97 | —0— |

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

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Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 5,043,438 (3502nd)**

**PROCESS FOR THE SYNTHESIS OF POLYOL FATTY-ACID ESTERS**

**Markus G. Buter, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.**

**Reexamination Request Nos. 90/002,711, May 1, 1992 and 90/003,072, May 27, 1993 and 90/004,646, May 22, 1997.**

**Reexamination Certificate for Patent 5,043,438, issued Aug. 27, 1991, Ser. No. 477,776, Feb. 9, 1990.**

**Claims priority, application European Pat. Off., Feb. 16, 1989, 89200371.6; Nov. 20, 1989, 89202931.5**

**Int. Cl.**[6] **C07H** *13/00; 1/00;* **C11C** *3/00*

**U.S. Cl. 536—119**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9** and **13–21** is confirmed.

Claim **10** is determined to be patentable as amended.

Claims **11–12**, dependent on an amended claim, are determined to be patentable.

New claims **22–73** are added and determined to be patentable.

*33. A process for the synthesis of polyol fatty-acid esters by reacting a polyol and a fatty-acid lower-alkyl ester of a monoalcohol under substantially solvent free conditions in the presence of a transesterification catalyst and an emulsifier, the process comprising an initial reaction stage (a) which is carried out in a first reaction zone under such conditions that the reaction mixture in said first zone is in steady-state with massbalanced one or more in-going reactant streams into said first zone and out-going product streams from said first zone, said one or more in-going reactant streams comprising polyol and fatty-acid lower-alkyl ester of a monoalcohol, and said out-going product streams comprising reaction mixture having a polyol conversion of 1% or more and lower-alkyl alcohol formed during the initial stage of the synthesis, and a subsequent reaction stage (b) in which the reaction mixture from said first zone is further reacted to said polyol fatty-acid esters in one or more subsequent reaction zones.*

*67. A process for the synthesis of polyol fatty-acid esters by reacting a polyol and a fatty-acid lower-alkyl ester under substantially solvent free conditions in the presence of a transesterification catalyst and an emulsifier, the process comprising*

*an initial reaction stage (a) which is carried out in a first reaction zone under such conditions that the reaction mixture in said first zone is in steady-state with massbalanced one or more in-going reactant streams into said first zone and out-going product streams from said first zone, said one or more in-going reactant streams comprising polyol and fatty-acid lower alkyl ester, and said out-going product streams comprising reaction mixture having a polyol conversion of 1% or more and lower-alkyl alcohol formed during the initial stage of the synthesis, such conditions being effective, on an average, to overcome substantially de-mixing of the reactant mixture, and*

*a subsequent reaction (b) in which the reaction mixture from said first zone is further reacted to said polyol fatty-acid esters in one or more subsequent reaction zones.*

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,776

## AUTOMATIC CONTROL SYSTEM FOR THERMAL POWER PLANT

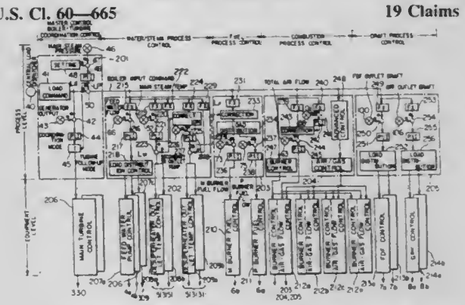
**Akira Sugano, and Sachio Yamanobe, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Engineering Co., Ltd., Ibaraki-ken, both of Japan**

**Original No. 4,653,276, dated Mar. 31, 1987, Ser. No. 837,347, Mar. 7, 1986. Continuation of Ser. No. 577,067, Sep. 4, 1990, abandoned, which is a continuation of Ser. No. 331,296, Mar. 31, 1989. Application for reissue Dec. 4, 1991, Ser. No. 801,637**

**Claims priority, application Japan, Mar. 13, 1985, 60-48344**

**Int. Cl.[6] F22D** *5/00*

**U.S. Cl. 60—665** **19 Claims**



*7. An automatic control system for an electric power plant comprising:*

*a master controller responsive to an external load command signal for producing a first command signal indicative of an amount of electric power to be generated by the power plant;*

*a plurality of subsystems providing individual flows of materials for executing respective processes relating to generation of the electric power by controlling the flows of materials, respectively;*

*subsystem controllers coupled to the subsystems, respectively, each of said subsystem controllers being solely responsive to said first command signal for determining definitely a second command signal indicative of a set value of given variable of the process executed by the associated subsystem for generating the electric power indicated by said first command signal;*

*means coupled to each of said subsystem controllers and responsive to the second command signal predetermined definitely by the associated subsystem controller for producing a third command signal for controlling the flow of material in the associated subsystem so that the given variable of the process executed by the associated subsystem assumes the set value indicated by the second command signal; and*

*means responsive to the third command signal for controlling the flow of material in the associated subsystem based on the third command signal.*

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Re. 35,777

## SELF STITCHING MULTILAYER PAPERMAKING FABRIC

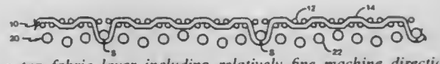
**William R. Givin, East Harwich, Mass., assignor to Huyck Licensco, Inc., Wilmington, Del.**

**Original No. 5,052,448, dated Oct. 1, 1991, Ser. No. 309,785, Feb. 10, 1989. Application for reissue Sep. 30, 1993, Ser. No. 129,674**

**Int. Cl.[6] D03D** *11/00*

**U.S. Cl. 139—383 A** **29 Claims**

*16. An endless papermaking fabric comprising:*



*a top fabric layer including relatively fine machine direction yarns interwoven with relatively fine cross machine direction yarns in a repeating pattern to form a 2×2 twill with an upper surface and a lower surface, the top fabric layer cross machine direction yarns including stitching and non-stitching cross machine direction yarns;*

*a bottom fabric layer including relatively coarse machine direction yarns interwoven with relatively coarse cross machine direction yarns in a repeating pattern to form an upper surface and a lower surface;*

*the number of the relatively fine top fabric layer cross machine direction yarns being approximately twice that of the relatively coarse bottom fabric layer cross machine direction yarns;*

*wherein said top fabric layer cross machine direction yarns* travel singly in said 2×2 twill pattern to engage the top fabric layer machine direction yarns and engage selected machine direction yarns of the bottom fabric layer at a highest elevation relative to the elevation of the machine direction yarns of the bottom fabric layer other than said selected machine direction yarns to bind the fabric layers together.

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Re. 35,778

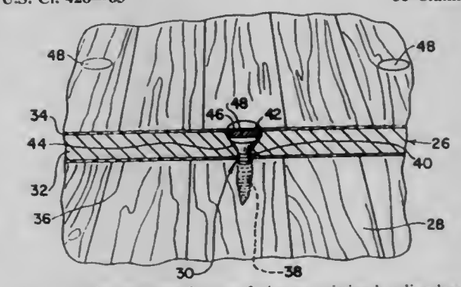
## STRUCTURE FOR RESURFACING BOWLING LANES

**Michael F. Stirling, Spring Lake; Michael G. Gautraud, Muskegon, and William C. Murphy, Fremont, all of Mich., assignors to Brunswick Bowling & Billiards, Muskegon, Mich.**

**Original No. 5,084,318, dated Jan. 28, 1992, Ser. No. 610,468, Nov. 8, 1990. Continuation of Ser. No. 280,947, Dec. 7, 1988, abandoned. Application for reissue Jan. 28, 1994, Ser. No. 190,799**

**Int. Cl.[6] A63D** *1/04*; **B32B** *3/10*

**U.S. Cl. 428—63** **35 Claims**



1. An overlay structure for resurfacing an existing bowling lane, comprising:

a homogeneous, plastic covering [layer laminate] sheet having a print layer to simulate the appearance of a wood bowling lane and at least one clear wear layer over said print layer, the homogeneous [laminate] sheet being greater than 3/16 inch thick and defining an exposed surface of the bowling lane to resist denting from pin and bowling ball impact;

a plurality of mechanical fastening means in respective recesses in the upper surface of the homogeneous [laminate] sheet and extending through the homogeneous [laminate] sheet for securement to the lane; and

plug means *sized to be inserted* in the recesses for hiding the mechanical fastening means, the plug means being fabricated of the same material as the homogenous [laminate] sheet.

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**Re. 35,779**

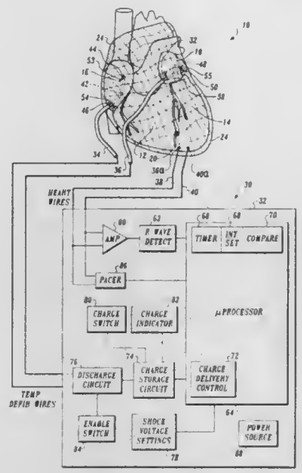
## POST-HEART SURGERY CARDIOVERTING SYSTEM AND METHOD

**Clifton A. Alferness; Gregory M. Ayers, both of Redmond, Wash.; Jerry C. Griffin, Chicago, Ill., and Kenneth R. Infinger, Issaquah, Wash., assignors to InControl, Inc., Redmond, Wash.**

**Original No. 5,403,353, dated Apr. 4, 1995, Ser. No. 100,492, Jul. 30, 1993. Application for reissue Feb. 28, 1996, Ser. No. 608,410**

**Int. Cl.[6] A61N** *1/36*

**U.S. Cl. 607—5** **51 Claims**




*32. A post-surgical cardioverting system for applying cardioverting electrical energy to the heart of a post-surgical heart patient, said system comprising:*

*a first lead including a first elongated electrode, said first electrode having a proximal end and a distal end;*

*a second lead including a second elongated electrode, said second electrode having a proximal end and a distal end;*

*said first and second electrodes adapted to be in electrical contact with the heart;*

*at least one anchor at the distal end of said first and second electrodes releasably connected beneath the skin of the patient; and*

*a non-implantable cardioverter electrically coupled for cardioversion by said first and second leads to the heart.*

# PLANT PATENTS

## GRANTED APRIL 28, 1998

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**10,352**

### MINATURE ROSE PLANT NAMED 'SAVINN'

**F. Harmon Saville, Newburyport, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.**

**Filed Jan. 22, 1997, Ser. No. 787,233**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—8.1** **1 Claim**

I. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described.

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**10,353**

### OSTEOSPERMUM PLANT NAMED 'SUNNY LADY'

**Bjarne Larsen, Odense, Denmark, assignor to Paul Ecke Ranch, Encinitas, Calif.**

**Filed Aug. 15, 1996, Ser. No. 698,336**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—68.1** **1 Claim**

I. A new and distinct cultivar of Osteospermum plant named 'Sunny Lady' as illustrated and described.

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**10,354**

### OSTEOSPERMUM PLANT NAMED 'SUNNY SILVIA'

**Bjarne Larsen, Odense, Denmark, assignor to Paul Ecke Ranch, Encinitas, Calif.**

**Filed Aug. 15, 1996, Ser. No. 698,339**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—68.1** **1 Claim**

I. A new and distinct cultivar of Osteospermum plant named 'Sunny Silvia' as illustrated and described.

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**10,355**

### PETUNIA PLANT NAMED 'SUNBELOCHIPI'

**Yasuyuki Murakami, Shiga, Japan, assignor to Suntory Limited, Osaka, Japan**

**Filed Nov. 20, 1996, Ser. No. 751,433**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—68.1** **1 Claim**

I. A new and distinct variety of petunia plant, substantially as herein illustrated and described, characterized particularly as to novelty by (A) being a semi-decumbent habit plant having long stems, (B) an over-abundant branching, particularly secondary branching is strong, and great profusion blooms, the whole bush remaining in bloom for a considerable period of time, (C) flowers are single and very small, the petals having a vivid purplish red color, and the bottom color of the corolla throat is strong yellow and the outside color of corolla tube is light greenish yellow and (D) a high resistance to rain, heat, drought and pest.

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**10,356**

### ASTER PLANT NAMED 'FREJA VIKING'

**Kell Kristiansen, Årslev, Denmark, assignor to Asterklubben, Arslev, Denmark**

**Filed Dec. 23, 1996, Ser. No. 771,671**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—68.1** **1 Claim**

I. A new and distinct cultivar of Aster plant named 'Freja Viking', as illustrated and described.

**10,357**

### ASTER PLANT NAMED 'PURPLE VIKING'

**Kell Kristiansen, Årslev, Denmark, assignor to Asterklubben, Arslev, Denmark**

**Filed Dec. 23, 1996, Ser. No. 771,902**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—68.1** **1 Claim**

I. A new and distinct cultivar of Aster plant named 'Purple Viking', as illustrated and described.

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**10,358**

### ASTER PLANT NAMED 'MARGRETHE VIKING'

**Kell Kristiansen, Årslev, Denmark, assignor to Asterklubben, Arslev, Denmark**

**Filed Dec. 23, 1996, Ser. No. 772,600**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—68.1** **1 Claim**

I. A new and distinct cultivar of Aster plant named 'Margrethe Viking', as illustrated and described.

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**10,359**

### ASTER PLANT NAMED 'LOKE VIKING'

**Kell Kristiansen, Årslev, Denmark, assignor to Asterklubben, Arslev, Denmark**

**Filed Dec. 23, 1996, Ser. No. 772,601**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—68.1** **1 Claim**

I. A new and distinct cultivar of Aster plant named 'Loke Viking', as illustrated and described.

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**10,360**

### ASTER PLANT NAMED 'ODIN VIKING'

**Kell Kristiansen, Årslev, Denmark, assignor to Aster Klubben, Arslev, Denmark**

**Filed Dec. 26, 1996, Ser. No. 772,602**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—68.1** **1 Claim**

I. A new and distinct cultivar of Aster plant named 'Odin Viking', as illustrated and described.

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**10,361**

### ASTER PLANT NAMED 'THYRA VIKING'

**Kell Kristiansen, Årslev, Denmark, assignor to Åster Klubben, Arslev, Denmark**

**Filed Dec. 23, 1996, Ser. No. 773,230**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—68.1** **1 Claim**

I. A new and distinct cultivar of Aster plant named 'Thyra Viking', as illustrated and described.

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10,362
**ALSTROEMERIA PLANT VARIETY NAMED 'STAPRISIS'**
**Jacob van Andel, Aalsmeer, Netherlands, assignor to Van Staaveren B.V., Aalsmeer, Netherlands**
Filed Sep. 16, 1996, Ser. No. 716,501
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.1 1 Claim

1. A new variety of Alstroemeria plant substantially as herein shown and described, suitable for growing in pots.

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10,363
**LILY PLANT LILIUM 'INDIA'**
**Johan A. Mak, 5595 Halls Ferry Rd., Independence, Oreg. 97351**
Filed Nov. 20, 1996, Ser. No. 752,649
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.4 1 Claim

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its high resistance to disease; its vigorous growth and rapid natural propagation; and in particular by its unusual consistency close to its stem "outward-facing" red flowers are unique among Asiatic hybrid lilies.

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10,364
**GERANIUM PLANT NAMED 'FISSAMBA'**
**Angelika Utecbt, Montabaur, Germany, assignor to Florfis AG, Binningen, Switzerland**
Filed Nov. 22, 1996, Ser. No. 754,363
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of geranium plant named 'Fissamba', as illustrated and described.

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10,365
**GERANIUM PLANT NAMED 'FISROCK'**
**Angelika Utecht, Montabaur, Germany, assignor to Florfis AG, Binningen, Switzerland**
Filed Nov. 22, 1996, Ser. No. 754,365
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of geranium plant named 'Fisrock', as illustrated and described.

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10,366
**GERANIUM PLANT NAMED 'FISDEL'**
**Angelika Utecht, Montabaur, Germany, assignor to Florfis AG, Binningen, Switzerland**
Filed Nov. 22, 1996, Ser. No. 754,366
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of geranium plant named 'Fisdel', as illustrated and described.

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10,367
**GERANIUM PLANT NAMED 'FISBERNO'**
**Angelika Utecht, Montabaur, Germany, assignor to Florfis AG, Binningen, Switzerland**
Filed Nov. 22, 1996, Ser. No. 755,308
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of geranium plant named 'Fisberno', as illustrated and described.

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10,368
**VRIESEA PLANT NAMED 'CHARLOTTE'**
**Reginald Deroose, Droogte 139, B-9940 Evergem, Belgium**
Filed Jun. 19, 1996, Ser. No. 668,626
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—88.8 1 Claim

1. A new and distinct cultivar of Vriesea plant named 'Charlotte', as illustrated and described.

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10,369
**GUZMANIA PLANT NAMED 'SALSA'**
**Gerardus J. Bak, Assendelft; Nicolaas D. Steur, Oude Niedorp, and Elly Bak, Rijsenhout, all of Netherlands, assignors to Corn. Bak B.V., Assendelft, Netherlands**
Filed Sep. 23, 1996, Ser. No. 717,914
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—88.8 1 Claim

1. A new and distinct cultivar of Guzmania plant named 'Salsa', as illustrated and described.

# PATENTS

## GRANTED April 28, 1998

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 004–615 | 5,742,961 |
| 229–087 | 3,458 |
| 424–094 | 3,477 |
| 415–058 | 3,721 |
| 446–085 | 3,786 |
| 525–391 | 4,068 |
| 425–347 | 4,357 |
| 562–028 | 4,629 |
| 310–360 | 4,902 |
| 350–631 | 5,295 |
| 360–105 | 5,325 |
| 360–106 | 5,326 |
| 360–126 | 5,329 |
| 345–330 | 5,711 |
| 107–515 | 5,745,910 |

179-272 O.G. - 98 - 2 : QL 3

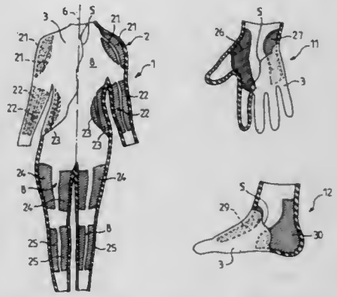
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# PATENTS

GRANTED APRIL 28, 1998

## GENERAL AND MECHANICAL

**5,742,936**
**TIGHT-FITTING GARMENT, NOTABLY FOR SPORTSWEAR SUCH AS DIVING SUITS**
**Nicolas Tronc, 46 Rue des Francs Bourgeois, 75003 Paris, France**
**Continuation-in-part of Ser. No. 244,963, Aug. 18, 1994, Pat. No. 5,603,116. This application Jan. 24, 1997, Ser. No. 787,285**
**Int. Cl.[6] A41D** *13/00*
**U.S. Cl. 2—2.15** **10 Claims**

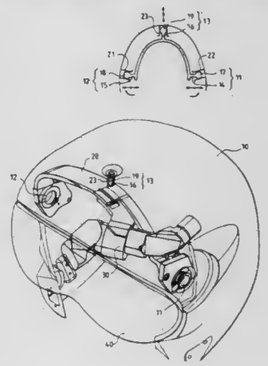


1. A tight-fitting garment comprising: an external layer made of material having characteristics of adherence and arranged to cling closely to a wearer's body, and at least one internal strip of a film of non-porous material, deprived of any holes, extending longitudinally in the direction of removal by the wearer, said strip of film having an exterior surface in the direction of the wearer's body of a predetermined dimension of slippery texture, said strip of film having an interior surface being secured by gluing on an internal portion of said external layer, said strip of film being arranged to extend in surface contact with an area of the body, said area of the body being an area of increased friction with said tight-fitting garment when putting on or removing said tight-fitting garment.

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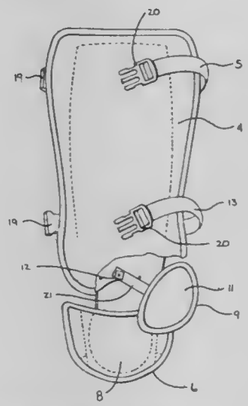
**5,742,937**
**HEAD EQUIPMENT WITH ISOSTATIC LINK BETWEEN SHELL AND OPTRONIC INSTRUMENTS**
**Joël Baudou, St Medard en Jalles, and Vincent Vitte, Bordeaux, both of France, assignors to Sextant Avionique, Meudon La Foret, France**
**Filed Mar. 2, 1995, Ser. No. 397,365**
**Claims priority, application France, Mar. 11, 1994, 94 02862**
**Int. Cl.[6] A42B** *3/06;* **G02B** *23/00*
**U.S. Cl. 2—6.3** **12 Claims**

1. Head equipment onto which an optronic means is mounted, the head equipment having a shell with flanks on each side of a plane of symmetry of the shell, an upper part and a rear part, and a rigid structure, the head equipment comprising linking assemblies to attach said rigid structure and said shell to each other in a locally movable way, said linking assemblies being attached to the rigid structure and to the shell, said linking assemblies comprising pins which are attached to one of said shell or said rigid structure and cylinders which are attached to the other of said shell or said rigid structure, said pins being axially slidable within said cylinders.



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**5,742,938**
**BATTERS' SHIN AND ANKLE GUARD**
**Matt Winningham, Maryland Heights, and Matthew S. McNamara, St. Louis, both of Mo., assignors to Rawlings Sporting Goods Company, Inc., St. Louis, Mo.**
**Filed Dec. 11, 1996, Ser. No. 764,613**
**Int. Cl.[6] A41D** *13/00*
**U.S. Cl. 2—22** **14 Claims**



1. A shin and ankle guard for attachment to a leg, comprising:
(a) a shin portion having a first rigid shell shaped to fit on an anterior surface of a shin of a leg;
(b) at least one strap securable around the leg to hold the shin portion in place on the anterior portion of the leg;
(c) a foot portion having a second rigid shell shaped to fit on an anterior surface of a foot;
(d) an ankle portion having a third rigid shell shaped to fit on an ankle of a wearer; and
(e) rotation means for rotating said ankle portion to a left position or a right position so that a wearer can adjust said ankle portion to suit his/her needs for protection.

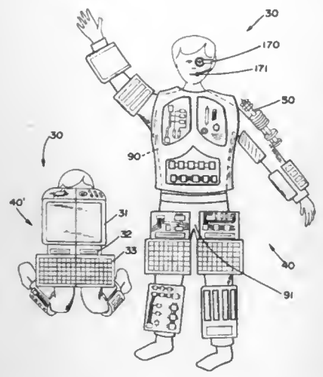
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**5,742,939**
**PLAY COSTUME WITH DETACHABLE PADS**
**Stan Williams, 180 Fashion Park Pl., Oxnard, Calif. 93033**
**Filed Aug. 24, 1995, Ser. No. 519,002**
**Int. Cl.[6] A41D** *1/00;13/00;* **A63H** *33/00*
**U.S. Cl. 2—69** **19 Claims**

1. A costume suitable for wear on the body of a person comprising:
a plurality of pads, each having a front side covered by color patterns representative of a character and a back side, a first hook and loop fastening element being fixed to said back side of each of said pads;

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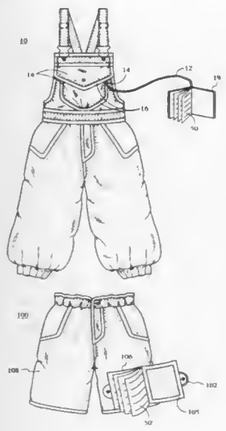


a clothing set for wear on the body of the person having arm and leg sections to which said pads can be attached over the arms and legs of the person including at least one body worn piece, each body worn piece having a body contacting inner side and an outer side, and a plurality of second hook and loop fastening elements affixed to said outer side, at least one of said elements being positioned on each arm and at least one of said elements being positioned on each leg of said clothing set, each said first hook and loop fastening element on said plurality of pads being temporarily attachable to a respective said second hook and loop fastening element on each said body worn piece, at least some of said pads capable of being detached from said body worn piece by the force of a playful impact against said pads during a mock fight; and

a torso pad having an outside pattern.

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**5,742,940**
**GARMENT INCLUDING A POCKET FOR HOLDING READING MATERIAL**
**Katrina Sparks, 621 20th St., Richmond, Calif. 94801**
**Filed Sep. 21, 1995, Ser. No. 532,066**
**Int. Cl.[6] A41D** *1/06*
**U.S. Cl. 2—79** **9 Claims**



1. Shorts including a book member to be worn by a child comprising:

a body portion including two leg portions;

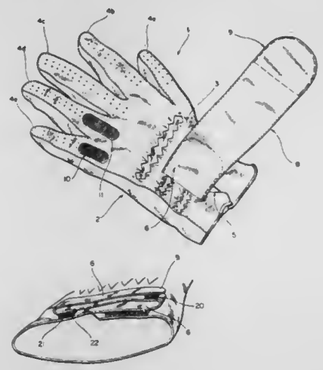
a book member with an attachment portion coupled thereto located on one of the leg portions of the shorts for retaining the book member to the shorts;

a flap portion coupled to the shorts adjacent said book member;

a snap member component located on the flap member and a corresponding snap member component located on said body portion adjacent said book member wherein upon connection of said snap member components the book member is held in a closed position when the book member is not in use.

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**5,742,941**
**GOLF GLOVE**
**Michael Porter, 26252 N. 43rd Pl., Phoenix, Ariz. 85024**
**Filed Jan. 19, 1996, Ser. No. 588,633**
**Int. Cl.[6] A41D** *19/00*
**U.S. Cl. 2—161.4** **14 Claims**



1. A golf glove, comprising:

a glove body having a palm portion and a backhand therebetween a handpocket, a thumb opening and a plurality of finger openings, wherein one of said finger openings is a ring finger opening;

wherein said palm portion and said backhand portion extensions forming a thumb pocket and a plurality of finger pockets each having a side and a backhand side, wherein one of said finger pockets is a ring finger pocket;

a single grip reinforcement strap having a glove end, said glove end being affixed to said backhand portion;

a first fastener affixed to said free end;

a second fastener disposed on said backhand side of said ring finger pocket on the portion of said ring finger pocket disposed so as to be positioned between the outermost joint of a ring finger and said hand pocket; said strap being wrappable around said glove from said backhand portion across said palm portion in the area if the base of said thumb pocket to said second fastener such that said first fastener engages said second fastener;

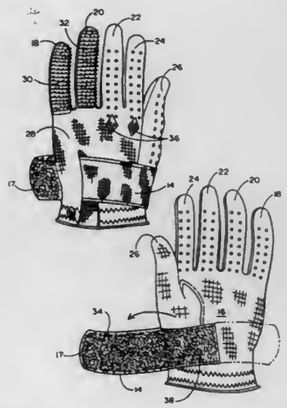
a first stowage fastening means attached to one side of said grip reinforcement strap;

a second stowage fastening means attached to said backhand portion; and

a third stowage fastening means attached to the other side of said grip reinforcement strap, wherein said first stowage fastening means engages said second stowage fastening means and said third stowage fastening means engages said first fastener to secure said grip reinforcement strap in a stowed position.



**5,742,942**
**GOLF GLOVE HAVING CLUB-GRIPPING STRAP**
**Philip K. Sykes, 5865 Fernwood St., Shoreview, Minn. 55126**
**Continuation of Ser. No. 317,019, Oct. 3, 1994, abandoned. This application Aug. 16, 1996, Ser. No. 698,777**
**Int. Cl.[6] A41D** *19/00*
**U.S. Cl. 2—161.4** **10 Claims**



1. An improved golf glove for enabling a golfer to firmly grasp the gripping portion of a golf club without the voluntary contraction of the muscles in the hand normally required to grasp an object; the glove having a palm side, a knuckle side, a wrist portion, a finger portion and a thumb portion, the latter having a plurality of fingers, the knuckle side having an opening slit adjacent the wrist portion; the improvement comprising:

an elongated strap having first hook and loop fasteners, said strap being attached to a knuckle side of said glove adjacent the wrist portion and being sufficiently long to substantially encircle said wrist portion, said elongated strap being secured on one end thereof to an edge of said knuckle side defining said opening slit; and

at least one region of second hook and loop fasteners on a knuckle-side of at least one finger of said glove for receiving said strap in fastening engagement with said first hook and loop fasteners when said strap is diagonally wrapped around said glove in a grasping configuration;

at least one region of third hook and loop fasteners on said palm side of said glove adjacent said thumb portion for receiving said strap in fastening engagement with said first hook and loop fasteners; and,

the direction of wrap of said strap effecting closure of said opening slit to secure said golf glove.

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**5,742,943**
**SLIP-COATED ELASTOMERIC FLEXIBLE ARTICLES AND THEIR METHOD OF MANUFACTURE**
**Mao C. Chen, Arlington, Tex., assignor to Johnson & Johnson Medical, Inc., Arlington, Tex.**
**Continuation-in-part of Ser. No. 673,302, Jun. 28, 1996, abandoned. This application Aug. 19, 1996, Ser. No. 699,032**
**Int. Cl.[6] A41D** *19/00*
**U.S. Cl. 2—168** **20 Claims**

4. A flexible elastomeric article having a wearer-contacting surface in which a lubricant composition has been applied to the wearer-contacting surface so as to provide lubricity of the surface with respect to damp skin, wherein the lubricant composition is selected from the group consisting of a first composition and a second composition,

wherein the first composition comprises

an acetylenic diol and

at least one compound selected from the group consisting of

an organo-modified silicone,

an amino-modified silicone, and

a cationic surfactant; and

wherein the second composition comprises

a cationic surfactant and

at least one compound selected from the group consisting of

an organo-modified silicone,

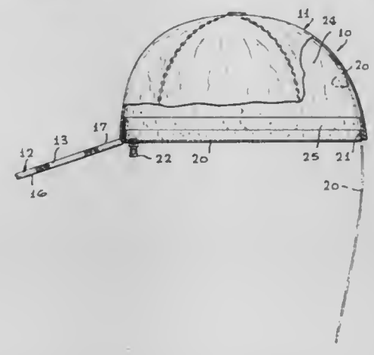
an amino-modified silicone, and

an acetylenic diol.

5. An article according to claim 4, wherein the article is a surgeon's glove.

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**5,742,944**
**COMBINED CAP AND CARRYING BAG**
**Erich S. Pfefferman, 11524 Pala Mesa Dr., Northridge, Calif. 91326**
**Filed Mar. 3, 1995, Ser. No. 398,005**
**Int. Cl.[6] A42B** *1/06*
**U.S. Cl. 2—209.12** **5 Claims**



1. A combined cap and carrying bag comprising:

a cap construction having a domed crown supporting an outwardly projecting visor;

said crown having an interior storage compartment terminating at a circular edge coextensive with said visor;

a cover detachably carried on said crown at its circular edge and having an open position permitting access to said internal storage compartment and a closed position blocking access to said internal storage compartment;

said visor having an elongated opening defined by a pair of side edge marginal regions joined by a front edge marginal region;

said cap construction including said visor and said crown constitutes a cap to be worn by a user when said cover is in its open position;

said cap construction constitutes a carrying bag when said cover is in its closed position, with said visor and said elongated opening being a handle and said crown and said cover being a bag;

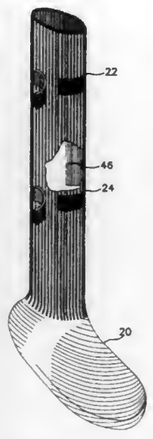
closure means cooperatively carried on said crown edge and said cover for detachably connecting said cover to said crown; and

said cover having a first portion attached to said crown at a location opposite from said visor and having a second portion of said cover which, in said open position, depends from said crown and said first portion.

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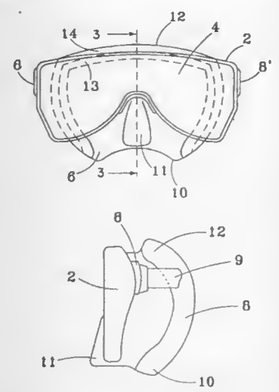
**5,742,945**
**SOCK WITH SHIN GUARD FASTENER**
**Glenn Lindaman, 690 S. 10th St., Allentown, Pa. 18103**
**Filed Feb. 21, 1997, Ser. No. 802,942**
**Int. Cl.[6] A41D** *13/00*
**U.S. Cl. 2—239** **12 Claims**




1. An article of protective apparel for securing the position of a shin guard comprising:
a sock having an upper end, a lower end, and an elongated cylindrical leg section;
at least one upper fastener and at least one lower fastener attached to the sock, the lower fastener positioned a distance apart from the upper fastener and closer to the lower end of the sock than the upper fastener, the upper and lower fasteners each being adjustably operable to shorten an upper and a lower circumference of the sock, whereby a receptacle for a shin guard is formed between the upper and lower fasteners.

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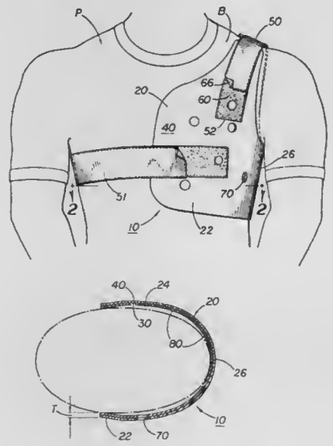
**5,742,946**
**DIVING MASK**
**Giovanni Garofalo, Rapallo, Italy, assignor to HTM Sport S.p.A., Italy**
**Filed Sep. 9, 1996, Ser. No. 709,299**
**Claims priority, application Italy, Sep. 27, 1995, GE95A0104**
**Int. Cl.[6] A61F** *9/02*
**U.S. Cl. 2—428** **3 Claims**




1. A diving mask comprising:
a body element made of elastomeric rubber-like material forming the face piece of the mask, said face piece including a front opening and a peripheral rim adhering against the face of the user;
a frame having a top edge secured in a water-tight manner to said front opening of said face piece;
at least one lens secured in a water-tight manner to said frame; and
a pair of fasteners for securing a strap to said frame, each of said fasteners having a top edge located at the sides of said frame, the top edges of said fasteners being close to, or aligned with the top edge of said frame so that the bottom edge of the mask lifts up and the top part of the mask remains firmly in contact with a diver's face as a result of air being blown through the diver's nose, and wherein no other strap is secured to said frame.

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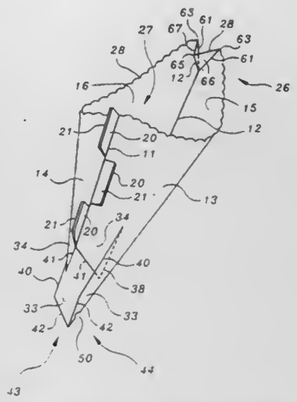
**5,742,947**
**ADJUSTABLE CHEST PROTECTOR**
**James B. Davis, 3553 Bellerive Cir., August, Ga. 30907**
**Continuation-in-part of Ser. No. 438,309, May 10, 1995. This application Sep. 25, 1996, Ser. No. 719,502**
**Int. Cl.[6] A41D** *13/00*
**U.S. Cl. 2—463** **14 Claims**




1. An apparatus for protecting a person wearing an outer garment from a chest or torso injury, comprising:
(a) a hardened shell being essentially C-shaped in a horizonal plane and comprising a first section, a second section, and an intermediate or third section, wherein the hardened shell is substantially rigid so that the hardened shell is not movable so as to be essentially linear in the horizontal plane, each section having an interior side to be adjacent to the person, an opposite exterior side, and a thickness separating the interior and the exterior sides, wherein the first section of the hardened shell extends downwardly and terminates adjacent the anterior thorax and ribs and extends up to and terminates adjacent the clavicle, the second section of the hardened shell extends downwardly to cover and terminates adjacent the posterior thorax and ribs and extends upwardly and terminates adjacent the clavicle, and the third section of the hardened shell covers the lateral torso therebetween so that the hardened shell extends from the sternum anteriorly to the spine posteriorly, a portion of the hardened shell being contoured convexly away from the person to assume the natural shape of the hemithorax of the person; and
b) means for removably securing the hardened shell to the person.



**5,742,948**
**FEMALE URINATION AID**
**William H. Cicio, 305 Blacksmith Rd., Levittown, N.Y. 11756**
**Filed Aug. 9, 1996, Ser. No. 693,644**
**Int. Cl.[6] A47K** *11/00*
**U.S. Cl. 4—144.3** **17 Claims**

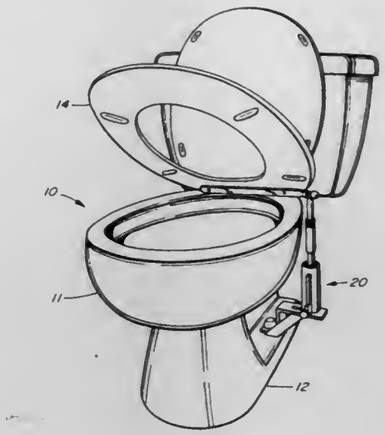



1. A disposable female urination device, comprising:
a main body portion, having a first and second end, said first end having a first opening, said second end having a second opening, said second opening located opposite from said first opening, wherein a perimeter of said first opening is comprised of frills for softening the edges of said first opening;
wherein said first opening is adapted to receive urine from a female user;
wherein urine from said female user is discharged from said second opening; and
wherein said disposable urinating device allows a female user to urinate while in the standing position.

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**5,742,949**
**TOILET SEAT LOWERING APPARATUS**
**Emil Goldi, 405 Tempe Crescent, North Vancouver, British Columbia, Canada, V7N 1E7, and Werner E. Pfisterer, 9267 Emerald Drive, Whistler, British Columbia, Canada, V0N 1B9**
**Filed Jun. 17, 1996, Ser. No. 669,031**
**Int. Cl.[6] A47K** *13/10*
**U.S. Cl. 4—246.2** **4 Claims**

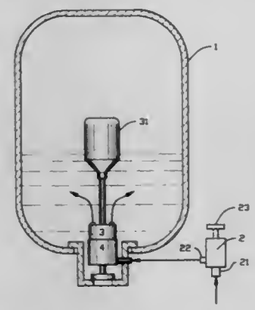
1. Apparatus for lowering a toilet seat from a raised position to a lowered position, said apparatus comprising:
a) a bracket attachable to a base of a toilet;
b a housing attached to said bracket, said housing containing a fluid;
c) a reciprocable piston contained within said housing to form first and second chambers within said housing;
d) a piston rod connected to said piston and extending upwardly through a top portion of said housing;
e) an arm mountable on the underside of said toilet seat;
f) a connecting rod assembly for connecting said piston rod to said arm, said rod assembly having a lower end attachable to a top portion of said piston rod, and an upper end attachable to said arm, wherein said connecting rod assembly has an adjustable length and wherein said connecting rod assembly further comprises a first connecting member having a threaded portion and a second connecting member axially threadable onto said first connecting member threaded portion;
g) a fluid flow conduit communicating between said first and second chambers, wherein said conduit is external said housing;




h) a first valve for regulating the rate of fluid flow between said first and second chambers;
i) a second normally closed valve in said piston, said second valve openable in response to a predefined fluid pressure in said first chamber for allowing fluid flow through said piston from said first chamber to said second chamber, wherein said second valve comprises a first conduit formed through said piston, a socket formed at an end of said first conduit communicating with said first chamber, and a ball normally urged into said socket by a spring;
j) a third normally closed valve in said piston, said third valve openable in response to a predefined fluid pressure in said second chamber for allowing flow of said fluid through said piston from said second chamber to said first chamber, wherein said third valve comprises a second conduit formed through said piston, a socket formed at an end of said second conduit communicating with said second chamber, and a ball normally urged into said socket by a spring; and,
k) locking means for maintaining said connecting rod assembly at a predetermined length.

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**5,742,950**
**APPARATUS FOR PRESSURE ASSISTED FLUSH TOILETS**
**Shih-Chih Chang, 2339 Davison Ave., Richland, Wash. 99352**
**Filed Sep. 6, 1996, Ser. No. 708,953**
**Int. Cl.[6] E03D** *1/18;3/06*
**U.S. Cl. 4—334** **4 Claims**




1. A toilet flush apparatus for a toilet bowl, comprising an enclosed flush tank for holding water and air under pressure, a feed

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valve for connecting a pressurized water supply source to said flush tank, volume control means for controlling the water volume of a flush, and a flush valve for connecting said flush tank to the toilet bowl to control water discharge from said flush tank to said toilet bowl, said feed valve having actuating means for opening said feed valve and consequently communicating a feed water flow from said water supply source to said flush tank, said feed valve remaining open when the flowrate of said feed flow is higher than a predetermined low flow threshold and closing automatically when said flowrate is reduced below said low flow threshold, said volume control means reducing said flowrate below said low flow threshold when a predetermined water volume is accumulated in said flush tank thereby causing the feed valve to close, said flush valve controlling the discharge flow from the flush tank to the toilet bowl in response to hydraulic conditions of both said feed water flow and pressurized water held in said flush tank such that when feed water flows, said flush valve closes automatically to allow the feed flow to be accumulated in said flush tank, and when said feed water flow stops, said flush valve opens automatically in response to the pressurized water in said flush tank to allow the water to discharge.

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**5,742,951**

## INLET VALVE MECHANISM

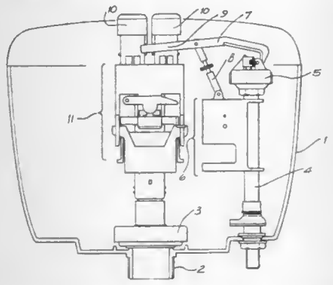
**Sonny Rene Wright, Coburg; Peter Ross Dunstan, Verdun, and Luke Daniel Streeter, Goolwa, all of Australia, assignors to Caroma Industries Limited, Queensland, Australia**

**Continuation-in-part of Ser. No. 527,449, Sep. 13, 1995, abandoned. This application Nov. 26, 1996, Ser. No. 756,624**

**Claims priority, application Australia, Sep. 29, 1994, PM8494**

**Int. Cl.[6] E03D** *1/34*

**U.S. Cl. 4—381** **3 Claims**



1. An interlock mechanism for a flush valve operated cistern having a flush valve in the base thereof which, when opened, drains water stored in said cistern to constitute a flush, said cistern further having an actuator mechanism interconnecting a flush actuator with said flush valve to open the latter on operation of said actuator, and an inlet valve having a refill actuator operable in response to the level of water in said cistern to refill same to a predetermined level, wherein said interlock mechanism comprising a latch means interconnected with said refill actuator and said flush actuator and operable to prevent refilling of said cistern, said latch means being releasable by operation of said flush actuator and being re-settable by initial re-filling of said cistern after a flush and wherein said refill actuator includes a first float linked to a float arm which is pivotally connected to said inlet valve and which is adjacent said actuator mechanism, said latch means comprises a pivoted lever extending between said float arm and said actuator mechanism and movable by operation of said actuator mechanism to move an abutment on said pivoted lever out of engagement with a stop member stationary relative to said cistern, and biasing means comprising gravity acting on said pivoted lever to return said abutment into engagement with said stop member following operation of said actuator mechanism, wherein said interlock mechanism further includes a latch securing mechanism comprising a second float mounted for movement with a pivoted locking lever and pivotable to bear against said pivoted lever with decreasing water levels in said cistern to secure said abutment and stop member in mutual engagement if said water level drops prior to actuation of said actuator mechanism.

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**5,742,952**

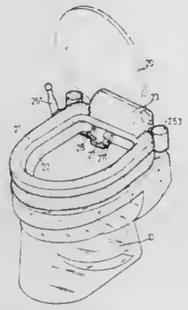
## FLUSHING SYSTEM FOR A LAVATORY

**Chang-Shin Huang, No. 331, Section 2, Yung Ping Road, Taichung, Taiwan**

**Filed Dec. 13, 1996, Ser. No. 768,770**

**Int. Cl.[6] A47K** *3/20*

**U.S. Cl. 4—420.4** **3 Claims**



1. A flushing system for a lavatory which comprises a lavatory bowl with a lavatory seat disposed thereon, said flushing system comprising:

a first cistern which is a flexible and annular member for receiving water therein, said first cistern being disposed between said lavatory seat and said lavatory bowl such that when the weight of a user is applied to said flexible and annular member water therein is forced to valve a means;

a block member attached to and being in fluid communication with said first cistern, said block member having an exit defined laterally therein and a tube extending therefrom;

said valve means being rotatably connected to said first cistern and having an L-shaped path defined therein which comprises a first section and a second section, said first section of said L-shaped path communicating with said first cistern and said second section of said L-shaped path adjustably and selectively alternatively communicating with said tube and said exit by operating said valve means by a crank extending from said valve means, and

a second cistern disposed above and in communication with said first cistern.

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**5,742,953**

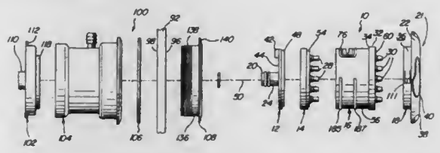
## GATLING JET

**Phillip Dudley Loizeaux, San Marcos, and Thai Ton, Lemon Grove, both of Calif., assignors to Watkins Manufacturing Corp., Vista, Calif.**

**Filed Nov. 12, 1996, Ser. No. 747,545**

**Int. Cl.[6] A61H** *33/02*

**U.S. Cl. 4—541.1** **17 Claims**



1. A jet adapted for placement in a wall of a hydrotherapeutic reservoir comprising:



a cylindrical, hollow jet body defining a chamber therein and having, at a first end of said jet body, a plurality of rear nozzles directed parallel to and spaced apart from an axis of said jet body; and, at a second end, a plurality of front nozzles, each front nozzle being aligned with a respective one of said rear nozzles, said front nozzles and said rear nozzles being spaced apart by said chamber;

means for introducing a flow of air into said chamber;

means actuable by a user for adjusting the flow of air introduced into said chamber from a no-air intake position to a maximum air intake position; and

fluid intake means at said first end of said jet body for receiving a flow of pressurized fluid.

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**5,742,954**

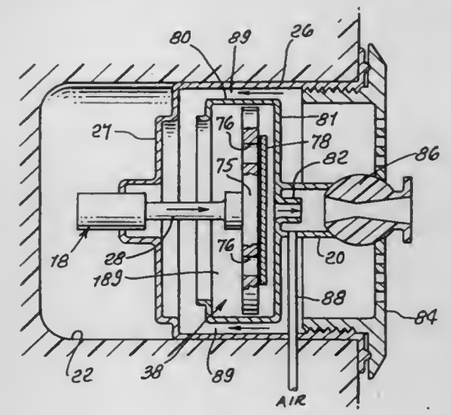
## ELECTRICALLY POWERED SPA JET UNIT

**Carsten H. Idland, Los Angeles, Calif., assignor to Softub, Inc., Chatsworth, Calif.**

**Filed Nov. 22, 1996, Ser. No. 755,306**

**Int. Cl.[6] A61H** *33/02*

**U.S. Cl. 4—541.1** **25 Claims**



1. For use in a water circulation device for a spa having wall means facing toward a water reception zone, the combination comprising

a) housing means adapted for carriage by said wall means,

b) pumping structure associated with said housing means,

c) and control means for controlling pumping operation of said pumping structure,

d) there being inlet and outlet porting provided to create a simultaneous intake and discharge of fluid, so as to balance and cancel or reduce an associated momentum change, which in turn reduces forces imposed on said wall means,

e) there being an inner chamber within which a movable part of the pumping structure is reciprocable, and from which water is discharged relatively forwardly to said outlet porting, said part having forward and rearward sides,

f) and there being an outer passage extending outwardly of and about said inner chamber, and to which water is drawn via said inlet porting, said outer passage communicating with a rear side of said inner chamber to deliver water to the rearward side of said part, said inlet and outlet porting, said inner chamber, and said outer passage being within said housing means.

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**5,742,955**

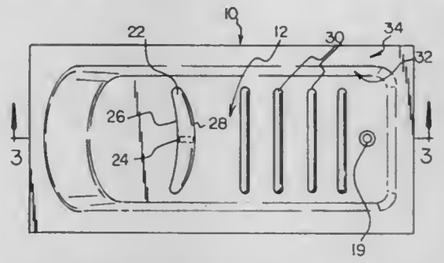
## BATHTUB LINER APPARATUS

**Steve Parkay, and Angie Parkay, both of HC 73 833 Buchanan Rd., Burns, Oreg. 97720**

**Filed Sep. 16, 1996, Ser. No. 714,592**

**Int. Cl.[6] A47K** *3/02*

**U.S. Cl. 4—583** **14 Claims**



1. A bathtub liner apparatus, comprising:

a flexible floor sheet member which includes a top surface and a bottom surface, wherein said flexible floor sheet member includes a drain channel extending from said top surface to said bottom surface,

a quantity of adhesive applied to said bottom surface of said flexible floor sheet member, and

flexible projection members projecting upward from said top surface of said flexible floor sheet member,

wherein said flexible projection members include a main crescent-shaped projection member projecting from said top surface of said flexible floor sheet member at a location distal to said drain channel, and

wherein said main crescent-shaped projection member includes a projection-drainage channel.

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**5,742,956**

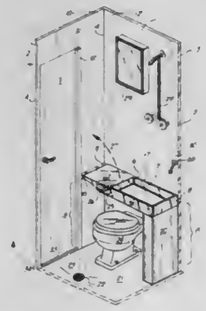
## MODULAR BATHROOM UNIT

**Alan Tarver, 84636 Hwy. 25 P.O. Box 431, Folsom, La. 70437**

**Filed Dec. 18, 1996, Ser. No. 769,139**

**Int. Cl.[6] A47K** *4/00*

**U.S. Cl. 4—663** **13 Claims**



1. A modular bathroom system having a floor, and first and second, and third walls, said first and second walls intersecting to form a corner, said modular bathroom system further comprising:

a lavatory unit having first and second ends, front and rear sides, a top and a bottom, a sink formed in said top of said lavatory unit, said sink having a drain formed therein, said rear side of said lavatory unit generally adjacent to said second wall,

pivotal connection means for pivotally supporting said first end of said lavatory unit to said first wall, said pivotal connection means allowing said lavatory unit to be pivoted along said first end of said lavatory, from a first, generally horizontal use position, to a second, generally vertical, storage position, said

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storage position placing said lavatory unit in general alignment with said first wall;

support means for supporting said lavatory unit in said use position, said support means engaging generally said second end of said lavatory, said support means having formed therein drainage means for removably engaging said drain formed in said sink to a drain conduit in a leak resistant fashion when said lavatory unit is in said use position, and disengaging said drain formed in said sink from said drainage conduit when said lavatory is pivoted from said use position to said storage position.

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**5,742,957**

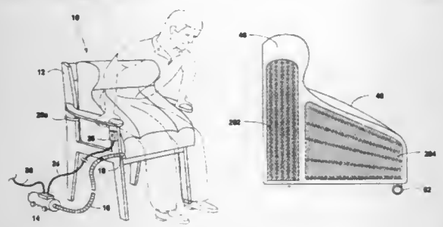
**PNEUMATIC SIT/STAND ASSISTANCE DEVICE HAVING IMPROVED STABILIZATION FEATURES**

**B. W. Vanzant, 7743 Pimlico, Boerne, Tex. 78006**

**Division of Ser. No. 333,624, Nov. 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 65,561, May 21, 1993, Pat. No. 5,361,433. This application Feb. 9, 1996, Ser. No. 599,142**

**Int. Cl.[6] A47C** *7/00*

**U.S. Cl. 5—81.1 R** **11 Claims**



1. An air operated inflatable, cushion-like sit/stand device for assisting physically disadvantaged persons in moving to or from a seated position, comprising:

one or more partitions defining a center cavity and an outer cavity, wherein said one or more partitions include orifices allowing passage of air between said center and outer cavities, wherein a person may be seated on the center cavity; and

an air supply assembly connected to said outer cavity which provides air to said outer cavity, wherein said outer cavity substantially inflates prior to said center cavity to stabilize the person rising from a seated position.

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**5,742,958**

**INFLATABLE PATIENT TRANSFER ROLLER MATTRESS**

**Anthony Solazzo, 904 Oak Tree Rd., South Plainfield, N.J. 07080**

**Continuation-in-part of Ser. No. 623,912, Mar. 28, 1996, abandoned. This application Mar. 19, 1997, Ser. No. 820,113**

**Int. Cl.[6] A61G** *7/08;7/10*

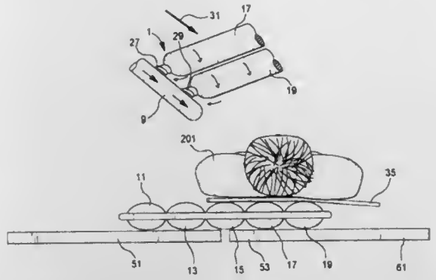
**U.S. Cl. 5—81.1 R** **15 Claims**

1. An inflatable patient transfer roller mattress for moving a patient from a first platform to a second platform, which comprises:

a) a top sheet and a bottom sheet capable of being selectively sealed together;

b) a set of parallel inflatable rollers, each roller having a pair of necked-down ends for introduction of an inflation gas, the rollers being formed by sealing selected areas of the top sheet and the bottom sheet together;

c) at least a pair of opposing, inflatable manifolds for delivery of an inflation gas to each roller, each manifold being disposed adjacent to and in gaseous contact with each necked-down end of said rollers, the manifolds being formed by sealing selected areas of the top sheet and the bottom sheet together; and



d) at least one valve connected to at least one of the manifolds to allow inflation of the manifolds and the rollers to an inflated, semi-rigid state such that the manifolds maintain the rollers in a spaced parallel relationship and the rollers become round such that an item resting on the top sheet on a first platform is lifted by the rollers and during movement of the item from a first platform to a second platform, the rollers revolving about the necked-down ends, which portions act as rotational pivots which rotate so as to minimize rolling resistance.

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**5,742,959**

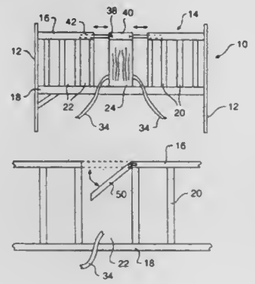
**MEDICAL BED WITH OPENABLE TOP RAIL**

**Staci J. Froelich, 6716 Cockerille Ave., Takoma Park, Md. 20912**

**Filed Feb. 21, 1997, Ser. No. 802,945**

**Int. Cl.[6] A47D** *7/01;7/02*

**U.S. Cl. 5—93.1** **12 Claims**



1. A bed comprising:

a pair of spaced ends,

a pair of opposed sides connecting said ends, and

at least one of said sides having a top rail, a bottom rail and a plurality of spaced vertical bars extending between said top and bottom rails,

said vertical bars forming a plurality of unobstructed vertical spaces between said top and bottom rails, and

at least a part of said top rail extending over one or more of said unobstructed vertical spaces, said part of said to rail being movable away from said one or more unobstructed vertical spaces while said vertical bars remain stationary, to form an opening at the top of said one or more unobstructed vertical spaces.



**5,742,960**

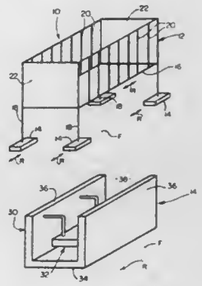
**ROCKABLE CRIB AND SUPPORT THEREFOR**

**Yoav Shamir, Yekutiel Adam Street 60/1, Beit Shemesh, Israel, 99000**

**Filed Oct. 15, 1996, Ser. No. 731,434**

**Int. Cl.[6] A47D** *9/04*

**U.S. Cl. 5—107** **20 Claims**



1. A rockable crib comprising a crib structure and a rocking support system for supporting the crib structure on a floor in a rockable manner, wherein:

the crib structure includes a resting platform and a plurality of supporting legs coupled to the resting platform;

the rocking support system includes a rocking support for each supporting leg of the crib structure;

each rocking support includes a base resting on the floor and a swing pivotally mounted to the base to pivot relative thereto in a substantially horizontal plane.

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**5,742,961**

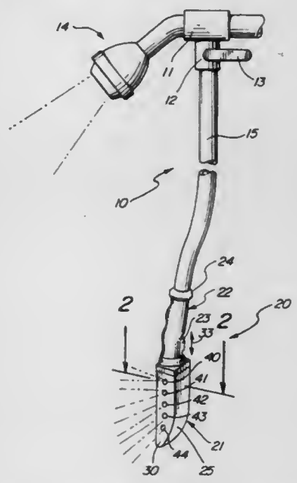
**RECTAL AREA HYGIENE DEVICE**

**John L. Casperson, 23010 Lake Forest Blvd., Unit D162, Laguna Hills, Calif. 92653, and Robert Ozeran, 11580 Sunset Blvd., Los Angeles, Calif. 90049**

**Filed Dec. 26, 1996, Ser. No. 773,077**

**Int. Cl.[6] A47K** *3/22*

**U.S. Cl. 4—615** **8 Claims**



1. For use in a shower facility having a supply of water, a rectal hygiene device comprising:

means for coupling to said supply of water;

a flexible hollow hose having a first end coupled to said means for coupling and a second end;

a handle having a passage therethrough coupled to said second end; and

a spray head, having an elongated spray body defining a plurality of spray apertures therein, coupled to said handle, said spray body further defining a pair of angled faces, said spray apertures being arranged in rows thereon;

a slide valve movable within said spray body and having a plurality of valve apertures corresponding to said spray apertures, said valve slide being movable to offset or align or partially align said valve apertures with said spray apertures,

said spray head providing an elongated water spray pattern for cleaning the user's rectal area.

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**5,742,962**

**ARMREST**

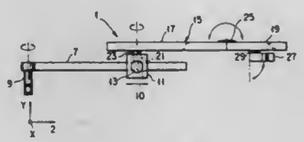
**Futoshi Yoshino, Aioi, and Mitsuo Oe, Utsunomiya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

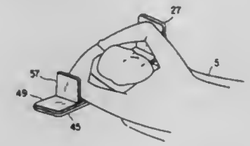
**Continuation of Ser. No. 582,420, Jan. 3, 1996, abandoned. This application Jun. 13, 1997, Ser. No. 874,883**

**Claims priority, application Japan, Jan. 19, 1995, 7-006338**

**Int. Cl.[6] A47B** *16/00*

**U.S. Cl. 5—623** **12 Claims**





1. An armrest assembly for an examination couch comprising:

a first horizontal member providing a horizontal surface;

a second horizontal member jointed to said first horizontal member by a first hinge, a surface of said second horizontal member forming a continuous horizontal surface along with the surface of said first horizontal member when said first hinge is in a first position, thereby an extended arm of a patient can be supported on said continuous horizontal surface, and said second horizontal member being folded on said first horizontal member when the first hinge is in a second position; and

a vertical member having a vertical surface against a rear surface of said second horizontal member, said vertical member disappearing under said second horizontal member when said first hinge is in said first position, and appearing so as to steady a held-up arm of the patient when the first hinge is in said second position.

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**5,742,963**

**PATIENT SUPPORT APPARATUS**

**John Trevino, 129 Acacia, Biloxoi, Miss. 39530, and Scott Allen Froboese, 3410 A Ave., Gulfport, Miss. 39507**

**Filed Jan. 6, 1997, Ser. No. 779,927**

**Int. Cl.[6] A61G** *7/06*

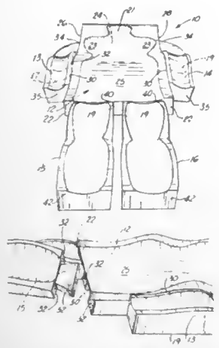
**U.S. Cl. 5—632** **15 Claims**

1. A patient support apparatus, formed of foam material, comprising:

a. a principal body portion having a lower face for resting on a generally flat surface, and an upper face for supporting the upper torso of a patient lying thereupon;

VOL 1209 ISS 4 AP 28 1998 UMI

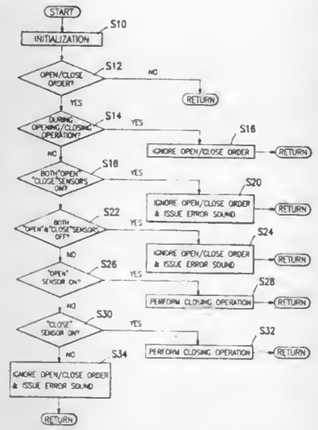




b. a pair of leg members securable to the body portion for supporting the legs of a patient;
c. a pair of arm members securable to the body portion for supporting the arms of the patient; and,
d. contoured regions formed in the upper body portion, leg members and arm members which generally conform to the shape of a person, for supporting the patient comfortably, yet securely on the support apparatus.

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**5,742,964**
**DOOR OPENING/CLOSING APPARATUS AND METHOD FOR A WASHING MACHINE**
**Ssi Chol Choi, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**
**Filed Oct. 30, 1996, Ser. No. 739,785**
**Claims priority, application DPR of Korea, Nov. 9, 1995, 95-40473**
**Int. Cl.[6] D06F** *33/02;39/14*
**U.S. Cl. 8—159** **18 Claims**

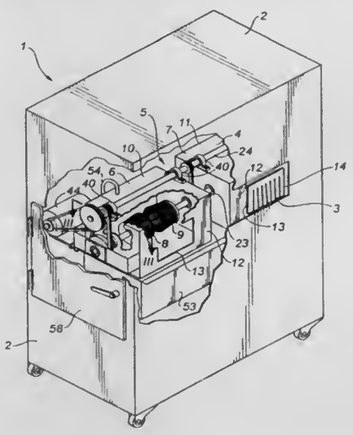



1. A door opening/closing apparatus in a washing machine, the apparatus comprising:
means for sensing an open state of a washing machine door;
means for sensing a closed state of said door;
means for supplying dynamic force to open and close said door;
means triggered by an external key operation for producing a door opening/closing command; and
means for determining a state of said door based on information supplied from each of said sensing means when a door opening/closing command is produced, and controlling the activation of said force-supplying means based on a result of the determination.

6. A door opening/closing method for a washing machine having an automatic door mechanism, the method comprising the steps of:
determining whether or not a door opening/closing demand exists;
sensing whether the door is opened or closed if the door opening/closing demand exists;
closing the door by driving a motor in the case when a door opened state is sensed while the door closed state is not sensed; and
opening the door by driving the motor in the case when a door opened state is not sensed while the door closed state is sensed.

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**5,742,965**
**GOLF CLUB HEAD CLEANER FOR WOODS AND IRONS**
**Ken J. Leask, 911 High Country Drive, High River, Canada, T1V 1E3**
**Filed Sep. 20, 1996, Ser. No. 717,154**
**Int. Cl.[6] A46B** *13/02;* **A63B** *57/00*
**U.S. Cl. 15—21.1** **4 Claims**



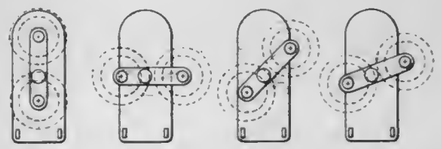
1. A golf club head cleaning apparatus comprising:
a structural housing forming first and second head-cleaning sections wherein each section has
a pair of facing brushes, a pair of rotating shafts having ends facing and spaced from each other, said brushes being cantilevered from the facing and spaced ends of said rotary shafts, said rotary shafts having axes are in-line, said brushes each having a backing disc, each backing disc having bristles which are mounted thereon which in a circular pattern along a periphery of the backing disc, the backing disc being centrally mounted on the shaft end, the bristles extending substantially axially outwards to a distal end defining a cup-shape, so that the facing brush's respective bristles extend toward each other, the distal ends of bristles of facing brushes being adjacent and spaced so as to form a gap between them, and
the first section having aggressive bristles and said facing brushes forming a narrow gap suitable for cleaning irons,
the second section having less aggressive bristles and said brushes forming a wider gap suitable for cleaning woods;
ports formed in the housing for permitting access and insertion of a wood or iron club head into the appropriate gap formed between brushes, the club being inserted substantially perpendicularly to the rotational axis of the brushes;
means for rotating the shafts;
means for circulating cleaning fluids to the brushes and collecting waste fluids; and



a cabinet having walls to completely enclose the housing and fluid circulation means, and having a port formed in one of the walls which aligns with the housing's access ports for permitting passage of the club head through to the cleaning sections.

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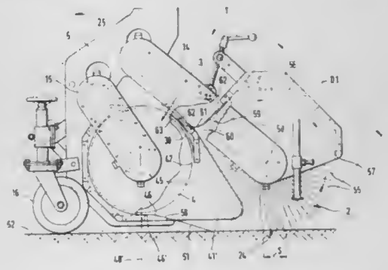
**5,742,966**
**FLOOR-CLEANING MACHINE PROVIDED WITH MOVABLE BRUSHES AND DRAGGING DISC**
**Gianni Tono, 11, via Locchi, Padova 35124, Italy**
**Filed Sep. 28, 1995, Ser. No. 535,820**
**Claims priority, application Italy, Oct. 5, 1994, PD940105 U; Dec. 2, 1994, PD94A0212; Feb. 21, 1995, PD95A0045**
**Int. Cl.[6] A47L** *11/16;11/283*
**U.S. Cl. 15—49.1** **3 Claims**



1. A floor cleaning machine having front, rear and opposite sides defining an outline of the machine, comprising:
a common support movably mounted to the machine;
at least two rotary brushes mounted to said common support about two spaced vertical axes of rotation;
a motor positioned in spaced relationship from said at least two rotary brushes on said common support;
said at least two rotary brushes and said motor being simultaneously movable with said common support, drive means for drivingly connecting said motor to said at least two rotary brushes; and said common support being moveable from a central position in which said at least two rotary brushes are inside of the outline of the floor cleaning machine to a lateral position in which at least one of said at least two rotary brushes extends outside of the outline of the floor cleaning machine.

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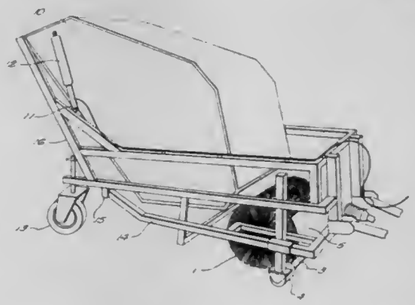
**5,742,967**
**UTILITY VEHICLE SWEEPING DEVICE**
**Matthias Giessler, Schlehenweg 8, 77933 Lahr, Germany**
**Filed Feb. 16, 1996, Ser. No. 602,314**
**Claims priority, application Germany, Feb. 18, 1995, 295 02 694 U**
**Int. Cl.[6] E01H** *1/05*
**U.S. Cl. 15—82** **20 Claims**



1. A sweeping device for utility vehicles for cleaning a traffic area, comprising:
a rotating bristle roller driven by a motor;
a protective housing covering said bristle roller on a top side;

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**5,742,968**
**APPARATUS FOR REMOVING DEBRIS FROM THE GROUND**
**David Nicholson, Near Downham Market, United Kingdom, assignor to Nicholson Farm Machinery Company Limited, United Kingdom**
**Filed Apr. 6, 1995, Ser. No. 417,851**
**Int. Cl.[6] E01H** *1/04*
**U.S. Cl. 15—83** **4 Claims**

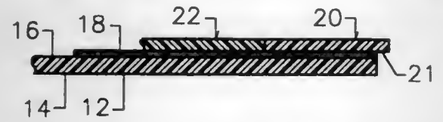


1. Apparatus for removing debris from the ground, the apparatus comprising:
a) a frame provided with ground engaging wheels;
b) a subframe pivotally mounted on said frame;
c) a brush carried on said subframe for rotational movement;
d) means for rotating said brush in a first direction;
e) a roller having ends carried generally parallel to said brush on said subframe for rotational movement;
f) means for rotating said roller in a direction counter to said first direction comprising second around engaging wheels supporting said ends of said roller; and
g) an arcuate guide carried on said subframe and disposed about said brush to guide debris carried by said brush.

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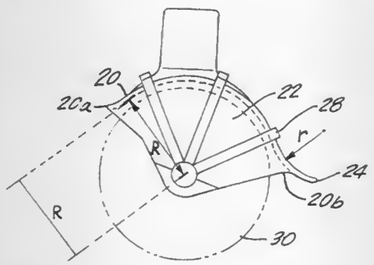
5,742,969
**DISPOSAL COMPACT APPARATUS FOR REMOVING LINT FROM CLOTHING**
**Andrew P. Thomas, 803 E. Jennifer Ct., Arlington Hts., Ill. 60004, and Mark J. Pociejewski, 710 E. Algonquin, Arlington Hts., Ill. 60005**
**Filed Sep. 25, 1996, Ser. No. 719,783**
**Int. Cl.[6] A46B** *15/00*
**U.S. Cl. 15—104.002** **7 Claims**




1. A device for removing loose particles from a fabric surface, comprising a thin flexible generally flat sheet having opposed faces, with a layer of sticky adhesive uniformly covering one of the faces while the other face is substantially plain, first and second quick release backer sheets together overlying and covering the adhesive layer on the sheet, the first backer sheet overlying and covering a portion of the adhesive layer on only a limited connection area adjacent only one end of the sheet and the second backer sheet overlying and covering the remainder of the adhesive layer on the rest of the sheet, the device in this flat configuration being suited for compact storage or carriage prior to use and being converted by a user from a flat configuration by first removing the first backer sheet to expose the adhesive layer at the connection area and then curling the sheet with the plain face on the inside and overlapping the plain face adjacent the opposite end of the sheet with the exposed adhesive layer to bond the opposite sheet ends together for defining a three-dimensional loop with the plain face on the inside thereof and sized generally to be fitted over the open hand and straightened fingers of the user, and then removing the second backer sheet to expose the remainder of the adhesive layer on the outside face of the three-dimensional loop suited to be patted or rolled against the fabric surface.

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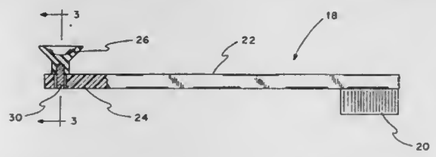
5,742,970
**COATER FOR APPLYING LIQUID**
**Michael Zurawin, New York, N.Y., assignor to AdamsBrush Mfg. Co. Inc., Ozone Park, N.Y.**
**Filed Nov. 27, 1996, Ser. No. 758,585**
**Int. Cl.[6] B05C** *17/02*
**U.S. Cl. 15—121** **7 Claims**




1. An improved coating apparatus, comprising:
(a) an elongated handle;
(b) a roller;
(c) an elongated frame to which said handle is attached and oriented transverse with respect thereto and wherein said frame comprises a single unitary body having opposite ends between which said roller is rotatably mounted, said frame further including a curved spatter shield extending between the ends thereof and corresponding to the shape of the roller, said curved spatter shield further having an edge extending between said ends, and a curved squeege member extending from the edge of said spatter shield along substantially the entire length thereof, the radius of curvature of said squeege member being less than the radius of curvature of said spatter shield and further wherein the curvature of the squeege member faces in a direction opposite that of the curvature of the spatter shield.

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5,742,971
**SUCTION CUP TOOTHBRUSH**
**Stephen Forrest Salinger, 134 Plumtree, Deerfield, Ill. 60015**
**Filed Nov. 30, 1995, Ser. No. 565,034**
**Int. Cl.[6] A46B** *9/04*
**U.S. Cl. 15—167.1** **2 Claims**



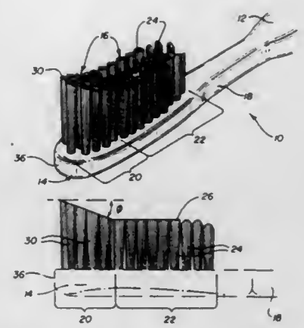

1. A toothbrush of integral construction, said toothbrush comprising a head portion and an elongated handle, said head portion having bristles at one end of said elongated handle, a vacuum cup attached near an opposite end of said elongated handle and on a side of said elongated handle opposite the bristles, and said vacuum cup being attached to said elongated handle by a swivel joint so that when said vacuum cup is used to store the toothbrush, said toothbrush hangs down under gravity in a vertical, sanitary position;
said swivel joint which attaches said vacuum cup to said elongated handle is selected from a group consisting of a rivet and a screw extending perpendicularly from the elongated handle, the toothbrush swinging freely to rotate about said selected one of said rivet and screw;
said selected one of said rivet and screw extends through said handle and terminates substantially in a plane of said elongated handle on a side opposite said vacuum cup in order to help keep said selected one of said rivet and screw clean and sanitary.

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5,742,972
**TOOTHBRUSH**
**William A. Bredall, Pacifica, Calif.; Miklos M. Breuer, Newton, Mass.; Ximena A. Gavino; Christopher Loew, both of San Francisco, Calif.; Jeffrey Scott Meessmann; Douglas J. McDowell, both of Iowa City, Iowa; Alberto B. Sabato, Atherton, Calif.; Jean L. Spencer, Boston, Mass.; James D. Vidra, Half Moon Bay, Calif., and Stanley Wreford, Boston, Mass., assignors to Gillette Canada Inc., Kirkland, Canada**
**Continuation of Ser. No. 573,735, Dec. 18, 1995, abandoned, which is a continuation of Ser. No. 409,616, Mar. 23, 1995, abandoned, which is a continuation of Ser. No. 970,327, Nov. 2, 1993, abandoned. This application Feb. 21, 1997, Ser. No. 803,704**
**Int. Cl.[6] A46B** *9/04*
**U.S. Cl. 15—167.1** **5 Claims**

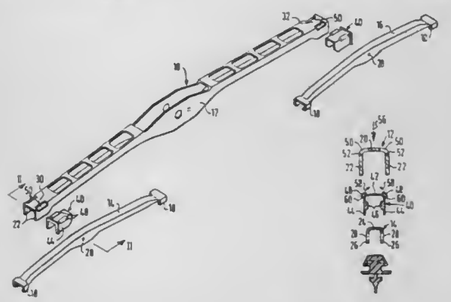
1. A toothbrush exhibiting interproximal and gingival margin cleaning comprising:
(a) an elongated handle member:
(b) an elongated head member connected to one end of the handle member comprised of a toe portion distal to the handle and a heel portion proximal to the handle and adjacent said toe portion;
(c) a multiplicity of bristles extending from the heel portion, the free ends of said bristles forming a longitudinally aligned concave groove which extends the entire length of the heel portion and wherein the free ends of the bristles of the heel portion proximal to said toe portion form a generally linear profile when viewed from the side; and
(d) a multiplicity of bristles extending from the toe portion, wherein the side profile view of the free ends of all of the bristles extending from the toe portion forms a generally linear surface which forms an obtuse angle relative to said generally linear profile of the free ends of the bristles extending from the heel portion proximal to said toe potion and wherein the side profile of said toe portion bristles results in a wedge shape with the tallest toe portion bristles being at the end of the head which is distal to said handle.






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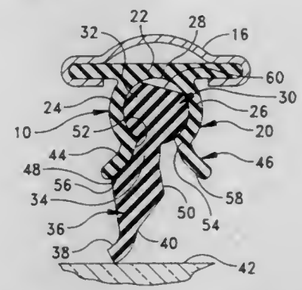
5,742,973
**WIPER APPARATUS FOR A WINDOW OF A MOTOR VEHICLE**
**Peter Kessler, Sasbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany**
**PCT No. PCT/DE95/00198, § 371 Date Aug. 14, 1996, § 102(e) Date Aug. 14, 1996, PCT Pub. No. WO95/23713, PCT Pub. Date Sep. 8, 1995**
**PCT Filed Feb. 17, 1995, Ser. No. 700,465**
**Claims priority, application Germany, Mar. 3, 1994, 44 07 050.0**
**Int. Cl.[6] B60S** *1/38*
**U.S. Cl. 15—250.46** **5 Claims**



1. A wiping apparatus for a windshield of motor vehicles, comprising a wiper blade having a multi-linked frame with an elongated upper bow of substantially U-shaped transverse cross-section defining a base interconnecting two legs, said frame also including elongated lower bows, each having bearing recesses therein, a wiping element placeable on the windshield and held by said lower bows, elastically deformable elongated hinge elements secured to opposite ends of said upper bow and dipping between said legs, said hinge elements being lockable within said upper bow and being U-shaped in transverse cross-section and also disposed between surfaces of said upper and lower bows facing each other, said hinge elements having inner hinge protrusions engaging said bearing recesses of said lower bows, respectively, said upper bow having a pair of openings in said base at each end located between said base and said legs, a pair of detent elements extending from each said hinge element and lockingly engaging through said pair of openings, respectively, in said base of said upper bow, said openings in said base extending to said legs so that limiting edges are formed on said legs to form counter-detent means for said detent elements, said detent elements extending from said hinge elements and having an outer surface extending in a longitudinal direction of said hinge element and said bows.

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5,742,974
**ARTICULATED WINDSHIELD WIPER BLADE ASSEMBLY**
**Peter H. Jeffer, New York, N.Y., and Michel Fernandes, E. Freetown, Mass., assignors to New-View Windshield Wiper, L.P., Freeport, N.Y.**
**Continuation-in-part of Ser. No. 708,669, Sep. 5, 1996, Pat. No. 5,644,814, which is a continuation-in-part of Ser. No. 634,346, Apr. 18, 1996, Pat. No. 5,572,764. This application Jan. 10, 1997, Ser. No. 781,277**
**Int. Cl.[6] B60S** *1/38;1/04*
**U.S. Cl. 15—250.361** **1 Claim**




1. An articulated twin spline windshield wiper assembly comprising:
a polymeric female spline including a planar backbone and two arcuate spline legs which depend from a lower side of the planar backbone in spaced symmetrical relation to define a cylindrical spline channel; and
an elastomeric male spline having a cylindrical body portion rotatably journaled within said spline channel of said female spline, said male spline further including a neck portion depending from the body portion, and a wiping portion depending from the neck portion, said wiping portion including opposing wiping edges which are alternately engagable with a surface to be wiped upon rotation of the male spline within the female spline channel, said male spline having a plane of symmetry extending through said body portion, said neck portion and said wiping portion, said body portion being truncated along a plane which extends substantially perpendicular to the plane of symmetry.

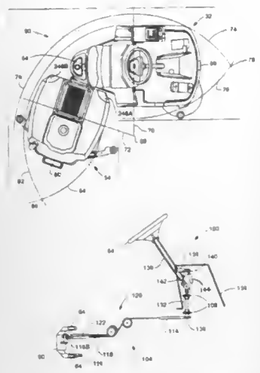
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5,742,975
**ARTICULATED FLOOR SCRUBBER**
**Christopher M. Knowlton, Pinehurst, N.C., and Robert J. O'Hara, Castle Rock, Colo., assignors to Windsor Industries, Inc., Englewood, Colo.**
**Filed May 6, 1996, Ser. No. 643,471**
**Int. Cl.[6] A47L** *11/293*
**U.S. Cl. 15—320** **76 Claims**

1. An articulated vehicle for cleaning a surface comprising:
a front portion that includes a front exterior surface;
a rear portion that includes a rear exterior surface;

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means for pivotally connecting said front portion and said rear portion;

a front set of wheels, operatively connected to said front portion, for use in moving said front portion over a surface;

a rear set of wheels, operatively connected to said rear portion, for use in moving said rear portion over a surface;

wherein said front set of wheels are all of the surface contacting, locomotion related wheels associated with said front portion, all non-steerable, and all incapable of supporting said front portion for rolling movement over a surface if said front portion is disconnected from said rear portion;

wherein said rear set of wheels are all of the surface contacting, locomotion related wheels associated with said rear portion, all non-steerable, and all incapable of supporting said rear portion for rolling movement over a surface if said rear portion is disconnected from said front portion;

steering means, operatively connected to said means for pivotally connecting, for causing pivotal relative movement between said front portion and said rear portion about a pivot point;

drive power means for applying rotational power to at least one wheel of said front and rear set of wheels;

brake means for decreasing the rotational velocity of at least one wheel of said front and rear set of wheels;

scrubbing means for scrubbing a surface as the vehicle moves over the surface; and

an operator station, operatively associated with said front portion, for accommodating an operator on the vehicle;

wherein said means for pivotally connecting includes an arm having a first arm end and a second arm end and in which said pivot point is located between said first arm end and said second arm end; and

said means for steering includes a cable means having a first cable end operatively connected to said first arm end and a second cable end operatively connected to said second arm end.

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**5,742,976**

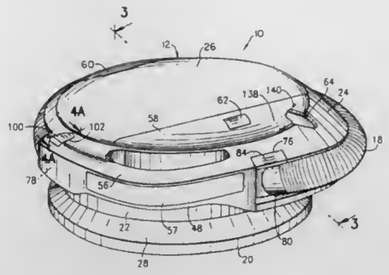
**HOLDING DEVICE FOR AN END OF A HOSE IN A VACUUM APPARATUS**

**Bernard L. Bensussen, Seymour, and Joseph Gelb, Jr., Milford, both of Conn., assignors to Black & Decker Inc., Newark, Del.**

**Filed Dec. 18, 1995, Ser. No. 574,064**
**Int. Cl.[6] A47L** *9/24*
**U.S. Cl. 15—323** **10 Claims**

**1**. In a vacuum apparatus having a housing, a motor, an impeller, a hose, and a latch removably holding an end of the hose to the housing, wherein the improvement comprises:

the latch comprising an oval one-piece member with a ring shaped section, said oval ring-shaped section being spread by contact with an outer surface of said hose as said hose is



placed into said ring-shaped section, at least a portion of said ring-shaped section moving into locking engagement with the outer surface of said hose, and an integral spring for ejecting the end of the hose from inside the ring-shaped section when the ring-shaped section is deformed when in locking engagement with the outer surface of said hose.

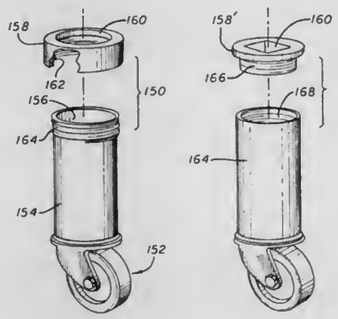
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**5,742,977**

**WHEELS FOR RESTAURANT AND INDUSTRIAL EQUIPMENT AND SHELVING**

**William J. Hoofe, III, P.O Box 5044, Newport Beach, Calif. 92662**

**Continuation-in-part of Ser. No. 542,894, Oct. 13, 1995, abandoned, which is a continuation-in-part of Ser. No. 150,587, Nov. 10, 1993, abandoned, which is a continuation of Ser. No. 886,036, May 20, 1992, abandoned, which is a continuation of Ser. No. 639,911, Nov. 10, 1991, abandoned. This application Feb. 7, 1997, Ser. No. 797,777**
**Int. Cl.[6] B60B** *33/00*
**U.S. Cl. 16—30** **10 Claims**



**1**. A wheel adapter that slips onto a leg of a piece of industrial equipment, comprising:

a wheel;

a socket attached to said wheel, said socket having a socket cavity; and,

a secondary adapter that is coupled to said socket, said secondary adapter having an opening that receives the leg and allows the leg to extend into said socket cavity, said opening being one of a plurality of different sizes to accommodate different size legs.

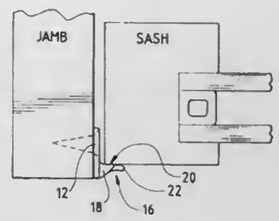


**5,742,978**

**CONCEALED SNUBBER**

**Gregory J. Vetter, Owatonna, Minn., assignor to Truth Hardware Corporation, Owatonna, Minn.**

**Filed Aug. 7, 1996, Ser. No. 694,500**
**Int. Cl.[6] E06B** *3/58*
**U.S. Cl. 16—220** **14 Claims**




**1**. A window snubber for maintaining a window sash in proper orientation relative to a window frame when closed relative thereto, comprising:

a flat metal base including securement means adapted for securing said base against a window frame;

a metal snubber flange integral with said base and extending substantially upright from said base, said flange having a side adapted to engage a window sash when closed relative to a window frame; and

supporting wings integrally formed with said base and said flange, said wings extending from opposite sides of said flange to integral connections to said base.

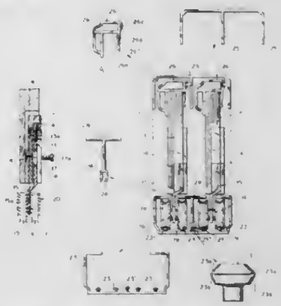
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**5,742,979**

**ROLLING SUPPORT AND GUIDE SYSTEM FOR SLIDING DOORS**

**Maria del Rosario Garcia-Hernando, Madrid, Spain, assignor to Rocio Aznar Escolano, Palma de Mallorca, Spain**

**Continuation of Ser. No. 140,166, Feb. 9, 1994, abandoned. This application May 23, 1996, Ser. No. 651,258**
**Claims priority, application Spain, Mar. 11, 1992, 9200544; WIPO, Mar. 9, 1993, PCT/ES93/00016**
**Int. Cl.[6] E05D** *15/00*; **E05F** *5/06*
**U.S. Cl. 16—95 R** **18 Claims**



**1**. A rolling support assembly for a sliding door wherein said door is of a predetermined thickness between opposed first and second faces and has peripheral edges including a lower edge, an upper edge, a leading edge and a following edge; a cavity defined in said door adjacent said lower edge and inward through said first face thereof to a depth less than the thickness of said door, said cavity terminating in an inner wall and having a restricted open lower end at said lower edge of said door, said cavity, at approximately mid-height upward from said lower end having a laterally restricted central portion defining upper and lower cavity sections laterally enlarged relative to said restricted central portion and said restricted lower open end, a carrier including a housing of a configuration conforming to that of said cavity and including upper and lower housing portions conforming to and receivable within said cavity sections, said housing further including a restricted intermediate area receivable within said restricted central portion of said cavity, said housing being receivable within said cavity solely through said first face of said door, said housing being precluded from longitudinal movement in said cavity and frictionally retained therein in a manner resisting free withdrawal laterally through said first face of said door for temporary retention of said carrier as an assist to positioning and fixedly mounting said carrier, said carrier further including a face plate rigid with said housing and receivable over said first face of said door upon engagement of said housing within said cavity, fastener means engageable through said face plate and into said door for a fixed mounting of said carrier, and a wheel set mounted on and vertically adjustable relative to said carrier and below said lower edge of said door.

**13**. A rolling support assembly for a sliding door, said support assembly including a carrier, a wheel set adjustably mounted to said carrier, and a track receiving and guiding said wheel set, said carrier being adapted for mounting to a lower edge portion of a door, said carrier including a housing with a face plate, said face plate having a lower edge, a recess defined in said face plate and opening through said lower edge, said wheel set including an adjusting stem longitudinally received and longitudinally adjustable within said recess, said stem projecting longitudinally beyond said recess and, below said face plate, being laterally offset and terminating in a lower linear extent paralleling said face plate, adjustment means for varying the vertical position of said stem and fixing said stem in selected vertically adjusted positions, said lower extent of said stem mounting a transverse axle with a pair of wheels mounted thereon, one to each side of said stem, said track including a pair of laterally spaced parallel wheel rails for receiving and guiding said wheels therealong, a second pair of wheel rails laterally spaced from and parallel to said first pair of wheel rails, an elongate support rail parallel to and centrally between said pairs of wheel rails, and a dust guard removably mounted to said support rail and extending vertically and laterally therefrom over an adjacent wheel rail of each pair of wheel rails at a height sufficient to accommodate a wheel therebelow.

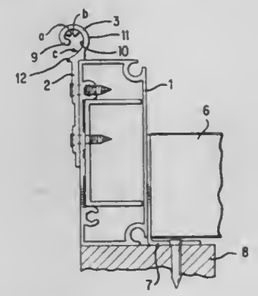
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**5,742,980**

**CONTINOUS HINGE FOR DOORS**

**Tomoharu Nitta, Sendai, Japan, assignor to Kabushikigaisha, ADD, Miyagi-ken, Japan**

**Filed Nov. 4, 1996, Ser. No. 743,357**
**Claims priority, application Japan, Nov. 13, 1995, 7-013463**
**Int. Cl.[6] E05D** *1/04*
**U.S. Cl. 16—355** **4 Claims**




**1**. A continuous hinge for a door and frame which allows a door to be opening 180° without forming a space between the door and the frame consisting of:

a female type base plate having a female type variable-diameter cylindrical portion which is to be attached to a box-like outer frame mounted on a house wall, and an integral door frame

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having a male type variable-diameter cylindrical portion which is formed integrally therewith and to be brought into slide-contact with an inner variable-diameter surface of said female type variable-diameter cylindrical portion, wherein said male type variable-diameter cylindrical portion has an outer perimetrical surface coincident with an inner variable-diameter perimetrical surface of said female type variable-diameter cylindrical portion consisting of a semicircle having a center, and two arcs which have progressively prolonged radii and having centers located at different points, and are successive or adjacent to said semicircle, and wherein said female type variable-diameter cylindrical portion is seam-assembled with said male type variable-diameter cylindrical portion.

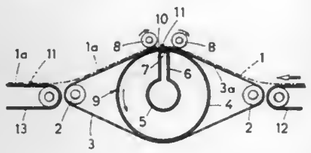
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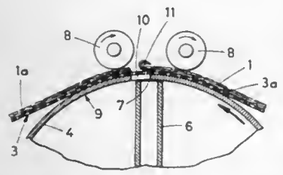
**5,742,981**

## DEVICE FOR DIVIDING A CARD WEB INTO LONGITUDINAL SECTIONS

**Ernst Fehrer, Auf der Gugl 28, A-4020 Linz, Austria**

**Filed Jul. 1, 1996, Ser. No. 674,202**
**Claims priority, application Austria, Jul. 7, 1995, 1156/95**
**Int. Cl.[6] D01G** *25/00*
**U.S. Cl. 19—151** **7 Claims**





1. A device for dividing a card web comprised of a loose structure of fibers into successive longitudinal sections, which comprises

(a) an air-permeable conveyor belt having a conveyor strand carrying the card web on one side thereof for conveying the card web in a conveying direction,

(2) a suction box arranged on a side of the conveyor strand opposite the one side, the suction box defining

(1) a suction slot extending transversely to the conveyor strand and facing the opposite side of the conveyor strand, and

(3) a screen arranged to close the suction slot and to open it periodically whereby suction is applied to the card web through the air-permeable conveyor belt and a respective one of the longitudinal sections is separated from the card web by sucking the fibers in alignment with the suction slot out of the card web.

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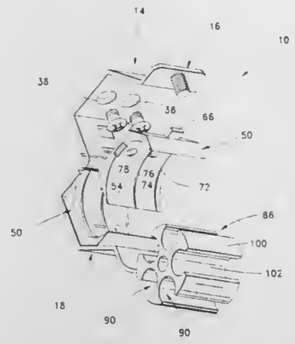
**5,742,982**

## CABLE STRAIN RELIEF APPARATUS

**Joseph K. Dodd, Lee's Summit, Mo.; J. D. Harvey, Trophy Club, Tex.; Mark D. Walters, Colleyville, Tex., and Kevin L. Morgan, Paradise, Tex., assignors to Siecor Corporation, Hickory, N.C.**

**Filed Nov. 25, 1996, Ser. No. 756,320**
**Int. Cl.[6] F16C** *1/10;* **F16L** *3/00*
**U.S. Cl. 24—16 R** **25 Claims**

1. A clamp for clamping a cable to a support, comprising:



a first clamp half having a base, a hinge portion, a forward portion and a securing portion, the base of said first clamp half having at least one hole therethrough to receive a securing fastener to fasten the clamp to the support;

a second clamp half having a base, a hinge portion, a forward portion and a securing portion;

the first and second clamp halves hinged together at their hinge portions and movable relative each other between an open and closed position; and

a member between said clamp halves, said member having a surface for strain relief engagement with said cable with the clamp halves in the closed position.

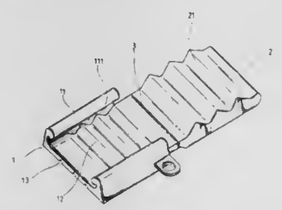
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**5,742,983**

## AIRTIGHT CLIP DEVICE FOR INFLATION NOZZLE OF AN AIR BAG

**Luke Lo, No. 9, Lane 34 Chin Men St., Taipei, Taiwan**

**Filed Nov. 16, 1995, Ser. No. 559,062**
**Int. Cl.[6] B65D** *77/10*
**U.S. Cl. 24—30.5 R** **4 Claims**



1. A clip device for the inflation nozzle of an airbag, said clip device comprising:

a) a clip seat having a top face, a bottom face, a pair of sides, a hook edge on each side, and a plurality of channels formed in the bottom face, the channels being parallel to the hook edges;

b) a clip board having a top face;

c) a plurality of first clip teeth formed on the top face of the clip seat and a plurality of second clip teeth formed on the top face of the clip board, the first and second clip teeth being correspondingly engageable together; and

d) a folding section connecting the clip seat and the clip board for permitting the clip board to fold into the clip seat and into engagement with the hook edges for airtightly clipping an inflation nozzle between the top faces of the clip seat and clip board.

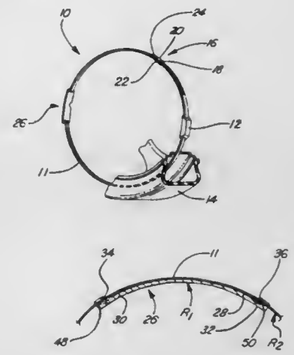


**5,742,984**

## STRAP TENSIONING APPARATUS

**Daniel Lee Baibak, Howell, and George Nicholas Villec, Ann Arbor, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.**

**Filed Oct. 7, 1996, Ser. No. 726,716**
**Int. Cl.[6] F16L** *33/02*
**U.S. Cl. 24—20 S** **4 Claims**



1. A strap tensioning apparatus comprising;

a tension strap having a first end and a second end opposite therefrom;

means for pulling said first end of said tension strap relative to said second end of said tension strap so as to apply a tension on said strap sufficient for said strap to attain a predetermined installed radius; and

an arcuate member having a first radius of curvature along a longitudinal axis unequal in an unloaded state than the installed radius of curvature of the installed strap;

first and second apertures disposed at opposite ends of said arcuate member, said first and second apertures being adapted to receive said strap therethrough; and

first and second protuberances protecting from said strap so as to engage first and second edges disposed at opposite ends of said arcuate member, said protuberances being adapted to retain said arcuate member in a predetermined position on said tension strap.

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**5,742,985**

## CLIP-ON CAMOUFLAGE OUTFIT ACCESSORY

**Christopher M. Larrabee, 107 N. Blake Rd. Apt. 205, Hopkins, Minn. 55343**

**Filed Dec. 23, 1996, Ser. No. 772,594**
**Int. Cl.[6] A41F** *1/00*
**U.S. Cl. 24—563** **4 Claims**

1. A new and improved clip-on camouflage outfit accessory comprising, in combination:

a base backing formed in a generally rectangular configuration with an upper surface and a lower surface, the base backing having two circular apertures extending therethrough, the base backing having a first end and a second end, the first end including an elongated semicircular clip release projecting upwardly therefrom, the second end including a generally semi-circular hinge member projecting upwardly therefrom;

a branch clip being formed in a generally arched configuration and having a first end, a second end, an upper surface and a lower surface, the first end of the branch clip being couplable to the clip release of the base backing, the second end of the branch clip being hingedly coupled to the hinge member of the base backing, the lower surface of the branch clip including a plurality of generally triangular grabbing teeth affixed thereto, in an operative orientation a user securing small branches of foliage with the branch clip; and



a safety pin being positioned through the apertures in the base backing, the pin having an upper region including foam backing affixed thereto, the pin being couplable to an item of camouflage clothing.

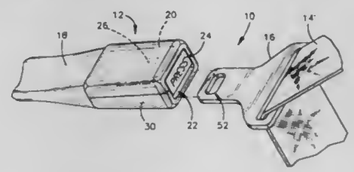
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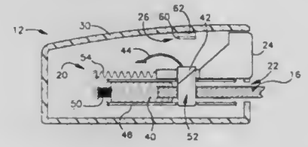
**5,742,986**

## SEAT BELT BUCKLE WITH HALL EFFECT LOCKING INDICATOR AND METHOD OF USE

**Steven G. Corrion, Oxford; Scott B. Gentry, Romeo, and Brian K. Blackburn, Rochester, all of Mich., assignors to TRW Inc., and TRW Vehicle Safety Systems Inc., both of Lyndhurst, Ohio**

**Filed Feb. 13, 1997, Ser. No. 800,263**
**Int. Cl.[6] A44B** *11/00;* **B60R** *21/00*
**U.S. Cl. 24—633** **13 Claims**





1. Apparatus comprising:

a latch mechanism which releasably interlocks with a seat belt tongue; and

a Hall effect assembly which has a first output if a seat belt tongue is not interlocked with said latch mechanism and a second, different output if a seat belt tongue is interlocked with said latch mechanism,

said Hall effect assembly including a Hall effect device and a source of a magnetic field which energizes said Hall effect device,

said latch mechanism including a magnetic part having a first position with a first effect on the flux density of said magnetic field and a second position with a second, different effect on said flux density,

said magnetic part moving from one of said positions to the other of said positions upon interlocking of a seat belt tongue with said latch mechanism.

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5,742,987

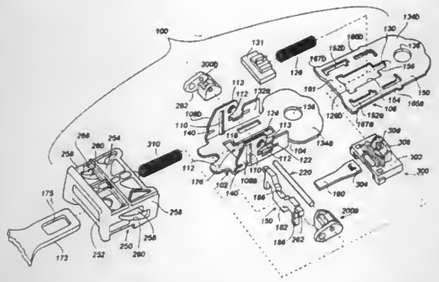
## BUCKLE FOR USE WITH A PRETENSIONER

**Michael A. Mikulec, Highland, Mich.; David Burke, Cumbria, England; Harjeet Gill, Ontario, Canada; Andrew Downie, Cumbria, England, and Tony Chamings, Royal Oak, Mich., assignors to AlliedSignal Inc., Morristown, N.J.**

**Filed Sep. 11, 1996, Ser. No. 712,064**

**Int. Cl.[6] A44B *11/26***

**U.S. Cl. 24—641** **5 Claims**



1. A seat belt buckle (**100**) operable with a pretensioner (**330**) connected thereto for moving the buckle a determinable distance to remove slack of the seat belt about an occupant, the buckle comprising:

a frame (**102**), adapted to be connected to the pretensioner (**330**), defining a tongue receiving opening (**170**) to receive a tongue (**173**) as the tongue is moved in a first direction, the frame having a first opening (**126***a*) therein, and opposing frame sides (**108***a,b*), each side including a latch plate slot (**110**) arranged generally perpendicular to the first direction and an arcuate slot (**112**), the arcuate slot (**112**) including a first portion (**112***a*) generally parallel to the latch plate slots (**110**) and a second portion (**113***a*) angled thereto,

a latch plate (**180**), having end portions (**186**) movable within the latch plate slots between an unlocked position a locked position in engagement with an opening within the tongue and with the first opening (**126***a*),

weight assembly means, pivotably connected to the latch plate to generate a force upon the latch plate during operation of the pretensioner tending to urge the latch plate into the first opening.

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5,742,988

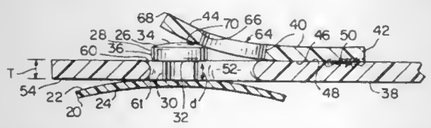
## QUICK-RELEASE PIN LATCH ASSEMBLY

**Thomas R. Swetish, Racine, Wis., assignor to Johnson Worldwide Associates, Inc., Sturtevant, Wis.**

**Filed Jun. 26, 1996, Ser. No. 670,586**

**Int. Cl.[6] A44B *17/00***

**U.S. Cl. 24—667** **15 Claims**



1. A quick-release latch assembly comprising:

a first rigid load supporting element including a body member and a load pin extending outwardly therefrom, the load pin having an enlarged head portion offset from the body member by a shank portion, the body member being an outwardly bowed pad; and

a second rigid load supporting element including a rigid, generally flat, thin, base plate and a flexible, elongate, generally flat, thin, latch plate, the latch plate rigidly anchored at one end thereof to the base plate thereby biasing the latch plate to a latching position, the base plate having an elongate opening for receiving the pin, the elongate opening being enlarged at one end for receiving the head portion of the pin therethrough and of reduced dimensions at an opposite end for receiving and establishing coupling engagement with the shank portion of the pin, the base plate radially supporting the pin, the latch plate having a retaining hole therein for receiving and establishing coupling engagement with the head portion of the pin, whereby the assembly is latched by inserting the pin through the enlarged end of the elongate opening to cause the latch plate to flex away from the base plate, and moving the pin toward the reduced end of the elongate opening until the head portion of the pin is received within the retaining hole of the latch plate and the latch plate resumes its biased latching position, and wherein loads are transferred radially between the pin of the first load supporting element and the base plate of the second load supporting element.

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5,742,989

## RIVET SETTING TOOL

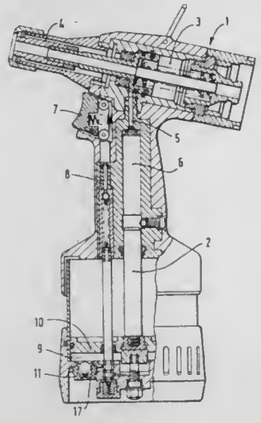
**Roman Subotsch, Am Heiligenhaus 30, D-65232 Taunusstein, Germany**

**Filed Mar. 18, 1996, Ser. No. 618,297**

**Claims priority, application Germany, Mar. 16, 1995, 295 04 316 U**

**Int. Cl.[6] B21J *15/22***

**U.S. Cl. 29—243.525** **14 Claims**



1. A rivet setting tool for setting a blind rivet member with a pulling pin arranged for axial movement in a pulling direction during a setting operation of said blind rivet member, comprising:

an actuating arrangement operable for upsetting said blind rivet member by imparting an axial movement to said pulling pin, said actuating arrangement including:

a piston-cylinder arrangement comprising:

a first cylinder containing substantially incompressible fluid,

a pressure piston movable in said first cylinder in a first direction for putting said substantially incompressible fluid under pressure and movable in a return direction opposite to said first direction,

a pneumatic actuation device for actuating said pressure piston,

a second cylinder,

a working piston movable in said second cylinder in said pulling direction by said substantially incompressible fluid for imparting axial movement to said pulling pin during said rivet setting operation and movable in a return direction opposite to said pulling direction after said rivet setting operation, and

a venting device for opening direct communication between said pneumatic actuation device and an exterior of said tool for escape of air from said pneumatic actuating device to said exterior of said tool during movement of said pressure piston and said working piston in their respective return directions.



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5,742,990

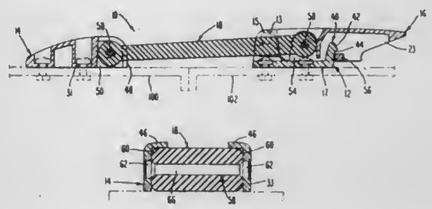
## FLEXIBLE DRAW LATCH ASSEMBLY METHOD

**Jeffrey L. Antonucci, King of Prussia, Pa., assignor to Southco, Inc., Concordville, Pa.**

**Division of Ser. No. 517,576, Aug. 21, 1995, Pat. No. 5,607,195. This application Nov. 6, 1996, Ser. No. 743,707**

**Int. Cl.[6] B23P *11/00***

**U.S. Cl. 29—434** **2 Claims**



1. A method of installing a pivot pin in a latch adapted for use in securing together a first closure member and a second closure member, the latch comprising:

a keeper adapted for being affixed to the first closure member; and

a latch assembly, the latch assembly comprising:

a base adapted for being affixed to the second closure member;

a substantially elastic latch body pivotally connected to the base, the latch body including two opposing surfaces at spaced separation defining a width of the latch body;

a lever pivotally connected to the latch body adapted for engaging the keeper, the lever being adapted to pivot from an open to a closed position when engaging the keeper for latching together the first and second closure members;

a pair of generally elongated attachment members for pivotally connecting the substantially elastic latch body to the base and to the lever, the latch body including a pair of apertures extending the width thereof for receiving said pair of generally elongated attachment members, wherein at least one of the pair of generally elongated attachment members comprises a pin member, wherein said pin member is generally elongated an amount greater than the width of the latch body and includes first and second areas of specified diameters proximate opposing ends thereof and a third area between and of a diameter less than that of the first and second areas, wherein at least one of said apertures through the latch body into which the pin member is received comprises a pin member aperture, wherein said pin member aperture is of a diameter less than that of the diameters of the first and second areas of the pin member, with the third area of the pin member being positioned within the pin member aperture through the latch body and the first and second areas being positioned outside of the pin member aperture and adjacent the two opposing surfaces thereof, the method comprising the steps of:

inserting a first end of said pin member within a first end of said pin member aperture in the latch body, wherein said first area of said pin member is proximate said first end; and

press fitting said pin member through said pin member aperture, wherein as said first area proximate said first end of said pin member passes through said pin member aperture, said diameter of said pin member aperture expands by said diameter of said first area of said pin member, wherein when said first area of said pin member is passed through said pin member aperture, said diameter of said pin member aperture decreases when said third portion of said pin member is positioned within said pin member aperture of said latch body.

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5,742,991

## METHOD FOR PRE-STRESSING BOLTS FOR CONNECTIONS, AND A DEVICE FOR EXECUTING IT

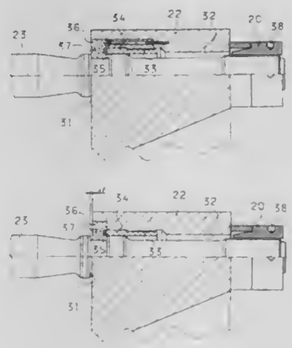
**Erhard Kurth, Edingen, Switzerland, assignor to Fahr Bucher GmbH, Gottmadingen, Germany**

**Filed Dec. 8, 1995, Ser. No. 569,600**

**Claims priority, application Germany, Dec. 8, 1994, 44 43 661.0**

**Int. Cl.[6] B21D *39/00***

**U.S. Cl. 29—452** **11 Claims**



1. A method for pre-stressing bolts for apparatus connections which, during operation of the apparatus, are stressed with tensile operational forces of a determinable magnitude by way of a force transfer element clamped between a support element and a stop, comprising the steps of

making a connection between the bolts and the support element that is able to withstand an applied load when stressed with the operational forces,

pre-stressing the connection with a tension force by way of the force transfer element to create a gap between the force transfer element and the stop,

closing said gap through operation of a filler element that is operatively associated with the force transfer element, and,

releasing the stress applied in the pre-stressing step.

5. A device for pre-stressing a bolt for apparatus connections, comprising:

at least one bolt;

a support element secured to the at least one bolt;

a stop operatively associated with said at least one bolt;

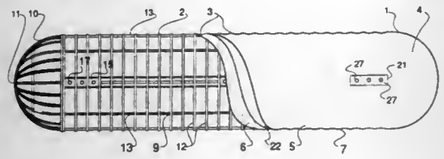
a force transfer element mounted on the at least one bolt, the force transfer element being positioned between the support element and the stop;

an insert operatively associated with the force transfer element on a side of the force transfer element facing said stop for closing, through operation of the insert, a gap created between the force transfer element and said stop during pre-stressing of the at least one bolt by way of the force transfer element.

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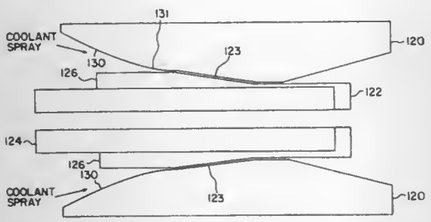
5,742,992
**METHOD FOR MAKING COMPOSITE DOUBLE-WALL UNDERGROUND TANK STRUCTURE**
**Charles E. Kaempen, Orange, Calif., assignor to Charles R. Kaempen, Alta Loma, Calif.**
**Division of Ser. No. 271,362, Jul. 6, 1994, Pat. No. 5,590,803. This application Feb. 26, 1996, Ser. No. 606,604**
**Int. Cl.[6] B21D** *39/00*
**U.S. Cl. 29—455.1** **2 Claims**



1. A method for fabricating a multiple wall tank structure comprising the steps of:
forming a metal frame with at least one outlet fitting plate;
surmounting said metal frame, at least partially, with an impermeable non-metallic primary container including a chemically resistant multiple-ply laminate structure, said primary container including at least one primary outlet panel disposed in registration with, and bonded to said at least one outlet fitting plate;
surmounting said primary container, at least partially, with an impermeable non-metallic secondary container including a chemically resistant multiple-ply laminate structure, said secondary container including at least one secondary outlet panel disposed in registration with, and bonded to said at least one primary outlet panel, whereby said at least one outlet fitting plate, said at least one primary outlet panel and said at least one secondary outlet panel forming a corresponding at least one pressure-resistant outlet seal;
forming a space between said primary and secondary containers; and
providing said secondary container with an annulus access conduit opening for enabling said space between said primary and secondary containers to be connected by said conduit to the atmospheric pressure.

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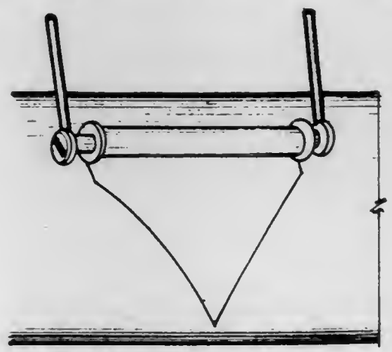
5,742,993
**METHOD FOR MAKING HOLLOW WORKPIECES**
**Tyzh-Chiang Sun, Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Pleasanton, Calif.**
**Continuation-in-part of Ser. No. 553,080, Nov. 3, 1995. This application Aug. 15, 1996, Ser. No. 698,503**
**Int. Cl.[6] B22D** *21/00*
**U.S. Cl. 29—527.5** **17 Claims**




1. A method for making hollow workpieces with a circular die comprising:
(a) forming a strip of an aluminum alloy into a cup for the manufacture of a hollow workpiece; and
(b) passing the cup through at least two dies to iron the walls of the cup and thereby lengthen the side walls of the cup to reduce their thickness with at least one die having a die angle of less than about 6°, and a chamfer angle of less than about 35 degrees.

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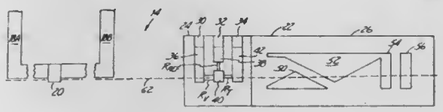
5,742,994
**PIPE WRAP REMOVAL TOOL**
**Charlie A. McDaniel, P.O. Box 42254, Las Vegas, Nev. 89116**
**Filed May 28, 1996, Ser. No. 653,049**
**Int. Cl.[6] B23P** *17/00*
**U.S. Cl. 29—566.1** **7 Claims**



1. An instrument for the cutting, loosening, and removal of a long, even strip of material from a surface to which said material is adhering, comprising:
a generally cylindrical shaft having two ends and an elongated aperture generally centered between said ends for receiving and securing an end of said strip therein;
two cutting discs, each said cutting disc mounted on said shaft proximate an end of said shaft; and
two female drive couplings, each machined into a respective end of said shaft, each of said drive couplings being configured to accept a male drive ratchet as means for controllably conveying one-way rotational movement to said shaft.

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5,742,995
**METHOD TO PREDICT AN ACCURATE MR SENSOR DIMENSION WHEN VIEWED FROM ABS**
**Nurul Amin, Burnsville; Lance E. Stover, Eden Prairie; Richard P. Larson, Brooklyn Park, and Gregory S. Mowry, Burnsville, all of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.**
**Filed May 24, 1996, Ser. No. 653,617**
**Int. Cl.[6] G11B** *5/42*
**U.S. Cl. 29—603.1** **17 Claims**



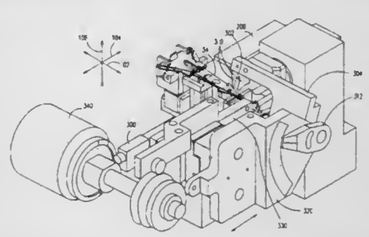
1. A method of determining a height of a magnetic sensor, the sensor formed from a magnetoresistive material and having an air bearing surface, the method comprising:
determining a pre-wafer processing width of a base of a first triangle at an air bearing surface, the first triangle formed of magnetoresistive material;
determining a pre-wafer processing width of a top of a second triangle at an air bearing surface, the second triangle formed of magnetoresistive material;



wafer processing the magnetic sensor, the first triangle and the second triangle;
simultaneously lapping the air bearing surface of the magnetoresistive sensor, the base of the first triangle and the top of the second triangle;
determining a post-lapping width of the base of the first triangle at the air bearing surface;
determining a post-lapping width of the top of the second triangle at the air bearing surface; and
calculating the height of the magnetic sensor through use of the pre-wafer processing widths and the post-lapping widths at the air bearing surfaces of the base of the first triangle and the top of the second triangle.

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5,742,996
**METHOD OF MANUFACTURING A TRANSDUCER SUSPENSION SYSTEM**
**Norman Kermit Frater, San Jose, Calif.; David Gerson, Chapel Hill, N.C.; Gary L. Heitkamp, Plymouth, Minn.; Thomas Mark Hoffmann, Santa Cruz, Calif.; John Philip Hollowell, Fremont, Calif.; Peter William Kanas, San Jose, Calif.; Oscar Jaime Ruiz, San Jose, Calif., and Enrique Eduardo Sanicky, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**
**Filed Jan. 3, 1996, Ser. No. 582,288**
**Int. Cl.[6] G11B** *5/48;21/16*
**U.S. Cl. 29—603.06** **9 Claims**

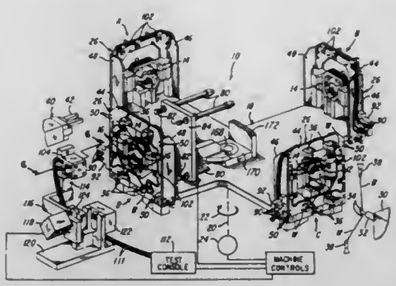


1. A method of manufacturing a transducer suspension system comprising the steps of:
attaching a plurality of wires to a surface of a transducer suspension at a plurality of attachment spots, the wires running in a direction substantially parallel to the longitudinal axis of the suspension;
electrically connecting the wires to electrical pads on a transducer slider attached to the suspension;
moving a swipe member in a direction substantially parallel to a lateral axis of the suspension, engaging the wires and bending them down onto the surface of the suspension, wherein the swipe member has two fingers, each of which engage a different portion of the wires.

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5,742,997
**STATOR MANUFACTURING METHOD**
**John M. Beakes, Fairborn, and Lawrence E. Newman, Tipp City, both of Ohio, assignors to Globe Products Inc., Huber Heights, Ohio**
**Continuation of Ser. No. 473,084, Jun. 7, 1995, abandoned, which is a division of Ser. No. 219,847, Mar. 30, 1994, Pat. No. 5,495,659. This application Feb. 20, 1997, Ser. No. 802,525**
**Int. Cl.[6] H02K** *15/085*
**U.S. Cl. 29—596** **8 Claims**

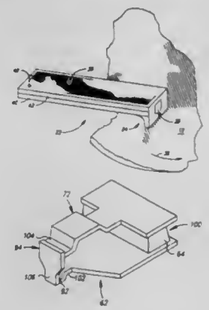
1. A stator manufacturing method comprising the steps of:
supporting a stator core on a support member at a winding station;




winding coils of insulated magnet wire onto said stator core while inserting coil lead wires extending to and from said coils between a fixed jaw and a movable jaw of respective temporary wire clamps supported in fixed relation to said support member, said pivotal jaws being spring biased to grip said lead wires;
transferring said support member with said stator supported thereon along with said temporary wire clamps from said winding station into a coil lead terminating station;
attaching said lead wires to stator terminals or terminal supports at said coil lead terminating station; and
moving said movable clamp jaws away from said fixed clamp jaws by engaging said movable clamp jaws by air actuators located adjacent said coil lead terminating station.

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5,742,998
**METHOD OF MAKING INTEGRATED SUSPENSION MAGNETIC HEAD STRUCTURES FOR LONGITUDINAL RECORDING**
**Robert Edward Jones, Jr., San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.**
**Divisions of Ser. No. 467,194, Jun. 6, 1995, Pat. No. 5,655,286, which is a division of Ser. No. 252,147, Jun. 1, 1994, Pat. No. 5,486,963, which is a continuation of Ser. No. 932,826, Aug. 19, 1992, abandoned. This application Feb. 27, 1997, Ser. No. 807,163**
**Int. Cl.[6] G11B** *5/127;5/105*
**U.S. Cl. 29—603.14** **5 Claims**



1. A method for making a combination thin film magnetic head transducer and suspension system comprising the steps of:
obtaining a wafer substrate;
forming a sloping contact region on said obtained substrate;
forming a release layer on said obtained substrate;
forming a first pole piece of a magnetic material on said formed release layer and said contact region;
forming a patterned backgap member on said formed first pole piece;
forming a wear resistant layer on said formed first pole piece extending along a distance for a suspension section;

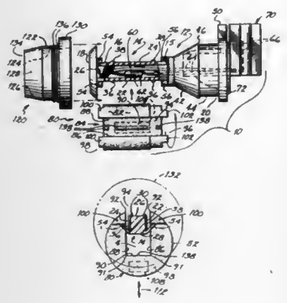
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forming a magnetic and electrical isolation layer on said formed wear resistant layer covering at least said first pole piece layer and extending along the distance for the suspension section as a first suspension layer;
forming a first one-half of a thin film coil of an electrically conductive material on said formed isolation layer;
forming a first electrical insulating layer covering at least said formed one-half of the thin film coil;
forming a horizontal section of a patterned second pole piece layer of a magnetic material on said formed insulating layer;
forming a second electrical insulating layer covering at least said patterned second pole piece layer;
forming a second one-half of the thin film coil of an electrically conductive material on said formed second electrical insulating layer and electrically connected to said first one-half to form a complete coil;
forming a magnetic and electrical isolation layer on said formed second one-half of the thin film coil and extending the distance for the suspension section as a second suspension layer;
forming a magnetic gap layer of a magnetically insulating material on a free end of the assembly produced by the forming steps and covering the end of said formed first pole piece layer opposite to said formed backgap layer;
forming a vertical section of the patterned second pole piece layer of a magnetic material on said formed magnetic gap layer;
forming a covering protective layer over said formed pole piece vertical section; and
releasing the substrate from said formed contact pad layer and said formed first pole piece layer by dissolving the release layer.

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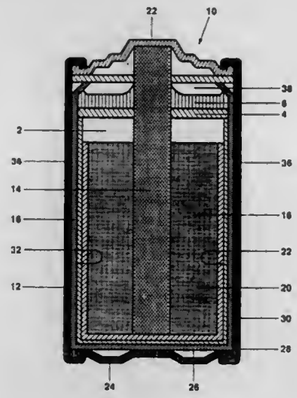
**5,742,999**
**METHOD OF ASSEMBLING SIDE-MOUNTABLE LIQUID LEVEL SENSOR ASSEMBLY**
**Edward Gomez, Jr., Douglas, Ariz., assignor to Standex International Corporation, Salem, N.H.**
**Division of Ser. No. 108,047, Aug. 17, 1993, Pat. No. 5,581,062. This application Apr. 23, 1996, Ser. No. 636,285**
**Int. Cl.[6] H01H** *11/00;* **B23P** *11/02;11/00*
**U.S. Cl. 29—622** **18 Claims**



7. A method of manufacturing a side-mountable liquid level sensor having (a) a rod-like member held to a support such as to be in a generally horizontal disposition when the sensor is side-mounted to a liquid container, the rod-like member having left and right sides and top and bottom sides, and (b) a buoyant member having a slot extending therein from one end thereof, the slot being defined by a pair of sides spaced apart to receive the rod-like member therebetween with the left and right sides of the rod-like member juxtaposed to the slot sidewalls whereby to allow the buoyant member to move laterally relative to the rod-like member depending upon liquid level in the liquid container, the method comprising:
associating a switch actuator with the buoyant member;
receiving a resilient grommet on the support surface;
providing an opening along the slot and through a portion of a peripheral outer wall sized to receive the rod-like member laterally therethrough and into the slot;
providing the buoyant member with a projection;
providing the rod-like member with a portion positioned to confront the projection of the buoyant member;
positioning the buoyant member such that the slot opening is directed at one of the top and bottom sides of the rod-like member with the projection bearing against the confronting rod-like member portion;
providing relative motion between the rod-like member and the buoyant member to cause the projection to snap over the confronting rod-like member portion such that the rod-like member passes laterally into the slot to bring the sides of the slot into juxtaposition with the left and right sides of the rod-like member whereby the projection and confronting rod-like portion cooperate to prevent the rod-like member from passing back out of the slot through the slot opening.

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**5,743,000**
**METHOD OF MAKING A REDUCED ENVIRONMENTAL HAZARD LECLANCHE CELL HAVING IMPROVED PERFORMANCE**
**Ronald J. Ekern, Verona; Miguel E. Armacanqui, and Janna L. Rose, both of Madison, all of Wis., assignors to Rayovac Corporation, Middleton, Wis.**
**Division of Ser. No. 526,762, Sep. 11, 1995, which is a continuation-in-part of Ser. No. 275,019, Jul. 13, 1994. This application May 13, 1996, Ser. No. 648,639**
**Int. Cl.[6] H01M** *6/08*
**U.S. Cl. 29—623.2** **10 Claims**

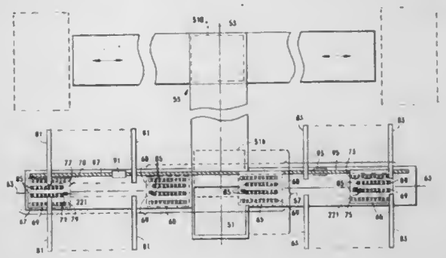


1. A method of making a Heavy Duty LeClanche cell, comprising the steps of:
(a) selecting a cathode material comprising manganese dioxide;
(b) selecting an electrolyte comprising zinc chloride as a primary component;
(c) selecting a zinc anode configured for use in the cell;
(d) selecting a cathode current collector comprising carbonaceous material;
(e) selecting an ionically permeable separator having first and second major opposing surfaces, and comprising a Kraft paper substrate and a coating on the substrate, the coating being selected for an ability to inhibit corrosion of the zinc anode and comprising an organic inhibitor, an inorganic inhibitor, a binding agent, and a starch;
(f) placing the first surface of the separator propinquant to the anode;
(g) placing the cathode material propinquant to the second surface of the separator;
(h) placing the cathode current collector propinquant to the cathode material;
(i) wetting at least one of the anode, the separator and the cathode material with the electrolyte, and
(j) sealing the cell to at least inhibit the ingress of air therein.



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**5,743,001**
**SURFACE MOUNT PLACEMENT SYSTEM WITH SINGLE STEP, MULTIPLE PLACE CARRIAGE**
**Stuart Baker, Santa Ynez, and George Michael Wohlhieter, Escondido, both of Calif., assignors to Amistar Corporation, San Marcos, Calif.**
**Filed Aug. 16, 1996, Ser. No. 699,131**
**Int. Cl.[6] H05K** *13/30;13/02;13/04;13/08*
**U.S. Cl. 29—740** **37 Claims**



1. A surface mount placement system, comprising:
a placement support location for receiving a substrate for placement of components thereon;
a carriage;
a means for causing relative movement between the placement support location and the carriage;
two or more groups of component holder mechanisms mounted on the carriage, each group of the two or more groups being positionable independently on the carriage with respect to each other group of the two or more groups and each group of the two or more groups including a plurality of component holder mechanisms;
each component holder mechanism of each group of the two or more groups being rotatable on the carriage independently of each component holder mechanism of each other group of the two or more groups; and
each component holder mechanism of each group being moveable on the carriage along a Z axis that is substantially orthogonal to the placement support location.

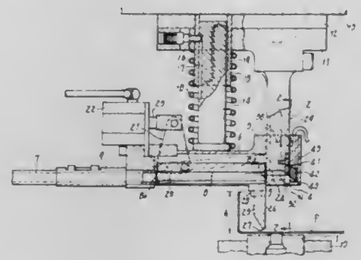
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**5,743,002**
**ELASTIC PART HOLDER FOR USE IN MOUNTING APPARATUS**
**Takashi Ito, Yokkaichi-cho; Tomoji Niwa, and Shigeharu Nakahira, both of Yokkaichi, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan**
**Filed Aug. 16, 1995, Ser. No. 516,012**
**Claims priority, application Japan, Sep. 12, 1994, 6-217550**
**Int. Cl.[6] B23P** *19/04*
**U.S. Cl. 29—754** **7 Claims**

1. A holder for an elastic part having both an opening therein into which an elongated element is to be inserted in a downstream insertion direction, and a gripped portion at which said elastic part is adapted to be held,
said holder comprising a contact holding portion adapted to embrace said gripped portion, said contact holding portion comprising a gripping portion and a deformation permitting portion adapted to accommodate radially outward deformation of said elastic part resulting from insertion of said elongated element into said opening, said deformation permitting portion comprising an annular groove in an inner surface of said holder, said gripping portion comprising an upstream holding portion adjacent said annular groove and a downstream holding portion adjacent said annular groove, said annular groove being between said upstream holding portion and said downstream holding portion.

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**5,743,003**
**APPARATUS FOR INTERMITTENT FEED AND AUTOMATIC FIXING OF THE SELF PIERCING NUTS**
**Hiroshi Shinjo, Osaka, Japan, assignor to Yugenkaisha Shinjo Seisakusho, Osaka, Japan**
**Filed Jun. 14, 1996, Ser. No. 663,943**
**Claims priority, application Japan, Jun. 21, 1995, 7-179341**
**Int. Cl.[6] B23P** *19/06*
**U.S. Cl. 29—798** **2 Claims**



1. An apparatus for intermittent feed and automatic fixing of the self-piercing nuts onto a metallic panel, the apparatus comprising:
a caulking die for supporting the metallic panel;
a striking punch connected by a connecting member to a press ram so as to face the caulking die;
a slide guide having a vertical bore and a nut feeding aperture extending perpendicular thereto;
the striking punch being capable of sliding up and down through the vertical bore;
a flexible chute connected to the slide guide and communicating with the nut feeding aperture;
a supporting device for holding and allowing the slide guide to slide up and down a vertical distance relative to the connecting member;

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the supporting device biasing the slide guide downwardly by a spring means such that the self-piercing nut having entered the vertical bore through the feeding aperture is struck by the punch so as to bite or punch and be secured to the metallic panel;

a rigid frame to which the slide guide is fixed;

a movable chute having a distal opening communicating with the feeding aperture and a proximal opening communicating with the flexible chute;

the movable chute being held in and connected to the rigid frame; and

an actuator mounted on the rigid frame so as to drive the movable chute to swing between an operative and inoperative positions thereof relative to the slide guide, whereby the distal opening of the movable chute is partially closed with a side face of the striking punch or of the slide guide every time when the movable chute swings to its inoperative position.

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**5,743,004**

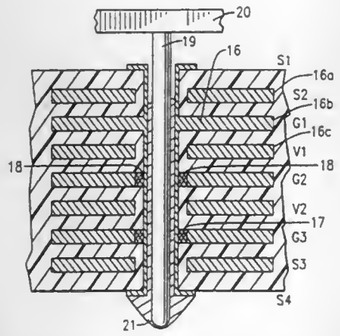
## METHOD OF FORMING ELECTRONIC MULTILAYER PRINTED CIRCUIT BOARDS OR CARDS

**Ivan Ivor Chobot, Whitby, Canada; John Arthur Covert, Binghamton; Randy Lee Haight, Waverly, both of N.Y.; Keith David Mansfield, New Milford, Pa.; Donald Wayne Miller, Newark Valley, N.Y.; Reinaldo Anthony Neira; Alexander Petrovich, both of Endicott, N.Y.; Paul Camilo Sviedrys, Great Neck, N.Y.; Louise Ann Tiemann, Endwell, N.Y.; Gerald Arthur Valenta, Haw River, N.C., and Thurston Bryce Youngs, Jr., Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 303,711, Sep. 9, 1994, Pat. No. 5,473,813, which is a division of Ser. No. 50,589, Apr. 22, 1993, Pat. No. 5,363,280. This application Jul. 21, 1995, Ser. No. 505,076**

**Int. Cl.[6] H05K** *3/36*

**U.S. Cl. 29—830** **20 Claims**




1. A method of forming a multi-layer circuit board or card, said method comprising the steps of:

a). forming a plurality of conductive planes, said conductive planes including ground, signal, or power planes;

b) forming a plurality of through holes through at least one of said conductive planes;

c) depositing an electrically conductive material onto an inside surface of said through holes to form plated through holes;

d) forming at least one unplated thermal relief passage in at least one of said conductive planes, said thermal relief passage preventing the diffusion of heat throughout said circuit board or card during the securing or removal of at least one pin attached to at least one component affixed to said circuit board or card, said at least one thermal relief passage located in the vicinity of at least one of said plated through holes and being free from electrical connection therewith;

e) depositing an electrically insulating material on at least one side of each of said conductive planes;

f) placing said conductive planes on top of each other such that a layer of electrically insulating material is located between each of said conductive planes; and

g) joining said conductive layers together to form said multilayer circuit board or card.

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**5,743,005**

## COMPONENT MOUNTING APPARATUS AND METHOD

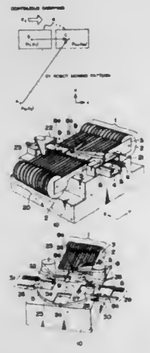
**Osamu Nakao, Moriguchi; Masanori Yasutake, Hirakata; Wataru Hirai, Osaka, and Makoto Kawai, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co, Ltd., Kadoma, Japan**

**Continuation of Ser. No. 266,659, Jun. 28, 1994, abandoned. This application Aug. 9, 1996, Ser. No. 700,755**

**Claims priority, application Japan, Jun. 28, 1993, 5-155947**

**Int. Cl.[6] H05K** *3/30;13/02;13/04;13/08*

**U.S. Cl. 29—833** **14 Claims**



1. A component mounting apparatus for mounting components on to-be-mounted positions of works, comprising:

a carrying device for continuously and successively transporting the works into a work area; and

a first component-mounting device for picking up one component from component supply units in a first component supply section and mounting the picked-up component on the to-be-mounted position of one of the works while said one of the works being successively transported in the work area, wherein motion of the works being successively transported in the work area by said carrying device is continuous.

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**5,743,006**

## METHOD FOR FABRICATING A FOCAL PLANE ARRAY FOR THERMAL IMAGING SYSTEM

**Howard R. Beratan, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 368,066, Jan. 3, 1995, Pat. No. 5,644,838. This application Jun. 7, 1995, Ser. No. 485,957**

**Int. Cl.[6] H01L** *31/0264;* **H05K** *3/10;3/34*

**U.S. Cl. 29—840** **16 Claims**

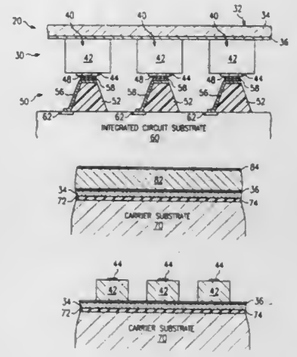
1. A method of fabricating a focal plane array having a plurality of thermal sensors for use with a hybrid thermal imaging system comprising the steps of:

forming a layer of optical coating on a carrier substrate;

depositing a first layer of electrically conducting material on the optical coating layer;

forming a film layer of pyroelectric material on the first layer of electrically conductive material by mixing particles with liquid pyroelectric material to provide nucleation sites for growing the film layer, wherein the pyroelectric material is selected from the group consisting of lead titanate, lead lanthanum titanate, lead zirconate titanate, lead strontium titanate, lead






scandium tantalate, barium strontium titanate, and lead lanthanum zirconate titanate;

forming a second layer of electrically conducting material on the pyroelectric film layer opposite from the first layer of electrically conducting material; and

patterning the pyroelectric film layer to correspond with the desired location and configuration of the associated thermal sensors.

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**5,743,007**

## METHOD OF MOUNTING ELECTRONICS COMPONENT

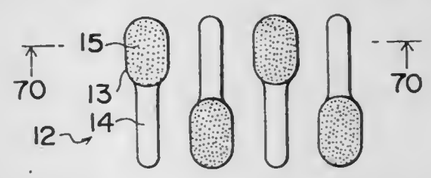
**Hiroaki Onishi, Higashiosaka; Haruto Nagata, Sakai; Masato Hirano, Osaka, and Kenichiro Suetsugu, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Filed Jan. 17, 1996, Ser. No. 587,461**

**Claims priority, application Japan, Jan. 17, 1995, 7-004785**

**Int. Cl.[6] H05K** *3/34*

**U.S. Cl. 29—840** **14 Claims**




1. A method of mounting an electronics component on a board comprising:

providing a board having lands corresponding to leads of an electronics component, the lands being arranged in parallel to each other;

forming a solder resist layer between the lands on the board;

applying solder paste on a portion of each land by using a stencil so that the portion of the applied solder paste is staggered among the lands; and

placing an electronics component on the board so that leads thereof are positioned on the lands, and performing reflow soldering of the leads to the lands with the solder paste in a nitrogen environment;

wherein a contour of the solder paste applied on each of the lands has a width wider than that of the land, but narrower than a distance between two of the lands which are positioned adjacent to each other.

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**5,743,008**

## METHOD FOR CORRECTING INCOMPLETE TERMINAL INSERTION

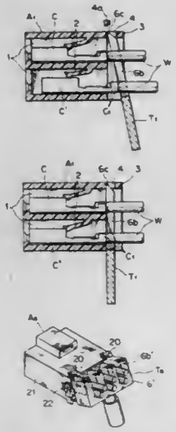
**Takayoshi Endo; Masanori Tsuji, and Motohisa Kashiyama, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan**

**Filed Feb. 21, 1996, Ser. No. 604,721**

**Claims priority, application Japan, Feb. 23, 1995, 7-035378; Jul. 21, 1995, 7-185892**

**Int. Cl.[6] H01R** *43/20;43/22*

**U.S. Cl. 29—842** **1 Claim**



1. A connector engagement correcting method for correcting an incomplete insertion of a terminal inserted into a connector housing, wherein said terminal is received in a terminal accommodating chamber in said connector housing and locked by a resilient locking piece provided in said chamber on completion of an insertion of said terminal, said method comprising the steps of:

inserting a tip end of an inserted position correcting jig into an opening formed in a peripheral wall which is provided extendedly from a rear end of said connector housing;

shifting said inserted position correcting jig toward said connector housing so as to fit said inserted position correcting jig with a rear end portion of said terminal which is in an incompletely inserted state;

pushing said terminal to a completely inserted position thereof; and

forcibly activating a correcting operation checking member, formed with a thin portion extending into said opening, to change an external appearance of said opening for checking perfect correcting operation.

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**5,743,009**

## METHOD OF MAKING MULTI-PIN CONNECTOR

**Kiyoshi Matsui; Takayuki Ono, both of Hadano; Kenichi Kasai, Ushiku; Tsutomu Imai, Hadano; Morio Suzuki, Hadano; Hideyuki Fukasawa, Hadano; Mitugu Shirai, Hadano; Toshitaka Murakawa, Hadano; Takeji Siokawa, Kanagawa-ken, and Takeshi Kuroda, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 4, 1996, Ser. No. 627,459**

**Claims priority, application Japan, Apr. 7, 1995, 7-082289; Jun. 28, 1995, 7-162133**

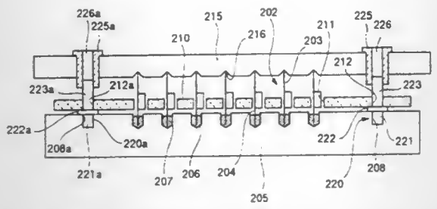
**Int. Cl.[6] H01R** *9/06*

**U.S. Cl. 29—843** **22 Claims**

1. A method of manufacturing a multi-pin connector for mounting other boards or electronic parts on a main board, comprising the steps of: forming a plurality of bottomed, contact pin connection holes in an upper surface of the main board; filling solder paste in the connection holes; placing a contact pin arraying jig on

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the main board; disposing a plurality of contact pins in the connection holes through the arraying jig; and soldering the contact pins to the connection holes.

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**5,743,010**

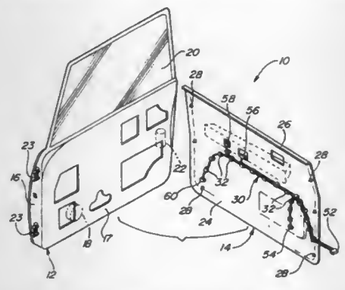
**WIRE HARNESS ASSEMBLY ON TRIM PANEL**

**Alex Zaguskin, Farmington Hills, and Robert Szudarek, Warren, both of Mich., assignors to UT Automotive Dearborn, Inc., Dearborn, Mich.**

**Filed Jul. 24, 1996, Ser. No. 687,133**

**Int. Cl.[6] H01R *43/00*; B60J *5/00***

**U.S. Cl. 29—857** **12 Claims**



8. A method of assembling electrical wires to a vehicle trim panel to a structural frame of a vehicle comprising the steps of:

forming a structural frame having an inner surface;

forming a trim panel having an outer surface adapted to overlie the inner surface of the frame;

positioning a plurality of electrical devices in the frame and the trim panel;

forming wire routing elements on the outer surface of the trim panel;

individually and sequentially securing a plurality of electrical wires along the routing elements to the electrical devices, with at least a plurality of said electrical wires being routed and secured within at least one of said wire routing elements, to eliminate the need for a prefabricated wiring harness; and

attaching the outer surface of the trim panel to the inner surface of the frame.

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**5,743,011**

**PROCESS OF MANUFACTURING VEHICLE MANIFOLDS**

**Devere Carl Dickerson, Hamburg, and Brian Stephen Anderson, Plymouth, both of Mich., assignors to Mascotech Tubular Products, Inc., Canton, Mich.**

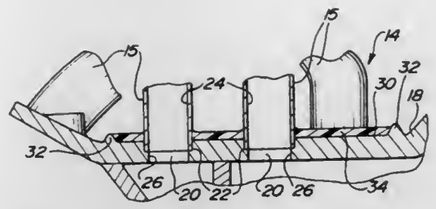
**Filed Feb. 23, 1996, Ser. No. 606,127**

**Int. Cl.[6] B23P *15/00***

**U.S. Cl. 29—888.01** **18 Claims**

1. A process of manufacturing manifolds for vehicle engines comprising the steps of:

providing a base plate having a plurality of throughbores matingly receiving a corresponding plurality of manifold tubes;



forming a raised ridge on said base plate, said ridge surrounding at least one throughbore with a manifold tube to form a basin within said raised ridge;

introducing a predetermined quantity of adhesive to said basin formed by said ridge to substantially fill said basin, said adhesive circumscribing said at least one manifold tube within said basin; and

curing said adhesive to secure said at least one manifold tube to said base plate.

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**5,743,012**

**PISTON AND PISTON RING**

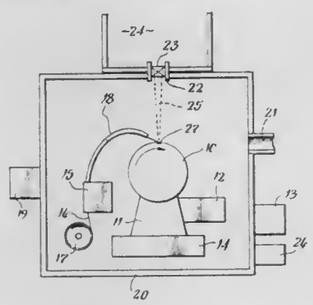
**David Robert Adams, Rugby, and Jonathan David Philby, W. Yorks, both of England, assignors to AE PLC, Warwickshire, England**

**Continuation of Ser. No. 609,113, Nov. 2, 1990, abandoned, which is a continuation of Ser. No. 462,497, Jan. 8, 1990, abandoned, which is a continuation of Ser. No. 158,685, Feb. 22, 1988, abandoned. This application Aug. 16, 1993, Ser. No. 106,759**

**Claims priority, application United Kingdom, Feb. 24, 1987, 8704325**

**Int. Cl.[6] B23P *15/10***

**U.S. Cl. 29—888.043** **6 Claims**



1. A method of reducing wear between radial side faces of a piston ring groove and cooperating radial side faces of a piston ring lying within the piston ring groove, comprising the steps of:

providing an aluminum alloy piston;

alloying a region of said piston with a strengthening material selected from the group consisting of nickel, nickel-based alloys, cobalt and cobalt-based alloys, by performing an energy beam melting procedure, thereby producing a region of alloyed material;

forming a piston ring groove within said region, wherein said piston ring groove is defined by two radial side faces interconnected by a back face such that at least the radial side faces are of said alloyed material;

providing a piston ring having two radial side faces interconnected by an outer peripheral face and an inner peripheral face;

coating the radial side faces of said piston ring with a material selected from the group consisting of a nickel-based alloy containing from 3 to 15 wt % phosphorus and a cobalt-based alloy containing from 3 to 15 wt % phosphorus; and



inserting said piston ring into said piston ring groove such that the radial side faces of said piston ring are in contact with the radial side faces of said piston ring groove, respectively.

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**5,743,013**

**ZIRCONIA-BASED TIPPED BLADES HAVING MACROCRACKED STRUCTURE AND PROCESS FOR PRODUCING IT**

**Thomas Alan Taylor, and Don Joseph Lemen, both of Indianapolis, Ind., assignors to Praxair S.T. Technology, Inc., Danbury, Conn.**

**Division of Ser. No. 307,204, Sep. 16, 1994, Pat. No. 5,520,516. This application Feb. 5, 1996, Ser. No. 596,797**

**Int. Cl.[6] B23P *15/00***

**U.S. Cl. 29—889.7** **10 Claims**

1. A process for producing a coating on at least the tip of a blade comprising the steps:

(a) radiusing the tip edge of a blade to a degree that the radius of the tip of the blade should be about ¼ to ¾ of the thickness of a coating deposited in accordance with steps (b) through (d) as described below;

(b) thermally depositing zirconia-based powders onto at least the tip of a blade at a rate to form a monolayer having at least two superimposed splats of the deposited powders on at least the tip of the blade in which the temperature of a subsequent deposited splat is higher than the temperature of a previously deposited splat;

(c) cooling and solidifying said monolayer wherein said monolayer has a porosity less than about 12 vol. percent and wherein a plurality of vertical cracks are produced in the monolayer due to shrinkage of the deposited splats; and

(d) repeating steps (a) and (b) at least once to produce an overall coated layer in which each monolayer has induced vertical cracks through the splats and wherein at least 70% of the vertical cracks in each monolayer are aligned with vertical cracks in an adjacent monolayer to form vertical macrocracks having a length of at least 4 mils up to the thickness of the coating and said coated layer having at least 5 vertical macrocracks per linear centimeter measured in a line parallel to the surface of the blade and in a plane perpendicular to the surface of the blade tip.

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**5,743,014**

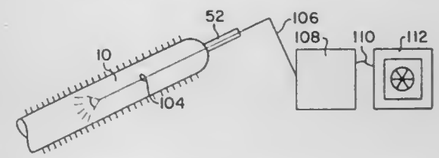
**METHOD OF MAKING FIELD SERVICEABLE FILL TUBE FOR USE ON HEAT PIPES**

**Robert J. Giammaruti, North Canton, and Morten Licht, Canton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.**

**Division of Ser. No. 539,397, Oct. 5, 1995. This application Feb. 12, 1997, Ser. No. 799,600**

**Int. Cl.[6] B23P *15/26***

**U.S. Cl. 29—890.032** **1 Claim**



1. A method of manufacturing a field-serviceable, spirally-finned, cylindrical heat pipe apparatus having a longitudinal axis of symmetry, comprising the steps of:

welding end caps to each end of a cylindrical heat pipe tube;

welding a first end of a fill tube to one of the end caps to provide a fluidic passage therethrough which provides access into an internal portion of the cylindrical heat pipe tube;

fluidically connecting disconnecting valve means to a second end of the fill tube so as to provide easy and repeatable access to and resealing of an internal portion of the cylindrical heat pipe tube;

evacuating and filling the cylindrical heat pipe tube using the disconnecting valve means; and

spinning the cylindrical heat pipe tube about its longitudinal axis of symmetry and applying the spiral fins thereto as the cylindrical heat pipe tube spins.

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**5,743,015**

**METHOD OF SECURING A SHAFT-BEARING BUSH OF A NON-WELDABLE MATERIAL IN A HOLE IN A METAL MOUNTING PLATE**

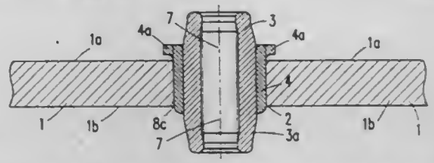
**Norbert Kunze, Ehringshausen, and Dieter Müller, Staufenberg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed May 30, 1996, Ser. No. 655,531**

**Claims priority, application Germany, Jun. 3, 1995, 195 20 474.3**

**Int. Cl.[6] B23P *11/00***

**U.S. Cl. 29—898.07** **7 Claims**



1. A method of securing a shaft-bearing bush of a non-weldable material, particularly a sintered metal, to a metal mounting plate having a hole wall forming a hole, characterized in that

a metal sleeve, whose material is weldable to the metal mounting plate, is securely press-fitted onto the outer wall of the shaft-bearing bush,

the shaft-bearing bush provided with the press-fitted metal sleeve is introduced into the hole in the metal mounting plate and is locked in a desired axial alignment, and

the metal sleeve is welded to the metal mounting plate.

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**5,743,016**

**METHOD FOR MOUNTING PRELOADED BEARINGS**

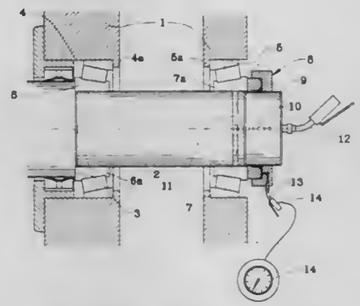
**Nils Manne, Göteborg, and Per-Olof Johansson, Jörlanda, both of Sweden, assignors to Aktiegolaget SKF, Goteborg, Sweden**

**Filed May 9, 1996, Ser. No. 647,112**

**Claims priority, application Sweden, May 10, 1995, 9501722**

**Int. Cl.[6] B23P *15/00***

**U.S. Cl. 29—898.062** **9 Claims**



1. A method for mounting a preloaded rolling bearing assembly on a shaft extending at least partly through a housing, the pre-

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loaded rolling bearing assembly incorporating a first and a second rolling bearing for supporting axial load, comprising:

mounting an outer race ring of the first bearing and an outer race ring of the second bearing in axially fixed positions in the housing, and mounting an inner race ring of the first bearing and an inner race ring of the second bearing on the shaft with a shrink fit, with rolling bodies being disposed between said inner race ring of said first bearing and said outer race ring of said first bearing and between said inner race ring of said second bearing and said outer race ring of said second bearing;

introducing a pressure medium in an interface between an inner envelope surface of the inner race ring of the second bearing and the shaft to create a thin medium film in said interface for allowing said inner race ring of the second bearing to be axially displaced on the shaft;

applying an axial force to said inner race ring of the second bearing;

measuring the applied axial force;

draining the pressure medium from the interface between said inner race ring of the second bearing and the shaft when a predetermined axial force is reached, and relieving said axial force.

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**5,743,017**

## DEVICE FOR HEATING THE BLADES OF SCISSORS, KNIVES AND THE LIKE

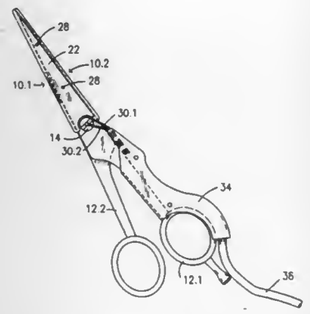
**Walter Dreher; Hans Kessing, both of Immendingen, and Klaus Paulat, Schoenebuerg Schwendi, all of Germany, assignors to Theracut-Hair-Technik GmbH, Germany**

**Filed Apr. 5, 1996, Ser. No. 626,133**

**Claims priority, application Germany, Apr. 12, 1995, 295 06 308.4**

**Int. Cl.[6] B26B** *13/24*

**U.S. Cl. 30—140** **15 Claims**




1. A pair of scissors comprising:

a first scissors part and a second scissors part pivotally connected via a connecting bolt, each of said scissors parts including a blade part and a grip part, said blade part having an outer surface and an inner surface and a longitudinal cutting edge;

wherein a first heating module is secured to said blade part of said first scissors part and a second heating module is secured to said blade part of said second scissors part;

a first electrical heating module and a second electrical heating module each comprising:

an electrical heat strip having an inner surface and an outer surface;

electrical conductors coupled to said heat strip for delivering current to said heat strip; and

a cowling of a synthetic material provided on said outer surface of said heat strip and contoured to conform to the outer surface of said blade part to which it is secured;

said electrical heat strip, said electrical conductors, and said cowling forming each said heating module;

wherein said first and second heating modules are secured to said first and second blade parts, respectively, in such a manner that the respective heat strip is in heat conductive contact with the respective outer surface of the blade part, extends along the length of the cutting edge of the blade part, and is covered over on its outer surface by said cowling.

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**5,743,018**

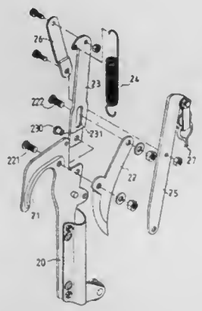
## PRUNING SHEAR DEVICE

**Meng Tun Wang, No. 9-4-1, Chung Nan Lane, Tai Ping City, Taichung Hsien, Taiwan**

**Filed Mar. 7, 1997, Ser. No. 813,057**

**Int. Cl.[6] B26B** *13/06*

**U.S. Cl. 30—249** **1 Claim**




1. A pruning shear device comprising:

a handle including an upper portion,

a hook provided on said upper portion of said handle for engaging with a tree limb,

a bar including a first end pivotally coupled to said handle and including an oblong hole and including a second end,

a cutter blade including a middle portion pivotally coupled to said handle at a pivot shaft for allowing said cutter blade to cut the tree limb, said cutter blade including a free end having a pin slidably engaged in said oblong hole of said bar,

a lever including a first end pivotally coupled to said handle and including a middle portion,

a link pivotally coupling said middle portion of said lever to said second end of said bar for allowing said lever to easily rotate said bar and said cutter blade, and

means for biasing said cutter blade away from said hook.

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**5,743,019**

## ROTARY FLAIL FEEDING DEVICE AND METHOD

**Robert C. Berfield, R. R. #4, Box 359, Jersey Shore, Pa. 17740**

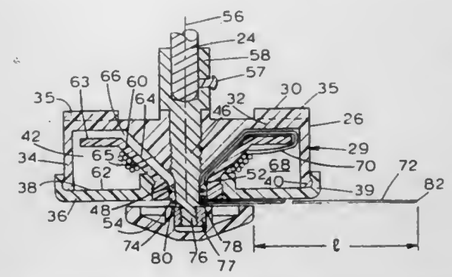
**Filed Jun. 7, 1995, Ser. No. 472,188**

**Int. Cl.[6] B26B** *27/00*

**U.S. Cl. 30—276** **72 Claims**

1. A rotary flail feeding device having an enclosure defining a recess adapted to receive a large diameter coil of flail said enclosure having an exterior surface, a post in the enclosure, and a generally annular flail feeding opening in the exterior surface of the enclosure, said opening surrounding the post, the post includ






ing a small diameter flail winding surface adapted to be surrounded by a small diameter coil of flail.

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**5,743,020**

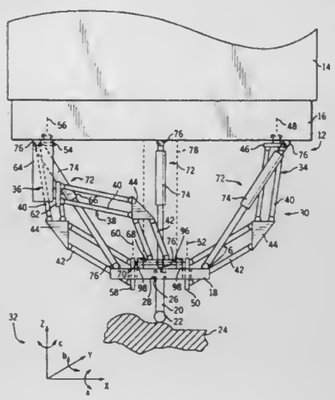
## THREE-AXIS CONTINUOUS PROBE

**Paul C. Sheldon, 10100 N. Sheridan Dr., Mequon, Wis. 53092**

**Filed Sep. 27, 1996, Ser. No. 722,363**

**Int. Cl.[6] G01B** *5/00*

**U.S. Cl. 33—559** **13 Claims**




1. A probe for use in an environment where the motion of an object can be defined as movement along one or more of six axes of which three axes are linear axes and three axes are rotary axes, the probe being connectable to a coordinate positioning machine having a moveable arm, the probe comprising:

a base structure by which the probe may be mounted to the moveable arm;

a stylus supporting member;

a sensor assembly cooperating with the base structure and the stylus supporting member to sense movement of the stylus supporting member relative to the base structure; and

a control system including at least one control arm connected to the stylus supporting member and to the base structure to permit movement of the stylus supporting member relative to the base structure along the three linear axes while restricting movement of the stylus supporting member relative to the base structure along the three rotary axes without flexure of the at least one control arm, the at least one control arm including a four bar linkage having a pair of rigid, equal-length, parallel bars.

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**5,743,021**

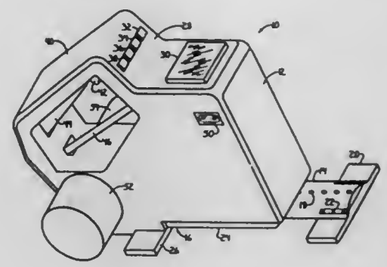
## DIGITAL LENGTH GAUGE

**Bradley H. Corcoran, 6580 Lakeview, Apartment 14107, Westland, Mich. 48185**

**Filed Feb. 6, 1996, Ser. No. 597,695**

**Int. Cl.[6] G01B** *3/10*

**U.S. Cl. 33—762** **20 Claims**



1. A length gauge comprising:

a housing, said housing including a tape guide attached to a bottom surface of the housing; and

a tape wound on a reel within the housing, said tape including a first side edge and a second side edge, said tape being wound on the reel such that an end of the tape extends from an opening in the housing adjacent to the tape guide, said tape being curved such that as the tape is withdrawn from the housing the first and second side edges bend away from the tape guide attached to the bottom surface of the housing so that a cross-section of the tape has a U-shape.

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**5,743,022**

## SHEET MATERIAL DRYING

**Nicholas Simon Hall Taylor, Cranbrook, United Kingdom, assignor to TMCI (UK) Limited, Reading, United Kingdom**

**Continuation of Ser. No. 503,725, Jul. 18, 1995, abandoned. This application Nov. 8, 1996, Ser. No. 745,250**

**Claims priority, application United Kingdom, Jul. 22, 1994, 9414856**

**Int. Cl.[6] F26B** *19/00*

**U.S. Cl. 34—68** **18 Claims**



1. A sheet drying apparatus, for use with a supply means for supplying a heated fluid medium, comprising:

a) a belt dryer comprising a belt conveyor having a first end, a second end and a continuous belt traveling, in use, over reversing rollers at said ends, means for casting a slurry thereon at said first end, means for providing steam to the underside of the belt and warm air supply means for provision of a current of warm air over the belt;

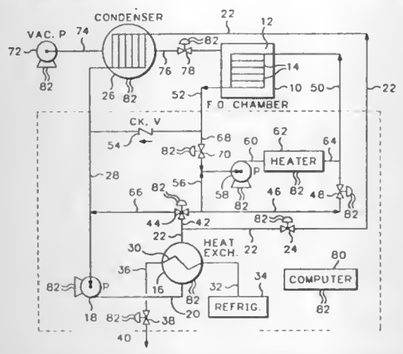
b) means for removal of the cast sheet material from said second end of the belt; and

c) a post dryer arrangement for completing drying of the sheet material to a predetermined moisture content, wherein the post dryer arrangement is formed of a plurality of steam plates in side-by-side arrangement to receive sheet material from said second end of the belt dryer and providing a substantially flat surface for travel of the sheet material thereover, the plates being hollow and connectable to the supply means for supplying to the interior thereof the heated fluid medium so that temperature increases from upstream end plate to downstream end plate.

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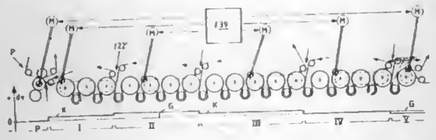
**5,743,023**
**METHOD AND APPARATUS FOR CONTROLLING FREEZE DRYING PROCESS**
**John M. Fay, 1517 Long Pond Dr., Warrington, Pa. 18976, and Donald S. Flnan, 8616 W. 121st St., Palos Park, Ill. 60464**
**Filed Sep. 6, 1996, Ser. No. 709,027**
**Int. Cl.[6] F26B** *13/10*
**U.S. Cl. 34—287** **11 Claims**




1. Apparatus for controlling the temperature of the chamber of a refrigeration system having a passageway therethrough for heat transfer fluid, the apparatus comprising:
a) a vacuum condenser communicating with the chamber and having a passageway therethrough for heat transfer fluid,
b) a heat exchanger for cooling a heat transfer fluid in a passageway through said heat exchanger,
c) first conduit means for circulating heat transfer fluid through the passageway in the heat exchanger and condenser,
d) second conduit means for circulating heat transfer fluid through the passageways in the heat exchanger and chamber, independently of the circulation of heat transfer fluid through the condenser, and
e) fluid pump means in the first and second conduit means for circulating heat transfer fluid through said first and second conduit means.

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**5,743,024**
**SINGLE-TIER DRYING SECTION TAILORED FOR COMPENSATING STRETCHING AND SHRINKING OF PAPER WEB**
**Markus Oechsle, Bartholomae, Germany, assignor to Voith Sulzer Papiermaschinen GmbH, Germany**
**Continuation-in-part of Ser. No. 544,710, Oct. 18, 1995, Pat. No. 5,638,611. This application Jan. 21, 1997, Ser. No. 786,237**
**Int. Cl.[6] D21F** *5/00*
**U.S. Cl. 34—447** **13 Claims**



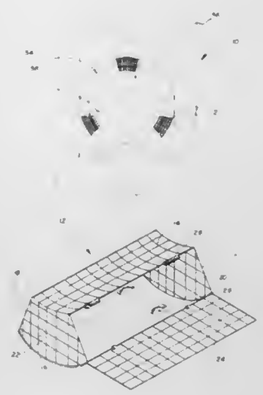
1. A method for manufacturing a paper web with a paper machine including a dewatering press through which the web moves and a drying section following the dewatering press in the path of the web, the method including the steps of:
providing in the drying section a plurality of dryer groups arranged one after the other along the path of the web through the drying section; a single row of heatable drying cylinders; a reversal suction roll between each two drying cylinders in the group; an endless, web support belt which supports the web to travel together with the support belt through the dryer group; guide means in each dryer ground for guiding the respective support belt in an endless loop through the respective dryer group;
the support belt passing through the dryer group in a meander path so that the web on the support belt directly contacts one of the drying cylinders in the respective dryer group, the support belt then touches the next reversal roll in sequence and the web then touches the next drying cylinder in sequence so that the web comes into direct contact with the drying cylinders and the support belt comes into direct contact with the reversal suction rolls; the press being so placed and the drying cylinders, the suction reversal rolls and the support belt of the first dryer group after the press being so placed that there is a first, open separation place where the web travels free of support between the press and the first dryer group; the respective drying cylinders, suction reversal rolls and guide means of each of the dryer groups being so placed so as to define a respective separation place between each preceding dryer group and the succeeding dryer group thereafter in the path of the web through the drying section, and including means at the separation place for transferring the web from the preceding dryer group to the succeeding dryer group in the drying section; at least toward the terminal end region of the path of the web through the drying section, at least one of the separation places between a preceding and a succeeding dryer group being developed as an open separation place where the web has a free unsupported path of travel from the respective preceding to the respective succeeding endless web support belt of the dryer groups;
driving the press to move a web through the press to the first dryer group of the drying section;
driving the drying cylinders in each of the dryer groups to rotate to move the web through the dryer group at a selectively variable and respective rotation speed and controlling the respective rotation speed of the drying cylinders of each of the dryer groups for enabling adjustment to produce a difference in rotation speeds between the drying cylinders of adjacent dryer groups;
setting the respective drive speed of the press and of the first dryer group following the press to achieve a positive speed difference at the first separation place under all operational modes of the paper machine, the positive speed difference meaning that the speed of the web through the first dryer group is greater than the speed of the web through the press, thereby relieving the tendency of the web to adhere to the surfaces of the drying cylinders of at least a first one of said plurality of dryer groups; and
setting the respective drive speeds between a second dryer group, immediately following the first dryer group, and the first dryer group in such a manner that the speed of the second dryer group is positive relative to the first dryer group under all operational modes of the paper machine, thereby relieving the tendency of the web to wrinkle.

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**5,743,025**
**DRYER BASKET FOR SNEAKERS INSERTABLE INTO A CLOTHES DRYER**
**Richard W. Jordan, Jr., 26 Sunset Rd., Norton, Mass. 02766**
**Filed Apr. 3, 1997, Ser. No. 831,901**
**Int. Cl.[6] F26B** *11/02*
**U.S. Cl. 34—600** **7 Claims**

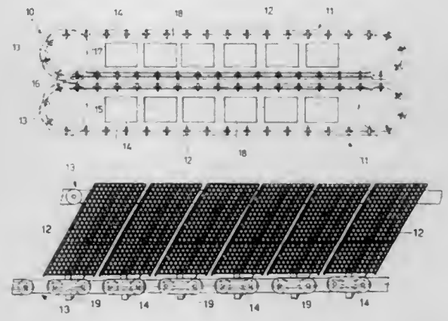
2. A dryer basket for sneakers comprising:
a plurality of baskets;
a plurality of mounting brackets secured within a dryer drum of a dryer adjacent to tumblers of the dryer, the mounting brackets each having means for securement to the baskets whereby the baskets are removably secured within the dryer drum adjacent to the tumblers.





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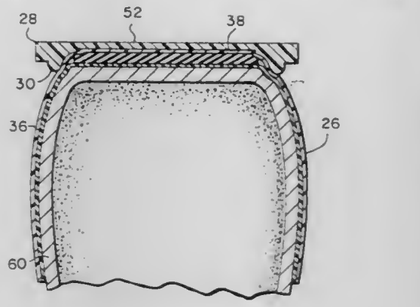
**5,743,026**
**DRYING DEVICE WITH IMPROVED GUIDE FOR ROTARY CUT WOOD VENEER**
**Lorenzo Cremona, Monza, Italy, assignor to Angelo Cremona, and Figlio S.p.A., both of Milan, Italy**
**PCT No. PCT/EP95/02278, § 371 Date Dec. 11, 1996, § 102(e) Date Dec. 11, 1996, PCT Pub. No. WO95/35472, PCT Pub. Date Dec. 28, 1995**
**PCT Filed Jun. 13, 1995, Ser. No. 750,427**
**Claims priority, application Italy, Jun. 17, 1994, MI940439 U**
**Int. Cl.[6] F26B** *13/00*
**U.S. Cl. 34—639** **4 Claims**



1. Device (10) for drying rotary cut wood veneer comprising at least two conveyor loops (11) facing each other along an outbound path to define between them a conveyance passage for the rotary cut veneer with there being along the outbound path drying means (18) acting on the conveyance passage by means of hot air flow, characterized in that the two conveyance loops comprise handling chains (13) supporting transversely to the direction of conveyance a sequential jointed plurality of rigid guidance elements (12) providing facing and essentially unbroken conveyance surfaces along said outbound path to delimit the conveyance passage, preventing deformation of the rotary cut wood veneer transverse to the direction of motion, the rigid guidance elements (12) being pierced to permit passage of air between the drying means (18) arranged on one side thereof and the conveyance passage on the other side.

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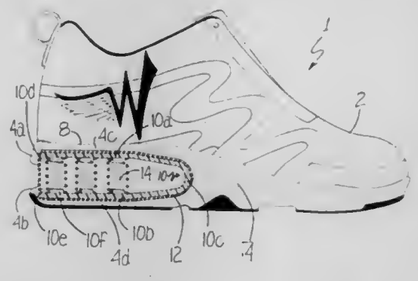
**5,743,027**
**RUBBER FOOTWEAR AND METHOD OF MAKING SAME**
**Tarachand S. Barma, 134 S. 29th St., Lacrosse, Wis. 54601**
**Filed Nov. 29, 1995, Ser. No. 563,986**
**Int. Cl.[6] A43B** *1/10*
**U.S. Cl. 36—4** **19 Claims**



1. A rubber footwear product, consisting essentially of
a) a cured rubber upper portion;
b) a molded rubber midsole vulcanizate having a bottom surface and a top surface equipped with an integrally formed raised welt vulcanizate portion extending vertically from the top surface of the midsole vulcanizate and extending around a periphery of the midsole vulcanizate, the size and shape of the midsole vulcanizate and raised welt portion thereof being determined by a contour of a cavity of a mold in which the midsole vulcanizate is formed, with the top surface of the midsole vulcanizate and an inner side wall of the raised welt vulcanizate portion of the midsole vulcanizate being bonded to the rubber upper portion by intervulcanization thereto; and
c) an outsole secured to the bottom surface of the midsole.

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**5,743,028**
**SPRING-AIR SHOCK ABSORBTION AND ENERGY RETURN DEVICE FOR SHOES**
**Thomas D. Lombardino, 82-11 160th. Ave., Howard Beach, N.Y. 11414**
**Filed Oct. 3, 1996, Ser. No. 727,705**
**Int. Cl.[6] A43B** *21/30;21/32*
**U.S. Cl. 36—27** **3 Claims**



1. An article of footwear of the type which includes an upper, a resilient mid-sole attached to the upper, and an out-sole attached to the mid-sole with a spring mechanism visibly exposed within an upper and lower heel portion of the mid-sole that will provide for a substantially improved means of absorbing shock, and storing and returning energy during running and jumping activities, the improvements comprising:
a. a substantially heel shaped outer spring mechanism molded of a strong resiliently flexible material;

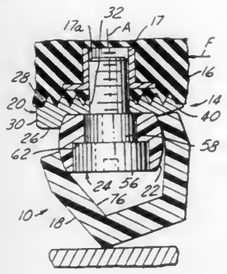
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b. said outer spring mechanism having corresponding planar top and bottom plates running parallel to one another and generally horizontally to the mid-sole and being cantilevered from an integral connecting member at the forward end of the spring mechanism;
c. the outer spring mechanism further comprises lateral edges on the top plate that are flanged downwardly beginning at a point set back from the said connecting member that encompass the perimeter of and terminate at an adjacent end of the top plate;
d. lateral edges on the bottom plate that are flanged upwardly and correspond with the lateral edges on the aforementioned top plate;
e. a plurality of integrally molded projections, spaced in a corresponding circular pattern within the said top and bottom plates, and essentially disposed to reside in an area below the calcaneous of the wearer's foot when the spring mechanism is inserted within the heel portion of the mid-sole of an athletic shoe,
f. the said plurality of integrally molded projections of the top and bottom plates serve to engage within an equal quantity of vertically affixed compression springs fixedly retained within, and biasing against the said outer spring mechanism, said springs working independently of one another thus providing a means for more effectively displacing shock throughout the outer spring mechanism, and;
g. said outer spring mechanism and all aforementioned elements comprising the outer spring mechanism being injection molded as a unitary component, providing for a simple and a cost effective means of manufacture.

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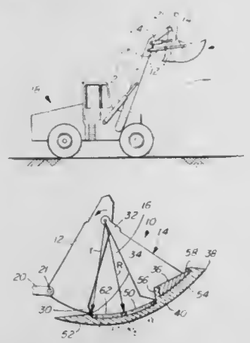
**5,743,029**
**BREAK-AWAY CLEAT ASSEMBLY FOR ATHLETIC SHOES**
**Andrew S. Walker, 815 Southfield Rd., Birmingham, Mich. 48009, and Elwyn Gooding, 2989 W. N. Territorial Rd., Ann Arbor, Mich. 48105**
**Continuation of Ser. No. 416,219, Apr. 4, 1995, Pat. No. 5,617,653, which is a continuation of Ser. No. 967,618, Oct. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 689,702, Apr. 15, 1991, abandoned. This application Sep. 13, 1996, Ser. No. 713,954**
**Int. Cl.[6] A43C *15/16;15/00***
**U.S. Cl. 36—134** **1 Claim**



1. An athletic shoe for reducing injuries to an athlete wearing the shoe, comprising;
a shoe body having a longitudinal axis along the length thereof and a lateral axis substantially perpendicular to said longitudinal axis;
said shoe body having an outside portion and an inside portion along said lateral axis corresponding to the outside and inside, respectively of the leg of the wearer wearing the shoe;
a sole attached to said shoe body, said sole generally defining a plane;
a plurality of cleat members detachably connected to said sole;
said detachable cleat members being independently detachable from said sole only upon a single application of a force in a predetermined direction parallel to said plane of said sole; and
selection means for permitting detachment of said detachable cleats only in a selected one of a plurality of directions parallel to said plane of said sole.

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**5,743,030**
**LOADER WITH SCREENING DEVICE**
**Chester Lea Sirr, S5A, C21, RR#1, Lumby, Canada, V0E 2G0**
**Filed Mar. 20, 1996, Ser. No. 619,955**
**Int. Cl.[6] E02F *03/96***
**U.S. Cl. 37—406** **16 Claims**



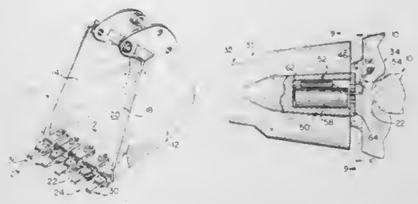
1. A bucket for earth moving equipment comprising a blade section having a lower leading edge, a collecting section pivotably connected to said blade section for movement about a normally horizontal axis of rotation, said axis of rotation being spaced from said lower leading edge and said collecting section being positioned in front of said blade section and having a leading end and a trailing end, a digging edge at said leading end and a trailing edge at said trailing end, said trading edge being adjacent to and being in close proximity to said leading edge when said bucket is in a closed position and means to pivot said collecting section relative to said blade section around said rotational axis to rotate said collecting section between said closed position and a fully open position with said leading edge and said trailing edge spaced apart characterized in that:
an annual separating section is connected to and projects rearwardly from said collecting section, said separating section having an inner surface with a radius measured from said axis of rotation substantially equal to the radial distance between said leading edge of said blade section and said axis of rotation, said separating section being on the side of said leading edge of said blade section remote from said collecting section when said bucket is in closed position, substantially radially exiting holes through said separating section, said separating section forming the bottom of said bucket between said leading and trailing edges when said trailing edge is spaced from said leading edge and said bucket is in a partially open screening position, thereby material may be separated through said holes in said separation section.

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**5,743,031**
**DIGGING HARDWARE SIGNALING APPARATUS**
**Brian L. Launder, Tulsa, and William A. Flagg, Owasso, both of Okla., assignors to H&L Company, Tulsa, Okla.**
**Filed Feb. 23, 1996, Ser. No. 606,065**
**Int. Cl.[6] E02F *9/28;* G08B *5/40;* E21C *35/08***
**U.S. Cl. 37—455** **50 Claims**

1. A digging tooth assembly for an earth digging implement, said digging tooth assembly comprising:
adapter configured to extend forwardly from a forward edge of said digging implement:

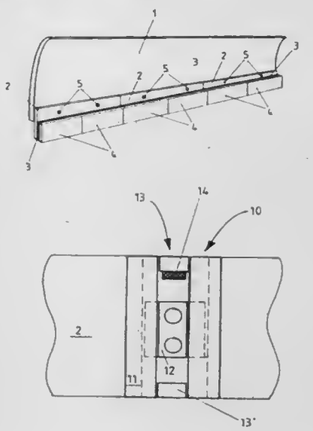




a digging tooth configured to slidably fit about and along a lengthwise portion of and be releasably secured to said adapter, said digging tooth having a ground penetrating edge transversely extending across a forward end portion thereof;
a wear member extending across a rear portion of said digging tooth for protecting said adapter against wear during use of said digging tooth assembly, said digging tooth and said wear member including cooperative instrumentalities for maintaining said digging tooth and said wear member in predetermined relation relative to each other; and
an apparatus for providing a signal indicative of an inadvertent change in the predetermined relationship between said wear member and said digging tooth.

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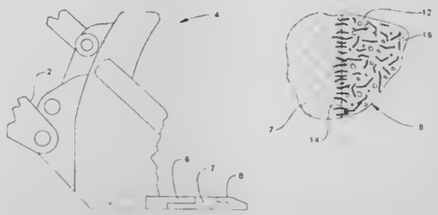
**5,743,032**
**PLOUGH BLADE ARRANGEMENT**
**Pertti Vauhkonen, Heinälammentie 353, FIN-77120 Venetmäki, Finland**
**PCT No. PCT/FI94/00027, § 371 Date Jul. 7, 1995, § 102(e) Date Jul. 7, 1995, PCT Pub. No. WO94/17248, PCT Pub. Date Aug. 4, 1994**
**PCT Filed Jan. 24, 1994, Ser. No. 495,432**
**Claims priority, application Finland, Jan. 22, 1993, U930032**
**Int. Cl.[6] E02F *3/36;* E01H *5/04***
**U.S. Cl. 37—446** **15 Claims**



1. A plough blade arrangement intended to be attached to a vehicle, the plough blade arrangement including a frame including a flat part removably and rigidly attached to a plough, several blade plates covering a desired working width and divided into separate and independent parts, and flexible attachment members for securing the blade plates to the frame and comprising flexible elastomeric material bonded between the frame and the blade plates, characterized in that each flexible member comprises an elastomeric plate having essentially an even thickness and directly opposite parallel surfaces, with one of said surfaces adherently fixed on a surface of the frame and the opposite of said surfaces adherently fixed on a frame-opposing parallel surface of the blade plate and each flexible member has a thickness at most ¼ of its height to permit the movement of the blade plates essentially in a direction parallel with said surface of the frame when the blade plate strikes an obstacle or pit wherein the arrangement includes a stop, which limits the movement of the blade plate.

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**5,743,033**
**EARTHWORKING MACHINE GROUND ENGAGING TOOLS HAVING CAST-IN-PLACE ABRASION AND IMPACT RESISTANT METAL MATRIX COMPOSITE COMPONENTS**
**Gérald A. Gegel, Morton, Ill., assignor to Caterpillar Inc., Peoria, Ill.**
**Filed Feb. 29, 1996, Ser. No. 608,804**
**Int. Cl.[6] E02F *3/00***
**U.S. Cl. 37—460** **22 Claims**



1. A ground engaging tool for an earthworking machine, comprising:
a ground engaging element having a cast-in-place metal matrix composite component, the ground engaging element comprising,
a metal base component of preselected dimensions,
a metal matrix composite component of preselected dimensions being bonded to said metal base component, said metal matrix composite component consisting of,
a preform having interconnecting porosity, and of preselected dimensions, and being formed from a material selected from one of ceramic, cermet, or mixtures thereof,
an infiltration metal,
said porosity of said preform being infiltrated by said infiltration metal, said infiltration metal being fusion bonded to said metal base component,
said preform, prior to being infiltrated by said infiltration metal, has a total porosity out of which, said interconnecting porosity is at least 90% of said total porosity.

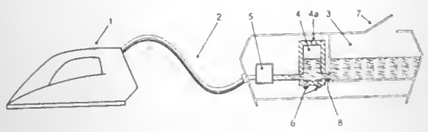
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**5,743,034**
**HOUSEHOLD STEAM APPLIANCE HAVING A SCALE-PREVENTING DEVICE**
**Jean Pierre Debourg, Lyons; Denis Daulasim, Villeurbanne, and Jean Claude Ledion, Paris, all of France, assignors to SEB S.A., France**
**Filed Jan. 17, 1997, Ser. No. 785,237**
**Claims priority, application France, Jan. 19, 1996, 96 00822**
**Int. Cl.[6] D06F *75/12;75/14***
**U.S. Cl. 38—77.8** **22 Claims**

1. An electric appliance for producing steam, said appliance comprising: a reservoir for holding a quantity of water; steam generation means for effecting a substantially instantaneous generation of steam; and a scale preventing device, wherein said scale preventing device is connected and operative for heating water upstream of said reservoir by an amount sufficient to precipitate minerals present in the water into a form which allows the precipi-

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tated minerals to be expelled from the appliance with steam generated by said steam generation means.

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**5,743,035**
**MACHINE PRODUCIBLE THREE DIMENSIONAL GREETING CARD**
**Sterling E. Lani Bradley, Olmsted; Jayne M. Gause, Cleveland, and Andrew Onachilla, Brooklyn, all of Ohio, assignors to American Greetings Corporation, Cleveland, Ohio**
**Filed Sep. 22, 1995, Ser. No. 532,312**
**Int. Cl.[6] G09F *1/00***
**U.S. Cl. 40—124.14** **12 Claims**

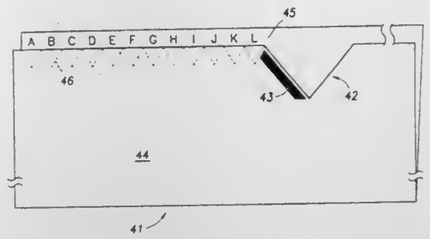


1. A three dimensional foldable greeting card comprising:
a single piece of card stock having multiple panels including end panels and intermediate panels adjoined at generally straight and parallel fold lines wherein the fold lines are spaced apart relative distances so that the panels of the card form a three dimensional structure,
each of the panels having peripheral edges cut to define generally curvilinear profiles,
a portion of the peripheral edge on each panel cut to extend past a fold line through the plane of an adjacent panel and not folded along the fold line crossed,
the panels oriented to be displayed by support upon generally straight bottom edges of the panels,
end panels of the greeting card intersecting,
graphics applied to both sides of at least one panel, whereby the card may be stood upon the generally straight bottom edges, when the card is in a three dimensional configuration.

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**5,743,036**
**FILING SYSTEM**
**Frank E. Zumwalt, 2044 Colquitt, Hnuston, Tex. 77098**
**Filed Sep. 17, 1996, Ser. No. 715,164**
**Int. Cl.[6] B42F *21/00***
**U.S. Cl. 40—359** **15 Claims**

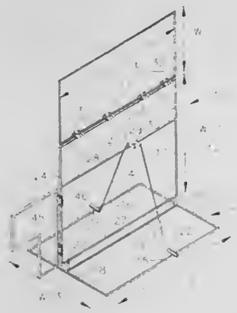
1. A filing system for allowing a user to identify and access documents, comprising:



at least one file folder having a first V-shaped notch, a front cover and a back cover, said front cover having a top, a left upper corner, and a right upper corner; the first V-shaped notch having a left side and a right side,
wherein the left side is designed to represent a first portion of the alphabet and the right side is designed to represent a second portion of the alphabet, and wherein one of the left and right sides of the first V-shaped notch is marked with a bold strip to indicate which of said first and second portions of the alphabet is desired to identify the file folder;
wherein said first V-shaped notch is located in the top of the front cover, is sufficiently deep to allow documents placed in the file folder to be visible, and is sufficiently deep and wide to allow the user access through the first V-shaped notch to grasp documents placed in the file folder; and
wherein said first V-shaped notch is designed to provide a location for the placement of means for identification selected from a group consisting of alphabetical index information, alphanumeric information, bar codes and magnetic strips, and combinations thereof.

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**5,743,037**
**FOLDABLE ORNAMENTAL SIGN**
**Neil Ronald Martin, 206 N. Barnes, Tonkawa, Okla. 74653**
**Continuation of Ser. No. 287,527, Aug. 8, 1994, abandoned.**
**This application Apr. 29, 1996, Ser. No. 638,718**
**Int. Cl.[6] G09F *15/00***
**U.S. Cl. 40—610** **1 Claim**



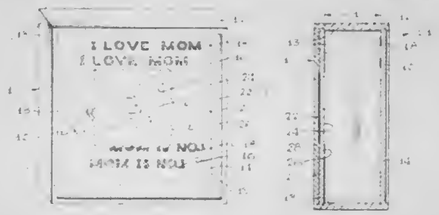
1. A display unit having a display portion, said display portion having a main section and a section means, pivotal means for attaching said section means to said main section; means for securing said section means to maintain said section means rigidly positioned with respect to said main section, whereby said section means can be unsecured and pivoted about said pivotal means, folding said section means against said main section for storage or shipping and wherein said section means can be rotated about said pivotal means and secured by said means for securing said section means to said main section, wherein said securing means and said pivotal means includes a hinge having first and second leaves and a pivot means attaching said first and second leaves; an opening through said first leaf, said second leaf having a threaded portion;



and bolt means passing through said opening in said first leaf and into said threaded portion in said second leaf in a manner to secure said first leaf to said second leaf.

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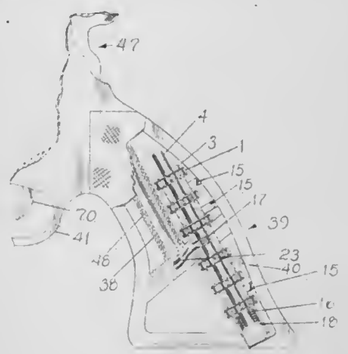
**5,743,038**
**THREE-DIMENSION SHADOW BOX DISPLAY DEVICE**
**David Soto, 554 21st St., Apt. #1, San Pedro, Calif. 90731**
**Filed Oct. 19, 1995, Ser. No. 593,238**
**Int. Cl.[6] A47G *1/06***
**U.S. Cl. 40—743** **18 Claims**




1. A three-dimension shadow box, comprising:
a frontwardly lying transparent and non-mirrored sheet;
a rearwardly lying reflective surface;
a means for retaining said frontwardly lying transparent sheet and said rearwardly lying reflective surface in a spaced apart orientation;
graphic indicia positioned on said frontwardly lying transparent sheet; and
visual indicia adjacent said rearwardly lying reflective surface; wherein said graphic indicia is viewable from the front of said transparent frontwardly lying sheet and a reflection of a rear side of said graphic indicia reflects off of said rearwardly lying reflective surface so as to appear as lying behind said visual indicia, giving the visual indicia the appearance of floating.

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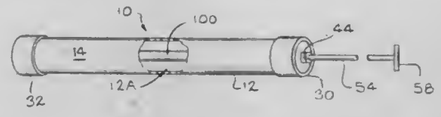
**5,743,039**
**COMBINATION LOCKING DEVICE FOR FIREARMS**
**John L. Garrett, P.O. Box 253, Longview, Tex. 75606**
**Filed Jul. 7, 1995, Ser. No. 499,401**
**Int. Cl.[6] F41A *17/00***
**U.S. Cl. 42—70.11** **7 Claims**



1. A combination safety locking arrangement for selectively disabling a firearm, the firearm having a barrel, a trigger and a hammer, whereas the hammer, in an unlocked position, being mechanically movable into a functional position for causing the firing of a projectile and in the locked position being mechanically immovable prohibiting the hammer to move causing the firing of a projectile, said combination locking arrangement comprising:
a. a movable plunger rod member inserted through a plurality arrangement of cam rollers;
b. a blocking engagement member governed by said plunger rod member engageable with the firing mechanism of said firearm functional to effectively block said firing mechanism;
c. a control member adapted to sustain said movable plunger rod member providing means to move said movable plunger rod member from the engaged position to the unengaged position and from the said unengaged position to the said engaged position

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**5,743,040**
**METHOD AND APPARATUS FOR CLEANING THE BARREL OF A GUN**
**Steven C. Kennedy, 11498 Broadhent Rd., Lansing, Mich. 48917**
**Filed May 27, 1997, Ser. No. 863,290**
**Int. Cl.[6] F41A *29/00***
**U.S. Cl. 42—95** **20 Claims**



1. An apparatus for cleaning a barrel of a gun, which comprises:
(a) a tubular member having a first end and a second end with a sidewall extending therebetween forming a chamber in the tubular member along a longitudinal axis of the tubular member;
(b) first and second end caps configured to be mounted on the first and second ends of the tubular member for sealing the ends of the tubular member to form a closed container, each end cap having an inside surface with a holder having a sidewall and a recess extending parallel to the longitudinal axis of the tubular member for holding the barrel of the gun wherein at least one of the holders has orifices in the sidewall to allow fluid to flow from the barrel through the holder and wherein one of the end caps has an opening extending through the recess of the holder and parallel to a longitudinal axis of the tubular member; and
(c) a cleaning rod mounted through the opening in the end cap and configured to fit inside the barrel of the gun for cleaning an inside surface of the barrel of the gun, wherein to clean the barrel, the barrel is mounted in the holders inside the tubular member, the tubular member is partially filled with cleaning fluid and the cleaning rod is moved up and down the inside of the barrel of the gun to move the cleaning fluid into the inside of the barrel of the gun.

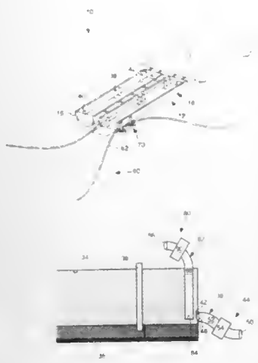
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**5,743,041**
**FLOATABLE CONTAINER APPARATUS FOR HARVESTING BRINE SHRIMP EGGS AND METHODS FOR USING SAME**
**Warren L. Fitzgerald, 1412 Beaconhill Dr., Murray, Utah 84123**
**Filed Oct. 3, 1996, Ser. No. 725,392**
**Int. Cl.[6] A01K *79/00***
**U.S. Cl. 43—6.5** **20 Claims**

14. A method for harvesting brine shrimp eggs comprising the steps of:
partially submerging a container assembly in relation to a body of water, wherein said container assembly comprising a buoyant capacity;
collecting a mixture of water, brine shrimp eggs, and other debris in said container assembly;

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extracting excess water and a substantial portion of said debris from said collected mixture;

depositing said extracted water and debris into said body of water;

increasing said buoyant capacity of said container assembly; and

delivering a remaining mixture of water, brine shrimp eggs, and other debris to at least one porous container.

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**5,743,042**

**Patent Not Issued For This Number**

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**5,743,043**

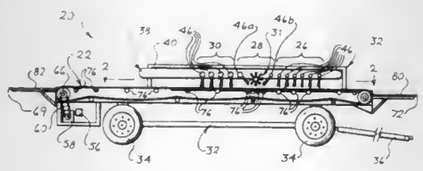
**CLEANED GRASS SOD APPARATUS**

**Darin P. Habenicht, Momence, and Larry R. Link, Frankfort, both of Ill., assignors to American Roller Bushing Corporation, Monee, Ill.**

**Division of Ser. No. 175,786, Dec. 30, 1993, Pat. No. 5,454,190. This application Jul. 20, 1995, Ser. No. 504,428**

**Int. Cl.[6] A01C** *1/04*

**U.S. Cl. 47—56** **8 Claims**



1. An apparatus for removing soil from a length of grass sod having an upper side with grass and a lower side with the root structure of the grass embedded in a thickness of soil, the apparatus comprising:

a frame;

a conveyor mounted on the frame for supporting and transporting the length of grass sod;

soaking means mounted on the frame for soaking the length of grass sod with water to loosen the soil as the conveyor transports the length of grass sod to the soaking means;

brushing means mounted on the frame for brushing the lower side of the length of grass sod to brush away substantially all of the soil loosened by the soaking means from the length of grass sod; and

a water flood means to transport the soil brushed away from the length of grass sod to leave a clean length of sod.

**5,743,044**

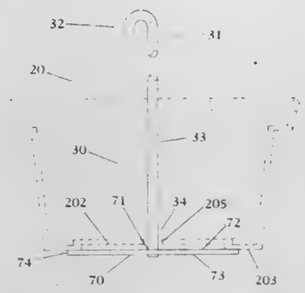
**FLOWER POT SUPPORT BRACKET**

**Jack A. Hopkins, P.O. Box T, Omak, Wash. 98841**

**Filed Jun. 24, 1996, Ser. No. 668,722**

**Int. Cl.[6] A41G** *7/02*

**U.S. Cl. 47—67** **3 Claims**



1. A flower pot support bracket, suitable for supporting a flower pot, the flower pot support bracket comprising:

(A) a support rod, having an upper portion and a lower portion, comprising:

(a) upper fastening means, carried by the upper portion, for attaching the flower pot support bracket to a supporting structure; and

(b) lower fastening means, carried by the lower portion, for fastening to a support plate, the lower fastening means comprising a welded connection between the lower portion of the support rod and the support plate; and

(B) wherein the support plate, defines a hole sized incrementally greater than the diameter of the support rod, to allow passage of the support rod therethrough, the support plate additionally comprising:

(a) an upper surface, sized to support a bottom portion of the flower pot; and

(b) a perimeter rim of at least 6 inches in length.

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**5,743,045**

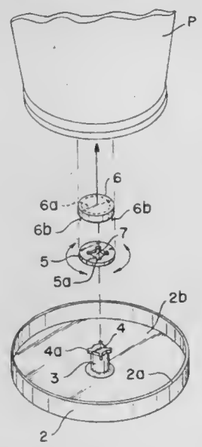
**DRIP PAN FOR HANGING PLANTS**

**Cody C. Hicks, 230 Oviedo St., Gulf Breeze, Fla. 32561**

**Filed Sep. 13, 1996, Ser. No. 713,796**

**Int. Cl.[6] A01G** *9/04*

**U.S. Cl. 47—71** **7 Claims**



1. A drip pan for hanging plants comprising:



container means for collecting excess water runoff at the bottom of a plant pot;

means for releasably connecting said container means to said plant pot;

means for locking said container means to said plant pot; and

means for securing said locking means to said bottom of said plant pot, and wherein

said means for locking said container means to said plant pot consists of a first disk, and

a second disk,

said first disk being secured to said plant pot,

said second disk being secured to said first disk,

said first disk having a central depression formed therein,

said second disk having a central aperture formed therein,

at least one slot projecting radially from said central aperture in said second disk,

said container means having a post attached thereto,

said post having at least one tab projecting radially therefrom,

said post and said at least one tab adapted to pass through said central aperture and said at least one slot in said second disk and to enter said central depression on said first disk,

whereby when said post is turned with respect to said plant pot, said at least one tab is moved out of alignment with said at least one slot and said container means is secured to said plant pot.

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**5,743,046**

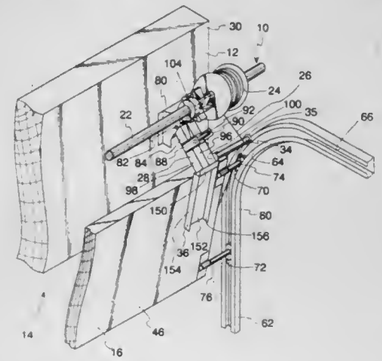
**JACK SHAFT DOOR GARAGE OPERATOR**

**Mark D. Siegler, Brookfield; James S. Chang, and David J. Miller, both of Arlington Heights, all of Ill., assignors to The Chamberlain Group, Inc., Elmhurst, Ill.**

**Continuation of Ser. No. 456,874, Jun. 1, 1995, abandoned. This application Mar. 31, 1997, Ser. No. 829,742**

**Int. Cl.[6] E05F** *11/00*

**U.S. Cl. 49—199** **4 Claims**



1. A jack shaft garage door operator for opening and closing a movable garage door, comprising:

a drive unit;

a jack shaft coupled to the drive unit to be turned thereby;

a pull-up cable drum connected to the jack shaft to be driven thereby;

a pull-up cable for connection to a movable garage door and connected to the pull-up cable drum to be raised and lowered thereby;

a pivotable arm mounted in proximity with the jack shaft and engaging the pull-up cable, said pivotable arm including a member for engaging the pull-up cable and holding it in tension, and means for engaging the jack shaft to prevent further jack shaft rotation when the pull-up cable becomes slack; and

means for preventing the garage door from opening adapted for engagement by the pivotable arm when the garage door is lifted without the drive unit operating.

**5,743,047**

**SEAL FOR SIMULTANEOUSLY SEALING A DOOR WINDOW PANE AND A DOOR OPENING ON A MOTOR VEHICLE**

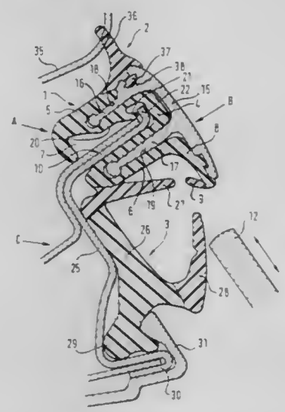
**Andreas Bonne, Neukirch; Klaus Glagow, Wasserburg, and Michael Haas, Kressbronn, all of Germany, assignors to Metzeler Automotive Profiles GmbH, Lindau/Bodensee, Germany**

**Filed Nov. 14, 1994, Ser. No. 338,680**

**Claims priority, application Germany, Nov. 15, 1993, 43 39 033.1**

**Int. Cl.[6] E06B** *7/16*

**U.S. Cl. 49—490.1** **24 Claims**



1. A seal for simultaneously sealing a door window pane and a door opening on a motor vehicle comprising:

a single-piece profile, made from an elastomer material, including a U-shaped fastening section having arms and two outwardly open slots, adapted to slip onto a door flange, a laterally projecting sealing lip section adapted to engage an outside surface of a door window pane and a sealing element adapted for sealing between an upper edge of the door and a roof, a strip of rigid material, having two webs which project at approximately right angles from the strip and engage the outwardly open slots for covering an entire outer face of the U-shaped fastening section.

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**5,743,048**

**SHIELD FOR DOOR-LOCKING DEVICE DISPOSED IN A FOAM-FILLED REFRIGERATOR DOOR**

**Chang Yong Kim, Kyunggi-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Aug. 8, 1996, Ser. No. 694,272**

**Claims priority, application Rep. of Korea, Nov. 30, 1995, 95-37586**

**Int. Cl.[6] E06B** *3/00*

**U.S. Cl. 49—503** **2 Claims**

1. A refrigerator door comprising:

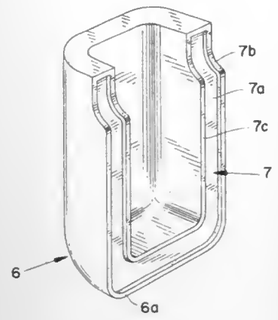
a wall structure forming an interior space filled with injected foam insulation;

a door-locking device disposed within the space; and

a U-shaped shield surrounding the door-locking device, the shield including an interior surface, an exterior surface and a mounting edge located between the interior surface and the exterior surface; said mounting edge facing the wall structure and the wall structure being spaced from the mounting edge to define a gap therebetween the gap extending from the interior surface of the shield to the space; the mounting edge having a shape to prevent the injected foam from reaching the interior surface of the shield and damaging the door-locking device;

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said shape including a U-shaped channel, forming an enlargement in the gap; said foam being disposed in the gap between the space and the enlargement and in the enlargement, the foam terminating short of the interior surface of the shield.

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**5,743,049**

**SUPPORT STRUCTURE FOR ARCHITECTURAL SYSTEMS**

**Axel Thallemer, Esslingen, Germany, assignor to Festo KG, Esslingen, Germany**

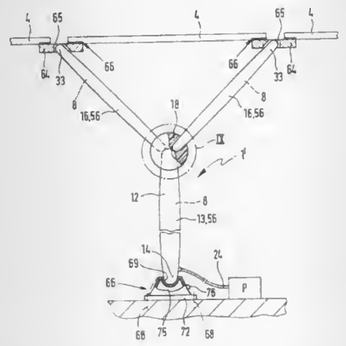
**PCT No. PCT/EP95/04214, § 371 Date May 9, 1997, § 102(e) Date May 9, 1997, PCT Pub. No. WO96/15344, PCT Pub. Date May 23, 1996**

**PCT Filed Oct. 26, 1995, Ser. No. 836,397**

**Claims priority, application Germany, Nov. 11, 1994, 9418076 U**

**Int. Cl.[6] E04H** *1/12;15/20*

**U.S. Cl. 52—2.21** **26 Claims**




1. A support structure for supporting a load with respect to a base, said support structure comprising:

a plurality of supports adopted to be positioned on the base and to support the load, each of said supports including a pillar, said pillar having a column, said column including:

a wall of flexible material forming a sealed air-tight hollow body having a diameter, a top region, a bottom region, and a longitudinal middle, wherein said hollow body is a substantially concentrically convex element wherein said diameter continuously decreases from said longitudinal middle toward said top and bottom regions and,

wherein said hollow body being inflated resulting in stiffening of said column.

**5,743,050**

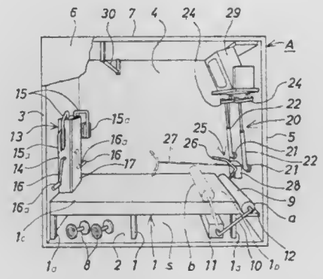
**TRAINING ROOM SERVING ALSO AS BED ROOM**

**Tsutomu Shibata, 3-10, Nishi 3-chome, Kita 36-jo, Kita-ku, Sapporo-shi, Hokkaido, Japan**

**Filed Dec. 1, 1995, Ser. No. 566,041**

**Int. Cl.[6] E04H** *1/12*

**U.S. Cl. 52—27** **5 Claims**




1. A physical strength training room also serving as a bedroom, comprising:

a housing including a floor plate, a plurality of wall plates, and a ceiling plate;

a sleeping bed provided within said housing, the sleeping bed being disposed so that a head receiving side end portion thereof, and a leg receiving side end portion thereof, both abut said wall plates wherein, said housing defines a space within which said sleeping bed is accommodated; and

a plurality of physical strength training machines provided proximate to said head receiving side end portion of said sleeping bed, and at said leg receiving side end portion of said sleeping bed;

wherein said user can selectively use said physical strength training machines while the user is at least one of lying on said sleeping bed with the face turned upwardly, and seated on said sleeping bed, to thereby permit physical strength training to be performed immediately prior to sleeping; and

wherein said physical strength training machines include an abdominal muscle training foot pillow provided at said leg receiving side end portion of said sleeping bed for movement between a position in which said foot pillow is received on an offset portion formed projectingly on the outer side of said leg receiving side end portion of said sleeping bed and is flush with an upper face of said sleeping bed and another position in which said foot pillow is received on the upper face of said leg receiving side end portion of said sleeping bed.

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**5,743,051**

**PRESENTATION SYSTEM**

**Wolfgang Bergmann, Gerokstrasse 14, D-70734 Fellbach, Germany**

**Filed Sep. 9, 1996, Ser. No. 709,750**

**Claims priority, application Germany, Sep. 12, 1995, 195 33 619.4**

**Int. Cl.[6] E04B** *2/76*

**U.S. Cl. 52—27** **16 Claims**

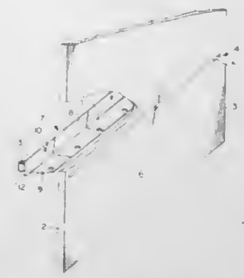
1. A presentation system, comprising:

a substantially rectangular plate element with vertical lateral edges, a front and a back, and a depression in said back;

at least one section rail running transversely between the vertical lateral edges of the plate element;

the at least one section rail having a vertical flange fixed to the plate element and having a bearing element on each of the ends of said at least one section rail; and,





the at least one section rail having a horizontal flange engaging in the depression from the back of the plate element.

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**5,743,052**

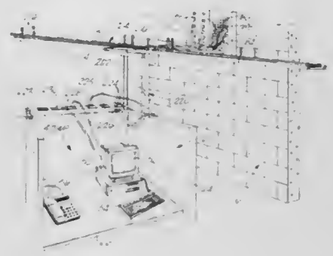
**BUSINESS RECOVERY INSTALLATION AND METHOD FOR ITS ERECTION**

**Michael W. Mayhall, 701 N. Crossecreek Cir., Walnut, Calif. 91789; John Simons, 30408 Jasmine Valley Dr., Canyon Country, Calif. 91351, and Cole Emerson, 8477 Hialeahway, Fair Oaks, Calif. 95628**

**Continuation-in-part of Ser. No. 205,854, Mar. 1, 1994, abandoned. This application Jun. 29, 1994, Ser. No. 268,770**

**Int. Cl.[6] E04H** *1/00*

**U.S. Cl. 52—36.1** **29 Claims**



1. A method for erecting a temporary business facility comprising the steps of:

assembling an array of modular work stations in an enclosed area;

assembling a modular cable supporting structure over the work stations;

installing a modular network of horizontal wire-carrying conduits along the work stations under the support structure, each conduit having a connector at one end and a plurality of outlets along its length adjacent to the respective work stations;

mounting cables on the support structure, each cable having connectors at its ends;

joining the connector at one end of each cable to the connector of one of the conduits;

joining the connector at the other end of each cable to a communications center; and

connecting a computer at each work station to one of the outlets along the length of the adjacent conduit to establish a data link to the communications center.

**5,743,053**

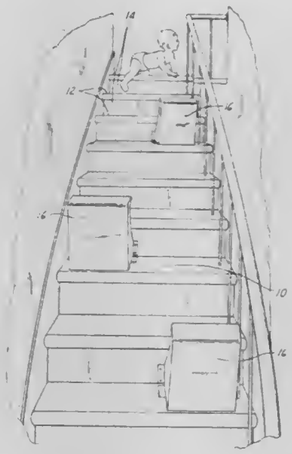
**PROTECTIVE BARRIER FOR ARRESTING THE FALL OF A PERSON ON A STAIRWAY**

**Ronald E. Somerville, 54263 Meadowood Ct., Shelby Township, Mich. 48316**

**Filed Mar. 25, 1997, Ser. No. 823,645**

**Int. Cl.[6] E04F** *11/02*

**U.S. Cl. 52—184** **17 Claims**




1. A protective barrier for mounting on a stairway for arresting the fall of a person on the stairway comprising:

a yieldable core;

a cover that encloses said core;

a plurality of flaps extending from said cover, said flaps used to secure said cover to the stairway; and

said flaps each having a reinforcement layer inserted therein.

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**5,743,054**

**MODULAR UTILITIES COVER**

**Robert J. Luchetti; Anne C. Ackerly, both of Cambridge, Mass.; James D. Houda, Grand Rapids, Mich.; Steven Imrich, Cambridge, Mass., and Michael E. Miles, Grand Rapids, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.**

**Continuation-in-part of Ser. No. 367,804, Dec. 30, 1994. This application Apr. 10, 1996, Ser. No. 628,992**

**Int. Cl.[6] E04F** *19/04*

**U.S. Cl. 52—220.7** **44 Claims**

1. A plurality of demountable overhead utility cover units in combination with at least one panel of a demountable moveable wall system having a utility passageway extending therethrough for use in a building room of the type having a generally open plan, an associated floor surface and ceilings of different heights, each of said demountable overhead utility cover units comprising:

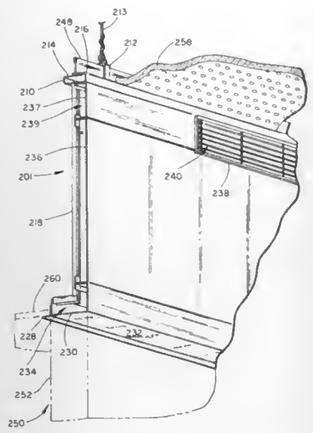
a vertical open framework comprising a header and a lower member vertically separated by at least one vertical support, said framework adapted to extend between the ceilings of different heights;

at least one horizontally extending utility trough positioned along a lower portion of said units for distributing utilities through an upper edge of said at least one panel of said moveable wall system to said utility passageway;

at least one cover panel, said cover panel having a horizontally elongated front elevational shape, detachably attached to said vertical open framework to access said trough and further adapted to access a space defined by the ceilings of different heights; and

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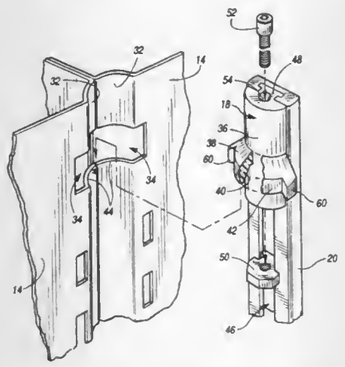
a connector at an end of each of said demountable units, said connector adapted to interconnect horizontally adjacent demountable overhead utility cover units in an end-to-end manner.

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**5,743,055**
**WALL PANEL CONNECTOR SYSTEM**

**John P. Conner, Grandville, Mich., and Sandra Lee From, Issaquah, Wash., assignors to Hon Industries Inc., Muscatine, Iowa**

**Filed Jun. 4, 1996, Ser. No. 664,098**
**Int. Cl.[6] E04B *1/38***
**U.S. Cl. 52—282.2** **14 Claims**



1. A system for connecting panels in edgewise relation comprising:

a pair of panels each having a frame member disposed along an edge thereof, the frame members having lengthwise corners, at least one corner of each panel being formed with a semi-circular cross-section recessed inwardly of said frame member;

a slot formed in the said one corner of each panel, the slot defining transverse semi-circular edges of said corner;

a first connector for connecting two adjacent panels together, said first connector having an internal recess and configured with a tapering conical wall, said first connector further having a through bore for receiving a mechanical fastener;

an elongate mast having first and second ends, a first end being connected to both of said frame members by a second connector and a second end being connected to said first connector by a mechanical fastener extending through said connector, said first connector being slidingly received on said mast;

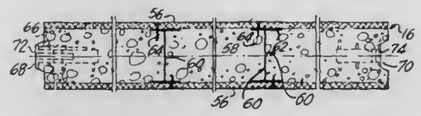
wherein said mechanical fastener draws said conical wall of said first connector into engagement with said semi-circular edges of said panel slots thereby forcing said two adjacent panels together.

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**5,743,056**
**BUILDING PANEL AND BUILDING MADE THEREFROM**

**Michael Steven Andrew Balla-Goddard, Clawdd Newyyd, Ruthin, Clwyd LL15 2NF; Andrew Francis Denny, 5 Westview Drive, Mynydd Isa, Near Mold, Clwyd CH7 6YF, and Philip Godfrey Harrison, 2 Gorstella Cottage, Gorstala, Near Dodleston, Clwyd CH4 9LL, all of United Kingdom**

**Filed Jun. 7, 1995, Ser. No. 476,446**
**Claims priority, application United Kingdom, Oct. 4, 1992, 92080159; Aug. 4, 1993, PCT/GB93/00758**
**Int. Cl.[6] E04C *2/26***
**U.S. Cl. 52—309.11** **16 Claims**



16. A rectilinear composite load-bearing building panel for building structural load-bearing walls of permanent buildings, having a pair of opposed faces, a top surface, a pair of opposed sides and a bottom surface, the panel comprising a pair of spaced-apart rigid face boards of thermally non-conductive, fire resistant material, a rigid insulating material sandwiched between, and adhering to the face boards to form a composite structure capable of withstanding compressive forces between the top surface and the bottom surface of at least 5 kN per meter length of the panel, an elongated member extending through the panel and having a pair of opposed flanges, wherein the opposed flanges are secured to the pair of face boards to resist relative movement between the face boards in the plane of the panel and out of the plane of the panel and wherein the opposed sides each have a profiled shape for mating with a correspondingly profiled side of an adjacent panel and wherein the sides have securing means for securing them to sides of adjacent panels.

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**5,743,057**
**AUXILIARY DOOR AND METHOD FOR MATCHING A SECTIONAL DOOR**

**David O. Martin, Salt Lake City, Utah, assignor to Martin Door Manufacturing, Inc., Salt Lake City, Utah**

**Filed Mar. 9, 1995, Ser. No. 401,557**
**Int. Cl.[6] E04C *2/30***
**U.S. Cl. 52—457** **13 Claims**

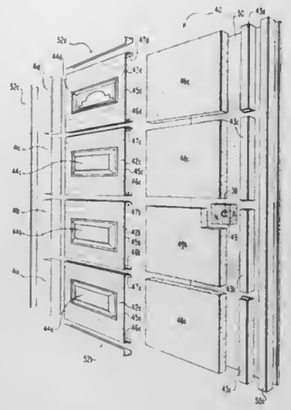
1. A door comprising:

a plurality of discrete lengths of door section facing, each said door section facing comprising a steel sheet formed into a front panel, a top edge, and a bottom edge, said front panel having a design formed therein, said top edge including a top return spaced from said front panel, said bottom edge including a bottom return spaced from said front panel;

a backing sheet mounted to the back of said length of door section facing to create a unitary door element, said backing sheet holding said unitary door element together as a door, said door having a peripheral edge; and

closure means for enclosing said peripheral edge.



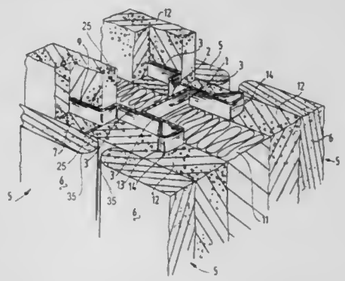


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**5,743,058**
**BOARD WALL SYSTEM**

**Harmen Boomsma, Den Haag, Netherlands, assignor to Flex Development B.V., Delft, Netherlands**

**PCT No. PCT/NL93/00057, § 371 Date Apr. 10, 1995, § 102(e) Date Apr. 10, 1995, PCT Pub. No. WO94/04770, PCT Pub. Date Mar. 3, 1994**
**PCT Filed Mar. 11, 1993, Ser. No. 379,565**
**Claims priority, application Netherlands, Aug. 14, 1992, 9201455; Nov. 23, 1992, 9202034; Jan. 25, 1993, 9300141**
**Int. Cl.[6] E04B *2/78***
**U.S. Cl. 52—481.2** **6 Claims**



1. System for constructing a wall, the system comprising:

at least a first wall board having a first edge including an inner surface and an outer surface;

at least a second wall board having a second edge including an inner surface and an outer surface;

at least one profile connected with said first edge of said first wall board and with said second edge of said second wall board;

the first wall board comprising at an inner side a first nose in the vicinity of the first edge, so that a groove is formed between the first edge of the first wall board and the first nose;

the second wall board comprising at an inner side a second nose int he vicinity of the second edge, said second nose extending beyond the first edge of the first wall board,

the profile comprising a spring fit for insertion in said groove, and comprising a surface extending parallel to an inner surface of the second nose,

characterized in that an outer surface of the second nose is flush with the inner surface of the first edge, so that the second nose is fit for locking between the profile and the first edge, and

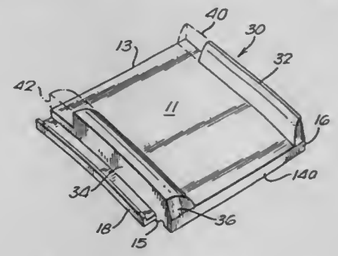
that a recess has been provided perpendicular to and in the inner surface of the second nose and a ridge shaped as the recess has been provided in the profile for gripping said recess.

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**5,743,059**
**ROOF TILE**

**John Alfred Fifield, Buckinghamshire, England, assignor to CRH Oldcastle, Inc., Los Angeles, Calif.**

**Filed Nov. 4, 1994, Ser. No. 334,497**
**Claims priority, application United Kingdom, Nov. 5, 1993, 9322805**
**Int. Cl.[6] E04D *1/16***
**U.S. Cl. 52—519** **16 Claims**



1. In a roof tile comprising an upper edge, a lower edge and opposed side edges when in an orientation installed on a roof, the tile further comprising an under surface and a contoured upper surface which has a shape to give the appearance of a profiled tile, including a contoured portion and a portion which is not contoured, thereby to provide an undulating or otherwise non-planar roof surface,

the improvement wherein the upper surface comprises an extrusion face, the tile has an overlap region extending from the upper edge toward the lower edge for a distance suitable to allow the upper edge of the tile to be overlapped by the lower edge of an upwardly adjacent roof tile, the contoured portion comprises at least one formation in the form of a projection which extends outwardly from the upper surface of the tile, the projection extending for a distance from the lower edge toward the upper edge for a distance as far as, but not into, the overlap region, and the under surface has a shape which generally corresponds to the shape of the portion of the upper surface of the tile that is not contoured.

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**5,743,060**
**BOX TRUSS FOR LIGHTS**

**Jerry R. Hayes, and Patrick F. Pasch, both of 6240 Columbia, Haslett, Mich. 48840**

**Division of Ser. No. 148,876, Nov. 8, 1993, Pat. No. 5,551,199. This application Aug. 28, 1996, Ser. No. 704,142**
**Int. Cl.[6] F21L *21/14***
**U.S. Cl. 52—648.1** **14 Claims**

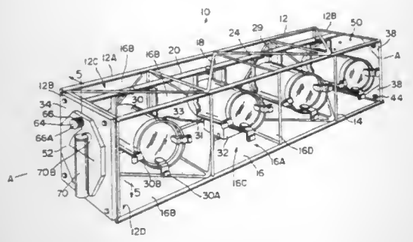
1. A truss for supporting electric lights which comprises:

(a) first rods extending parallel to a longitudinal axis of the truss each having spaced apart first and second ends perpendicular to the longitudinal axis of the truss so as to define a rectangular cross-section perpendicular to the longitudinal axis with four sides;

(b) second rods having spaced apart ends and extending between and perpendicular to two of the first rods to form a plurality of side-by-side openings along the length of the first rods wherein the openings are in a plane parallel to the longitudinal axis of the truss and provide a front side of the truss along one of the sides;

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(c) a plurality of third rods extending diagonally between two of the first rods and the ends of the second rods across each of the remaining sides within planes parallel to the longitudinal axis of the truss and defined by each of the remaining sides of the truss;

(d) fourth rods mounted parallel to the longitudinal axis and in a plane along an uppermost one of the sides of the truss and wherein electric lights are secured inside of the truss at an intersection of the third rod and the fourth rod by a first fastening means adjacent each of the side-by-side openings on the front side of the truss; and

(e) a pair of end plate means mounted on the first end and the second end of the first rods.

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**5,743,061**

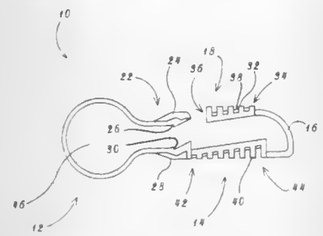
**WALL ANCHOR**

**Dennis P. Rolph, Charles City, Iowa, assignor to Diversified Fastening Systems, Inc., Charles City, Iowa**

**Filed Nov. 12, 1996, Ser. No. 746,475**

**Int. Cl.[6] E04C** *5/12*; **E04B** *1/38*

**U.S. Cl. 52—698** **20 Claims**



1. A one-piece wall anchor comprising:

(a) a first inclined plane having an exterior surface having an arcuate cross-section, a substantially flat interior surface, a low end and a high end;

(b) a second inclined plane having an exterior surface having an arcuate cross-section, a substantially flat interior surface, a low end and a high end;

(c) resilient means integrally molded between said first inclined plane and said second inclined plane for orienting said low end of said first inclined plane toward said high end of said second inclined plane and for orienting said high end of said first inclined plane toward said low end of said second inclined plane;

(d) a retainer secured to said first inclined plane and having a first end and a second end; and

(e) means for securing said first end of said retainer to said second end of said retainer.

**5,743,062**

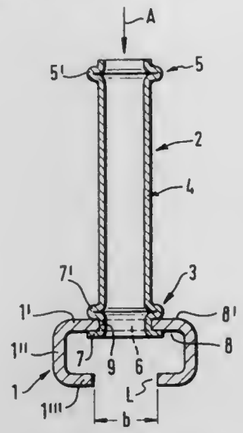
**ANCHORING DEVICE FOR HOUSING/BUILDING CONSTRUCTION**

**Siegfried Fricker, Heimsheim, Germany, assignor to Halfen GmbH & Co. Kommanditgesellschaft, Langenfeld-Richrath, Germany**

**Continuation-in-part of Ser. No. 197,506, Feb. 15, 1994, abandoned. This application Jun. 1, 1995, Ser. No. 457,665**

**Int. Cl.[6] E04B** *1/38*

**U.S. Cl. 52—704** **25 Claims**



1. An anchoring device for building construction, said anchoring device comprising:

a C-shaped anchoring track with a continuous longitudinal slot;

at least one anchoring member comprised of a pipe section and having an anchoring shaft with a first end and a second end;

said anchoring track having an opening for each one of said anchoring members;

said first end of said anchoring member connected to said opening by plastically deforming by beading said first end so as to enclose positive lockingly the edge of said opening;

said second end having a fastening element; and

wherein said first end has a first beaded collar resting on an inner side of said anchoring track, said first beaded collar having a greater diameter than a width of said longitudinal slot.

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**5,743,063**

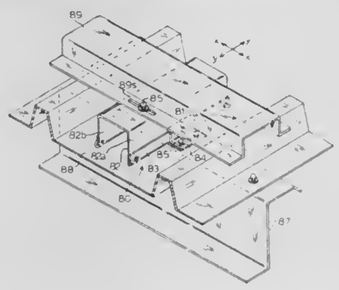
**SYSTEM FOR MOUNTING BUILDING PANELS ALLOWING BI-AXIAL FREEDOM OF MOVEMENT**

**David W. Boozer, Douglasville, Ga., assignor to Non Compact, Inc., Lumberton, N.C.**

**Continuation-in-part of Ser. No. 302,632, Sep. 8, 1994, abandoned. This application May 2, 1996, Ser. No. 641,973**

**Int. Cl.[6] E04B** *7/16*; **E04D** *3/36*

**U.S. Cl. 52—713** **7 Claims**





1. A method for allowing limited movement of a framing member to which a building panel is rigidly connected when said building panel changes dimensionally due thermal changes therein, comprising the steps of:

(a) supplying a first device having a pair of clamps engaged on each side member a U-shaped saddle slider and arranged for allowing limited movement of said framing member with said connected building panel in a selected direction relative to a stationary building component;

(b) fastening a first one of said pair of clamps to said stationary building component;

(c) fastening a second one of said pair of clamps to said stationary building component;

(d) fastening said framing member to said saddle slider in a manner to allow said framing member with said connected building panel to move a limited amount in said selected direction relative to said stationary building component; and

(e) forming said framing member with a slot positioned for loosely receiving a fastener and assembling said fastener to said saddle slider so as to allow movement of said framing member with said connected building panel in a second direction substantially perpendicular to said selected direction.

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**5,743,064**

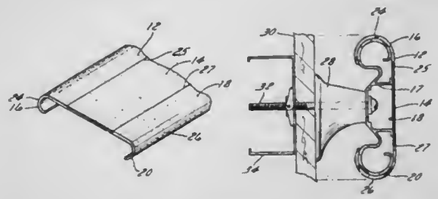
**PROTECTIVE WALL RAIL HAVING DECORATIVE VINYL STRIP**

**Matthew Bennett, New Berlin, Wis., assignor to IrPro Corporation (IPC), Muskego, Wis.**

**Filed Dec. 28, 1995, Ser. No. 579,224**

**Int. Cl.[6] E04F** *19/02*

**U.S. Cl. 52—718.04** **4 Claims**



1. A protective wall rail comprising:

an extruded thermoplastic sheet comprising upper and lower edges and an unnotched planar side portion disposed between said upper and lower edges, said extruded thermoplastic sheet having a textured pattern embossed onto an exposed surface of said side portion, and said side portion of said thermoplastic sheet having a width defined by a distance between said upper and lower thermoplastic sheet edges;

a decorative vinyl film having a decorative pattern thereon, said decorative vinyl film being thermoformably bonded to the exposed surface of said unnotched planar side portion of said extruded thermoplastic sheet, the thermoformed bond between said decorative vinyl film and said thermoplastic sheet being free of adhesives, said decorative vinyl film comprising upper and lower edges, said decorative vinyl film having a width defined by a distance between said upper and lower decorative vinyl film edges, said decorative vinyl film width being substantially less than said side portion of said thermoplastic sheet width, and said decorative vinyl film being thermoformably bonded onto said side portion of said extruded thermoplastic sheet (1) such that said upper and lower edges of said decorative vinyl film (a) are substantially spaced from, (b) are disposed between, and (c) are parallel with, said upper and lower edges of said side portion (2) such that a patterned face of said decorative vinyl film is left exposed, and (3) such that the textured pattern embossed on said extruded thermoplastic sheet gives said decorative pattern on said decorative vinyl film a three-dimensional appearance;

a retainer, said retainer being slidably mounted to said extruded thermoplastic sheet, and said retainer adapted to be fastened to a wall thereby mounting said protective wall rail to said wall, and said retainer defining means for structurally reinforcing said protective wall rail;

and wherein said protective wall rail defines one of (1) guardrail means for protecting said wall from being damaged by a movable object and (2) handrail means for securing the movement of a human through along said protective wall rail.

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**5,743,065**

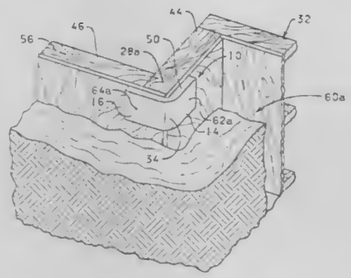
**METHOD FOR REDUCING STRESS CRACKS AT RE-ENTRANT CORNERS OF A CONCRETE SLAB**

**Grant Crews, El Reno; Ben D. Fuller, and Michael Caldarone, both of Edmond, all of Okla., assignors to Dolese Brothers Co., Oklahoma City, Okla.**

**Division of Ser. No. 543,244, Oct. 13, 1995. This application Nov. 12, 1996, Ser. No. 745,545**

**Int. Cl.[6] E04G** *21/02*

**U.S. Cl. 52—745.05** **9 Claims**



1. A method for reducing cracking at re-entrant corners of a concrete slab by effectively reducing stress concentration at the re-entrant corners of the concrete slab, the method comprising:

providing a form, a stem wall or a combination thereof defining a confined area into which concrete is to be poured to produce a concrete slab, a first portion and a second portion of the form, stem wall or combination thereof cooperating to define at least one re-entrant corner;

providing a stress reducing device having a body member formed of a first leg and a second leg, the first leg having a first surface and an opposed second surface and the second leg having a first surface and an opposed second surface, the first surface of the first leg and the first surface of the second leg defining an angle in the body member substantially corresponding to the angle of the re-entrant corner defined by the first and second portions of the form, the stem wall or combinations thereof, the second surface of the first leg and the second surface of the second leg cooperating to define an arcuate concrete engaging surface;

positioning the body member of the stress reducing device substantially adjacent the first and second portions of the form, stem wall or combination thereof defining the re-entrant corner such that the first surface of the first leg is disposed substantially adjacent the first portion of the form, stem wall or combination thereof defining the re-entrant corner and the first surface of the second leg is disposed substantially adjacent the second portion of the form, stem wall or combination thereof defining the re-entrant corner such that the angle formed by the first surfaces of the first and second legs substantially conforms with the angle of the re-entrant corner defined by the first and second portions of the form, the stem wall or combinations thereof in a substantially abutting relationship therewith whereby upon pouring concrete into the confined area defined by the form, the stem wall or combination thereof the arcuate concrete engaging surface of the body member of the stress reducing device is exposed to the concrete so as to reduce the concentration of stresses in the

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concrete slab adjacent the re-entrant corner and thereby reduces development of cracks in the concrete slab adjacent the re-entrant corner.

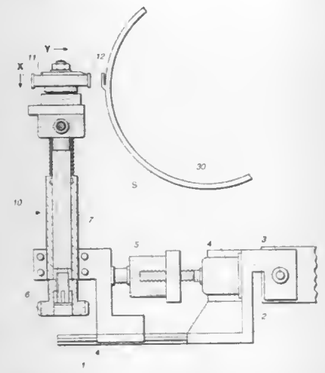
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**5,743,066**

## LONGITUDINAL SEALER FOR BAG MAKER-PACKAGING MACHINE

**Masao Fukuda, and Yukio Nakagawa, both of Shiga, Japan, assignors to Ishida Co., Ltd., Kyoto, Japan**

**Filed Jul. 10, 1996, Ser. No. 678,640**
**Claims priority, application Japan, Aug. 18, 1995, 7-233384**
**Int. Cl.[6] B65B** *51/26;9/20;51/18*
**U.S. Cl. 53—64** **22 Claims**



1. A longitudinal sealer for a bag maker-packaging machine, said longitudinal sealer comprising:

film driving means for transporting a bag-forming film longitudinally;

heating means for applying heat to edge parts of said film to thereby longitudinally seal said edge parts together; and

control means for deactivating said film driving means immediately upon receiving an abnormality detecting signal while maintaining said heating means activated for a delay time necessary to seal said edge parts together and deactivating said heating means thereafter.

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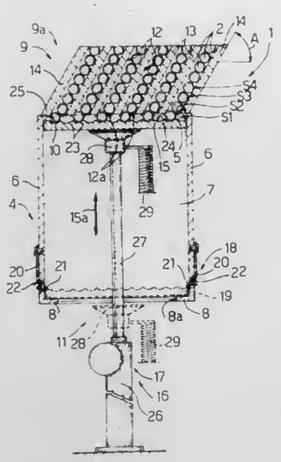
**5,743,067**

## DEVICE FOR LOADING STORAGE CONTAINERS FOR ELONGATED ARTICLES

**Carlo Trimani, Bologna, Italy, assignor to G.D Societa' Per Azioni, Bologna, Italy**

**Filed Jan. 30, 1996, Ser. No. 594,250**
**Claims priority, application Italy, Feb. 2, 1995, BO95A0033**
**Int. Cl.[6] B65B** *19/10;5/10*
**U.S. Cl. 53—151** **12 Claims**

1. A device (**1**; **35**) for loading storage containers (**4**) for elongated articles (**2**), in particular tobacco products (**2**); the device comprising a feedbox (**9***a*) for the articles (**2**), in turn comprising an outlet (**9**) defined by a number of side by side channels (**12**) for respective columns of said articles (**2**), each channel (**12**) presenting an output opening (**12***a*), and said outlet (**9**) presenting a bottom output window (**10**) defined by said side by side output openings (**12***a*); a horizontal plate (**15**) for receiving and supporting a mass of articles (**2**) issuing from said output window (**10**); and actuating means (**16**) for moving said plate (**15**) along a storage container (**4**) positioned, in use, with its input opening (**5**) beneath said output window (**10**); characterized in that the horizontal plate (**15**) presents, on top, side by side seats (**24**) for respective said articles (**2**); each seat (**24**) being separated by a rib (**23**) from each adjacent seat (**24**); each said output opening (**12***a*) facing a rib



(**23**) separating two respective adjacent seats (**24**) on the plate (**15**); and the channels (**12**) all being inclined to the same side in relation to the plate (**15**).

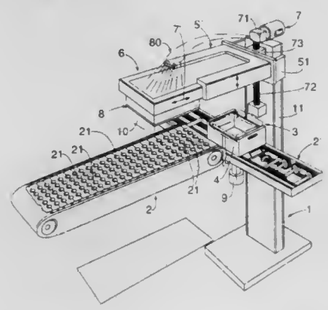
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**5,743,068**

## CITRUS FRUIT PACKING MACHINE

**Javier Madariaga, Guipuzcoa, Spain, assignor to Engranajes Ekin, S.A., Spain**

**Filed Jul. 26, 1996, Ser. No. 686,736**
**Claims priority, application Spain, Nov. 24, 1995, 9503006 U**
**Int. Cl.[6] B65B** *3/04;5/10;25/04;35/00*
**U.S. Cl. 53—247** **6 Claims**



1. A citrus fruit packing machine positioned at a convergence between two endless conveyors, wherein one conveyor holds citrus fruit and the other conveyor holds a box into which said citrus fruit is packed by said citrus fruit packing machine, said citrus fruit packing machine comprising:

(a) a framework structure;

(b) a first head movably attached to said framework structure and positioned above said endless conveyors; said first head having a means for guiding and moving said first head in a vertical plane;

(c) a second head movably attached to said first head, said second head having a means for guiding and moving said second head in a linear manner in a horizontal plane;

(d) a lifting and depositing means for lifting said citrus fruit from said one conveyor and depositing said citrus fruit in said box, said lifting and depositing means comprising:

(d1) a frame attached to said second head;

(d2) at least two cup-bearing crosspieces movably connected to each other by means of spacer rods;



(d3) bearing shafts movably connecting said cup-bearing crosspieces to said frame;

(d4) a set of cups mounted to said cup-bearing crosspieces; and

(d5) a means for moving said cup-bearing crosspieces in both an X-axis and a Y-axis in a horizontal plane;

(e) a box-holder means for holding and rotating said box 180° during packing of said box, said box holder means positioned below said box; and

(f) means for facilitating the tamping entrance of said citrus fruit into said box during packing so as to pack said citrus fruit in said box in an orderly fashion.

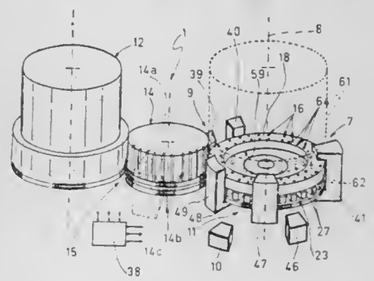
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**5,743,069**

## METERING MACHINE

**Angelo Ansaloni, Crespellano, Italy, assignor to MG2 S.p.A., Pian di Macina-Pianoro, Italy**

**Filed Mar. 3, 1997, Ser. No. 808,996**
**Claims priority, application Italy, Mar. 4, 1996, BO96A0105**
**Int. Cl.[6] B65B** *1/04;43/50*
**U.S. Cl. 53—282** **11 Claims**



1. A machine for filling capsules, each capsule (**2**) comprising a bottom shell (**4**) and a lid (**5**), both hollow and substantially cylindrical, and fitted one inside the other; the machine comprising a supply unit (**12**) for supplying said capsules (**2**) and defining an orderly succession of capsules (**2**) arranged in a given manner; a filling assembly (**7**) located downstream from said supply unit (**12**) in a preferred traveling direction of said capsules (**2**); ordering means (**38**) for optimizing operation of said filling assembly (**7**); and first control means (**14***c*) cooperating with said ordering means (**38**) to determine transfer of said capsules (**2**) from said supply unit (**12**) to said filling assembly (**7**); said filling assembly (**7**) comprising an input station (**9**) and an output station (**11**) for said capsules (**2**); and a first and a second seat (**19**, **28**) for each of said capsules (**2**), and for respectively housing a said lid (**5**) and a said bottom shell (**4**); said filling assembly (**7**) also comprising filling means (**62**) for metering substantially particulate material into said bottom shells (**4**) between said input and output stations (**9**, **11**); and a closing device (**46**) located upstream from said output station (**11**) to fit said lids (**5**) and respective bottom shells (**4**) containing said material one inside the other; characterized in that said filling assembly (**7**) also comprises at least one cleaning station (**48**) located downstream from said output station (**11**); and cleaning means (**49**) being provided at said cleaning station (**48**), and cooperating with said first control means (**14***c*), via said ordering means (**38**), to clean said first and/or second seats (**19**, **28**).

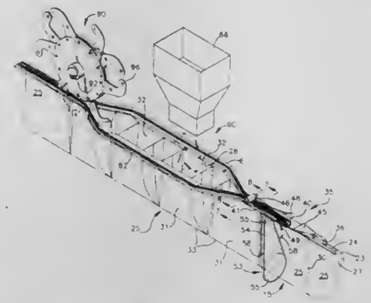
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**5,743,070**

## PACKAGING MACHINE, MATERIAL AND METHOD

**Hershey Lerner, Aurora, and Dana J. Liebhart, Cuyahoga Falls, both of Ohio, assignors to Automated Packaging Systems, Inc., Streetsboro, Ohio**

**Filed Aug. 16, 1996, Ser. No. 699,129**
**Int. Cl.[6] B65B** *43/26;43/28;41/12;41/14*
**U.S. Cl. 53—459** **26 Claims**



1. A packaging machine for loading bags of a web of side connected bags comprising:

a) a frame structure;

b) a bag feed and preparation mechanism carried by the frame structure for pulling a web of side connected bags from a supply and feeding the web along an entrance to a path of travel;

c) the feed and preparation mechanism including:

i) a pair of grooved main transport belts supported on the frame structure and delineating a load station section of the path of travel;

ii) spreading structure for spreading upstanding bag lips; and,

iii) a pair of lip folding plows for folding the spread lips oppositely and respectively over the main transport belts;

d) a pair of lip transport belts each associated with a different one of the main belts for coacting disposition in the groove of the associated main belt to trap such lips in the grooves and thereby fix the lips in the grooves;

e) a cam mechanism carried by the frame and positioned for camming the lip belts into their respective and associated grooves;

f) adjustable transport belt spreaders interposed between the transport belts of each pair to spread and space reaches of the transport belts as they move through the load station whereby to sequentially open the bags into polygonal configurations as they traverse the load station; and,

g) a pair of oppositely rotatable sets of pulley structures carried by the frame structure, each of the sets coacting with a different and associated one of the main transport belts to move the belts from closely spaced relationship near the preparation mechanism, through the load station in spaced relationship and return to closely spaced relationship downstream from the load station.

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**5,743,071**

## ASSEMBLY FOR AUTOMATIC PACKAGING OF SERIES OF ARTICLES OR PRODUCTS DELIVERED ON CONVEYOR BELTS

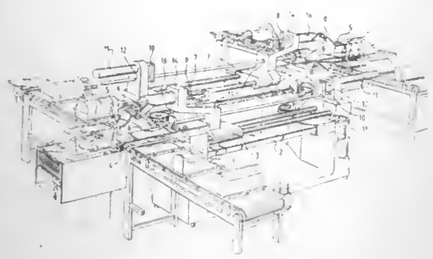
**Huite Wolthuizen, De Koppele 3, NL-5632 LE Eindhoven, Netherlands**

**Filed Mar. 22, 1995, Ser. No. 408,243**
**Claims priority, application Netherlands, Dec. 13, 1994, 94 02 112**
**Int. Cl.[6] B65B** *43/14*
**U.S. Cl. 53—571** **9 Claims**

1. An apparatus for automatically packing in bags a series of articles comprising: a first conveying means for delivering the articles, a bag holder arranged next to the first conveying means for supporting the bags.

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a first gripper assembly comprising a substantially horizontally extending lower spoon and an upper spoon that is pivotable about a horizontal axis, said spoons being carried at their proximal ends by a spoon yoke that is mounted on a reciprocating spoon bracket, said spoon bracket being horizontally movable in a direction substantially perpendicular to the delivery direction of the first conveying means, so as to move the spoons between a first or idle position adjacent the first conveying means and opposite the bag holder and a second or pick-up position in which the spoons extend across the first conveying means into a bag supported by the bag holder,

a pusher member arranged between the spoons and movable between an idle position adjacent the first conveying means opposite the bag holder and a blocking position over the first conveying means, and

a second conveying means for carrying off the articles packed in the bags to a storage;

wherein the spoon bracket is supported by a slide element that is mounted on an endless belt or chain, said belt or chain being guided over at least two pulleys, at least one of which is driven by a first drive means under control of an electronic control system, said drive means turning said driven pulley back and forth over an angle corresponding to the required stroke of the spoons between their first and second positions;

wherein said upper spoon is drivably connected to a second drive means controlled by said electronic control system, said upper spoon being movable by said second drive means from a closed position in which its distal end is adjacent said lower spoon to an open position in which its distal end is removed from said lower spoon for opening a bag; and

wherein the upper spoon comprises a protrusion cooperating with a cam track that is fixedly arranged in the apparatus, whereby the upper spoon is pivoted back to its closed position at the end of a packaging cycle, thus releasing the bag.

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**5,743,072**

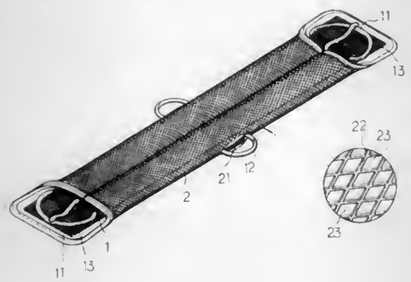
**SADDLE CINCH**

**Ju-Sung Chang, 4, Lane 48, Min Sheng 3 Street, Tsaotwen, Nantou, Taiwan**

**Filed Oct. 1, 1996, Ser. No. 723,886**

**Int. Cl.[6] B68C** *1/14*

**U.S. Cl. 54—23** **1 Claim**



1. A saddle cinch comprising:

a belt provided respectively at both longitudinal ends thereof with a fastening segment and a buckle fastened therewith, said belt further provided at a midsegment thereof with retaining rings fastened therewith; and

a protective jacket provided at a midsegment thereof with through holes and fitted over said belt such that said protective jacket is fastened securely and respectively at both longitudinal ends thereof with said fastening segment of said belt, and that said retaining rings of said belt are located outside said protective jacket via said through holes of said protective jacket;

wherein said protective jacket is provided in an outer surface thereof with a plurality of free grooves arranged equidistantly such that said grooves intersect one another to form therebetween a plurality of knobs having a smooth top.

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**5,743,073**

**AUTOMATIC FORAGE HARVESTER KNIFE SHARPENING METHOD USING FIRST AND SECOND SPEED RATIOS**

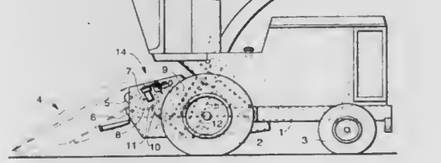
**Bert Juul Frans Paquet, Sint-Andries, Belgium, assignor to New Holland North America, Inc., New Holland, Pa.**

**Filed Mar. 28, 1996, Ser. No. 625,449**

**Claims priority, application United Kingdom, Mar. 31, 1995, 95 06 692.4**

**Int. Cl.[6] A01D** *75/10*

**U.S. Cl. 56—12.1** **10 Claims**



1. A method of sharpening a cutterhead in a forage harvester comprising a rotatable cutterhead (**9**), cutterhead sharpening means (**15**), means (**33**) for moving said sharpening means (**15**) along a path adjacent said cutterhead (**9**) and means for moving said sharpening means (**15**) towards said cutterhead (**9**), said method comprising the steps of:

rotating said cutterhead (**9**) at a substantially constant rotational speed above a predetermined threshold;

initially moving said sharpening means (**15**) back and forth along said path at a first speed ratio versus said cutterhead speed; and

subsequently moving said sharpening means (**15**) at least once along said path at a second speed ratio versus said cutterhead speed.

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**5,743,074**

**LAWN MOWER DECK PROTECTING DEVICE**

**Ernest Edward Swayney; Norman Frank Jones, both of 1507 Glassell St., and Christopher Joseph Parker, 1218 Carmel Dr., all of Simi Valley, Calif. 93065**

**Filed Apr. 15, 1996, Ser. No. 631,978**

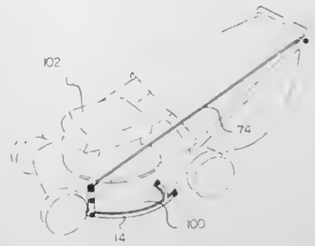
**Int. Cl.[6] A01D** *67/00*

**U.S. Cl. 56—17.4** **8 Claims**

2. A lawn mower deck protecting device comprising:

a lawn mower deck mounting portion comprised of a right side brace and a left side brace;





an elongated bar adapted for direct coupling with a handle of the lawn mower and the right side brace of a lawn mower deck mounting portion.

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**5,743,075**

**HAYMAKING MACHINE**

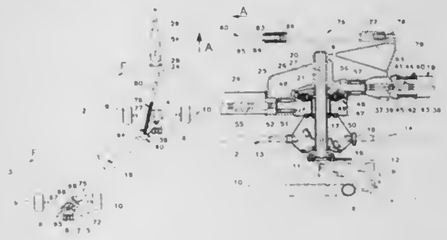
**Jerome Aron, Dossenheim-Sur-Zinsel, and Marc Helfer, Otterstthal, both of France, assignors to Kuhn, S.A., Saverne Cedex, France**

**Filed Sep. 16, 1996, Ser. No. 713,122**

**Claims priority, application France, Sep. 15, 1995, 95 11003**

**Int. Cl.[6] A01D** *78/10*

**U.S. Cl. 56—366** **20 Claims**



1. A haymaking machine, which comprises:

a frame having first and second rotors which are driven respectively in rotation around first and second substantially vertical axles and which are provided with carrier wheels;

a traction beam which is connectable to a tractor,

a linkage beam which connects the approximately vertical axle of the first rotor to the approximately vertical axle of the second rotor, said linkage beam being articulated to said approximately vertical axle of the first rotor, said linkage beam including at least one transverse joint shaft which is substantially horizontal wherein the first rotor includes a toothed ring which meshes with a first gear wheel which is rigidly fastened to a drive shaft and with a second gear wheel which is rigidly fastened to a transmission shaft which extends towards the second rotor and which includes a third gear wheel which meshes with a toothed ring of the second rotor, and wherein said transmission shaft is located in the linkage beam and is pivotable with the linkage beam about the approximately vertical axle of the first rotor, and

said transmission shaft includes at least one universal joint which is located at a level of the transverse joint shaft of the linkage beam.

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**5,743,076**

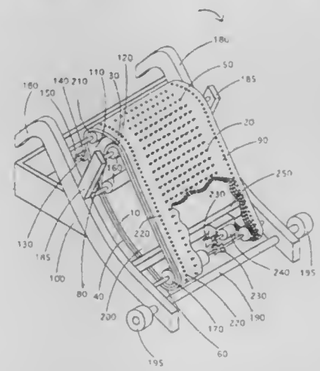
**ROTARY TYPE DEBRIS COLLECTOR**

**Kim Kwee Ng, PO Box 379, Selden Post Office, Selden, N.Y. 11784-0379**

**Continuation-in-part of Ser. No. 526,587, Sep. 11, 1995, abandoned, and a continuation-in-part of Ser. No. 380,396, Jan. 30, 1995, abandoned. This application Sep. 9, 1996, Ser. No. 707,864**

**Int. Cl.[6] A01D** *7/10*

**U.S. Cl. 56—400.02** **6 Claims**



1. A device of the type for picking up debris from lawns and the like, in combination with a wheeled means defining a frame, comprising:

a) first means defining a rotational flexible first belt mounting an array of uniformly spaced-apart tines extending outwardly from said rotational flexible first belt; and,

b) second means defining a rotational flexible second belt exterior to said first means, said second belt having an array of spaced-apart transverse through openings adapted for through penetration by said tines, said first means and said second means cooperatively interacting to pick up said debris, comprising paper, leaves and the like, on said tines while said tines protrude through said openings and to remove said debris from said tines during selective retraction of said tines.

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**5,743,077**

**METHOD FOR FORMING CORE/WRAP YARN**

**A. Paul S. Sawhney, Metairie, and Craig L. Folk, New Orleans, both of La., assignors to The United States of America as represented by the Department of Agriculture, Washington, D.C.**

**Division of Ser. No. 195,429, Feb. 14, 1994, Pat. No. 5,531,063, which is a continuation-in-part of Ser. No. 22,207, Feb. 25, 1993, abandoned, which is a continuation-in-part of Ser. No. 603,504, Oct. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 366,702, Jun. 15, 1989, Pat. No. 4,976,096. This application Jul. 2, 1996, Ser. No. 675,396**

**Int. Cl.[6] D01H** *13/04;5/28*

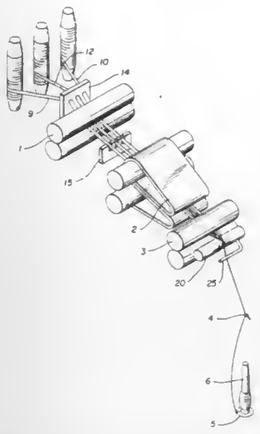
**U.S. Cl. 57—261** **2 Claims**

1. A method of piecing-up core/wrap yarn on a ring spinning device that includes a pair of draft rollers forming a nip therebetween, a strand feeding apparatus for feeding a core strand, a first wrap strand and a second wrap strand to the nip, and a support surface on which the first and second wrap strands are wrapped around the core strand while supported on the support surface, the support surface extending substantially parallel to the nip, the method comprising the steps of:

when the yarn has broken, moving the support surface out of a support surface operative position immediately downstream of the nip to a second support surface position spaced form the support surface operative position;

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after the support surface has been moved out of the support surface operative position, performing a piecing-up operation; and subsequently moving the support surface back into the support surface operative position.

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**5,743,078**

**M+N STEEL CORD WITH EQUAL PLE PER FILAMENT**

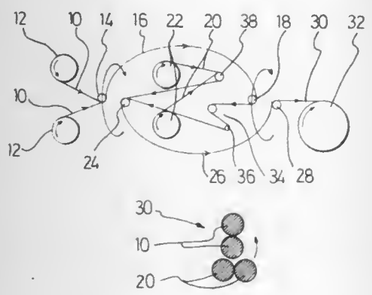
**Ghislain Doornaert, Marke, and Yvan A. Lippens, Vichte, both of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium**

**Filed Mar. 3, 1997, Ser. No. 813,967**

**Claims priority, application European Pat. Off., Mar. 11, 1996, 96200660**

**Int. Cl.[6] D02G** *3/36;3/02*

**U.S. Cl. 57—902** **9 Claims**



1. A steel cord (**30**) consisting of a first group and a second group, the first group comprising two or more plastically deformed outer steel filaments (**10**) twisted around each other with a first twist pitch, the second group comprising one or more plastically deformed inner steel filaments (**20**) twisted around each other with a second twist pitch,

the second group twisted around the first group with a cord twist pitch,

one of the inner or the outer steel filaments having a part load elongation of x %,

all the other inner and outer steel filaments having a part load elongation of y %,

x and y fulfilling the equation:

$$x-0.10 \leqq y \leqq x+0.10,$$

all the inner and outer steel filaments having a deforming pitch that is substantially equal to the cord twist pitch.

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**5,743,079**

**TURBINE ENGINE CONTROL SYSTEM**

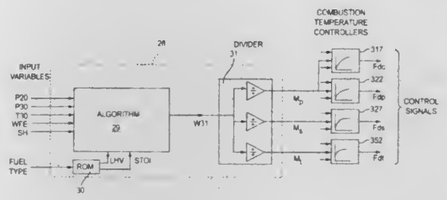
**Philip P. Walsh, Birmingham; Nicholas C. Corbett, Solihull, and Arthur L. Rowe, Derby, all of England, assignors to Rolls-Royce plc, London, England**

**Filed Sep. 19, 1996, Ser. No. 715,734**

**Claims priority, application United Kingdom, Sep. 30, 1995, 9520002**

**Int. Cl.[6] F02C** *9/28*

**U.S. Cl. 60—39.03** **24 Claims**




1. A method for regulating fuel flow in a gas turbine engine comprising a compressor section, a combustor section, a turbine section, turbine nozzle guide vanes, fuel inputs and means to measure values for one or more of the parameters: engine entry pressure, compressor delivery pressure, combustor entry temperature, compressor exit capacity, nozzle guide vane throat temperature, nozzle guide vane throat capacity, fuel flow rate, specific humidity of the air,

wherein the method includes the evaluation of combustor entry air mass flow rate, the method for said evaluation comprising the steps of:

a) estimating a value for the nozzle guide vane throat air mass flow rate;

b) evaluating nozzle guide vane throat temperature;

c) evaluating nozzle guide vane throat pressure;

d) evaluating nozzle guide vane throat capacity;

e) using the values of nozzle guide vane throat temperature, pressure and capacity to calculate nozzle guide vane throat mass flow rate;

(f) taking a value for fuel flow rate and deducting it from the nozzle guide vane throat mass flow rate to give a value for air mass flow rate;

g) comparing the calculated value of the air mass flow rate with the estimated value of the air mass flow rate and checking whether the two values agree within a specified tolerance;

h) if the two values of air mass flow rate do not agree within a specified tolerance making a revised estimate and carrying out steps b) to g) again until the two values of air mass flow rate agree within the specified tolerance;

i) when the two values of air mass flow rate agree within the specified tolerance outputting the calculated value of air mass flow rate to give an output for the combustor entry air mass flow rate where calculated value of air mass flow rate=combustor entry air mass flow rate plus any air flow diverted from the combustor entry air flow.

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**5,743,080**

**VAPOR-AIR STEAM ENGINE**

**J. Lyell Ginter, Fresno, Calif., assignor to Ginter Vast Corporation, Los Angeles, Calif.**

**PCT No. PCT/US93/10280, § 371 Date Apr. 26, 1994, § 102(e) Date Apr. 26, 1994, PCT Pub. No. WO94/10427, PCT Pub. Date May 11, 1994**

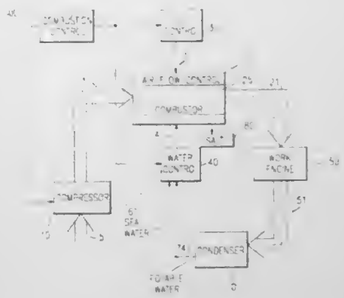
**Continuation-in-part of Ser. No. 967,288, Oct. 27, 1992, Pat. No. 5,221,041. This PCT application Oct. 27, 1993, Ser. No. 232,047**

**Int. Cl.[6] F02C** *3/00*

**U.S. Cl. 60—39.05** **28 Claims**

1. A method of operating an engine comprising the steps of:





compressing ambient air into compressed air having a pressure equal to or greater than six atmospheres, and having an elevated temperature;

ducting the flow of compressed air into a combustion chamber;

injecting controlled amounts of fuel into the combustion chamber the compressed air and fuel being mixed and ignited;

injecting controlled amounts of salt water into the combustion chamber down stream from a point of ignition;

independently controlling the amount of compressed air, the amount of fuel injected, and the amount of salt water injected so as to completely combust the injected fuel with the compressed air to create a hot combustion product, the injected liquid being transformed into a vapor, the vaporization of the salt water causing salt in the sea water to be deposited in the combustion chamber as molten salt and the transformation into a vapor providing substantially all of the cooling of the working fluid from downstream of the point of ignition; and

removing the molten salt from the combustion chamber;

wherein a working fluid consisting of a mixture of any excess compressed air, fuel combustion products and vapor is generated in the combustion chamber during combustion at a predetermined combustion temperature.

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**5,743,081**

**GAS TURBINE ENGINE**

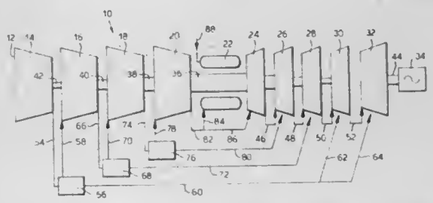
**Graham A. Reynolds, Coventry, England, assignor to Rolls-Royce plc, London, England**

**Filed Apr. 10, 1995, Ser. No. 419,390**

**Claims priority, application United Kingdom, Apr. 16, 1994, 9407588**

**Int. Cl.[6] F02C** *3/14*

**U.S. Cl. 60—39.17** **11 Claims**



1. A gas turbine engine comprising a plurality of compressors arranged in flow series, combustion means arranged to receive an oxygen containing gas from the last compressor in the series, means to supply fuel to the combustion means, a plurality of turbines arranged in flow series to sequentially receive the exhaust gases from the combustion means, each of the compressors being arranged to be driven by a respective one of the turbines, the last compressor in the series being arranged to supply super-stoichiometric amounts of oxygen containing gas to the combustion means such that rich combustion occurs and unburned fuel exits from the combustion means with the exhaust gases, a plurality of combustion duct means arranged in flow series, each combustion duct means being positioned between two adjacent ones of the plurality of turbines, each compressor being arranged to supply a portion of oxygen containing gas to a respective one of the combustion duct means to allow the combustion of at least some of the unburned fuel in the exhaust gases in the combustion duct means, at least one of the combustion duct means receiving super-stoichiometric amounts of oxygen containing gas such that rich combustion occurs, said means to supply a portion of oxygen containing gas from the compressors to the combustion duct means comprising ducts to supply the oxygen containing gas firstly to the respective turbine to cool the turbine, the oxygen containing gas subsequently flowing into the respective combustion duct means.

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**5,743,082**

**APPARATUS FOR DETECTING REDUCTION OF PURIFYING CAPACITY OF CATALYST FOR PURIFYING EXHAUST GAS FROM INTERNAL COMBUSTION ENGINE AND METHOD THEREOF**

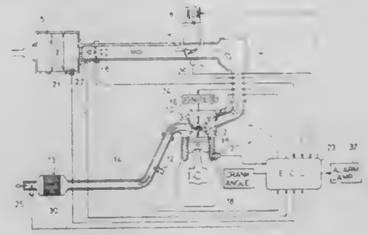
**Takuya Matsumoto; Toru Hashimoto; Mitsuhiro Miyake; Hitoshi Kamura, all of Kyoto, Japan, and Yasuhisa Yoshida, Corella New Port Beach, Calif., assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 28, 1995, Ser. No. 535,641**

**Claims priority, application Japan, Sep. 30, 1994, 6-237431; Sep. 30, 1994, 6-237432; Sep. 30, 1994, 6-237433**

**Int. Cl.[6] F01N** *3/20*

**U.S. Cl. 60—274** **18 Claims**



1. An apparatus for detecting a reduction of purifying capacity of a catalytic converter in an exhaust gas passage through which exhaust gas from an internal combustion engine is guided, the catalytic converter having a catalyst therein for purifying the exhaust gas, said apparatus comprising:

a first sensor disposed in the exhaust gas passage at an upstream side of the catalytic converter, said first sensor detecting a component in the exhaust gas and outputting a first detection signal;

a second sensor for detecting the component in the exhaust gas flowing in a downstream side of the catalytic converter and outputting a second detection signal;

purification signal outputting means for outputting a purification signal indicative of a degree of reduction of the purifying capacity of the catalyst in accordance with said first and second detection signals from said first and second sensors;

reference value setting means for setting a reference value to be compared with said purification signal based on said first detection signal; and

comparing means for comparing said purification signal from said purification signal outputting means with said set reference value and outputting a comparison result indicative of an occurrence of a predetermined reduction of the purifying capacity of the catalyst.

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**5,743,083**

## METHOD FOR INTERRUPTING THE METERING OF FUEL DURING OVERRUN OPERATION OF AN INTERNAL COMBUSTION ENGINE

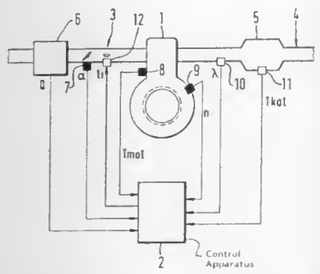
**Eberhard Schnaibel, Hemmingen, and Frank Blischke, Hildesheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed May 13, 1996, Ser. No. 645,274**

**Claims priority, application Germany, May 12, 1995, 195 17 434.8**

**Int. Cl.[6] F01N** *3/20*

**U.S. Cl. 60—274** **2 Claims**




1. A method for interrupting fuel metered to an engine during overrun operation, the engine being equipped with a catalytic converter and having a parameter representing the load state on the engine, said engine being driven with said parameter shortly before reaching said overrun mode of operation; and, said method comprising the steps of:

determining a criterion for the temperature of the catalytic converter to be said parameter;

utilizing said parameter as said criterion for the temperature of said catalytic converter;

checking to determine if said criterion satisfies a condition for the temperature of the catalytic converter which is characteristic for a high temperature of said catalytic converter;

providing a load threshold; and,

considering said condition as being satisfied when said load threshold is exceeded and interrupting the metering of fuel to said engine when said condition is not satisfied.

**5,743,084**

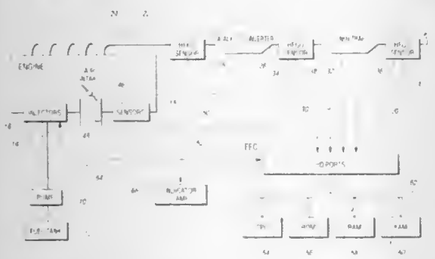
## METHOD FOR MONITORING THE PERFORMANCE OF A $NO_x$ TRAP

**Jeffrey Scott Hepburn, Dearborn, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.**

**Filed Oct. 16, 1996, Ser. No. 732,626**

**Int. Cl.[6] F01N** *3/20*

**U.S. Cl. 60—274** **20 Claims**



1. A vehicle on-board computer method of diagnosing the status of a $NO_x$ trap disposed in an exhaust passage of an internal combustion engine, comprising a sequence of the following steps:

performing a purge of said trap after meeting predetermined lean mode engine operating criteria; and

providing an indication of trap deterioration if the time interval between successive purges is less than a predetermined time interval.

**5,743,085**

## DIAGNOSTIC EQUIPMENT FOR AN EXHAUST GAS CLEANING APPARATUS

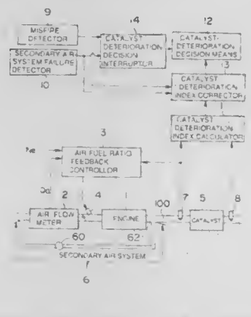
**Yutaka Takaku, Katsuta, and Toshio Ihshii, Mito, both of Japan, assignors to Hitachi, Ltd., Japan**

**Filed Apr. 8, 1994, Ser. No. 224,881**

**Claims priority, application Japan, Apr. 9, 1993, 5-083326**

**Int. Cl.[6] F01N** *3/28*

**U.S. Cl. 60—276** **2 Claims**




1. Diagnostic equipment for an exhaust gas cleaning apparatus directed toward an engine system having a secondary air system which introduces air into a part of an exhaust pipe located between said engine and said catalyst and furnished with an air-fuel-ratio controller which detects an air fuel ratio of exhaust gas emitted from an engine and which adjusts a quantity of fuel injection so as to hold the air fuel ratio of the exhaust gas at a predetermined value and a catalyst for cleaning said exhaust gas;

said diagnostic equipment, comprising:

a first air-fuel-ratio sensor which detects the air fuel ratio of the exhaust gas upstream of said catalyst;

a second air-fuel-ratio sensor which detects the air fuel ratio of the exhaust gas downstream of said catalyst;

catalyst-deterioration-index calculation means for calculating a catalyst deterioration index indicative of a deterioration state of said catalyst from output signals of said first air-fuel-ratio sensor and said second air-fuel-ratio sensor;

catalyst-deterioration decision means endowed with a predetermined threshold value, for deciding the deterioration state of said catalyst through a comparison between the threshold value and the catalyst deterioration index;

abnormality detection means comprising secondary-air-system failure detection means for detecting a failure of said secondary-air-system as affects said catalyst deterioration index; and

at least one of a catalyst-deterioration-index correction means for correcting said catalyst deterioration index when the abnormality has been detected by said abnormality detection means and a catalyst-deterioration-decision interruption means for interrupting the decision of said catalyst-deterioration decision means when the abnormality has been detected by said abnormality detection means.



**5,743,086**

## DEVICE FOR JUDGING DETERIORATION OF CATALYST OF ENGINE

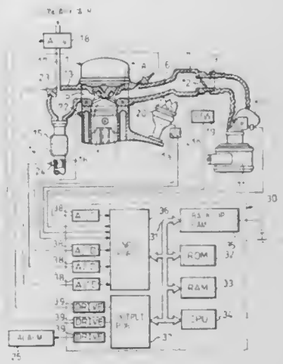
**Toshinari Nagai, Shizuoka, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Filed Oct. 21, 1996, Ser. No. 734,543**

**Claims priority, application Japan, Oct. 26, 1995, 7-279002**

**Int. Cl.[6] F01N** *3/20*; **F02D** *41/14*

**U.S. Cl. 60—276** **8 Claims**



1. A device for judging the deterioration of a three-way catalyst arranged in exhaust passage of an engine in which an air-fuel ratio is controlled by feedback operation so that it becomes equal to the stoichiometric air-fuel ratio, said device comprising

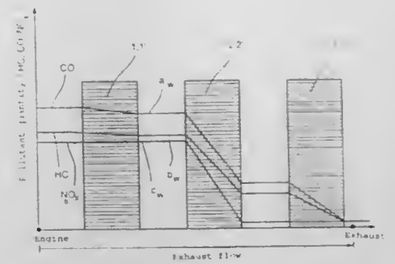
a downstream air-fuel ratio sensor arranged in the exhaust passage downstream of the three-way catalyst;

fluctuation calculating means for calculating an amount of fluctuation of sensor output, which changes in accordance with a change in the amount of fluctuation of an output of said downstream air-fuel ratio sensor and increases as the three-way catalyst deteriorates;

deterioration judging means for judging that the three-way catalyst deteriorates when the amount of fluctuation of the sensor output exceeds a predetermined amount of fluctuation;

air-fuel ratio deviation judging means for judging whether or not a mean value of the air-fuel ratio deviates from the stoichiometric air-fuel ratio; and

controlling means for controlling the predetermined amount of fluctuation on the basis of a judgement by the air-fuel ratio deviation judging means to lower the predetermined amount of fluctuation when the mean value of the air-fuel ratio deviates from the stoichiometric air-fuel ratio.




lyzers, viewed in the exhaust flow direction, being suitable for at least the catalytic conversion of HC and CO exhaust gas constituents, and the first catalyzer including a catalytically reactive layer possessing no capability or only a very slight capability for alternative adsorption and desorption of oxygen such that the first catalyzer is an at least largely inactive oxidation catalyzer in a warm operating condition of the engine under λ-control;

wherein a second catalyzer is a three-way catalyzer optimized for the reduction of $NO_x$, and a third catalyzer is a conventional oxidation catalyzer.

**5,743,087**

## METHOD AND APPARATUS FOR PURIFYING EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

**Wolfgang Zahn, Ludwigsburg; Gunter Loose, Remseck, and Axel Hirschmann, Goeppingen, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany**

**Division of Ser. No. 396,958, Mar. 1, 1995, Pat. No. 5,556,604. This application Jun. 18, 1996, Ser. No. 665,725**

**Claims priority, application Germany, Mar. 3, 1994, 44 06 648.1**

**Int. Cl.[6] F01N** *3/28*

**U.S. Cl. 60—301** **4 Claims**

1. Apparatus for performing a method for purifying exhaust gases from an internal combustion engine, the apparatus comprising:

a catalyzer system which includes three catalyzers arranged in series for the conversion of HC, CO and $NO_x$ exhaust gas constituents;

wherein exhaust gases flow through said three catalyzers during an entire operating period of the engine, a first of said cata-

**5,743,088**

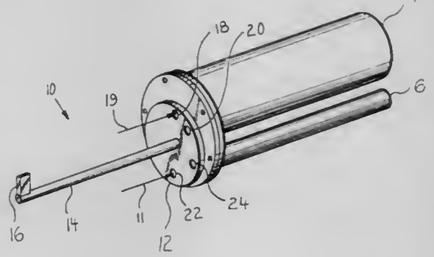
## TRIAD EXHAUST SYSTEM

**Francis R. Grath, 28 Berkshire La., Palm Coast, Fla. 32137**

**Filed Mar. 24, 1997, Ser. No. 823,228**

**Int. Cl.[6] F01N** *7/00*

**U.S. Cl. 60—324** **13 Claims**




1. A triad exhaust system comprising a diverter rotatably engageable with a muffler and an exhaust pipe, said muffler comprising a muffler intake, said exhaust pipe comprising an exhaust pipe intake, said diverter comprising a diverter plate, a diverter plate first muffler port sized to engage said muffler intake and a diverter plate first exhaust pipe port sized to engage said exhaust pipe intake disposed in said diverter plate.

**5,743,089**

## HYDRAULIC CONTROL SYSTEM

**Yutaka Tohji, Hiroshima, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan**

**Filed Jul. 25, 1996, Ser. No. 686,704**

**Int. Cl.[6] F16D** *31/02*

**U.S. Cl. 60—450** **8 Claims**

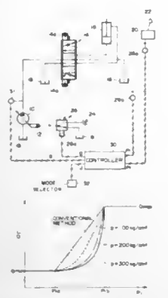
1. A hydraulic control system comprising:

a variable displacement hydraulic pump for pumping a working fluid;

a hydraulic actuator;

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a line connecting said hydraulic actuator to said hydraulic pump such that said hydraulic actuator receives the working fluid from said hydraulic pump;

a control valve provided in said line for changing a flow rate of the working fluid;

a control element which controls said control valve according to a manipulated variable; and

discharge control means for controlling a working fluid discharge quantity of said hydraulic pump such that:

a) the discharge quantity increases for increases of the manipulated variable beyond a threshold level of the manipulated variable, and

b) a ratio of increase of the discharge quantity to increase of the manipulated variable adjacent the threshold level is smaller for larger discharge pressures in said line at a position between said pump and said control valve and is larger for smaller discharge pressures in said line at said position between said pump and said control valve.

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**5,743,090**

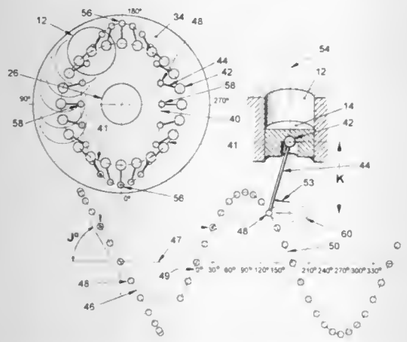
**HYDRAULIC TORQUE TRANSMITTER AND SYNCHRONIZER**

**Andrew W. Barrowman, 330 W. Stevens Ave., Wyckoff, N.J. 07481**

**Filed Sep. 29, 1995, Ser. No. 537,304**

**Int. Cl.[6] F16D** *39/00;* **F16B** *13/04*

**U.S. Cl. 60—488** **12 Claims**



1. An apparatus which translates the linear motion of one or more reciprocating members into the rotational motion of a rotating member or, alternately, translates the rotational motion of said rotating member into the linear motion of said reciprocating member or members, wherein the linear motion of the reciprocating members is in a direction parallel with the axis about which the rotating member rotates and the linear displacement from the mean position of each of the reciprocating members is defined by a mathematical function of the angular displacement of the rotating member from a corresponding datum position of the rotating member, a particular datum position having been defined for each reciprocating member, said apparatus further including,

said rotating member constrained axially and radially in a housing by a first anti-friction mounting means,

swash plate means, affixed to said rotating member, the plane of said swash plate means obliquely inclined to the plane perpendicular to the axis of said rotating member,

connecting plate means, radially and axially constrained through attachment by a second anti-friction mounting means, to the obliquely inclined swash plate means,

said connecting plate means prevented from rotating relative to the axis of rotation of said rotating member by means of first and second interlocking device means, said first interlocking device means affixed to said connecting plate means, said second interlocking device means affixed to the housing,

said first interlocking device means meshing with said second interlocking device means,

wherein the meshing of said first and second interlocking device means results in the rotational motion of said rotating member translating into swivelling action of said connecting plate means, or vice versa,

said connecting plate means including one or more bearing means, corresponding in number to the number of said reciprocating members,

and interconnecting means disposed in contact between each reciprocating member and each connecting plate bearing means,

wherein the swivelling action of said connecting plate means is translated through said interconnect means into reciprocating linear motion of said reciprocating members, or, contrariwise, the reciprocating linear motion of said reciprocating members is translated through said interconnect means, into swivelling action of said connecting plate means and, in turn, rotational motion of said rotational member,

wherein said mathematical function is a sinusoidal function thereof.

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**5,743,091**

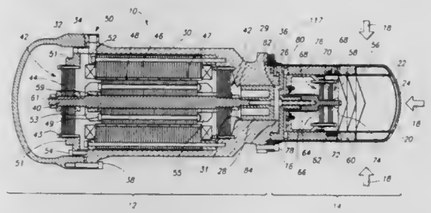
**HEATER HEAD AND REGENERATOR ASSEMBLIES FOR THERMAL REGENERATIVE MACHINES**

**Laurence B. Penswick, Richland, and Ray Erbeznik, Pasco, both of Wash., assignors to Stirling Technology Company, Kennewick, Wash.**

**Filed May 1, 1996, Ser. No. 637,923**

**Int. Cl.[6] F01B** *29/10*

**U.S. Cl. 60—517** **35 Claims**



14. A heater head for use with a thermal regenerative machine, comprising:

a heater shell having a smooth outer surface configured to radiantly couple with an external heat source comprising a cap-shaped head and a tubular side wall extending from the head toward an open mouth portion opposite the head, the head comprising a thickened conductive portion and the tubular side wall comprising a thinned, tapered wall portion having a reduced wall thickness extending away from the head; and



a heat exchanger portion formed substantially from a corrugated piece of sheet metal, the heat exchanger portion affixed to an inner surface of the heater shell, and the heater shell and heat exchanger portion cooperating to form a plurality of working gas flow paths having a large thermally conductive surface area.

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**5,743,092**

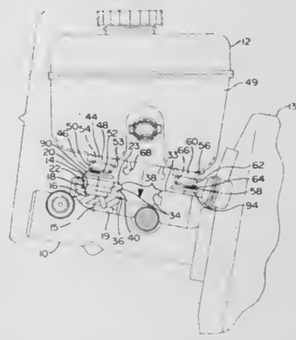
**MASTER CYLINDER AND BRAKE FLUID RESERVOIR ASSEMBLY HAVING A SNAP-IN RETENTION FEATURE**

**Stefan Guenther, Orion; Kevin Gallagher, Commerce, both of Mich., and M. Brent Jensen, Bountiful, Utah, assignors to ITT Automotive Inc., Auburn Hills, Mich.**

**Filed Sep. 17, 1996, Ser. No. 714,916**

**Int. Cl.[6] F15B** *7/00;* **B60T** *11/28*

**U.S. Cl. 60—583** **3 Claims**



1. A combination of a master cylinder and a fluid reservoir comprising:

a master cylinder having a first bore defining a first reservoir seat, a second bore defining a second reservoir seat spaced a predetermined distance from the first bore and a rigid snap-in attachment seat disposed between the first bore and the second bore;

a reservoir having a first cylindrical seating projection, a second cylindrical seating projection spaced the predetermined distance from the first seating projection, and a snap-in attachment member disposed between the first and second seating projections for alignment and engagement with the snap-in attachment seat; and

an elastomeric seal disposed between each of the first bore and the first seating projection and the second bore and the second seating projection wherein the snap-in attachment member is engaged with the attachment seat the seals are both compressed between the reservoir and the master cylinder preventing fluid leakage therepast; wherein

the snap-in attachment member includes a pair of tangs each having a shoulder and a radiused backside with a relatively thin section proximate to the reservoir and a relatively thick section proximate to the shoulder, thereby making the tang flexible at the reservoir body and relatively stiff along the rest of its length; and wherein

the snap-in seat has a pair of shoulders engaged by the shoulders of the snap-in attachment member.

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**5,743,093**

**RESERVOIR FOR MASTER CYLINDER**

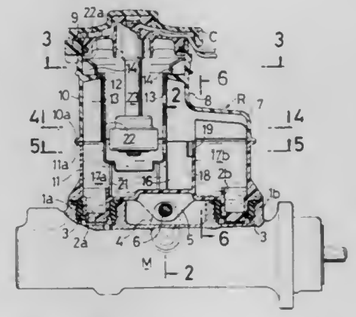
**Nobuhisa Nakayoku; Jiro Suzuki; Masayuki Sugita, all of Wako, and Kazuhiro Kosugi, Ueda, all of Japan, assignors to Nissin Kogyo Co., Ltd., Nagano-ken, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan**

**Filed Jul. 31, 1996, Ser. No. 688,783**

**Claims priority, application Japan, Aug. 2, 1995, 7-197319**

**Int. Cl.[6] B60T** *11/26*

**U.S. Cl. 60—585** **2 Claims**



1. A reservoir made of synthetic resin for a master cylinder, which is mounted to the master cylinder and in which a working oil of the master cylinder is stored, said reservoir comprising:

an inward turned flange integrally molded on an inner peripheral surface of said reservoir to protrude radially inwardly from the middle of said inner peripheral surface, and

a plurality of lower ribs also integrally molded on the inner peripheral surface of said reservoir to extend downwardly from said inward turned flange and disposed in a distributed manner in a circumferential direction of said flange, said inward turned flange being formed, on an upper surface thereof, with an annular flat surface area, with which a tip end of a working oil filler is closely contacted.

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**5,743,094**

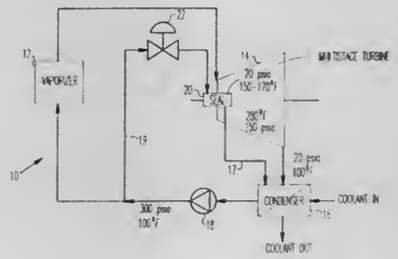
**METHOD OF AND APPARATUS FOR COOLING A SEAL FOR MACHINERY**

**Ohad Zimron, Gan Yavne; Shimon Hatzir, Holon; Meir Regal, Doar Na Avatah, and Nadav Amir, Rehovot, all of Israel, assignors to Ormat Industries Ltd., Yaune, Israel**

**Continuation of Ser. No. 199,697, Feb. 22, 1994, abandoned. This application Sep. 25, 1996, Ser. No. 720,172**

**Int. Cl.[6] E01D** *25/08*

**U.S. Cl. 60—646** **41 Claims**




1. A method for cooling the rotary seal of a turbine operating on vaporized working fluid that expands in the turbine producing expanded vaporized working fluid that is condensed in a condenser from which condensate is pumped into a vaporizer that produces said vaporized working fluid, said method comprising connecting

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the seal operating environment to the condenser, and pumping condensate into the seal operating environment.

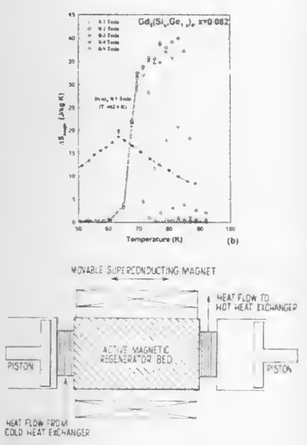
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**5,743,095**

**ACTIVE MAGNETIC REFRIGERANTS BASED ON GD-SI-GE MATERIAL AND REFRIGERATION APPARATUS AND PROCESS**

**Karl A. Gschneidner, Jr., and Vitalij K. Pecharsky, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa**

**Filed Nov. 19, 1996, Ser. No. 753,064**
**Int. Cl.[6] F25B *21/00***
**U.S. Cl. 62—3.1** **28 Claims**




**20**. A method of magnetic regenerating comprising subjecting a working medium to a magnetic field wherein said working medium consists essentially of about 53 to about 58 atomic % Gd, up to about 47 atomic % Ge, and up to about 47 atomic % Si, exhibiting a reversible ferromagnetic to antiferromagnetic or ferromagnetic-II to ferromagnetic-I first order phase transition with changing temperature and magnetic field.

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**5,743,096**

**CONTROLLED DOSING OF LIQUID CRYOGEN**

**Russell Blanton, Acton; John W. Ross, Ipswich, and Thorton Stearns, Winchester, all of Mass., assignors to Vacuum Barrier Corporation, Woburn, Mass.**

**Filed Apr. 11, 1996, Ser. No. 631,187**
**Int. Cl.[6] F17C *7/02***
**U.S. Cl. 62—50.1** **19 Claims**

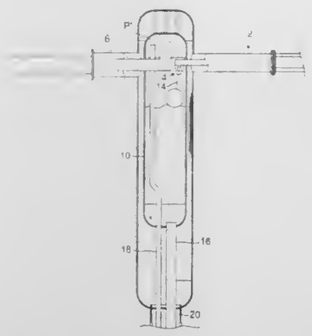
**1**. A system for delivering controlled doses of liquid cryogen from an valved outlet comprising:

(a) a phase separating reservoir to contain cryogen in liquid and vapor phase, the reservoir being positioned above the outlet;

(b) a feed conduit for conveying liquid phase cryogen from the reservoir to the outlet; and

(c) a return conduit communicating between a point P in the feed conduit immediately upstream of the outlet and vapor phase cryogen in the reservoir, the return conduit having a minimum cross-sectional area $A_R$;

the feed conduit and the return conduit being thermally isolated from each other, the feed conduit and the return conduit forming a circulation path comprising minimum cross-sectional area restriction $A_R$ designed to maintain flow in the circulation path, whereby liquid cryogen at point P is replenished from the reservoir as liquid is delivered from the outlet.




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**5,743,097**

**APPARATUS AND METHOD FOR CONTROLLING THE FLOW RATE OF REFRIGERANT TO A REFRIGERATION DEVICE**

**Jimmy I. Frank, 17 Woodsborough Cir., Houston, Tex. 77055**

**Filed Jan. 23, 1996, Ser. Nn. 590,133**
**Int. Cl.[6] F25C *1/18***
**U.S. Cl. 62—68** **19 Claims**



**11**. A method for controlling the flow of refrigerant in a refrigeration device having a mixing chamber that produces a product, an evaporator secured to the exterior of the mixing chamber that freezes the product being produced within the mixing chamber, a valve coupled to the evaporator for regulating the flow of refrigerant through the evaporator, a scraper disposed in the mixing chamber that scrapes the frozen product from the interior surface of the mixing chamber, a beater motor that operates the scraper, and a control circuit connected to the beater motor and the valve, comprising the steps of:

(a) transmitting a signal from the beater motor to the control circuit indicative of the viscosity of the product being produced within the mixing chamber;

(b) determining an instruction to communicate to the valve based on the signal received from the beater motor; and

(c) transmitting the instruction to the valve via a control signal, said control signal being used to open, close, and vary the open percent of the valve so as to control the rate of refrigerant flowing through the evaporator.

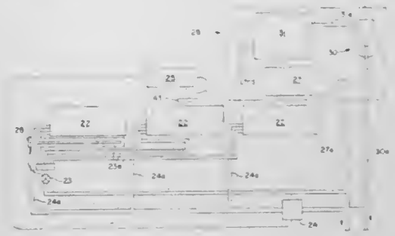


**5,743,098**

**REFRIGERATED MERCHANDISER WITH MODULAR EVAPORATOR COILS AND EEPR CONTROL**

**John A. Behr, Defiance, Mo., assignor to Hussmann Corporation, Bridgeton, Mo.**

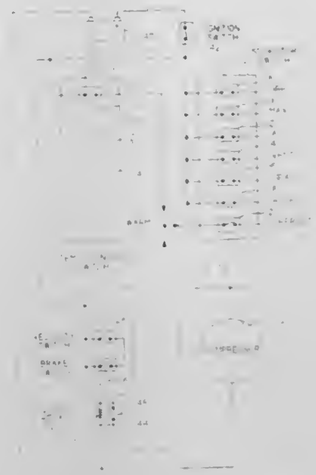
**Continuation of Ser. No. 407,676, Mar. 14, 1995, abandoned. This application May 29, 1996, Ser. No. 655,157**
**Int. Cl.[6] A47F *3/04***
**U.S. Cl. 62—80** **38 Claims**



**15**. An air cooling system in a commercial refrigerated merchandiser having an insulated cabinet with a product zone, comprising:

evaporator means having a refrigeration mode and being constructed and arranged for cooling air within the cabinet to achieve a preselected exit air temperature down stream thereof, liquid refrigerant metering means for controlling the flow of liquid refrigerant to the high side of said evaporator means, means for circulating air flow through said evaporator means and said product zone; and

other refrigerant metering means constructed and arranged on the low side of said evaporator means for controlling the suction pressure thereof, said other metering means comprising evaporator pressure regulating (EEPR) valve means for modulating the refrigerant vapor flow from said evaporator means, and means for sensing exit air temperatures downstream of said evaporator means, and controller means responsive to said sensing means for operating said EEPR valve means in the refrigeration mode and in a defrost mode.



a means for intermittently activating said air conditioning compressor during said defrosting mode.

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**5,743,099**

**ENERGY SAVING HVAC CONTROL SYSTEM**

**Francis Kraynak, R.D. #4, Box 162, and Robert Kraynak, 38 McCormick Ave., both of Uniontown, Pa. 15401**

**Filed Jun. 11, 1996, Ser. No. 661,744**
**Int. Cl.[6] F25D *21/00***
**U.S. Cl. 62—150** **7 Claims**

**1**. An energy efficient HVAC system for a motorized vehicle including:

an HVAC selector switch for selectively activating one of an air conditioning mode, a vent mode, a heat mode, a bi-level mode and a defrost mode;

a temperature control switch for regulating an amount of hot or cold air produced by said HVAC system;

an air conditioning compressor;

a means for activating said air conditioning compressor during said air conditioning mode; and

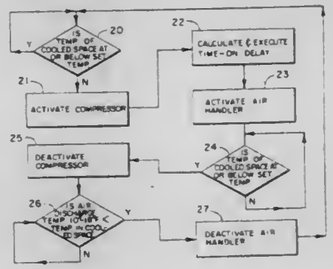
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**5,743,100**

**METHOD FOR CONTROLLING AN AIR CONDITIONING SYSTEM FOR OPTIMUM HUMIDITY CONTROL**

**Richard F. Welguisz, Tyler; Stephen E. Guy, Longview, both of Tex., and John T. Taylor, Dunnellon, Fla., assignors to American Standard Inc., Piscataway, N.J.**

**Filed Oct. 4, 1996, Ser. No. 725,789**
**Int. Cl.[6] G05D *23/32***
**U.S. Cl. 62—158** **17 Claims**




**1**. A method of conditioning the air in a space, which comprises the steps of:

a. providing a compressor, a condenser, an expansion device, and a cooling coil, operatively connected to function as an air conditioner;

b. providing an air mover for passing air from a space across the cooling coil to cool and dehumidify the air, then back into the space;

c. alternately activating and deactivating the compressor;

d. substantially at the time the compressor is activated, determining the amount of time which has elapsed since the compressor was last deactivated;

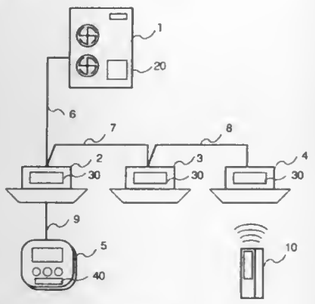
e. determining a time-on delay for activating the air mover, where the time-on delay is a function of the amount of time since the compressor was last deactivated; and

f. after the compressor has been activated for a period substantially equal to the time-on delay, activating the air mover.

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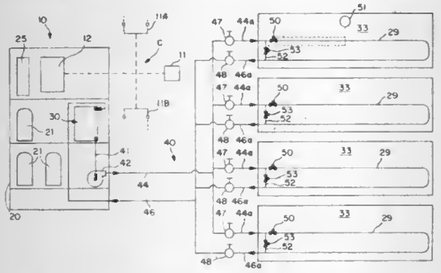
**5,743,101**
**AIR-CONDITIONER**
**Yasunori Shida; Yukihiko Iwata; Takashi Watanabe; Akihiro Kobayashi, all of Tokyo; Osamu Kamiya, Aichi, and Tatsunao Hayashida, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Oct. 30, 1996, Ser. No. 739,835**
**Claims priority, application Japan, Nov. 17, 1995, 7-299872**
**Int. Cl.[6] F24F** *11/02*
**U.S. Cl. 62—175** **17 Claims**




1. An air-conditioner comprising:
an exterior unit;
a plurality of interior units connected to the exterior unit;
a transmitter which transmits data between the exterior unit and the plurality of interior units connected to the exterior unit;
an operation commander, connected to at least one of the exterior unit and the plurality of interior traits, which sets a same operation condition for causing all of the interior units to operate in a same condition; and
a controller, provided in the exterior unit, for collecting operation data from the interior units based on a command from the operation commander, for determining the same operation condition for each of the interior units based on the collected operation data from the interior units, and for instructing each of the interior units to perform the determined same operation condition via the transmitter;
wherein each of the plurality of interior units operates in the same operation condition based on the instruction from the controller.

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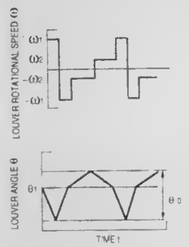
**5,743,102**
**STRATEGIC MODULAR SECONDARY REFRIGERATION**
**Charles D. Thomas; Terry J. Broccard, both of St. Louis; Wayne G. Schaeffer, Ballwin, and Doron Shapiro, St. Louis, all of Mo., assignors to Hussmann Corporation, Bridgeton, Mo.**
**Filed Apr. 15, 1996, Ser. No. 632,219**
**Int. Cl.[6] F25D** *17/02*; **F25B** *1/10*
**U.S. Cl. 62—185** **29 Claims**




1. In combination: a modular refrigeration unit including a condensing unit rack constructed and arranged for placement in strategic proximity to multiple refrigerated fixtures having temperature associated product cooling zones within the shopping arena of a food store, said refrigeration unit being configured to accommodate the maximum aggregate refrigeration loads of the associated cooling zones and comprising primary closed refrigeration circuit components mounted on said condensing unit rack including a plurality of multiplexed compressor means and evaporator means with associated high side and low side refrigerant delivery and suction means operatively connected thereto; and said refrigeration unit also including condenser means connected between the compressor means and evaporator means as a component of the closed refrigeration circuit; and other means constructed and arranged for cooling the condenser means; and
a secondary coolant fluid system having first heat transfer means directly associated with multiple fixtures and being constructed and arranged to operate at frosting temperatures for cooling the temperature associated product cooling zones thereof, second heat transfer means comprising a liquid chiller in heat exchange relationship with the evaporator means of the closed refrigeration circuit for cooling the coolant fluid to frosting temperatures, and pumping means for circulating the coolant fluid in a closed coolant fluid loop through the first and second heat transfer means, at least one of the liquid chiller and pumping means of the coolant fluid system being disposed on the condensing unit rack.

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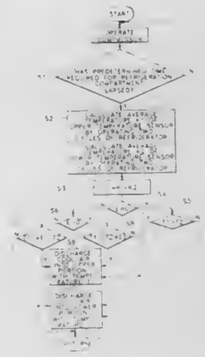
**5,743,103**
**AIR CONDITIONER**
**Masami Taniguchi; Fumio Kondoh, both of Nagoya; Hironari Fujiki; Kenichi Miyazawa, both of Nishi-Kasugai-gun, and Masahiko Takahashi, Nagoya, all of Japan, assignors to Mitsubishi Jokogyo Kabushiki Kaisha, Tokyo, Japan**
**Filed Sep. 27, 1996, Ser. No. 722,832**
**Claims prinrity, application Japan, Oct. 23, 1995, 7-274140**
**Int. Cl.[6] F24F** *13/14*
**U.S. Cl. 62—186** **8 Claims**




1. An air conditioner in which a louver is provided at a blowing opening and said louver is moved rotationally from above to below or from below to above by a variable speed mechanism, wherein, at the time of heating, a rotational speed of said louver while said louver is moved rotationally below a predetermined blowing angle is set to a speed within a vortices non-generation area relative to a wind velocity of blowing air flow and a rotational speed of said louver while said louver is moved rotationally above the predetermined blowing angle is set to a speed within a vortices generation area relative to the wind velocity of blowing air flow.



**5,743,104**
**TEMPERATURE CONTROLLING METHOD FOR REFRIGERATOR AND APPARATUS THEREFOR**
**Jae-in Kim, Seoul; Yun-seok Kang, Suwon, and Seong-wook Jeong, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**
**Filed Mar. 12, 1997, Ser. No. 820,339**
**Claims priority, application Rep. of Korea, Apr. 2, 1996, 96-9913**
**Int. Cl.[6] F25D** *29/00*
**U.S. Cl. 62—209** **6 Claims**

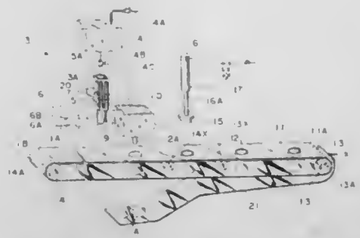


1. A temperature controlling method for a refrigerator in which cool air is discharged into a portion requiring the cool air based on temperature signals sensed by a plurality of temperature sensors positioned at different locations in the refrigeration compartment, the temperature controlling method comprising the steps of:
(a) sensing temperatures of the different locations within the refrigeration compartment using said plurality of temperature sensors several times when the temperatures in the refrigeration compartment are in equilibrium;
(b) calculating the average temperatures of the respective temperature sensors from a number of the temperatures respectively sensed by said plurality of temperature sensors;
(c) selecting one of said plurality of temperature sensors as a reference sensor and calculating error values of the average temperatures of the remaining temperature sensors with respect to that of the reference sensor;
(d) adding the error values of the respective temperature sensors to the temperatures directly sensed by the corresponding temperature sensors to obtain corrected temperature values; and
(e) controlling discharge of cool air based on the corrected temperature values.

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**5,743,105**
**APPARATUS FOR PRODUCING ICE VESSEL**
**Keijiro Yamauchi, Kabushiki Kaisha Yamanouchi Seisakushn of 1-8-18, Katakura, Kanagawa-ku, Yokohama-shi, Kanagawa-ken, Japan**
**Continuation-in-part of Ser. No. 515,474, Aug. 15, 1995, Pat. No. 5,634,344. This application Apr. 10, 1997, Ser. No. 835,657**
**Claims priority, application Japan, Sep. 30, 1994, 6-237792; Jun. 27, 1995, 7-161044**
**Int. Cl.[6] F25C** *5/14*
**U.S. Cl. 62—320** **8 Claims**

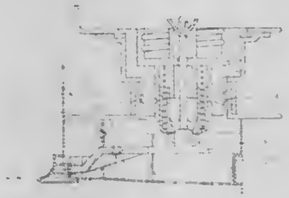
1. An apparatus for producing ice vessels comprising:
an ice making machine;
an ice crusher for crushing ice masses supplied from said ice making machine, said ice crusher having an outlet chute;
a plurality of female dies for accommodating crushed ice therein into, said female dies being provided on an endless conveyor;
a male die opposite to said female dies;




an elevating device for raising or lowering said male die.

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**5,743,106**
**WATER DISPENSER OF A REFRIGERATOR**
**Yong-Kweon Lee, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Rep. of Korea**
**Filed Feb. 6, 1997, Ser. No. 796,863**
**Claims priority, applicatinn Rep. of Korea, May 31, 1996, 96-18939**
**Int. Cl.[6] B67D** *5/62*
**U.S. Cl. 62—389** **16 Claims**



1. A water dispenser of a refrigerator comprising:
a reservoir installed in a pocket of the inner side of the refrigerator door, for storing water therein;
a holding member for supporting the pocket;
a dispensing panel having a support conduit in which a latching boss is formed on an inner peripheral surface thereof, a support plate connected to a lower portion of the support conduit, and a rear plate which has a bracket and supports the support plate, the rear plate being connected to the lower portion of the support plate;
a valve assembly inserted into and mounted to the holding member, the valve assembly having a connecting section connected to the reservoir, a valve cock selectively closing and opening the connecting section at first and second positions respectively, and a bias spring for exerting a first biasing force on the valve cock so that the valve cock is positioned at the first position; and
an opening means pivotally mounted in said dispensing panel, for moving said valve cock so that said valve cock is positioned at the second position.

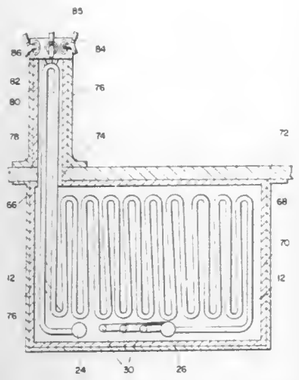
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**5,743,107**
**APPARATUS FOR COOLING FLUIDS**
**Melvin Kyees, 16732 Intrepid La., Huntington Beach, Calif. 92649**
**Filed Sep. 13, 1995, Ser. No. 531,568**
**Int. Cl.[6] B67D** *5/62*
**U.S. Cl. 62—390** **22 Claims**

1. An apparatus for cooling at least one fluid comprising

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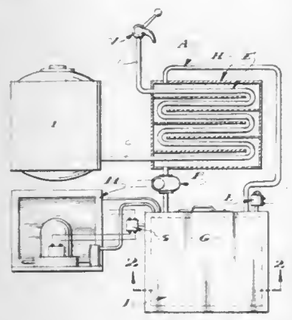




a) a coolant system defining a cold plate portion and a tower portion,
b) a fluid system defining a cold plate portion and a tower portion, said portions being in heat exchange relationship with said coolant system,
c) means for dispensing said at least one fluid from said tower portion, and
d) a metallic unit comprising unitary cold plate and tower portions which respectively incorporate said cold plate and tower portions of said coolant system and said fluid system.

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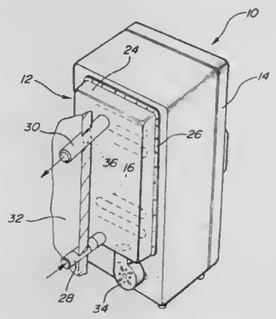
**5,743,108**
**GLYCOL CHILLER MACHINE**
**Robert K. Cleland, 11051 Via El Merado, Los Alamitos, Calif. 90720**
**Continuation-in-part of Ser. No. 419,286, Apr. 10, 1995. This application Oct. 4, 1996, Ser. No. 726,866**
**Int. Cl.[6] B67D** *5/62*; **F25D** *11/04*
**U.S. Cl. 62—393** **6 Claims**



1. A glycol chiller comprising an elongate vertical sheet metal tank with spaced apart front and rear walls, laterally spaced vertical end walls, vertically spaced top and bottom walls and a horizontal central wall spaced vertically between the top and bottom walls and defining a lower glycol chiller chamber and an upper replenishment glycol reservoir within the tank, a filler opening in the top wall and a lid removably closing the filler opening, a flow transfer port in the central wall conducting replenishment glycol from the reservoir into the chiller chamber, a plurality of spaced apart partitions in the chiller chamber defining an elongate zig zag glycol flow passage with upstream and downstream ends within the chamber, glycol inlet and outlet fittings communicating with the upstream and downstream ends of the flow passage and projecting freely from the tank to connect with glycol return and glycol delivery lines extending from a heat exchanging device served by the glycol chiller; a motor driven pump positioned downstream from the inlet fitting and operating to continuously recirculate glycol downstream through the glycol chiller and the heat exchange device served thereby; an electric powered freon charged refrigeration machine including an elongate zig zag formed evaporator coil positioned within the chiller chamber and extending longitudinally through the flow passage; and, a thermal insulating jacket structure about the exterior of the tank.

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**5,743,109**
**ENERGY EFFICIENT DOMESTIC REFRIGERATION SYSTEM**
**Edward R. Schulak, 567 Aspen, Birmingham, Mich. 48009**
**Filed Aug. 23, 1996, Ser. No. 702,102**
**Int. Cl.[6] F25D** *17/06*
**U.S. Cl. 62—428** **6 Claims**



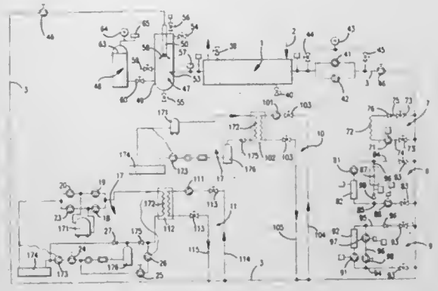
1. A refrigeration or freezer appliance comprising:
a housing surrounding a cooling storage compartment;
refrigeration means for cooling said cooling storage compartment, said refrigeration means having components including a compressor and a condenser;
at least one passage disposed adjacent to said cooling storage compartment and having a first inlet and a first outlet for enabling ingress and egress of outdoor outside air and a venting system positioned within said housing for circulating the outdoor outside air through and out of said housing;
a compartment for storing at least one of said components of said refrigeration means fluidly isolated from said passage and having a second inlet and a second outlet for enabling ingress and egress of outdoor outside air and a venting system positioned within said compartment for circulating the outdoor outside air through and out of said compartment.

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**5,743,110**
**UNIT FOR DISTRIBUTION AND/OR COLLECTION OF COLD AND/OR OF HEAT**
**Adrien Laude-Bousquet, 70, Avenue de l'Europe, 6940 Anse, France**
**Filed Mar. 1, 1995, Ser. No. 396,714**
**Claims priority, application France, Mar. 4, 1994, 94 02734**
**Int. Cl.[6] F25D** *17/02*
**U.S. Cl. 62—434** **11 Claims**

1. A unit for distributing and/or collecting cold and/or heat, comprising:
a) a main exchanger of heat between a refrigerant fluid in the course of vaporization and a heat transfer fluid to be pumped;
b) a means for producing cold, including at least one refrigeration loop including a compressor for refrigerant fluid in gaseous phase, a means for condensing the compressed refrigerant fluid, a means for heat exchange between the condensed

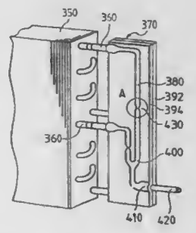




refrigerant fluid and the heat transfer fluid, included in the main exchanger, the compressor drawing in the vaporized refrigerant fluid;
c) a closed main circuit for continuous free circulation of the heat transfer fluid, enclosing or connected to the main exchanger, including at least one main circulation pump for said heat transfer fluid, said circuit exhibiting an appreciably uniform flow cross-section from one end to the other of said circuit;
d) at least one drawing loop for the heat transfer fluid, including an additional pump for circulating said heat transfer fluid, the suction and the delivery of which communicate with the same section of the main circuit, and at least one secondary heat exchanger with one of a hot or cold source, for the utilization of the heat transfer fluid, enclosed in or connected to the drawing loop;
wherein a heat transfer fluid drawing loop further comprises:
an upstream leg and a downstream leg on either side of the secondary exchanger with the additional pump in one of the upstream and downstream legs;
a bypass leg between the upstream and downstream legs, with a heater in said bypass leg;
a stop valve in the part of the downstream leg downstream of a junction between the bypass leg and the downstream leg; and
a valve situated in the bypass leg upstream of the heater, ensuring the flow of the heat transfer fluid only when the stop valve is closed.

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**5,743,111**
**AIR CONDITIONER SYSTEM HAVING A REFRIGERANT DISTRIBUTOR AND METHOD OF MAKING SAME**
**Shunji Sasaki, Shizuoka-ken; Atsuhiro Kohayashi, Shimizu; Hideki Okuzono, Shizuoka-ken; Futoshi Kawamura; Masahiro Ito, both of Shimizu; Hiroyasu Yoneyama, Shizunka-ken, and Kazuhisa Yagi, Yaidu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed Sep. 19, 1995, Ser. No. 530,517**
**Claims priority, application Japan, Sep. 19, 1994, 6-222968**
**Int. Cl.[6] F25B** *41/06*
**U.S. Cl. 62—511** **29 Claims**



1. An air conditioner system having a refrigerant distributor comprising:
at least one heat exchanger including a plurality of conduits for refrigerant; and
a refrigerant distributor disposed upstream of said heat exchanger and made by joining a pair of corrugated plate members to form distributor refrigerant conduits along facing corrugation grooves of the plate members for communicating refrigerant to the respective heat exchanger refrigerant conduits;
wherein at least one of said distributor refrigerant conduits includes a control portion preformed at the grooves of the plate members for controlling a flow rate of the refrigerant flowing therethrough.

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**5,743,112**
**ULTRA HIGH PURITY NITROGEN AND OXYGEN GENERATOR UNIT**
**Takao Yamamoto; Shinji Tomita, and Ryo Den, all of Hyogo-ken, Japan, assignors to Teisan Kabushiki Kaisha, Tokyo, Japan**
**Filed Nov. 4, 1996, Ser. No. 743,095**
**Claims priority, application Japan, Nov. 2, 1995, 7-286134; May 20, 1996, 8-124693**
**Int. Cl.[6] F25J** *1/00*
**U.S. Cl. 62—643** **10 Claims**




1. An ultra high purity nitrogen and oxygen generator unit, which comprises:
a first rectification column having, in order from above, a first upper space part, an upper rectifying part, a middle rectifying part, a lower rectifying part and a first lower space part;
a second rectification column having a second upper space part, a rectifying part and a second lower space part;
a main heat exchanger for cooling down air as a feed material through an indirect heat exchange with a refrigerant, and supplying the thus-cooled air to below said lower rectifying part;
a high purity liquid nitrogen supply pipe for supplying high purity liquid nitrogen as a reflux liquid to above said upper rectifying part;
a nitrogen condenser for cooling down high purity nitrogen gas collected in the first upper space part, which is introduced therein, and supplying the thus-condensed high purity liquid nitrogen to above the upper rectifying part as a portion of the reflux liquid and discharging the non-condensed gas out of the system;
a first expansion valve for reducing the pressure of oxygen-rich liquid air collected in the first lower space part, which is introduced therein, and supplying the thus-generated oxygen-rich waste gas to the nitrogen condenser as a refrigerant;
an oxygen-rich waste gas pipe for supplying the oxygen-rich waste gas which has been used as a refrigerant in the nitrogen condenser and then discharged therefrom to said main heat exchanger as a refrigerant;
an ultra high purity nitrogen delivery pipe for recovering a portion of the reflux liquid from between the upper rectifying part and the middle rectifying part as ultra high purity liquid nitrogen;
a second expansion valve for reducing the pressure of a portion of the reflux liquid which is introduced therein from between

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the middle rectifying part and the lower rectifying part, and supplying the thus-generated gas-liquid mixture to above the rectifying part of the second rectification column;

a reboiler placed in the second lower space part for heating liquid collected in the second lower space part to evaporate a portion thereof;

a waste gas pipe for discharging gas collected in the second upper space part out of the system; and

an ultra high purity oxygen delivery pipe for recovering liquid collected in the second lower space part as ultra high purity liquid oxygen.

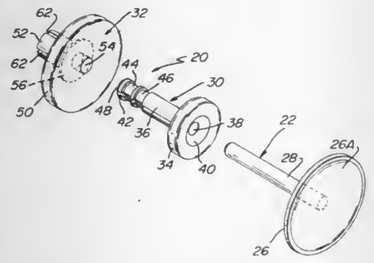
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**5,743,113**

## PIERCED EARLOBE PROTECTOR

**Robert A. Kogen, Elkins Park, Pa., assignor to L. Lawrence Products, Inc., Huntingdon Valley, Pa.**

**Filed Jun. 18, 1996, Ser. No. 666,712**
**Int. Cl.[6] A44C** *7/00*
**U.S. Cl. 63—12** **9 Claims**



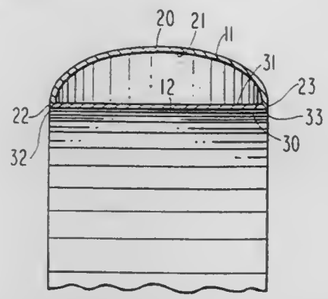

1. A pierced earlobe protector for disposition within an opening extending through the earlobe of a person from the front surface of the earlobe to the rear surface thereof, said protector being arranged to hold a conventional pierced earring including a decorative portion and a post projecting therefrom, said protector comprising a clutch member and a flanged tubular member, said clutch member comprising a flanged front portion, a rear portion, and a central passageway extending through said clutch member and having at least one projection extending into said central passageway, said flanged tubular member having a flanged front portion and an elongated rear portion, said elongated rear portion having a free end and being arranged to be extended through the opening in the person's earlobe, said flanged tubular member also having a central passageway extending therethrough, said flanged front portion of said flanged tubular member being arranged for disposition adjacent the front surface of the earlobe when said elongated rear portion of said flanged tubular member is extended through the opening in the earlobe, said free end of said elongated rear portion including an outer surface and at least one annular recess extending about said outer surface for snap-fitting receipt of a portion of said clutch member therein to releasably secure said flanged tubular member to said clutch member wherein the spacing between the flanged front portion of said flanged tubular member and said flanged portion of said clutch member is adjustable and wherein said flanged portion of said clutch member is located adjacent the rear surface of the earlobe to prevent said protector from becoming dislodged out of the earlobe opening, the post of the earring being arranged to be extended through said central passageway in said flanged tubular member and into said central passageway in said clutch member to be frictionally engaged by said at least one projection.

**5,743,114**

## FREE STANDING EARRING AND METHOD OF MAKING SAME

**Josef J. Barr, 6001 Georgia Ave., P.O. Box 70, West Palm Beach, Fla. 33405**

**Filed Sep. 16, 1996, Ser. No. 714,377**
**Int. Cl.[6] A44C** *7/00*
**U.S. Cl. 63—12** **2 Claims**




1. A hollow article of jewelry comprising a first outer wall and a second inner wall; said outer wall being formed from sheet metal stock and shaped to hollow arcuate configuration to include an outer surface and an inner surface; said inner wall also being formed from sheet metal stock, and shaped to planar arcuate configuration; said outer surface of said outer wall having surface ornamentation impressed thereon; said outer surface of said inner wall having surface ornamentation impressed thereon, which ornamentation is a continuation of the surface ornamentation on said outer surface of said outer wall; said inner and outer surfaces being interconnected at peripheral edges thereof, wherein said peripheral edges lie in an arcuate plane congruent with said inner wall.

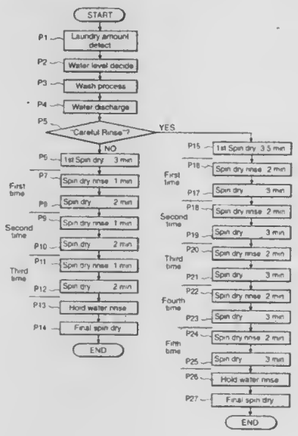
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**5,743,115**

## WASHING MACHINE HAVING A RINSE MODE

**Yoshimi Hashimoto, Aichi-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Division of Ser. No. 423,757, Apr. 18, 1995, Pat. No. 5,606,877.**
**This application Nov. 4, 1996, Ser. No. 743,036**
**Claims priority, application Japan, Apr. 18, 1994, 6-078469**
**Int. Cl.[6] D06F** *33/02*
**U.S. Cl. 68—12.12** **16 Claims**




1. A washing machine, comprising:

a tub for receiving laundry to be washed;



means for supplying water into the tub;

means for rotating the tub;

rinse mode control means for controlling 1) water supplied into the tub and 2) rotation of the tub to carry out a spin dry rinse mode which includes a plurality of spin dry rinse cycles, each spin dry rinse cycle including:

a first operation during which water is supplied into the tub while the tub is rotated, and

a second operation during which water is not supplied into the tub and the tub is rotated;

rinse degree selecting means for manually selecting a degree of rinse desired; and

rinse time changing means for controlling a time period of the spin dry rinse mode by changing a time period of each second operation in accordance with the degree of rinse selected by the rinse degree selecting means.

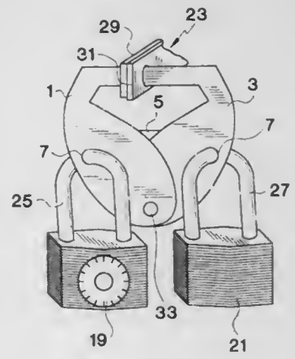
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**5,743,116**

## MULTI-LOCK HASP

**Thomas Mitchel Suster, 91-939 Mailani St., Ewa Beach, Hi. 96706**

**Filed Jun. 3, 1997, Ser. No. 867,938**
**Int. Cl.[6] E05B** *73/00*
**U.S. Cl. 70—14** **3 Claims**




1. A multi-locking hasp apparatus comprising:

two jaws pivotally joined near their lower ends and having a reduced area upper hasp hole engaging end, each of said jaws having an upper hole therein extending through a jaw body and adapted to receive a lock keeper loop from a different lock; and

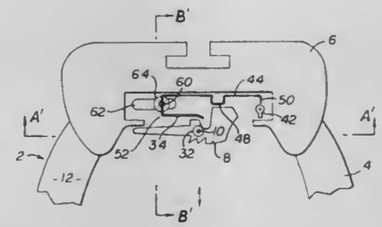
a common back plate having two holes that can be aligned with each of the upper jaw holes, each of said plate holes being adapted to receive a lock keeper loop from a different lock and lock the jaw and the hasp hole engaging ends in place with respect to the plate and an engaged hasp hole; wherein said jaws are pivotally joined together by a pivot pin which extends through both jaws and the common back plate.

**5,743,117**

## QUICK RELEASE HANDCUFF HAVING OVERRIDING MEANS FOR ENABLING DUAL USE AS A TRAINING AND A RESTRAINING DEVICE

**Lansing S. Woo, 143 S. Saltair Ave., Los Angeles, Calif. 90049, and Ronnie J. Frigulti, 955 Thistlegate Rd., Agoura Hills, Calif. 91301**

**Continuation-in-part of Ser. No. 276,093, Jul. 15, 1994, Pat. No. 5,463,884. This application Aug. 1, 1995, Ser. No. 510,107**
**Int. Cl.[6] E05B** *75/00*
**U.S. Cl. 70—16** **16 Claims**




1. A handcuff for dual use as a quick-release training device and an actual restraint device, the handcuff comprising:

a bail having parallel side plates extending between first and second ends of the bail, the bail comprising an arcuate ratchet member having a proximate end pivotally coupled to the first end of the bail and a distal end with teeth adapted for passage through the side plates of the bail upon pivotal movement of the ratchet member;

a locking assembly disposed within the side plates at the second end of the bail and comprising

a pawl having a first end pivotally coupled to the bail and a second end adapted with teeth, the second end of the pawl pivotal between a secured position in which the teeth of the pawl engage the teeth of the ratchet member and an unsecured position in which the second end of the pawl is separated from the ratchet member, the second end of the pawl further having a vertical shoulder for engagement with the flange of a key inserted within the locking assembly for manipulating the pawl between the secured and unsecured positions upon rotation of the key;

a stop member disposed above the pawl movable in and out of contact with the pawl upon engagement with the key to prevent the pawl from being placed in the unsecured position when the stop member is in contact with the pawl, the stop member being movable rotating the key within the assembly to contact the stop member with the flange of the key, the stop member including a spring portion for biasing the second end of the pawl toward the secured position;

a first shaft coupled to the pawl and protruding from the second end of the bail for placing the pawl in the unsecured position upon translation of the first shaft in a direction generally away from the ratchet member; and

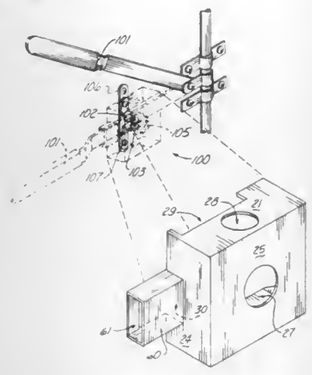
a second shaft coupled to the stop member and protruding from the second end of the bail for placing the stop member in and out of contact with the pawl;

whereby when the handcuff is locked by insertion of the ratchet member within the bail and the stop member is not in contact with the pawl the handcuff is easily unlocked during training by movement of the first shaft away from the ratchet member, and when the handcuff is locked by insertion of the ratchet member within the bail and the stop member is in contact with the pawl the handcuff cannot be unlocked by movement of the first shaft away from the ratchet member, and whereby the stop member is placed in and out of contact with the pawl by movement of the second shaft in a generally horizontal direction.

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5,743,118
**LOCK GUARD FOR A TRACTOR TRAILER**
Kenneth E. Anderson, Rt. 2 Box 2674, Soldiers Grove, Wis. 54655
Filed Jan. 24, 1997, Ser. No. 790,352
Int. Cl.[6] E05B 67/38
U.S. Cl. 70—56 7 Claims



1. A lock guard for use with a padlock and a conventional tractor trailer door latch system including a door handle, a pair of vertical locking bars and a pair of hasps wherein the lock guard comprises:
an enlarged generally rectangular housing member including a pair of side panels, a top panel, a bottom panel, and a face panel wherein two of the side panels are provided with aligned openings; each top and bottom panel is provided with an enlarged aperture and a rectangular recess, said enlarged apertures and said rectangular recesses being, respectively, aligned with one another;
an auxiliary housing unit operatively associated with said one of the side panels and further provided with a rectangular cut-out aligned with both of said aligned openings in the side panels; and
a center piece member extending from at least one of said panels within said housing and aligned generally parallel to said top and bottom panels; wherein, said center piece member is further provided with a discrete aperture which is aligned with said enlarged apertures in the housing member.

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5,743,119

**Patent Not Issued For This Number**

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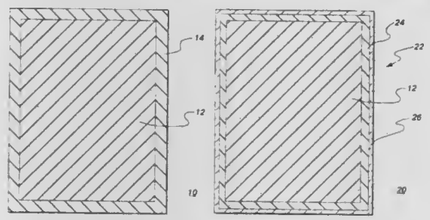
5,743,120
**WIRE-DRAWING LUBRICANT AND METHOD OF USE**
Robert W. Balliett, Westborough, Mass., assignor to H.C. Starck, Inc., Newton, Mass.
Filed May 12, 1995, Ser. No. 439,525
Int. Cl.[6] B21B 45/02
U.S. Cl. 72—42 5 Claims

1. Process for high speed fine wire-drawing of tantalum metal comprising the steps of
(a) introducing a large diameter, elongate tantalum workpiece into a conventional wet wire-drawing machine having at least one reduction die;
(b) lubricating the elongate workpiece during the drawing process with a fluid selected from the group consisting of perfluoroalkanes having the general formula $C_nF_{2n+2}$ and perfluoroamines and a viscosity less than 20 centistokes;
(c) drawing the elongate workpiece through said at least one die lubricated with a perfluorocarbon fluid by a method selected from the group consisting of total immersion, splashing, spraying, and dripping, the conditions of drawing being conducted in relation to the related perfluorocarbon fluid to conduct the drawing at enhanced speed and higher reduction per pass; and
(d) repeating the process until the necessary wire diameter is obtained, and further characterized in that surface cleaning for lubricant removal is essentially avoided in all of the above steps, the method producing a lubricant-free final wire.



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5,743,121
**REDUCIBLE GLASS LUBRICANTS FOR METALWORKING**
Mark Lloyd Miller, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed May 31, 1996, Ser. No. 655,544
Int. Cl.[6] B21B 45/02
U.S. Cl. 72—42 6 Claims



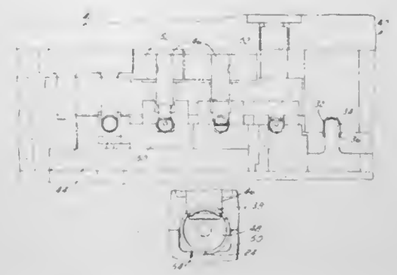
1. A method of hot working a metal workpiece comprising the steps of:
providing a metal workpiece,
providing a glass lubricant which comprises a metal oxide in which the metal is selected from the class consisting of bismuth, tin, and copper,
coating said metal workpiece with said glass lubricant,
reducing the metal oxide to form a duplex lubricant film, and
hot working the metal workpiece to produce a near-net-shape part with a good quality finish.

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5,743,122
**APPARATUS FOR MAKING A MANIFOLD FOR AN AUTOMOTIVE HEAT EXCHANGER**
Eugene E. Rhodes, 45221 Harmony La., Belleville, Mich. 48111, and Wen Fei Yu, 5675 Shaun Rd., West Bloomfield, Mich. 48322
Filed Mar. 29, 1996, Ser. No. 625,656
Int. Cl.[6] B21D 39/02;51/28; B21C 37/02
U.S. Cl. 72—51 2 Claims

1. An apparatus for manufacturing a manifold for an automotive heat exchanger from a planar sheet of deformable material, comprising:
a progressive die tool having a plurality of metal forming stations, said progressive die tool being operative to form the planar sheet of material into an elongate, generally cylindrical member having a seam along the longitudinal length thereof;

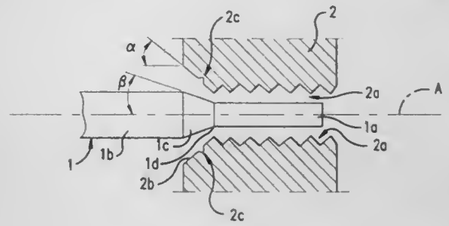




a punch tool operatively associated with said progressive die tool, said punch tool being operative to form a plurality of tube receiving slots in the generally cylindrical member; and
an axially reciprocating arbor operative to slide into said generally cylindrical member and cooperate with said punch tool such that said punch tool is operative to strike said arbor in a vertical direction through said plurality of tube receiving slots, forcing said arbor to apply pressure perpendicularly against the seam of said cylindrical member so as to flatten the seam and provide sealing contact thereby.

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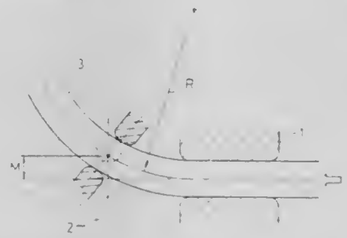
5,743,123
**METHOD OF THREAD ROLLING A SCREW SHAFT**
Masatoshi Yamamoto, and Hiromasa Hosono, both of Kiryu, Japan, assignors to Mitsuba Corporation, Kiryu, Japan
Filed Jan. 31, 1997, Ser. No. 792,222
Claims priority, application Japan, Feb. 1, 1996, 8-038876
Int. Cl.[6] B21H 3/06
U.S. Cl. 72—88 2 Claims



1. A method of thread rolling of a screw shaft for forming a screw groove into an outer periphery of a cylindrical screw shaft by pressing screw groove forming dies against the outer periphery of the screw shaft comprising the steps of:
providing the screw shaft extending along a longitudinal axis and having an inclining portion disposed between and connected to a machining portion having a small diameter and a non-machining portion having a large diameter relative to the small diameter, wherein the inclining portion inclines at an inclining angle from the machining portion to the non-machining portion relative to the longitudinal axis; and
forming the screw groove into the machining portion of the screw shaft using the screw groove forming dies, the dies having teeth formed therein to form the screw groove and a taper portion for receiving the inclining portion in a manner that the taper portion presses against the inclining portion of the screw shaft and forms a taper angle relative to the longitudinal axis larger than the inclining angle during the thread rolling.

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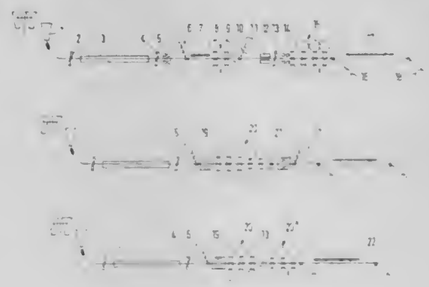
5,743,124
**METHOD OF BENDING EXTRUDED SHAPES**
Keiichi Sugiyama, Tokyo; Mitsuo Tsuge; Tadashi Hakamada, both of Ihara-gun; Masayoshi Ohhashi, and Kunihiro Yasunaga, both of Saitama, all of Japan, assignors to Nippon Light Metal Co., and Honda Giken KKK, both of Tokyo, Japan
Filed Nov. 12, 1996, Ser. No. 747,703
Claims priority, application Japan, Nov. 16, 1995, 7-298143
Int. Cl.[6] B21D 5/06
U.S. Cl. 72—166 4 Claims



1. A method of bending extruded shapes using a movable bending die for controlling a bending radius in accordance with a moving distance, said method of bending extruded shapes comprising the steps of:
measuring a hardness of an extruded shaped to be processed;
converting the measured hardness into a proof stress;
determining a bending condition for compensating spring-back based on said proof stress; and
bending said extruded shape to produce said bending angle, whereby said moving distance is determined based upon said bending condition, said extruded shaped is placed in said movable die and said movable die is accordingly moved said moving distance to produce said extruded shape having said bending radius.

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5,743,125
**HOT STRIP PRODUCTION PLANT FOR ROLLING THIN ROLLED STRIP**
Günter Kneppe, Hilchenbach; Dieter Rosenthal, Niederfischbach, and Stephan Krämer, Hilchenbach, all of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany
Filed Aug. 23, 1996, Ser. No. 701,969
Claims priority, application Germany, Sep. 6, 1995, 195 32 792.6; Oct. 11, 1995, 195 38 341.9
Int. Cl.[6] B21B 27/06;41/00
U.S. Cl. 72—201 11 Claims



1. A production plant for hot-rolled flat products in the form of strip, the production plant comprising a rolling train including a

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plurality of roll stands, a run-out table including devices for cooling the strip, and subsequently arranged coiling machines for coiling the strip, wherein at least a first of the roll stands of the rolling train is a reversing stand, at least one reeling furnace each being arranged in front of the reversing stand the cooling unit being controlled so as to be switched on or off in dependence on whether rolling in subsequent passes is to be carried out in the ferritic or austenitic range and following the reversing stand, and wherein a controllable cooling unit is arranged between the reversing stand and the reeling furnace in front of the reversing stand, further comprising a heating unit arranged between the reversing stand and a stand of the rolling train following the reversing stand.

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**5,743,126**

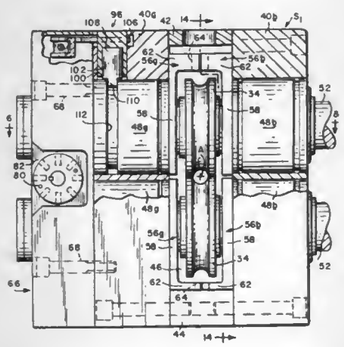
## ROLL STAND WITH SEPARABLE ROLL PARTING ADJUSTMENT MODULE

**Terence M. Shore, Princeton; Harold E. Woodrow, Northboro, both of Mass., and Yoshio Kato, Chita-gun, Japan, assignors to Morgan Construction Company, Worcester, Mass.**

**Filed Jul. 6, 1995, Ser. No. 498,630**

**Int. Cl.[6] B21B *31/26***

**U.S. Cl. 72—237** **13 Claims**



1. A roll stand for a rolling mill, said roll stand comprising:

a housing having a through opening;

two sets of axially aligned first and second sleeves journalled in said housing for rotation about parallel axes, the first and second sleeves of each of said sets having axially aligned eccentric bores and being located on opposite sides of said opening;

a pair of roll shafts extending across said opening, segments of each of said roll shafts on opposite sides of said opening being journalled for rotation in the eccentric bores of the first and second sleeves of a respective one of said sets;

work rolls carried on said roll shafts, said work rolls being located in said opening and defining a roll pass therebetween;

coupling means for rotatably interconnecting the first and second sleeves of each of said sets;

a module detachably secured to and separable from said housing; and

adjustment means contained within said module, said adjustment means being axially engageable with the first sleeves of each of said sets for simultaneously rotating said first sleeves in opposite directions, the rotation of said first sleeves being transmitted via said coupling means to the respective second sleeves of each of said sets to thereby adjust parting between the work rolls carried on said roll shafts, said adjustment means being separable from said first sleeves in conjunction with separation of said module from said housing.

**5,743,127**

## ROUND STEEL BAR GUIDE APPARATUS AND METHOD

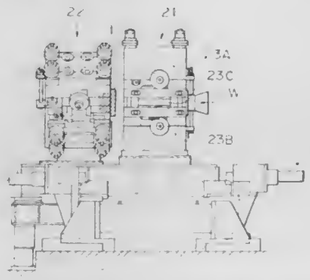
**Ryo Takeda; Hidenori Kondo, and Yukihiro Hoashi, all of Kurashiki, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan**

**Filed Dec. 28, 1995, Ser. No. 580,357**

**Claims priority, application Japan, Dec. 28, 1994, 6-328563; Jul. 31, 1995, 7-195436**

**Int. Cl.[6] B21B *30/20***

**U.S. Cl. 72—250** **20 Claims**



1. A method for guiding rolling material of various sizes to calibers of rolls while holding the rolling material by a guide apparatus, wherein the guide apparatus comprises guide rollers installed at an inlet of at least one of a plurality of multi-roll sizing mills disposed in a line, a stand of each sizing mill comprising at least three rolls, the method comprising the steps of:

elastically holding a free unrolled surface portion of said rolling material with a press force in the range of approximately 100 to 500 kg; and

sizing the rolling material.

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**5,743,128**

## APPARATUS FOR BENDING METAL SHEET

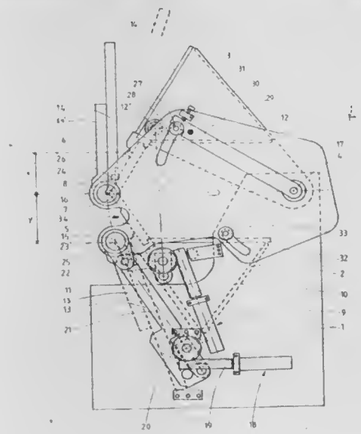
**Cornelis Hendricus Liet, Denekamperdijk 38, NL-7581 PJ Losser, Netherlands**

**Filed May 29, 1996, Ser. No. 654,697**

**Claims priority, application Netherlands, May 31, 1995, 1000459; Mar. 8, 1996, 1002553**

**Int. Cl.[6] B21D *5/04***

**U.S. Cl. 72—319** **20 Claims**



1. An apparatus for bending metal sheet, comprising:

a frame having a front side and a backside;



a lower beam joined to the frame, the lower beam having a front wall and an upper wall;

an upper beam joined to the frame, the upper beam having a front wall and a lower wall facing the upper wall;

a clamping assembly comprising:

a lower clamp joined to the lower beam; and

an upper clamp joined to the upper beam;

wherein the lower and upper clamps each have a clamping face for clamping a metal sheet in a working position therebetween;

a bending beam for bending a metal sheet clamped in the working position by said upper and lower clamps, said bending beam having a body with first and second ends and being supported in the frame for rotation around an axis independent of the upper and lower beams, said axis disposed at the front side of the frame, said body of the bending beam in a working starting position extending perpendicular to said clamping faces; and

wherein said lower clamp extends obliquely upwardly and to said front side from said upper wall along a length from the upper wall to the clamping face of the lower clamp which is at least three times the thickness of said lower clamp, and said upper clamp extends obliquely downwardly and to said front side from said lower wall along a length from the lower wall to the clamping face of the upper clamp which is at least three times the thickness of said upper clamp, wherein said lower and upper clamps determine in cross-section in the working position a V-shape, the apex of which is directed towards said front side and towards the axis of the bending beam in the working position, in such a manner that forces exerted by the bending beam on a metal plate are directed at least partially towards the backside of the frame.

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**5,743,129**

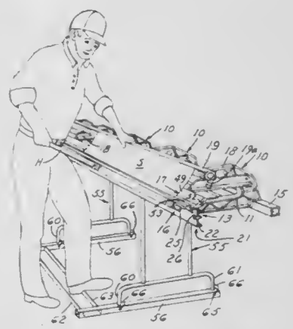
## HEAVY DUTY SHEET BENDING BRAKE

**Arthur B. Chubb, Romulus, and James E. Snyak, Lincoln Park, both of Mich., assignors to Tapco International Corporation, Plymouth, Mich.**

**Continuation-in-part of Ser. No. 268,808, Jun. 30, 1994, Pat. No. 5,582,055, which is a continuation of Ser. No. 987,249, Dec. 7, 1992, Pat. No. 5,343,728, which is a continuation of Ser. No. 798,207, Nov. 26, 1991, abandoned. This application Nov. 26, 1996, Ser. No. 756,608**

**Int. Cl.[6] B21D *5/04***

**U.S. Cl. 72—319** **29 Claims**



1. A portable sheet bending brake comprising

a first longitudinally extending clamping member having a clamping surface,

clamping means movable toward and away from the clamping surface for holding a workpiece in position for bending,

a handle member attached to said clamping member,

a second bending member for bending a workpiece clamped on said clamping surface extending longitudinally with respect to said first member,

means hinging said second bending member to said first member,

handle means attached to said second bending member and normally extending downwardly such that when the clamping means is moved to hold a workpiece in position for bending, a person standing on the floor and facing the side of the brake having said bending member thereon grasps said handle means and raises said handle means in a direction away from the person and toward the clamping member to pivot said second bending member away from the person relative to the first member about said hinging means for bending a workpiece clamped on said clamping surface to produce a desired bend,

leg assemblies extending downwardly from said sheet bending brake elevating said brake above the floor,

said leg assemblies having portions projecting outwardly from beneath the sheet bending brake toward the side of the brake opposite to the side from which said handle member and handle means are accessible,

said sheet bending brake being constructed and arranged such that when a workpiece of increased thickness is clamped for bending when a person stands on the floor facing the handle means and the handle means is grasped and raised in a direction away from the person in order to move the handle means and raise the handle means, forces occur which prevent the handle means from moving sufficiently to produce a predetermined bend and the forces cause the entire sheet bending brake to tip away from the person about the portions of the legs which project outwardly from said bending brake which prevent the movement of the bending member relative to the first member and prevent bending of the workpiece,

a stabilizing assembly for counteracting such forces on said sheet bending brake comprising

transversely spaced rails receiving at least a portion of said leg assemblies,

said transversely spaced rails which receive at least a portion of said leg assemblies having portions extending outwardly from beneath the sheet bending brake beyond the brake toward the side of the brake from which said handle member and handle means are accessible,

longitudinally extending rail means interconnecting said transverse rails,

said longitudinally extending rail being attached to said portions,

the weight and positioning of said sheet bending brake, legs and rail being such that in the absence of said stabilizing assembly when bending thicker metal by a person standing on the floor and facing the side of the brake, grasping and raising the handle means, the forces opposing bending are not counteracted and the bending can not be achieved and such that the person must place one foot or both feet on the longitudinally extending rail means during the movement of the bending member away from the person for performing the bending to a desired bend without tipping of the bending brake away from the person and permit movement of the bending member relative to the first member to bend the workpiece.

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**5,743,130**

## APPARATUS FOR INSTALLING EXPANSIBLE ANCHORS

**Herbert Erath, Waldaechtal, and Christian Schmid, Schopfloch-Oberiflingen, both of Germany, assignors to fischerwerke Artur Fischer GmbH & Co. KG, Waldaechtal, Germany**

**Filed Jul. 8, 1996, Ser. No. 676,425**

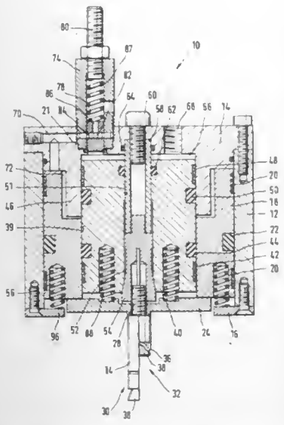
**Int. Cl.[6] B21J *15/10;15/18***

**U.S. Cl. 72—391.4** **6 Claims**

1. An apparatus for installing an expansible anchor having a shank, an expander head and an expansible sleeve, the apparatus comprising clamping means for clamping the shank of the expansible anchor; expanding means movable in the relation to said clamping means in a longitudinal direction of the clamped expansible anchor for displacing the expansible sleeve located on the shank towards the expander head in order to expand the expansible

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anchor., said collet chuck having a cone, said clamping means further including an expander cone which is arranged to be pushed onto said cone of said collet chuck, said collet chuck having a shank, said clamping means including a pressurizable clamping piston which is displaceably guided on said shank of said collet chuck and displacing said cone of said collet chuck.

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**5,743,131**

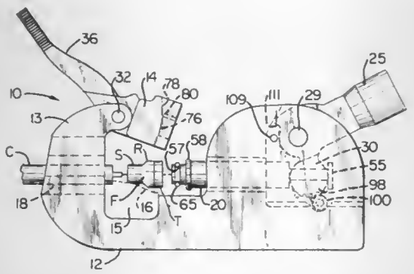
**RATCHETED CRIMPING TOOL**

**Randall A. Holliday, Westminster, and Ricky A. Yates, Denver, both of Colo., assignors to ICM Corporation, Denver, Colo.**

**Filed Nov. 1, 1996, Ser. No. 742,503**

**Int. Cl.[6] B21D** *39/04*

**U.S. Cl. 72—409.1** **17 Claims**



11. A crimping apparatus for connecting a cable fitting having an external shoulder and a generally tubular connector sleeve to an end of a cable wherein said sleeve is composed of a thin-walled deformable material, said apparatus comprising:

a die member defining a tapered cavity therein, said cavity comprising an outer surface of a diameter greater than an outside diameter of said external shoulder, a tapered crimping surface defined in part by an intermediate diameter substantially corresponding to the outer diameter of the sleeve and tapering into a smaller diameter axially spaced from said intermediate diameter and substantially corresponding to the outer diameter of the cable, and means disposed between said outer and crimping surfaces engageable with said external shoulder for limiting axial movement of the sleeve into said die member;

carrier means axially spaced from said cavity including means for releasably supporting the fitting with the sleeve in facing relation to said cavity and the cable end extending through said cavity and at least partially into said sleeve; and

support means mounting said carrier means for reciprocal axial movement between a position retracted away from said die member and a position maximally extended toward said die member whereby to force the sleeve axially into said tapered cavity under sufficient force to radially contract the sleeve into a tapered configuration conforming with said crimping surface to thereby connect the sleeve to the end of cable.

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**5,743,132**

**THROTTLE VALVE SWITCH UNIT**

**Hajime Hosoya, Takasaki, and Satoru Watanabe, Machashi, both of Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan**

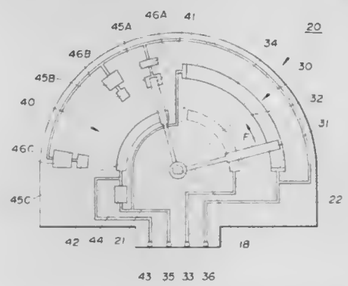
**Continuation of Ser. No. 606,801, Feb. 26, 1996, abandoned.**

**This application May 13, 1997, Ser. No. 855,511**

**Claims priority, application Japan, Feb. 28, 1995, 7-064738**

**Int. Cl.[6] G01M** *15/00*

**U.S. Cl. 73—118.2** **20 Claims**



1. A throttle valve switch unit for use with a throttle valve situated in an internal combustion engine, comprising:

a mobile contact drivingly connected to the throttle valve for movement with rotation of the throttle valve, the mobile contact including a wiper arm;

at least first and second fixed contacts physically separated from each other, the first fixed contact being provided for engagement with a top portion of the wiper arm of the mobile contact when the throttle valve occupies a first predetermined position, the second fixed contact being provided for engagement with the top portion of the wiper arm of the mobile contact when the throttle valve occupies a second predetermined position;

a first terminal for connection to a ground;

a second terminal for connection to a source of voltage;

a first resistance element connected between the first fixed contact and one of the first and second terminals, the first resistance element having a first predetermined resistance value;

a second resistance element connected between the second fixed contact and the one terminal, the second resistance element having a second predetermined resistance value different from the first predetermined resistance value;

a third resistance element connected between the mobile contact and the other terminal; and

a signal terminal connected to the mobile contact for producing signals having a first voltage level when the throttle valve occupies the first predetermined position and a second voltage level when the throttle valve occupies the second predetermined position, said second voltage level being different from said first voltage level.



**5,743,133**

**LOAD DETECTABLE VALVE**

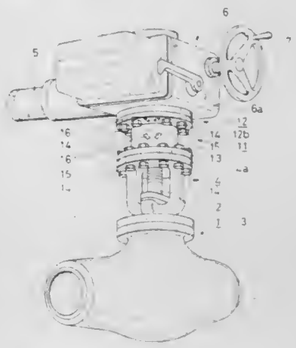
**Susumu Watanabe, Hiratsuka, Japan, assignor to Nippon Gear Co., Ltd., Kanagawa-ken, Japan**

**Filed Oct. 13, 1995, Ser. No. 542,938**

**Claims priority, application Japan, Mar. 24, 1995, 7-065436**

**Int. Cl.[6] G01L** *5/00*

**U.S. Cl. 73—168** **4 Claims**



1. A load detectable valve comprising:

a valve body which comprises a valve element and a valve casing;

a valve stem which projects upwards from the valve body;

valve drive means provided above the valve body for driving the valve stem; and

a hollow cylinder provided concentrically to the valve stem between the valve body and the valve drive means to connect them, the hollow cylinder having a thinner annular flange fixed to the valve drive means, a first detecting means which comprises two strain gauges being attached on the annular flange of the hollow cylinder to detect thrust which acts on the valve stem, a second detecting means which comprises two strain gauges being attached on an outer circumferential surface of the hollow cylinder to detect torque which acts on the valve stem, thereby determining extent of deterioration of the valve precisely.

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**5,743,134**

**METHOD AND ARRANGEMENT FOR DETERMINING AND/OR MONITORING A PREDETERMINED LEVEL OF MATERIAL IN A CONTAINER**

**Volker Dreyer, Lörrach, Germany, assignor to Endress + Hauser GmbH + Co., Germany**

**PCT No. PCT/EP95/00195, § 371 Date Sep. 25, 1995, § 102(e) Date Sep. 25, 1995, PCT Pub. No. WO95/20749, PCT Pub. Date Aug. 3, 1995**

**PCT Filed Jan. 19, 1995, Ser. No. 522,389**

**Claims priority, application Germany, Jan. 26, 1994, 44 02 234.4**

**Int. Cl.[6] G01F** *23/28*

**U.S. Cl. 73—290 V** **8 Claims**




1. A method for determining and/or monitoring a predetermined level of material in a container with a level sensor having a mechanical oscillatory structure mounted at the height of the predetermined level of material in such a way that it comes into contact with the material when the material reaches the predetermined level, an electromechanical excitation transducer, an electromechanical reception transducer, an amplifier circuit having an input and an output, an electrical connection connecting the input of the amplifier circuit to the reception transducer, and an electrical connection connecting the output of the amplifier circuit to the excitation transducer so that the mechanical oscillatory structure is excited to oscillate at the mechanical oscillatory structure self-resonant frequency, the method comprising: periodically interrupting the electrical connection connecting the output of the amplifier circuit to the excitation transducer, during each interruption comparing the phase of an output signal from the output of the amplifier circuit to the phase of a signal from the excitation transducer to recognize a fault in the method for determining and/or monitoring the predetermined level.

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**5,743,135**

**OPTICAL-FIBER LIQUID-LEVEL MONITOR**

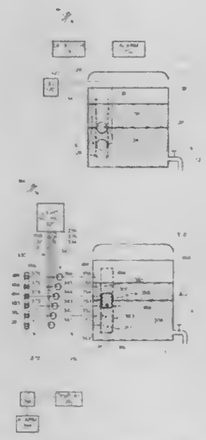
**Anthony Sayka, and Robert J. Rocks, both of San Antonio, Tex., assignors to VLSI Technology, Inc., San Jose, Calif.**

**Continuation of Ser. No. 113,162, Aug. 27, 1993, abandoned.**

**This application Feb. 10, 1995, Ser. No. 387,036**

**Int. Cl.[6] G01F** *23/292;23/64*

**U.S. Cl. 73—293** **2 Claims**



1. A liquid-level monitor for monitoring the level of a boundary between a liquid and another fluid within a vessel, said liquid having a first specific gravity, said fluid having a second specific gravity less than said first specific gravity, said monitor comprising:

a light source for providing source light;

photodetector means for providing a characterization of return light, said characterization including whether or not said return light meets a predetermined intensity criterion, said photodetector means responding more sensitively to the return light frequency than to the source light frequency;

optical fiber means for guiding said source light to a location set within said vessel and guiding said return light from said location set to said photodetector means, said set including at least one location, each location of said set corresponding to a respective level of said boundary within said vessel, said optical fiber means including at least one length of optical fiber through which said source light travels in one direction and said return light travels in an opposing direction;

a float disposed at said boundary, said float having a third specific gravity between said first specific gravity and said second specific gravity, said float converting said source light into said return light meeting said intensity criterion, said float

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being fluorescent so that the frequency of said return light is different from the frequency of said source light; and

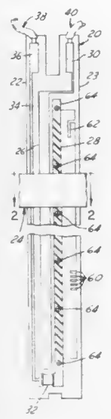
guide means for confining movement of said float to a vertically extending path.

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**5,743,136**
**FLUID LEVEL SENSOR WITH RESISTIVE AND CONDUCTIVE LAYERS**

**Robert Duane Gaston, Dearborn Heights, and Narayanaswamy Rajendran, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Sep. 27, 1995, Ser. No. 534,780**
**Int. Cl.[6] G01F** *23/36;23/52;23/60*
**U.S. Cl. 73—313** **9 Claims**



1. A sensor for measuring a level of liquid in a vessel, said sensor comprising:

a resistor element having an insulating substrate;

a float;

a contact responsively coupled to said float and slidably biased against said resistor element, slidable movement of said contact with respect to said resistor element defining a path traveled by said contact along said resistor element;

a resistive layer deposited on said insulating substrate, at least a portion of said resistive layer located along said path; and

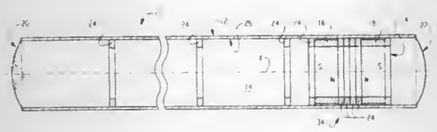
conductive segments deposited on said resistive layer along said path, said conductive segments disposed such that travel of said contact along said path will result in said contact successively contacting said segments.

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**5,743,137**
**MAGNETIC FLOAT ASSEMBLY**

**David E. Brown, Strongsville, and David E. Purcel, Amherst, both of Ohio, assignors to Clark-Reliance Corporation, Strongsville, Ohio**

**Filed Nov. 9, 1995, Ser. No. 556,102**
**Int. Cl.[6] G01F** *23/76*
**U.S. Cl. 73—322.5** **18 Claims**



1. A magnetic float assembly, comprising:

a float enclosure having first and second closed end portions located at opposite ends of an axis running the length thereof, having an interior surface located between said end portions, and having an inner diameter, said float enclosure being constructed from a non-magnetic metallic material;

a first generally annular magnet disposed within said float enclosure at a first location along said axis, having an outer surface which substantially corresponds to said interior surface of said float enclosure, and having an outer diameter that is slightly less than said inner diameter of said float enclosure; and

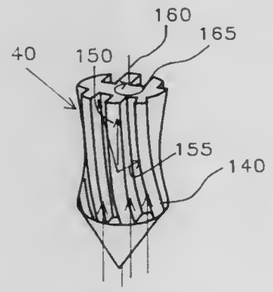
a second generally annular magnet disposed within said float enclosure at a second location along said axis, having an outer surface which substantially corresponds to said interior surface of said float enclosure, and having an outer diameter that is slightly less than said inner diameter of said float enclosure.

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**5,743,138**
**SPIRALLY FLUTED FLOAT**

**Wei Hua Cheng, Singapore, Singapore, assignor to Chartered Semiconductor Manufacturing Ltd., Singapore, Singapore**

**Filed Jan. 22, 1997, Ser. No. 788,872**
**Int. Cl.[6] G01F** *23/76*
**U.S. Cl. 73—322.5** **29 Claims**



1. A spirally fluted float device comprising:

an elongated cylinder having an upper end and a lower end forming said spirally fluted float;

an external surface extending therebetween said upper end and said lower end of said elongated cylinder;

a cone having an apex and integrally extending downwardly from said lower end of said elongated cylinder; and

groove means formed into said external surface to provide stability when said spirally fluted float is placed floatingly in a fluid environment to measure fluid characteristics.

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**5,743,139**
**STARTER WITH ALIGNMENT MEANS FOR PLANETARY GEARS**

**Mitsuhiro Murata, Anjo, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan**

**Filed May 16, 1996, Ser. No. 648,824**
**Claims priority, application Japan, May 18, 1995, 7-119430**
**Int. Cl.[6] F02N** *15/02*
**U.S. Cl. 74—6 E** **9 Claims**

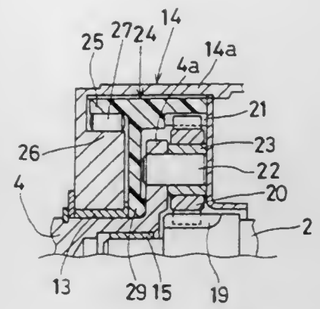
1. A starter comprising:

a starter motor having an armature rotor and a motor shaft;

a drive shaft disposed coaxially with said motor shaft;

a planetary gear reduction mechanism, connected between said motor and said drive shaft, for changing rotational speed and torque of said motor shaft and transmitting changed speed and torque to said drive shaft, said mechanism including a sun gear formed around a periphery of the motor shaft, a plurality of planetary gears rotatable around the sun gear, with the





planetary gears in mesh with the sun gear and an internal gear in engagement with said planetary gears;

a cylindrical rotary member having said internal gear at one end thereof, a clutch outer member at the other end thereof, and an integral boss portion to align said cylindrical rotary member coaxially with said drive shaft;

a center case having a clutch inner member disposed around said drive shaft; and

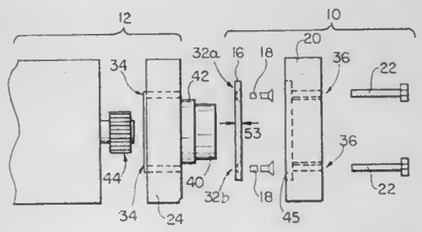
a one-way clutch having said clutch outer member and said clutch inner member and a plurality of rollers accommodated between said clutch outer member and clutch inner member for restraining said the internal gear when said motor shaft rotates.

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**5,743,140**
**UNIVERSAL STARTER MOTOR ATTACHMENT ANGLE ADJUSTMENT**

**Keith A. Gustafson, 415 Essex Ave., Gloucester, Mass. 01830**

**Filed Jun. 7, 1996, Ser. No. 659,864**
**Int. Cl.[6] F02N** *15/00*
**U.S. Cl. 74—6** **19 Claims**



1. A mounting adapter for mounting a starter motor having at least two threaded starter motor holes to an engine mount having at least two engine mount holes, comprising:

an intermediate adapter having a starter motor confronting side and an engine mount confronting side, said intermediate adapter having a central opening through said intermediate adapter from said starter motor confronting side to said engine mount confronting side;

said intermediate adapter having a first member including at least two primary attachment holes and at least two secondary attachment holes, said primary attachment holes positioned to coaxially align with said starter motor holes when said intermediate adapter is aligned in confronting relation to the starter motor; and

a second member including a plurality of angle defining alignment holes extending through said second member, said angle defining alignment holes positioned such that predefined pairs of said secondary attachment holes coaxially align with said angle defining alignment holes when said second member is aligned in confronting relation with said first member, said second member being secured to the engine mount,

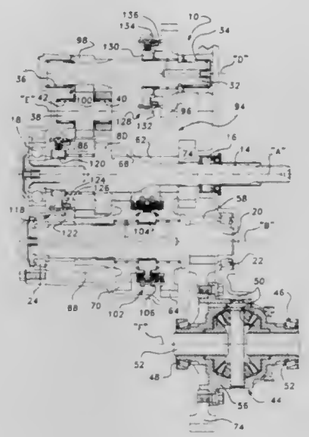
whereby the angular mounting position of said starter motor is defined by the secondary attachment holes which are selected to be aligned in coaxial relation with said angle defining alignment holes.

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**5,743,141**
**COMPACT TRANSAXLE**

**John R. Forsyth, Romeo, Mich., assignor to New Venture Gear, Inc., Troy, Mich.**

**Filed Oct. 4, 1996, Ser. No. 726,885**
**Int. Cl.[6] F16H** *3/087*
**U.S. Cl. 74—331** **15 Claims**



1. A manual transmission comprising:

an input shaft;

an output shaft;

a first input gear fixed to said input shaft;

a first speed gear rotatably supported on said output shaft and meshed with said first input gear;

a second input gear fixed to said input shaft;

a second speed gear rotatably supported on said output shaft and meshed with said second input gear;

a first synchronizer clutch for selectively coupling either of said first and second speed gears to said output shaft;

a first intermediate shaft having a first transfer gear fixed thereto;

a third input gear fixed to said input shaft;

a third speed gear rotatably supported on said first intermediate shaft and meshed with said third input gear;

a fourth input gear fixed to said input shaft;

a fourth speed gear rotatably supported on said first intermediate shaft and meshed with said fourth input gear;

a second synchronizer clutch for selectively coupling either of said third and fourth speed gears to said first intermediate shaft;

a fifth input gear rotatably supported on said input shaft;

a fifth speed gear fixed to said output shaft and meshed with said fifth input gear;

a third synchronizer clutch for selectively coupling said fifth input gear to said input shaft;

a second intermediate shaft having a second transfer gear fixed thereto;

an idler gear meshed with said second transfer gear and said fifth input gear;

a reverse gear rotatably supported on said second intermediate shaft and in driven connection with said input shaft; and

a fourth synchronizer clutch for selectively coupling said reverse gear to said second intermediate shaft.

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5,743,142

## MULTI-RATIO POWER-SHIFTABLE REVERSING GEAR

Fritz Leber, and Wolfgang Rebholz, both of Friedrichshafen, Germany, assignors to ZF Friedrichshafen AG, Friedrichshafen, Germany

PCT No. PCT/EP95/01748, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO95/31655, PCT Pub. Date Nov. 23, 1995

PCT Filed May 9, 1995, Ser. No. 737,263

Claims priority, application Germany, May 13, 1994, 44 16 929.9

Int. Cl.[6] F16H *3/093*

U.S. Cl. 74—331 10 Claims



1. A multi-ratio powershiftable reversing gear (1) having one input shaft (11), a plurality of countershafts (15, 16, 20 and 21), one reversing gear set (19), clutches (17, 18, 23 and 26) being mounted upon said countershafts (15, 16, 20 and 21), a plurality of loose pinions (13, 14, 22 and 25) which are each selectively non-rotatably connected with a respective one of said countershafts (15, 16, 20 and 21) by said clutches for selecting a gear and a drive direction, and one output gear set (31) with one fixed pinion (24) being mounted upon an output shaft (20);

wherein said reversing gear set (19) includes one pinion (12) non-rotatably fixed to said input shaft (11) and loose pinions (13, 14) rotatable supported on said respective countershafts (15, 16); a fixed pinion (27, 28 and 29) is mounted on each of said respective countershafts (15, 16 and 21) and one loose pinion (25) is rotatably mounted upon said output shaft (20) to form a drive wheel chain (30); and said output gear set is formed by said fixed pinion (24) of said output shaft (20) and a first loose pinion (22) supported on a first said respective countershaft (21).

5,743,143

## TRANSMISSION SHIFTING MECHANISM AND POSITION SENSOR

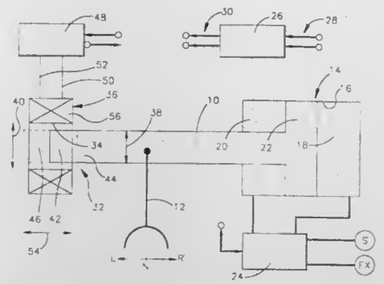
Jeffrey L. Carpenter, Kalamazoo; Mark L. Lanting, Portage; Michael J. Huggins, and David L. Wadas, both of Kalamazoo, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 9, 1996, Ser. No. 695,052

Int. Cl.[6] F16H *59/04;63/42;* G01B *7/00*

U.S. Cl. 74—335 6 Claims

1. In combination, a lead screw and nut shift actuator mechanism and nut position sensor assembly, said actuator mechanism comprising a controllable motor for selectively rotating an axially fixed ferromagnetic lead screw, a nut member axially movable on said lead screw to two or more unique axial shifting positions relative to said lead screw, said sensor assembly providing an output signal, the magnitude or rate of change of magnitude of which is indicative of the shifting position of said nut member, said sensor assembly comprising a multiple-winding electrical coil having a bore, a portion of said lead screw passing through said bore,



and a magnetic flux insulating tubular sleeve movable with said nut member to a unique sensing position relative to said bore, including at least one unique position wholly or partially within said bore, for each of said unique shifting positions.

5,743,144

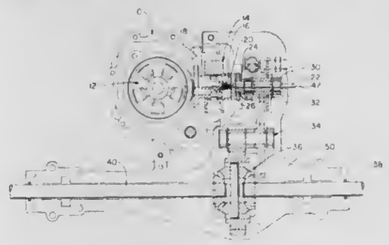
## HYDROSTATIC TRANSMISSION GEAR DRIVE DISCONNECT

William Douglas Krantz, Ft. Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Jul. 24, 1996, Ser. No. 685,500

Int. Cl.[6] F16H *37/08;* F16D *11/02*

U.S. Cl. 74—405 8 Claims



1. A device for mechanically disconnecting a hydraulic transmission from at least one driven axle within a housing, the device comprising:

a rotor connected to the hydraulic transmission, said rotor mounted rotatably on an end of a first shaft having an axis, but longitudinally movable thereupon, the rotor further having a set of internal splines located coaxially with the first shaft;

a biaser located between the rotor and the shaft end, urging the rotor longitudinally away therefrom;

a hollow second shaft, mounted coaxially with the first shaft, the second shaft being restrained from longitudinal movement along the axis, the second shaft having an end adapted for engaging the internal splines of the rotor;

a drive train comprising a series of at least two enmeshed gears, a first of the at least two enmeshed gears connected to the second shaft and a final gear of the series of at least two enmeshed gears connected to each axle of the at least one driven axle; and

a pin having a first end and a second end, the pin being positioned coaxially within the second shaft with the first end located external to the housing and the second end bearing against the rotor, so that longitudinal movement of the pin within the second shaft can push the internal splines on the rotor toward the first shaft and out of engagement with the end of the second shaft.



5,743,145

## GEAR MECHANISM FOR ADJUSTING BACKLASH BETWEEN BEVEL GEARS

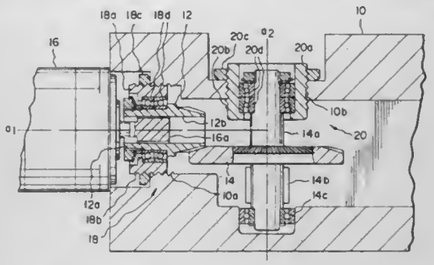
Akihiro Terada, Fujiyoshida, and Kenichiro Abe, Yamanashi, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

Filed Dec. 27, 1995, Ser. No. 580,429

Claims priority, application Japan, Dec. 28, 1994, 6-327749

Int. Cl.[6] F16H *55/20*

U.S. Cl. 74—409 4 Claims



1. A gear mechanism comprising:

a first bevel gear connected to a driving source, the first bevel gear being rotatable about a first axis;

a second bevel gear engaging the first bevel gear, the second bevel gear being rotatable about a second axis;

an intermediate gear connected to the second bevel gear for rotation with the second gear;

an output gear engaging the intermediate gear, the output gear being rotatable about an axis parallel to the second axis;

a supporting member for the first and second bevel gears and the output gear, the supporting member including a first threaded portion; and

a frame for mounting the second bevel gear and the intermediate gear to the supporting member, the frame including a second threaded portion, and being mounted to the supporting member so as to move along the first axis;

means for securing the frame relative to the supporting member at an axial position along the first axis;

first bearing means for rotatably supporting the first bevel gear on the supporting member;

second bearing means for rotatably supporting the second bevel gears on the frame; and

the first bearing means including a cylindrical member with a threaded portion for engagement with the first threaded portion of the supporting members and the second bearing means including a cylindrical member with a threaded portion for engagement with the second threaded portion of the frame.

5,743,146

## INTERLOCKING DEVICE

Hans-Peter Oesterle, Tuningen; Heinz Schaefer, Villingen-Schwenningen, and Wolfgang Blaffert, Rottweil, all of Germany, assignors to Binder Magnete GmbH, Germany

Filed Apr. 19, 1996, Ser. No. 635,301

Claims priority, application Germany, Apr. 20, 1995, 195 14 554.2

Int. Cl.[6] F16H *63/38;61/18;* B60K *41/26*

U.S. Cl. 74—475 18 Claims

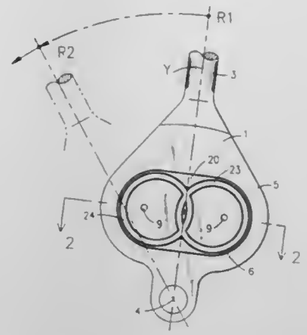
1. A locking device with an electromagnet for interlocking two longitudinally moveable elements (1, 2) moveable relative to each other along longitudinal axis (X), comprising:

a magnetic yoke (40) fixed in position relative to the second element;

an operative winding (41) fixed in position relative to the second element; and

a magnet armature (20), fixed in position on the first element with respect to the longitudinal movement direction (X);

wherein activation of said magnet armature (20) results in interlocking of the two elements (1, 2);



wherein the magnet armature (20) is pressed with one of its walls (26) against an opposing wall (43) of the magnetic yoke (40) via a spring device;

wherein the walls (26, 43) of the magnet armature (20) and the magnetic yoke (40) which face each other are provided with an at least approximately form engaging register contour (23, 24, 25) defining releasable register positions (R1, R2, R3);

wherein upon the exceeding of a predetermined operating force in the longitudinal movement direction (X) upon one of the two elements (1, 2) the magnet armature (20) and the magnetic yoke (40) are capable of being moved out of their register position (R1, R2, R3) or, as the case may be, locking positions.

5,743,147

## GEAR SHIFT DEVICE

Ünal Gazyakan, Friedrichshafen, Germany, assignor to ZF Friedrichshafen AG, Friedrichshafen, Germany

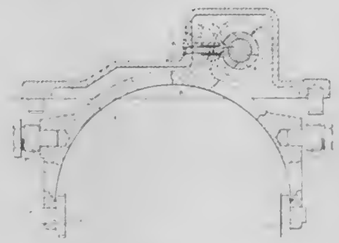
PCT No. PCT/EP94/04107, § 371 Date Jun. 14, 1996, § 102(e) Date Jun. 14, 1996, PCT Pub. No. WO95/16869, PCT Pub. Date Jun. 22, 1995

PCT Filed Dec. 10, 1994, Ser. No. 656,341

Claims priority, application Germany, Dec. 16, 1993, 43 42 957.2

Int. Cl.[6] F16H *63/36*

U.S. Cl. 74—477 11 Claims



1. A gearshift device, for gearshift actuation of a multi-speed transmission, comprising:

a transmission housing;

a gearshift rod being slidably and rotatably mounted to the transmission housing and having a longitudinal axis, the gearshift rod being slidable along and rotatable about the longitudinal axis;

a plurality of gearshift mechanisms being movable between a disengaged position and an engaged position;

each of said gearshift mechanisms having a coupling mechanism for coupling the gearshift mechanism to the gearshift rod, each coupling mechanism being adjustable between a slide position and a drive position such that when the coupling mechanism is in the slide position the gearshift rod is slidable

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relative to the gearshift mechanism, and when the coupling mechanism is in the drive position the gearshift rod is secured to the gearshift mechanism and translational movement of the gearshift rod along the longitudinal axis causes the corresponding gearshift mechanism to move to one of the engaged and disengaged positions; and

the gearshift mechanisms being gearshift levers rotatably mounted to the transmission housing about a second axis oriented perpendicular to the longitudinal axis of the gearshift rod;

wherein each coupling mechanism comprises:

a sleeve-shaped basic member secured about the gearshift rod and having a center along the longitudinal axis;

a groove is provided in a peripheral surface of the basic member;

a bore is provided through a top portion of the gearshift lever and is alignable with the groove in the basic member, and the top portion is in sliding communication with the basic member;

a stop bolt is slidably inserted into the bore and has a first end adjacent the basic member and a second end removably inserted into the transmission housing to define the slide position of the coupling mechanism; and

a biasing mechanism for biasing the stop bolt towards the basic member and, when the groove in the basic member and the bore in the top portion are aligned with one another, the biasing mechanism urges the first end of the stop bolt into the groove and removes the second end of the stop bolt from the transmission housing to define the drive position of the coupling mechanism.

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**5,743,148**

**ENGINE OVER-REVOLUTION PREVENTIVE SYSTEM UTILIZED WITH A MANUAL SHIFT SELECT LEVER ASSEMBLY**

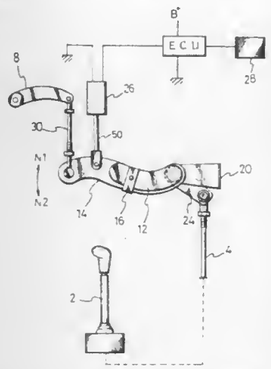
**Sang Pil Na, Kyungsangnam-do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea**

**Filed Jul. 22, 1996, Ser. No. 684,762**

**Claims priority, application Rep. of Korea, Jul. 22, 1995, 95-21749**

**Int. Cl.[6] F16H *61/18***

**U.S. Cl. 74—477** **7 Claims**




1. An engine over-revolution preventive system utilized with a manual shift select lever assembly comprising:

a first selector rod connected to the shift select lever, the first selector rod being operated by the shift select lever;

a shift rod connected to the shift select lever, the shift rod being operated by the shift select lever;

a selector shaft rotated by the selecting operation of the first selector rod;

a first selector member rotated together with the selector shaft, the first selector member being connected to the selector shaft;

a second selector member selectively coupled to the first selector member for rotation therewith;

a second selector rod for transmitting the selecting operation of the second selector member to a transmission; and

a control device for controlling the second selector member.

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**5,743,149**

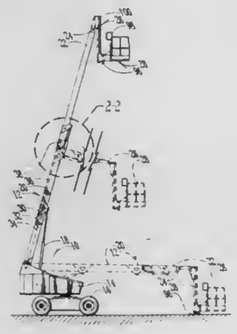
**ARTICULATED TELESCOPIC BOOM HAVING SLIDE-THROUGH KNUCKLE**

**Richard E. Cullity, Atlantic, Iowa, assignor to Skyjack Equipment Inc., Atlantic, Iowa**

**Filed Feb. 26, 1996, Ser. No. 607,346**

**Int. Cl.[6] B66C *23/04***

**U.S. Cl. 74—490.05** **17 Claims**




1. An articulated telescopic boom assembly for a lifting device, comprising:

a first elongated boom having a central longitudinal axis and opposite ends, one of the ends having an opening therein;

a second elongated boom having a first end normally telescopically received by and extensible from the opening in the first boom, the first end including at least one elongated pivot guide slot thereon having a central longitudinal axis and an open end remote from the first end and a closed end proximate to the first end;

a slide-through knuckle mechanism having a housing with an opening therethrough for receiving the second boom during extension and retraction thereof with respect to the first boom, the housing being pivotally connected to the first boom by a pair of opposing elongated pins disposed coaxially to define a pivot axis;

the central longitudinal axis of the pivot guide slot being perpendicular to the pivot axis such that upon the second boom being extended so that the pivot pins register with the closed end of pivot guide slot the second boom is pivotable with respect to the first boom;

extension means connected to the first boom and the second boom for extending and retracting the second boom with respect to the first boom, the extension means being pivotally connected to the second boom by a pivot shaft registered with the closed end of the pivot guide slot; and

means pivotally connected to the first boom and the housing for pivoting the housing and thereby the second boom with respect to the first boom.



**5,743,150**

**SYSTEM FOR GUIDING AND LOCKING A MOTOR VEHICLE STEERING COLUMN**

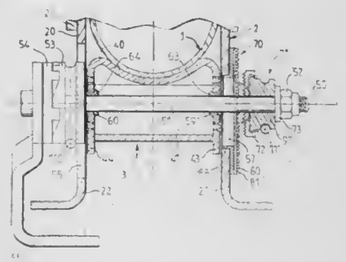
**Laurent Fevre, Saint-Sulpice, and Jean-Christophe Bodin, Saint Ouen, both of France, assignors to Lemforder Nacam S.A., Vendome, France**

**Filed Jul. 26, 1996, Ser. No. 686,672**

**Claims priority, application France, Jul. 26, 1995, 95 09109**

**Int. Cl.[6] B62D *1/18***

**U.S. Cl. 74—493** **11 Claims**



1. Motor vehicle steering column comprising:

a column body extending substantially in the longitudinal direction of the vehicle,

a fixed portion rigidly linked to the frame of the vehicle and including two first brackets situated on each side of the column body,

a mobile portion rigidly linked to the column body and including two second lateral brackets cooperating respectively with the first brackets so that the mobile portion can have a movement which is limited with respect to the fixed portion,

a guiding and locking system for positioning and fixing the mobile portion with respect to the fixed portion, said guiding and locking system comprising:

at least one fixed notched element integral with one of the brackets of the fixed portion,

at least one mobile notched element connected to the mobile portion and disposed opposite the fixed element,

fixing means adapted to render integral the mobile and fixed portions in a locked position in which the notches of the two notched elements cooperate by shape mating,

said steering column further including an elastic means being provided between said notched fixed and mobile elements, so as to be compressed by the fixing means in the locked position and to cause said notched elements to be spaced from each other when the fixing means are inactivated, which corresponds to an unlocked position in which the mobile portion is adapted to move with respect to the fixed portion, said at least one fixed notched element comprising at least one track extending in a direction substantially parallel to the direction of movement of the mobile portion with respect to the fixed portion and said elastic means comprising at least one bracket adapted to slide on said track and being integral with the mobile notched element associated with said fixed notched element, so that the elastic element ensures both the function of elastically spacing said notched elements and guiding said notched elements with respect to one another.

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**5,743,151**

**LOCKING MECHANISM FOR TILT STEERING COLUMN**

**Mustafa A. Khalifa, Dearborn; Kenneth Budowick, Lapeer; Lawrence C. Kosinski, Warren, and John A. Cole, Sterling Heights, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.**

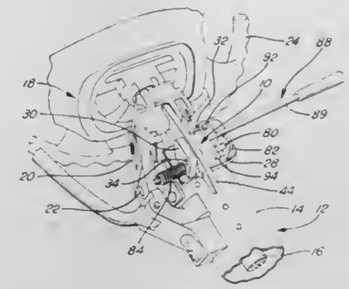
**Filed Aug. 12, 1996, Ser. No. 695,459**

**Int. Cl.[6] B62D *1/18*; F16C *1/10***

**U.S. Cl. 74—493** **7 Claims**

7. Apparatus for releasably locking a tilt steering wheel assembly of an automotive vehicle in adjusted position, comprising

support structure affixed to the vehicle frame,




means pivotally mounting the steering wheel assembly on said support structure for vertical pivotal movement,

means for releasably locking said steering wheel assembly in a desired position of adjustment comprising a bracket affixed to said support structure and having a bracket hole therein,

an elongated pawl pivoted to said steering wheel assembly and extending across said bracket,

said pawl having a series of spaced apart pawl holes,

said pawl having a cam track extending generally lengthwise thereof,

a cam engageable with said cam track to cause said pawl holes to align successively with said bracket hole when said steering wheel assembly is pivoted to various different positions,

a lock pin axially movable to an advanced position engaging said bracket hole and a pawl hole aligned therewith to lock said steering wheel assembly in a desired position of pivotal adjustment,

said cam comprising a cam pin extending parallel to said lock pin,

means supporting said cam pin for axial sliding movement, and

means connecting said lock pin and said cam pin together.

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**5,743,152**

**CRANK ROD**

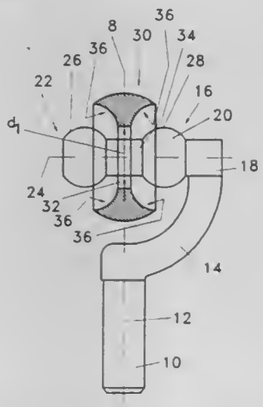
**Josef Grüdl, Löchgau, Germany, assignor to Gerhard Geiber GmbH, Germany**

**Filed Aug. 20, 1996, Ser. No. 697,139**

**Claims priority, application Germany, Jun. 8, 1994, 44 22 142.8**

**Int. Cl.[6] E04F *10/06***

**U.S. Cl. 74—545** **6 Claims**




1. A winding rod which comprises an elongated part having two enlarged portions separated by a smaller cross-section portion disposed substantially perpendicularly to the longitudinal axis of said elongated part and being rotatable about the axis, said

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enlarged portions each having a spherical or elliptical outer faces disposed within an eyelet having two opposed inner faces shaped complimentarily to said outer faces, said annular eyelet having a curved inner face partially surrounding said part, said part having an enlarged portion having an outer face curved complimentarily to said inner face within at least a section for cooperating with said outer face and being substantially coaxially disposed within said eyelet, said inner face being adapted to accommodate said outer face therein.

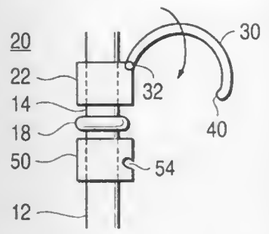
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5,743,153

## BICYCLE HANDLEBAR STABILIZER

Joseph A. Valentino, 230 Sycamore Mills Rd., Media, Pa. 19063

Filed Dec. 10, 1996, Ser. No. 764,725
Int. Cl.[6] B62K *21/12*; F16H *53/00*
U.S. Cl. 74—551.8 18 Claims




1. A bicycle, comprising:
a frame including a head tube;
a set of handlebars projecting from a stem, said stem being mounted to be pivotable at a pivot point with respect to said head tube; and
a bicycle handlebar stabilizer, said stabilizer comprising:
a first clamp attached to the stem above the pivot point;
a bracket pivotally attached to said first clamp, a cam follower being defined on a distal end of said bracket; and
a second clamp attached to the head tube below the pivot point, said second clamp having a surface and a notch disposed in said surface, said notch defining a cam;
wherein said bracket is pivotable between a first position with said cam follower engaging said cam, and a second position with said cam follower disengaged from said cam.

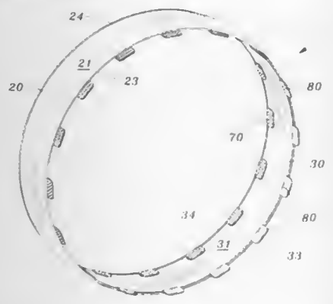
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5,743,154

## STEERING WHEEL COVER

Anthony A. Jacinth, 581 Pomona Ave. #21, Chico, Calif. 95928

Filed May 21, 1996, Ser. No. 651,969
Int. Cl.[6] B62D *1/06*
U.S. Cl. 74—558 16 Claims




1. A cover for a substantially circular steering wheel, comprising in combination:
a single continuous loop of flexible material having an inside surface and an outer surface,
said material having two substantially circular edges, including a forward edge and a rearward edge, spaced from each other by a width of said inside surface and said outer surface,
said width of said inside surface and said outer surface similar to a circumference of a section of the steering wheel,
each of said edges including a means to fasten to an opposite said edge of said material, with said forward edge abutting at least a portion of said rearward edge, when said material is wrapped around said steering wheel,
said fastening means including at least one attachment surface and at least one connection surface, said attachment surface configured to adhere to said connection surface, said attachment surface secured to said forward edge and said connection surface secured to said rearward edge,
wherein said fastening means includes at least one stationary tab secured to said inside surface adjacent one of said two substantially circular edges of said material, and at least one pivoting tab, said pivoting tab attached to said material adjacent the other of said two substantially circular edges of said material,
said stationary tab supporting said attachment surface of said fastening means thereon and said pivoting tab supporting said connection surface of said fastening means thereon,
said connection surface of said pivoting tab extending from an attached edge of said pivoting tab adjacent said forward edge to a free edge of said pivoting tab opposite said forward edge, and
said attachment surface of said stationary tab extending from an outer edge of said stationary tab adjacent said rearward edge to an inner edge of said stationary tab, said inner edge adjacent said inside surface, said attachment surface on a side of said stationary tab opposite said inside surface.

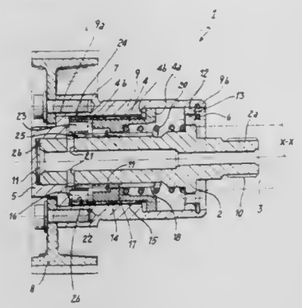
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5,743,155

## MECHANICAL DEVICE FOR CHANGING THE PHASE RELATIONSHIP BETWEEN THE ENGINE SHAFT AND A CAMSHAFT OF AN INTERNAL COMBUSTION ENGINE

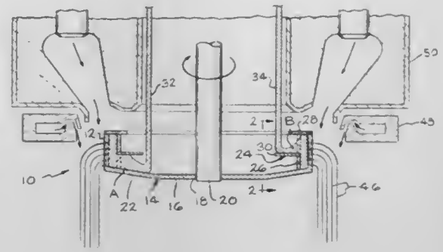
Renzo Tortul, San Pier D'Isonzo, Italy, assignor to Carraro S. p. A., Padova, Italy

Filed May 10, 1996, Ser. No. 644,192
Claims priority, application Italy, May 11, 1995, PD95A0094
Int. Cl.[6] F16H *53/00*
U.S. Cl. 74—568 R 15 Claims




1. A mechanical device for changing the phase relationship between an engine shaft and a camshaft of an internal combustion engine, of the type comprising a first component and a second component coaxial with one another and adapted to be connected kinematically to the engine shaft and to the camshaft, respectively, and a piston interposed between the components and having two sets of teeth of which one has an angle of twist relative to the other, and which are meshed with a set of teeth of the first component and with a set of teeth of the second component, respectively, the piston moving relative to the components under the action of a pressurized fluid so as to change the relative angular positions of the first component and of the second component and the phase relationship between the engine shaft and the camshaft, comprising an auxiliary annular element interposed between the components at a predetermined distance from the piston and having two sets of teeth meshed with the teeth of the first component and with the teeth of the second component, respectively, and stop means which limit the travel of the auxiliary annular element preventing relative rotation between the components and stopping the piston due to engagement in the teeth of the components.





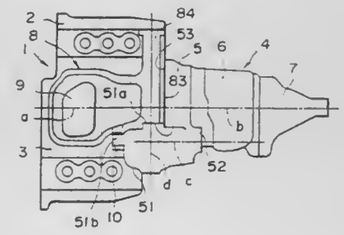

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5,743,156

## VEHICLE POWER UNIT STRUCTURE

Kenzo Watanabe; Masayuki Ushiki; Yuichiro Yanagida, and Hajime Kashiwase, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1996, Ser. No. 670,981
Claims priority, application Japan, Aug. 11, 1995, 7-227087
Int. Cl.[6] F16H *57/02*
U.S. Cl. 74—606 R 22 Claims




1. A power unit, comprising:
an engine having a first bank and a second bank;
a transmission;
a transmission case for receiving said transmission, said transmission case having a mating surface connected with said engine; and
a differential housing having a first portion and a second portion, said first portion being supported by said engine and said second portion being supported by said transmission case, said differential housing having an inner housing portion disposed between said first bank and said mating surface of said transmission case.

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5,743,157

## METHOD FOR MAKING A STRENGTHENED SPINNER HAVING INTEGRALLY FORMED RIBS

Jay W. Hinze, Newark, Ohio, assignor to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Filed Jul. 31, 1996, Ser. No. 692,898
Int. Cl.[6] B21K *5/20*
U.S. Cl. 76—107.6 20 Claims

1. A method of forming a spinner for centrifuging fibers from molten material comprising:
warm working a dispersion strengthened metal at a temperature above the minimum warm working temperature and below the recrystallization temperature of the metal, to form a spinner having an annular peripheral wall and a plurality of ribs formed integrally with the peripheral wall and extending radially inwardly therefrom;
heat treating the warm worked spinner to recrystallize the metal to a coarse grain structure; and
forming a plurality of orifices through the peripheral wall.

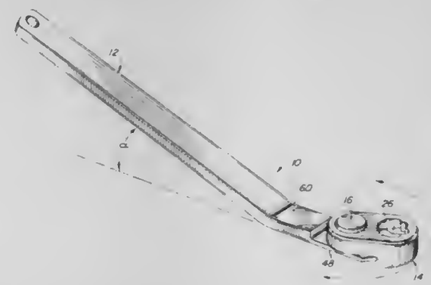
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5,743,158

## HAND WRENCHING TOOL FOR REMOVING TORQUE LIMITED FASTENERS

Leland M. Perkins, Thousand Oaks, Calif., assignor to Omega Technologies Inc., Thousand Oaks, Calif.

Filed Sep. 20, 1996, Ser. No. 717,002
Int. Cl.[6] B25B *13/28*
U.S. Cl. 81—58.5 10 Claims

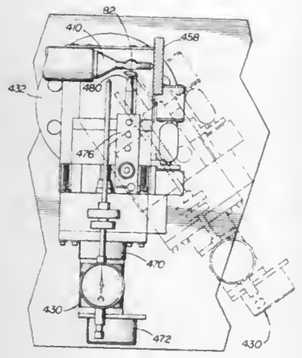



1. A hand wrenching tool for removing torque limited fasteners, comprising:
a socket head including a through socket at one end thereof, an aperture through another end, a first set of teeth forming a portion of a wall for the socket, and a second set of teeth forming another portion of the wall for the socket, wherein the second set of teeth adjoin the first set of teeth along a longitudinal axis of the socket;
an elongated handle having a jaw end forming an arcuate surface, and an aperture aligned with the socket head aperture; and
an assembly pin extending through the aligned handle and socket head apertures, to pivotally attach the handle to the socket head;
wherein the first set of teeth has an edge adjoining a lower surface of the socket head, and the wall portion formed thereby defines semi-cylindrical cutouts each having a first radius of curvature, whereby the first set of teeth are formed at common edges of adjacent semi-cylindrical cut-outs;
wherein the wall portion formed by the second set of teeth defines semi-cylindrical cut-outs each having a second radius of curvature, whereby the second set of teeth are formed at common edges of adjacent semi-cylindrical cutouts; and
wherein the second radius of curvature is greater than the first radius of curvature.

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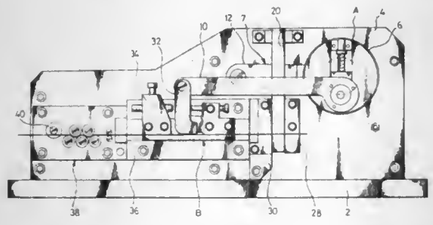
**5,743,159**
**MULTIFOCAL CONTACT LENS AND METHOD AND APPARATUS FOR MAKING THE SAME**
**Jan B. Svochak, Watauga, and Colin Howard Wess, Euless, both of Tex., assignors to Tru-Form Optics, Inc., Euless, Tex.**
**Division of Ser. No. 538,099, Oct. 2, 1995. This application Oct. 21, 1996, Ser. No. 729,637**
**Int. Cl.[6] B23B** *33/00*
**U.S. Cl. 82—168** **4 Claims**




1. A device for making a monocentric multivision lens on a lathe from a lens blank having an optical axis and an anterior side, comprising:
a. a mandrel, having a rotational axis, rotatably mounted on the lathe;
b. means for mounting the lens blank on the mandrel so that the optical axis is perpendicular to the axis of rotation of the mandrel;
c. means for varying the distance between the rotational axis and the anterior side of the lens blank as the mandrel rotates about the rotational axis; and
d. means for cutting a vision surface on the anterior side of the lens blank as the mandrel rotates.

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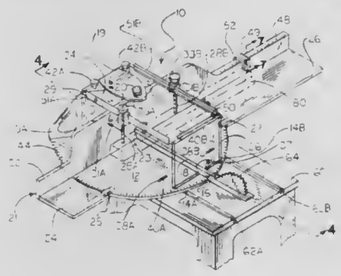
**5,743,160**
**METALLIC TAPE CUTTING DEVICE**
**Youngkook Park, Kyungki-do, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea**
**Filed Jun. 13, 1996, Ser. No. 665,102**
**Claims priority, application Rep. of Korea, Sep. 25, 1995, 95-31627**
**Int. Cl.[6] B26D** *5/22*
**U.S. Cl. 83—276** **6 Claims**




1. A metallic tape cutting device comprising:
a driving device for providing rotational power;
means for moving a crank member in a crank motion and a fork member in a fluctuation motion by receiving the rotational power from the driving device;
a tape transferring means which pressurizes tape material through a link member receiving force from the crank member, the link member thereby causing the pressurized tape material to be transferred;
a tape cutting means which receives force from the fork member and cuts the tape material transferred from the tape transferring means by an ascending and descending motion.

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**5,743,161**
**ANGULARLY ADJUSTABLE TABLE SAW JIG**
**Jon P. Boudreau, 35 Garrison Ave., Somerville, Mass. 02144**
**Continuation of Ser. No. 508,379, Jul. 31, 1995, abandoned. This application Dec. 17, 1996, Ser. No. 770,681**
**Int. Cl.[6] B27B** *25/08;27/06;* **B26D** *7/01*
**U.S. Cl. 83—435.11** **20 Claims**



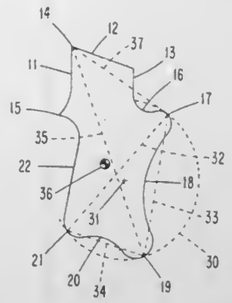
1. A jig for feeding work to a table cutting saw, the table cutting saw with a cutting blade projecting through a generally flat upper table face, and the jig comprising:
a base plate with an underside and an upper flat surface for supporting a work piece;
a means for slidably mounting the jig on the upper table face of the table cutting saw for enabling the jig to slide along a jig sliding path, wherein the jig sliding path is parallel to a cutting path of the cutting blade;
an elongated guide rail for advancing a work piece into the cutting blade, wherein the guide rail is rotatably connected to the base plate for rotation of the guide rail about a single axis of rotation, wherein the axis of rotation of the guide rail is fixed with regard to the jig, and wherein the axis of rotation of the guide rail is coincident with a cutting plane of the cutting blade; and
a slot in the base plate wherein the slot is generally parallel to the sliding path of the jig for providing clearance for the cutting blade when the base plate is slid over the upper table face of the table cutting saw.

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**5,743,162**
**CUTTING INSERT AND TOOL HOLDER FOR FRICTIONALLY HOLDING THE INSERT**
**Erik Sundström, Sandviken, Sweden, assignor to Sandvik AB, Sandviken, Sweden**
**Filed Sep. 9, 1996, Ser. No. 709,873**
**Int. Cl.[6] B23D** *61/04;* **B26D** *1/00*
**U.S. Cl. 83—839** **6 Claims**

1. A cutting insert adapted to be held in a tool seat without separate fasteners; the insert having a contour which includes an outwardly projecting region and first, second, and third convex regions; the projecting region forming a cutting edge; the first, second, and third convex regions terminating in first, second, and third support points, respectively; the first, second, and third support points being equidistantly spaced from a common point situated in an area of the insert enclosed by a first line extending between the first and third support points, a second line extending between the first and second support points, and a third line






extending between the second and third support points; the first and second convex regions being separated by a first separation region of the contour, and the second and third convex regions being separated by a second separation region of the contour; all portions of the first and second separation regions being disposed closer to the common point than are the first, second and third support points.

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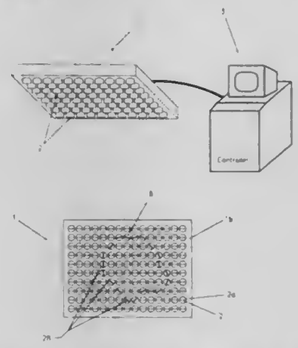
**5,743,163**
**CLEAN CUTTING CIRCULAR SAW BLADE**
**Edward E. Lavinder, P.O. Box 66, Oxford, Ark. 72565, and William R. Yeamans, Sr., P.O. Box 645, Melbourne, Ark. 72556**
**Filed May 23, 1995, Ser. No. 447,983**
**Int. Cl.[6] B27B** *33/08*
**U.S. Cl. 83—851** **6 Claims**




1. An improved circular saw blade having a centrally apertured plate and a series of two tooth sets disposed around an outer periphery of the plate, each set being separated by a first gullet, each of the tooth sets comprising:
a forward ripper tooth and a rearward cleaner tooth, the two teeth of the set being separated by a second gullet therebetween, said second gullet being smaller than the first gullet;
wherein each of said teeth has a front surface, a rear surface, a top surface, and two side surfaces, and each of said side surfaces tapers rearwardly inwardly at an angle between the front and rear surfaces, and
wherein the top surface of each of the two teeth of the tooth set has an equal and opposite downward lateral rake and in addition each top surface of the ripper tooth is slanted downwardly from the front surface toward the rear surface thereof, and each ripper tooth has a chamfer at the intersection of the front surface with each of the side surfaces;
wherein the lateral rake is about a 7.5 degree angle and the rearward taper of the top surface is about a 30 degree angle;
wherein each of said side surfaces tapers rearwardly inwardly at an angle of about 3 degrees between the front and rear surfaces;
wherein the front surface of the ripper tooth is vertically longer than the front surface of the cleaner tooth;
wherein each ripper tooth is spaced about every 15 degrees around the outer periphery of said plate;
wherein said plate is within a range of 10–18 inches in diameter and has tooth sets in a range of 33–43 tooth sets;
wherein the cutting tip of each of said ripper teeth is about ⅛ inches long and the cutting tip of each of said cleaner teeth is about 5/16 inches long;
wherein a length of each of said teeth along the upper surfaces thereof in a direction parallel to the outer periphery of said plate is about 9/32 inches.

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**5,743,164**
**AUTOMATIC RECONFIGURABLE DIE**
**Allon Guez, 560 Sprague Rd., Penn Valley, Pa. 19072**
**Filed Mar. 1, 1996, Ser. No. 609,391**
**Int. Cl.[6] B26D** *1/00;3/08*
**U.S. Cl. 83—862** **16 Claims**




1. An automatic reconfigurable die for scoring and cutting a sheet of material, comprising:
a bottom base portion having a plurality of knives attached thereto, and
means for actuating each of the plurality of knives,
wherein the means for actuating each of the plurality of knives includes means for pivotably orienting each of the plurality of knives about a respective longitudinal axis, and means for extending and retracting each of the plurality of knives along the respective longitudinal axis, and
further wherein the automatic reconfigurable die includes control means for controlling the means for actuating such that operation of the control means allows a selected number of the plurality of knives to be oriented and extended to score and cut a selected piece of a material.

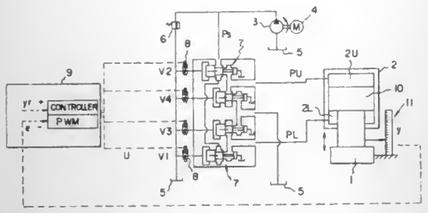
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**5,743,165**
**METHOD FOR CONTROLLING DRIVING OF A RAM OF A HYDRAULIC CYLINDER OF A HYDRAULIC PRESS EQUIPMENT**
**Hirohisa Tanaka, Tokyo, and Takeshi Nagata, Aichi, both of Japan, assignors to Nisshinbo Industries, Inc., Tokyo, Japan, by said Takeshi Nagata**
**Filed Dec. 4, 1995, Ser. No. 567,124**
**Claims priority, application Japan, Dec. 20, 1994, 6-335501**
**Int. Cl.[6] F15B** *11/048*
**U.S. Cl. 91—419** **2 Claims**

1. Method for controlling driving of a ram of a hydraulic cylinder of a hydraulic press equipment, wherein four proportional sheet valves are connected with a hydraulic circuit so as to form a full-bridge hydraulic circuit, said hydraulic circuit comprising a

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hydraulic pump and a hydraulic cylinder to make said ram of said hydraulic press equipment move upward and downward, each of said proportional sheet valves comprising a sheet-formed main valve and a pilot valve for controlling motions of said main valve, characterized in that:

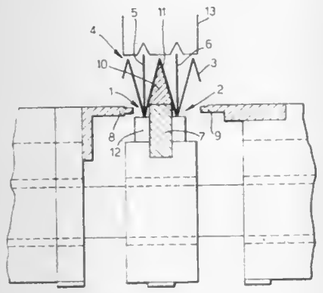
in case of a machining process with a wide load fluctuation, rapidly turning-on one of said proportional sheet valves in a pressure oil supply position and flowing pressure oil into a discharge line of pressure oil from a lower chamber of said hydraulic cylinder as soon as a stamping load decreases rapidly in order to prevent said ram from overshooting a target position by increasing back pressure of a discharge line from the lower chamber of said hydraulic cylinder.

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**5,743,166**
**BELLOWS**

**Albert Stöhr, Am Wiedenberg 8, 85570 Markt Schwaben, Germany**

**Filed May 3, 1996, Ser. No. 642,353**
**Claims priority, application Germany, May 11, 1995, 295 07 800.6**
**Int. Cl.[6] F01B *19/00*; F16J *3/00***
**U.S. Cl. 92—42** **7 Claims**



1. A bellows comprising:

a bellows body having outer pleats;

supporting frames forming a portion of the bellows body having lateral sides and edges each of the supporting frames connected to and extending from inside portions of the outer pleats by two weld seams which are disposed on lateral sides of the supporting frame near edges of the supporting frame which are adjacent the outer pleats; and

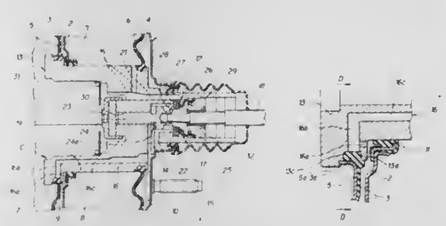
a high-frequency welded joint forming the connections between the frames and the outer pleats.

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**5,743,167**
**PNEUMATIC BOOSTER**

**Shuzo Watanabe, Yamanashi-ken; Mitsuhiro Endo, Kanagawa-ken, and Hiromi Ando, Yamanashi-ken, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan**

**Filed Sep. 19, 1996, Ser. No. 715,894**
**Claims priority, application Japan, Sep. 20, 1995, 7-266331; Sep. 20, 1995, 7-266333**
**Int. Cl.[6] F01B *19/00*; F15B *11/00***
**U.S. Cl. 92—48** **2 Claims**



1. A pneumatic booster including a shell body;

a center shell dividing the interior of said shell body into front and rear chambers;

said front chamber being divided into a front negative pressure chamber and a front working pressure chamber by a front power piston with a diaphragm;

said rear chamber being divided into a rear negative pressure chamber and a rear working pressure chamber by a rear power piston with a diaphragm;

a valve body supported by said front and rear power pistons, said valve body extending through said center shell and said shell body with seal members therebetween and projecting rearward of said shell body;

said front and rear negative pressure chambers being communicated with each other through a negative pressure passage provided in said valve body;

said front and rear working pressure chambers being communicated with each other through an air passage provided in said valve body;

a valve mechanism provided in said valve body so as to operate in association with an input shaft, thereby selectively introducing atmospheric air and a negative pressure into said front and rear working pressure chambers;

said pneumatic booster further comprising:

a communicating port of said air passage which leads to said front working pressure chamber, said communicating port opening axially into said front working pressure chamber,

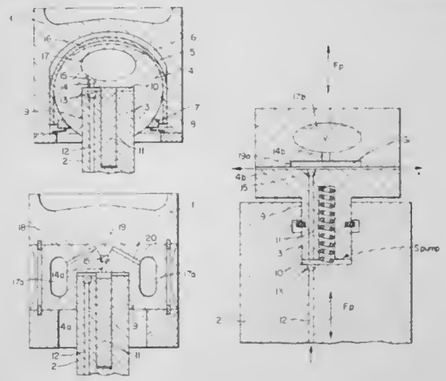
wherein said diaphragm of said front power piston has a bead on an inner periphery thereof, said valve body having a groove on an outer periphery thereof, and wherein a portion of said air passage which leads to said front working pressure chamber has a main passage portion extending axially in said valve body, and a bypass extending radially outward from said main passage portion, said communicating port extending axially from said bypass, said bypass opening into said groove, and said bypass being sealed at a radially outer end thereof by said bead.



**5,743,168**
**DEVICE FOR LUBRICATING AN ASSEMBLY BETWEEN TWO MECHANICAL COMPONENTS WHICH CAN MOVE WITH RESPECT TO EACH OTHER, ESPECIALLY A CONNECTING ROD/PISTON ARTICULATION**

**Jean Frédéric Melchior, 126 Boulevard du Montparnasse, 75014 Paris, France**

**PCT No. PCT/FR95/01289, § 371 Date Aug. 1, 1996, § 102(e) Date Aug. 1, 1996, PCT Pub. No. WO96/10706, PCT Pub. Date Apr. 11, 1996**
**PCT Filed Oct. 4, 1995, Ser. No. 640,793**
**Claims priority, application France, Oct. 4, 1994, 94 11842**
**Int. Cl.[6] F15B *21/04***
**U.S. Cl. 92—80** **16 Claims**




1. Device for a pressurized lubrication of an assembly between first and second mechanical components which move with respect to each other, said first component being subjected to forces which are cyclically alternating in intensity but not in direction and of variable average intensity, these forces being transmitted to said second component via a layer of a compressible liquid lubricant filling an interstice having a defined area of action and located in an interface formed between said first and second mechanical components, where a quantity of said lubricant leaks and escapes from said interface via functional clearances in said assembly, which said assembly includes:

means for supplying the compressible liquid lubricant at low pressure;

means for generating high pressure in the compressible liquid lubricant comprising a hydraulic pump which includes a pump piston axially moveable in a cylinder between two extreme positions, so as to form a chamber having a variable volume which is variable between a minimal volume and a maximal volume, which variation is called a swept volume of the pump, said chamber of variable volume being connected, through a first one-way communication means, to said means for supplying liquid lubricant, and emerging through a second one-way communication means into said interstice, and elastic return means exerting a return force on said pump piston so as to increase said variable volume of said pump;

said means for generating high pressure in said compressible liquid lubricant being actuated by said cyclically alternating forces and by the return force of said elastic return means;

said elastic return means returning said pump piston to an initial rest position when the intensity of said cyclically alternating forces approaches or is close to a minimum cyclic value, an articulation component being interposed between said first and second mechanical components which move with respect to each other, said articulation component interacting with the first mechanical component so as to form said interface, and with said second mechanical component so as to form said hydraulic pump;

said device being characterized in that:

said interstice communicates with a cavity of fixed volume forming a reserve of the liquid lubricant;

a ratio between the fixed volume of said cavity and said swept volume of said pump being sufficiently high so that said pump piston travels cyclically between two positions, under only the action of said cyclically alternating forces and of said return force of the elastic return means, at least when said forces reach a maximum average intensity;

said defined area of action of the interstice being sufficiently high and the fixed volume of said cavity, with respect to said swept volume of the pump, being sufficiently low so that a pressure generated in said interstice reaches a value enabling said first mechanical component to be moved away from said articulation component during that part of a cycle of variation in said cyclically alternating forces in which the intensity of said cyclically alternating forces is a minimum and at an end of a small number of cycles;

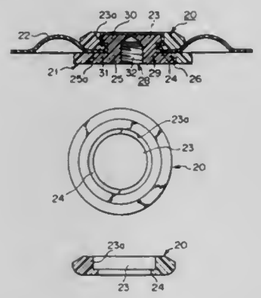
said swept volume of said pump being sufficiently high to compensate cyclically for said quantity of liquid lubricant which leaks and escapes from the said interface via said functional clearances of the assembly, said functional clearances being sufficiently high to allow hydrodynamic lubrication of said assembly without direct contact between said components of said assembly.

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**5,743,169**
**DIAPHRAGM ASSEMBLY AND METHOD OF MANUFACTURING SAME**

**Kazumasa Yamada, Ohta-ku, Japan, assignor to Yamada T.S. Co., Ltd., Tokyo, Japan**

**Filed Aug. 29, 1995, Ser. No. 520,828**
**Claims priority, application Japan, Jan. 6, 1995, 7-000783**
**Int. Cl.[6] F01B *19/00***
**U.S. Cl. 92—100** **3 Claims**



1. A diaphragm assembly comprising a center disk and a diaphragm made of resin;

said center disk comprising first and second center disk members, made of resin, embracing said diaphragm interposed between them;

said first center disk member having an inner peripheral wall defining a resin charging space and an inwardly directed inner flange provided on said inner peripheral wall;

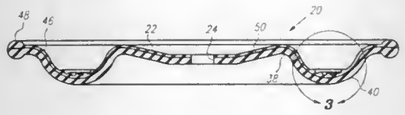
said second center disk member comprising a resin-molded body formed by charging a resin into said resin charging space and having an outwardly directed outer flange;

a portion of said diaphragm being clamped between said inner flange and said outer flange.

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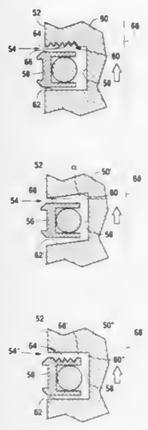
5,743,170
**DIAPHRAGM MECHANISM FOR AN AIR DRIVEN DIAPHRAGM PUMP**
**Wilfred D. Pascual, Baldwin Park, and Eric L. Forman, Rancho Cucamonga, both of Calif., assignors to Wilden Pump & Engineering Co., Grand Terrace, Calif.**
**Filed Mar. 27, 1996, Ser. No. 622,943**
**Int. Cl.[6] F01B** *19/00*
**U.S. Cl. 92—103 F** **7 Claims**



1. A diaphragm mechanism for an air driven diaphragm pump, comprising
a diaphragm having an air chamber side and a pump chamber side, the diaphragm including an inner attachment portion, an outer attachment portion, an annular flexure portion between the inner attachment portion and the outer attachment portion, an inner transition portion joining the inner attachment portion and the annular flexure portion and an outer transition portion joining the annular flexure portion and the outer attachment portion, the annular flexure portion having a constant radius of curvature as seen in radial cross section, the locus of the center of curvature of the constant radius of curvature being substantially in a plane with the intersection of the inner transition portion and the inner attachment portion, the annular flexure portion being concave on the air chamber side;
structural fabric fully embedded in the diaphragm and extending across the diaphragm closer to the air chamber side than the pump chamber side,
the structural fabric being embedded in the air chamber side to about one-third of the thickness of the diaphragm.

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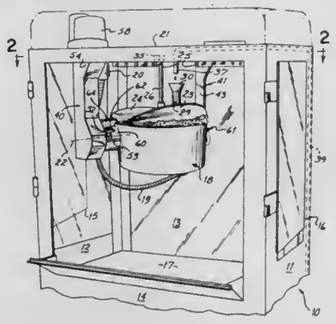
5,743,171
**OIL CONTROL RING AND GROOVE ARRANGEMENT FOR IMPROVED BLOWBY CONTROL**
**Susumu Ariga, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.**
**Filed Mar. 14, 1997, Ser. No. 818,539**
**Int. Cl.[6] F16J** *1/04*
**U.S. Cl. 92—208** **3 Claims**



1. A piston and ring assembly for an internal combustion engine, comprising a piston having a cylindrical surface and an annular groove defined by a cylindrical wall spaced radially inwardly from said cylindrical surface of the piston, an upper wall extending inwardly from said cylindrical surface of the piston to the cylindrical wall of the groove, and a lower wall extending inwardly perpendicularly from said cylindrical surface of the piston to the cylindrical wall of the groove, said upper and lower walls of the groove being spaced apart at a predefined distance at the cylindrical surface of the piston; and an oil control ring disposed in said annular groove and having a thickness defined by the spaced apart distance between an upper and a lower surface of the ring that is less than the predefined distance between the upper and lower walls of the groove at the cylindrical surface of the piston, wherein one of said upper wall of the groove and said upper surface of the ring is disposed at an angle with respect to a plane normal to a central axis of the piston so that a tapered annular cavity, beginning at and diverging away from the cylindrical surface of the piston, is formed between the upper wall of the groove and the upper surface of the oil control ring when respective portions of the upper surface of the oil control ring and the upper wall of annular groove, adjacent the cylindrical surface of the piston are in mutual contact.

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5,743,172
**AUTOMATIC POPCORN POPPER WITH THERMAL CONTROLLER**
**Ronald R. Weiss, Okeana, and Lee Kindley Hodgson, Cincinnati, both of Ohio, assignors to Gold Medal Products Co., Cincinnati, Ohio**
**Continuation-in-part of Ser. No. 345,303, Nov. 28, 1994. This application Apr. 17, 1996, Ser. No. 633,580**
**Int. Cl.[6] A23L** *1/01;1/18*
**U.S. Cl. 99—323.7** **37 Claims**



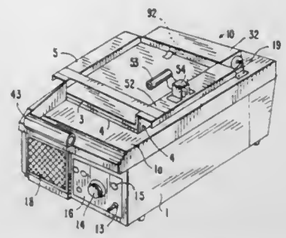
1. Apparatus for popping corn comprising:
a kettle;
a kettle operating system for heating and operating the kettle and popping popcorn placed therein;
a control system responsive to a kettle temperature condition and operably coupled to the kettle operating system to control kettle operation in response to said kettle temperature condition.

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5,743,173
**BAKE STUFF COOKER**
**Takahiro Hayashi; Taijiro Kasahara, both of Otsu; Terumi Furuya, Uji, and Minoru Yoshida, Otsu, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan**
**Filed Jan. 30, 1997, Ser. No. 791,534**
**Claims priority, application Japan, Jan. 31, 1996, 8-015615; Jan. 31, 1996, 8-015617**
**Int. Cl.[6] A47J** *27/00;31/00;* **H05B** *1/02;6/68*
**U.S. Cl. 99—331** **12 Claims**

1. A bake stuff cooker comprising:
a main body case;

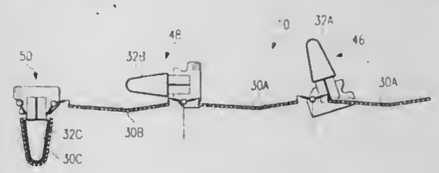




a mount plate attached on an upper surface of the main body case for mounting a cook stuff;
a heating plate pivotally switchable between a facing position facing the mount plate to form a gap corresponding to the thickness of the cook stuff above the mount plate and a separating position separating from the facing position;
the heating plate forming a heating face on an upper surface and/or a lower surface thereof;
a lid for forming another gap corresponding to the thickness of another cook stuff above the heating plate and for covering the heating face on the upper surface of the heating plate;
a heating device for heating the heating face;
a control unit for controlling to drive and stop the heating device; and
a temperature detecting means for detecting a temperature of the heating face,
wherein the control unit is provided with a drive time setting circuit for setting a drive time of the heating device in accordance with the temperature of the heating face detected by the temperature detecting means in starting to drive the heating device.

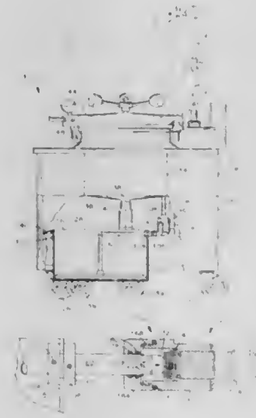
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5,743,174
**TACO CENTERING APPARATUS**
**John S. Stickle, Plano, Tex., assignor to The Double "JJ" Corporation, Dallas, Tex.**
**Filed Jan. 24, 1997, Ser. No. 788,284**
**Int. Cl.[6] A47J** *37/12*
**U.S. Cl. 99—404** **7 Claims**



1. A taco frying apparatus, comprising:
first and second parallel chain elements;
first and second rods extending between said first and second chain elements, the first and second rods parallel each other and spaced a predetermined distance along the chain elements from each other;
a mesh extending between the first and second rods; and
a mold pivotally mounted to said first rod for pivotal motion between a first release position exposing the mesh and a second capture position with the mesh formed over the mold.

5,743,175
**DISCONNECT MECHANISMS BETWEEN A DEEP FAT FRY POT AND FILTER VAT**
**John W. Crain, and Michael G. Walpole, both of Greer, S.C., assignors to Standex International Corporation, Salem, N.H.**
**Filed Jun. 21, 1996, Ser. No. 669,874**
**Int. Cl.[6] A47J** *37/12*
**U.S. Cl. 99—408** **9 Claims**



1. A food preparation appliance having a deep fat fry pot supported by a cabinet frame above a filter vat, said fry pot having a drain therein for gravity transfer of cooking fluid from said pot past a selectively closed valve in said drain, a pump for extracting cooking fluid from said filter vat and returning said fluid to said fry pot, a fluid filter and first suction line section secured to said filter vat for filtering a flow of cooking fluid drawn from said vat by said pump, a second suction line section for carrying said filtered cooking fluid from said first suction line section into said pump and connector means for selectively connecting said first suction line section to said second suction line section, said connector means comprising a valve element that is resiliently biased against a first O-ring seal to block fluid flow through said connector means, said first suction line section having a connector coupling end for penetrating said connector means and displacing said connector means valve element from said first O-ring seal to facilitate fluid flow through said connector means, said connector coupling end having a substantially cylindrical external perimeter surface for fluid sealing cooperation with said first O-ring seal and finger projections from said cylindrical perimeter to displace said valve element whereby removal of said filter vat from said cabinet frame withdraws said connector coupling end from said connector means and consequently positions said valve element against said first O-ring seal to block fluid flow from said second suction line section through said connector means.

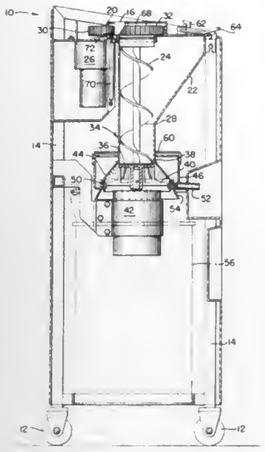
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5,743,176
**FRUIT AND VEGETABLE JUICE EXTRACTOR**
**David N. Anderson, Auburndale, and Wayne C. Sherman, Lakeland, both of Fla., assignors to FMC Corporation, Chicago, Ill.**
**Continuation-in-part of Ser. No. 38,437, Mar. 29, 1993, abandoned. This application Dec. 13, 1994, Ser. No. 355,424**
**Int. Cl.[6] A23N** *1/00*
**U.S. Cl. 99—512** **2 Claims**

1. Apparatus useable in the mid-size market for extracting juice from vegetables and fruit comprising:
a frame

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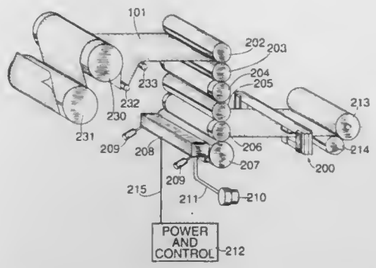


a motor mounted on said frame and having an upwardly directed output shaft;
a backer mounted on and driven by said output shaft;
a grater plate supported by said backer and rotatable therewith;
a containment tube positioned essentially vertically above said grater plate and having a lower discharge end in close proximity to said grater plate;
a screened centrifuge secured to said backer and rotatable therewith;
said centrifuge having a frusto-conical section with a larger end and an upper smaller end encircling said tube just above the lower end thereof;
said grater plate being positioned substantially horizontal and adjacent the upper end of the centrifuge so that material abraded by said grater plate is immediately thrown against said centrifuge;
a flighted screw rotatable within said tube;
drive means for rotating said screw at a slower speed than said grater plate and in a direction to cause said screw to force fruit or vegetables against said grater plate;
a hopper for holding fruits and vegetables and in communication with said tube so that fruits and vegetables may be continuously supplied to said screw;
a collector pan surrounding the centrifuge to collect juice passing therethough; and
a hopper removable even during operation of the apparatus positionable below the larger end of said centrifuge to collect the remains of said fruits and vegetables as they drop from said centrifuge.

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**5,743,177**
**ENHANCED CROSS-DIRECTIONAL CALIPER CONTROL SYSTEM**
**Edward M. Wostbrock, Guyton, Ga., assignor to Union Camp Corporation, Wayne, N.J.**
**Filed Feb. 29, 1996, Ser. No. 608,660**
**Int. Cl.[6] D21G** *1/00*
**U.S. Cl. 100—47** **11 Claims**

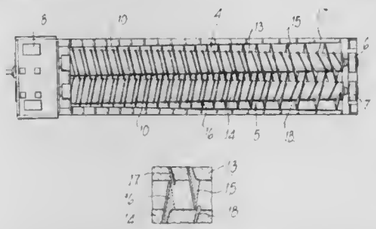
1. A cross-directional caliper control system for a calender, comprising:
coarse caliper control means for adjusting the nip pressure in the calender over a first range of values;
fine caliper control means for adjusting the nip pressure in the calender over a second range of values, the second range of values being smaller than the first range of values;
sensing means for sensing the dimensions of the paper web passing through the calender;




control means, coupled to the coarse caliper control means, fine caliper control means and sensing means, for controlling the caliper by varying the nip pressure with both the coarse caliper control means and the fine caliper control means to shift the variability of the caliper so that it corresponds to nip pressure adjustments within the second range of values wherein the control means controls the coarse caliper control means based on input from the sensing means and controls the fine caliper control means based on the adjustments made by the coarse caliper control means.

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**5,743,178**
**SCREW PRESS FOR DEHYDRATING FIBROUS MATERIALS**
**Lionello Babbini, Galeata, Italy, assignor to F.Lli Babbini di Lionello Babbini & C. S.a.s., Civitella di Romagna, Italy**
**Filed Nov. 1, 1996, Ser. No. 742,617**
**Claims priority, application Italy, Nov. 10, 1995, BO95A0532**
**Int. Cl.[6] B30B** *9/16*
**U.S. Cl. 100—127** **4 Claims**



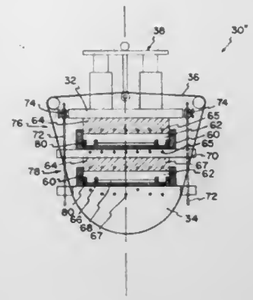
1. A screw press for squeezing out liquid from a fibrous material comprising a screen cage having an inlet for the material to be pressed and an outlet for the pressed material, a pair of parallel Archimedean screws, rotatably arranged inside said screen cage, each of said Archimedean screws having a main thread extending around a shaft with a height and a pitch decreasing in the direction from said inlet towards said outlet, wherein around each shaft and between the turns of each main thread an auxiliary thread is provided having a reduced height with respect to the height of said main thread, and wherein the auxiliary thread of an Archimedean screw is arranged close to the main thread of the other Archimedean screw at least along the portion of said main thread having a lesser height.

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**5,743,179**
**FRAMELESS HIGH PRESSURE PLATEN PRESS**
**Andrew P. Pohl, 5721 B Bayside Rd., Virginia Beach, Va. 23455**
**Filed Sep. 27, 1996, Ser. No. 721,869**
**Int. Cl.[6] B30B** *15/34;7/02;5/00*
**U.S. Cl. 100—325** **20 Claims**

1. A high pressure press comprising:
first and second opposed plates;



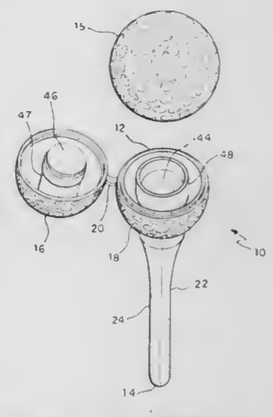


a wrapping structure at least partially surrounding the plates;
a lift unit positioned on one of the first and second plates at a location offset from the wrapping structure; and
a linkage structure for transferring a tensioning force generated by the lift unit to the wrapping structure such that the wrapping structure forces the plates together.

**20**. A high pressure press comprising:
first and second opposed plates moveable between an open orientation in which the plates are distantly spaced from one another, and a closed orientation in which the plates are proximately spaced from one another;
a wrapping structure at least partially surrounding the plates, a portion of the wrapping structure being substantially parallel to the first plate when the plates are in the open orientation, and forming an oblique angle with respect to the first plate when the plates are in the closed orientation; and
a lift unit positioned on the first plate for tensioning the wrapping structure such that the first and second plates are forced together from the open orientation to the closed orientation.

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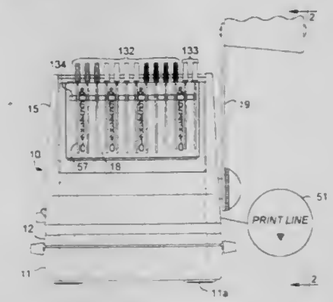
**5,743,180**
**GOLF BALL MARKER**
**Michael C. Arnke, 805 B Valley View Dr., Pflugerville, Tex. 78660**
**Filed Apr. 3, 1997, Ser. No. 825,749**
**Int. Cl.[6] B41F** *17/00*
**U.S. Cl. 101—35** **15 Claims**



1. A golf ball marking device comprising:
a hollow, spherical first portion comprising an upper half having an interior surface, a lower half and a tether, said tether connecting said upper half and said lower half, said lower half and said upper half when joined together defining an enclosed, interior first cavity, said lower half further defining a first aperture;
a blotting member comprising a support post having a first end attached to said inner surface of said upper half and a second end, and an absorbent blotter pad substantially perpendicularly connected to said second end;
an elongated portion having a top defining a second cavity for rotatably receiving a threaded stem, said second cavity aligned in registry with said first aperture of said lower half, said elongated portion attached to said first portion;
an inking member comprising a threaded stem and an ink pad tray bearing indicia for marking a golf ball surface with ink, said ink pad tray substantially perpendicularly attached to said threaded stem and forming a terminal flange thereon, said threaded stem received by said second cavity and extending through said first aperture into said first cavity of said lower half disposing said ink pad tray within said first cavity, said inking member being coaxially aligned and opposing said blotting member when said upper half and said lower half are joined together, said threaded stem being dimensioned to extend sufficiently into said first cavity to cause said ink pad to engage said blotter pad and permit axial extension by rotation of said threaded stem; and,
a spring-actuated plunger comprising a cylindrical member having a floor having a diameter slightly larger that of said ink pad tray and a hole, said threaded stem closely and freely passing through said hole, and a spring coaxially surrounding said threaded stem, said spring having a first end engaging said lower half and a second end outwardly biasing said floor against said lower half thereby causing said cylindrical member to jacket said ink pad tray and said blotter pad when said upper half and said lower half are joined.

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**5,743,181**
**CHECK WRITING MACHINE**
**Robert P. Koper, Bensenville, and Howard R. Konieczka, Chicago, both of Ill., assignors to Paymastet Technologies, Inc., Elk Grove Village, Ill.**
**Division of Ser. No. 367,001, Dec. 30, 1994, Pat. No. 5,611,273.**
**This application Aug. 8, 1996, Ser. No. 694,169**
**Int. Cl.[6] B41F** *1/02*
**U.S. Cl. 101—93** **6 Claims**




1. A prefix plate member for use with a check writing machine including a frame means having a printing mechanism and a printing line therein, a plurality of type segment members supported by the frame and each having a set of printing characters on the peripheral printing face thereof and each being selectively moveable to locate the printing characters on the printing line, and a prefix plate holder assembly associated with the frame means and having an elongated mounting portion extending therefrom for receiving and positioning the prefix plate member adjacent the plurality of type segment members on the printing line, the prefix plate member comprising:
an elongated, box-like member having an opening therein which defines a cavity extending the length of said elongated member, said cavity being defined by curvilinear sidewall portions and a flat wall support portion of the prefix plate member, said

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flat wall support portion having printing characters on the outside surface thereof, said cavity of the prefix plate member being structurally arranged to engage the elongated mounting portion of the prefix plate holder assembly and to be slidingly movable with respect to said holder assembly, with said sidewalls and said flat wall support portions supporting said printing characters on said plate member during printing on the printing line.

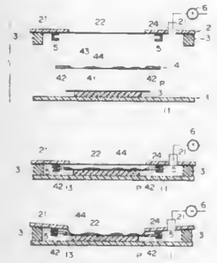
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5,743,182

## STENCIL PRINTING METHOD AND APPARATUS

Akio Kobayashi; Yoshifumi Noguchi; Masakazu Kawano, and Akira Ikezawa, all of Inashiki-gun, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed May 7, 1996, Ser. No. 643,975
Claims priority, application Japan, May 11, 1995, 7-138528
Int. Cl.[6] B41M 1/12
U.S. Cl. 101—129 13 Claims



1. A stencil printing method which comprises the combination of steps of:

placing a lump of printing ink on a side of a stencil, said lump having a sufficient consistency to hold its shape,

providing a pressure chamber which has a first wall constituted by a frame member, and a diaphragm having flexibility extended on said frame member, said frame member having a flexibility sufficient to bend in all directions when pressure is reduced in said pressure chamber,

disposing said stencil in said pressure chamber so that the side of the stencil on which the printing ink has been placed, faces said diaphragm, and

reducing pressure in the pressure chamber to bend the frame to a surface to be printed whereby stencil printing is effected on the surface by virtue of pressing force exerted by the diaphragm.

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5,743,183

## DAMPENING UNIT FOR AN OFFSET PRINTING MACHINE

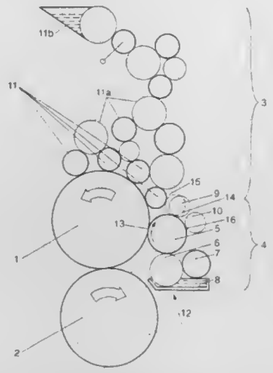
Peter Hummel, Offenbach am Main, and Robert Ortner, Alzenau, both of Germany, assignors to MAN Roland Druckmaschinen AG, Germany

Filed Aug. 9, 1996, Ser. No. 694,990
Claims priority, application Germany, Aug. 9, 1995, 195 29 204.9
Int. Cl.[6] B41L 23/00
U.S. Cl. 101—147 13 Claims

1. An offset printing machine comprising a rotatable plate cylinder having a printing form,

an inking unit having at least one rotatable ink applicator roller for transferring ink to the plate cylinder,

a dampening unit having at least one rotatable dampening applicator roller adjacent to said plate cylinder for transferring a dampening medium to said plate cylinder at a determined contact point,



a dampening medium feed device for supplying dampening medium to said dampening applicator roller at a contact point in front of the contact point of said dampening applicator roller with plate cylinder in the direction of rotation of said dampening applicator roller, and

a first auxiliary roller having a surface made of a material for receiving dampening medium from the dampening applicator roller and a second auxiliary roller having a surface made of a material different from the surface material of said first auxiliary roller for receiving printing ink from the dampening applicator roller, said auxiliary rollers being mounted in contact with the dampening applicator roller after the contact point between the dampening applicator roller and the plate cylinder.

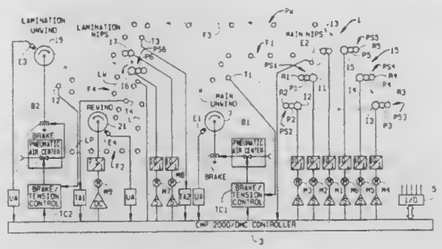
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5,743,184

## GEARLESS PRINTING PRESS

Joseph Skudrzyk, St. Louis, Mo., assignor to Joe Irace, Osprey, Fla.

Filed May 27, 1997, Ser. No. 863,167
Int. Cl.[6] B41F 5/16
U.S. Cl. 101—181 16 Claims



1. A printing press capable of printing in a plurality of colors and of printing on a paper or film substrate, the printing press including:

a main unwind roller about which the substrate to be printed is wound;

a main nip through which the substrate passes, the nip being directly driven by a main nip motor;

a substrate printing area comprising a plurality of print stations, each said print station having an impression cylinder, a printing cylinder in rolling contact with the impression cylinder to be driven thereby, and a motor which directly drives the impression cylinder;

a rewind roller about which the printed substrate is wound;

a rewind motor which drives the rewind roller; and

alignment means for maintaining the printing stations in registry with each other to substantially prevent the printing of blurred multi-colored images; the alignment means including



a central processing unit;

a speed monitor for monitoring the speed of the substrate between the main nip and a first of the plurality of printing stations; said speed monitor generating a signal indicative of the speed of the substrate, said speed signal being received by the central processing unit; and

means for monitoring the rotational position of the at least one of the cylinders of each printing station, said cylinder monitoring means generating a signal indicative of the rotational position of the cylinder of each printing station, said signal being received by said central processing unit;

said central processing unit individually controlling said main nip motor and each printing station motor to maintain said printing stations in alignment.

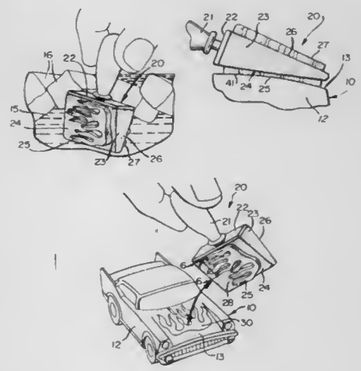
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5,743,185

## FLEXIBLE THERMALLY CONDUCTIVE STAMP AND MATERIAL

Keith A. Hippely, Manhattan Beach; Terence A. Choy, Lawndale; Kevin W. Gray, San Pedro, and Brian E. Walsh, Mission Hills, all of Calif., assignors to Mattel, Inc., El Segundo, Calif.

Continuation of Ser. No. 373,921, Jan. 17, 1995, abandoned.
This application May 12, 1997, Ser. No. 854,423
Int. Cl.[6] B41F 31/00
U.S. Cl. 101—327 13 Claims



1. For use in imposing an image upon a toy object, the combination comprising:

a toy object having a curved surface covered with a thermochromic material;

a thermally conductive stamp comprising:

a handle;

a flexible large high thermal capacity body secured to said handle and defining a flexible surface; and

a flexible thermally conductive image portion, substantially smaller than said body and being raised from, supported by and thermally coupled to said flexible surface thereof, said flexible thermally conductive image portion defining a contact surface and divergent angled sides extending from said contact surface to said flexible surface,

whereby subjecting said object and said body to substantially different temperatures after which said image portion is forced against a portion of said curved surface and conforms thereto whereby heat is transferred between the contacted portion of said curved surface and said thermally conductive image portion to form an image.

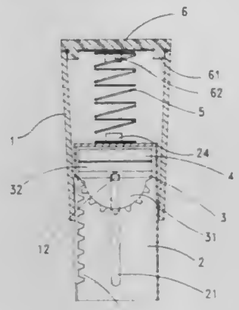
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5,743,186

## STAMP

Shu Chiao Liao, No. 20, Alley 70, Lane 294, Sec. 4, Chung Kung Rd., Taipei, Taiwan

Filed Jan. 14, 1997, Ser. No. 783,495
Int. Cl.[6] B41K 1/42
U.S. Cl. 101—334 1 Claim



1. A stamp comprising:

a casing having a top open end, a bottom open end, two through holes bilaterally aligned near the bottom open end, and a transverse insertion slot at a front side thereof near the top open end;

a pivot connected between the through holes of said casing;

an actuating member moved in and out of the bottom open end of said casing, said actuating member comprising a bottom open end, a closed top end, a longitudinal rack on the inside, two longitudinal sliding slots disposed at two opposite lateral sides through which said pivot passes, a stub rod raised from the closed top end, a transverse insertion slot at a front side thereof near the closed top end, and two symmetrical inside flanges bilaterally disposed on the inside adjacent to the closed top end;

a stamp plate turned about said pivot within a 180° angle and moved in and out of the open bottom end of said actuating member, said stamp plate comprising a semi-circular gear at one end meshed with the longitudinal rack of said actuating member, an axle hole which receives said pivot, and a stamping face made with a mark for stamping;

a top cover covered on the top open end of said casing, said top cover having a bottom coupling flange fitted into the top open end of said casing and a downward stub rod raised from a bottom side thereof;

spring means connected between the stub rod of said actuating member and the stub rod of said top cover to impart a downward pressure to said actuating member; and

an ink pad inserted through the transverse insertion slot of said casing and the transverse insertion slot of said actuating member and held inside said actuating member in contact with the stamping face of said stamp plate by the inside flanges of said actuating member;

wherein when said actuating member is pressed on a workpiece and said casing is pressed down relative to said actuating member, the stamping face of said stamp plate is turned out of the bottom open end of said actuating member and stamped on the workpiece.

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5,743,187

## PLATE CLAMPING DEVICE OF PRINTING PRESS

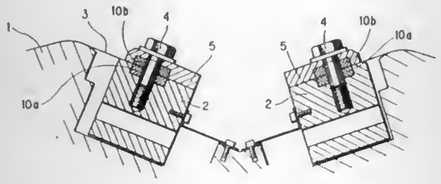
Hideaki Toyoda, and Yutaka Endo, both of Higashikatsushika-gun, Japan, assignors to Komori Corporation, Tokyo, Japan

Filed Oct. 4, 1996, Ser. No. 725,986

Claims priority, application Japan, Oct. 4, 1995, 7-257349; Jan. 23, 1996, 8-008828

Int. Cl.[6] B41F *1/28*

U.S. Cl. 101—415.1 5 Claims




1. A plate clamping device of a printing press, for clamping a plate comprising:

a bottom clamping rail and a pressure plate each having a clamping surface parallel to each other and parallel to at least one end of the plate, wherein each clamping surface defines a lateral direction,

at least one of the clamping surfaces is provided with a serrated portion including serrations biting in to said plate, said serrations being inclined with respect to the lateral direction, so that disengagement of the plate from the clamping device is prevented,

wherein the at least one clamping surface includes a plurality of locations containing the serrations, and the serrations in the plurality of the locations face in different directions.

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5,743,188

## METHOD OF IMAGING A ZIRCONIA CERAMIC SURFACE TO PRODUCE A LITHOGRAPHIC PRINTING PLATE

Syamal Kumar Ghosh; Dilip Kumar Chatterjee, both of Rochester; Donald Michael Korn, Penfield; Nicoletta Assaro Zongrone, and Mark Anthony Harris, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 21, 1995, Ser. No. 576,178

Int. Cl.[6] B41C *1/10*

U.S. Cl. 101—467 20 Claims

1. A method of lithographic printing, said method comprising the steps of:

(1) providing a lithographic printing plate having a zirconia ceramic surface;

(2) providing an image on said printing plate by imagewise exposing said zirconia ceramic surface to electromagnetic radiation which transforms said surface from a hydrophilic to an oleophilic state or from an oleophilic to a hydrophilic state, thereby creating a lithographic printing surface having both image areas and non-image areas, which printing surface is hydrophilic in the non-image areas and is oleophilic and thus capable of accepting printing ink in the image areas;

(3) contacting said lithographic printing surface with an aqueous fountain solution and with a lithographic printing ink, whereby the non-image areas retain said fountain solution and repel said ink and the image areas accept said ink and repel said fountain solution to thereby form an inked lithographic printing surface; and

(4) contacting said inked lithographic printing surface with a substrate to thereby transfer said ink to said substrate and form an image thereon.

5,743,189

## METHOD FOR SUPPLYING INK TO A PRINTING PRESS

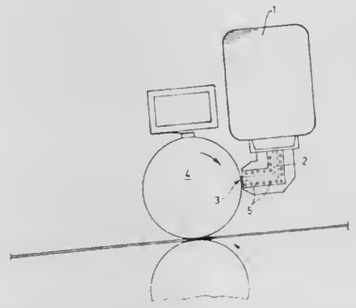
Christian Compera, Dossenheim; Martin Greive, Heidelberg; Bernd Herrmann, Malsch, and Anton Rodi, Leimen, all of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Jul. 15, 1996, Ser. No. 679,982

Claims priority, application Germany, Jul. 15, 1995, 195 25 848.7

Int. Cl.[6] B41J *2/175*

U.S. Cl. 101—487 2 Claims




2. Method for supplying a printing unit of a printing press with ink which is solid at normal temperature, which comprises:

supplying a printing unit having a container with ink in the form of solid bodies selected from the group consisting of sheet forms and slab forms,

supplying the solid bodies to the container, the container communicating via at least one channel with a transfer location at which the ink is to be applied to a cylinder and feeding the ink through the at least one channel by a conveying device,

melting the solid bodies in the container, and

applying the ink in a molten state to the cylinder of the printing unit.

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5,743,190

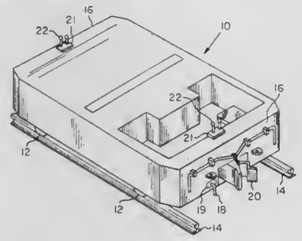
## RERAILER APPARATUS

John M. Dinger, Brookville, and Larry J. Saver, Falls Creek, both of Pa., assignors to Brookville Mining Equipment Corporation, Brookville, Pa.

Filed Jun. 24, 1996, Ser. No. 668,782

Int. Cl.[6] B61K *5/02*

U.S. Cl. 104—263 14 Claims




1. A retailer apparatus for installation in a rail car comprising:

a foot;

at least two vertical lifting members connected to said foot and adapted to be connected to the rail car for lifting the rail car vertically, wherein each said vertical lifting member is adapted to be pivotally connected to the rail car and is pivotally connected to said foot;

a lateral movement mechanism which is adapted to allow the rail car to move laterally relative to said foot once said foot is lowered and the rail car is lifted; and



a control device to control the operation of said vertical lifting members and said lateral movement mechanism.

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5,743,191

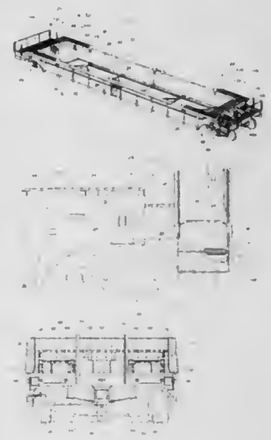
## PLATFORM STEP AND FOOTHOLD ARRANGEMENT FOR RAILCAR END STRUCTURE

Ilario A. Coslnvi, Burlington, Canada, assignor to National Steel Car Ltd., Canada

Filed Apr. 30, 1996, Ser. No. 642,226

Int. Cl.[6] B61D *3/00*

U.S. Cl. 105—355 14 Claims



1. A platform arrangement in an end structure of a railway well car, the railway well car having spaced apart side structures, opposing end structures and a floor structure extending between the side structures, whereby the side structures, end structures and floor structure together define a well portion for receiving a cargo container, the end structures each having spaced apart sidewalls, with a substantially planar and horizontally disposed shear plate extending between the sidewalls and connected thereto, the shear plate having an inboard end, each of the end structures further having a transverse structural member extending upwardly from the shear plate and between the sidewalls, the transverse structural member being connected to the shear plate and to the sidewalls, the end structure further having a bulkhead depending from the inboard end of the shear plate, the bulkhead extending into the well portion and between the sidewalls to connect thereto, and a stub centre sill for housing a coupler means for connecting the well car to another railway car, the stub centre sill being positioned below the shear plate and extending longitudinally of the well car from an inboard position adjacent the bulkhead to an outboard position external of the well car, the arrangement comprising:

(a) a first horizontal platform surface extending transversely of the well car and disposed at a position outboard of the transverse structural member;

(b) a second horizontal platform surface extending transversely of the well car and disposed immediately above the transverse structural member;

(c) an outboard intermediate horizontal platform surface disposed above the first horizontal platform surface and below the second horizontal platform surface at a position outboard of the transverse structural member;

(d) an inboard intermediate horizontal platform surface disposed below the second horizontal platform surface and above the shear plate at a position inboard of the transverse structural member; and

(e) a foothold provided with the bulkhead and located at a vertical position intermediate of the shear plate and the floor structure;

wherein the platform arrangement constitutes means for accessing the well portion of the well car from ground level by successively stepping onto the first horizontal platform surface, the outboard intermediate horizontal platform surface, the second horizontal platform surface, the inboard intermediate platform surface, the shear plate and the foothold.

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5,743,192

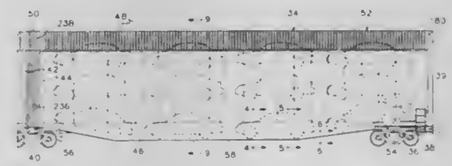
## RAILROAD FREIGHT CAR FOR CARRYING MOTOR VEHICLES

Gregory J. Saxton; Jon B. Zaerr, and Daniel W. Aberle, all of Portland, Oreg., assignors to Gunderson, Inc., Portland, Oreg.

Filed Oct. 17, 1996, Ser. No. 730,810

Int. Cl.[6] B61D *3/04;3/18*

U.S. Cl. 105—355 24 Claims



1. A car body for a railroad freight car for carrying motor vehicles, comprising:

(a) a pair of body bolsters, each located at a respective one of a pair of opposite ends of said car body;

(b) a pair of deep side sills spaced apart laterally from each other and extending longitudinally between said body bolsters, said side sills each including a middle chord of the car body and each said side sill having opposite ends each attached to a respective one of said body bolsters, said side sills defining a cargo well between them and said car body being free from any center sill extending longitudinally thereof and interconnecting said body bolsters thereof with each other;

(c) a well floor for carrying motor vehicles, extending laterally between said side sills and having a top surface of which part is located at a height lower than said middle chord; and

(d) at least one motor vehicle carrying deck spaced upwardly apart from said well floor.

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5,743,193

## TABLE WITH AN ELEVATING PANEL, AN ELEVATING TABLE AND A COMBINATION THEREOF

Tomokazu Kakuta, Yokohama; Tetsuya Narita, Funahashi; Makoto Takahashi, Ayase, and Nobuyuki Kojima, Yokohama, all of Japan, assignors to Okamura Corporation, Japan

Filed Dec. 30, 1996, Ser. No. 775,203

Claims priority, application Japan, Jan. 18, 1996, 8-006327; Jan. 18, 1996, 8-006887; Jan. 18, 1996, 8-006888

Int. Cl.[6] A47B *9/00*

U.S. Cl. 108—147 6 Claims

1. A table with an elevating panel, comprising:

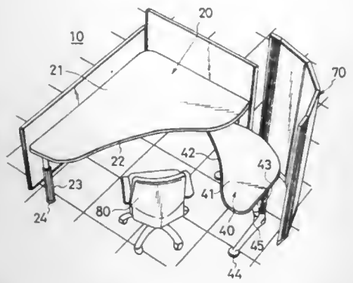
a top of the table;

a plurality of brackets at a side of the top of the table, each of the brackets having a plurality of grooves; and

a plurality of vertical slide rails on the elevating panel which projects on the top, each of the slide rails having a hemisphere-ended member, said hemisphere-ended member being pushed by elastic means to engage in any of said

VOL 1209 ISS 4 AP 28 1998 UMI

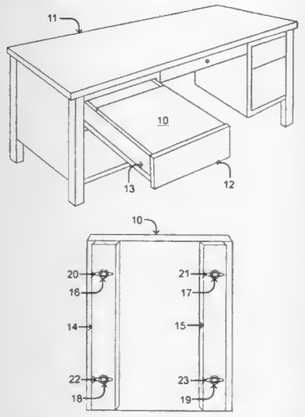





plurality of grooves so that the slide rails may be held at a desired height with respect to the brackets.

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**5,743,194**
**REMOVABLE WORKING SURFACE FOR A COMMON DESK DRAWER**
**Wesley B. Ziegeler, 104 Grass St., Waveland, Miss. 39576**
**Filed Feb. 27, 1997, Ser. No. 807,759**
**Int. Cl.[6] A47B** *47/00*
**U.S. Cl. 108—157.13** **1 Claim**

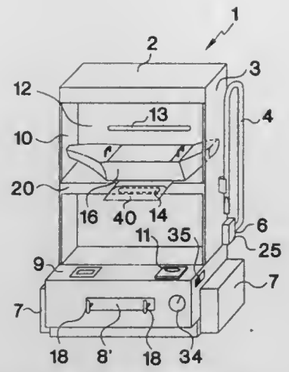



1. A removable working surface supported by a desk drawer comprising: a drawer having two side walls, a rear wall and a front wall, each wall having a top edge and the front wall having a height greater than the height of the side walls, one rectangular surface supported at least by the side wall top edges, two adjustable, parallel members fastened to a bottom of the rectangular surface, said members having a length less than the distance between said rear wall and said front wall and a width less than half of the distance between the drawer side walls, said members adjustable outwardly to engage inside surfaces of the side walls to secure the rectangular surface.

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**5,743,195**
**APPARATUS FOR THE VENTILATION, FILTRATION AND COLLECTION OF CREMATED REMAINS DUST PRODUCED DURING PROCESSING**
**William E. Sucharski, 14003 Erwin St., Philadelphia, Pa. 19116**
**Filed Feb. 10, 1997, Ser. No. 797,848**
**Int. Cl.[6] F23G** *1/00;* **B02C** *9/04*
**U.S. Cl. 110—194** **8 Claims**

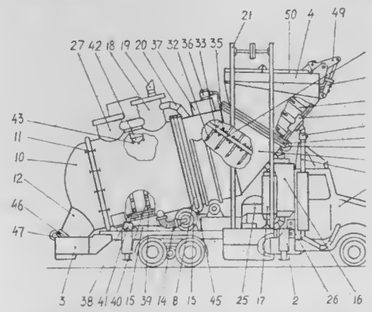
1. An apparatus for the ventilation, filtration and collection of cremated remains dust comprising:




a stand having a top, bottom, back and sides,
said stand having at least two shelves positioned between said top and bottom,
one of said at least two shelves adapted to hold a comminuting apparatus,
vent means on at least said back wall and on one of said at least two shelves for collecting debris produced by said comminuting apparatus,
means for pulling air through said vent means,
duct means for connecting said vent means to said means for pulling air through said vent means.

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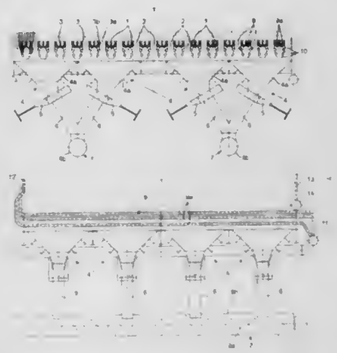
**5,743,196**
**MOBILE WASTE INCINERATOR**
**Vladimir Beryozkin, 3 Stephen Ct., New City, N.Y. 10956, and Alexander Rudshteyn, 2060 Ocean Ave., #6A, Brooklyn, N.Y. 11230**
**Filed Sep. 3, 1996, Ser. No. 706,905**
**Int. Cl.[6] F23G** *5/40*
**U.S. Cl. 110—240** **13 Claims**




1. A mobile waste incinerator, comprising a moving vehicle having an engine with an exhaust gas system; a receiving chamber arranged to receive waste to be incinerated and to preliminarily heat the waste, said receiving chamber being connected with said exhaust system so as to receive the exhaust gases for preliminary heating of the waste; a preparation chamber connected with said receiving chamber for receiving the waste heated in said receiving chamber and provided with means for reducing a size of the wastes, said preparation chamber also having means for injecting fuel; an incineration chamber connected with said preparation chamber and provided with means for mixing the fuel with air and igniting a mixture, said incineration chamber being connected with said preparation chamber so that hot gases form said incineration chamber are supplied into said preparation chamber; means for connecting said chambers with one another and closing chambers from one another; and means for discharging the wastes from said incineration chamber.



**5,743,197**
**GRATE ASSEMBLY FOR A FLUIDIZED BED BOILER**
**Jouni Kinni, Tampere; Jukka Louhimo, Siivikkala; Pentti Janka, Tampere, and Kari Haverinen, Sääksjärvi, all of Finland, assignors to Tampella Power Oy, Tampere, Finland**
**Continuation of Ser. No. 354,038, Dec. 6, 1994, abandoned. This application Dec. 9, 1996, Ser. No. 762,156**
**Claims priority, application Finland, Dec. 7, 1993, 935455**
**Int. Cl.[6] F23G** *5/00*
**U.S. Cl. 110—245** **12 Claims**



1. A grate assembly for a fluidized bed boiler which includes a combustion chamber located above said grate assembly for effecting a combustion process and receiving means, located below said grate assembly, for receiving at least some fluidized bed material, said grate assembly comprising:
a plurality of parallel sparge pipes positioned in a substantially horizontal plane and including fluidizing air means extending towards said combustion chamber for supplying fluidizing air from said sparge pipes into said combustion chamber; and
aperture means, formed between adjacent sparge pipes, for discharging said at least some fluidized bed material into said receiving means,
wherein at least some of said sparge pipes include therein cooling means for circulating a cooling medium through said fluidized bed boiler.

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**5,743,198**
**SEWING MACHINE HAVING CYLINDER BED**
**Masami Yamanaka, and Yoji Seto, both of Osaka, Japan, assignors to Pegasus Sewing Machine Mfg. Co., Ltd., Osaka, Japan**
**Filed May 14, 1997, Ser. No. 856,207**
**Claims priority, application Japan, May 15, 1996, 8-146592**
**Int. Cl.[6] D05B** *27/08*
**U.S. Cl. 112—63** **1 Claim**

1. A sewing machine having a cylinder bed for feeding cloth in the direction orthogonal to the longitudinal direction of the cylinder bed projecting from a bed main body of the sewing machine, wherein in the cylinder bed, said sewing machine comprising:
a main feed bar mounting a main feed dog,
a differential feed bar mounting a differential feed dog,
an oscillating shaft for main feed for moving the main feed bar back and forth in the cloth feed direction formed as a part of a horizontal moving mechanism for moving the main feed dog,
an oscillating shaft for differential feed for moving the differential feed bar back and forth formed as a part of a horizontal moving mechanism for moving the differential feed dog, and
an oscillating shaft for front vertical motion and an oscillating shaft for rear vertical motion for moving both feed bars up and down in the front and rear portions formed as parts of



vertical moving mechanisms of the main feed dog and differential feed dog,
and wherein in the bed main body, said sewing machine further comprising:
a main shaft,
a main feed mechanism for oscillating the oscillating shaft for main feed in cooperation with the main shaft and including an oscillating amount adjusting mechanism formed as a part of the horizontal moving mechanism for the main feed dog,
a differential feed mechanism for oscillating the oscillating shaft for differential feed in cooperation with the main shaft and including an oscillating amount adjusting mechanism formed as a part of the horizontal moving mechanism for the differential feed dog, and
a front vertical moving mechanism for oscillating the oscillating shaft for front vertical motion in cooperation with the main shaft and a rear vertical moving mechanism for oscillating the oscillating shaft for rear vertical motion in cooperation with the main shaft out of the vertical moving mechanisms for both feed dogs.

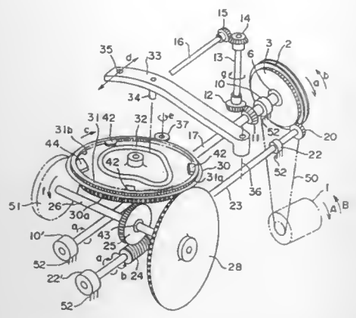
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**5,743,199**
**FEEDING MECHANISM OF EYELET-END BUTTONHOLE SEWING MACHINE**
**Yoshiyuki Odaka, and Takeshi Yoshida, both of Utsunomiya, Japan, assignors to The Singer Company N.V., Curaco, Netherlands Antilles**
**Filed Mar. 12, 1997, Ser. No. 814,914**
**Claims priority, application Japan, May 10, 1996, 8-140742**
**Int. Cl.[6] D05B** *3/08*
**U.S. Cl. 112—66** **3 Claims**

1. A feeding mechanism of an eyelet-end buttonhole sewing machine comprising a bed shaft rotatably supported by a bed, a rapid feed shaft rotatably supported by the bed, a pattern wheel shaft being rotatably supported by the bed and driven by the rapid feed shaft, and a feed wheel being rotatably supported by the bed and driven by the pattern wheel shaft for giving a rapid feed to a cloth to be sewn in a forward and backward direction, and also being rotatably driven by the bed shaft for giving a rapid feed to the cloth to be sewn in a forward and backward direction involved in a sewing step, the feeding mechanism further comprising:
a rotary driving source being rotatably driven normally and reversely;
a bed shaft rotary member being rotatably driven normally and reversely by the rotary driving source;

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a rapid feed rotary member being fixed to the rapid feed shaft and retained by the bed shaft rotary member so as to be reversely rotated therewith;

a one way sewing clutch for transmitting only normal rotation of the bed shaft rotary member to the bed shaft; and

a one way rapid feed clutch for transmitting only a reverse rotation of the bed shaft rotary member to the pattern wheel shaft by way of the rapid feed rotary member and the rapid feed shaft.

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**5,743,200**

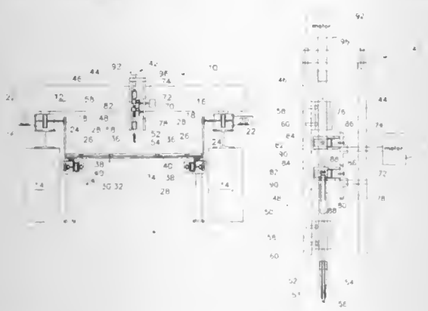
**APPARATUS FOR MANUFACTURING TUFTED RUGS**

**Richard Miller, Lookout Mountain, Tenn., and K. C. Keys, Ringgold, Ga., assignors to Davis & Davis Custom Rugs and Broadloom, Chattanooga, Tenn.**

**Filed Mar. 28, 1996, Ser. No. 623,248**

**Int. Cl.[6] D05B *3/00*; D05C *15/30***

**U.S. Cl. 112—80.01** **15 Claims**



1. An apparatus for manufacturing tufted rugs, said apparatus comprising:

an upper gantry oriented along an X-axis and movable along a Y-axis;

a lower gantry oriented parallel to and below said upper gantry, said lower gantry being movable along said Y-axis; and

a tufting head carried by said upper gantry and movable along said X-axis, said tufting head including:

a frame carried by said upper gantry and having at least one pillow block secured thereto, said at least one pillow block defining a through opening oriented along a Z-axis, said through opening defined by each of said at least one pillow block being coaxial one with another;

a cylinder closely received within said through opening defined by each said at least one pillow block, said cylinder being movable along and pivotally about said Z-axis, said cylinder being reciprocal toward and away from a backing material to be tufted;

a piston slidably received within said cylinder, said piston being reciprocated within said cylinder independently from reciprocation of said cylinder, said piston being prevented from axial rotation within said cylinder such that as said cylinder is rotated about said Z-axis, said piston is likewise rotated about said Z-axis;

a needle secured to a distal end of said cylinder, said needle defining a centrally-disposed through opening coaxial with said cylinder, said needle being reciprocated along said Z-axis as said cylinder is reciprocated; and

a blade secured to a distal end of said piston, a longitudinal axis of said blade being coaxial with said cylinder and with said through opening defined by said needle, said blade being projected from and withdrawn into said needle as said cylinder and said piston are independently reciprocated.

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**5,743,201**

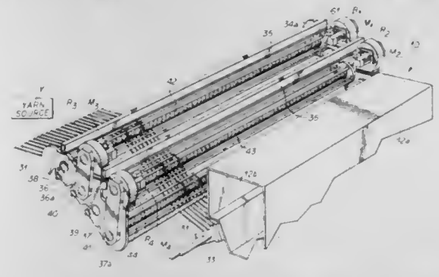
**TUFTING MACHINE PATTERN YARN FEED MECHANISM**

**Roy T. Card, Chattanooga, Tenn.; Wilton Hall, Oglethorpe, Ga.; Marshall Allen Neely, Soddy Daisy, and Michael L. Kilgore, Whitwell, both of Tenn., assignors to Card-Monroe Corp., Chattanooga, Tenn.**

**Continuation-in-part of Ser. No. 376,345, Jan. 23, 1995, Pat. No. 5,622,125. This application Apr. 18, 1997, Ser. No. 843,559**

**Int. Cl.[6] D05C *15/18***

**U.S. Cl. 112—80.73** **30 Claims**



1. A yarn feed mechanism for use with a tufting machine for producing tufted articles, the tufting machine having a frame, a yarn supply, a needle bar supported on the frame and reciprocated toward and away from a tufting zone underneath the needle bar and through which a backing material is transversely passed, the needle bar having a spaced series of tufting needles aligned thereon and disposed along the length thereof for penetrating the backing material for sewing tuffs of yarn therein, and a yarn feed path along which yarns extend from the yarn supply to the respective needles of the tufting machine, said yarn feed mechanism comprising:

(a) a framework for being mounted on the frame of the tufting machine along the yarn feed path;

(b) a yarn feed roll assembly supported for rotation on said framework, said yarn feed roll assembly being positioned adjacent said yarn feed path and having:

an elongate yarn feed roll rotatably supported on the yarn feed roll assembly, said yarn feed roll extending along a longitudinal axis and having an exterior yarn driving periphery for engaging yarns thereon;

means for rotating said yarn feed roll about said axis in timed relationship with the reciprocation of the needle bar;

an orbital yarn applying member supported on the yarn feed roll assembly and being spaced from said yarn feed roll, said yarn applying member being movable about the yarn feed roll in an orbital path from a yarn receiving position for receiving an intermediate portion of selected yarns thereon, into a yarn applying position in which the yarn applying member selectively applies the selected yarns against at least a portion of the yarn driving periphery of the yarn feed roll so that the rotation of the yarn feed roll drives the yarn toward the needles of the tufting machine.



**5,743,202**

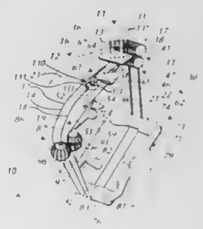
**ELASTIC WAISTBAND ATTACHMENT SYSTEM**

**Elvin C. Price, Dacula; Preston B. Dasher, Buford, and Michael Pate, Duluth, all of Ga., assignors to Atlanta Attachment Company, Lawrenceville, Ga.**

**Continuation-in-part of Ser. No. 503,518, Jul. 18, 1995, Pat. No. 5,562,060, which is a continuation-in-part of Ser. No. 311,921, Sep. 26, 1994, Pat. No. 5,522,332, which is a continuation-in-part of Ser. No. 131,131, Oct. 4, 1993, Pat. No. 5,437,238. This applicatinn Nov. 13, 1995, Ser. No. 556,707**

**Int. Cl.[6] D05B *35/00*; *27/00***

**U.S. Cl. 112—470.31** **33 Claims**



1. A method of attaching a looped elastic band to the waist edge portion of a garment, comprising the steps of:

(a) supporting the elastic band in a stretched loop configuration;

(b) placing the waist edge of the garment in surrounding overlapping relationship with respect to the band,

(c) stretching the overlaid portions of the band and waist edge portion of the garment to expand the overlaid portions of the band and waist edge portion of the garments to a common breadth;

(d) advancing the garment and band in a prefeeding cycle along a sewing path through a sewing area, with edges of the band and garment passing adjacent a cutter of the sewing station;

(e) detecting the position of the waist edge of the garment along the sewing path as the garment and band are moved during the prefeeding cycle;

(f) in response to the detection moving the waist edge of the garment across the band to align the pants and band and maintain the waist edge of the pants out of engagement with the cutter prior to the start of a sewing operation;

(g) advancing the band and waist edge portion of the garment along their lengths along the sewing path through a sewing area in a sewing cycle and forming stitches in the overlaid portions of the band and garment to connect the band and garment together;

(h) as the band and garment are advanced toward the sewing station during a sewing operation, folding an edge of the garment about the band so that the band is enclosed within the fold of the garment as the folded edge of the garment is sewn; and

(i) moving the garment in a reciprocating motion across the sewing path to position the waist edge of the garment to a desired position for folding.

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**5,743,203**

**BOAT HULL AND DECK ASSEMBLY**

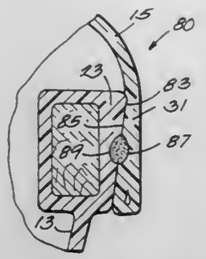
**Don B. NcNamara, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.**

**Filed Apr. 3, 1996, Ser. No. 627,022**

**Int. Cl.[6] B63B *3/04***

**U.S. Cl. 114—85** **18 Claims**

1. A boat comprising a hull member including a gunwale having an outer peripheral surface, and a deck member including a depending peripheral portion including an inner concave surface engaged with said outer surface of said hull member with an interference fit, wherein said outer surface of said gunwale includes a centrally located recess, wherein said peripheral portion of said deck member includes an aperture communicating with said recess, and wherein said boat further includes an adhesive located in said recess and said aperture.



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**5,743,204**

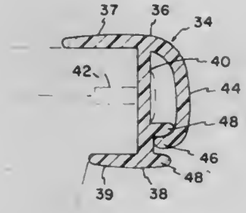
**EDGE TRIM FOR WATERCRAFT**

**Ole Tweet, Thief River Falls, Minn., assignor to Arctic Cat Inc., Thief River Falls, Minn.**

**Filed Aug. 29, 1996, Ser. No. 705,310**

**Int. Cl.[6] B63B *19/00***

**U.S. Cl. 114—219** **11 Claims**



1. A watercraft, comprising:

a top member;

a bottom member joined to the top member, and

an edge trim piece for covering the area of joinder between the top and bottom members, the edge trim piece comprising:

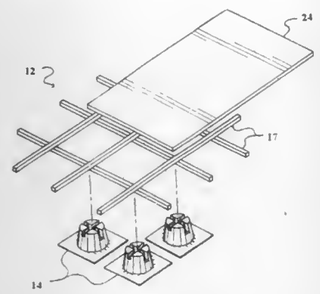
a main body having a first end associated with a portion of the top member in the area of joinder between the top and bottom members, a second end associated with a portion of the bottom member in the area of joinder between the top and bottom members, and a bridging section disposed between the first and second ends; and

a cover for the bridging section having a first end that is secured to the area of the first end of the main body and a second end that extends toward the area of the second end of the main body, wherein the second end of the cover is held in contact with the area of the second end of the main body by the resilience of the cover, but is not secured to said area.

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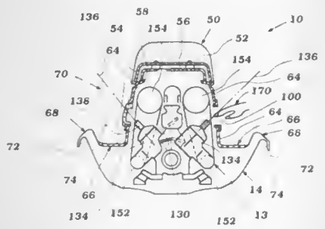


5,743,205
**FLOATING DOCK ELEMENT**
Richard D. Morris, 1440 Poinciana Ave., Ft. Myers, Fla. 33901
Continuation-in-part of Ser. No. 167,062, Dec. 16, 1993, Pat. No. 5,421,282. This application Feb. 14, 1995, Ser. No. 388,551
Int. Cl.[6] B63B *35/035*
U.S. Cl. 114—266 4 Claims



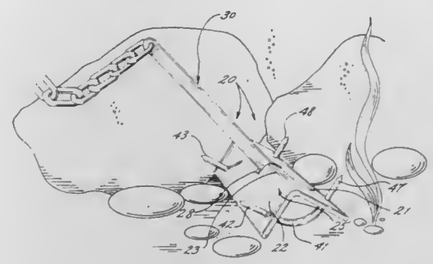

1. A floatation element comprising: a hollow open bottom container having, a top surface and sidewalls depending from said top surface which end at the bottom edges meant to be immersed in a body of water such that said top surface said side walls and a surface of the body of water define an air pocket, whereby said top is smaller than said bottom providing a nesting means for its copy, and said top surface contains an means for bolting a structure to said top surface and said side walls have a flange extending from the open end, providing for increased strength.

5,743,206
**HULL FOR SMALL WATERCRAFT**
Toshiyuki Hattori, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka, Japan
Filed Feb. 14, 1997, Ser. No. 800,843
Claims priority, application Japan, Feb. 14, 1996, 8-026717
Int. Cl.[6] B63B *35/73*
U.S. Cl. 114—270 38 Claims




1. A small watercraft comprising a hull, said hull including at least two footrests positioned on either side of a pedestal located in a rider area, the pedestal comprising two side walls bridged by a seat, said hull defining an enclosed space below the seat, at least one of said pedestal side walls having a maintenance port therein communicating with the enclosed space to provide access to the enclosed space.

5,743,207
**ANCHORING APPARATUS AND METHOD OF ANCHORING**
Sabah Naser Al-Sabah, Al-Ras, Kuwait, assignor to International Design Systems Company, Kuwait
Filed Mar. 12, 1997, Ser. No. 815,893
Int. Cl.[6] B63B *21/24*
U.S. Cl. 114—294 41 Claims




1. An apparatus for anchoring a buoyant device, the apparatus comprising:
first and second plates adjoined along a common line, an end of said second plate being transversely connected to an end of said first plate along the common line and extending inwardly therefrom at a predetermined angle so that said first and second plates in combination define an angled plate member;
a shank pivotally connected to a medial portion of said angled plate member and extending outwardly therefrom; and
at least one prong member connected to and extending outwardly from the outer surface of each of said first and second plates of said angled plate member.

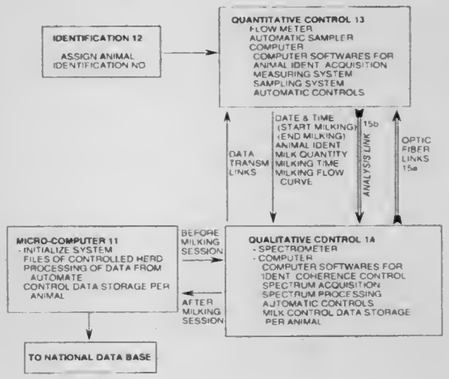
5,743,208
**TENSIONING DEVICE FOR BOAT COVER**
Randolph F. Miller, Mt. Vernon, Wash., assignor to Bayliner Marine Corporation, Everett, Wash.
Filed Sep. 24, 1996, Ser. No. 719,178
Int. Cl.[6] B63B *17/00*
U.S. Cl. 114—361 8 Claims




1. A tensioner for tightening a flexible boat covering, comprising:
a first tube having an axis;
a second tube axially aligned with the first tube; and
a sleeve telescopically fitted between the first and second tubes, one of the first tube and the sleeve having a plurality of apertures, the other of the first tube and the sleeve having at least one detent for adjustably connecting the first tube to the sleeve, the apertures defining at least a first row lying substantially along the first tube axis and a second row adjacent to the first row, each aperture having a center, the centers of the apertures of the first row offset axially relative to the centers of the apertures of the second row such that the centers of the apertures of the first row are between the centers of the apertures of the second row, the detent engageable with the apertures to axially lock the first tube and the sleeve relative to one another, and means for fastening the second tube to the sleeve to lock the second tube axially to the sleeve, wherein the sleeve and the first tube can be positioned axially and locked in small increments relative to one another by engaging the detent with any aperture.



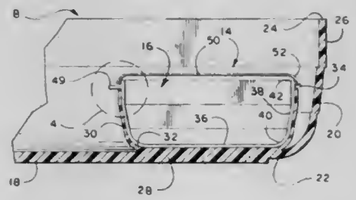
5,743,209
**SYSTEM AND METHOD FOR MONITORING AND CONTROLLING MILK PRODUCTION AT DAIRY FARMS**
Serge Bazin, Paris, and Andre Bechu, Saint Pierre des Landes, both of France, assignors to La Federation Francaise De Contrôle Laitier (F.E.C.L.), Paris, France
PCT No. PCT/IB95/00679, § 371 Date Apr. 25, 1996, § 102(e) Date Apr. 25, 1996, PCT Pub. No. WO96/03859, PCT Pub. Date Feb. 15, 1996
PCT Filed Aug. 1, 1994, Ser. No. 624,422
Claims priority, application European Pat. Off., Aug. 1, 1994, 94490036
Int. Cl.[6] A01J *7/00*
U.S. Cl. 119—14.08 23 Claims




FULLY AUTOMATED SYSTEM

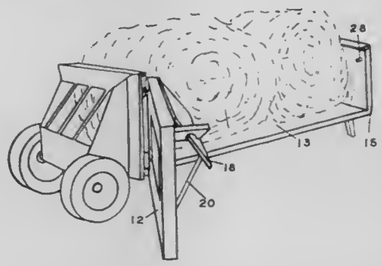
1. An automated method for controlling the quantity and quality of milk production at a dairy farm site regardless of the milking equipment, operable by a milk control authority for compliance with international genetic, zoological and sanitary regulations and norms, comprising using at least two modules of a modular and transportable system to carry out steps comprising:
assigning each dairy farm or herd a unique identification code;
assigning each milk producing animal in said dairy farm or herd a unique animal identification code;
providing means for measuring quantitative milk production from an individual dairy animal using a milk flow meter temporarily connectable with a milking machine for an individual dairy animal, which milk flow meter is capable of continuously weighing milk produced per unit time by an individual dairy animal during a single milking session;
providing means for qualitative analysis of the composition of a sample of milk from an individual dairy animal, which means includes an infra-red optical mode associated with said milk flow meter said infra-red probe being connected with an analyzer capable of detecting qualitative composition of milk;
providing system control and memory means in each of said qualitative measuring means and qualitative analysis means;
entering a dairy herd code into the system control means and thereby initiating control of the herd and accessing stored data for said herd and each individual dairy animal therein;
entering an individual dairy animal identification code in the system control means when the corresponding individual dairy animal is present at the milking machine, thereby activating the milk flow meter;
measuring quantitative milk production from the individual dairy animal at the milking machine using said means for measuring quantitative milk production, thereby continuously charting the milk flow curve for said animal;
qualitatively analyzing a sample of milk from the individual dairy animal at the milking machine using the intra-red optical probe associated with the milk flow meter;
detecting completion of milking session as indicated by said milk flow meter, and entering a completion of milking signal into the system control means;
indicating that the analysis can commence; and
storing in the system memory data from the milking session.

5,743,210
**NON-SLIDING PET FOOD DISH WITH INSERT DISH**
Thomas F. Lampe, 3371 Paxton Court, Marietta, Ga. 30066
Filed Mar. 4, 1997, Ser. No. 810,072
Int. Cl.[6] A01K *5/01;7/00*
U.S. Cl. 119—51.5 37 Claims




36. A pet food dish, comprising:
an outer container having an outer container lid sealingly secured across an open upper end of the outer container;
a holder positioned completely within the outer container and fixedly and non-removably secured to an interior portion thereof, the holder being space from an interior surface of the outer container such that when fluid is positioned within the outer container it completely surrounds the holder; and,
an insert dish removably disposed within the holder and positioned completely within the outer container, with an insert dish lid sealingly engaged to the insert dish so as to extent across an open upper end thereof.

5,743,211
**UNIVERSAL FEED BUNKER FOR LIVESTOCK**
John R. Schoessow, N5820 Johnson Rd., Portage, Wis. 53901
Filed Aug. 31, 1993, Ser. No. 114,391
Int. Cl.[6] A01K *5/00*
U.S. Cl. 119—58 6 Claims




1. In a livestock feeding structure embodying a floor and at least one upright framework side provided with opening for livestock to

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reach with their heads and neck into the structure for the purpose of feeding, an improvement comprising:

a) at least a portion of at least said one upright framework side being hinged to rotate about a substantially vertical axis for providing unobstructed access into said structure through at least a portion of one side of said structure above the level of said floor to facilitate loading large round bales into said structure in side by side disposition.

b) a feed hopper having an open bottom elevated above said floor wherein said hopper is permanently affixed in said structure with at least a portion of one side of said hopper being carried by said portion of at least one upright framework side.

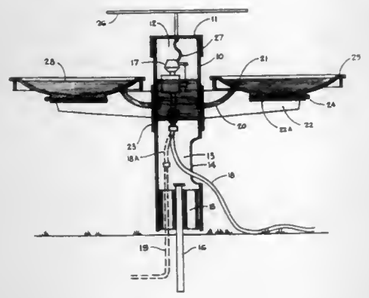
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**5,743,212**

**SELF FILLING MODULAR BIRD BATH**

**Anthony W. Forjohn, 4143 Redwood Rd., Lafayette Hill, Pa. 19444**

**Filed Dec. 13, 1996, Ser. No. 766,756**
**Int. Cl.[6] A01K** *7/04*
**U.S. Cl. 119—69.5** **8 Claims**



1. A self filling modular bird bath comprising:

(a) a support module containing an automatic fill valve in a float chamber with means for connecting said fill valve to a pressurized water source,

(b) single or multiple basin modules attached to said support module by a basin module support collar and basin module brackets,

(c) means for connecting said float chamber to said basin modules causing gravity flow of water from said float chamber to said basin modules, whereby said self filling modular bird bath will maintain constant and identical water levels in the basin modules and the float chamber,

(d) a support module bracket for fixing said support module to the ground by attachment of said bracket to a support module stake.

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**5,743,213**

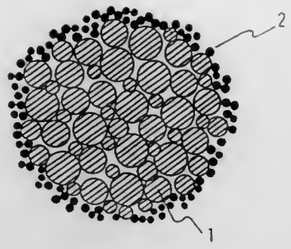
**TREATING MATERIAL FOR ANIMAL EXCRETIONS AND METHOD OF PRODUCING THE SAME**

**Yoji Fujiura, Kyoto, Japan, assignor to Sanyo Chemical Industries, Ltd., Kyoto, Japan**

**Continuation of Ser. No. 862,187, Apr. 2, 1992, abandoned. This application Jul. 25, 1994, Ser. No. 279,816**
**Claims priority, application Japan, May 10, 1991, 3-135929**
**Int. Cl.[6] A01K** *1/015*
**U.S. Cl. 119—172** **17 Claims**

1. A treating material for animal excretions comprising:

agglomerates which contain a powdery or short-fiber-like excretion treating base material formed with water and having a water content of 1 to 100% by weight based on the weight of the base material, the base material being selected from the



group consisting of inorganic powder, natural fibers, organic short fibers, sawdust and cellulosic pulverized product; and

fine powder of water-absorbent synthetic resin adhered to the surface of said agglomerates;

wherein the water-absorbent synthetic resin has a particle diameter of about 200 microns or less and a water-absorption capacity with respect to pure water of about 350 to 1000 ml/g and absorbs moisture by chemical absorption,

said water-absorbent synthetic resin being at least one selected from the group consisting of a crosslinked starch/sodium acrylate graft polymer water-absorbent resin, a crosslinked sodium polyacrylate water-absorbent resin, a crosslinked polyvinyl alcohol/sodium polyacrylate water-absorbent resin, and a crosslinked isobutylene/sodium maleate copolymer water-absorbent resin.

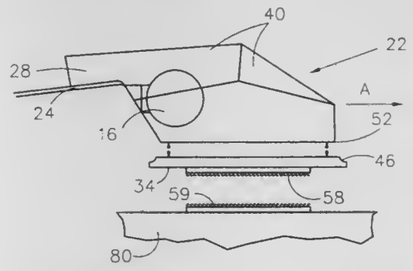
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**5,743,214**

**LIGHT FOR CLIPPERS**

**Nancy A. McClain, 4009 Allard Rd., Medina, Ohio 44256**

**Filed Jul. 3, 1996, Ser. No. 674,830**
**Int. Cl.[6] A01K** *13/00*
**U.S. Cl. 119—601** **17 Claims**



17. A lighting apparatus to be retrofitted to a clipping apparatus for grooming animals, said lighting apparatus comprising:

a light bulb;

power supply means for supplying power to said light bulb;

a canopy, said canopy covering said light bulb and dispersing light generated by said light bulb, said canopy having a plurality of facets, each of said facets dispersing light from said light bulb, said canopy having an upper portion and a lower portion, said lower portion being securable to said upper portion and to said clipping apparatus;

attaching means for attaching said canopy to said clipping apparatus, said attaching means comprising a first hook and loop fastening strip attached to said lower portion of said canopy and a second hook and loop fastening strip attached to said clipping apparatus, said first hook and loop fastening strip being selectively engagable with said second hook and loop fastening strip; and,

power switch means for turning said power supply means on and off.



**5,743,215**

**CAT TOY FOR RELIABLY TRIGGERING PLAY OR ATTACK BEHAVIOR**

**Jack D. Zeff, 12061-46 Brighton River, Fountain Valley, Calif. 92708**

**Filed Sep. 30, 1996, Ser. No. 724,083**
**Int. Cl.[6] A01K** *29/00*
**U.S. Cl. 119—708** **18 Claims**



1. A toy for use with a pet comprising:

a flexible rod;

a line attached to said rod and depending from a distal end of said rod; and

a target attached to an end of said line distal to said rod, said target being comprised of a durable and flexible material resistant to chewing and breakage by animal play formed as a spiral suspended from a center thereof by said line with outer arms of said spiral hanging spring-like below said center so that said arms will continue to oscillate after the rod and the line have ceased movement.

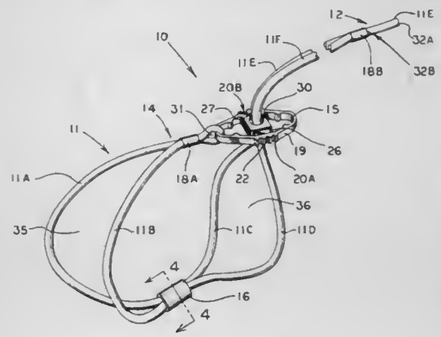
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**5,743,216**

**COMBINED SMALL ANIMAL HARNESS AND LEAD**

**Robert C. Holt, Jr., North Canton, Ohio, assignor to Coastal Pet Products, Inc., Alliance, Ohio**

**Filed Jan. 18, 1996, Ser. No. 588,387**
**Int. Cl.[6] A01K** *27/00*
**U.S. Cl. 119—793** **13 Claims**



1. An animal restraint and control device comprising harness means adapted to fit on the body of an animal, said harness means including a cord member defining a neck loop adapted to be fitted around the animal's neck and a body loop adapted to be fitted around the animal's midsection, lead means combined with said harness means for controlling and restraining the animal, and adjustment means associated with said harness means for quickly and securely adjusting said harness means around the animal's body, said adjustment means including a floating retaining slide between said neck loop and said body loop, and an adjustment slide engaging said cord member between said neck loop and said body loop, said adjustment slide including means for receiving said cord member which has means for selectively clamping said cord member therein, a portion of said cord member being disposed on the opposite side of said adjustment slide from said body loop, said lead means being formed by said portion.

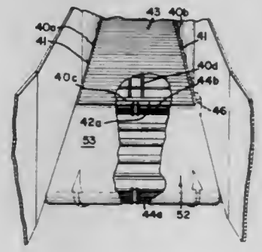
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**5,743,217**

**TURKEY LOADING APPARATUS AND METHOD**

**Wallace H. Jerome, 1480 E. Maple Ave., Barron, Wis. 54812**

**Filed Jan. 9, 1995, Ser. No. 370,444**
**Int. Cl.[6] A01K** *29/00*
**U.S. Cl. 119—846** **33 Claims**



1. A method of loading birds into a transport coop of the type having an access loading port opening through a side of the coop, comprising the steps of:

a. positioning an exit end of a bird loading conveyor belt apparatus into loading proximity with the access port of the transport coop;

b. moving birds by means of said loading conveyor belt apparatus from an entrance end to the exit end thereof; and

c. accelerating the birds being moved at said exit end to automatically continuously deposit said birds directly from the conveyor belt apparatus into the coop through its access port.

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**5,743,218**

**LIQUID COOLED CYLINDER HEAD FOR AN INTERNAL COMBUSTION ENGINE**

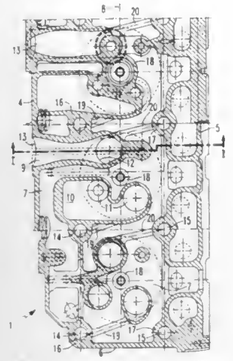
**Walter Aupperle, Korb, and Heinrich Jurka, Murrhardt, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany**

**Filed Jan. 6, 1997, Ser. No. 778,755**
**Claims priority, application Germany, Jan. 9, 1996, 196 00 448.9**
**Int. Cl.[6] F02F** *1/38*
**U.S. Cl. 123—41.82 R** **2 Claims**

1. A liquid cooled cylinder head for a multi-cylinder internal combustion engine including a cooling water space defined between outer side walls, a cylinder head bottom wall and a cylinder head top wall disposed above the cylinder head bottom wall in spaced relationship therefrom, with gas intake and exhaust channels extending transversely through said water space from valve openings formed in said cylinder head bottom wall to channel openings in a cylinder head side wall, reception chambers extending centrally above each cylinder through said cooling water space between said cylinder head bottom and said cylinder head top walls and between said gas intake and exhaust channels for receiving injectors or spark plugs, support columns extending in said water space between said cylinder head bottom and said cylinder head top walls and having bores for receiving cylinder head mounting bolts, and reinforcement ribs formed on the cylinder head bottom wall in said water space, said reinforcement ribs

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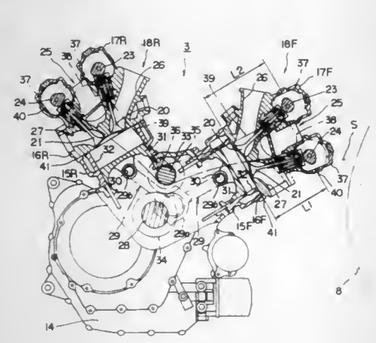
extending straight between, and joining, adjacent support columns and gas flow channels to form a rigid compound structure.

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**5,743,219**
**FOUR-STROKE-CYCLE V-TYPE ENGINE OF MOTORCYCLE**

**Hiroshi Iio, Hamamatsu, and Hiroyuki Nakai, Shizuoka-ken, both of Japan, assignors to Suzuki Kabushiki Kaisha, Shizuoka-ken, Japan**

**Filed Mar. 31, 1997, Ser. No. 828,591**
**Claims priority, application Japan, Apr. 24, 1996, 8-102885**
**Int. Cl.[6] F02B *77/00***
**U.S. Cl. 123—54.4** **3 Claims**



1. A four-stroke-cycle V-type engine of a motorcycle arranged between front and rear wheels thereof, comprising:

a crank case in which a crank shaft is arranged; and

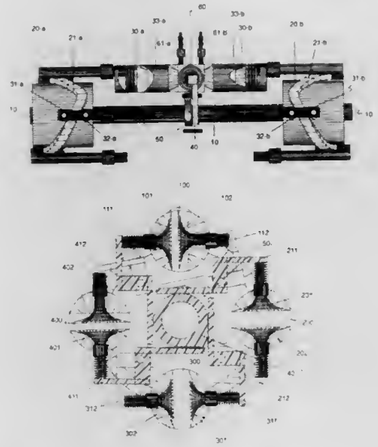
a plurality of cylinder assemblies operatively connected to the crank shaft and including a front-side cylinder assembly and a rear-side cylinder assembly along a longitudinal direction of a motorcycle body, each of the cylinder assemblies being composed of a cylinder block, a cylinder head mounted to a head portion of the cylinder block and a head cover covering the cylinder head, said cylinder assemblies being arranged so as to provide V-shapes along the longitudinal direction of the motorcycle body,

wherein a mating surface formed between the head cover and the cylinder head of at least the front-side cylinder assembly of said plural cylinder assemblies has an inclination obliquely downward towards the front wheel with respect to a mating surface formed between the cylinder head and the cylinder block of the front-side cylinder assembly.

**5,743,220**
**INTERNAL COMBUSTION ENGINE WITH CENTRAL CHAMBER**

**Enrique Eduardo Guarner-Lans, Periferico Sur 3840-301, Col. Pedregal de San Angel, Mexico, 01900**

**Filed Jul. 29, 1996, Ser. No. 681,850**
**Int. Cl.[6] F02B *75/26***
**U.S. Cl. 123—56.9** **10 Claims**



1. A central combustion chamber engine comprising:

an assembly formed by a main shaft;

circular means connected to the longitudinal ends of said shaft having radial guides;

axially opposing pistons connected to the circular means;

assemblies of valves for the intake, sealing and exhaust of combustion gases actioned by a cam assembly; and

central combustion chambers with corresponding ignition means and sealed expansion chambers wherein lateral sides of said combustion chambers are conformed mainly by the valve's parallel faces and the head of the pistons.

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**5,743,221**
**METHOD FOR A THROTTLE-FREE LOAD CONTROL OF AN INTERNAL COMBUSTION ENGINE BY MEANS OF VARIABLY CONTROLLABLE CYLINDER VALVES**

**Günter Schmitz, Aachen, Germany, assignor to FEV Motorentechnik GmbH & Co. KG, Aachen, Germany**

**Filed Jul. 22, 1996, Ser. No. 683,972**
**Int. Cl.[6] F01L *9/04;13/00***
**U.S. Cl. 123—90.11** **5 Claims**

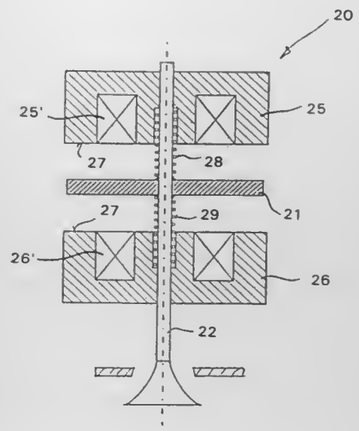
1. A method of operating an internal-combustion engine including a plurality of cylinders; cylinder valves for admitting gases into and removing gases from the cylinders; and actuators connected to the valves for reciprocating the valves between open and closed positions; comprising the following steps:

(a) controlling the actuators of the valves of said plurality of cylinders with a first control process as a function of load requirements arising during engine run, as long as the load requirements remain at or above a minimum value;

(b) controlling the actuators of the valves of at least one first cylinder of said plurality of cylinders with a second control process when the load requirement falls below said minimum value; and

(c) simultaneously with step (b), controlling the actuators of the valves of at least one second cylinder of said plurality of cylinders with a third control process different from said first control process; said second control process being different from said third control process; and said second and third control processes each being selected from at least one of a





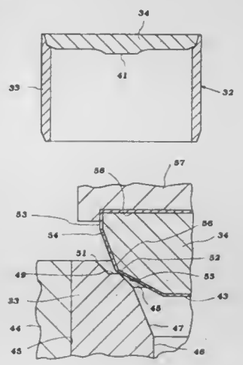
normal operational mode, a free-flying operational mode and a zero-load operational mode.

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**5,743,222**
**VALVE LIFTER**

**Shuhei Adachi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan**

**Filed Oct. 24, 1996, Ser. No. 736,414**
**Claims priority, application Japan, Oct. 24, 1995, 7-275532**
**Int. Cl.[6] F01L *1/14***
**U.S. Cl. 123—90.48** **12 Claims**

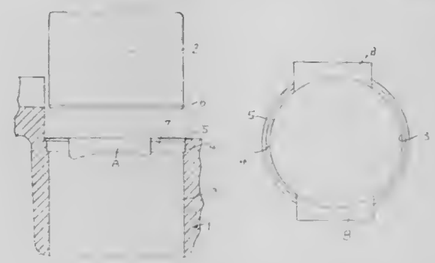


1. A valve actuating tappet for operating a poppet valve of a reciprocating machine from a cam, said reciprocating machine having a bore in which said tappet is slidably supported, said tappet being comprised of a tubular body having an axis and formed from a first, light weight metal, a recess formed in said tubular body at one end thereof, and a disk shaped member having an end portion received at least in part in said recess and metallurgically bonded to and closing one end of said tubular member, said disk being formed from a second metal harder and more wear resistant than said first metal, said recess and said end portion having cooperating tapered portions disposed at different angles to the axis of said tubular body and lying in the metallurgically bonded area.

**5,743,223**
**BUCKET TAPPET GUIDE**

**Christoph Spengel, Grossbettlingen; Uwe Matena, Backnang, and Christoph Kugel, Stuttgart, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany**

**Filed May 27, 1997, Ser. No. 863,859**
**Claims priority, application Germany, May 28, 1996, 196 21 318.5**
**Int. Cl.[6] F01L *1/00*; F02F *1/00***
**U.S. Cl. 123—90.48** **3 Claims**



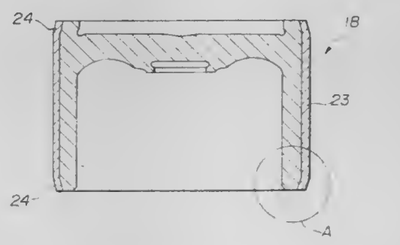
1. A bucket tappet guide structure for a valve tappet of a valve controlled reciprocating piston internal combustion engine having a tappet receiving bore in which a bucket tappet is slideably supported with a close slide fit, said tappet bucket having a chamfered front end providing for a tappet front face having a diameter smaller than the diameter of the tappet body and said tappet guide structure having, in front of said tappet bore, a guide bore which is concentric relative to said tappet bore and has a diameter which is larger than the diameter of the tappet bore by less than the difference between the diameter of said tappet body and the diameter of the tappet front face.

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**5,743,224**
**VALVE LIFTER SURFACE AND PROCESSING METHOD THEREOF**

**Noriomi Hosaka; Hirokazu Uehara; Akira Hidaka, and Nobutaka Hayashi, all of Atsugi, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan**

**Continuation-in-part of Ser. No. 305,370, Sep. 13, 1994, abandoned. This application Jul. 8, 1996, Ser. No. 676,949**
**Claims priority, application Japan, Sep. 14, 1993, 5-228761**
**Int. Cl.[6] F01L *1/16***
**U.S. Cl. 123—90.51** **13 Claims**



1. A processing method for a valve lifter surface on a valve lifter mounted in a bore of a cylinder head of an internal combustion engine, comprising the steps of:

tapering an annular circumferential edge portion of a cylindrical wall portion of said valve lifter so as to form a beveled edge at said circumferential edge portion;

thereafter, removing a burr or excess material at said beveled edge to smooth said beveled edge; and

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thereafter, forming a hardening layer on said cylindrical wall portion of said valve lifter including said beveled edge,

wherein a thickness of said hardening layer is increased in the vicinity of said beveled edge.

7. A valve lifter for operation in cooperation with a cam of an internal combustion engine, comprising:

a substantially cylindrical, cup shaped lifter body including a circumferential wall portion;

a polished beveled edge provided on at least one of upper and lower edges of said cup shaped lifter body; and

a protective placing layer of a predetermined thickness uniformly established over at least a portion of said valve lifter inducing said at least one polished beveled edge,

wherein a thickness of said hardening layer is increased in the vicinity of said at least one polished beveled edge.

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**5,743,225**

**VALVE SYSTEM FOR ENGINE**

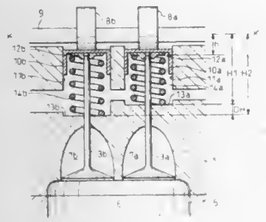
**Kazuhiro Sakurai, Gotenba, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan**

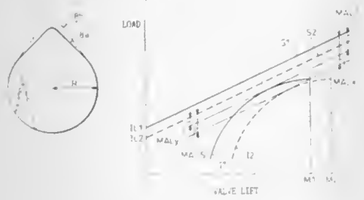
**Filed Apr. 10, 1997, Ser. No. 835,596**

**Claims priority, application Japan, Apr. 19, 1996, 8-098210**

**Int. Cl.[6] F01L** *1/26;3/10*

**U.S. Cl. 123—90.65** **7 Claims**






1. A valve system for an engine comprising:

a plurality of intake or exhaust valves adapted to be driven by cams, of which the profiles are different from each other to make maximum valve lifts of the valves different from each other; and

compression springs biassing the valves toward the corresponding closing directions, the springs being identical to each other;

wherein an initial length of the spring is made shorter as the maximum valve lift of the valve becomes smaller, to make an initial load of the spring larger as the maximum valve lift of the valve becomes smaller.

**5,743,226**

**VALVE LIFTER**

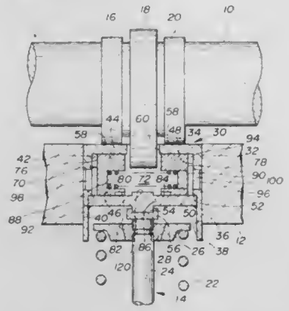
**Tamotsu Tohdoh; Yasuo Fukuda, both of Atsugi, and Hiroaki Kawakami, Sagamihara, all of Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan**

**Continuation of Ser. No. 549,158, Oct. 27, 1995, abandoned. This application Jul. 18, 1997, Ser. No. 897,023**

**Claims priority, application Japan, Oct. 27, 1994, 6-263338; Apr. 11, 1995, 7-085101**

**Int. Cl.[6] F01L** *13/00*

**U.S. Cl. 123—90.16** **25 Claims**



1. A valve lifter for an internal combustion engine having a cylinder head and a camshaft, the camshaft having a set of different adjacent cams including a first cam and a second cam, comprising:

a lifter body formed with a bore, said lifter body having a first surface adapted to rest on the first cam for reciprocal motion and a window opening to said bore; and

means disposed in said bore for unitary motion with said lifter body during the reciprocal motion of said lifter body, said means is operable in a first state to define, within said bore, a chamber adapted to allow entry of the second cam through said window and into the chamber so as to have the second cam not in contact with said lifter body and means for unitary motion;

said means being shiftable also to a second state in which said means is operable to define, adjacent to said window, a second surface adapted to rest on the second cam.

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**5,743,227**

**METHOD AND DEVICE FOR STOPPING THE STARTER OF A MOTOR VEHICLE ONCE THE ENGINE OF THE VEHICLE HAS STARTED**

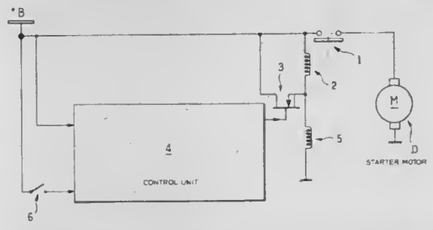
**René Jacquet, Lyons; Bruno Lefebvre, Villeurbanne, and Gérard Vilou, Tassin, all of France, assignors to Valeo Equipments Electriques Moteur, Creteil, France**

**Filed Feb. 27, 1997, Ser. No. 807,132**

**Claims priority, application France, Feb. 28, 1996, 96 02464**

**Int. Cl.[6] F02N** *11/08*

**U.S. Cl. 123—179.3** **9 Claims**




1. A method of controlling cut-off of a motor vehicle starter, comprising the steps of supplying electrical power to the said starter, taking a signal corresponding to a parameter of the said power, the parameter being selected from power supply voltage and power supply current, detecting successive waves defined by a varying amplitude of the said parameter, and stopping the starter when the said waves disappear, the method further comprising, at each new wave, generating a monitoring period having a duration which decreases as the frequency of the said waves increases, and detecting the absence of any said new wave in the final said monitoring period, the starter being stopped in response to the said absence of a wave.



**5,743,228**

**CAMSHAFT DRIVE FOR OUTBOARD MOTOR**

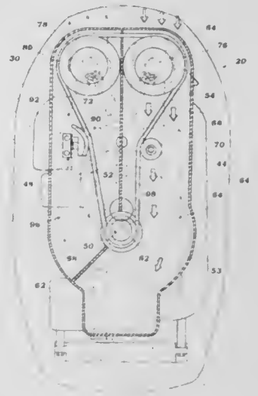
**Masanori Takahashi, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka-ken, Japan**

**Filed Oct. 31, 1996, Ser. No. 739,881**

**Claims priority, application Japan, Oct. 31, 1995, 7-282866**

**Int. Cl.[6] F02F** *7/00*

**U.S. Cl. 123—195 P** **26 Claims**



15. An outboard motor comprising an engine positioned within a cowling and a propulsion device driven by said engine, said engine having a cylinder block having a first end and a second end, an output shaft journalled to said cylinder block for rotation with respect thereto, said output shaft extending generally vertically and having a first end extending outwardly of the first end of said block and a second end extending outwardly of said second end of said block for driving said propulsion device, a cylinder head fixed relative to said block, a first camshaft journalled to said cylinder head for rotation with respect thereto and a second camshaft journalled to said cylinder head for rotation with respect thereto, a flexible transmitter mounted in driving communication with said first end of said crankshaft and a first end of each of said first and second camshafts whereby said crankshaft drives said first and second camshafts, and a cover, said cover comprising an outer wall having an air inlet and an air outlet therethrough and a baffle, said baffle cooperating with said outer wall to define a first air flow pathway from said air inlet across said first end of said engine for providing cooling air to cool a first portion of said belt and a second air flow pathway across said first end of said engine to said air outlet for providing cooling air to cool a second portion of said belt.

**5,743,229**

**ENGINE ACCESSORY DRIVE**

**Takahisa Hosoya, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Shizuokoa-ken, Japan**

**Filed Jan. 16, 1997, Ser. No. 783,873**

**Claims priority, application Japan, Jan. 16, 1996, 8-004442**

**Int. Cl.[6] F02F** *7/00*

**U.S. Cl. 123—195 A** **16 Claims**



1. An engine having an engine accessory drive, the engine having a cylinder block with a cylinder head connected thereto and cooperating therewith to define at least one combustion chamber, a piston mounted for reciprocation within said chamber and connected to a crankshaft, said crankshaft journalled for rotation with respect to said block and extending from an end thereof, an intake passage leading to said combustion chamber and an exhaust passage leading therefrom, intake valve means positioned in said intake passage for controlling the flow of the intake valve means, an exhaust camshaft for controlling the exhaust camshaft, a camshaft drive, the camshaft drive comprising a timing pulley mounted to said end of said crankshaft and a drive pulley mounted to each of said exhaust and intake camshafts, a timing belt engaging said drive pulleys, whereby said crankshaft drives said camshafts, a cover for cooperation with said cylinder block and head to partly enclose said camshaft drive, a mounting bracket for providing an external connection to said engine, said mounting bracket having a section thereof extending over at least a portion of said camshaft drive and cooperating with said cover to at least partly enclose said camshaft drive, said cover and mounting bracket connected to said engine.

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**5,743,230**

**BALANCER SHAFT SUPPORTING STRUCTURE IN ENGINE**

**Masakazu Yamazaki; Kensuke Nakamura; Fuminori Kawashima; Nobuyoshi Takamatsu; Toru Kano; Tomoki Okita, and Hideo Ueshima, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 4, 1997, Ser. No. 795,302**

**Claims priority, application Japan, Feb. 6, 1996, 8-020297; Feb. 6, 1996, 8-020299**

**Int. Cl.[6] F02F** *7/00*; **F02B** *75/06*

**U.S. Cl. 123—195 H** **13 Claims**

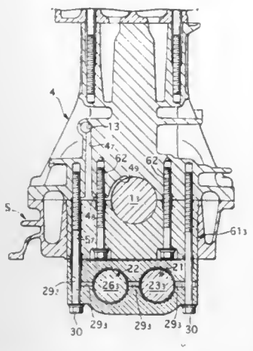
1. A balancer shaft supporting structure in an engine including a balancer shaft disposed below a cylinder block, said balancer shaft supporting structure comprising:

a lower block abutting against opposite sidewalls of the cylinder block and having a bearing cap for supporting journal portions of a crankshaft; and

a balancer shaft supporting member for supporting the balancer shaft, said balancer shaft supporting member abutting against a lower surface of said lower block, said lower block and said balancer shaft supporting member being commonly clamped to said cylinder block by a common bolt passing through a

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bolt bore which is utilized as an oil passage for supplying oil to journal portions of said balancer shaft.

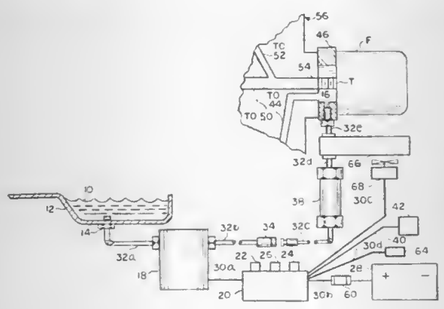
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5,743,231

## AUTOMATIC METHOD AND APPARATUS FOR PREVENTING WEAR IN AN INTERNAL COMBUSTION ENGINE

Adan Reinosa, 1729 Westmoreland Dr., Montebello, Calif. 90640

Filed Feb. 26, 1997, Ser. No. 807,022
Int. Cl.[6] F01M *5/02*
U.S. Cl. 123—196 S 20 Claims



1. A method for preventing wear in an internal combustion engine having an ignition switch, a battery, an engine lubricating gallery, a lubricating oil, said method comprising the steps of:

a. providing a programmable logic control means coupled to an electric pump for automatically switching control power from said battery according to an operating cycle program;

b. programming into said programmable logic control means said operating cycle program which is defined as the elapsing of a predetermined duration and thereafter the elapsing of a predetermined period of time;

c. actuating said electric pump according to said predetermined duration in step b to pump and discharge said lubricating oil into said engine lubricating gallery;

d. thereafter, elapsing of said predetermined period of time; and

e. thereafter, repeating steps c and d automatically according to said operating cycle program in step b; said steps being carried out continuously and independently of whether said engine is operating or not;

whereby said engine is automatically and adequately prevented from wear.

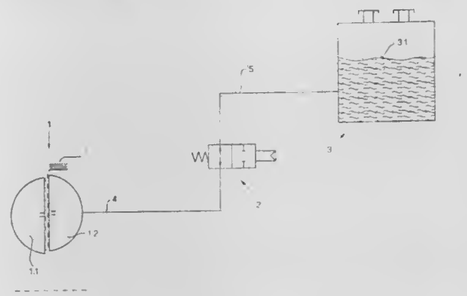
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5,743,232

## DRIVE UNIT WITH AN ENGINE AND A RETARDER

Klaus Vogelsang, Crailsheim; Peter Rose, Ilshofen; Helmut Ott, and Peter Heilinger, both of Crailsheim, all of Germany, assignors to Voith Turbo GmbH & Co. KG, Heidenheim, Germany

Filed Apr. 24, 1997, Ser. No. 847,563
Claims priority, application Germany, Apr. 25, 1996, 196 16 426.5
Int. Cl.[6] F02D *39/02*
U.S. Cl. 123—320 3 Claims



1. A drive unit comprising:

a) a hydrodynamic retarder having a rotor paddle wheel, a stator paddle wheel, and a housing surrounding said wheels;

b) a coolant cycle system, through which a coolant flows for an internal combustion engine, the coolant also being a working medium of the retarder;

c) a working medium container for the coolant;

d) a pipe having a valve, the pipe disposed between the retarder and the working medium container; and

e) a coolant feed line to the retarder.

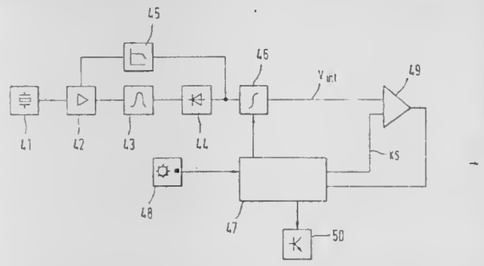
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5,743,233

## METHOD FOR DETECTING KNOCKING

Stefan Unland; Oskar Torno, both of Schwieberdingen; Stefan Bollig, Markgroeningen; Werner Haeming, Neudenau, all of Germany; Ulrich Rothhaar, Milan, Italy; Iwan Surjadi, Vaihingen, Germany; Wolfgang Hilbert, Moeglingen, Germany; Robert Sloboda, Markgroeningen, Germany; Michael Baeuerle, Besigheim, Germany, and Thomas Edelmann, Bietigheim-Bissingen, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 1, 1996, Ser. No. 617,834
Claims priority, application Germany, Oct. 5, 1993, 43 33 965.4
Int. Cl.[6] G01M *15/00*; G01D *1/18*; G01L *23/22*; G01H *1/00*
U.S. Cl. 123—425 10 Claims



1. A method of detecting knocking of an internal combustion engine, comprising the steps of:



specifying a normal range of engine noise for a plurality of operating points of the engine;

determining when an engine noise deviates from the normal range of engine noise;

multiplying a knocking threshold by a weighting factor not equal to 1 when the engine noise deviates from the normal range of engine noise;

sensing a knocking signal; and

detecting knocking when the sensed knocking signal exceeds the knocking threshold.

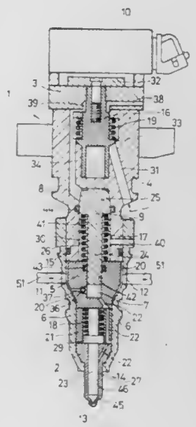
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5,743,234

## FUEL INJECTOR FOR INTERNAL COMBUSTION ENGINES

Hideki Nemoto; Tomoaki Kakihara, and Tadashi Uchiyama, all of Fujisawa, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Feb. 4, 1997, Ser. No. 794,382
Claims priority, application Japan, Feb. 9, 1996, 8-046830
Int. Cl.[6] F02M *41/00*
U.S. Cl. 123—446 7 Claims



1. A fuel injector for internal combustion engine in which a pressure increasing piston is moved by working fluid pressure to inject fuel comprising injection ports for fuel injection, a pressure increasing piston provided with a small and large diameter portions, a small diameter hollow with which said small diameter portion of said pressure increasing piston is fitted slidably, a large diameter hollow with which said large diameter portion of said pressure increasing piston is fitted slidably, a fuel pressure increasing chamber formed by an end of said small diameter portion of said pressure increasing piston and said small diameter hollow, and which is communicated with a fuel supply passage and injection ports, a pressure chamber formed by an end of said large diameter portion of said pressure increasing piston and said large diameter hollow, and which is communicated with a working fluid supply source, a return spring biasing said pressure increasing piston toward said pressure chamber and which is disposed in said large diameter hollow, a seal member provided around said small diameter portion of said pressure increasing piston, at least one port communicating a large diameter hollow portion with atmospheric air.

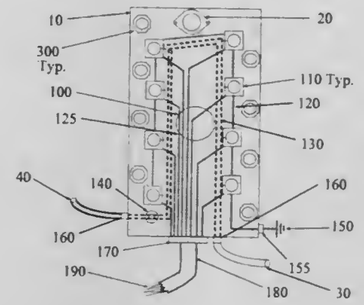
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5,743,235

## MOLDED-IN WIRING FOR INTAKE MANIFOLDS

Lawrence Arimidio Lueder, 698 Bridgeton Pike, Mantua, N.J. 08051-1351

Filed Nov. 22, 1996, Ser. No. 753,264
Int. Cl.[6] F02M *55/02;35/10*
U.S. Cl. 123—468 13 Claims



1. An internal combustion engine one piece fuel and air intake manifold made of plastic, comprising; integrally molded-in electrical wiring via which electrical control is made available to an electrical temperature sensor installed on said manifold, said molded-in wiring extends within said manifold from an electrical harness connecter at one end of said manifold, and from there to a molded-in electrical temperature socket, said socket being disposed in a molded-in through socket hole structure such that the electrical contact surfaces are communicated with the molded-in electrical wiring by means of an electrical connector in hole opening lending into the manifold air plenum area, wherein said temperature sensor socket comprises securing means with at least one conductive element that is engaged with a corresponding securing catch-receiving means in said electrical temperature sensor adjacent said through socket hole structure.

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5,743,236

## FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSION ENGINE

Takeshi Kawakami, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1996, Ser. No. 764,396
Claims priority, application Japan, May 30, 1996, 8-136598
Int. Cl.[6] F02D *41/04*
U.S. Cl. 123—491 6 Claims

1. A fuel injection control system for an internal combustion engine comprising:

a fuel tank which stores fuel supplied to said internal combustion engine;

a fuel pump which pumps said fuel out of said fuel tank;

fuel pressure regulating means for regulating a pressure of said fuel supplied from said fuel pump;

a pressurized fuel flow path with a first end connected to said fuel pressure regulating means, for supplying said fuel to said internal combustion engine;

a fuel injection valve which is connected to a second end of said fuel flow path, for injecting fuel into said internal combustion engine;

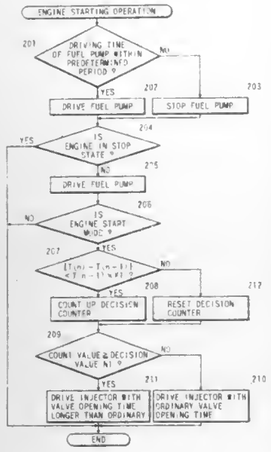
start mode detecting means for detecting when said internal combustion engine is in a start mode;

non-combustion detecting means for detecting a non-combustion state of said internal combustion engine; and

correcting means for rapidly expelling air from said pressurized fuel flow path by correctively increasing the valve opening

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time of said fuel injection valve when said internal combustion engine is in the start mode and in the non-combustion state.

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**5,743,237**

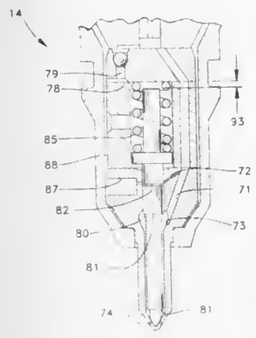
**HYDRAULICALLY-ACTUATED FUEL INJECTOR WITH NEEDLE VALVE OPERATED SPILL PASSAGE**

**George M. Matta, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.**

**Filed Jan. 28, 1997, Ser. No. 788,494**

**Int. Cl.[6] F02M *37/04***

**U.S. Cl. 123—496** **15 Claims**




1. A hydraulically actuated fuel injector comprising:

an injector body that defines an actuation fluid cavity, a piston bore, a plunger bore, a nozzle chamber and a nozzle outlet that opens to said nozzle chamber;

a piston slidably received in said piston bore and moveable between an upper position and a lower position;

a plunger slidably positioned in said plunger bore and moveable between a retracted position and an advanced position;

a portion of said plunger and said plunger bore defining a fuel pressurization chamber that opens to said nozzle chamber;

said injector body further defining a nozzle supply passage extending between said fuel pressurization chamber and said nozzle chamber, a spill passage extending between said nozzle supply passage and said nozzle chamber, and a fuel return passage opening into said nozzle chamber;

a needle valve member positioned in said nozzle chamber and moveable a distance between an open position in which said nozzle outlet is open and a closed position in which said nozzle outlet is blocked; and

said needle valve member blocking said spill passage and said fuel return passage when said needle valve member is in said open position and said closed position, but said spill passage being open to said fuel return passage over a portion of said distance between said open position and said closed position

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**5,743,238**

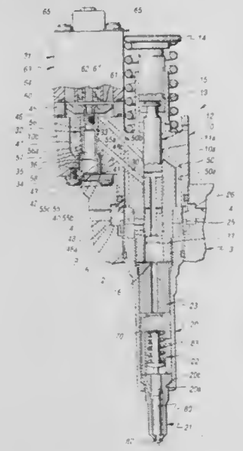
**FUEL PUMPING AND INJECTION SYSTEMS**

**Stacy Jean Shorey, Grand Rapids; Randall Clare Harkema, Caledonia; Beckie J. DeYoung, Stanwood; Kenneth R. Potter, Kalamazoo, and Robert Daniel Straub, Lowell, all of Mich., assignors to Diesel Technology Company, Wyoming, Mich.**

**Continuation of Ser. No. 543,306, Oct. 16, 1995, Pat. No. 5,636,615, which is a continuation-in-part of Ser. No. 393,127, Feb. 21, 1995, abandoned. This application Mar. 25, 1997, Ser. No. 824,373**

**Int. Cl.[6] F02M *37/04***

**U.S. Cl. 123—506** **13 Claims**



1. An armature adapted for attachment to a control valve within an armature chamber in a device for pumping fuel to an internal combustion engine, wherein the armature comprises:

a flat plate having a top surface, the flat plate being attachable to the control valve by means of a flat headed counter-sunk screw, the head of which resides within the flat plate and the threaded shank portion of which is secured within the control valve; and

said flat headed screw having a flat exposed surface substantially on the same plane as the top surface, said screw and flat plate in combination including means for precluding cavitation erosion of the screw head by fuel within the armature chamber, and wherein said screw includes an unthreaded shank portion adjacent said head, said unthreaded shank portion including anti-rotation means precluding relative rotation between the screw and the armature plate.



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**5,743,239**

**FUEL PUMP CONTROL SYSTEM FOR VEHICLE**

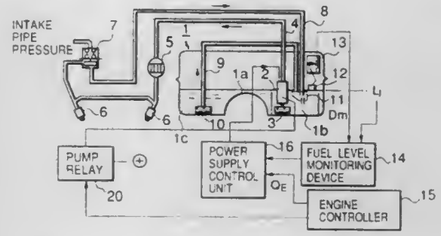
**Tsutomu Iwase, Gunma-Ken, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed May 29, 1997, Ser. No. 864,886**

**Claims priority, application Japan, Jun. 7, 1996, 8-168375**

**Int. Cl.[6] F02M *37/04***

**U.S. Cl. 123—514** **8 Claims**




1. A fuel pump controller for controlling a fuel pump in a fuel feed system for a vehicle, provided with a fuel tank having a bottom wall having an upwardly projecting portion dividing an interior space of the fuel tank into a first chamber and a second chamber, an electric fuel pump for pumping fuel from the first chamber into a delivery line, and a jet pump to be operated by return fuel returned through a return line connected to the delivery line into the fuel tank to suck fuel from the second chamber into the first chamber, comprising:

a fuel meter unit for detecting a level of fuel in the fuel tank;

fuel level monitoring means for comparing the level of fuel in the fuel tank with a predetermined threshold fuel level; and

power supply control means for controlling a power supply to the fuel pump according to a signal from said fuel level monitoring means.

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**5,743,240**

**HAND-GUIDED, PORTABLE TOOL WITH INTERNAL COMBUSTION ENGINE**

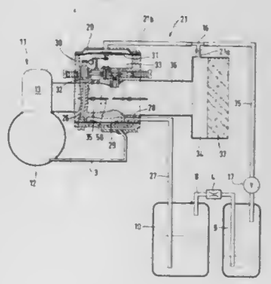
**Gerhard Zerrer, and Manfred Reinhardt, both of Korb, Germany, assignors to Andreas Stihl, Waiblingen, Germany**

**Filed Feb. 7, 1997, Ser. No. 796,321**

**Claims priority, application Germany, Feb. 7, 1996, 196 04 288.7**

**Int. Cl.[6] F02M *17/04***

**U.S. Cl. 123—518** **14 Claims**



1. A hand-guided, portable tool comprising:

a housing;

an internal combustion engine mounted in said housing;

a fuel tank mounted in said housing;

said internal combustion engine comprising a carburetor for preparing a fuel/air mixture;

said carburetor having an induction port;

an air filter mounted in said housing, said air filter having a clean air side;

said clean air side connected to said induction port of said carburetor;

said internal combustion engine further comprising a control chamber having an inlet valve;

said control chamber filled with fuel supplied thereto via said inlet valve from said fuel tank;

said carburetor connected to said control chamber for supplying fuel to said carburetor;

said internal combustion engine further comprising a compensation chamber delimited on one side thereof by a control diaphragm;

said control diaphragm controlling said inlet valve;

a compensation line connecting said compensation chamber to said clean air side of said air filter;

said compensation line comprising a first connection section connected to said clean air side of said air filter and a second connection section connected to said compensation chamber;

a pressure-equalization line for connecting said fuel tank to said clean air side of said air filter, wherein said pressure-equalization line opens into said compensation line at a location between said first and second connection sections.

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**5,743,241**

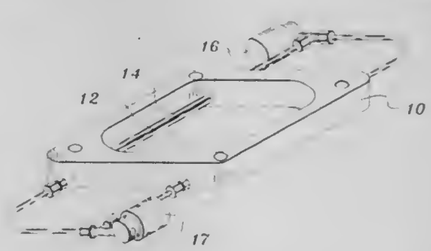
**NITROUS OXIDE PLATE SYSTEM**

**John M. Wood, and John T. Stewart, both of Wichita Falls, Tex., assignors to Nitrous Express, Inc., Wichita Falls, Tex.**

**Filed Jul. 14, 1997, Ser. No. 892,192**

**Int. Cl.[6] F02M *25/10***

**U.S. Cl. 123—531** **7 Claims**




1. An apparatus to supply an oxidizer to an internal combustion engine, said engine having an intake manifold with passages to each cylinder of the engine, said apparatus including a plate having an orifice therein, at least one fuel supply tube, at least one oxidizer supply tube adjacent said fuel supply tube, said fuel supply tube and said oxidizer supply tube being supported by said plate, wherein the improvement comprises:

said oxidizer supply tube having at least one oxidizer discharge port,

said fuel supply tube having at least one fuel discharge port adjacent said oxidizer discharge port,

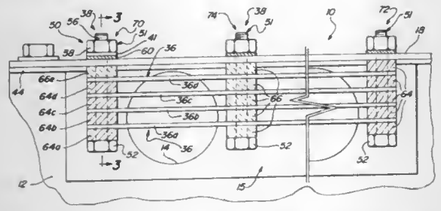
said oxidizer discharge port being positioned and aligned so that a stream of oxidizer from said oxidizer discharge port entrains and atomizes a stream of fuel from said fuel discharge port, and

said oxidizer discharge port being positioned and aimed to direct a flow of oxidizer and atomized fuel toward a mouth of a passage of the intake manifold.

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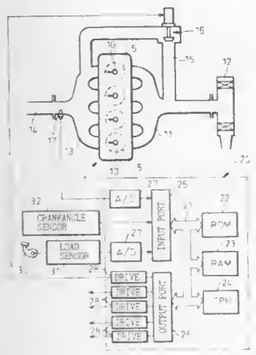
5,743,242
**AIR INTAKE HEATER WITH CONNECTOR POSTS**
**Jan P. Thimmesch, Eden Prairie, Minn., assignor to Phillips & Temro Industries Inc., Eden Prairie, Minn.**
**Filed Jan. 4, 1996, Ser. No. 582,747**
**Int. Cl.[6] F02M** *31/00*
**U.S. Cl. 123—549** **26 Claims**



1. A heating device for use in an internal combustion engine comprising:
a frame including means for attaching said frame to an engine;
first and second resistance ribbons;
a first mounting post coupling said first and second resistance ribbons to said frame, said first mounting post electrically connected to a power source;
a second mounting post coupling said first and second resistance ribbons to said frame, said second mounting post electrically connected to ground; and
securing means for selectively coupling said first and second resistance ribbons to said first and second mounting posts in one of a first arrangement wherein said first and second resistance ribbons are electrically connected in parallel with the power source and a second arrangement wherein said first and second resistance ribbons are electrically connected in series with the power source.

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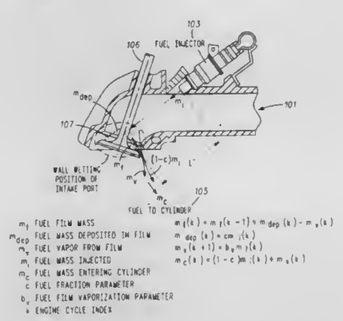
5,743,243
**COMPRESSION-IGNITION TYPE ENGINE**
**Hiromichi Yanagihara, Gotemba, Japan, assignor to Toyota Jidosha Kubushiki Kaisha, Aichi-ken, Japan**
**Filed Apr. 22, 1997, Ser. No. 837,745**
**Claims priority, application Japan, Apr. 23, 1996, 8-101672; Apr. 23, 1996, 8-101675**
**Int. Cl.[6] F02M** *25/07*
**U.S. Cl. 123—569** **18 Claims**




1. A compression-ignition type engine having a combustion chamber, an intake passage, and an exhaust passage, said engine comprising:
injection means for injecting fuel in the combustion chamber and forming fuel droplets diffused in the combustion chamber, the mean value of the particle size of said fuel droplets being larger than a predetermined particle size at which the temperature of the fuel droplets having said predetermined particle size reaches a boiling point of a main ingredient of said fuel, which boiling point is determined by pressure in the combustion chamber, at about the top dead center of the compression stroke;
injection time control means for controlling said injection means to carry out an injecting operation by said injection means at a predetermined timing during a period from the start of an intake stroke to approximately 60 degrees before top dead center of the compression stroke;
an exhaust gas recirculation passage interconnecting the exhaust passage to the intake passage; and
exhaust gas recirculation control means for controlling an amount of exhaust gas recirculated to the intake passage from the exhaust passage to make an exhaust gas recirculation ratio more than approximately 40 percent at least when the engine is operating under a heavy load.

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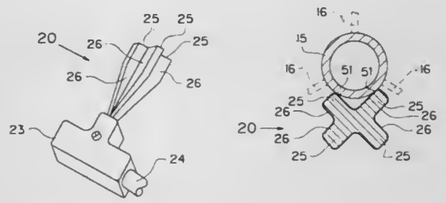
5,743,244
**FUEL CONTROL METHOD AND SYSTEM WITH ON-LINE LEARNING OF OPEN-LOOP FUEL COMPENSATION PARAMETERS**
**Kevin J. Bush, Northville; Darren A. Schumacher, Ypsilanti, and Bruce A. Church, Dearborn, all of Mich., assignors to Motorola Inc., Schaumburg, Ill.**
**Filed Nov. 18, 1996, Ser. No. 751,291**
**Int. Cl.[6] F02D** *41/00*; **F02M** *23/00*
**U.S. Cl. 123—674** **12 Claims**




1. A method for fuel delivery to an engine comprising the steps of:
measuring when an exhaust gas sensor is in a non-lit-off condition;
identifying when the exhaust gas sensor is in a lit-off condition;
estimating fuel puddle dynamics for an intake system of the engine when the exhaust gas sensor is in the lit-off condition as determined in the step of identifying; and
updating an open-loop fuel parameter table dependent on the fuel puddle dynamics estimated in the step of estimating; and
adjusting fuel delivery to the engine dependent on the fuel puddle dynamics estimated in the step of estimating when the exhaust gas sensor is in the lit-off condition as determined in the step of identifying, and adjusting fuel delivery to the engine dependent on the open-loop fuel parameter table, updated in the step of updating, when the exhaust gas sensor is in the non-lit-off condition as determined in the step of measuring.



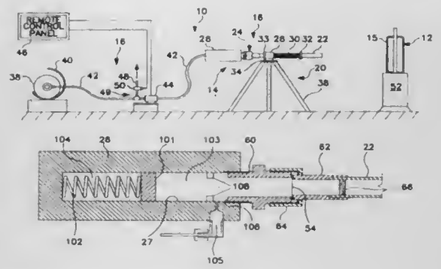
5,743,245
**ARROW REST**
**Robert S. Mizek, Downers Grove, Ill., assignor to New Archery Products Corp., Forest Park, Ill.**
**Filed Dec. 13, 1996, Ser. No. 766,284**
**Int. Cl.[6] F41B** *5/22*
**U.S. Cl. 124—44.5** **18 Claims**



1. An arrow rest comprising:
at least three flanges extending outward in a generally radial direction, said at least three flanges peripherally spaced with respect to each other, each said flange having at least one flange surface, peripherally adjacent said flange surfaces forming a clearance cutout between said flange surfaces that face each other, a first distance between a first pair of opposing arrow contact areas of said flanges of one said clearance cutout being different than a second distance between a second pair of opposing arrow contact areas of said flanges of another said clearance cutout; and
connection means for securing said flanges with respect to each other.

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5,743,246
**CANNON FOR DISARMING AN EXPLOSIVE DEVICE**
**Charles C. Mattern, Clermonte, Fla., assignor to Earth Resources Corporation, Ocoee, Fla.**
**Continuation-in-part of Ser. No. 119,717, Sep. 10, 1993, Pat. No. 5,460,154. This application Aug. 30, 1995, Ser. No. 520,792**
**Int. Cl.[6] F41B** *9/00*
**U.S. Cl. 124—56** **15 Claims**




1. A method for propelling a projectile substance comprising the steps of:
inserting the projectile substance into a bore of a barrel;
attaching a rupture disk to a first end of the barrel;
coupling the first end of the barrel to a first end of a reservoir having a chamber, wherein the rupture disk forms a seal between the bore and the chamber;
slidably disposing a piston within the chamber;
introducing a gas into the chamber until a sufficient pressure is attained within the chamber to rupture the rupture disk and propel the projectile substance out of the barrel;
forcing the piston toward the projectile substance to increase an average pressure in the bore for propelling the projectile substance.

11. An apparatus for propelling a projectile substance comprising:
a barrel having a bore therethrough from which the projectile substance is propelled;
a reservoir having a chamber therein, and having a first end connected to a first end of said bore of said barrel;
a rupture disk disposed between said chamber and said bore to prevent communication between said chamber and said bore, until a pressure in said chamber causes said rupture disk to rupture; and
a piston slidably disposed within said chamber to separate said chamber into at least a first portion and a second portion, wherein a pressure in said second portion forces said piston toward said rupture disk when a pressure in said first portion ruptures said rupture disk.

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5,743,247
**METHOD AND APPARATUS FOR SAFE OPERATION OF SELF PROPELLED CONCRETE SAW**
**Michael G. Kingsley, Independence, and Kevin R. Wilson, Blue Springs, both of Mo., assignors to Diamant Boart, Inc., Olathe, Kans.**
**Filed Sep. 15, 1995, Ser. No. 528,849**
**Int. Cl.[6] B28D** *1/04*
**U.S. Cl. 125—12** **31 Claims**



1. A method for safely controlling operation of a self propelled concrete saw having an engine to selectively rotate a saw blade, the steps of said method comprising:
switching said engine between on and off power states;
raising said saw blade to an elevated, non-cutting position;
lowering said saw blade to a lowered, cutting position;
preventing said raising and lowering steps whenever said engine is switched to said off power state.

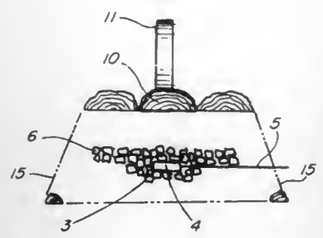
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5,743,248
**PORTABLE FUSED CAMPFIRE**
**Herman W. Jansen, Jr., 206 Pear St., Damiansville, Ill. 62215**
**Filed Nov. 13, 1996, Ser. No. 748,576**
**Int. Cl.[6] C10L** *11/00*
**U.S. Cl. 126—25 B** **6 Claims**

1. A portable, fused campfire, comprising:

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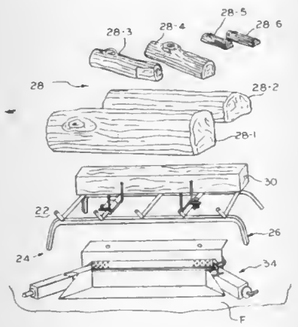





(a) an arrangement of combustible wood with an essentially trapezoidal cross-section, having an internal combustion area located near the lower center of said cross-section;
(b) said internal combustion area comprising a firestick surrounded by small kindling and connected to a fuse;
(c) said fuse having one end connected to said firestick and a second end protruding outwardly from said campfire;
(d) intermediate-sized wood surrounding said small kindling;
(e) large-sized wood surrounding said intermediate wood;
(f) largest semi-circular top wood logs located on the top of said campfire; further comprising
(g) a clear, combustible outer shell for maintaining said trapezoidal campfire in said shape, said shell having a handle means for carrying said campfire.

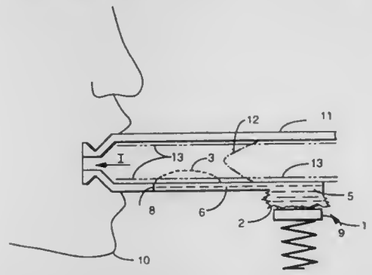
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**5,743,249**
**GAS FIREPLACE SYSTEM BURNER ASSEMBLY**
**Maurice O. Boekeloo, San Dimas; Terrell A. Stone, Glendora, and A. Robert St. Julien, Artesia, all of Calif., assignors to Robert H. Peterson Co., City of Industry, Calif.**
**Filed Jan. 11, 1996, Ser. No. 585,179**
**Int. Cl.[6] F24C *3/00***
**U.S. Cl. 126—512** **22 Claims**




1. In a gas fireplace system including a set of gas logs and means for supporting the gas logs above a generally horizontal surface, an improved burner assembly comprising:
a generally horizontal burner pan positionable beneath the gas log set; and
a burner affixed to and extending upwardly from said burner pan, said burner comprising a generally rectangular elongate tube having a depth of approximately one-eighth inch and a height at least eight times greater than the depth, to define an interior gas chamber, an inlet into said chamber for connection to a gas supply and an outlet from said chamber, the outlet comprising an elongate narrow slot at a bottom of the burner proximate the burner pan to force gas out the narrow slot to produce a high sheet flame.

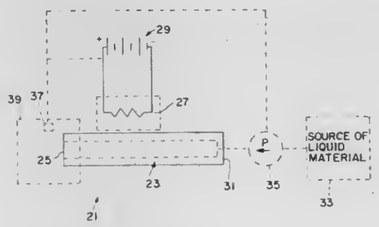
**5,743,250**
**INSULIN DELIVERY ENHANCED BY COACHED BREATHING**
**Igor Gonda, San Francisco, and Reid M. Rubsamen, Oakland, both of Calif., assignors to Aradigm Corporation, Hayward, Calif.**
**Continuation-in-part of Ser. No. 549,343, Oct. 27, 1995, which is a continuation-in-part of Ser. No. 331,056, Oct. 28, 1994, which is a continuation-in-part of Ser. No. 11,281, Jan. 29, 1993, Pat. No. 5,364,838. This application Nov. 22, 1996, Ser. No. 754,423**
**Int. Cl.[6] A61M *11/00***
**U.S. Cl. 128—200.14** **20 Claims**




1. A method of enhancing the rate at which insulin migrates into a patient's circulatory system, comprising:
aerosolizing a formulation;
inhaling the aerosolized formulation into lungs of a patient and allowing particles of insulin to deposit on lung tissue;
inhaling maximally followed by exhaling the forced vital capacity of the lungs.

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**5,743,251**
**AEROSOL AND A METHOD AND APPARATUS FOR GENERATING AN AEROSOL**
**Tony M. Howell, Midlothian, and William R. Sweeney, Richmond, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.**
**Filed May 15, 1996, Ser. No. 648,253**
**Int. Cl.[6] A61M *5/00***
**U.S. Cl. 128—200.14** **57 Claims**

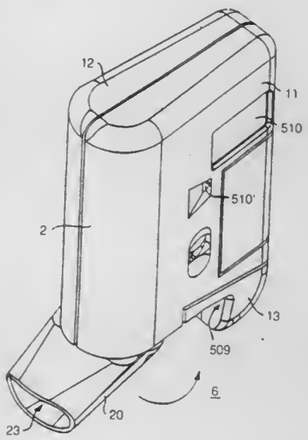



1. An aerosol generator, comprising:
a tube having a first open end;



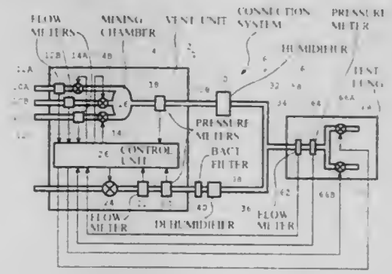
means for heating the tube to a temperature sufficient to volatilize material in a liquid form in the tube such that the volatilized material expands out of the open end of the tube and mixes with ambient air to form an aerosol; and
a mouthpiece member disposed proximate the open end of the tube.

**5,743,252**
**METHOD FOR RELEASING CONTROLLED AMOUNT OF AEROSOL MEDICATION**
**Reid M. Rubsamen, Berkeley, and Eric T. Johansson, Dublin, both of Calif., assignors to Aradigm Corporation, Hayward, Calif.**
**Division of Ser. No. 525,838, Sep. 8, 1995, Pat. No. 5,608,647, which is a division of Ser. No. 10,783, Jan. 29, 1993, Pat. No. 5,450,336, which is a continuation-in-part of Ser. No. 664,758, Mar. 5, 1991, Pat. No. 5,404,871. This application Nov. 27, 1996, Ser. No. 756,409**
**Int. Cl.[6] A61M *11/00***
**U.S. Cl. 128—200.14** **7 Claims**




1. A device for delivering aerosol to a patient, comprising:
a container holding formulation for delivery to a patient;
a means for aerosolizing the formulation;
a flow path;
a transducer having an analog signal corresponding to sensed pressure flow in either direction through the flow path wherein the drift offset of the transducer is corrected by:
an analog to digital converter having a defined range of digital counts and a digital value in the digital range corresponding to the base zero flow in either direction;
means for controlling the analog to digital converter to convert the transducer output signal to a digital value at a given sampling rate;
means for identifying a zero-flow condition through the flow path when the digital values do not vary more than a selected number of digital counts over a first period of time;
first means for determining an offset value based on the difference between the identified base digital count and the digital value output of the analog to digital converter during a zero-flow condition; and
means for adjusting the output of the analog to digital converter by the determined offset value.

**5,743,253**
**METHOD AND APPARATUS FOR MAINTAINING A DEFINED RESPIRATORY GAS FLOW PATTERN TO A SUBJECT BY IDENTIFYING A TRANSFER FUNCTION OF THE CONNECTION SYSTEM**
**Rolf Castor, Hägersten; Göran Cewers, Lund; Rolf Wernbro, Malmö, and Magnus Nord, Bromma, all of Sweden, assignors to Siemens-Elema AB, Solna, Sweden**
**Filed Jan. 19, 1996, Ser. No. 588,684**
**Claims priority, application Sweden, Jan. 26, 1995, 9500275**
**Int. Cl.[6] A61M *15/00***
**U.S. Cl. 128—200.24** **20 Claims**




1. A method for regulating the supply of breathing gas to and the removal of expired gas from the respiratory system of a subject in a ventilator system having a ventilator unit connectable to the respiratory system of the subject, said method comprising the steps of:
connecting a connection system to said ventilator unit, said connection system having a transfer function associated therewith identifying an influence of said connecting system on gas pressure and gas flow in said connection system;
setting a test gas flow pattern in said ventilator unit and supplying gas with said test flow pattern to said connection system;
measuring a response gas flow pattern arising from said test gas flow pattern;
determining said transfer function from said test gas flow pattern and said response gas flow pattern;
selecting a therapeutic gas flow pattern; and
setting a compensated gas flow pattern at said ventilator unit, dependent on said transfer function, for producing said selected therapeutic gas flow pattern, via said connection system, at said respiratory system of said subject.

**5,743,254**
**OROTRACHEAL INTUBATION GUIDE**
**Jeffrey D. Parker, Cincinnati, Ohio, assignor to Parker Medical Limited Partnership, Cincinnati, Ohio**
**Continuation-in-part of Ser. No. 819,289, Mar. 18, 1997, abandoned. This application Mar. 31, 1997, Ser. No. 829,737**
**Int. Cl.[6] A61M *16/00*; *5/178*; A62B *9/06***
**U.S. Cl. 128—200.26** **30 Claims**




1. An intubation guide comprising:
a generally horizontal aft member;
a generally vertical support member depending from a distal end of the aft member;

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a generally vertical guide wall spaced forwardly of the support member; and

a spout extending from the aft member beyond the support member toward the guide wall.

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**5,743,255**

**Patent Not Issued For This Number**

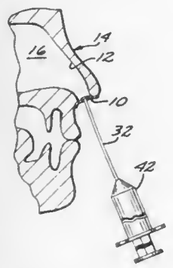
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**5,743,256**

## NOSTRIL CLOSURE MEANS

**Alfredo A. Jalowayski, 6864 Lipman St., San Diego, Calif. 92122**

**Filed Mar. 7, 1996, Ser. No. 612,374**
**Int. Cl.[6] A62B *18/02***
**U.S. Cl. 128—201.18** **11 Claims**




1. Nostril closure means for controlling the flow of air through a nostril, the nostril closure means comprising:

a nostril patch having an adhesive side and preconfigured to approximate the configuration of the edge margins of a patient's nostril opening whereby adherence of the adhesive side of the patch to the edge margins of a patient's nostril opening blocks airflow past adhered portions of the nostril patch and the edge margins, the nostril patch including a prepunched tubing opening having a predetermined diameter; and

a length of flexible tubing having a predetermined diameter and extending through the tubing opening to provide fluid communication with the interior of a patient's nose, the outside diameter of the tubing being greater than the diameter of the tubing opening in the nostril patch to thereby promote a fluid tight relation between the tubing and the portion of the nostril patch which defines the tubing opening, one end of the tubing being forcibly insertable through the tubing opening, the other end of the tubing having means for engaging the adhesive side of the nostril patch to provide a fluid tight relation.

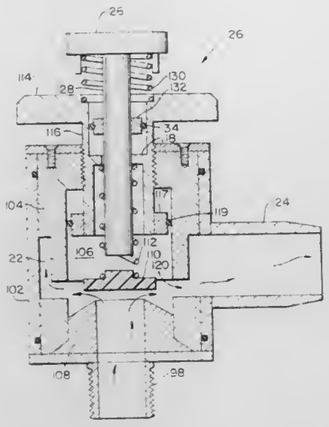
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**5,743,257**

## DUAL VALVE, ANESTHESIA MACHINE HAVING SAME, AND METHOD FOR USING SAME

**Raymond Koehler, Whitehouse Station, and James E. Donaldson, Neptune, both of N.J., assignors to Delmarva Laboratories, Inc., Midlothian, Va.**

**Continuation of Ser. No. 397,671, Mar. 2, 1995, Pat. No. 5,568,910. This application Oct. 28, 1996, Ser. No. 738,497**
**Int. Cl.[6] A62B *9/02***
**U.S. Cl. 128—205.24** **21 Claims**




1. A pressure relief valve for an anesthesia machine, comprising:

a housing;

a valve seat in the housing, the valve seat defining an opening adapted for flow communication with the anesthesia machine; and

a venting device cooperating with the valve seat to reduce pressure in the anesthesia machine, in a normal operating mode, when pressure in the anesthesia machine exceeds a threshold setting, the venting device including a valve element adapted to cover the valve seat opening and biased against the valve seat by a biasing force corresponding to the pressure threshold setting, the venting device further comprising a member having a manually actuatable portion external of the housing, whereby actuation of the member closes the valve seat opening regardless of the pressure threshold setting to override the normal operating mode, and release of the member immediately returns the venting device to the normal operating mode without changing the pressure threshold setting.

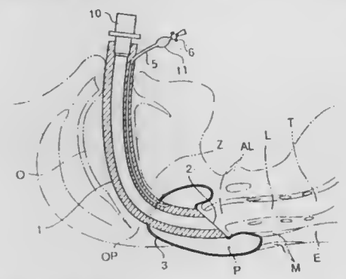
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**5,743,258**

## PHARYNGEAL AIRWAY

**Toru Sato, Yonago; Minoru Shibata, and Shiro Agehama, both of Akita, all of Japan, assignors to Mallinckrodt Medical, Inc., St. Louis, Mo.**

**PCT No. PCT/JP95/01043, § 371 Date Jan. 26, 1996, § 102(e) Date Jan. 26, 1996, PCT Pub. No. WO95/32754, PCT Pub. Date Dec. 7, 1995**
**PCT Filed May 30, 1995, Ser. No. 586,912**
**Claims priority, application Japan, May 31, 1994, 6-118169**
**Int. Cl.[6] A61M *16/04***
**U.S. Cl. 128—207.15** **18 Claims**




1. A pharyngeal airway selected from the group consisting of:

(A) a pharyngeal airway comprising an arched airway wide bore tube having a bevelled opening formed by diagonally cutting the distal end thereof; and a balloon formed of a soft, flexible thin film, connected to the edge of the bevelled opening and the circumference of a part of the airway tube behind the bevelled opening, and capable of being inflated in a hemispherical shape so as to surround the circumference of a portion of the airway tube behind the distal end of the airway tube; said airway tube being provided with a longitudinal small bore gas passage or tube for passing a gas to inflate or shrink the balloon, longitudinally extending through the wall of the airway tube, having a distal end opening into the balloon and a proximal end having a small bore tube fitted with a connector through which the gas is pumped into and discharged from the balloon;

(B) a pharyngeal airway comprising an arched airway tube having a bevelled opening formed by bevelling the distal end thereof; a first balloon formed of a soft, flexible thin film, connected to the edge of the bevelled opening and the circumference of a part of the airway tube behind the bevelled opening, and capable of being inflated in a ring shape so as to surround the circumference of a portion of the airway tube behind the distal end of the airway tube; and a second balloon formed of a soft, flexible thin film connected to a part of the airway tube near and behind the first balloon and on the side opposite the bevelled opening; said airway tube being provided with two longitudinal small bore gas passages or tubes for supplying a gas to inflate the first and second balloons, longitudinally extending through the wall of the airway tube, having distal ends opening into the first balloon and second balloons, respectively, and proximal ends having small bore tubes fitted with connectors through which the gas is pumped into and discharged from the first and the second balloons, respectively; and

(C) a pharyngeal airway comprising an arched airway tube having a closed, round distal end and provided with a plurality of ventilating side holes in a ventilating part of the airway tube near the distal end; and a balloon formed of a soft, flexible thin film, and attached to the airway tube at a part around the ventilating part of the airway tube so as to enclose the distal part of the airway tube and surround the ventilating part of the airway tube when inflated to seal a transitional part from the lower pharynx to the esophagus, and the periphery of laryngeal opening; a small bore gas supply passage being formed longitudinally in the wall of the airway tube so as to open in a pore opening into the interior of the balloon, a tube fitted at its proximal end with a connector for supplying a gas into and discharging the gas from balloon being connected to the proximal end of the gas supply passage.

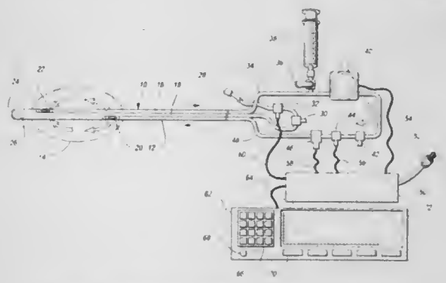
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**5,743,259**

## APPARATUS AND METHOD FOR CONTINUOUS MONITORING OF TISSUE CARBON DIOXIDE AND PH USING CAPNOMETRIC RECIRCULATING GAS TONOMETRY

**James Alexander Kruse, Bloomfield Hill, and Jorge Alberto Guzman, Southfield, both of Mich., assignors to Wayne State University, Detroit, Mich.**

**Filed Feb. 16, 1995, Ser. No. 390,406**
**Int. Cl.[6] A61B *5/00***
**U.S. Cl. 128—632** **20 Claims**



1. A tonometry catheter apparatus comprising:



an elongate flexible tube having a proximal extracorporeal end and a distal intracorporeal end;

the distal end of the tube having

a distensible, inflatable, gas-permeable tonometry vessel, the vessel and the distal end defining therebetween a space which is filled with a gas,

an in-flow orifice in communication with the space, through which gas may enter the vessel,

an in-flow lumen with a distal end and a proximal end, the distal end being in communication with the in-flow orifice,

an out-flow orifice in communication with the space, through which the gas may exit the vessel, and

an out-flow lumen with a distal end and a proximal end, the distal end being in communication with the out-flow orifice,

the proximal end of the tube having

means for propelling gas into the vessel, the propelling means being selected from a group consisting of a peristaltic pump, a roller pump, an impeller pump, a blower, a propeller, a fan, a circulator, and their equivalents, and

means for continuously quantifying the level of carbon dioxide ($CO_2$) gas exiting the vessel, and

a hollow connecting member linking the propelling and quantifying means to define with the vessel, the in-flow lumen and the out-flow lumen a closed path through which the gas may continuously recirculate under a relatively constant pressure, thereby resulting in a substantially error-free, stable reading.

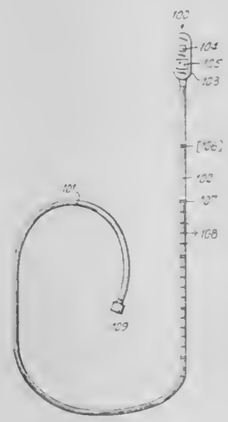
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**5,743,260**

## FETAL PULSE OXIMETRY APPARATUS AND METHOD OF USE

**Christopher Chung, Pleasanton, Calif., and Helen M. McNamara, Leeds, England, assignors to Nellcor Puritan Bennett Incorporated, Pleasanton, Calif.**

**Continuation of Ser. No. 94,632, Jul. 19, 1993, abandoned, which is a division of Ser. No. 598,850, Oct. 15, 1990, Pat. No. 5,228,440. This application Mar. 17, 1995, Ser. No. 406,761**
**Int. Cl.[6] A61B *5/00***
**U.S. Cl. 128—633** **9 Claims**




9. A fetal probe comprising:

sensor means, including a light detector and a light source, for measuring a tissue or blood characteristic of a fetus;

means for accurately placing the sensor at a site on the fetus beyond a presenting part of the fetus and beyond a transcervical region; and

means for indicating a depth of insertion of the sensor means into a vagina.

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**5,743,261**

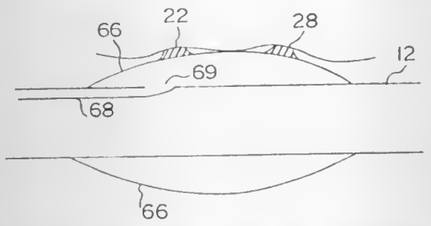
## METHODS AND APPARATUS FOR THE INVASIVE USE OF OXIMETER PROBES

**Louis M. Mainiero, Delafield; Stephen H. Gorski, Eage, and Robert L. Young, Waukesha, all of Wis., assignors to Sensor Devices, Inc., Waukesha, Wis.**

**Continuation-in-part of Ser. No. 163,052, Dec. 6, 1993, Pat. No. 5,417,207. This application Mar. 28, 1995, Ser. No. 412,287**

**Int. Cl.[6] A61B *5/00***

**U.S. Cl. 128—633** **23 Claims**




1. A probe useful for invasively monitoring an oxygen saturation level of blood in at least one tissue wall of an esophagus, the probe comprising:

a chassis having a proximal end and a distal end;

an electrical connector extending from said proximal end of said chassis and

terminating at a plug configured for connection to a pulse oximeter box;

a reflectance optics assembly configured to generate and transmit electrical signals to said oximeter box, said signals being indicative of the oxygen saturation level of blood in the wall tissue; and

a deployment device attached to said chassis and said reflectance optics assembly, said deployment device useful in urging said reflectance optics assembly into at least one tissue wall of the esophagus to aid in generation of said electrical signals.

**5,743,262**

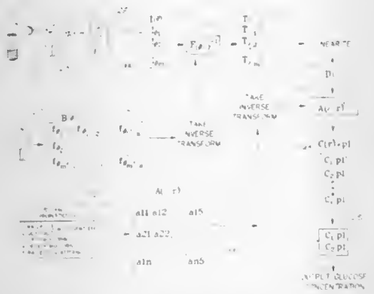
## BLOOD GLUCOSE MONITORING SYSTEM

**James M. Lepper, Jr., Trabuco Canyon, and Mohamed Kheir Diab, Mission Viejo, both of Calif., assignors to Masimo Corporation, Irvine, Calif.**

**Filed Jun. 7, 1995, Ser. No. 479,164**

**Int. Cl.[6] A61B *5/000***

**U.S. Cl. 128—633** **22 Claims**



21. A method of noninvasively determining a concentration of a blood constituent comprising the steps of:

illuminating a living medium having blood with optical radiation, wherein the blood has a concentration of the blood constituent and the optical radiation traverses at least one path length through the medium;

filtering the optical signals with a filter having known spectral characteristics;

detecting the optical radiation after attenuation through said living medium and said blood to produce electrical signals indicative of the optical characteristics of the medium and the blood;

linearizing the electrical signals;

deconvolving components of the electrical signal due to the filter; and

calculating the concentration of the blood constituent based upon the linearized and deconvolved electrical signals.

**5,743,263**

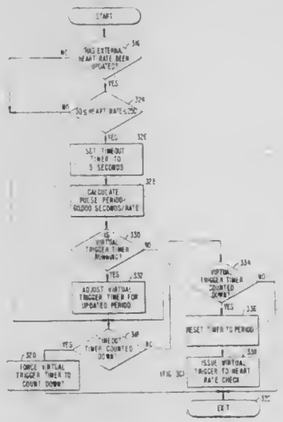
## PULSE OXIMETER USING A VIRTUAL TRIGGER FOR HEART RATE SYNCHRONIZATION

**Clark R. Baker, Jr., Castro Valley, Calif., assignor to Nellcor Puritan Bennett Incorporated, Pleasanton, Calif.**

**Continuation of Ser. No. 134,572, Oct. 8, 1993, Pat. No. 5,485,847. This application Oct. 5, 1995, Ser. No. 539,579**

**Int. Cl.[6] A61B *5/00***

**U.S. Cl. 128—633** **14 Claims**



1. An apparatus comprising:

means for generating a first signal from a periodic physical activity;

means for generating a second signal having a first frequency corresponding to said periodic physical activity;

means for generating a trigger having said first frequency, said trigger being generated independent of any waveform feature defining a period of said second signal; and

means for processing said first signal in periods defined by said trigger.

**5,743,264**

## METHOD OF IMAGING AN ANKLE OF A PATIENT

**Peter M. Bonutti, 1303 W. Evergreen Plz., Effingham, Ill. 62401**

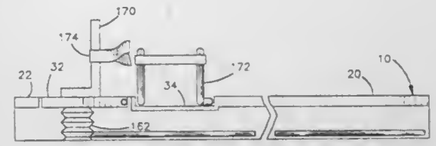
**Division of Ser. No. 221,848, Apr. 1, 1994, Pat. No. 5,577,503, which is a division of Ser. No. 802,358, Dec. 4, 1991, Pat. No. 5,349,956. This application Jun. 1, 1995, Ser. No. 456,817**

**Int. Cl.[6] A61B *5/055***

**U.S. Cl. 128—653.2** **12 Claims**

7. A method of imaging at least a portion of an ankle connected with a foot and leg of a patient, said method comprising the steps of providing a movable member having first portion with a longitudinal central axis and a second portion which extends transverse to the longitudinal central axis of the first portion, connecting the foot of the patient with the movable member, said step of connecting the foot of the patient with the movable member includes positioning the sole of the foot of the patient against the first portion of the movable member and positioning the heel of the foot of the patient against the second portion of the movable member, moving at least a portion of the ankle of the patient into a primary imaging coil of an imaging apparatus, bending the ankle of the patient while the foot of the patient is connected with the movable member and while the ankle of the patient is in the primary coil, said step of bending the ankle of the patient includes pivoting the first and second portions of the movable member about an axis which extends transverse to the longitudinal central axis of the first portion of the movable member while the sole of the foot of the patient is positioned against the first portion of the movable member and while the heel of the foot of the patient is positioned against the second portion of the movable member, and imaging the ankle of the patient with the primary coil while the foot of the patient and the movable member are in each of a plurality of positions and while the ankle of the patient is in the primary coil.






**5,743,265**

**Patent Not Issued For This Number**

**5,743,266**

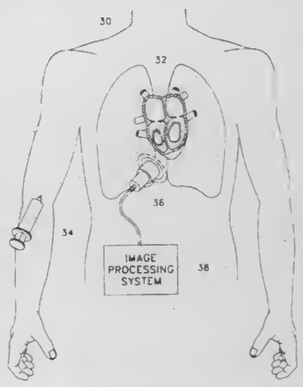
## METHOD FOR PROCESSING REAL-TIME CONTRAST ENHANCED ULTRASONIC IMAGES

**Harold Levene, San Diego, and Bob Webster, Carlsbad, both of Calif., assignors to Molecular Biosystems, Inc., San Diego, Calif.**

**Filed Apr. 25, 1995, Ser. No. 428,723**

**Int. Cl.[6] A61B *8/00***

**U.S. Cl. 128—662.02** **38 Claims**




1. A method of colorizing corresponding points in a region of interest of a subject in a series of grey-scale ultrasound images comprising:

a) commencement of grey scale imaging of the region of interest of the subject;

b) administration of contrast agent to the subject wherein the contrast agent perfuses to the region of interest;

c) for the first image to be colorized, colorize each corresponding point according to the results of a comparison between a parameter and the value of the reflected signal of the corresponding point; and

d) for each subsequent image in the series, colorizing each corresponding point according to the results of a comparison made between a parameter, the value of the reflected signal from the corresponding point in the image and a previous non-baseline value of the reflected signal of the corresponding point.

**5,743,267**

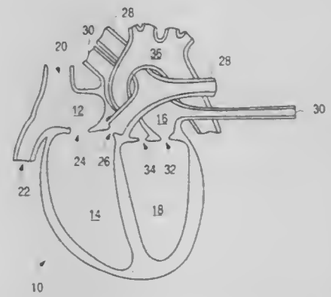
## SYSTEM AND METHOD TO MONITOR THE HEART OF A PATIENT

**Serjan D. Nikolic, San Francisco, and Gary Feierbach, Belmont, both of Calif., assignors to Telecom Medical, Inc., San Francisco, Calif.**

**Continuation-in-part of Ser. No. 545,306, Oct. 19, 1995. This application Oct. 27, 1995, Ser. No. 549,375**

**Int. Cl.[6] A61B *5/00***

**U.S. Cl. 128—673** **33 Claims**




1. A system used to monitor a patient's heart, the system comprising:

a measuring device configured to measure the absolute blood pressure of the patient and to generate an absolute blood pressure signal; and

a processing element configured to be coupled to receive the absolute blood pressure signal, the processing element being further configured to generate a filtered blood pressure signal from the absolute blood pressure signal by substantially removing variations from the absolute blood pressure signal caused by the respiratory activity of the patient, the processing element further including:

a filtering element further including a sampling element configured to sample the absolute blood pressure signal during a plurality of selected heart cycles that occur over a course of a plurality of respiratory cycles of the patient, the plurality of selected heart cycles being selected at approximately the same phase during each of the plurality of respiratory cycles respectively;

an averaging element configured to generate the filtered blood pressure signal by averaging the absolute blood pressure signal measured during the plurality of selected heart cycles; and

a computation element configured to generate a set of parameters derived from the filtered blood pressure signal which are indicative of the condition of the patient.

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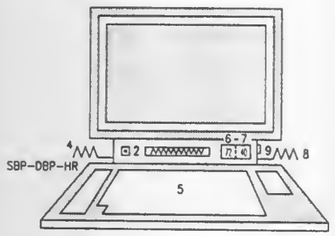
## NONINVASIVE HEMODYNAMIC ANALYZER ALTERABLE TO A CONTINUOUS INVASIVE HEMODYNAMIC MONITOR

John Kabal, 1142 Walker Rd., Ste. D, Great Falls, Va. 22066

Continuation of Ser. No. 314,732, Oct. 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 140,453, Oct. 25, 1993, Pat. No. 5,584,298. This application Apr. 11, 1995, Ser. No. 548,513

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—691 16 Claims




1. A computerized apparatus for electronically determining cardiac parameters in a human patient in the presence of a regular heart rate pattern, comprising:

computing means for receiving and storing a set of input parameters including a single actual heart rate value, a single actual systolic blood pressure value and a single actual diastolic blood pressure value, and sex, weight, age and height of the patient;

calculating means associated with the computing means for generating an estimate of actual cardiac stroke volume from:

(a) said single heart rate value,

(b) blood pressure information consisting only of said single systolic and diastolic blood pressure values, and

(c) said sex, weight, age, and height of the patient; and

output means connected to the calculating means for providing an output to an operator representing said estimate of actual cardiac stroke volume.

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5,743,269

## CARDIOTACHOMETER

Tomio Okigami, Tokorozawa; Hiroyuki Kihara, Kodaira; Tomomi Murakami, Higashimurayama, and Takashi Osa, Sayama, all of Japan, assignors to Citizen Watch Co. Ltd., Tokyo, Japan

PCT No. PCT/JP96/00661, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO96/29005, PCT Pub. Date Sep. 26, 1996

PCT Filed Mar. 15, 1996, Ser. No. 737,565

Claims priority, application Japan, Mar. 17, 1995, 7-057871; Aug. 9, 1995, 7-202971; Aug. 9, 1995, 7-202972

Int. Cl.[6] A61B *5/04*

U.S. Cl. 128—706 8 Claims

1. A cardiotachometer for processing electrocardiographic signals on cardio-condition of the heart of a human body obtained from a pair of electrodes mounted near the heart of a human body, the cardiotachometer comprising:

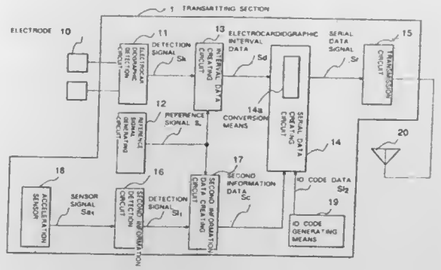
a transmitting section which includes:

a detection circuit for detecting the electrocardiographic signals and generating detection signals with generation intervals,

an interval data creating circuit coupled with the detection circuit for counting the generation intervals of the detection signals with signals of a preset period and generating interval data,

ID code generating means for creating a transmitted ID code for identification,

a serial data creating circuit coupled to the interval data creating circuit and ID code generating means for linking




the interval data with the transmitted ID code to generate a serial data signal, and

a transmission circuit coupled to the serial data creating circuit for modulating the serial data signal and transmitting the modulated serial data signal as a radio signal; and

a receiving section which includes:

a reception circuit for receiving and demodulating the radio signal from the transmitting section and generating a reception signal,

a data decoding circuit coupled to the reception circuit for decoding the reception signal and generating the serial data signal,

data separation means coupled to the data decoding circuit for separating the interval data and the transmitted ID code from the serial data signal,

ID code storage means for storing a stored ID code,

ID code comparison/determination means coupled to the data separation means and the ID code storage means for comparing the transmitted ID code and the stored ID code and determining a comparison signal indicating whether the separated interval data are reliable,

a calculation circuit coupled to the data separation means and ID code comparison/determination means for receiving the interval data and calculating a heart rate from the interval data if the comparison signal indicates the separated interval data are reliable, and

a display section for displaying the heart rate.

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5,743,270

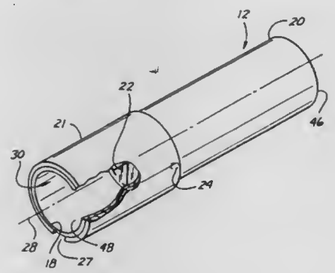
## RESISTIVE ELEMENT FOR SPIROMETER

Peter J. Gazzara, Reading, and John W. Burke, Jr., Melrose, both of Mass., assignors to Desert Moon Development Limited Partnership, Dana Point, Calif.

Filed Jun. 21, 1996, Ser. No. 667,396

Int. Cl.[6] A61B *5/08*

U.S. Cl. 128—724 21 Claims




1. A resistive element for use in a spirometer, comprising:

a member having a substantially planar first face and an opposing substantially planar second face;



a plurality of through slots in the member, each of the plurality of through slots having a length and having an inner end and an opposing outer end; and

a plurality of hinge slots, each of the hinge slots being located at and extending through the outer end of one of the through slots and having a length oriented in a generally different direction relative to the length of the one through slot, the plurality of through slots and the plurality of hinge slots together forming a plurality of hinged windows in the member.

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5,743,271

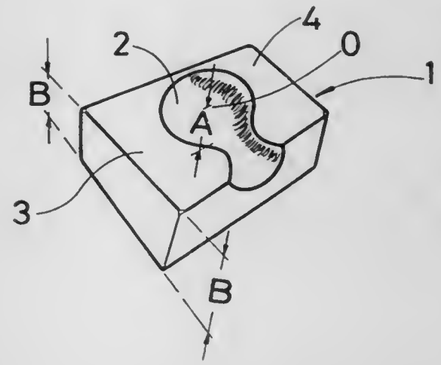
## CERVICAL RECLINATION CUSHION

Miguel B. Royo-Salvador, Barcelona, Spain, assignor to Instituto Vesalio S.L., Barcelona, Spain

Continuation of Ser. No. 489,431, Jun. 12, 1995, abandoned, which is a continuation of Ser. No. 215,565, Mar. 22, 1994, abandoned. This application Apr. 3, 1997, Ser. No. 832,533

Int. Cl.[6] A61F *13/12*

U.S. Cl. 128—845 1 Claim




1. A cervical reclination cushion for supporting a person's head, comprising:

a rectangular prismatic body including three support surfaces;

a first of said three support surfaces formed by a central hollow having the form of an enlarged imprint, rounded at the edges thereof, of a person's occipito-cervical region, for adaptation thereto in the supine position; and

a second and a third of said three support surfaces formed by two masses of cushion on both sides of said central hollow and defining planar surfaces for supporting a person's head when the person is lying on his side, said second and third of said three support surfaces each being at least as wide as one-half of a width of said central hollow, said cervical reclination cushion supporting a person's cervical region to be maintained in a natural physiological position, aligned with an axis of the person's backbone when the person is lying on his back or on his side,

wherein a distance between a center of the central hollow of the cushion and a base of the cushion ranges from 6 to 8 cms, with said distance exact for each case corresponding to the distance between the external occipital protuberance to a tangential plane passing through the dorsal region,

wherein a height of said two masses of cushion ranges from 10 to 15 cms, an exact height corresponding to a measurement from a plane tangential to a person's shoulder up to a person's ear region on a same side, and

wherein said height of said two masses is approximately twice the distance between the center of the central hollow and the base of the cushion.

5,743,272

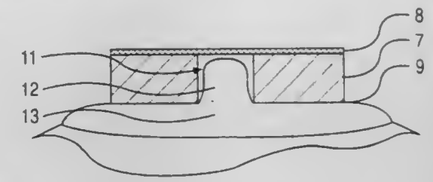
## MALE NIPPLE ABRASION PROTECTOR

Robert W. Kocher, Jr., 4828 N. 3rd St., Arlington, Va. 22203

Filed Apr. 10, 1996, Ser. No. 629,867

Int. Cl.[6] A61F *5/37*

U.S. Cl. 128—846 4 Claims




1. An inexpensive nipple protector for use on a human body to minimize abrasion on the nipple surface including: a base portion sized to contact and cover a portion of the area surrounding the nipple to be protected, the base portion having an aperture formed therein the aperture allowing the nipple to protrude there through without irritation, a cover attached to the base portion that is disposed over and encloses the aperture forming a cavity and an adhesive layer disposed on the side of the base member opposite the cover and being suitable for attaching and holding the nipple protector in place during exercise when exposed to normal body secretions caused during exercise.

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5,743,273

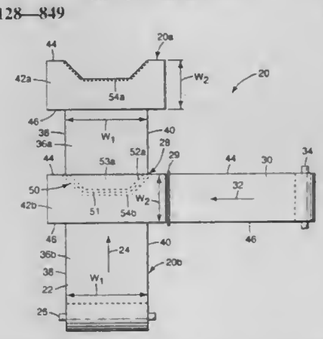
## METHOD FOR MAKING A SURGICAL DRAPE

Charles L. Newman, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 546,587, Oct. 23, 1995, Pat. No. 5,586,563. This application Nov. 13, 1996, Ser. No. 747,242

Int. Cl.[6] A61B *19/00*

U.S. Cl. 128—849 25 Claims




1. A method of making a series of surgical drapes each comprising a screen portion, and a body portion having a fitted portion, the method comprising:

advancing a first web along a first longitudinal axis to a cutting and bonding location, the first web being continuous and having first and second long edges generally parallel with the first longitudinal axis;

locating a second web having a first edge such that the first edge of the second web is adjacent the cutting and bonding location and generally perpendicular to the first longitudinal axis;

forming a seam between the first and second webs along a path extending into the second web, the path generally originating and terminating proximate the intersection of the first edge of the second web and the first and second long edges of the first web, respectively;

cutting the first and second webs generally along the path such that a first portion of the second web forms the fitted portion attached to the body portion of a first surgical drape, and a

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second portion of the second web forms the screen portion attached to the body portion of a second surgical drape in the series of surgical drapes.

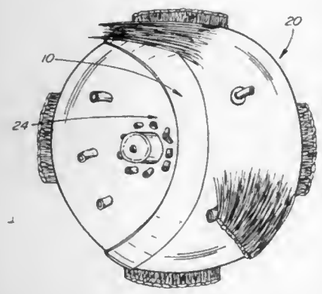
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5,743,274

**MACULAR BANDAGE FOR USE IN THE TREATMENT OF SUBRETINAL NEOVASCULAR MEMBERS**

Gholam A. Peyman, 2020 Gravier St., New Orleans, La. 70112-2234

Filed Mar. 18, 1996, Ser. No. 617,114
Int. Cl.[6] A61B *19/00*; A61F *2/14*
U.S. Cl. 128—898 14 Claims




1. A method of treating a disorder of an eye, the eye having a macular area and a sclera, the method comprising the steps of placing a strip of material over the macular area, the strip having edges and a pair of opposed ends, determining whether placement of the strip has increased intraocular pressure and if so cutting one of the edges to reduce intraocular pressure, and suturing the ends to the sclera.

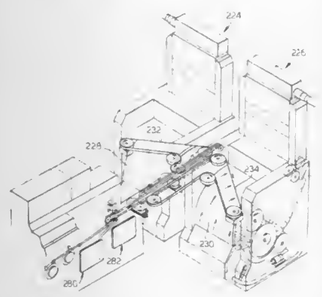
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5,743,275

**CIGARETTE MAKING MACHINE**

John Dawson, and Derek Henry Dyett, both of High Wycombe, United Kingdom, assignors to Molins PLC, Miltin Keynes, United Kingdom

Filed Jun. 24, 1996, Ser. No. 668,682
Claims priority, application United Kingdom, Jun. 24, 1995, 9512938; Jul. 14, 1995, 9514452; Oct. 7, 1995, 9520555
Int. Cl.[6] A24C *5/14*
U.S. Cl. 131—84.1 14 Claims



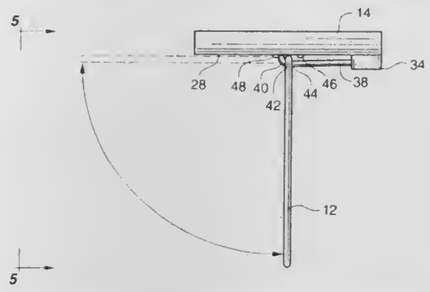

1. A twin-track cigarette making machine arranged to form two closely spaced continuous cigarette rods having parallel axes, the filler streams used to form the cigarette rods being conveyed towards the respective rod-forming devices by suction bands arranged to move along converging paths and to be tilt away from one another about the respective rod axes.

5,743,276

**CIGAR CADDIE DIVOT REPAIR TOOL**

Stephanie A. Tamayo-Rivera, 1085 Dearborn La., Vernon Hills, Ill. 60061, and Ken A. Arnswald, Mundelein, Ill., assignors to Stephanie A. Tamayo-Rivera, Vernon Hills, Ill.

Filed Dec. 4, 1996, Ser. No. 760,307
Int. Cl.[6] A24F *13/00*
U.S. Cl. 131—329 15 Claims




1. A cigar caddie divot repair tool comprising a ball mark repairer for repairing dents and divots in a golf green and a tray body having a substantially uniform upper receiving surface along a longitudinal central axis of said tray body for the support of an object to be placed thereon, said ball mark repairer being hingedly interconnected to said tray body to selectively achieve a closed inoperative position of said tray body wherein the ball mark repairer is substantially parallel to said uniform upper receiving surface of said tray body or an open operative position of said tray body wherein said ball mark repairer is substantially perpendicular to said uniform upper receiving surface of said tray body.

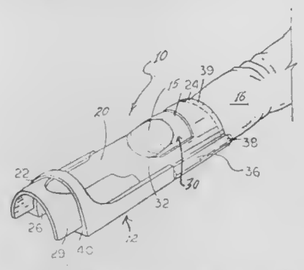
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5,743,277

**DEVICE AND METHOD FOR FORMING ARTIFICIAL NAILS**

Cynthia L. Moreshead, 42 Pine Acres Rd., Foxboro, Mass. 02035

Filed Mar. 11, 1996, Ser. No. 614,967
Int. Cl.[6] A45D *29/00*
U.S. Cl. 132—200 27 Claims




1. A device for forming an artificial finger nail of selected dimensions by an artificial nail coating composition on a natural finger nail, which device comprises:

a) a frame means having a first end and a second end and including an arcuate base having sides and arranged and constructed to fit in a snug, retaining relationship about the end of a finger of an user;

b) said base characterized by a window aperture of selected dimensions in a section near said second end of said frame means for surrounding said natural finger nail and extending outwardly therefrom;

c) guide means at said first end of said frame means to receive and support an insert means therein;



d) an insert means for controlling the contour and shape of the artificial nail to be formed, said insert means arranged and constructed to be slidably received and supported in said guide means in association with said window aperture to form a reservoir of selected dimensions to receive the artificial nail coating composition; and

e) wire forming means in the arcuate base to permit the user to mold said arcuate base by finger pressure of the user about the finger.

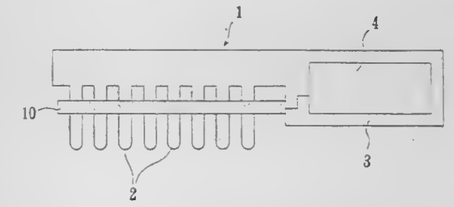
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5,743,278

**METHOD OF AND TOOL FOR HAIR TREATMENT**

Hiroyuki Ookura, and Shigeya Yamakawa, both of Nagoya, Japan, assignors to Shigeya Yamakawa, Japan

Filed May 2, 1996, Ser. No. 641,753
Claims priority, application Japan, May 10, 1995, 7-111790; Jun. 27, 1995, 7-160757; Jul. 10, 1995, 7-173432
Int. Cl.[6] A45D *7/00*
U.S. Cl. 132—210 7 Claims




1. A hair treatment tool substantially made of an insulating material and comprising at least one set of an anode electrode bar and a cathode electrode bar, both connected to a power supply, the anode and cathode electrode bars being conducted such that the hair treatment liquid applied to the hair having existed between the electrode bars is treated without heating the hair.

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5,743,279

**PACKAGING UNIT FOR A PRODUCT SUCH AS MASCARA**

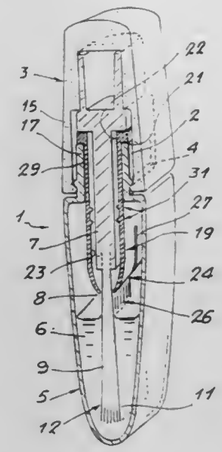
Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Aug. 30, 1996, Ser. No. 705,653
Claims priority, application France, Aug. 30, 1995, 95 10230
Int. Cl.[6] A45D *40/26*
U.S. Cl. 132—218 19 Claims

1. A packaging unit for a liquid to pasty product to be applied to keratinous fibers, comprising:

a reservoir for the product and provided with a wiper; and

an applicator having a planar handle and a bristly part having bristles, said applicator being mountable on said reservoir for closing said reservoir, wherein said wiper has a shape complementary to that of said bristly part, wherein said wiper is positioned so as to wipe the bristles along their longitudinal axes, and wherein said bristly part has at least one tuft of bristles implanted parallel to the plane of the handle.



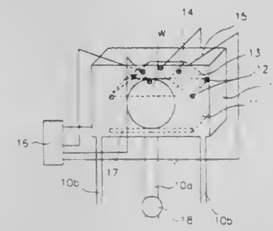

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5,743,280

**APPARATUS FOR CLEANSING SEMICONDUCTOR WAFER**

Suk-Bin Han, Choongcheongbuk-Do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Choongcheongbuk-do, Rep. of Korea

Filed Dec. 18, 1996, Ser. No. 769,072
Claims priority, application Rep. of Korea, Dec. 19, 1995, 51997/1995
Int. Cl.[6] B08B *3/04*
U.S. Cl. 134—56 R 4 Claims




1. An apparatus for cleansing a semiconductor wafer, comprising:

an outer tub having a supply tube for supplying a cleansing liquid and for discharging the cleansing liquid;

a lower inner tub disposed inside the outer tub;

an upper lower tub disposed above the lower inner tub, which upper lower tub is adjustable in cooperation with a first hinge member;

a driving means disposed in cooperation with a second member for opening and closing the upper inner tub;

a control means for controlling the driving means;

a baffle plate for distributing the cleansing liquid supplied through a supply tube; and

a pump disposed in the supply tube for supplying the cleansing liquid into the inner tub.

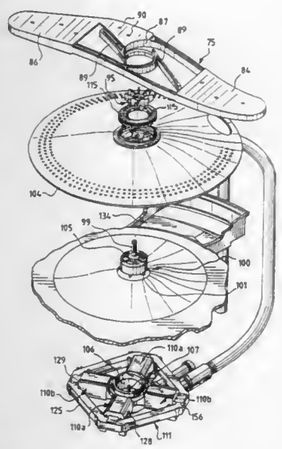
VOL 1209 ISS 4 AP 28 1998 UMI



**5,743,281**
**DISHWASHER**

Adrian Anthony Sargeant; William Hugh Currie, both of Dunedin; Willem Ouwens, Outram; Philip John Brace, Auckland; Robert William Todd, Dunedin, and Hans-Joachim Scholz, Brighton, all of New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Division of Ser. No. 992,828, Dec. 18, 1992, Pat. No. 5,470,142. This application Jun. 8, 1995, Ser. No. 480,686
Claims priority, application New Zealand, Dec. 20, 1991, 241093
Int. Cl.[6] A47L *15/23;15/42*
U.S. Cl. 134—57 D 20 Claims



1. A dishwasher comprising:
a) a wash chamber adapted to accommodate dishes and within which wash liquid is circulated,
b) a non-magnetic cylindrically sided well provided in the floor of said chamber and forming part of said chamber,
c) an electric motor including:
(i) a rotor mounted within said well, said rotor having a drive shaft and
(ii) a co-acting stator mounted outside said wash chamber about the exterior surface of said well such that the cylindrical sides of said well lie in the rotor-stator air gap, and
d) a pump having an impeller mounted on said rotor drive shaft.

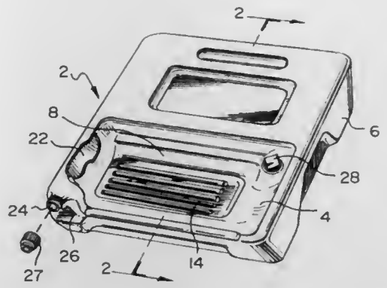
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**5,743,282**
**RECUPERATION BASIN**

Michel Pellerin, 2483 Junction Ave., Ottawa, Ontario, Canada, K1V 8J9

Filed Aug. 7, 1995, Ser. No. 512,199
Int. Cl.[6] B08B *3/04*
U.S. Cl. 134—117 10 Claims

1. A recuperation basin comprising a basin section having a bottom and circumscribing walls, and an adjacent liquid storage container having walls circumscribing a central chamber, one of the walls of the basin and one of the walls of the container intermediate the two forming a common wall, an aperture located in said common wall so as to permit passage of liquid in the container chamber into the basin and to permit passage of liquid from the basin Into the container chamber by tilting the recuperation basin so the basin is somewhat above the container chamber, and wherein a container wall opposite the common wall is flat and positioned to provide a bottom to support the recuperation basin in an upright position and a side of the recuperation basin below the basin section is oriented at 90° to said bottom, to form a base to support the basin in liquid-containing position, the aperture being positioned on the common wall so that, when the recuperation basin is supported on its base bottom, the level line of liquid about half filling the chamber will pass through the aperture, and wherein the common wall is contoured as an elongated groove to collect liquid from the basin and channel it towards the aperture when the recuperation basin is oriented in upright position.

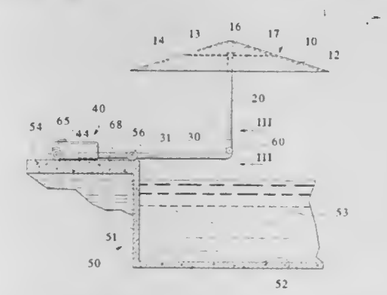


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**5,743,283**
**SHIELDING DEVICE FOR PROTECTING RECREATION AREAS**

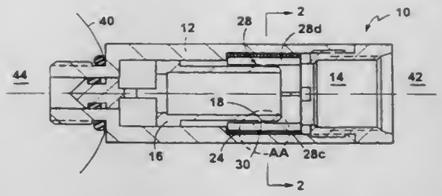
John Horvath, 14016 Chestnut La., Orland Park, Ill. 60462

Continuation-in-part of Ser. No. 551,531, Nov. 1, 1995, Pat. No. 5,636,649. This application Dec. 13, 1996, Ser. No. 766,670
Int. Cl.[6] B60R *11/00;* A45B *11/00;* E04H *4/00*
U.S. Cl. 135—16 2 Claims



1. In combination with an in-ground swimming pool having side walls extending below grade level and a bottom wall and surrounded by an apron forming a deck at grade level, a cantilevered above-water pool umbrella assembly for protecting pool occupants while in the water, said assembly comprising:
an umbrella adapted to be selectively extended and retracted in a horizontal direction above grade and water level and extended to be disposed in a generally superjacent space parallel relationship above the level and surface of the water in the pool;
a vertical umbrella support pole projecting vertically upwardly above grade and water level to form an upright vertical support column carrying said umbrella;
a horizontally disposed mounting bar,
a connecting joint between one end of said mounting bar and the lower end of said umbrella pole to vertically support the pole and the umbrella in an upright position above the level and surface of the water in the pool,
and anchoring means connected to the other end of said mounting bar to anchor the umbrella to the apron of the pool and more particularly comprising;
a horizontally disposed base tube embedded in said apron below the surface of said deck and having transverse rebar means integrating said base tube with said apron and forming together therewith lateral displacement prevention means to firmly lock the umbrella support assembly against involuntary later displacement toward or away from the pool.
said base tube having an opening in the pool side wall for selectively receiving said mounting bar in telescopic therewith for locking to the end of said mounting bar,
coupling means between said base tube and said mounting bar and selectively interconnecting said other end of said mounting tube and said base tube for resisting lateral displacement forces, thereby to provide vertical support for the cantilevered umbrella on the vertical support column, and
a closure cap for selectively closing said opening in said base tube when not in use.



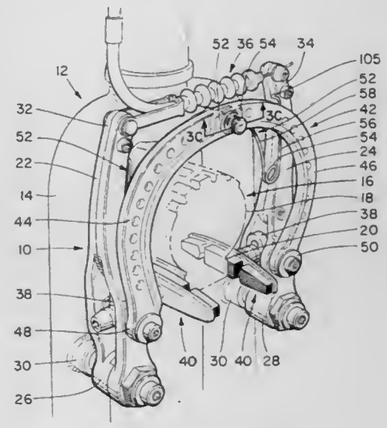


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**5,743,284**
**CANTILEVER BRAKE WITH PAD ATTITUDE CONTROL**

Wayne R. Lumpkin, Littleton, Colo., assignor to Avid Enterprises, Inc., Englewood, Colo.

Filed Sep. 18, 1996, Ser. No. 716,505
Int. Cl.[6] B62L *3/00*
U.S. Cl. 188—24.22 18 Claims



1. A cantilever brake for a bicycle comprising:
first and second brake arms, each having a distal and a proximal end;
pivotal mounting means at the proximal end of each brake arm for pivotally mounting each brake arm to a brake arm attachment stud of a bicycle frame;
means for attaching a brake pad assembly to each brake arm proximate the pivotal mounting means;
a spring extending between the distal ends of the brake arms to bias the distal ends of the brake arms apart; and
a clamp in a fixed position relative to the distal ends of the brake arms, the clamp receiving a portion of the spring and being selectively placed in an open state wherein the portion of the spring, is slidable laterally relative to the clamp and a closed state wherein the portion of the spring is fixed laterally relative to the clamp.

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**5,743,285**
**GAS CYLINDER THERMAL RELIEF VALVE**

Mark Shalkevich, North Hollywood, Calif., assignor to Circle Seal Controls, Inc., Corona, Calif.

Filed Apr. 17, 1996, Ser. No. 633,926
Int. Cl.[6] F16L *37/28*
U.S. Cl. 137—74 4 Claims

1. A thermal relief valve for a gas cylinder comprising:
a body having an inner wall defining an axial bore with an inlet and an outlet, said axial bore providing a passageway for flow of fluid between said inlet and said outlet,
a piston disposed within said axial bore for movement between a first position, arresting flow of fluid from said inlet towards said outlet, and a second position, permitting flow of fluid from said inlet towards said outlet, in response to pressure differential between said inlet and said outlet,
said piston being assembled in said first position, to arrest flow of fluid from said inlet towards said outlet, and
said piston being urged towards said second position, to permit flow of fluid from said inlet towards said outlet, by a pressure differential, wherein pressure at said inlet exceeds pressure at said outlet by at least predetermined amount,
a restricting assembly positioned to releasably arrest movement of said piston from said first position towards said second position;
said restricting assembly comprising:
a thermal sensitive element comprising a sleeve segment of eutectic material disposed in at least close proximity to said inner wall of said axial bore,
one or more protrusions extending from said piston and defining a first camming surface, and
two or more restricting elements defining a second camming surface positioned, in a first position of said restricting elements, for engagement with said first camming surface,
said thermal sensitive element, at a temperature condition below a predetermined first temperature, disposed relative to said restricting elements in a position to maintain said second camming surface disposed for engagement with said first camming surface, thereby to arrest movement of said piston from said first position towards said second position, and
said thermal sensitive element, at a temperature condition at and above said predetermined first temperature, adapted to permit movement of said restricting elements from said first position of said restricting elements towards a second position of said restricting elements, with said second camming surface spaced from engagement with said first camming surface, thereby to permit movement of said piston towards said second position for release of fluid.

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**5,743,286**
**REVERSE FLOW PROOF CONTROL-VALVE FOR A MONO-FAUCET**

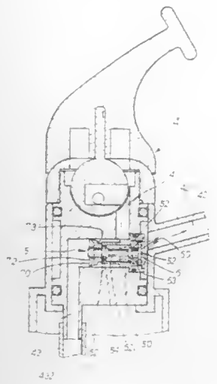
Hsi-Chia Ko, Changhua Hsien, Taiwan, assignor to Chung Cheng Faucet Co., Ltd., Changhua Hsien, Taiwan

Filed Jul. 3, 1996, Ser. No. 675,070
Int. Cl.[6] G05D *11/00*
U.S. Cl. 137—119.04 1 Claim

1. A reverse flow proof control valve comprising a valve shaft, a valve sleeve in which said valve shaft is movably housed and a driving block attached to a first end of said valve shaft, said control valve being used in a fixture to automatically shift the paths of water discharged from a faucet or shower head;
said valve shaft having an enlarged head with a downwardly tapered leak proof sealing portion, said head fixed to a column, a circular flanged portion spaced apart from a flat cone-shaped bottom second end on said column with an engagement journal defined between said circular flanged portion and said flat cone-shaped bottom second end;

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said valve sleeve having a counter sunk portion with a central hole through a center thereof, a plurality of spaced retaining ribs defined on an inner wall of said counter sunk portion confining said enlarged head of said valve shaft to slidable linear movement in said valve sleeve, a sealing seat adjacent to said retaining ribs for engagement to said tapered leak proof sealing portion, a sealing ring on an outer periphery of said valve sleeve, a plurality of spaced supporting rods extending from said counter sunk portion to a closed circular hoop member, said supporting rods and said closed circular hoop member forming an open frame structure below said sealing seat which permits water to flow through said central hole when said tapered leak proof sealing portion is disengaged from said sealing seat;

said driving block having a flat cone-shaped structure with a circular protrusion defined on a top thereof, a flat cone-shaped cavity formed at the bottom thereof, said flat-cone shaped structure having a through hole disposed at the center thereof, wherein said engagement journal engages the flat cone-shaped structure;

wherein said valve shaft is housed in said valve sleeve with said enlarged head received in said counter sunk structure for slidable engagement with to said retaining ribs; said column of said valve shaft extending through said open frame structure of said valve sleeve with said flanged portion moveable through said closed circular hoop member,

wherein said flat cone-shaped driving block and said circular protrusion are respectively sealably engaged to said fixture and against said closed circular hoop member when said tapered leak proof sealing portion is opened to discharge water from said faucet, and

wherein said flat cone-shaped driving block and said circular protrusion are respectively disengaged from said fixture and said closed circular hoop member when said tapered leak proof sealing portion is engaged to said sealing seat to discharge water from said shower head.

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**5,743,287**

**AUTOMATIC POOL CHLORINATOR**

**George P. Rauchwerger, 147 Cromart Ct., sunnyvale, Calif. 94087**

**Filed Apr. 3, 1996, Ser. No. 627,901**
**Int. Cl.[6] B01D** *11/02*
**U.S. Cl. 137—268** **18 Claims**

**1**. Apparatus for dispersing solute into a reservoir of solvent having a solvent inlet conduit, said apparatus comprising:

a fluid conduit communicative with said inlet conduit such that solvent flowing into said reservoir passes through said fluid conduit;

container means located above said fluid conduit for containing said solute, said container means having an opening communicative with said reservoir such that solvent can pass from said reservoir into said container means and cause said solute to enter into solution; and

a duct connecting said fluid conduit with said container means, such that solvent flowing through said fluid conduit causes said solution to be aspirated from said container means through said duct into said fluid conduit.

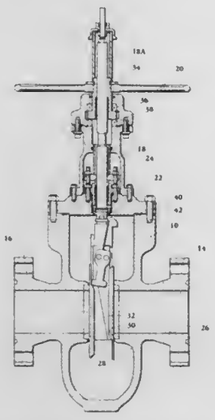
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**5,743,288**

**VALVE HAVING PROVISION FOR REPLACING STEM PACKING WHILE THE VALVE IS UNDER PRESSURE**

**Bradley W. Mosman, Shawnee, Okla., and Frederick A. Hausler, III, Emporia, Kans., assignors to ERC Industries, Inc., Houston, Tex.**

**Filed Mar. 12, 1997, Ser. No. 815,722**
**Int. Cl.[6] F16K** *41/04;41/18;43/00*
**U.S. Cl. 137—315** **10 Claims**



**1**. A valve having provision for replacing stem packing while the valve is under pressure, comprising:

a valve body with an open top and a flow passageway therethrough;

a gate within said body that is vertically positioned to open and close said flow passageway;

a stem extending upwardly from said valve body, a lower end of the stem being secured to said gate by which said gate is vertically positioned and having above the lower end, an enlarged diameter stem shoulder;



a bonnet secured to said valve body by which said valve body open top is closed, the bonnet having a stem receiving opening therein;

a packing box sealably and vertically positionable in said bonnet opening and having an opening therethrough receiving said valve stem;

packing received within said packing box opening and surrounding said valve stem;

a packing gland having an opening therethrough receiving said valve stem and having a tubular portion on a lower end thereof telescopically received in said packing box opening and in engagement with and for sealably compressing said packing around said valve stem;

a back seat ring having an opening therethrough receiving said stem above said stem shoulder and being slidably and sealably received within said bonnet opening below said packing box, and being positionable by positioning of said packing box and having an annular sealing surface surrounding said valve stem, said back seat ring and said packing box being urged upwardly by internal fluid pressure within said valve body and

an adjustable means for vertically positioning said packing box whereby when said valve stem is in a full upward position said packing box and said back seat ring can be selectably downwardly positioned so that said valve stem annular shoulder sealably engages said back seat ring sealing surface to close flow along said valve stem and to thereby permit said packing received within said packing box upper recess to be removed and replaced.

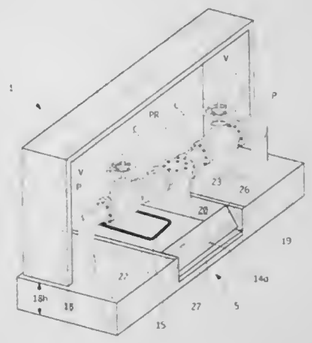
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**5,743,289**

**DRAIN CHANNEL AND FORMS FOR BACKFLOW PREVENTION DEVICE COVER**

**Herman W. Griffin, Mt. Juliet, and Edgar L. Cantrell, Lebanon, both of Tenn., assignors to Griffin & Cantrell Co., Inc., Mt. Juliet, Tenn.**

**Filed Nov. 5, 1996, Ser. No. 743,940**
**Int. Cl.[6] F16K** *49/00*
**U.S. Cl. 137—341** **22 Claims**



**1**. Apparatus for protecting a fluid conveying device in fluid communication with valves and piping upstream and downstream of the device that is used in connection with a slab having an upper surface, wherein the upstream and downstream piping extend through the slab, comprising:

a drain channel configured for support on the surface of the slab;

a valve disposed in the drain channel, said valve sealing the drain channel when closed and allowing the passage of fluid to the atmosphere when open; and

a cover surrounding the fluid conveying device and the drain channel, said cover having a top wall and side walls wherein the side walls of the cover are adapted to be disposed upon the surface of the slab.

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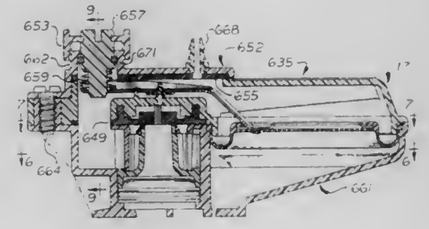
**5,743,290**

**MULTI-PURPOSE AUTOMATIC FILLING AND LEVELING LIQUID BASIN WITH LIQUID TRANSFER**

**Randal D. Locke; Daniel P. Dunbar, and Teresa M. Locke, all of P.O. Box 1325, Redway, Calif. 95560-1325**

**Continuation-in-part of Ser. No. 479,712, Jun. 7, 1995, and a continuation-in-part of Ser. No. 488,289, Jun. 7, 1995, and a continuation-in-part of Ser. No. 488,292, Jun. 7, 1995. This application Dec. 17, 1996, Ser. No. 767,837**

**Int. Cl.[6] F16K** *31/128;31/385*
**U.S. Cl. 137—403** **2 Claims**



**1**. An adjustable reservoir fill valve adapted for communication by conduit with a separate water reservoir displaced above the valve, which valve comprises:

(i) a reservoir valve crown held in liquid tight combination with the reservoir valve cover;

(ii) an interior cavity with a lower portion adapted for liquid communication with a source thereof under pressure and an upper portion adapted for liquid communication with the reservoir;

(iii) a second interior cavity which houses a diaphragm which reciprocally closes the valve, in response to the weight of liquid in the the reservoir above the diaphragm when the liquid is at the selected liquid level, add opens the valve in response to a drop in the level of the liquid in the reservoir below the selected liquid level;

(iv) a liquid inlet port adapted for liquid communication with the liquid inlet of the reservoir and the lower portion of the valve interior cavity;

(v) a single liquid outlet port adapted for providing liquid communication between the upper portion of the valve cavity and the elevated reservoir for dispensing liquid from the fill valve into the reservoir when the valve is in its open position;

(vi) a gas port providing gas communication between the diaphragm cavity and the exterior of the reservoir for maintaining the diaphragm of the fill valve at ambient pressure;

(vii) a reservoir valve assembly which is sealed with an integral gasket that closes and seals the interior cavity of the valve;

(viii) a detachable reservoir valve crown that fits in liquid tight communication onto and around the open top of the reservoir valve cover, thereby preventing liquid from leaving the valve in any but the single outlet port located on the top of the valve crown;

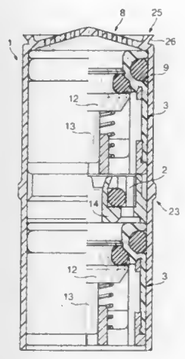
(viiii) a sealed liquid tight valve adjusting screw that fits through the valve crown and incorporates a sealing gasket around its shank to prevent liquid leakage from the valve, and

(x) a sealing gasket to seal the space between the valve crown and the reservoir valve cover.

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5,743,291
**SANITARY SAFETY DEVICE**
**Holger Nehm, Mullheim, and Christoph Weis, Lorrach, both of Germany, assignors to Dieter Wildfang GmbH, Mullheim, Germany**
**Filed Jan. 27, 1997, Ser. No. 790,752**
**Claims priority, application Germany, Jan. 31, 1996, 196 03 393.4**
**Int. Cl.[6] F16K *25/00***
**U.S. Cl. 137—454.2** **7 Claims**

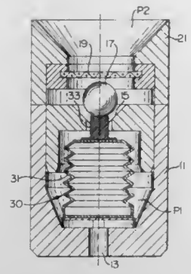


7. A flow-control cartridge for insertion into a tubular conduit comprising:
a. a cylindrical tubular housing having a plurality of inside diameter portions and having an upstream end and a downstream end and an outward peripheral element adapted to center the housing in the tubular conduit,
b. a plurality of separate and independently structured cylindrical flow-control insert elements having respectively the same outside diameter as the inside diameter of the portions and disposed snugly in stacked relation inside the respective portions, the insert elements comprising:
(1) a backflow preventor comprising a first annular body having an upstream end and downstream end and having a valve seat at its upstream end, a spider unitary with the first annular body and having a central tubular hub at the downstream end and a valve element comprising a head disposed adjacent the valve seat and a stem extending slidably in the tubular hub, and a spring disposed around the stem and between the spider and the head and biasing the head toward the seat, and
(2) a flow restrictor comprising a second annular body formed with a central opening and a concentric annular trough facing the upstream end of the tubular housing, the trough having an inner margin, the second annular body having ports therethrough arranged outward from the inner margin and a resilient O-ring disposed in the trough normally adjacent the inner margin and adapted under pressure to expand outward to partly cover the ports and restrict flow,
c. inward retaining means in the housing for retaining the insert elements from moving axially of the housing.

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5,743,292
**PRESSURE ACTUATED CHECK VALVE**
**Norman F. Robinson, Manhattan Beach, Calif., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.**
**Filed Oct. 7, 1996, Ser. No. 726,915**
**Int. Cl.[6] F16K *31/18***
**U.S. Cl. 137—493.9** **3 Claims**

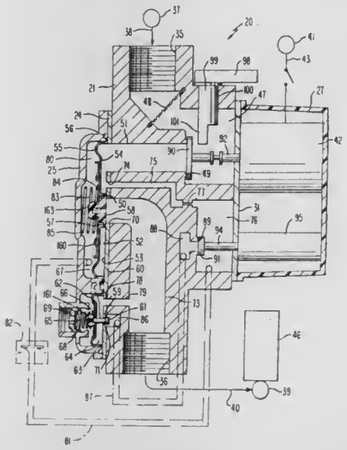
1. A check valve comprising:
a valve casing having a first opening and a second opening;
valve means operationally disposed in said valve casing, said valve means having a first side exposed to a first pressure



inside the valve casing and a second side exposed to a second pressure outside the valve casing, and configured to open when the pressure inside said valve casing is greater than or equal to said second pressure outside the valve casing; and
pressure sensitive control means located within said valve casing for opening said valve means for reverse flow when the pressure within said valve casing is less than a predetermined pressure, said pressure sensitive control means comprising a prefilled aneroid bellows filled with a predetermined quantity of gas.

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5,743,293
**FUEL CONTROL DEVICE AND METHODS OF MAKING THE SAME**
**Samuel T. Kelly, Torrance, and Robert G. Dewey, Jr., Whittier, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.**
**Division of Ser. No. 267,111, Jun. 24, 1994, Pat. No. 5,447,287. This application Jun. 21, 1995, Ser. No. 492,780**
**Int. Cl.[6] F16K *13/128***
**U.S. Cl. 137—489.5** **17 Claims**

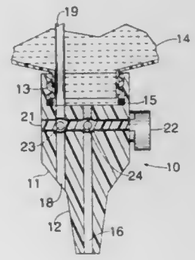


1. A fuel control device, comprising:
a housing means, said housing means including a substantially flat plate having opposed substantially parallel sides, said plate having first and second openings in spaced apart relation passing therethrough, wherein said first opening defines a first valve seat and said second opening defines a second valve seat;
a first movable valve member carried by said housing means for opening and closing said first valve seat; and
a second movable valve member carried by said housing means for opening and closing said second valve seat, wherein one of said movable valve members operatively controls the position of the other of said movable valve members, and wherein one of said valve seats is disposed on one of said sides of said plate and the other of said valve seats is disposed on the other of said sides of said plate.



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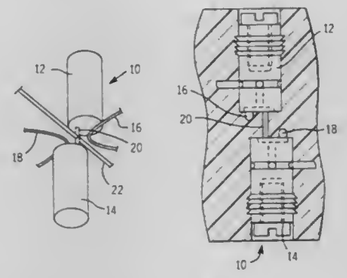
5,743,294
**LIQUID FLOW CONTROL VALVE AND BOTTLE ADAPTER**
**John G. Donzella, 8021 Bergenline Ave., North Bergen, N.J. 07047**
**Filed Dec. 4, 1996, Ser. No. 759,522**
**Int. Cl.[6] F16K *24/00***
**U.S. Cl. 137—588** **7 Claims**



1. A combined open-closed fluid flow control valve and adapter to be fitted to a liquid container having external threads for controlling the flow of liquid from the liquid container into a liquid receiving means when said liquid container is inverted comprising:
(a) an adapter;
(b) a tapered portion formed integrally with said adapter;
(c) a discharge nozzle extending downwardly from said tapered portion;
(d) female threads formed internally of said adapter for fitting said adapter to said liquid container;
(e) an axially extending opening formed through the length of said adapter and communicating at one end with said liquid in said container and at its other end with said discharge nozzle;
(f) a valve having a valve handle operatively associated with said adapter for controlling the flow of liquid from said liquid container wherein said valve is in fluid flow communication with said axially extending opening wherein said valve is a rod rotatable in said adapter and wherein said valve handle is attached to one end of said rod externally of said adapter, and wherein said valve is a rod having a length co-extensive with the outside diameter of said adapter and rotatable in said adapter and wherein said valve handle is attached to one end of said rod externally of said adapter said valve further having first and second apertures formed therethrough for communicating with ambient air and liquid in said container; and,
(g) means for equalizing the pressure between the ambient air and the top of the liquid level in said inverted liquid container whereby when said valve handle is rotated to an open position liquid is caused to flow downwardly from said liquid container, through said valve, through said axially extending opening, through said discharge nozzle and into said liquid receiving means.

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5,743,295
**VALVE CONSTRUCTION AND METHOD OF USE**
**Alan J. Alcock, Mundelein; Jeffrey Y. Pan, Lake Forest; Karen A. Egan, Gurnee, and Tung-Ming Huang, Buffalo Grove, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.**
**Continuation of Ser. No. 504,986, Jul. 20, 1995, abandoned. This application Jul. 25, 1996, Ser. No. 686,297**
**Int. Cl.[6] F16K *11/10***
**U.S. Cl. 137—599** **9 Claims**



1. A valve construction comprising:
(a) a first valve having a first diaphragm defining a first plane;
(b) a second valve having a second diaphragm defining a second plane, the second plane being non co-planar with the first plane;
(c) a first fluid conveying conduit fluidly conveying a first fluid fluidly connected with but not terminating at the first valve;
(d) a second fluid conveying conduit fluidly conveying a second fluid fluidly connected with but not terminating at the second valve; and
(e) a third fluid conveying conduit being outside of the first plane and the second plane and being fluidly connected with the first valve and the second valve; the first diaphragm being movable between a first position where first fluid flows between the first fluid conveying conduit and the third fluid conveying conduit, and a second position where first fluid does not flow between the first fluid conveying conduit and the third fluid conveying conduit; and the second diaphragm being movable between a first position where the second fluid flows between the second fluid conveying conduit and the third fluid conveying conduit, and a second position where the second fluid does not flow between the second fluid conveying conduit and the third fluid conveying conduit.

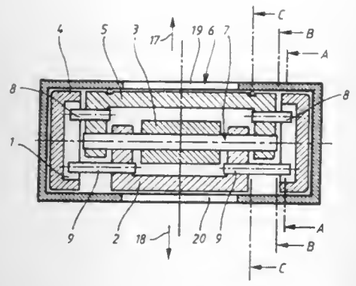
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5,743,296
**VALVE MECHANISM WITH CONSTRAINT GUIDE MEANS**
**Hubert Bösch, Sand-strasse 29, A-6890 Lustenau, Austria**
**Filed Dec. 7, 1994, Ser. No. 350,780**
**Claims priority, application Germany, Dec. 8, 1993, 43 41 816.3**
**Int. Cl.[6] F16K *3/00***
**U.S. Cl. 137—614.21** **10 Claims**

1. A valve mechanism for opening and closing of the valve, the valve comprises a housing with an inlet and an outlet opening, the mechanism comprising:
guide means oppositely disposed in said housing;
at least one movable plate arranged in-between said guide means;
a central plate movably arranged in-between said guide means and in parallel to the movable plate;
the movable plate is provided with slots and with shafts which are fixedly connected thereto;
the shafts are guided in the guide means; and

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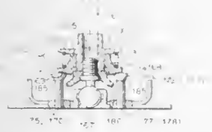




the central plate having at least one shaft fixedly connected thereto, the shaft extends through said slots in the movable plate and is guided in said guide means.

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**5,743,297**
**DETENT ARRANGEMENT FOR HOLDING HYDRAULIC VALVE MEMBER STROKED**
**Michael A. Mueller, Circle Pines, Minn., assignor to Dana Corporation, Toledo, Ohio**
**Continuation-in-part of Ser. No. 609,734, Mar. 1, 1996, Pat. No. 5,638,866. This application Feb. 27, 1997, Ser. No. 806,713**
**Int. Cl.[6] F15B** *13/04;* **F16K** *11/18;31/06*
**U.S. Cl. 137—636.2** **6 Claims**



1. In a joystick operated hydraulic valve having a casing with at least four work ports; at least first and second valve members disposed to open and close the respective four work ports, and at least four operating plungers each having outer ends and being biased to a neutral position within the casing, the four operating plungers being engageable with the respective second valve members; a joystick pivotally mounted on the casing and operably engaging selective end surfaces of the outer ends of the operating plungers to allow pivotal movement of the joystick to cause up to two of the operating plungers to move inwardly from a neutral position to a depressed position to stroke the respective valve to an open position, while the other operating plungers remain in a neutral position; the improvement comprising:

detents within the casing for latching against axial movement the plungers, each of the detents having first components which are stationary with respect to the plungers and second components which are fixed to the plungers, the second components being disposed between the outer ends of the plungers and the first components and acting to hold the respective operating plunger depressed and the valve member stroked after a selected pivotal movement of the joystick;

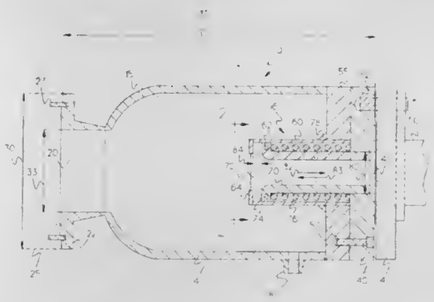
a slidable cam cooperatively disposed between the outer ends of the plungers and a surface on the joystick for engaging the end surfaces of the outer ends of the plungers, the slidable cam having a surface depressing the plungers to stroke the respective valve member upon pivoting the joystick toward the plunger selected for operation;

a spring a spring disposed between an axial location on the joystick and an opposing location on the slidable cam for urging the slidable cam surface toward the end surface of the plungers; and,

a plurality of second cam surfaces disposed annularly about an axis on the joystick for engaging the outer ends of the plungers when the plungers are depressed to pull the plungers and disengage the first and second components of the detents from one another so as to unstroke to a closed position the valves.

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**5,743,298**
**SPRING PULSATION DAMPENER**
**Richard F. Whitesell, Clarence, N.Y., assignor to Techniflo Corporation, Clarence Center, N.Y.**
**Filed Apr. 22, 1996, Ser. No. 635,600**
**Int. Cl.[6] F16L** *55/04*
**U.S. Cl. 138—31** **24 Claims**



1. A gas or liquid pulsation dampening system comprising a spring pulsation dampening valve and a vessel for housing said valve and for containing a gas or liquid, said vessel having a pulsating gas or liquid inlet and a dampened gas or liquid outlet, and support means for holding said spring pulsation dampening valve in axial alignment with said dampened gas or liquid outlet, said spring pulsation dampening valve comprising first and second ends, a stationary outer sleeve, a gas or liquid flow restricting tube means positioned in the interior of said stationary sleeve for axial oscillation therein, said gas or liquid flow restricting tube means having a gas or liquid intake at the first end of said spring pulsation dampening valve and gas or liquid outlet at the second end of said spring pulsation dampening valve, and a spring operated pressure receiving means proximate to said gas or liquid intake for receiving and sensing gas or liquid pressure.

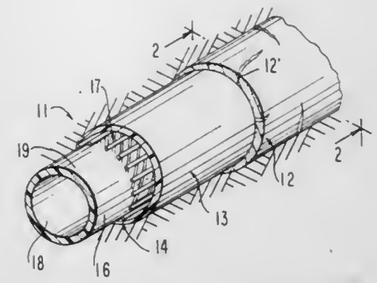
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**5,743,299**
**DUAL CONTAINMENT PIPE REHABILITATION SYSTEM AND METHOD OF INSTALLATION**
**Douglas K. Chick, Elstree, England, and F. Thomas Driver, Memphis, Tenn., assignors to Insituform (Netherland) B.V., Netherlands**
**Continuation of Ser. No. 183,146, Jan. 18, 1994, Pat. No. 5,546,992. This application Jun. 7, 1995, Ser. No. 485,013**
**Int. Cl.[6] F16L** *55/16*
**U.S. Cl. 138—98** **22 Claims**

1. A dual containment pipe system suitable for installation into an existing secondary containment conduit of a given length, comprising

an impervious primary containment pipe which is adapted to be installed in the existing secondary containment conduit and after installation is configured to conform to the interior configuration of the secondary containment conduit, and

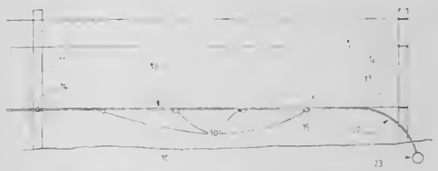




substantially crush-resistant spacer means disposed about the entire external circumference and along substantially the entire length of the primary containment pipe for maintaining the primary and secondary containment pipe substantially coaxial by forming a substantially uniform space between the primary containment pipe and the secondary containment conduit after installation of the primary containment pipe.

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**5,743,300**
**TUBE WITH LINE MEMBER**
**Paul Anthony McNeill, Paddington, Australia, assignor to PPI Corporation Pty. Ltd., Queensland, Australia**
**Filed Jan. 13, 1997, Ser. No. 781,496**
**Claims priority, application Australia, Jan. 25, 1996, PN7730; Jul. 8, 1996, PO0872**
**Int. Cl.[6] F16L** *3/00;* **E21F** *17/02;* **B05B** *15/06*
**U.S. Cl. 138—107** **13 Claims**



1. A flexible irrigation tube arrangement comprising:

a flexible plastic tube through which fluid can be conveyed;

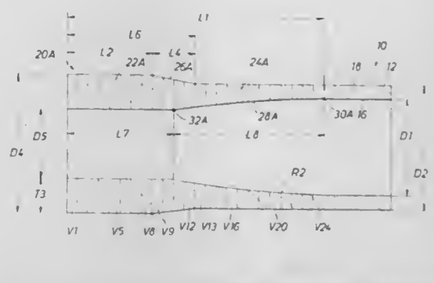
a flexible but substantially inextensible line member formed with the tube to allow the tube to be stretched between spaced apart supports without undesirable sagging of the tube; and

a series of spaced apart drippers extending from the tube, the drippers having an inlet in fluid communication with the fluid in the tube and an outlet to allow fluid to pass from the tube, wherein the line member allows the tube to be suspended substantially horizontally so that the fluid which passes through the drippers does not run along an outside wall of the tube.

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**5,743,301**
**METAL PIPE HAVING UPSET ENDS**
**Thomas E. Winship, Houston, Tex., assignor to Shaw Industries Ltd., Ontario, Canada**
**Division of Ser. No. 338,959, Nov. 14, 1994, Pat. No. 5,517,843, which is a continuation-in-part of Ser. No. 214,391, Mar. 16, 1994, abandoned. This application Nov. 24, 1995, Ser. No. 562,449**
**Int. Cl.[6] F16L** *9/02;* **B21D** *41/02*
**U.S. Cl. 138—109** **3 Claims**

1. A metal pipe having a central portion of uniform inner and outer peripheral surfaces and an internal upset end portion adjacent said central portion at an end of said pipe, said internal upset end portion comprising:

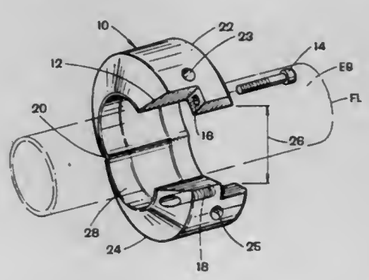


an end section of an increased outer diameter and wall thickness at the end of said upset end portion and defining inner and outer peripheral surfaces; and

an inner transition section of a varying wall thickness between said central portion and said end section; said inner transition section having an inner peripheral surface extending between said inner peripheral surface of said central portion and said inner peripheral surface of said end section, said inner transition section having an axial length which is greater than one-half the inside diameter of said central portion of said pipe, and said inner peripheral surface of said transition section being of an inner concave curvature formed from a radius having a length which is at least three times the axial length of said transition section.

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**5,743,302**
**FLOW LINE SEGMENT WITH NON-METALLIC PIPE COLLAR**
**Jess McNeely, P.O. Box 1888, Humble, Tex. 77347-1888**
**Filed Sep. 3, 1996, Ser. No. 712,107**
**Int. Cl.[6] F16L** *9/18*
**U.S. Cl. 138—113** **35 Claims**



1. A collar for encircling the external surface of a pipe, said collar comprising:

a plurality of substantially arcuate individual non-metallic sections, each of said substantially arcuate individual non-metallic sections being constructed and arranged to partially encircle the external surface of the pipe;

at least one non-metallic threaded fastener for threadably interconnecting each of said plurality of said substantially arcuate individual non-metallic sections one to another so that together said plurality of said substantially arcuate non-metallic sections encircle the pipe, said at least one non-metallic threaded fastener being oriented in a direction substantially parallel to the long axis of the pipe;

said at least one non-metallic threaded fastener for threadably interconnecting each of said plurality of substantially arcuate individual non-metallic sections not extending beyond the outer surface of said substantially arcuate individual non-metallic sections.

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**5,743,303**

## LOW VOLUME, HIGH STRENGTH, HIGH MELTING POINT SINGLE JACKET ELASTOMER LINED FIRE HOSE

**Duane Leonhardt, Dollard des Ormeaux, Canada, assignor to Mercedes Textiles Limited, Canada**

**Filed Oct. 10, 1995, Ser. No. 541,796**

**Int. Cl.[6] F16L *11/02***

**U.S. Cl. 138—126** **2 Claims**

1. A fire hose comprising an outer woven layer of aramid fibers having a burst strength of at least 750 p.s.i., a melting point of at least 400° C., a weight of between 5 pounds and 8 pounds per one hundred feet and an inner elastomer lining, said fire hose having a volume of less than 0.18 cubic feet per one hundred feet when rolled.

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**5,743,304**

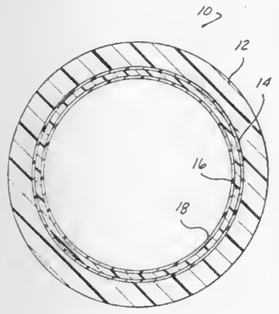
## MULTI-LAYER FUEL AND VAPOR TUBE

**Frank L. Mitchell, Rochester, Mich.; David L. Noone, Marsberg, Germany, and Tao Nie, Macomb, Mich., assignors to ITT Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 896,824, Jun. 11, 1992, Pat. No. 5,383,087, which is a continuation-in-part of Ser. No. 868,754, Apr. 14, 1992. This application Oct. 27, 1994, Ser. No. 329,900**

**Int. Cl.[6] F16L *11/04***

**U.S. Cl. 138—137** **28 Claims**




1. A layered tubing for use in a motor vehicle, the tubing comprising:

a flexible outer layer having a given thickness and an inner and an outer face, the outer layer consisting essentially of an extrudable thermoplastic composed of polyamides and thermoplastic elastomers selected from the group consisting of thermoplastic vulcanates and melt processible rubbers;

an intermediate bonding layer bonded to the inner face of the outer layer, the intermediate bonding layer consisting essentially of an extrudable melt processible thermoplastic capable of sufficiently permanent laminar adhesion to the inner face of the outer layer;

an interior layer bonded to the intermediate bonding layer, the interior layer consisting essentially of an extrudable, melt-processible thermoplastic material capable of sufficiently permanent laminar adhesion with the intermediate bonding layer, the melt-processible thermoplastic of the interior layer being chemically dissimilar to the thermoplastic employed in the outer layer and containing at least one fluoroplastic component, the melt-processible thermoplastic of the interior layer being resistant to permeation by and interaction with short-chain aliphatic and aromatic hydrocarbon compounds; and

an innermost electrostatic dissipation layer integrally bonded to the interior layer, the electrostatic dissipation layer consisting of an extrudable, melt-processible thermoplastic material capable of sufficiently permanent laminar adhesion with the intermediate bonding layer and of dissipating electrostatic energy, the electrostatic dissipation capacity being in a range between about $10^4$ to $10^9$ ohm/cm$^2$.

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**5,743,305**

## SHEDDING CONTROL METHOD BASED ON STORED SHEDDING CURVES

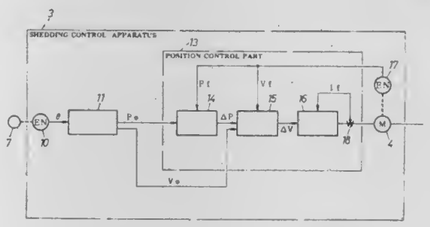
**Zenji Tamura, and Satoshi Azuma, both of Kanazawa, Japan, assignors to Tsudakoma Kogyo Kabushiki Kaisha, Kanazawa, Japan**

**Filed Oct. 17, 1996, Ser. No. 733,326**

**Claims priority, application Japan, Oct. 18, 1995, 7-294884; Sep. 5, 1996, 8-253976**

**Int. Cl.[6] D03C *13/00;17/06;* D03D *51/02***

**U.S. Cl. 139—1 E** **6 Claims**




1. A shedding control method in an electric shedding apparatus for driving each of a plurality of heddle frames independently in synchronization with rotation of a main shaft of a loom, said method comprising:

partitioning one repeating shedding pattern between maximum shedding positions for each cycle of said loom;

storing, in advance, partitioned shedding pattern constituents in a memory so that said partitioned shedding pattern constituents correspond to specified numbers;

storing, in advance, said repeating shedding pattern in said memory by partitioned shedding sequential step numbers and the corresponding specified numbers of said partitioned shedding pattern constituents;

selecting shedding patterns constituents corresponding to output steps based on step numbers which are output and conform to an amount of rotation of said loom main shaft, said stored partitioned pattern constituents, and said partitioned shedding sequential step numbers; and

outputting an instruction of shedding amount for each of said heddle frames in accordance with the rotation of said main shaft based on the selected shedding pattern constituents, and switching the shedding pattern constituents by an angle of said main shaft which dwells at the maximum shedding state so as to drive said heddle frame.



**5,743,306**

## APPARATUS AND METHOD FOR LOADING TUFTS INTO A TUFT CARRIER

**Richard Donald Stewart, Co. Down, and John Dalton Griffith, Sunderland, both of United Kingdom, assignors to Ulster Carpet Mills (Holdings) Limited, Craigavon, United Kingdom**

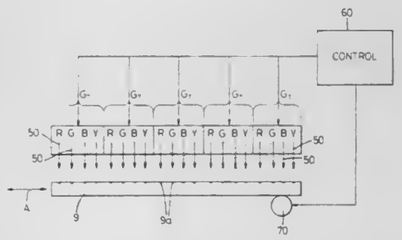
**PCT No. PCT/GB95/01090, § 371 Date Jul. 22, 1996, § 102(e) Date Jul. 22, 1996, PCT Pub. No. WO95/31594, PCT Pub. Date Nov. 23, 1995**

**PCT Filed May 12, 1995, Ser. No. 676,383**

**Claims priority, application United Kingdom, May 12, 1994, 9409442**

**Int. Cl.[6] D03D *39/00***

**U.S. Cl. 139—7 A** **11 Claims**




1. Loading apparatus to load individual tufts into an elongate tuft carrier having tuft retention sites spaced along its length, the apparatus including:

guide means for guiding the tuft carrier along a path of travel,

a series of individually selectively operable tuft forming means spaced along said path of travel,

each tuft forming means being operable when selected to feed an individual tuft to a tuft retention site on said carrier,

drive means drivingly connected to the carrier for moving the carrier along said path of travel, the drive means being operable to intermittently move the carrier through a series of successive positions where predefined tuft retention sites are moved temporarily into registry with each tuft forming means, and

control means for controlling selective operation of the series of tuft forming means, the control means being operable to actuate selected tuft forming means to feed tufts to those sites in registry with the selected tuft forming means while the carrier is located at each successive position.

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**5,743,307**

## HYDRAULIC WARP TENSIONING APPARATUS

**Carlos Derudder, Heule, and Joseph Verschelde, Anzegem, both of Belgium, assignors to Michel Van De Wiele N.V., Marke, Belgium**

**Filed Oct. 17, 1996, Ser. No. 733,663**

**Claims priority, application Belgium, Oct. 24, 1995, 09500882**

**Int. Cl.[6] D03D *49/12***

**U.S. Cl. 139—110** **4 Claims**

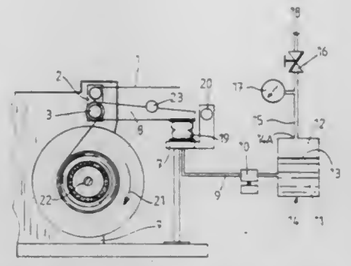
1. A system for bringing ground warp threads under tension on a beam stand comprising:

a) a first roller on which the ground warp threads run;

b) a second roller on which the ground warp threads run;

c) a support on which said first roller is mounted and which is movable in relation to the second roller; and

d) a hydraulic element exerting force on said support whereby the ground warp threads on the beam stand are brought under tension, said hydraulic element being connected to a hydraulic pressure vessel by means of a pipe, said pipe including an adjustable and controllable hydraulic fluid valve allowing regulation and control of hydraulic damping in said pipe.




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**5,743,308**

## DOUBLE LIFT WEAVE SYSTEM

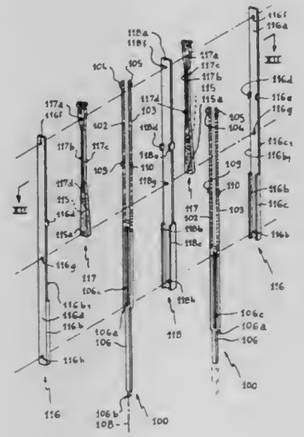
**Dario Bassi; Damien Bouchet, both of Chaponnay, and Laurent Stocker, Caluire, all of France, assignors to Staubli Lyon, Chassieu, France**

**Filed Dec. 9, 1996, Ser. No. 761,382**

**Claims priority, application France, Dec. 12, 1995, 95 14882**

**Int. Cl.[6] D03C *3/20;3/06***

**U.S. Cl. 139—455** **18 Claims**




1. A double-lift weave system for a weaving loom, the weave system comprising:

a plurality of hooks each having two arms extending from a base, each arm including a lift lip adapted to be selectively engageable with a knife of a griffe frame,

an actuator disposed between said arms for moving said arms to selectively position said lift lips thereof from a first position wherein said lift lips are free of engagement with a knife to a second position wherein said lift lips are engageable with a knife, each hook further including two open shed heels adapted to be selectively engageable with open shed bars spaced on opposite sides of said hooks, said open shed heels being controlled by said actuator so as to be moveable from a first position spaced from the open shed bars to a second position wherein said open shed heels are engageable with the open shed bars.

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5,743,309

## JOINING TOOL AND A METHOD FOR ITS USE

Rolf James Slater Christensen, Mølagervej 23, DK-8382, Hinnerup, Denmark

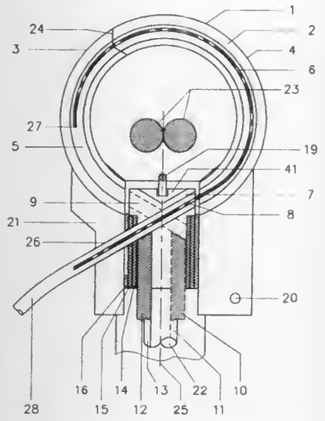
PCT No. PCT/DK95/00165, § 371 Date Oct. 1, 1996, § 102(e) Date Oct. 1, 1996, PCT Pub. No. WO95/29021, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 20, 1995, Ser. No. 718,395

Claims priority, application Denmark, Apr. 20, 1994, 0454/94

Int. Cl.[6] B21F *09/02*

U.S. Cl. 140—119 8 Claims




1. A method for automatically joining at least two reinforcement bars using a joining tool that includes a two-section annular body and a rotation head, said annular body defining a radially inwardly-open track along which a binding wire can be pushed so as to surround the reinforcement bars to be joined and to pass into the rotation head, the method comprising the steps of:

(a) positioning the annular body around the reinforcement bars to be joined,

(b) passing a binding wire in a forward direction along said track in the annular body so as to surround the reinforcement bars to be joined and so that a free end of the binding wire enters the rotation head,

(c) fixedly clamping the free end of the binding wire in the rotation head,

(d) pulling the binding wire in a backward direction so that the binding wire moves inwardly out of said track and tightly around the reinforcement bars to be joined,

(e) clamping the binding wire at a point remote from the free end so that the binding wire remains tightly wrapped around the reinforcement bars to be joined,

(f) cutting the binding wire adjacent said clamping point,

(g) rotating said rotation head so that ends of said binding wire are twisted together to fixedly wrap said binding wire around said reinforcement wires to be joined, said rotation including rotation in a first direction with brief intermittent rotations in a reverse, second direction, and

releasing said binding wire from said rotation head.

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5,743,310

## SINGLE-HANDLED BANDING TOOL HAVING MULTIPLE PIVOT POINTS

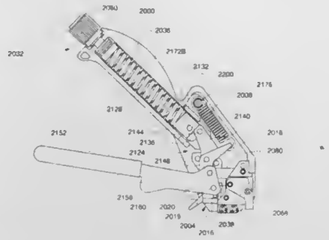
Richard T. Moran, Denver, Colo., assignor to Band-It-IDEX, Inc., Denver, Colo.

Filed May 22, 1996, Ser. No. 651,452

Int. Cl.[6] B21F *9/02*

U.S. Cl. 140—123.6 42 Claims

1. A banding tool for tensioning a band about an object, comprising:




a banding tool housing;

a first handle associated with said banding tool housing;

a band tensioning assembly associated with said banding tool housing;

a band cutting assembly associated with said banding tool housing;

first means for actuating said band tensioning assembly, said first means for actuating comprising first means for pivoting said first handle substantially about a first pivot point in a first direction; and

second means for actuating said band cutting assembly, said second means for actuating comprising second means for pivoting said first handle about a second pivot point different from said first pivot point and in said first direction, wherein when said second means for actuating said band cutting assembly is engaged said first handle pivots about said second pivot point and is disengaged from pivoting about said first pivot point.

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5,743,311

## LIQUID DISPENSER FOAM LIMITING ELEMENT

Garry William Crossdale, Ripley, and Michael James Stevens, Derby, both of Great Britain, assignors to Diversey Lever, Inc., Plymouth, Mich.

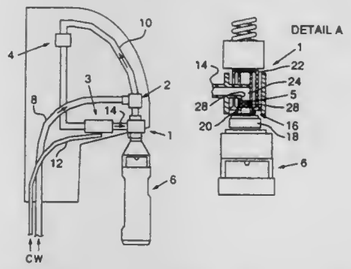
PCT No. PCT/CA94/00380, § 371 Date Mar. 1, 1996, § 102(e) Date Mar. 1, 1996, PCT Pub. No. WO95/01934, PCT Pub. Date Jan. 19, 1995

PCT Filed Jul. 15, 1994, Ser. No. 586,649

Claims priority, application United Kingdom, Jul. 5, 1993, 9313854.3

Int. Cl.[6] B67C *3/26*

U.S. Cl. 141—31 8 Claims




1. A foam control element configured for use in a dispenser for liquids which tend to foam when dispensed, the element comprising a three-dimensional mesh of multiplicity of fine fibres which are connected together to create a multiplicity of irregular liquid paths through the spaces between the fibres, the ratio of the fineness f (decitex) of the fibres to the product of the element thickness t (mm) and the element density d ($kg/m^3$) being less than 0.6, said element having a three-dimensional configuration to fit within a dispensing head of a dispenser, whereby said foam control element when in use in absence of air flowing therethrough reduces foam height when a container is filled with such liquid.



5,743,312

## COMPONENT MIXING APPARATUS AND SYSTEM INCLUDING A MOVABLE CANNULA

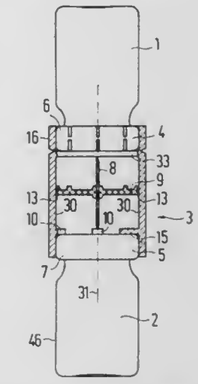
Thomas Pfeifer, Eschenburg; Dietmar Weitzel, Marburg; Wolfgang Kneip, Marburg; Bernhard Vohwinkel, Marburg, and Axel von Brand, Budenheim, all of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Germany

Filed Apr. 9, 1996, Ser. No. 629,630

Claims priority, application Germany, Apr. 11, 1995, 195 13 666.7

Int. Cl.[6] B65B *1/04*

U.S. Cl. 141—329 20 Claims




19. An apparatus for combining a first substance in a first container and a second substance in a second container, comprising:

a hollow body having a first open end for receiving a closure-end portion of the first container and a second open end for receiving a closure end portion of the second container;

a cannula holder in the hollow body;

at least one cannula for penetrating a first stopper on the first container and a second stopper on the second container, the cannula extending from the cannula holder; and

retainer bridges connecting the cannula holder to an inner wall surface of the hollow body, the retainer bridges being fractured after the cannula penetrates the first stopper during insertion of the first container in the hollow body so that the cannula holder and cannula move toward the second open end of the hollow body.

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5,743,313

## APPARATUS AND METHOD FOR EMPTYING A CONTAINER IN AN ASEPTIC MANNER

Lars Josefsson, Libertyville, Ill., assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Filed Apr. 10, 1996, Ser. No. 629,830

Int. Cl.[6] B65B *1/04*

U.S. Cl. 141—330 25 Claims

1. A device for emptying a container in a generally hygienic manner, the device comprising:

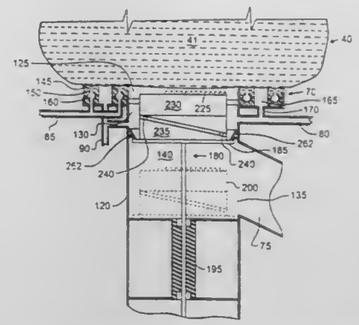
a housing having a first aperture that opens to a first internal chamber and having a second aperture that opens to a second internal chamber, the second internal chamber being generally hygienic;

a sealing member disposed about the first aperture for sealing the container to be emptied over the first aperture;

sterilizing means for rendering the first internal chamber generally hygienic when the container has been sealed over the first aperture;

chamber separating means for selectively providing fluid communication between the first and second internal chambers, the chamber separating means being operable to seal the first internal chamber from the second internal chamber when the first internal chamber is exposed to a non-hygienic environment, and operable to allow fluid communication between the first and second internal chambers after the first internal chamber has been rendered generally hygienic by the sterilizing means, the chamber separating means comprising a piston moveable between a first position in which it defines and seals the first internal chamber and a second position in which the first and second internal chambers are in fluid communication; and

a cutting member operable to cut the container in the area of the first aperture to thereby allow the container to be emptied into the first internal chamber.




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5,743,314

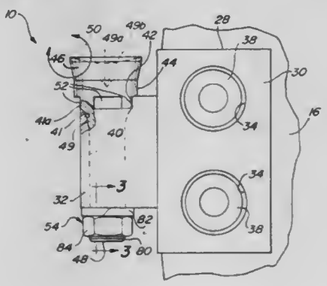
## STUMP CUTTING TOOL ASSEMBLY

Leonard D. Puch, New Boston, Mich., assignor to Green Manufacturing Inc., New Boston, Mich.

Continuation-in-part of Ser. No. 635,484, Apr. 22, 1996, abandoned. This application Jan. 27, 1997, Ser. No. 789,002

Int. Cl.[6] A01G *23/06*; B27G *13/04*

U.S. Cl. 144—24.12 21 Claims




1. A stump cutting tool assembly for a stump cutting apparatus having a rotatable cutting wheel comprising:

at least one tool holder removably secured to the cutting wheel;

at least one cutting tooth having a substantially continuous unobstructed front face and a substantially continuous unobstructed rear face mounted circumferentially and removably to said at least one tool holder;

said at least one tool holder comprising a wheel portion extending circumferentially along the cutting wheel and a tool portion extending axially at an angle to a plane of said wheel portion, said tool portion having an aperture extending circumferentially therethrough; and

means mounting said cutting tooth to said tool holder including a shank attached to said rear face of said cutting tooth, said shank comprising an elongated portion extending through said aperture and an insert attached to said shank.

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### 5,743,315
### METHOD FOR CUTTING TREES AND GRINDING AND MULCHING TREE STUMPS

Pasquale A. Esposito; Patsy A. Esposito, Jr., and Wayne J. Esposito, all of P.O. Box 6, Davenport, Fla. 33837

Continuation of Ser. No. 425,936, Apr. 19, 1995, Pat. No. 5,499,771, and a continuation of Ser. No. 579,152, Dec. 27, 1995, Pat. No. 5,641,129. This application Apr. 28, 1997, Ser. No. 845,921
Int. Cl.[6] A01G *23/06*
U.S. Cl. 144—334 11 Claims



1. A method for cutting and grinding trees and grinding and mulching the resulting tree stump with a vehicle having a substantially arcuate shield, a boom assembly pivotally attached to said shield, means to pivot said boom assembly relative to said shield, a substantially cylindrical drum with cutting teeth attached to said boom assembly, means carried by said boom assembly to move said drum with cutting teeth up and down to engage a tree, and means to rotate said drum with cutting teeth, comprising the steps of:

(a) grinding substantially all of an area of said upper portion of a tree trunk with said cylindrical drum with cutting teeth;

(b) pushing said drum against said tree trunk at a point above said area of said upper portion of said tree trunk resulting from said grinding step until said upper portion of said tree trunk breaks off, leaving a tree stump;

(c) grinding said tree stump resulting from said pushing step down to ground level with said drum with cutting teeth; and,

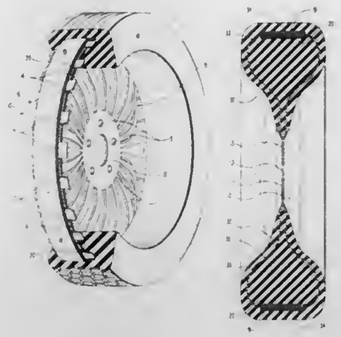
(d) depositing the tree cuttings that result from said grinding step (c) around said tree stump as said tree stump is ground down to ground level.

### 5,743,316
### DYNAMIC STEERABLE WHEEL SPRING

Dennis S. Chrobak, Silver Lake, Ohio, assignor to American Mobility Systems, Inc., Boulder City, Nev.

Filed Mar. 2, 1995, Ser. No. 398,422
Int. Cl.[6] B60B *9/04*
U.S. Cl. 152—12 26 Claims

1. A dynamic steerable wheel spring comprising, a pair of units each individually formed from a single section of a spring steel material having a uniform thickness with said section of spring steel manufactured to have a flat circular center hub having hole means formed therein for axial mounting, and where, from an outer edge of said hub, identical equidistantly spaced segments extend radially outwardly that are each identically bent outwardly from the plane of said hub at identical points therealong and with said elements each sloping outwardly from said plane of said hub, are bent inwardly at identical points therealong towards the plane of said hub, and each element, at a top portion is bent inwardly at a same radius to form segment ends that are each at an identical

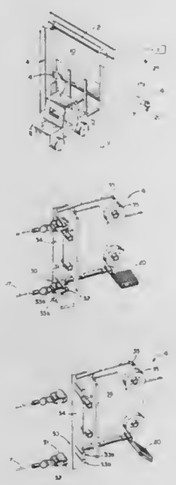


distance from, the circumference of and cross at right angles to said hub to form a plurality of equal spaced apart fingers; and the hubs of said pair of units are secured together such that the hole means in said hubs are aligned and the fingers of one of each said units interdigitate with and fit alongside to be equally spaced apart from the fingers of the other unit.

### 5,743,317
### IMPACT DETECTION SYSTEM FOR INDUSTRIAL DOORS

Mark D. Beringer, Sherril; David P. Leppert, Zwingle, both of Iowa, and Peter S. Schulte, East Dubuque, Ill., assignors to Rite-Hite Corporation, Milwaukee, Wis.

Filed Jul. 24, 1996, Ser. No. 686,996
Int. Cl.[6] G08B *13/08*
U.S. Cl. 160—10 17 Claims



1. An impact detection system for use on an industrial door movable relative to a doorway between blocking and unblocking positions, the detection system comprising:

a first member adapted to be disposed adjacent the door, and capable of movement therewith;

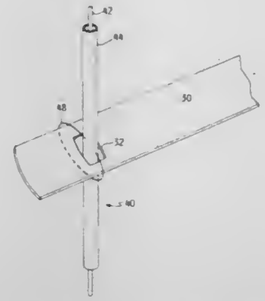
a second member which can be coupled to the door for travel therewith;

a releasable coupling between the first member and the second member, the releasable coupling providing coupling of the first and second members such that they travel together with the door during unimpeded door operation, and providing separation of the first and second members for an impact on the door above a predetermined magnitude;

a reflector coupled to the first member and movable from a first position to a second position in response to separation of the first member and the second member, and

a radiation emitter which emits a radiation beam, and a radiation detector, which are disposable adjacent the doorway such that the radiation beam is reflected back to the detector with the reflector in one of the first and second positions, and such that the radiation beam is reflected away from the detector with the reflector in the other of said first and second positions.

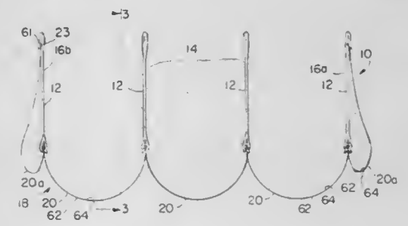




### 5,743,318
### VERTICAL WINDOW SHADE

Bryan K. Ruggles; Jace N. Green, both of Salt Lake City, Utah, and Richard F. Chacon, Brea, Calif., assignors to Newell Operating Company, Freeport, Ill.

Continuation-in-part of Ser. No. 263,058, Jun. 21, 1994, abandoned. This application Mar. 15, 1996, Ser. No. 619,822
Int. Cl.[6] E06B *9/30*
U.S. Cl. 160—168.1 V 25 Claims



1. A blind assembly comprising:

a plurality of elongated main louvers and a pair of end louvers, each main louver and each end louver having a leading edge and a rear edge, each main and end louver including a front socket adjacent the leading edge, the front socket having an interior, each end louver including a rear socket proximate the rear edge, the rear socket including a rear interior; and

a curtain including a first end and a second end, the curtain having a plurality of parallel spaced longitudinal members attached thereto, the curtain disposed and passing adjacent each front leading edge of the main and end louvers, the first end of the curtain adjacent the rear edge of one end louver and the second end of the curtain adjacent the rear edge of the other end louver, each longitudinal member fitting within the front and rear sockets.

### 5,743,319
### WINDOW BLIND WITH SAFETY PULL CORD

Herman P. Christopherson, 18321 Deer Run Ct., Prior Lake, Minn. 55372

Filed Jan. 7, 1997, Ser. No. 779,842
Int. Cl.[6] E06B *9/30*
U.S. Cl. 160—173 R 6 Claims

1. An improved window blind comprising

a bottom rail and a head rail;

two or more pull cords connecting the bottom rail to the head rail, for raising and lowering the window blind,

multiple slats between the bottom rail and the head rail, each of said slats having a cord hole for the passage of each pull cord therethrough, the cord holes of each slat aligned with the pull cords;

wherein the improvement comprises:

(a) each pull cord having a length and comprising an inner element and a longitudinally compressible outer element, the inner element used for raising and lowering the bottom rail and the slats, and the outer element used for attaching the pull cord to the slats, said outer element

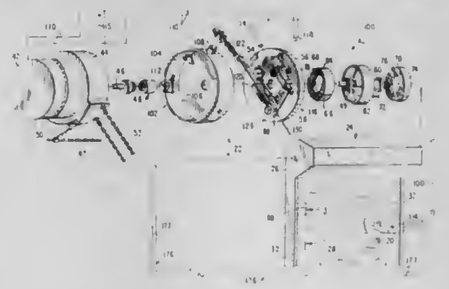
(1) encompassing the inner element over a portion of the length of the inner element, and

(2) affixed to one or more slats of the window blind.

### 5,743,320
### OBSTRUCTION-RESPONSIVE BRAKE ACTUATOR FOR FIRE DOOR OR THE LIKE

James M. McKeon, Brooklyn, N.Y., assignor to Mckeon Rolling Steel Door Company, Inc., Brooklyn, N.Y.

Filed Jun. 11, 1996, Ser. No. 664,205
Int. Cl.[6] E06B *9/56*
U.S. Cl. 160—310 10 Claims



1. An obstruction-responsive brake actuator for a fire door safety barrier comprising a rollable fire door curtain having a leading edge which, when the curtain is closing, faces the direction of travel such that an object obstructing closure of the curtain is brought in close proximity to the leading edge, the safety barrier further including a brake operatively engageable with the curtain for preventing closure thereof, the brake being biased against operative engagement with the curtain, the curtain being biased to close when it is out of operative engagement with the brake, said obstruction-responsive brake actuator comprising:

a support;

a bumper carried by said support and movable relative thereto in a direction parallel to the direction of travel of said curtain between an operative position and an inoperative position, said bumper having a lower surface which contacts said object obstructing closure of the curtain; and

a load-carrying linkage carried by said support and including actuating means connected to the brake and moveable into and out of an actuating position relative to said support so that when a force is applied to said bumper sufficient for movement of said bumper to said operative position, the force is transmitted through said linkage to the brake for causing operative engagement of the brake with the curtain, thereby preventing further closure of the curtain.

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5,743,321

## PROCESS FOR THE PRODUCTION OF PARTS WITH A SPIRALLY SYMMETRICAL OUTER CONTOUR

Friedrich-W. Joern, Battenbarg; Rolf Dieterich, Horb, and Wolfgang Sandkoetter, Herrenberg, all of Germany, assignors to Bitzer Kuehlmaschinenbau GmbH & Co. KG, Sindelfingen, Germany

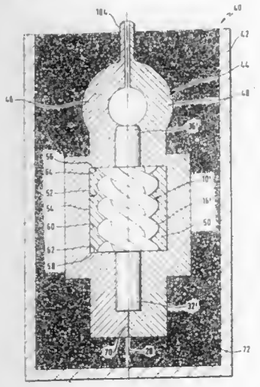
Filed Mar. 27, 1996, Ser. No. 622,742

Claims priority, application Germany, Jul. 27, 1994, 44 26 567.0; Aug. 31, 1994, 44 30 890.6

Int. Cl.[6] B22C *9/22*; B22D *25/02*

U.S. Cl. 164—44 17 Claims

1. A process for the production of a part made of cast iron



comprising a rotor for a screw compressor having a compression section with an outer contour which is spirally symmetrical to an axis of symmetry, comprising the steps of:

producing a casting mold member from a master having said compression section, such that said casting mold member surrounds said master in an azimuthally closed manner with respect to said axis of symmetry;

providing a casting mold by placing said casting mold member as an insert in an outer mold;

producing said rotor as a casting by (a) feeding a cast iron melt into said casting mold (b) cooling said cast iron melt in said casting mold member, and (c) adapting the feeding conditions and cooling conditions so as to produce a graphitization pressure due to graphite separating out from said cast iron melt during solidification of said cast iron melt to prevent cavities and pores in the casting, and to chill facial regions of said cast iron melt in said casting mold to obtain shell hardening of said cast iron melt therein.

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5,743,322

## METHOD FOR FORMING AN ARTICLE EXTENSION BY CASTING USING A CERAMIC MOLD

Melvin Robert Jackson; Bernard Patrick Bewlay, both of Niskayuna, and Ann Melinda Ritter, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 27, 1996, Ser. No. 672,160

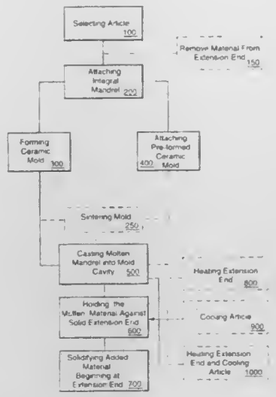
Int. Cl.[6] B22D *19/10*

U.S. Cl. 164—98 25 Claims

1. A method for providing an integral extension on an article, comprising the steps of:

selecting an article comprising an extension end having a cross-sectional shape, an extension bonding surface and an outer surface defined by the cross-sectional shape, the extension end also having a microstructure comprising a superalloy composition and a directionally oriented crystal structure;

attaching a mandrel to the extension bonding surface, the mandrel having a cross-sectional shape that is compatible with the cross-sectional shape of the extension end and an outer surface that communicates with the outer surface of the extension end;




forming a ceramic mold over the outer surface of the mandrel and at least a portion of the outer surface of the extension end, the mold having a mold cavity with a shape that is defined by the mandrel and defines the shape of an integral extension, the mold having at least one gating means that communicates with the mold cavity;

removing the mandrel;

casting a molten material having an alloy composition that is compatible with the superalloy composition of the article into the mold cavity through the gating means, the article and mold having been oriented prior to said casting so that the cast molten material is in contact with the extension bonding surface;

heating the cast molten material with external means for heating while holding the extension end in contact with the molten material for a time sufficient to allow a portion of the extension bonding surface to be heated by and interact with the molten material as a microstructure growth seed; and

cooling the extension end under controlled thermal conditions so as to cause the molten material to solidify on the growth seed, at an interface between them that moves from the extension bonding surface into the molten material, as an integral extension that generally conforms to the shape of the mold cavity and has a microstructure that is compatible with the microstructure of the extension end, the cooling under controlled thermal conditions comprising maintaining a temperature gradient within the article such that the temperature is highest at the interface and decreases within the article as a function of increasing distance from the interface.

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5,743,323

## APPARATUS FOR CONTINUOUS CASTING

Haruo Ohguro; Toshihiro Kosuge; Katsuhiko Kawamoto; Ryuuzou Hanzawa; Shogo Matsumura; Hiroyuki Kawai; Hiroyuki Nakashima; Yukio Morimoto; Youji Ao; Tsutomu Fujii, all of Hikari; Hideo Kaneko, and Hatsuyoshi Kumashiro, both of Kobe, all of Japan, assignors to Nippon Steel Corporation, Tokyo, and Kawasaki Jukogyo Kabushiki Kaisha, Kobe, both of Japan

Division of Ser. No. 742,422, Aug. 8, 1991, Pat. No. 5,335,715. This application Apr. 25, 1994, Ser. No. 232,667

Claims priority, application Japan, Jun. 7, 1990, 2-147407; Jul. 3, 1990, 2-70392; Aug. 9, 1990, 2-209298; Aug. 9, 1990, 2-209299; Jan. 11, 1991, 3-12560; Apr. 10, 1991, 3-77690; Apr. 10, 1991, 3-77691; Jun. 7, 1991, 3-51409

Int. Cl.[6] B22D *11/10*

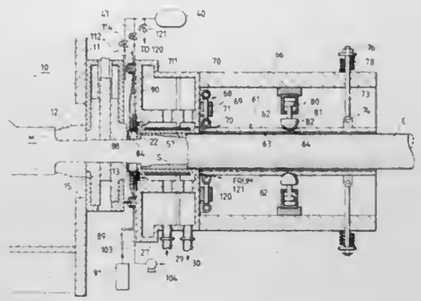
U.S. Cl. 164—415 18 Claims

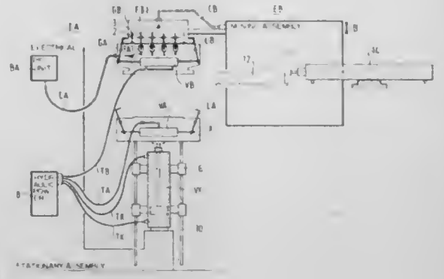
1. A continuous casting apparatus, comprising:

a tundish for containing molten metal;

a tundish nozzle provided at the bottom of said tundish;







a break ring communicating with said tundish nozzle;

a mold, said mold having an inlet, an outlet and a contact area, for continuously cooling molten metal the molten metal being supplied from said tundish through said tundish nozzle and said break ring, in direct contact with said mold and forming the molten metal into a cast section by allowing solidification of the molten metal to start below the surface thereof in said mold said break ring being fitted in said inlet of said mold so that said break ring contacts said inlet of said mold on said contact area thereof;

means for intermittently withdrawing the cast section relative to said mold through said outlet thereof;

first annular sealing means at said inlet of said mold for forming a first cut-off space at said inlet of said mold for preventing the infiltration of air into said mold through said contact area, said first annular sealing means having a diameter larger than a maximum diameter of said contact area between said break ring and said inlet of said mold;

a second annular sealing means for forming a second cut-off space at said inlet of said mold having said first cut-off space inside thereof and sealing said first cut-off space from said second cut-off space;

means for maintaining the pressure in said first cut-off space below atmospheric pressure; and

means for constantly supplying a sealing gas that is soluble in molten metal at a pressure higher than atmospheric pressure into said second cut-off space.

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5,743,324

## DISCONNECTABLE ELECTRICAL CONNECTION SYSTEM FOR A MOVING ASSEMBLY

Siebo Kunstreich, Saint Ouen; Michel Kouyoumdjian, Chatou, both of France, and Minoru Takata, Fukuyama, Japan, assignors to Rotelec, Bagnolet, France

PCT No. PCT/FR95/00749, § 371 Date Feb. 7, 1996, § 102(e) Date Feb. 7, 1996, PCT Pub. No. WO95/34925, PCT Pub. Date Dec. 21, 1995

PCT Filed Jun. 8, 1995, Ser. No. 592,347

Claims priority, application France, Jun. 10, 1994, 94 07133

Int. Cl.[6] B22D *27/02*; H01R *13/62*

U.S. Cl. 164—504 8 Claims

1. A disconnectable electrical connection system for a moving assembly, the system comprising:

a downstream block (GB) electrically connected in permanent manner to a moving assembly (EB) performing limited functional displacements relative to an upstream assembly (EA);

an upstream block (GA) complementary to the downstream block for making a temporary mutual electrical connection between said two blocks;

deformable conductors (CA) electrically connecting the upstream block (GA) to the upstream assembly (EA) in permanent manner while enabling said upstream block to follow said functional displacements in order to maintain said connection;

a carriage (K) performing go-and-return displacements on a transfer path carried by the upstream assembly EA, said carriage being suitable for carrying the upstream block (GA) both during a go displacement (PA-PB) to move the upstream block to a front position (PB) making said connection, and during a return displacement (PB-PA) for bringing said upstream block to a rear position (PA) remote from the downstream block; and

hooking members (LA, LB) controlled to hook the upstream block (GA) to at least one of the downstream block (GB) and the carriage;

wherein the go-and-return displacements (PA-PB, PB-PA) of the carriage (K) and the operation of the hooking members (LA and LB) are controlled from the upstream assembly.

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5,743,325

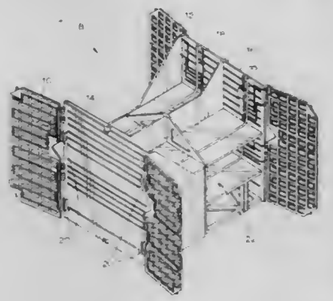
## FLEXIBLE HEAT TRANSPORT DESIGN FOR DEPLOYABLE RADIATOR APPLICATIONS

David B. Esposto, Redondo Beach, Calif., assignor to Hughes Electronics, Los Angeles, Calif.

Continuation of Ser. No. 577,440, Dec. 22, 1995, abandoned. This application May 22, 1997, Ser. No. 861,493

Int. Cl.[6] F28F *27/00*

U.S. Cl. 165—41 22 Claims



18. A method of deploying a deployable structure from a payload structure of a spacecraft, comprising the steps of:

providing at least one flexible section having a serpentine configuration including a plurality of U-shaped curves;

connecting said deployable structure by a hinge having a fixed axis to said payload structure of said spacecraft, said deployable structure including means for rejecting heat from said spacecraft;

attaching said at least one flexible section to said deployable structure and to said payload structure of said spacecraft;

forming an arc with a portion of said at least one flexible section;

unfolding said at least one flexible section from a compressed stowed position to a deployed position, said at least one flexible section retaining said serpentine configuration while in said deployed position; and

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transporting one of liquid and vapor through a portion of said at least one flexible section.

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5,743,326

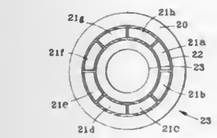
**METHOD OF AND APPARATUS FOR DAMPING BENDING VIBRATIONS WHILE ACHIEVING TEMPERATURE CONTROL IN BEAMS AND RELATED**

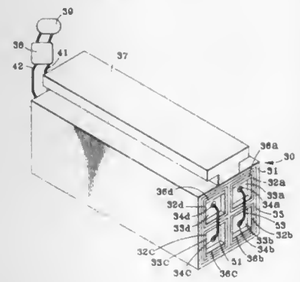
**Alexander H. Slocum, Concord, N.H., assignor to AESOP, Inc., Concord, N.H.**

**Filed Oct. 5, 1994, Ser. No. 318,148**

**Int. Cl.[6] B23Q** *1/01;15/18*

**U.S. Cl. 165—47** **13 Claims**





1. A method of damping longitudinally extending beam and related structures having internal axially extending openings(s), that comprises, inserting into and along such a beam, at least one longitudinally extending internal member of cross-sectional area a substantial portion of the cross-sectional area of the beam; coupling the internal member(s) to the beam surrounding the opening with a thin viscoelastic layer so that any vibrational bending of the beam results in relative shear displacement between the beam and the internal member(s) which shears the viscoelastic layer and thereby dissipates the vibration energy; and circulating temperature-controlled fluid along one of the member(s) and an opening along the beam, and in which each of the beam and the internal member(s) has a neutral bending axis, and the internal member(s) is sized and proportioned with its neutral axis as far as possible away from the beam neutral axis.

6. A beam-damping and temperature-controlling apparatus having, in combination with a longitudinally extending hollow or openings-provided beam, at least one longitudinally extending internal structural member inserted within and along the beam hollow substantially throughout the length of the beam and coupled to the beam by a viscoelastic layer for providing shear damping in response to vibrational bending of the beam, and means for circulating temperature-controlled fluid along and within the hollow of the beam and in which each of the beam and the internal structural member(s) has a neutral bending axis, and the internal structural member(s) is sized and proportioned with its neutral axis as far as possible away from the beam neutral axis.

7. Apparatus as claimed in claim 6 and in which one at least the member is tubular, and means is provided for circulating the fluid therethrough.

5,743,327

**RADIATOR SYSTEM**

**Philip Ferdinando Villa, Outwood, Lark Rise, East Horsley, Surrey KT24 6TN, England**

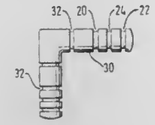
**PCT No. PCT/GB94/00123, § 371 Date Jul. 21, 1995, § 102(e) Date Jul. 21, 1995, PCT Pub. No. WO94/17321, PCT Pub. Date Aug. 4, 1994**

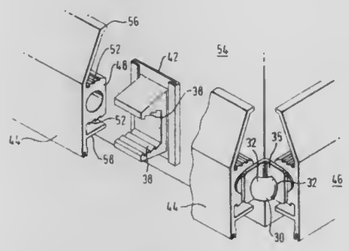
**PCT Filed Jan. 21, 1994, Ser. No. 495,510**

**Claims priority, application United Kingdom, Jan. 21, 1993, 9301132; Jun. 14, 1993, 9312221**

**Int. Cl.[6] F24D** *19/02*

**U.S. Cl. 165—55** **30 Claims**





1. A radiator system comprising a plurality of elongate panels each incorporating a longitudinally extending conduit for heating or cooling fluid, at least one mounting member comprising a first part for attachment to a supporting surface, and a second part which co-operates with the panel so that the panel is slidably movable at least in the longitudinal direction; a connector for interconnecting the conduits of the system, the connector having at least one tubular end portion which is adapted to fit slidably into the end of one of the conduits, and carries at least one circumferentially extending sealing element adapted to form a fluid-tight coupling with the conduit, and at least one seating on said connector for a detachable stop member which seating is located so as to retain the stop member at a position which is spaced from the at least one tubular end portion of the conduit after assembly so as to allow some free motion to take up thermal expansion, while limiting the maximum degree of interengagement between the connector and the conduit.

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5,743,328

**DUPLEX HEAT EXCHANGER**

**Hironaka Sasaki; Hirohiko Watanabe; Tetsuya Tategami, and Nobuaki Goh, all of Tochigi, Japan, assignors to Showa Aluminum Corporation, Osaka, Japan**

**Division of Ser. No. 176,416, Dec. 30, 1993, Pat. No. 5,529,116, which is a continuation-in-part of Ser. No. 821,257, Jan. 10, 1992, abandoned, which is a continuation of Ser. No. 564,842, Aug. 9, 1990, abandoned. This application Mar. 21, 1996, Ser. No. 619,994**

**Claims priority, application Japan, Aug. 23, 1989, 1-217959; Mar. 27, 1990, 2-080387; Mar. 27, 1990, 2-080388**

**Int. Cl.[6] F28F** *9/26;13/08*

**U.S. Cl. 165—144** **3 Claims**

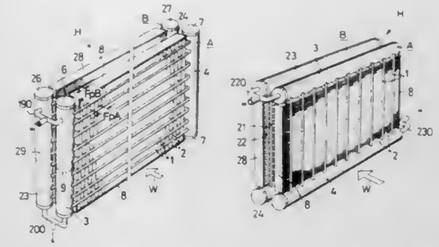
1. A duplex heat exchanger comprising:

a plurality of unit heat exchangers;

each of the unit heat exchangers having a circuit formed therethrough for a heat exchanging medium; and

a connecting means for connecting the circuits in fluid communication with each other; each of the unit heat exchangers comprising:





a plurality of tubes arranged in parallel with each other; and a pair of hollow headers to which both ends of each tube are connected in fluid communication,

wherein the unit heat exchangers are arranged fore and aft in a direction of air flow so that one of the unit heat exchangers faces the windward, with the other unit heat exchanger lying leeward,

wherein the circuits formed through the unit heat exchangers for the heat exchanging medium are connected in parallel with one anther so that the medium flows in harmony through the circuits, and

wherein each unit heat exchanger has a plurality of fins arranged at a fin pitch and each interposed between two adjacent tubes, and wherein the fin pitch in the leeward unit heat exchanger is different than the fin pitch in the windward unit heat exchanger, such that a heat exchange area in contact with an air flow per unit area of the leeward unit heat exchanger is different than the windward unit heat exchanger.

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5,743,329

**HEAT EXCHANGER HAVING A COLLECTING PIPE WITH A SLOT FORMED THEREIN**

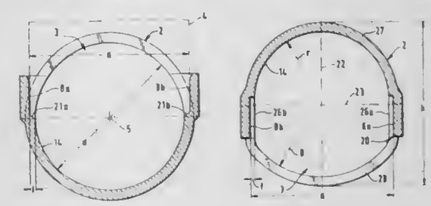
**Herbert Damsohn, Aichwald; Wolfgang Gerlach, Schönaich, and Walter Wolf, Oppenweiler-Zell, all of Germany, assignors to Behr GmbH & Co., Stuttgart, Germany**

**Filed Nov. 21, 1995, Ser. No. 561,331**

**Claims priority, application Germany, Nov. 25, 1994, 44 42 040.4**

**Int. Cl.[6] F28F** *9/02*

**U.S. Cl. 165—174** **7 Claims**



1. A heat exchanger having a collecting pipe with an outer and an inner casing, said collecting pipe having an inner diameter (d), wherein said collecting pipe comprises at least one slot lying in a plane roughly perpendicular to a longitudinal axis of said collecting pipe, said slot being defined by narrow sides which are limited by parallel-running slot walls of the collecting pipe which extend roughly along a tangent to a circle around said pipe longitudinal axis, said slot walls being separated by a distance and said slot having a length, (a), determined by the distance between said slot walls, said length (a) being equal to at least the collecting pipe inner diameter (d),

said slot walls being formed from deformed wall portions of said collecting pipe which have a constant wall thickness (s) over their wall length (L), and outer sides of the slot walls lie outside the outer casing of said collecting pipe,

wherein said slot walls are offset radially outward relative to the pipe inner casing and a shoulder is formed between the slot walls and the pipe inner casing, and

wherein said slot is capable of accepting either a flat pipe which can accommodate flowing fluid, or a partition.

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5,743,330

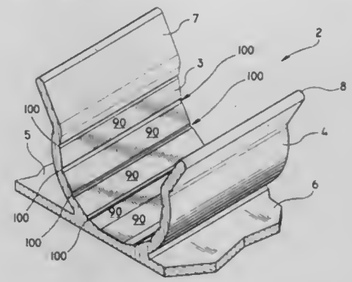
**RADIANT HEAT TRANSFER PANELS**

**Frank Bilotta, Port Jefferson Station, and Todd Shaw, Sound Beach, both of N.Y., assignors to Radiant Technology, Inc., Bellport, N.Y.**

**Filed Sep. 9, 1996, Ser. No. 711,019**

**Int. Cl.[6] F28F** *1/20*

**U.S. Cl. 165—183** **26 Claims**



1. A radiant heating panel comprising

a track for receiving tubing carrying heat transfer fluid, said track comprising an inner surface that is multi-faceted, and

a pair of extensions mounted upon said track and arranged to flare outwardly away from said track and thereby facilitate insertion of the heat transfer tubing into said track.

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5,743,331

**WELLBORE MILLING SYSTEM**

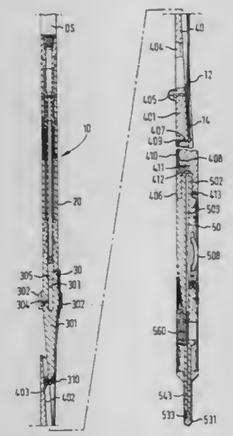
**Courtney W. Adkins, Katy; Thurman B. Carter; William A. Blizzard, Jr., both of Houston, and Richard M. Ward, Conroe, all of Tex., assignors to Weatherford/Lamb, Inc., Houston, Tex.**

**Filed Sep. 18, 1996, Ser. No. 715,573**

**Int. Cl.[6] E21B** *29/00*

**U.S. Cl. 166—55.7** **13 Claims**

4. A milling system for milling an opening in a tubular in a



tubular string in a wellbore extending down from a surface of the earth, the milling system comprising

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an anchor assembly comprising a body, a slip movably mounted to the body, the body having a fluid flow bore therethrough, the fluid flow bore having an enlarged cavity and a bottom cavity, a piston movably mounted in the fluid flow bore, the piston having a top and a bottom and with a piston flow bore therethrough from top to bottom through which fluid from the surface is flowable through the piston into the bottom cavity to force the piston upwardly in the enlarged cavity to move the slip from the body to set the anchor assembly in the tubular,

a whipstock connected to the anchor assembly,

a mill apparatus releasably connected to the whipstock,

a valve assembly connected at a top end thereof to the tubular string and at a bottom end thereof to the mill apparatus for selectively controlling fluid flow from the surface to the anchor assembly, and

the anchor assembly further comprising a hollow stem extending from an end of the fluid flow bore of the body of the anchor at a top of the enlarged cavity to a top of the piston so that fluid from the surface is flowable through the fluid flow bore of the body of the anchor, through the hollow stem into the piston flow bore, the hollow stem preventing fluid from flowing into the enlarged cavity above the piston, and the hollow stem movable up into the fluid flow bore of the body of the anchor as the piston moves upwardly in the enlarged cavity.

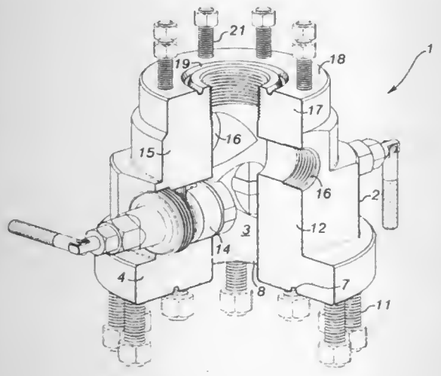
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**5,743,332**

**INTEGRAL WELLHEAD ASSEMBLY FOR PUMPING WELLS**

**Tony M. Lam, and Keith D. Farquharson, both of Edmonton, Canada, assignors to Stream-Flo Industries Ltd., Edmonton, Canada**

**Filed Feb. 16, 1996, Ser. No. 602,994**
**Int. Cl.[6] E21B** *34/02*
**U.S. Cl. 166—85.4** **2 Claims**




1. An adapted/BOP/flow tee structure for mounting to a top flanged connection of a pumping well wellhead assembly tubing head and connecting with a rotary pump drive assembly and stuffing box, comprising:

an integral steel housing forming a vertical bore extending therethrough, said housing comprising from bottom to top,

a bottom flanged connection having means for enabling mounting to the top flanged connection of the tubing head,

a first housing section forming side openings, extending into the vertical bore, for receiving the ram components of a side-opening blow-out preventer,

a flow tee section forming at least one side opening, communicating with the vertical bore, for producing well fluid, and

a top connection for connection with the rotary pump drive assembly and stuffing box.

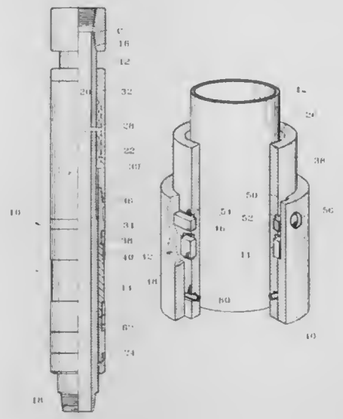
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**5,743,333**

**EXTERNAL CASING PACKER WITH ELEMENT END SLEEVE TO COLLAR RETAINER AND METHOD**

**Darrin L. Willauer, The Woodlands, and Wilhelm E. Becker, Houston, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.**

**Filed May 3, 1996, Ser. No. 642,773**
**Int. Cl.[6] E21B** *33/127*
**U.S. Cl. 166—122** **28 Claims**



1. An inflatable packer for positioning downhole along the tubular string in a well, comprising:

a mandrel for interconnection with the tubular string, the mandrel having a throughbore therein for communication with the tubular string;

an elastomeric sealing element radially outward of the mandrel;

a pressurized chamber radially between the mandrel and the elastomeric sealing element for inflating the sealing element into sealing engagagement with a wall within the well;

an upper collar axially above the sealing element and radially outward of the mandrel;

a lower collar axially below the sealing element and radially outward of the mandrel;

an upper end sleeve interconnected with an upper end of the sealing element and radially outward of the mandrel;

a lower end sleeve interconnected with a lower end of the sealing element and radially outward of the mandrel;

a circumferential collar groove in a radially outer surface of at least one of the upper collar and lower collar;

a circumferential sleeve groove in a radially inner surface of a respective one of the upper end sleeve and lower end sleeve; and

a retaining member extending radially between the collar groove and the sleeve groove to axially interconnect the at least one of the upper collar and lower collar with the respective one of the upper end sleeve and lower end sleeve, the retaining member being positioned entirely within the circumferential collar groove and the circumferential sleeve groove to permanently interconnect the respective collar and sleeve.

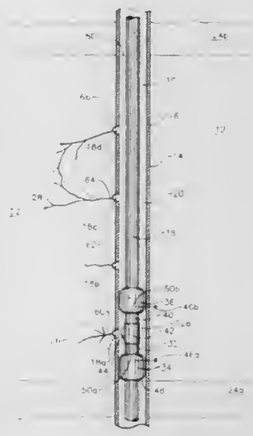


**5,743,334**

**EVALUATING A HYDRAULIC FRACTURE TREATMENT IN A WELLBORE**

**Donald G. Nelson, Bakersfield, Calif., assignor to Chevron U.S.A. Inc., San Francisco, Calif.**

**Filed Apr. 4, 1996, Ser. No. 627,564**
**Int. Cl.[6] E21B** *47/06;47/10*
**U.S. Cl. 166—250.07** **20 Claims**



1. A method for evaluating a fracture treatment comprising:

a) providing a wellbore penetrating a subterranean hydrocarbon-bearing formation, wherein a pressure differential exists between said wellbore and said formation, and further wherein said formation and said wellbore are bounded by a wellbore face of a production or injection interval across which said formation and said wellbore fluid communicate, said formation having at least one fracture formed therein;

b) placing a first fluid seal across a first cross-section of said wellbore at a first point of said wellbore face in said production or injection interval to block fluid flow across said first cross-section;

c) placing a second fluid seal across a second cross-section of said wellbore at a second point of said wellbore face in said production or injection interval spaced a first wellbore distance from said first point to block fluid flow across said second cross-section, wherein said first and second seals define a wellbore chamber bounded by said first and second seals and a segment of said wellbore face positioned between said first and second points;

d) measuring a plurality of pressure values in said wellbore chamber over a period of time to obtain a pressure rate for said wellbore chamber;

e) repeating steps b) through d) at at least one different sequential pair of points in said production or injection interval to define a plurality of wellbore chambers across the length of said production or injection interval in said wellbore; and

f) comparing said pressure rates for said wellbore chambers to determine whether each of said wellbore chambers is in fluid communication with said fracture.

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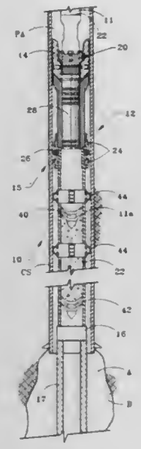
**5,743,335**

**WELL COMPLETION SYSTEM AND METHOD**

**Terry R. Bussear, San Jose, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.**

**Filed Sep. 27, 1995, Ser. No. 534,552**
**Int. Cl.[6] E21B** *33/13*
**U.S. Cl. 166—285** **23 Claims**

1. A method for cementing a liner in a wellbore below a well casing, comprising:



positioning a liner in a wellbore from a tubing string passing through the well casing;

pumping cement through the tubing string and the liner to cement the liner in the wellbore; and

setting a packer to seal between the tubing string and the well casing while the liner is positioned within the wellbore.

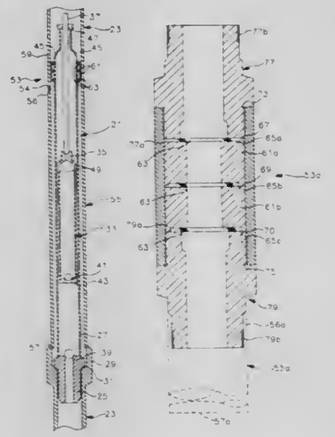
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**5,743,336**

**PUMP-PACKING DEVICE FOR DOWN-HOLE WELL ARRANGEMENTS**

**Bob G. Davis, Hobbs, N. Mex., assignor to Bull Dog Tool, Inc., Hobbs, N. Mex.**

**Filed Sep. 18, 1996, Ser. No. 718,116**
**Int. Cl.[6] F04B** *47/00;53/62*
**U.S. Cl. 166—380** **15 Claims**



15. A method for installing well tubing and an insert pump in a down-hole well, comprising the steps of:

installing a seating nipple in a down-hole well at a pumping depth;

attaching a first end of a tubular member to the seating nipple, the tubular member having a second end;

attaching a pump-packing device to the tubular member, the pump-packing device including a tubular body having a first

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end attachable to the tubular member and a second end, one or more annular spacer members, the spacer members being disposed inside the tubular body and having a first inside diameter, and one or more annular flexible elements supported inside the tubular body by the spacer members and having a second inside diameter smaller than the first inside diameter;

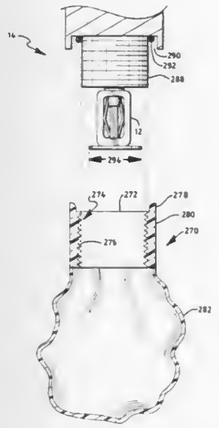
attaching well tubing to the second end of the pump-packing device;

lowering an insert pump having a pump barrel, the pump barrel having a top end and a bottom end, through the tubing, the pump-packing device, and the tubular member until the bottom end of the insert pump is disposed proximate the seating nipple,

wherein the second inside diameter of the flexible members is sufficiently large to permit the pump barrel to be removably inserted through the flexible elements, and the pump-packing device and the tubular member are of sufficient length such that, when the bottom end of the pump barrel is disposed proximate the seating nipple, the flexible elements are disposed proximate and below the top end of the pump barrel.

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**5,743,337**
**RELOCATABLE SPRINKLER ASSEMBLAGE**
**Norman J. MacDonald, III, Lunenburg, Mass., assignor to PNM, Inc., Boxboro, Mass.**
**Continuation-in-part of Ser. No. 455,026, May 31, 1995, Pat. No. 5,570,745. This application Nov. 4, 1996, Ser. No. 743,498**
**Int. Cl.[6] A62C *37/50***
**U.S. Cl. 169—16** **18 Claims**




1. In a sprinkler system having hydraulic distribution, a grid of flexible conduits operatively feeding therefrom, a plurality of sprinkler assemblages having operative connections thereto, and a structure having a lattice and a plurality of tiles, said structure enabling transportation of said sprinkler assemblages about said system while maintaining said operative connections, wherein the improvement comprises at least one of said sprinkler assemblages comprising, along an assemblage axis:

(a) a rigid fitting communicating with one of said flexible conduits, said fitting having a longitedinal axis, a conduit end at one end of said longitudinal axis, and a head end at another end of said longitudinal axis;

(b) said fitting having a conduit end outer surface adjacent to said conduit end and a head end outer surface adjacent to said head end;

(c) said fitting having an inner surface concentric about said longitudinal axis, said inner surface including a fitting inner threaded surface extending from said head end and an inner conduit surface extending from said fitting inner threaded surface to said conduit end;

(d) a sprinkler head having an externally threaded cylindrical pipe that is turned into said fitting inner threaded surface;

(e) said sprinkler head having a thermally sensitive plug blocking fluid from exiting said pipe at normal room temperatures and melting to unblock said pipe at predetermined elevated temperatures;

(f) said sprinkler head having two operative conditions, an inactive condition when said plug is blocking said fluid and an active condition when said sprinkler head is not blocking said fluid;

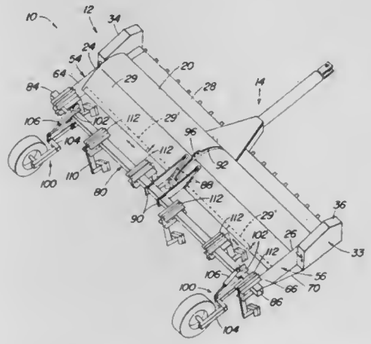
(g) a cap adapted to removably attach to said fitting, forming a substantially watertight attachment and enclosing said sprinkler head in a watertight compartment when said cap is attached to said fitting;

(h) said cap including a means for indicating which one of said two operative conditions exists at a given time; and

(i) a means for mounting said one assemblage to said structure.

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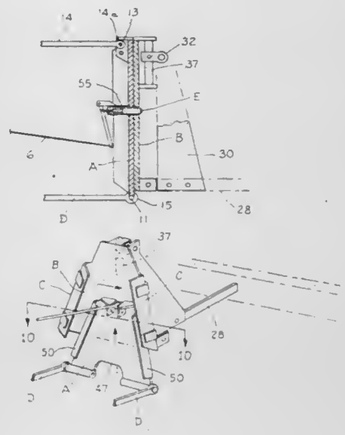
**5,743,338**
**CONSERVATION IMPLEMENT INCLUDING A SHREDDER**
**Pompeyo Jaime Benavides Gomez; Antares Salvador Ortega de la Cruz; Raul Americo Reyes Gonzales; Senen Alfonso Arzate Ramirez, all of Monterrey Nuevo Leon; Jesus Esteban Garza Huerta, Guadalupe Nuevo Leon, and Jose Rafael Garcia Villanueva, Monterrey Nuevo Leon, all of Mexico, assignors to Industrias John Deere S.A.de C.V., Monterrey N.L., Mexico**
**Filed Oct. 30, 1996, Ser. No. 741,078**
**Int. Cl.[6] A01B *49/04***
**U.S. Cl. 172—28** **21 Claims**




1. An implement including a shredder adapted for towing forwardly over a field wherein plant debris is located, the shredder including a transversely extending rotor for contacting and shredding the plant debris, transverse hood structure extending over the rotor for containing material contacted by the rotor, the hood structure having opposite ends, end panels connected to the opposite ends and generally closing the ends, the end panels having integral planar extensions projecting rearwardly of the shredder and defining support areas, a transversely extending toolbar fixed to the support areas, earthworking tools, and first adjustable bracket structure connecting the earthworking tools to the toolbar at selectable locations along the toolbar, wherein the support areas have narrow profiles to minimize interference with the adjustable bracket structure when the selectable locations are near the support areas.



**5,743,339**
**TRACTOR HITCH AND METHOD**
**William J. Alexander, III, P.O. Box 848, Mauldin, S.C. 29662**
**Filed Feb. 9, 1996, Ser. No. 598,991**
**Int. Cl.[6] B60D *1/00***
**U.S. Cl. 172—272** **34 Claims**




1. A hitch for securing a device for transport by a tractor comprising:

an inwardly tapering cam positionable transversely in upright position on said tractor;

an inwardly tapering cam follower positionable transversely in upright position on said device for engagement by marginal surfaces of said upright cam;

a pair of opposed marginal forwardly and inwardly tapering guiding elements on said cam follower for moving said cam follower laterally into interlocking wedging engagement relative to said cam against substantial further movement with respect thereto during the transport; and

power operated apparatus for carrying said cam on said tractor forcefully moving said cam causing said cam to engage said guiding elements to effect interlocking wedging engagement therewith;

whereby said hitch may be easily and quickly secured by an operator while seated upon the tractor.

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**5,743,340**
**WEED PULLING APPARATUS**
**Michael E. Giacomini, P.O. Box 726, Ross, Calif. 94957**
**Continuation of Ser. No. 336,255, Nov. 7, 1994, abandoned, which is a continuation-in-part of Ser. No. 44,383, Apr. 1, 1993, abandoned. This application Oct. 2, 1996, Ser. No. 724,226**
**Int. Cl.[6] B66F *3/00***
**U.S. Cl. 172—371** **5 Claims**

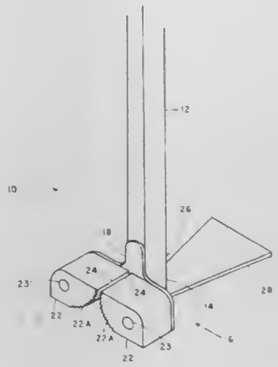
1. A weed pulling apparatus for rooted vegetation, from the ground comprising:

a normally vertically upright elongate handle defining a first leveraging arm terminating in a lower end;

a ground engaging second leveraging arm attached at an inner end of said second leveraging arm to said lower end of said lower handle end and extending laterally outwardly from a first side of said handle at an angle substantially normal to said elongate handle;

said second leveraging arm also defining a ground engaging fulerum about which said first leveraging arm pivots;

jaw pivot means mounted to said lower end of said handle on a second side opposite said first side of said lower handle end;




said jaw pivot means defining a pivotal axis substantially perpendicular to the longitudinal axis of said handle and substantially parallel to said ground surface when said handle is in normal upright position;

a weed clamp including at least one jaw;

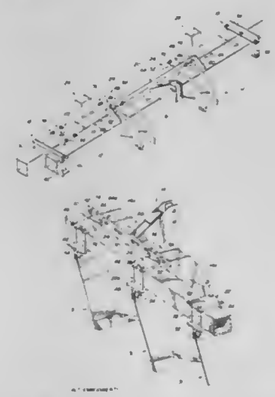
a clamping surface proximate said at least one jaw;

said jaw mounted on said pivot means to pivot about said axis to close toward and proximate said clamping surface;

said at least one jaw and clamping surface arranged and constructed to engage and clamp the stem of a weed or shrub against slippage whereby when the upper part of said handle is rocked about said fulerum from upright position in the direction of said first side of said handle.

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**5,743,341**
**TOOLBAR MOUNTING STRUCTURE PROVIDING TOOL ADJUSTMENT IN THE HITCH AREA**
**Jason Daniel Wattonville, Maxwell, Iowa, assignor to Deere & Company, Moline, Ill.**
**Filed Sep. 20, 1996, Ser. No. 717,333**
**Int. Cl.[6] A01B *13/08***
**U.S. Cl. 172—451** **20 Claims**



1. In an implement including a transversely extending toolbar with top, bottom, front and rear planar walls, earthworking tool assemblies, first bracket structure connected at transversely spaced locations on the toolbar and facilitating transverse adjustability of the tool assemblies on the toolbar, a hitch member fixed to the toolbar and extending forwardly therefrom at a central location, the hitch member defining interfering locations on the toolbar, wherein placement of the first bracket structure at the interfering locations is hindered, mounting structure facilitating placement of at least

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one earthworking tool assembly at a selected one of the interfering locations, the mounting structure comprising:

bracket support fixed to the toolbar at the central location and projecting outwardly from at least one of the toolbar walls;

second bracket structure having a toolbar embracing portion and an extension portion adapted to mate with the bracket support adjacent the hitch at the selected one of the interfering locations; and

connector structure releasably securing the toolbar embracing portion to the toolbar and the extension portion to the bracket support for maintaining the tool assembly at the selected one of the interfering locations.

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**5,743,342**

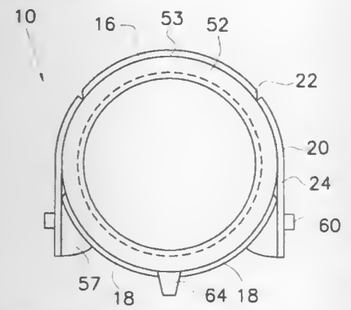
**GRADER CIRCLE ASSEMBLY**

**James Dennis Gibbs, Harrogate, Tenn., assignor to CBJ Plating and Machine of Tennessee, Knoxville, Tenn.**

**Filed May 22, 1996, Ser. No. 651,393**

**Int. Cl.[6] E02F *3/76***

**U.S. Cl. 172—781** **5 Claims**




1. An improved grader circle comprising:

said improved grader circle comprising:

a circle defining an outer surface;

two vertical beams each defining an upper portion which includes a first end and a second end, said upper portion of each of the vertical beams being secured to said outer surface, said two vertical beams extending from said circle in an opposing manner;

a tip cylinder bracket being carried at a rear of said circle between the vertical beams; and,

a front reinforcement plate welded to said outer surface at a front portion of said circle, said front reinforcement plate extending between said first ends of each of said vertical beams, said front reinforcement plate for distributing stress over said front of said circle.

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**5,743,343**

**METHOD AND APPARATUS FOR FLUID AND SOIL SAMPLING**

**Noah Heller, Mill Valley; Jeffrey Barrow, Woodland, and Jeffrey Gamble, Yuba City, all of Calif., assignors to Simulprobe Technologies, Inc., Mill Valley, Calif.**

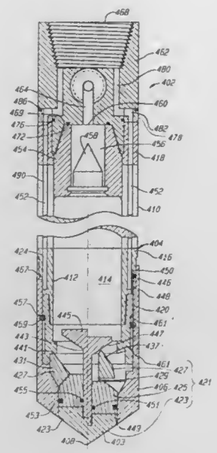
**Continuation-in-part of Ser. No. 124,789, Sep. 21, 1993, Pat. No. 5,421,419. This application Mar. 15, 1995, Ser. No. 403,371**

**Int. Cl.[6] E21B *49/02;49/08***

**U.S. Cl. 175—20** **28 Claims**

**14**. A method of collecting a soil sample and a soil gas sample, comprising the steps of:

providing a sampling device having an exterior surface, a hollow interior configured to receive a soil sample, a soil gas entrance independent of the hollow interior, and a soil gas path fluidly coupled to the soil gas entrance;




driving the sampling device into a subsurface so that a soil sample enters the hollow interior;

drawing a soil gas sample from the subsurface through the soil gas entrance and the soil gas path; and

removing the sampling device from the subsurface after the driving and drawing steps.

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**5,743,344**

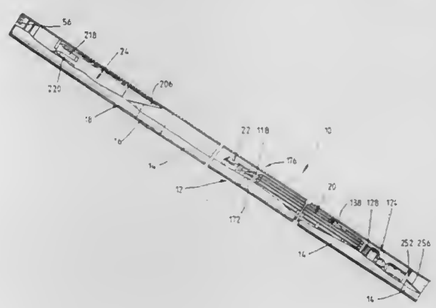
**SYSTEM FOR IN SITU REPLACEMENT OF CUTTING MEANS FOR A GROUND DRILL**

**Gavin Thomas McLeod, Bullcreek, and Matthew Vance Egan, Leeming, both of Australia, assignors to Down Hole Technologies Pty. Ltd., Myaree, Australia**

**Division of Ser. No. 433,402, May 18, 1995. This application Jun. 7, 1995, Ser. No. 473,881**

**Int. Cl.[6] E21B *10/32***

**U.S. Cl. 175—259** **13 Claims**




1. A segment of a cutting means adapted for retention in a ground drill, said segment being one of a plurality of separate and identical segments which together comprise said cutting means, said segment comprising:

a cutting face for engaging and cutting the ground when said segment is seated in a cutting position in said ground drill; and,

a shank extending from said cutting face and having one side adapted for facing and bearing against an internal circumferential wall of said ground drill when in said cutting position, said side comprising a series of surfaces configured and juxtaposed so that said segment can slide linearly relative to said ground drill when in said cutting position in response to said ground drill being lifted from and lowered onto the bottom of a hole being drilled by said ground drill.



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**5,743,345**

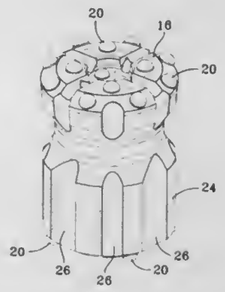
**DRILL BIT FOR REVERSE DRILLING**

**Charles D. Hollar, Roanoke, and Stuart A. Connell, Buchanan, both of Va., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.**

**Filed Jul. 30, 1996, Ser. No. 688,584**

**Int. Cl.[6] E12B *10/00***

**U.S. Cl. 175—401** **5 Claims**




1. A drill bit for reverse drilling in a drill hole being produced by a percussive, fluid-actuated drill comprising:

(a) an elongated body having a body centerline axis extending axially therealong;

(b) a bore extending through said body, for passing a fluid therethrough;

(c) said body terminating in a shank end portion and a head end portion;

(e) connection means on said shank end portion for removably connecting to a first drill string component;

(f) said head end portion having a plurality of wear resistant drilling buttons thereon;

(g) said shank end portion having a plurality of wear resistant drilling buttons thereon; and

(h) said body having an outer surface containing a plurality of spaced apart undercut portions extending axially along said body, said undercut portions being substantially smooth and without obstructions therein, to provide flow passageways for unimpeded flow therealong of drill hole debris, when said bit is moved downwardly or upwardly in a drill hole.

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**5,743,346**

**ABRASIVE CUTTING ELEMENT AND DRILL BIT**

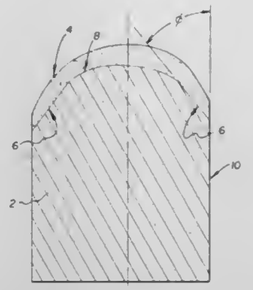
**Gary Martin Flood, Canal Winchester; David Mark Johnson, Westerville, and Bradley Earl Williams, Worthington, all of Ohio, assignors to General Electric Company, Pittsfield, Mass.**

**Filed Mar. 6, 1996, Ser. No. 611,896**

**Int. Cl.[6] E21B *10/56***

**U.S. Cl. 175—420.2** **16 Claims**

**1**. An abrasive cutting element consisting essentially of a hemispherical abrasive layer and a metal substrate having a center and a cylindrical outer surface, said abrasive layer is exposed when inserted into a holder, and wherein said abrasive layer consists essentially of an outer surface and an inner surface, which inner surface is bonded to the metal substrate thereby defining an interface therebetween, said interface has a tangential chamfer which slopes away from the center of the metal substrate such that a plane of the slope of the tangential chamfer forms an angle of about 5 to about 85° with a vertical plane of the cylindrical surface of the metal substrate, and further, said interface has a central position which is other than the tangential chamfer.




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**5,743,347**

**ELECTRIC POWERED SMALL TRACTOR**

**Newton Roy Gingerich, 565 Snyders Rd East, Baden, Ontario, Canada, N0B 1G0**

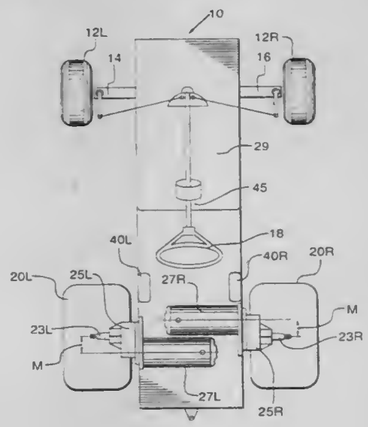
**PCT No. PCT/CA94/00232, § 371 Date Nov. 13, 1995, § 102(e) Date Nov. 13, 1995, PCT Pub. No. WO94/26551, PCT Pub. Date Nov. 24, 1994**

**PCT Filed May 13, 1994, Ser. No. 545,863**

**Claims priority, application United Kingdom, May 15, 1993, 9310036**

**Int. Cl.[6] B60K *1/02***

**U.S. Cl. 180—65.1** **4 Claims**




1. Electric-powered vehicle, having a vehicle frame, wherein:

The vehicle includes left and right drive-wheels;

the left and right drive-wheels lie in a co-axial relationship to each other;

the vehicle includes left and right electric drive motors;

the left and right motors are mechanically independent of each other;

the left and right drive wheels are mechanically free to rotate independently of each other;

the left motor is mechanically drive-coupled to the left drive-wheel, and the right motor is mechanically drive-coupled to the right drive-wheel;

the vehicle includes a battery pack;

the vehicle includes a speed and steering controller;

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the speed and steering controller includes a means for receiving power from the battery pack, and a means for feeding required amounts of that power to the two motors;

the vehicle includes left and right speed sensors, for sensing the respective rotational speeds of the two drive-wheels, and for sending to the controller signals indicative of the instant values of those rotational speeds;

the vehicle includes settable input means for setting a respective desired speed of each motor, whereby the input means is effective to set a desired speed of the vehicle, and to set a desired steering radius of the vehicle;

the controller is effective, if the signal from the speed sensor of the left drive wheel indicates that the left drive wheel is rotating at less than the desired speed for that wheel, to increase the power from the battery to the left motor;

the controller is effective, if the signal from the speed sensor of the right drive wheel indicates that the right drive wheel is rotating at less than the desired speed for that wheel, to increase the power from the battery to the right motor;

the controller is effective, if the signal from the speed sensor of the left drive wheel indicates that the left drive wheel is rotating at more than the desired speed for that wheel, to reduce the power passing from the battery to the left motor;

the controller is effective, if the signal from the speed sensor of the right drive wheel indicates that the right drive wheel is rotating at more than the desired speed for that wheel, to reduce the power to the right motor;

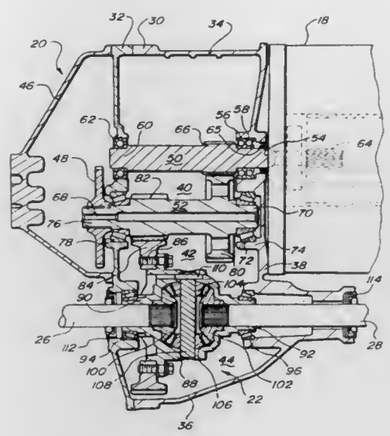
in respect of each motor, if the actual speed of the wheel differs from the set speed of the wheel, the controller is effective to increase the power supply to that wheel, proportional to the difference;

the vehicle includes left and right actuable regenerative braking means respective to the left and right wheels, and wherein, if the wheel is over-running one of the motors, the controller is effective to actuate regenerative braking in respect of that motor;

the controller is effective to control the speeds of the motors such that the speed setting of one wheel is greater than that of the other wheel by an amount to suit the radius of a steering turn;

the vehicle includes means for chopping electrical current to the motor at a programmed frequency and programmed on/off ratio;

and the speed sensor comprises a means for determining an electrical parameter that varies with the rotational speed of the motor, and which is present in the wires supplying current to the motor.




**5,743,348**

**SINGLE SPEED TRANSMISSION FOR AN ELECTRIC MOTOR VEHICLE**

**Michael D. Coppola, Auburn; Richard E. Eastman, Central Square; Ronald J. Mayville, Jamesville; Christopher W. Phelan, Chittenango; Michael S. Tianello, Sr., Canastota; Alan P. Zajac, Clay, and Sankar K. Mohan, Syracuse, all of N.Y., assignors to New Venture Gear, Inc., Troy, Mich.**

**Filed Feb. 13, 1995, Ser. No. 387,461**

**Int. Cl.[6] B60K** *1/00*

**U.S. Cl. 180—65.6** **23 Claims**

1. A power transfer system for use in an electric vehicle for delivering torque from an electric power source to a pair of driven wheels, the power transfer system comprising:

(i) a single variable speed electric motor; and

(ii) a single speed transmission including:

a housing;

an input shaft mounted for rotation in said housing for receiving a source of torque from said electric motor, said input shaft having a first end extending from said housing, said first end of said input shaft engaging said variable speed electric motor;

at least one output shaft mounted for rotation in said housing;

an intermediate shaft supported for rotation in said housing between said input shaft and said at least one output shaft, said at least one output shaft being driven by said intermediate shaft;

a drive mechanism mounted in said housing for movement between a park position, a drive position, a neutral position and a reverse position, said drive mechanism including a rotatable sector plate;

mode select means for enabling a vehicle operator to select one of a park mode, reverse mode, neutral mode, and drive mode, said mode select means operative to cause selective movement of said drive mechanism such that said drive mechanism moves to said park position when said park mode is selected, said drive mechanism moves to said drive position when said drive mode is selected, said drive mechanism moves to said neutral position when said neutral mode is selected, and said drive mechanism moves to said reverse position when said reverse mode is selected;

sensor means for sensing the position of said drive mechanism, said sensor means being operable for generating a mode select signal indicative of the position of said drive mechanism, said sensor means for sensing the position of said drive mechanism includes a printed circuit disposed on said sector plate and a switch operatively associate with said printed circuit; and

control means for receiving said mode select signal and generating a motor control signal in response thereto for controlling said electric motor such that said motor control signal controls said electric motor to produce an output torque for rotating said input shaft in a first direction when said drive mechanism is in said drive position and in a second direction opposite to said first direction when said drive mechanism is in said reverse position.

**5,743,349**

**NON-INVASIVE OPTICAL BLOOD ALCOHOL CONCENTRATION READER AND VEHICLE IGNITION INTERLOCK SYSTEM AND METHOD**

**Steven Steinberg, 6851 Vista de Pueblo, Tucson, Ariz. 85750**

**Filed Sep. 23, 1996, Ser. No. 718,759**

**Int. Cl.[6] B60K** *28/06*

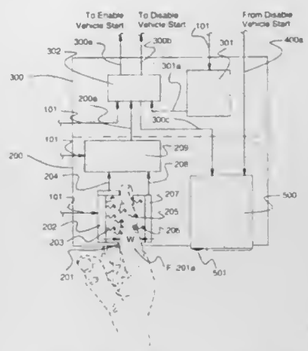
**U.S. Cl. 180—272** **18 Claims**

1. A vehicle ignition interlock system apparatus for preventing an alcohol impaired operator from starting a vehicle's engine, said apparatus comprising:

a non-invasive, blood alcohol concentration tester member, said tester member comprising an electromagnetic energy light source, an incident light collector, a human tissue receptacle, an emanating light collector, a light absorption analyzer, and a blood alcohol concentration generator; and

electrical and electronic circuitry responsive to a signal generated by said tester member, said electrical and electronic circuitry comprising a blood alcohol concentration comparator for generating a first signal indicative of an operator's non-impaired state for enabling start-up of a vehicle's engine, and for generating a second signal indicative of an operator's impaired state for disabling start-up of a vehicle's engine.






**5,743,350**

**ELECTRIC POWER STEERING APPARATUS**

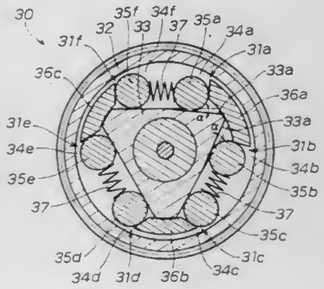
**Shigeru Yamawaki; Yasuo Shimizu, and Katsuji Watanabe, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 27, 1996, Ser. No. 673,198**

**Claims priority, application Japan, Jul. 5, 1995, 7-170051**

**Int. Cl.[6] B62D** *5/04*

**U.S. Cl. 180—444** **10 Claims**




1. An electric power steering apparatus including an electric motor for generating an auxiliary torque according to a steering torque, and a plurality of sets of friction clutch mechanisms for transmitting the auxiliary torque to a steering system, said plurality of sets of friction clutch mechanisms comprising:

an input member;

an output member;

a plurality of tapering spaces defined between said input member and said output member;

a plurality of locking members movably disposed in said tapering spaces, respectively, for selectively engaging and disengaging said input and output members;

a plurality of position control members for positioning said locking members; and

a plurality of urging members urging said locking members against the adjacent position control members,

wherein the clutch mechanisms of at least one of said plurality of sets of clutch mechanisms are brought to a disengaged state in advance to the clutch mechanisms of the remaining set of clutch mechanisms.

**5,743,351**

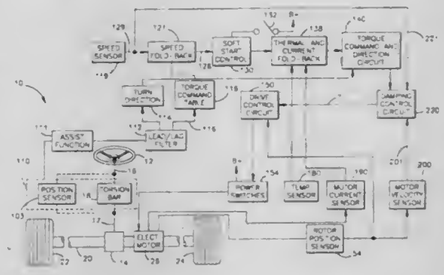
**METHOD AND APPARATUS FOR CONTROLLING AN ELECTRIC ASSIST STEERING SYSEM BY LINEARIZING SYSTEM INPUT-OUTPUT TORQUE GAIN**

**Kevin Michael McLaughlin, Troy, Mich., assignor to TRW Inc., Lyndhurst, Ohio**

**Filed May 29, 1996, Ser. No. 654,594**

**Int. Cl.[6] B62D** *5/04*

**U.S. Cl. 180—446** **5 Claims**




1. An apparatus for controlling a steering assist system, said steering assist system providing steering assist in response to a steering control signal, said steering assist system including a variable reluctance motor, said apparatus comprising:

motor position sensing means for sensing the relative position between the motor's rotor and stator;

torque sensing means operatively connected to a vehicle hand wheel for sensing applied steering torque;

motor torque assist determining means for determining a desired motor torque assist value in response to the sensed applied steering torque;

modifying means for modifying said desired torque assist value to linearize the gain between said desired torque assist value and motor torque output;

a plurality of motor torque look-up tables, each of said motor torque look-up tables having a plurality of motor current values that vary as a function of motor position;

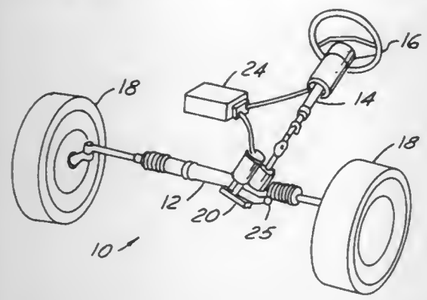
control means operatively connected to said modifying means and to said motor position sensing means, said control means (i) selecting a first and second torque look-up table from said plurality of look-up tables wherein said first look-up table corresponds to a torque value less than the modified motor torque assist value and said second look-up table corresponds to a torque value greater than the modified motor torque assist value, (ii) determining a first motor current value by interpolating between two current values associated with the two motor positions stored in the first look-up table closest to the sensed motor position, (iii) determining a second motor current value by interpolating between two current values associated with the two motor positions stored in the second look-up table closest to the sensed motor position, and (iv) determining a final motor current value by interpolating between the first and second determined motor current values; and

providing a motor control signal in response to said determined final motor current value.

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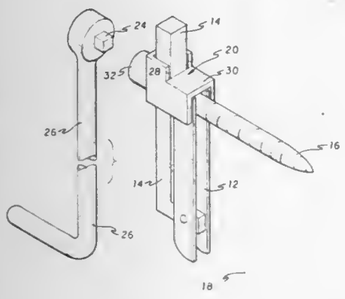
5,743,352
**ELECTRICALLY-ACTUATED POWER STEERING SYSTEM**
**John Michael Miller, Saline, and Robert Howard Erickson, Novi, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.**
**Filed Sep. 3, 1996, Ser. No. 707,258**
**Int. Cl.[6] B62D** *5/04*
**U.S. Cl. 180—446** **14 Claims**




1. An electric power assist steering system for a motor vehicle, said system comprising:
(a) steerable wheels;
(b) a polyphase induction motor mechanically coupled to provide assistance in steering said steerable wheels;
(c) a vehicle battery having a DC voltage; and
(d) an inverter electrically coupled to said vehicle battery and to said induction motor and adapted to convert said DC voltage to AC phase voltages having line-to-line amplitudes less than or equal to said DC voltage.

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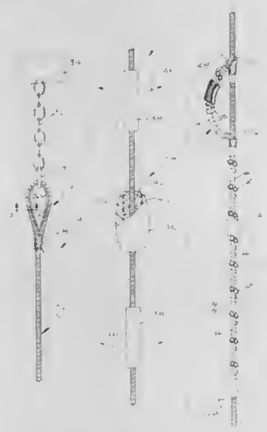
5,743,353
**TREE STEP SOCKET**
**Paul Ray Browning, 1009 Cooper Dr., Oak Grove, Ky. 42262, and Paul Ray Browning, Sr., 5233 Sedalia Dr., Columbus, Ohio 43232**
**Filed Oct. 3, 1996, Ser. No. 725,175**
**Int. Cl.[6] E06C** *9/00*
**U.S. Cl. 182—92** **5 Claims**




1. A socket for allowing a driver tool to be used to turn a tree step relative to a tree trunk,
the tree step including a main bar having a first end and a second end, a foot peg hingedly attached to the first end of the main bar, and a screw portion hingedly attached to the second end of the main bar,
the driver tool having a socket attachment shaft, said socket comprising:
a first bracket having a backside and an open front;
a second bracket extending substantially perpendicularly from said open front; and
a projection projecting substantially perpendicularly from said backside, said projection having a cavity for receiving the socket attachment shaft of the driver tool, said cavity being square in cross section;
whereby when said second bracket surrounds the second end of the main bar; and
when the socket attachment shaft of the driver tool engages said cavity, the driver tool can be used to turn the tree step relative to the tree trunk to perform one of screwing the screw portion of the tree step into the tree trunk and unscrewing the screw portion of the tree step from the tree trunk.

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5,743,354
**OFFSHORE PLATFORM ACCESS ROPE**
**Valentino H. Hunter, P.O. Box 502, Rockport, Tex. 78381**
**Filed Jun. 20, 1996, Ser. No. 666,240**
**Int. Cl.[6] E06C** *9/14;9/00*
**U.S. Cl. 182—100** **20 Claims**



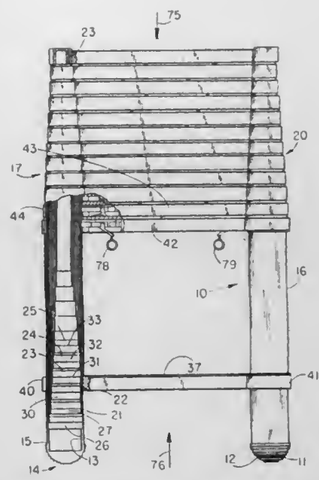
1. Access for an offshore platform comprising a rope having an upper end providing means for connection to the platform; a lower end providing a series of hand holding implements; and a central section, between the upper and lower sections, providing means for stabilizing the rope against wind induced movement comprising a series of weights spaced along the rope, an uppermost of the hand holding implement being at least about three feet below a lowermost of the weights.

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5,743,355
**RETRACTABLE LADDER**
**Charles A. McDonnell, 7 Post Ct., and Leonard Silverman, 17 Renfrew Rd., both of New City, N.Y. 10956**
**Filed Jul. 31, 1996, Ser. No. 693,792**
**Int. Cl.[6] E06C** *1/00*
**U.S. Cl. 182—195** **5 Claims**

1. A retractable ladder having several rungs and a plurality of telescoping stiles joined thereto in which the stiles are hollow and have two ends comprising a low coefficient of friction plastic bushing having two ends, said bushing being on one end of at least one of the stiles, a portion on one end of said bushing protruding over and across the end of the stile to extend over and engage at least a part of said stile end to prevent relative longitudinal movement between said stile and said bushing, a flange formed on the other bushing end, a coupling integral with said rung bearing

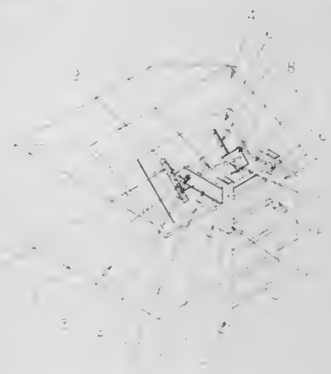





against said flange and in engagement with said bushing to join the stile to the rung associated therewith.

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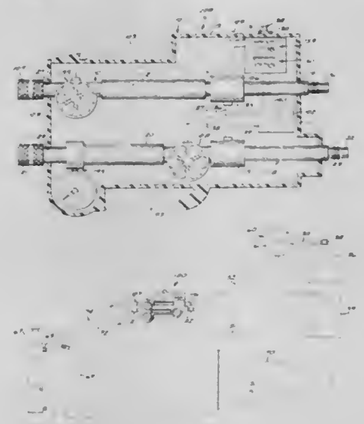
5,743,356
**GUTTER BUDDY LADDER EXTENDER**
**Frank A. Mitchell, 883 N. Ellsworth Ave., Columbiana County, Salem, Ohio 44460**
**Filed Jul. 10, 1996, Ser. No. 677,879**
**Int. Cl.[6] E06C** *7/48*
**U.S. Cl. 182—214** **3 Claims**



1. A ladder extender apparatus to extend a ladder away from a structure during use for a ladder having a pair of stiles connected together by a plurality of rungs which comprises a flat base plate having a length adapted to be greater than the width of the ladder with a plane of said plate adapted to be in contact with the roof of a structure ranging from a flat roof to a roof of any vertical pitch, a pair of support arms at one end removably and adjustably attached to said flat base plate by a corresponding pair of L-shaped channels and to be secured to said flat plate at widths corresponding with the ladder in use, said support arms extending generally vertically and downwardly from said flat base plate and adapted at the opposite end to pivotably attach to a pair of extension arms, said pair of L-shaped channels each fastened one side to one support arm and fastened on the other side to the flat base plate and spaced on the flat base plate to accommodate the width of the ladder, said pair of extension arms at one end pivotably attached to each of said support arms by a rod and rod fastening means adapted to pivot about the axis of the rod and adjust to the pitch of the roof of the structure and at the other end adapted to attach to a ladder fastener assembly to secure the apparatus to the ladder, said rod extending perpendicular to and through an orifice in one end of each support arm and each extension arm to allow the support arms and extension arms to pivot about the axis of the rod, said rod fastening means to fasten the rod to the support arms and extension arms, a plurality of orifices disposed along the vertical axis of support arms adapted to accept the rod and the pair of extension arms to adjustably vary the distance of the ladder form the structure, said ladder fastener assembly attached by means at one end of each of the extension arms and adapted to secure and engage the apparatus to the stiles and rungs of the ladder, and fastening means to secure the ladder fastener assembly to the extension arms

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5,743,357
**AUTOMATIC HAND HELD TRANSMISSION FLUID CHARGER**
**Jeffrey P. Few, Elkhart, Ind., assignor to Flo-Dynamics, Inc., Compton, Calif.**
**Continuation-in-part of Ser. No. 403,180, Mar. 13, 1995, Pat. No. 5,535,849. This application Oct. 18, 1995, Ser. No. 544,644**
**Int. Cl.[6] F16C** *3/14*
**U.S. Cl. 184—1.5** **7 Claims**



1. In a transmission fluid changing system having a pressurized unused fluid supply hose, a disposal hose, an unused fluid hose, a used fluid hose, a supply tank and a drain tank, a portable, automatic hand held controller apparatus comprising:
a hand held, portable housing formed with oppositely disposed end walls, an interior compartment, a pair of exterior hand holds for being grasped by an operator to be carried thereby and manipulated about, and a pair of elongated, laterally spaced apart openings defining respective windows;
coextensive, rigid supply and drain tubes housed in said compartment and projecting at their respective opposite ends outwardly through the respective said end walls to project from said housing to form, at the respective opposite ends thereof, a supply tube inlet and outlet and a drain tube inlet and outlet;
respective supply inlet and outlet couplings at the respective said supply tube inlet and outlet and disposed exterior to the respective said end walls for connection, respectively, with said supply hose and said unused fluid hose;
respective drain inlet and outlet couplings at the respective said drain tube inlet and outlet and disposed exterior to said housing for connection, respectively, with said used fluid hose and said disposal hose;

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respective drain and supply flow meters in the respective said drain and supply tubes for sensing the fluid flow rates through the respective said drain and supply tubes and generating respective electrical supply and drain flow signals corresponding to the respective flow rates;

a pair of display devices mounted on said housing and electrically connected to the respective said flow meters for displaying the flow rates through the respective said drain and supply tubes;

a pressure sensor and gauge mounted in said housing and connected to said drain tube for sensing and displaying the pressure in said drain tube;

a pair of sight glasses in the respective said drain and supply tubes and disposed in confronting relation with the respective said windows in said housing;

a control valve in said supply tube including an electrical operator; and

a controller electrically coupled with said drain flow meter and said electrical operator and responsive to said electrical drain flow signal to control said control valve in said supply tube to maintain the flow rate therethrough substantially equal to the flow rate in said drain tube as sensed by said drain flow meter, whereby said housing may be grasped by said hand holds to be held by the operator and said supply inlet coupling connected to one end of said pressurized unused fluid supply hose and the other end of said pressurized unused fluid supply hose connected to said supply tank, said supply outlet coupling connected to one end of said unused fluid hose and the other end of said unused fluid hose connected to a first transmission fluid port, said drain inlet coupling connected to one end of said used fluid hose and the other end of said used fluid hose connected to a second transmission fluid port, and said drain outlet coupling connected to one end of said disposal hose and the other end of said disposal hose connected to said drain tank to flow unused fluid from said supply tank through said pressurized unused fluid supply hose, supply tube and unused fluid hose to said first transmission fluid port and flow used fluid from said second transmission fluid port through said used fluid hose, drain tube and disposal hose to said drain tank, while said controller receives said electrical flow signals from said drain flow meter and is responsive to said flow signals to manipulate said control valve accordingly to maintain substantially equal flow rates through said drain and supply tubes.

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**5,743,358**

## FILTER MOUNTING ADAPTER AND FITTING MOUNTED TO SAME

**Ram D. Bedi, and Adrianus J. van der Griendt, both of Birmingham, Mich., assignors to K. J. Manufacturing Co., Wixom, Mich.**

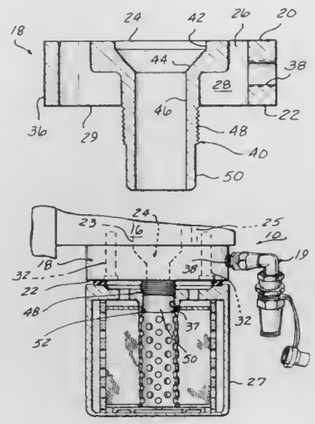
**Continuation of Ser. No. 125,291, Sep. 22, 1993, abandoned. This application Feb. 12, 1996, Ser. No. 600,123**

**Int. Cl.[6] F01M** *1/00*

**U.S. Cl. 184—1.5** **9 Claims**

1. An oil filter mounting adapter connectable with an internal lube oil passage system located in an engine block of an internal combustion engine, the oil filter mounting adapter comprising:

a sandwich adapter having a first face having an essentially flat planar surface adapted to sealingly contact an oil filter mounting boss and communicate there through with the internal lube oil passage system in the internal combustion engine, the oil filter mounting boss having an oil entry orifice and at least one oil exit orifice defined in the engine block, the oil entry orifice having an inner diameter, said oil filter sandwich adapter having a second face adapted to sealingly contact an associated oil filter unit, and an outer wall member defining an outer perimeter of said sandwich adapter disposed between said first and said second faces and perpendicularly attached thereto, said sandwich adapter having at least one fluid transfer opening defined in said flat first face in fluid communication with the internal lube oil passage system of the internal




combustion engine, at least one oil collection chamber proximate to said oil filter unit, at least one fluid exit opening proximate to said oil filter unit, a central through bore extending laterally through said sandwich adapter from said first face to said second face, said fluid transfer opening, oil collection chamber and fluid exit opening forming at least one fluid transfer channel extending laterally through said oil collection chamber to said engine oil exit opening, and an aperture located in said outer wall member, said aperture defining an associated longitudinal fluid transfer channel, said longitudinal fluid transfer channel terminating in fluid communication with said at least one lateral fluid transfer channel defined in said sandwich adapter, the sandwich adapter further having a nipple extension integrally formed with the sandwich adapter positioned coaxially with said central through bore and extending outward from said second face, said nipple extension comprising means for releasable engagement with a central aperture located in said associated oil filter unit, wherein said associated oil filter unit is engaged in releasable sealing attachment with said second face of said sandwich adapter;

a fluid coupling assembly sealingly positionable in said associated outer wall aperture,

means for connecting said sandwich adapter to said oil filter mounting boss;

wherein said central through bore defined in said sandwich adapter has a first section in fluid communication with said oil entry orifice, the first section having an inner diameter, the central through bore further having an intermediate section in fluid communication with said first section and a second section in fluid communication with the intermediate section and extending through said nipple extension, said second section having an inner diameter less than said diameter of said first section, said intermediate section having a tapered surface connecting said first section and said second section.

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**5,743,359**

## BOLT LUBING TOOL

**Timothy L. Parnell, Raleigh, N.C., assignor to General Electric Company, Cincinnati, Ohio**

**Filed Nov. 22, 1996, Ser. No. 754,344**

**Int. Cl.[6] F16N** *7/12*

**U.S. Cl. 184—102** **14 Claims**

1. A lubricating tool comprising:

a longitudinally extending casing,

a resilient absorbent means disposed within said casing,





longitudinally extending slits radially extending from a longitudinally extending centerline essentially in a center of said absorbent means, and

a lubricant supply passage extending from a lubricant supply aperture in said casing through said absorbent means to said center line.

14. A lubricating tool comprising:

a longitudinally extending casing,

a resilient absorbent means disposed within said casing,

longitudinally extending slits radially extending from a longitudinally extending centerline essentially in a center of said absorbent means,

said resilient absorbent means is charged with a lubricant,

a longitudinally extending pilot hole in said absorbent means,

said pilot hole extending along said centerline to a longitudinally distal end of said absorbent means, and

said slits radially extending away from said pilot hole.

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**5,743,360**

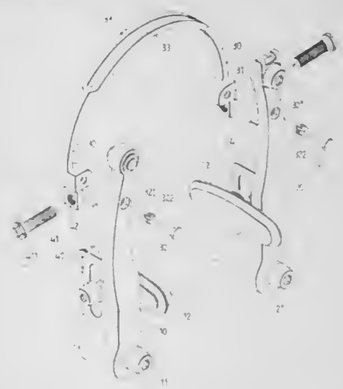
## ADJUSTABLE BICYCLE BRAKE

**Howard Ke, Taichung Hsien, Taiwan, assignor to Dia-Compe. Taiwan, Co., Ltd., Taichung, Taiwan**

**Filed Dec. 5, 1996, Ser. No. 759,217**

**Int. Cl.[6] B62L** *1/06;3/00*

**U.S. Cl. 188—24.19** **6 Claims**



1. An adjustable bicycle brake comprising:

two brake arms symmetrical in construction and adapted to be fastened pivotally and respectively at one end thereof with a bicycle frame, said brake arms having respectively at another end thereof a stopping block, said brake arms provided respectively with a brake shoe fastened therewith such that said brake shoe is located between said one end and said another end; and

a tension spring having two ends opposite to each other and provided respectively with a pivoting portion which is engaged with said another end of one of said two brake arms, said tension spring provided with two pushing devices each being contiguous to said pivoting portion, said pushing devices comprising a pushing device urging at each end thereof said stopping block of one of said two brake arms such that said pushing device can be displaced for adjusting a distance between said brake shoe and a bicycle wheel fastened with the bicycle frame.

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**5,743,361**

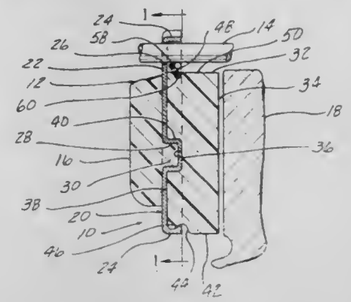
## LIGHT WEIGHT BRAKE SHOE APPARATUS WITH REMOVABLE FRICTION PAD

**Klaus Winter, Hardegsen, Germany, assignor to ITT Automotive, Inc., Auburn Hills, Mich.**

**Continuation of Ser. No. 468,720, Jun. 6, 1995, abandoned. This application Jan. 2, 1997, Ser. No. 778,113**

**Int. Cl.[6] F16D** *69/00*

**U.S. Cl. 188—250 G** **11 Claims**




1. A brake shoe apparatus for selectively and operatively engaging a moveable member comprising:

replaceable pad means for frictionally engaging said moveable member, and said replaceable pad means having a centrally disposed recess and sidewalls;

dish shaped pad supporting means for cooperatively engaging said replaceable pad means, and said pad supporting means having a continuous sidewall substantially perpendicular to a back wall and extending along a perimeter of said pad supporting means for cooperatively engaging said sidewalls of said replaceable pad means to prohibit lateral movement of said replaceable pad means, and said pad supporting means having a centrally disposed hub portion engaging said recess of said replaceable pad means to prohibit radial movement of said replaceable pad means with respect to said pad supporting means;

means for mounting said pad supporting means wherein said mounting means extends substantially perpendicular through said pad supporting means; and

means for biasing said replaceable pad means into cooperative engagement with said pad supporting means, and restraining movement of said replaceable pad means with respect to said pad supporting means.

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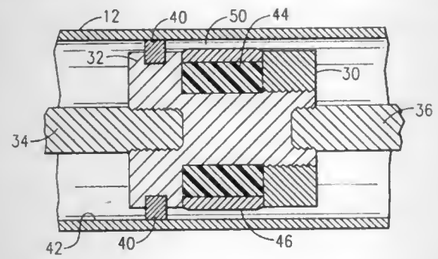


5,743,362

## TEMPERATURE COMPENSATED VISCOUS DAMPER

R. Leon Clinard, Gatzville, and Peter M. Jurns, Cheektowaga, both of N.Y., assignors to Enidine Incorporated, Orchard Park, N.Y.

Filed Jun. 28, 1996, Ser. No. 671,690
Int. Cl.[6] F16F 15/03
U.S. Cl. 188—277 8 Claims



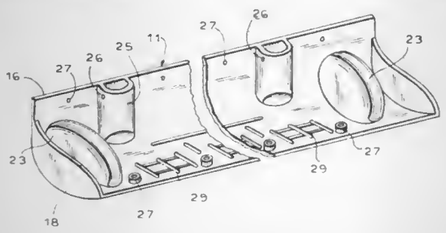

1. A temperature compensating damper for absorbing energy imparted to a structure, comprising:
a cylinder containing a viscous fluid, said first cylinder adapted for connection to said structure;
a piston head within said cylinder, adapted for reciprocation with respect to said cylinder;
a piston rod connected to said piston head at a first end and adapted for connection to said structure at a second end;
a first plastic ring surrounding said piston head having a relatively high coefficient of thermal expansion;
a second ring surrounding said first ring having a relatively low coefficient of thermal expansion, said first and second rings sized such that an annular orifice is present between said second ring and said cylinder such that said viscous fluid can flow through said annular orifice when said piston head reciprocates with respect to said cylinder.

5,743,363

## SCUFF RESISTANT BAG

Richard J. Rekuc, Pattenburg, and Carmen Cook, Asbury, both of N.J., assignors to Royalox International, Inc., Phillipsburg, N.J.

Filed Aug. 22, 1996, Ser. No. 701,378
Int. Cl.[6] A45C 5/14
U.S. Cl. 190—18 A 6 Claims



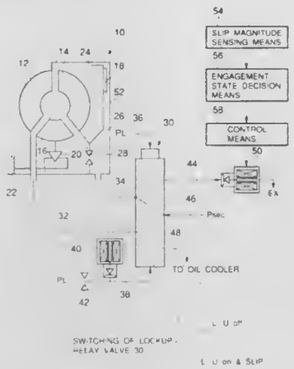

1. A bottom protector for a duffle bag formed with a supported side and a bottom, comprising a one-piece member molded from synthetic resin material and having an arcuate portion and provided with means for affixing said member to said wall and said bottom and bridging a pair of planar portions which are mutually perpendicular, a pair of webs at opposite ends of said member perpendicular to said planar portions and bridging said planar portions while being adapted to flank the duffle bag, a pair of spaced apart tubular seats and a pair of wheel wells formed in said arcuate portion proximal to the respective webs and flanking said pair of seats for receiving wheels on which said duffle bag can ride as said duffle bag is drawn over the ground.

5,743,364

## SLIP CONTROL SYSTEM OF LOCKUP CLUTCH

Hidehiro Oba, Numazu, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 12, 1996, Ser. No. 679,111
Claims priority, application Japan, Jul. 17, 1995, 7-179901
Int. Cl.[6] F16H 61/14
U.S. Cl. 192—3.3 14 Claims




1. A slip control system of a lockup clutch wherein the lockup clutch is slipped and controlled in accordance with hydraulic pressures of working oil within an engagement side oil chamber and a release side oil chamber in order that a magnitude of a slip between an input element and an output element may be brought to a desired value, comprising:
an orifice which is provided between said engagement side oil chamber and said release side oil chamber;
control means for calculating the desired value and for outputting as an output a duty factor correspondent to the calculated desired value; and
a duty solenoid which is disposed in an exhaust oil passage for the working oil to be exhausted out of said release side oil chamber, and which receives the duty factor outputted from said control means and then controls a quantity of exhaust in a state where said working oil is to be exhausted out of said release side oil chamber.

5,743,365

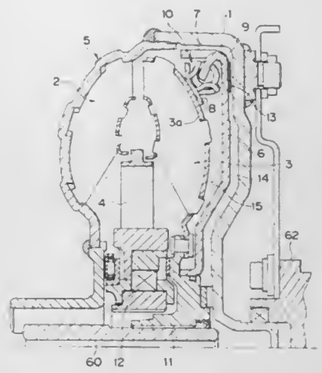
## LOCK-UP DAMPER DEVICE FOR FLUID TRANSMISSION APPARATUS

Tetsuya Makino, Fuji, Japan, assignor to Jatco Corporation, Japan

Filed May 1, 1996, Ser. No. 639,625
Int. Cl.[6] F16H 45/02
U.S. Cl. 192—3.29 10 Claims

1. An apparatus comprising:
a fluid transmission device comprising a cover, a pump impeller connected to an input shaft of the device through the cover, and a turbine runner connected to an output shaft of the device and disposed such that the turbine runner is opposed to the pump impeller with a fluid being present therebetween;
a lock-up piston disposed between said turbine runner and said cover of said fluid transmission device, and selectively placed in one of a lock-up release position for transmitting a drive force through the fluid circulating in the fluid transmission device, and a lock-up engaging position for directly connecting said input shaft and said output shaft with each other to transmit the drive force; and
a lock-up damper for absorbing torsional vibrations included in the drive force when said lock-up piston is placed in said lock-up engaging position, said lock-up damper comprising a driving plate disposed on a side of said lock-up piston, a driven plate disposed on a side of said turbine runner, and a plurality of coil springs mounted between the driving plate and the driven plate;
wherein said driving plate is located inside a radially outer flange of said lock-up piston and is integral with the lock-up piston;
wherein said driving plate has a plurality of slots formed through said radially outer flange of said lock-up piston, and a plurality of driving claws formed by bending inward parts of the radially outer flange at a proximal portion thereof surrounded by said slots; and
wherein recesses are formed on the opposite sides of the proximal portion of said each driving claw.



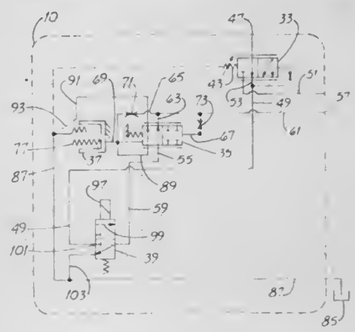



5,743,366

## AUTO-MODULATING HYDRAULIC CIRCUIT AND RELATED METHOD

Guy T. Stoever, and Jimmie D. Clifford, both of Naperville, Ill., assignors to Case Corporation, Racine, Wis.

Filed Sep. 23, 1996, Ser. No. 717,684
Int. Cl.[6] F16D 67/04;25/12
U.S. Cl. 192—12 C 19 Claims



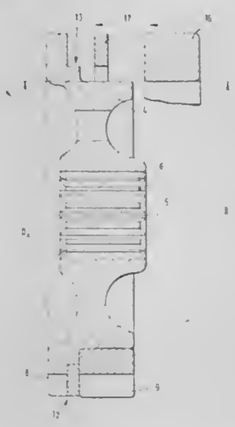

1. In combination, a clutch and a modulating hydraulic circuit for controlling the clutch and including:
a throttling valve having (a) an inlet port for receiving hydraulic fluid from a source, and (b) a discharge port connected to the clutch;
and wherein:
the discharge port is also connected to an accumulator and to an accumulator drain line;
the accumulator includes a member which closes the drain line when the accumulator pressure rises to a closure pressure;
the accumulator is at an accumulator pressure; and
the discharge port and the clutch are at a pressure generally proportional to the accumulator pressure.

5,743,367

## MULTIPLE PLATE FRICTION CLUTCH WITH AXIAL STOP

Klaus Hofmann, Leutershausen; Klaus Betten, Rötschenhausen; Jürgen Loibersbeck, Grafenrheinfeld; Thomas Schubert, Grettstadt, and Peter Wiggen, Grafenrheinfeld, all of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed May 21, 1996, Ser. No. 651,091
Claims priority, application Germany, May 22, 1995, 195 18 679.6; Jan. 31, 1996, 195 49 337.0
Int. Cl.[6] F16D 13/52
U.S. Cl. 192—70.2 8 Claims




1. A friction clutch, said friction clutch comprising:
a hub body having an axis of rotation;
said hub body being configured to be rotationally coupled to a shaft member for the transmission of rotation about said axis of rotation from said hub body to a shaft member;
said hub body comprising a first face facing in a first direction along said axis of rotation, said hub body also comprising a second face facing in a second direction along said axis of rotation opposite to said first direction;
said hub body additionally comprising a peripheral surface extending circumferentially about said hub body, said peripheral surface having a width extending parallel to said axis of rotation between said first face of said hub body and said second face of said hub body;
at least a first clutch plate;
said first clutch plate being disposed adjacent said first face of said hub body;
said hub body comprising a first peripheral gearing, said first peripheral gearing being disposed on said peripheral surface of said hub body and extending from said first face of said hub body toward said second face of said hub body;
said first clutch plate comprising a first clutch plate gearing arrangement to engage said first peripheral gearing of said hub body;
said first clutch plate being axially translatable along said axis of rotation while maintaining engagement between said first clutch plate gearing arrangement and said first peripheral gearing of said hub body;

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an axial limitation arrangement for limiting the extent of axial translation between said hub body and said first clutch plate;

at least a second clutch plate;

said second clutch plate being disposed adjacent said second face of said hub body;

said hub body additionally comprising a second peripheral gearing, said second peripheral gearing being disposed on said peripheral surface of said hub body and extending from said second face of said hub body toward said first face of said hub body;

said second clutch plate comprising a second clutch plate gearing arrangement to engage said second peripheral gearing of said hub body;

said second clutch plate being axially translatable along said axis of rotation while maintaining engagement between said second clutch plate gearing arrangement and said second peripheral gearing of said hub body;

said axial limitation arrangement being disposed between said first peripheral gearing on said hub body and said second peripheral gearing on said hub body;

said first peripheral gearing comprising a first plurality of gear teeth, said first plurality of gear teeth extending radially outward from a first root diameter along which the roots of said first plurality of gear teeth are disposed to a first outside diameter along which the radially outward tips of said first plurality of gear teeth are disposed;

said second peripheral gearing comprising a second plurality of gear teeth, said second plurality of gear teeth extending radially outward from a second root diameter along which the roots of said second plurality of gear teeth are disposed to a second outside diameter along which the radially outward tips of said second plurality of gear teeth are disposed;

said axial limitation arrangement comprising at least one arcuate member disposed about at least a portion of said peripheral surface of said hub body;

said at least one arcuate member extending radially outward beyond at least one of said first and second root diameters;

said hub body and said at least one arcuate member comprising separate and nonintegral structural components;

said hub body additionally comprising a peripheral groove extending at least partially about said peripheral surface, said peripheral groove being disposed between said first peripheral gearing and said second peripheral gearing of said hub body, said peripheral groove extending radially inward from said peripheral surface toward said axis of rotation, and said at least one arcuate member being disposed within said peripheral groove;

said at least one arcuate member comprising an annular member;

said hub body comprising a first hub member and a second hub member;

said first hub member comprising said first plurality of gear teeth and said second hub member comprising said second plurality of gear teeth;

said first hub member additionally comprising:

a first cylindrical portion of a first diameter extending along said axis of rotation;

a second cylindrical portion of a second diameter extending along said axis of rotation, said second diameter being substantially greater than said first diameter; and

a third cylindrical portion of a third diameter extending along said axis of rotation, said third diameter being substantially greater than said second diameter;

said second hub member comprising an annular surface encircling said first cylindrical portion of said first hub member; and

said annular member being disposed about said second cylindrical portion of said first hub member and between said first cylindrical portion of said first hub member and said third cylindrical portion of said first hub member.

**5,743,368**

## AUTOMATIC TRANSMISSION CONTROL SYSTEM

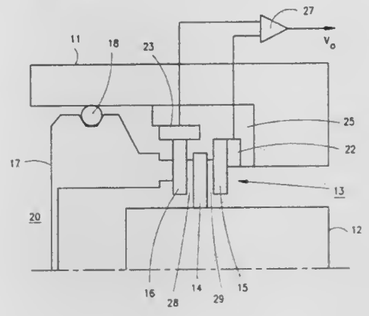
**Frank de Schepper, Venusberg, Belgium, and Kenji Suzuki, Okazaki, Japan, assignors to Aisin AW Co., Ltd., Japan**

**Filed Jul. 10, 1996, Ser. No. 678,043**

**Claims priority, application Japan, Jul. 10, 1995, 7-173243**

**Int. Cl.[6] F16D** *25/0638;* **F16H** *61/00*

**U.S. Cl. 192—85 AA** **9 Claims**




1. An automatic transmission control system comprising:

a frictional engagement element, including alternating radially inner and radially outer plates, for selectively transmitting torque responsive to an apply force;

a hydraulic servo including a piston mounted for movement between engagement with said frictional engagement element to impart the apply force thereto and disengagement from said frictional engagement element, responsive to feed of an oil pressure;

wherein two of said piston and said plates are electrically conductive members at least one of which moves relative to the other as said frictional engagement element is engaged/disengaged;

electric characteristic detecting means for detecting an electric characteristic which changes with the relative movement of said two electrically conductive members and which is related to the apply force of said frictional engagement element and for generating a characteristic signal representative of the detected electrical characteristic;

an apply force control unit for computing the apply force based on said characteristic signal and for generating an apply force signal in accordance with the computed apply force; and

hydraulic control means for controlling the apply force of said frictional engagement element by controlling the feed of oil pressure to said hydraulic servo, responsive to the apply force signal.

**5,743,369**

## WET CLUTCH ASSEMBLY

**Patrick Lorriette, Jaux, France, assignor to Massey-Ferguson S.A., France**

**Filed Dec. 20, 1995, Ser. No. 575,716**

**Claims priority, application United Kingdom, Dec. 24, 1994, 9426248; Jan. 30, 1995, 9501753**

**Int. Cl.[6] F16D** *25/08*

**U.S. Cl. 192—85 CA** **2 Claims**

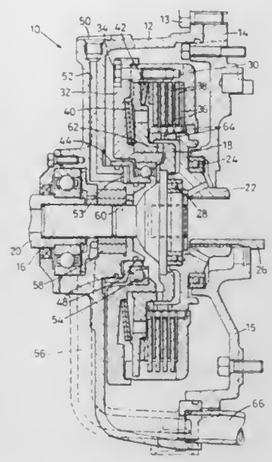
1. A wet clutch assembly comprising:

a) an input shaft;

b) first and second sets of substantially parallel clutch members interleaved to form a stack;

c) a hydraulic actuator piston concentrically disposed with respect to the input shaft, but arranged not to rotate with it, said piston being arranged either to engage or to disengage said clutch members, said piston being journalled to a member which is rotationally fast to said first set of clutch members by means of a bearing having inner and outer races and






rolling members between the said races so as to allow relative rotation between said piston and said first set of clutch members, wherein the said inner race and the said piston constitute a unitary member.

**5,743,370**

## HYDRAULIC CLUTCH RELEASE BEARING FOR A MOTOR VEHICLE DIAPHRAGM CLUTCH

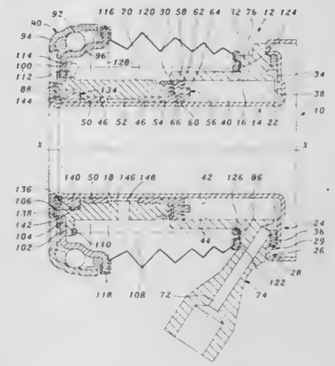
**Sylvain Thomire, Levallois, France, assignor to Valeo, Paris, France**

**Filed Sep. 11, 1996, Ser. No. 718,095**

**Claims priority, application France, Sep. 14, 1995, 95 10748**

**Int. Cl.[6] F16D** *25/08*

**U.S. Cl. 192—85 CA** **14 Claims**




1. A fluid-pressure operated clutch release bearing for a diaphragm clutch, the release bearing having a fixed part which comprises an annular cylindrical external body and an internal support and guide tube coaxial with the said external body, the external body and the internal tube together defining between them a blind annular cavity for receiving pressurised fluid for actuation of the clutch release bearing, the clutch release bearing further including: a tubular piston mounted within the said cavity for axial sliding movement therein, whereby to define in the said cavity a control chamber of the clutch release bearing, the piston having a front end portion projecting out of the said control chamber; and an actuating element carried by the said front end portion of the piston for acting on a diaphragm of said clutch, wherein the clutch release bearing further includes a finned sealing ring carried by the front end portion of the piston, the said internal tube having an outer peripheral surface, the piston having an internal bore defining an annular space between the said internal bore and the said outer peripheral surface of the tube, the finned sealing ring cooperating with the outer peripheral surface of the tube to restrict any escape of said fluid through the said annular space, the clutch release bearing further having means, including the outer periphery of the piston, defining a leakage recovery zone for collection of any said fluid leaked into the said annular space, and the piston having at least one evacuation orifice connecting the said annular space with the said recovery zone.

**5,743,371**

## CLUTCH DISC ASSEMBLY

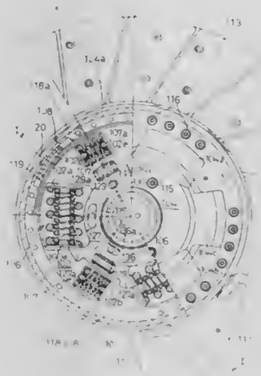
**Yasushi Takehira, and Shinichi Noda, both of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan**

**Division of Ser. No. 144,682, Oct. 28, 1993, Pat. No. 5,590,752. This application Nov. 8, 1996, Ser. No. 745,750**

**Claims priority, application Japan, Oct. 30, 1992, 4-075538**

**Int. Cl.[6] F16D** *3/80; 13/64*

**U.S. Cl. 192—208** **10 Claims**




6. A clutch disc assembly comprising:

a hub having a flange on its outer circumference;

a disc-like plate rotatably mounted on said hub, said disc-like plate at least partially defining a fluid chamber which is filled with a fluid medium;

an elastic member located in said fluid chamber for elastically connecting said flange and said disc-like plate for a limited rotary displacement relative to each other;

a viscous damper mechanism disposed in said fluid chamber, having:

an annular member connected to said disc-like plate and disposed radially outwardly of said elastic member within said fluid chamber, said annular member defining a plurality of arcuate chambers, each of said arcuate chambers being sealed from adjacent ones of said arcuate chambers such that no fluid may flow between adjacent ones of said arcuate chambers;

a plurality of sliders each of said sliders having opposing abutting portions, each one of said sliders being disposed in a corresponding one of said arcuate chambers and being displaceable in circumferential directions;

a plurality of stop members connected to said flange and each of said stop members extended into a corresponding one of said arcuate chambers and a corresponding one of said sliders, an inside portion of each of said sliders being divided by said stop members into two first chambers, and said sliders dividing said arcuate chambers into two second chambers;

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a first choke formed between each corresponding one of said stop members and said sliders;

a second choke formed between an inner wall of each of said arcuate chambers and said sliders, an amount of fluid flow through said second choke being smaller than that of said first choke; and

said first choke being opened in response to a first-angle of relative rotary displacement between said disc-like plates and said flange so that said fluid medium flows through said first choke, generating a first viscous resistance, and said first choke portion being closed in response to a second-angle of relative rotary displacement between said disc-like plates and said flange which is larger than said first-angle so that said fluid medium flows through said second choke, generating a second viscous resistance higher than said first viscous resistance.

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**5,743,372**

## COIN DISCRIMINATING APPARATUS

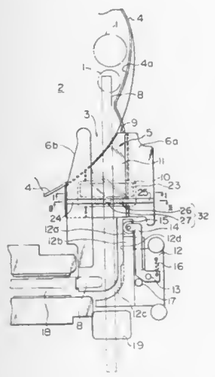
**Katusuke Furuya, Matsudo, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan**

**Filed Jul. 5, 1996, Ser. No. 678,537**

**Claims priority, application Japan, Jul. 17, 1995, 7-179875**

**Int. Cl.[6] G07D** *5/08*

**U.S. Cl. 194—318** **12 Claims**



1. A coin discriminating apparatus for discriminating coins transported in a coin passage comprising:

a magnetic sensor having oscillating inductor means and receiving inductor means,

the receiving inductor means being constituted by connecting a plurality of tip-like inductors disposed in a direction perpendicular to a longitudinal direction of the coin passage in series with each other,

the respective tip-like inductors having capacities selected so that output levels thereof are equal with respect to magnetic flux density produced by supplying electrical current of high frequency into the oscillating inductor means,

wherein the plurality of tip-like inductors constituting the receiving inductor means are arranged in a zigzag pattern and adjacent tip-like inductors are in contact with each other.

**5,743,373**

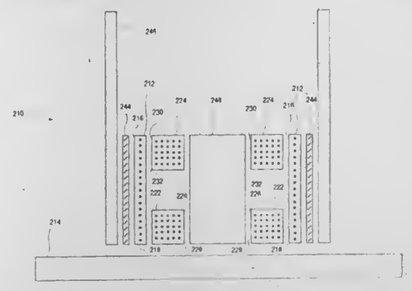
## COIN DISCRIMINATION SENSOR AND COIN HANDLING SYSTEM

**Eric Strauts, Park Ridge, Ill., assignor to Cummins-Allison Corp., Mt. Prospect, Ill.**

**Continuation of Ser. No. 399,771, Mar. 7, 1995, Pat. No. 5,630,494. This application Nov. 7, 1996, Ser. No. 744,373**

**Int. Cl.[6] G07D** *3/14*

**U.S. Cl. 194—318** **7 Claims**



1. A coin discrimination sensor for discriminating among desired and undesired coins, comprising:

an excitation coil and a voltage source connected thereto for producing an alternating magnetic field;

said alternating magnetic fields coupling to said desired and undesired coins to induce eddy-currents in said coins;

a detection coil having a pair of windings for detecting said eddy currents in said desired and undesired coins, said windings being positioned at different distances from said coins to produce a differential voltage across said detection coil corresponding to the composition of the desired and undesired coins being sensed, said excitation coil and said detection coil being both located on the same side of and above the coin being sensed,

means for producing a single signal representing both the amplitude of the voltage produced by said detection coil and the phase difference between the voltage applied to the excitation coil and the differential voltage induced in the detection coil, and

wherein said means for detecting a phase difference between the voltage applied to the excitation coil and the differential voltage induced in the detection coil detects the amplitude of said differential voltage.

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**5,743,374**

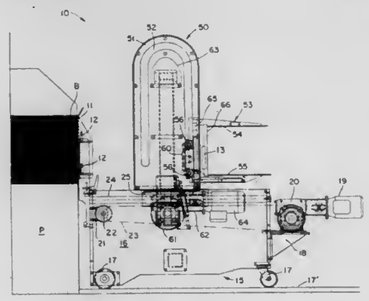
## STACK TURNER AND REPLENISHER AND METHOD

**Claude E. Monsees, 80 Carowood Dr., Charlotte, N.C. 28226**

**Filed Aug. 25, 1995, Ser. No. 519,242**

**Int. Cl.[6] B65G** *47/24*

**U.S. Cl. 198—403** **20 Claims**



1. A stack turner and replenisher comprising:

a clamp for receiving a stack of articles;



a first power source associated with said clamp for moving said clamp in a lateral direction;

a second power source associated with said clamp for moving said clamp along an entire length of an inverted U-shaped path, said first and second power sources operating independent of one another;

whereby operating said first and second power sources inverts and moves said stack of articles received in said clamp from a first lateral position to a second lateral position.

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**5,743,375**

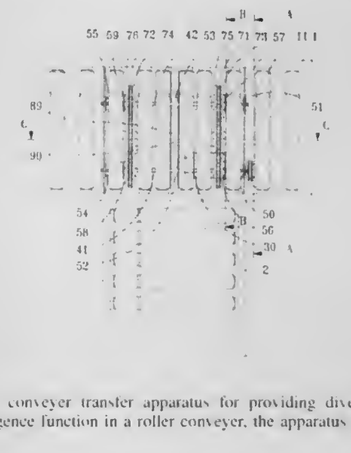
## CONVEYER TRANSFER APPARATUS

**Duen-Jyh Shyr, Fu Chain, and Kuan-Chou Chen, Shing Ying, both of Taiwan, assignors to Industrial Technology Research Institute**

**Filed Sep. 11, 1995, Ser. No. 526,614**

**Int. Cl.[6] B65B** *37/00*

**U.S. Cl. 198—463.3** **5 Claims**



1. A conveyer transfer apparatus for providing diversion or convergence function in a roller conveyer, the apparatus comprising:

a base;

a reversible motor located on the base;

a pair of side-roller-chains, located between a plurality of conveyer rollers, each side-roller-chain having a chain pitch with two sides and a pair of chain rollers disposed respectively at both sides of said chain pitch;

a pair of spindles disposed perpendicularly to said conveyer rollers, each spindle being supported by bearings at both ends and a middle portion thereof which are engaged with said base, one end of one of said spindles having a driven sprocket mounted thereon;

four eccentric sleeves disposed respectively near both ends of said pair of spindles;

four sprockets housed in said four eccentric sleeves, respectively, wherein said four sprockets are grouped into two pairs and each pair of sprockets are mounted on each of said pair of spindles and are engaged with each of said side-roller-chains;

four bearings, each being mounted respectively on an outside end of each of said eccentric sleeves; and

a pair of guide channels each being formed into an H-shape, each guide channel including an inside guide rail, an outside rail and a central slot between them to allow said sprocket to travel therewithin, said guide channels are structured such that when said side-roller-chain moves on a surface of the guide channel, said outside guide rail is in contact with said bearing while said inside guide rail hangs on said sprocket so that said guide channels are moved and lifted with said sprocket synchronously;

whereby when an article on the conveyer is being carried above the side-roller-chain, the article is lifted upward and moved laterally to a secondary conveyer by a cam action of said spindles, which are offset in the sleeves.

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**5,743,376**

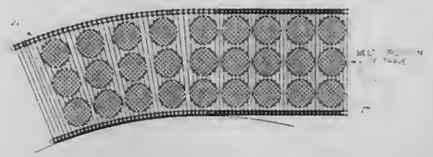
## SPIRAL FREEZER CONVEYOR BELT INFEED COLLAPSING SYSTEM

**Gregory L. Ochs, Kirkland, Wash., assignor to York International, York, Pa.**

**Filed Jan. 23, 1996, Ser. No. 590,339**

**Int. Cl.[6] B65G** *13/02*

**U.S. Cl. 198—778** **10 Claims**



1. A food processing system comprising a food processor; a food product conveyor associated with said food processor comprising a conveyor belt constructed of segments that are displaceable relative to one another and linked together to form an endless conveyor belt that extends through said food processor, said conveyor belt being arranged to travel from a lineal course into and through an arcuate course; a conveyor drive drivingly engaged with said conveyor belt; a controller associated with said conveyor drive; a detector for detecting a condition of said conveyor belt at a predetermined location; said controller being responsive to the detected condition for controlling said conveyor drive to displace conveyor belt segments into a collapsed condition so that conveyor belt segments enter said arcuate course from said lineal course in a collapsed condition with inner edges of said conveyor belt segments remaining collapsed as the belt segments enter said arcuate course and with outer edges of said conveyor belt segments expanding apart as the belt segments enter said arcuate course.

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**5,743,377**

## TRANSPORT STAR FOR CONTAINERS

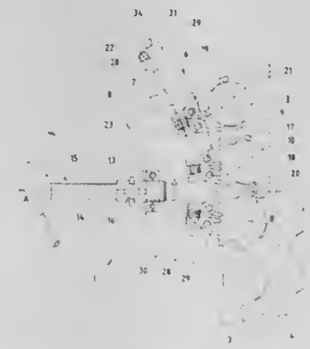
**E. H. Hermann Kronseder, Regensburgerstrabe 42, 93086 Worth/Donau, Germany**

**Filed Apr. 24, 1996, Ser. No. 639,115**

**Claims priority, application Germany, May 13, 1995, 295 07 933.9; Nov. 15, 1995, 195 42 518.9**

**Int. Cl.[6] B65G** *47/86*

**U.S. Cl. 198—803.9** **24 Claims**



1. A transport star for containers, consisting of a rotating basic structure having a feed-in area and an exit area and a plurality of

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gripping pliers with pivoting clamps positioned around the perimeter of the structure, each of said gripping pliers comprising a pair of double levers with gripping arms facing outward radially and a pair of counter-arms facing inward radially, and being engaged by a control apparatus consisting of a plurality of expanders, said expanders running on a plurality of flexible bearings and biasing the counter-arms into locking positions, each of said expanders having at least three different self-locking positions that alter the spacing between the gripping arms.

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**5,743,378**

**DEVICE FOR STABILIZING THE CONVEYOR BELT IN A SELF-ADJUSTING BELT STEERING ASSEMBLY**

**Kenneth Hovstø, Heistad, and Kjell Arne Gaarden, Herøya, both of Norway, assignors to AS Techno Track, Skien, Norway**

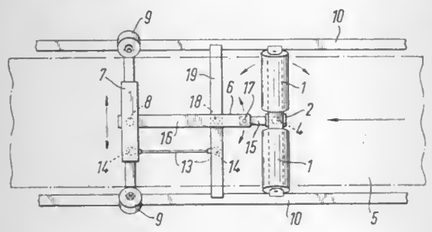
**PCT No. PCT/NO94/00187, § 371 Date May 22, 1996, § 102(e) Date May 22, 1996, PCT Pub. No. WO95/14627, PCT Pub. Date Jun. 1, 1995**

**PCT Filed Nov. 21, 1994, Ser. No. 624,426**

**Claims priority, application Norway, Nov. 22, 1993, 934221**

**Int. Cl.[6] B65G** *39/16*

**U.S. Cl. 198—806** **3 Claims**



1. A conveyor belt aligning device comprising a pair of supporting rollers (1) having axes that intersect at an obtuse angle, said supporting rollers providing an upwardly opening cradle for supporting and centering a conveyor belt resting on said supporting rollers, a frame on which said supporting rollers are mounted, means (4) mounting said frame for horizontal swinging movement about a vertical axis that intersects said axes of said supporting rollers at a common point, guide rollers (9) adapted to engage opposite longitudinal edges of a conveyor belt with said conveyor belt disposed between said guide rollers, and means (6-8, 15-17) interconnecting said guide rollers with said frame such that movement of said guide rollers transversely of the said conveyor belt rotates said frame and causes said supporting rollers to swing about said vertical axis.

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**5,743,379**

**CONVEYOR BELT FEED/DISCHARGE INSERT**

**Karl Warnecke, Sibbesse, Germany, assignor to Transnorm System GmbH, Harsum, Germany**

**Continuation-in-part of Ser. No. 423,883, Apr. 18, 1995, abandoned. This application Nov. 22, 1996, Ser. No. 754,892**

**Claims priority, application Germany, Apr. 19, 1994, 44 13 137.2**

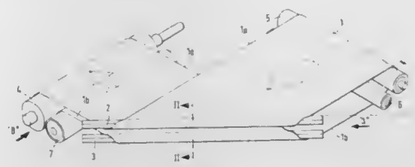
**Int. Cl.[6] B65G** *15/62*

**U.S. Cl. 198—839** **10 Claims**

1. A device for transporting goods at an acute angle with respect to a main conveyor belt, the device comprising:

an endless loop conveyor belt having an upper segment and a lower segment;

two rigid deflection bars having polygonal cross-sections with alternating planar surfaces and vertices for guiding and deflecting said upper and lower segments,



a belt drive comprising a cylindrical drive drum with a circumference, said endless loop conveyor belt contacting said drive drum about at least 180° of the circumference to increase traction to drive said belt under low tension;

wherein said conveyor belt makes linear contact with the vertices with air cushions formed between said planar surfaces and said low tension belt so that ventilation is provided between then vertices to reduce friction.

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**5,743,380**

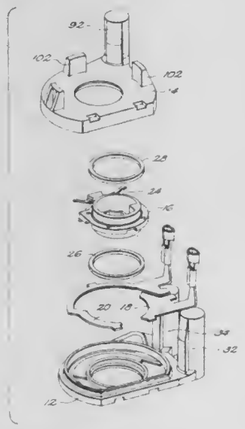
**ROTARY DOOR LOCK SWITCH ASSEMBLY AND METHOD FOR MANUFACTURING SAME**

**Bradford K. Gauker, Clinton Township, Mich., assignor to Augat Inc., Mansfield, Mass.**

**Filed Dec. 2, 1996, Ser. No. 759,113**

**Int. Cl.[6] H01H** *27/06*

**U.S. Cl. 200—43.08** **18 Claims**



1. A rotary switch assembly comprising:

a first housing formed from a dielectric insulative material comprising a plate-like first stator member defining a first arcuate contact path and having a first opening therein, and a first wire tower integrally formed with the first stator member;

a first electrical contact including a first conductive pad disposed on a portion of the first arcuate contact path and a first wire grip crimped to a wire disposed within the first wire tower;

a second housing formed from a dielectric insulative material comprising a plate-like second stator member defining a second arcuate contact path concentric with the first arcuate contact path and having a second opening therein, and a second wire tower integrally formed with the second stator member;

a second electrical contact including a second conductive pad disposed on a portion of the second arcuate contact path and a second wire grip crimped to a wire disposed within the second wire tower;

a rotor comprising a rotor body and a rotor contact disposed within the rotor body, the rotor body disposed for rotation between the first housing stator member and the second housing stator member within the openings therein, the rotor body having an opening therein concentric with the first and second openings in the first and second housing stator members and sized to receive a lock assembly, the rotor contact including a pair of first contact beams disposed for electrical contact with the first conductive pad and a pair of second contact beams disposed for electrical contact with the second conductive pad; and

the first and second housings being fixedly joined about a peripheral joint, the first and second housings being sealed sufficiently to prevent entry of environmental contaminants and moisture at the peripheral joint, at wire entrance areas, and between the rotor and the first and second housings.



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**5,743,381**

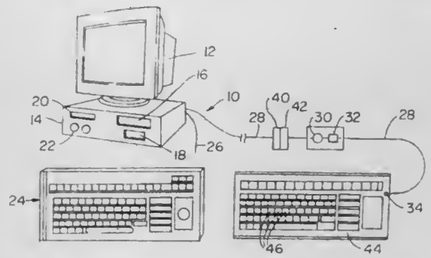
**APPARATUS FOR ILLUMINATING KEYBOARDS**

**Melvin Patak, P.O. Box 297, Ennis, Tex. 75120, and Martin Sachs, 17 Dunbar Dr., Robbinsville, N.J. 08691**

**Filed Mar. 17, 1997, Ser. No. 819,475**

**Int. Cl.[6] H01H** *9/00*

**U.S. Cl. 200—310** **6 Claims**



1. An appartus adapted to overlie an existing keyboard for illuminating keys on the keyboard comprising:

A. a thin transparent material having:

a) a thickness, a top and bottom surface and external edges wherein light rays can pass throughout said thickness,

b) a plurality of through apertures wherein each said aperture extends through said top and bottom surfaces, and wherein each said aperture being adapted to receive a key on the keyboard when said material is placed over the keyboard such that clearance is provided between the edges of the keys and edges of said through apertures,

c) said top and bottom surfaces and the external edges of said relatively thin transparent material being treated to prevent light from escaping therefrom,

d) edges of said through apertures being left clear for permitting light to exit therefrom and into said clearance to illuminate each said keys;

B. at least one bracket means adapted to removably retain a light source, said bracket means being adapted to be retained on said material to permit light rays emanating from the light source to enter into a portion of said relatively thin transparent material;

C. a light source adapted to be received into said bracket means and positioned within said material; and

D. coupling means, for coupling a source of electrical power to said light source.

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**5,743,382**

**SWITCH HAVING A DISPLAYING FUNCTION**

**Jenny Luo, Shin-Tien, Taiwan, assignor to Shin Jiuh Corp., Taipei Hsien, Taiwan**

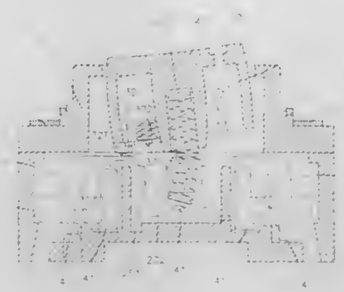
**Filed Sep. 3, 1996, Ser. No. 706,795**

**Int. Cl.[6] H01H** *9/00*

**U.S. Cl. 200—315** **19 Claims**

1. A switch having a displaying function, comprising:

a housing;



a switching device installed in said housing for performing a switching operation; and

a displaying device installed in said housing for displaying an ON/OFF status of said switch, wherein said displaying device further comprises:

a positioning piece for connecting with said switching device, wherein said positioning piece is a printed circuit board;

an indicating element providing said switch status;

a resilient element connecting with said indicating element in order that said indicating element provides said switch status in response to said switching operation; and

a spiral spring cushion device connecting with said resilient element for cushioning a pressure imposed thereon during said switching operation.

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**5,743,383**

**PUSH BUTTON SWITCH**

**Tadashi Yano, Hirakata, and Takefumi Inoue, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jul. 23, 1996, Ser. No. 681,419**

**Claims priority, application Japan, Jul. 25, 1995, 7-188883**

**Int. Cl.[6] H01H** *3/12*

**U.S. Cl. 200—344** **2 Claims**



1. A push button switch comprising:

a baseplate;

a membrane switch disposed on the baseplate;

a cup-shaped rubber disposed above the membrane switch and having a bulge for pressing the membrane switch;

a case for enclosing the cup-shaped rubber;

a key top disposed above the cup-shaped rubber and having a stem for pressing the cup-shaped rubber; and

a link mechanism disposed between the case and the key top for engaging the case and the key top,

wherein the link mechanism comprises,

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a first link member composed of a pair of mutually confronting first arms, a first support bar for coupling one end of the first arms, and a coupling portion for coupling each middle section of the first arms, the coupling portion having a middle hole, and

a second link member composed of a pair of mutually confronting second arms, and a second support bar for coupling one end of the second arms,

wherein the first arms and second arms are engaged with each other in their middle sections so as to intersect in an X-form, and the hole of the coupling portion is disposed above the cup-shaped rubber, and

wherein an outer diameter of a head of the cup-shaped rubber is smaller than an outer diameter of a bottom thereof, and an inner diameter of the hole of the coupling portion is larger than the outer diameter of the head and smaller than the outer diameter of the bottom.

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**5,743,384**

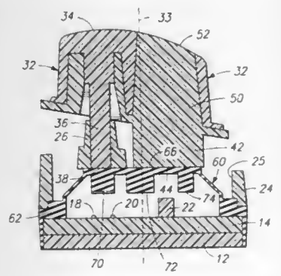
## SELF-LEVELING KEY SWITCH

**Neal S. Clark, Spokane, Wash., assignor to Key Tronic Corporation, Spokane, Wash.**

**Filed May 9, 1997, Ser. No. 853,712**

**Int. Cl.[6] H01H *13/70***

**U.S. Cl. 200—344** **9 Claims**




1. A self-leveling keyswitch, comprising:

an elongated keytop having a major dimension in a lateral direction from a central axis;

said elongated keytop having a keystem that extends outward from the keytop along but spaced from the central axis in the lateral direction;

said elongated keytop having a self-leveling projection that extends outward from the keytop along the central axis but spaced from the keystem in the lateral direction;

a keytop support means having a bearing surface that slidably receives the keystem to enable the keytop to move parallel with the central axis between an un-depressed, non-actuating position and a depressed, actuating position;

a printed circuit having electrical switch contacts that are actuated when the keytop is moved to the depressed position; and

an elongated elastomeric dome return spring having a major dimension in the lateral direction sufficient to receive and spring bias both the keystem and self-leveling projection along the central axis from the depressed position to the un-depressed position.

**5,743,385**

## DRIVE DEVICE WITH A LOCKING DEVICE TO PREVENT SWITCH SHAFT REBOUND

**Ludvik Godesa, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

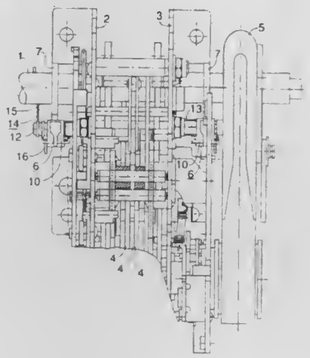
**PCT No. PCT/DE95/00494, § 371 Date Feb. 5, 1997, § 102(e) Date Feb. 5, 1997, PCT Pub. No. WO95/29499, PCT Pub. Date Nov. 2, 1995**

**PCT Filed Apr. 10, 1995, Ser. No. 727,502**

**Claims priority, application Germany, Apr. 20, 1994, 4416091.7**

**Int. Cl.[6] H01H *23/00***

**U.S. Cl. 200—401** **7 Claims**




1. A drive device for a multi-pole power switch comprising:

a switch shaft in common for several poles;

toggle levers configured for linkage with a spring energy store for actuating the shaft for a power on sense and utilizing pole-side breaking forces for a power off sense;

a resetting spring;

a fixed bearing;

at least one retainer that is secured to the switch shaft;

a clamp that is pivotable about the fixed bearing, said clamp being actuatable by the retainer for protection against rebounding of the switch shaft from its final position upon power off, wherein the retainer has a working surface for cooperation with the clamp so as to form a connection therewith; and

wherein the clamp has an aperture open on one side and a curved outer wall portion which is adapted to cooperate with the retainer, and wherein the retainer and the clamp are configured with a degree of overlapping upon juxtaposition with one another so that the overlapping between the retainer and the clamp is dimensioned to be considerably larger than is necessary to block the switch shaft from turning back.

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**5,743,386**

## MEMBRANE SWITCH ASSEMBLY

**Pin-Chien Liao, Taoyuan, Taiwan, assignor to Acer Peripherals, Inc., Taiwan**

**Filed Jul. 17, 1996, Ser. No. 682,491**

**Int. Cl.[6] H01H *1/10***

**U.S. Cl. 200—512** **8 Claims**

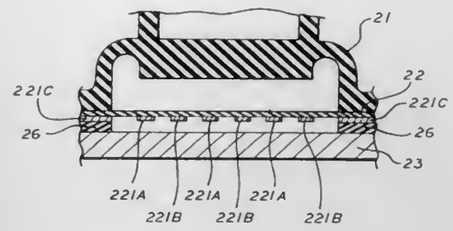
1. A membrane switch assembly including at least N membrane switches, N being a whole number that is 2 or greater, comprising:

a single electric-conductive support plate;

a membrane having a bottom surface printed with a circuit pattern including at least N pairs of non-contacting circuit leads, each pair of non-contacting circuit leads corresponding to one of said N membrane switches;

at least N rubber domes each having an actuator disposed on said membrane to actuate one of said corresponding membrane switches;






an insulating layer on a predetermined area of said circuit pattern in contact with said single electric-conductive support plate;

wherein each of said membrane switches is ON as its corresponding pair of non-contacting circuit leads is forced to contact said single electric-conductive support plate due to an external force applied on said corresponding rubber dome, and, as said corresponding rubber dome is freed of an external force, said corresponding pair of non-contacting circuit leads becomes spaced from said single electric-conductive support plate resulting in an OFF state of said corresponding membrane switch.

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**5,743,387**

## MULTISTAGE SWITCH

**Chi-hsiang Hung, Taipei, Taiwan, assignor to Chin-huei Chiu, Taipei, Taiwan**

**Filed Jan. 29, 1997, Ser. No. 791,090**

**Int. Cl.[6] H01H *19/20***

**U.S. Cl. 200—571** **5 Claims**




1. An improved multistage switch comprising:

a pedestal defining a central recess therein, a cavity at a first end thereof, a pair of opposed channels at a second end thereof leading to outside and a pair of holes at an appropriate position therein, said pedestal further having a boss extending upwardly from a bottom face of the central recess;

an input conductive strip, an output conductive strip and a central conductive strip respectively disposed within the central recess of the pedestal, an input wire connected with the input conductive strip and an output wire connected with the output conductive strip being respectively received within the pair of channels of the pedestal,

a diode received within the cavity of the pedestal and connected between the input conductive strip and the central conductive strip;

a star wheel rotatably mounted on the boss, said star wheel having a plurality of ratchet teeth extending from an outer periphery thereof;

a conductive base mounted on the boss for receiving the star wheel, said conductive base having a plurality of contact pieces respectively abutting an outer face of a corresponding ratch of the star wheel and contacting with the input conductive strip, the output conductive strip and the central conductive strip; and

a cover defining a pair of holes corresponding to the pair of holes of the pedestal for a pair of rivets to extend therethrough and engage the cover with the pedestal, said cover having a knob mounted thereon, said knob having a driving piece mounted therein to drive the star wheel and a spring to control the driving piece.

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**5,743,388**

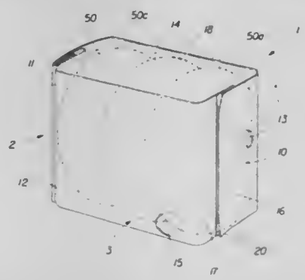
## FLEXIBLE AND SUBSTANTIALLY RECTANGULAR PACKAGE FOR CONTAINING MULTIPLE IRREGULAR SHAPED OBJECTS SUCH AS SOAP BARS

**G. Scott Kerr, Mason, and Gene M. Altonen, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 556,866, Nov. 2, 1995, abandoned, which is a continuation of Ser. No. 126,460, Sep. 24, 1993, abandoned. This application Jul. 2, 1996, Ser. No. 682,865**

**Int. Cl.[6] B65D *71/06***

**U.S. Cl. 206—77.1** **18 Claims**




1. A flexible and substantially non-resilient package containing a plurality of three-dimensional objects, the package being such that multiple packages are stackable on top of one another, the package comprising:

(a) a container comprising opposing top and bottom walls and at least one side wall, the walls being joined together to form an interior chamber containing the three dimensional objects;

(b) a balance component integral to the top and bottom walls for providing stability of the package so that the package remains balanced and steady when containing the three-dimensional objects;

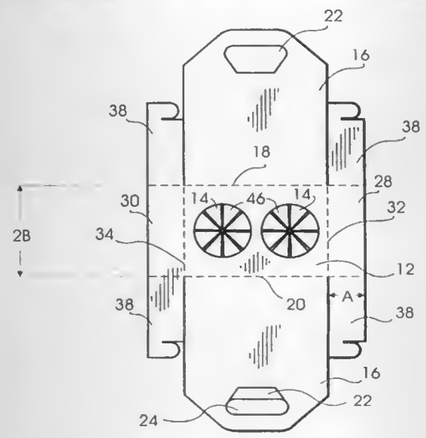
(c) the three-dimensional objects being substantially rigid and non-rectangular, and substantially in contact with each other; and

(d) the objects being substantially constrained within the package so that movement of the objects with respect to one another and with respect to the container is substantially limited so that multiple packages can be stacked on top of one another whereby the load of the objects can be transmitted through columns of stacked objects.

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**5,743,389**
**REVERSIBLE FOOD AND BEVERAGE VESSEL CARRIER**
**Donna Cutler, Kirkland, Wash., assignor to CLK Factor, Inc., Kirkland, Wash.**
**Continuation-in-part of Ser. No. 501,148, Jul. 11, 1995, abandoned. This application Nov. 27, 1996, Ser. No. 757,825**
**Int. Cl.[6] B65D** *77/00*
**U.S. Cl. 206—216** **7 Claims**




1. A food and beverage vessel carrier comprising a blank adapted to be folded into a box including a base having opposite base sides and having opposite first and second ends of width, 2B, and having end walls depending from base ends and further having a pair of side walls arms attached to each of the end walls the width of the arms on the end walls being within a distance, A, from the base ends with each side wall arm disposed to interlock with a side wall arm attached to an opposite end wall when the blank is folded therein forming side walls, the end walls and side walls forming an open box with the base as its bottom, the improvement comprising

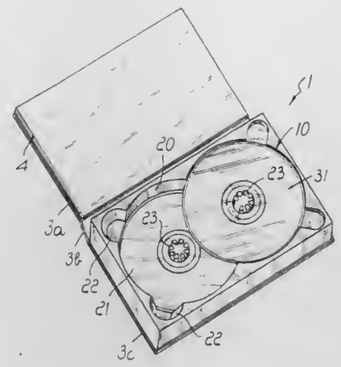
a pair of handle panels, one panel extending on the unfolded blank from each of the base sides a-distance from the base sides substantially greater than the sum of distances A and B such that the panels are foldable alongside and around respective adjacent side walls when the carrier is assembled into an upright box having four sides and a hottom and open at a top, joining together at their distal ends to form a handle over the open, upright box, the box thereby covered by the handle panels and supported by said handle panels from the box bottom.

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**5,743,390**
**CONTAINER FOR A PLURALITY OF DISCS, PARTICULARLY FOR COMPACT DISCS**
**Aldo Pozzoli, Inzago, Italy, assignor to Pozzoli S.p.A., Inzago, Italy**
**Continuation of Ser. No. 498,494, Jul. 5, 1995, abandoned. This application Jan. 10, 1997, Ser. No. 783,297**
**Claims priority, application Italy, Jul. 15, 1994, MI94A1490; Jan. 19, 1995, MI950025 U**
**Int. Cl.[6] B65D** *85/57*
**U.S. Cl. 206—232** **22 Claims**

1. A container for a plurality of identical disc items, the container comprising:

a tray-like body including a first end part, a second end part and a median part, said first and second end parts being opposite to each other with respect to said median part;




a first accommodation region being housed at said tray-like body to extend over said first end and median parts of the tray-like body, at least one first disc being accommodatable, to lay in a generally flat condition in said first disc receiving area;

a second accommodation region being housed at said tray-like body to extend over said second end and median parts of the tray-like body, at least one second disc being accommodatable to lay in a generally flat condition in said second disc receiving area, said first and second accommodation regions only partially overlapping at the median part of the tray-like body, and said at least one second disc being arrangeable at said second accommodation region spaced from, and partially overlapping said at least one first disc only at said median part of the tray-like body; and

disc retention means provided at said first and second accommodation regions for retaining said discs in said partially overlapping configuration.

11. A container for a plurality of disc items, said container comprising:

a tray-like body having an elongate configuration with external dimensions in a length-to-width ratio being less than 2-to-1 and including a first peripheral end wall, a second peripheral end wall and a median part, the first and second end walls being opposite to each other with respect to said median part;

a first accommodation region being housed at said tray-like body between the first peripheral end wall and the median part of the tray-like body, at least one first disc being accommodatable, to lay in a generally flat condition in said first accommodation region substantially tangentially to said first peripheral end wall;

a second accommodation region being housed at said tray-like body between the second peripheral end wall and the median part of the tray-like body, at least one second disc being accommodatable, to lay in a generally flat condition in said second accommodation region substantially tangentially to said second peripheral end wall, the first and second accommodation regions only partially overlapping at the median part of the tray-like body, said at least one second disc being arrangeable at said second accommodation region to be spaced from, and partially overlapping said at least one first disc.

21. A container for a plurality of identical disc items, said container comprising:

an elongated tray-like body extending between first and second end peripheral walls thereof, the end walls being opposite to each other with respect to a median part of the tray-like body;

a first accommodation region being housed at said tray-like body between said first peripheral end wall and the median part thereof, at least one first disc being accommodatable, to lay in a generally flat condition in said first accommodation region;

a second accommodation region being housed at said tray-like body at a higher level than said first accommodation region between the second peripheral end wall and the median part of the tray like body, said second accommodation region only partially overlapping, at the median part of the tray-like body, said first accommodation region, at least one second disc being accommodatable to lay in a generally flat condition in said second accommodation region; and

disc retention means provided at said first and second disc receiving areas to retain said at least one first and second discs in said first and second accommodation regions substantially tangent to said first and respectively second end walls, with said at least one second disc arranged at said second disc receiving area to be spaced from, and partially overlapping said at least one first disc.

22. A container and a plurality of identical disc items accommodatable therein, the container comprising:

a tray-like body;

a first accommodation region for accommodating at least one first disc;

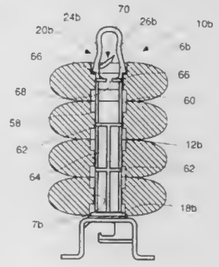
a second accommodation region for accommodating at least one second disc,

said first and second regions being housed at said tray-like body and opening onto a same side thereof for accommodating said identical discs, said at least one first and at least one second discs lying in a generally flat condition, with said at least one second disc arranged in said second region so as to be spaced from, and to partially overlap said at least one first disc in an offset manner.



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**5,743,391**
**WHEEL RETAINING DEVICE**
**Louis Hsiao, 765A Loma Verde Ave., Palo Alto, Calif. 94303, assignor to Louis Hsiao, Palo Alto, Calif.**
**Continuation-in-part of Ser. No. 444,308, May 18, 1995, Pat. No. 5,586,649. This application Nov. 26, 1996, Ser. No. 756,655**
**Int. Cl.[6] B65D** *85/02*
**U.S. Cl. 206—303** **11 Claims**




1. In combination, a wheel retaining device and at least one wheel having an aperture formed therethrough, said wheel retaining device comprising:

an elongate body extending through said aperture of said wheel, first and second retainers carried by said elongate body for holding said wheel thereon, at least one of said retainers being resiliently deformable to permit movement of said wheel past said at least one of said retainers and onto said elongate body,

a locking mechanism adjustable between a disengaged position, for movement of said wheel onto said elongate body, and an engaged position, for resisting the resilient deformation of said at least one of said retainers to securely retain said wheel on said elongate body.

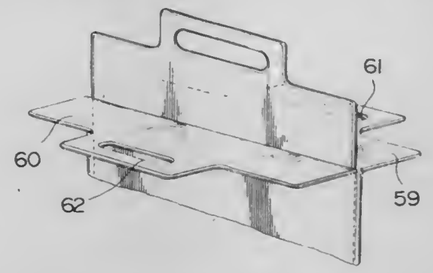
6. A wheel retaining device for retaining a plurality of wheels each having an aperture formed therein, said wheel retaining device comprising:

an elongate body insertable through said aperture of said wheels, first and second retainers carried by said elongate body for holding said wheels on said elongate body, at least one of said retainers being resiliently deformable to permit movement of said wheel past said at least one of said retainers for position said wheels on said elongate body and removing said wheels from said elongate body, and

a locking mechanism cooperable with said at least one of said retainers to secure said wheels on said elongate body, said locking mechanism being adjustable between an engaged position for resisting the resilient deformation of said at least one of said retainers to secure said wheels on said elongate body and a disengaged position for movement of said wheels onto and off of said elongate body.

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**5,743,392**
**HOLDER FOR JIG SAW PUZZLES, DRAWINGS, PHOTOS AND THE LIKE**
**David R. Chapman, 145 Wychwood Place, London, Ontario, Canada, N6G 1S7**
**Filed Nov. 28, 1995, Ser. No. 563,599**
**Int. Cl.[6] B65D** *85/20*
**U.S. Cl. 206—315.1** **10 Claims**




1. A holder for multi-piece items such as jigsaw puzzles comprising:

(a) a stiff rectangular planar member having a top edge, a bottom edge, a pair of side edges and an upper flat surface on which the pieces can be assembled;

(b) a flexible cover sheet to overlie pieces on said upper flat surface of said member;

(c) a carrying handle on the top edge of said stiff member;

(d) a pouch which is open at a top end thereof and comprising front and rear walls joined together along a common bottom edge thereof and along a respective one of a pair of spaced apart side edges, said walls having top edges and;

(e) a carrying handle on said pouch at said open top end thereof, said handle on said pouch and said handle on said stiff member being aligned in overlapping relation with one another for use in carrying the holder when said stiff member is essentially fully inserted into said pouch and wherein said stiff member side edges taper inwardly toward one another in a direction toward the bottom edge thereof and wherein said pouch side edges have a corresponding taper.

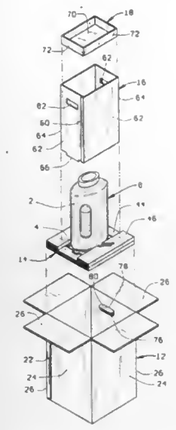
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**5,743,393**
**PROTECTIVE PACKAGE FOR HEAVY OBJECTS**
**H. Richard Webb, 14687 Los Padres, Chesterfield, Mo. 63017, and Peter H. Webb, 1108 E. Third St., Washington, Mo. 63090**
**Filed May 6, 1997, Ser. No. 851,671**
**Int. Cl.[6] B65D** *85/68*
**U.S. Cl. 206—319** **18 Claims**

1. A package comprising: a box having side walls located around an interior, a bottom wall at the lower end of the side walls and generally closing the interior at its lower end, and a top wall at the upper end of the side walls and generally closing the interior at its upper end; a base located within the interior of the box along its bottom wall, the base having a main panel that is formed from a generally rigid material and has depressions which open upwardly out of it, the base further having retaining members which extend partially over the depressions, so as to hold a packaged object in

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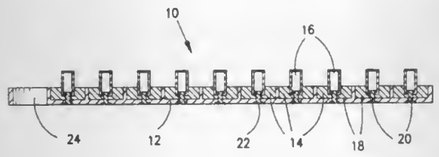




the depressions; and a spacer member extended between the base and the top wall and preventing the base from moving away from the bottom wall of the box.

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5,743,394
MAGNETIC SOCKET HOLDER
John R. Martin, Naple, Fla., assignor to Southern Mag-Clip, Inc., Sanibel, Fla.
Filed Oct. 20, 1995, Ser. No. 546,292
Int. Cl.[6] B65D *85/20*
U.S. Cl. 206—378 14 Claims

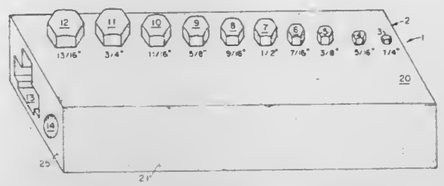


1. A magnetic socket holder comprising:
a base having a plurality of recesses formed in a first side of the base;
a plurality of magnets, each of said plurality of magnets disposed in one of the plurality of recesses with a first side of each of the plurality of magnets substantially aligned with the first side of the base;
a plurality of posts for receiving sockets, each of the plurality of posts positioned at a center portion of one of the plurality of magnets; and
mounting means for mounting each of the plurality of posts and each of the plurality of magnets to the base.

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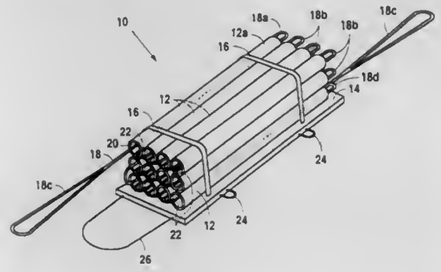
5,743,395
SOCKET HOLDER
William E. Baeker, One Industrial Rd., P.O. Box 128, Fulton, Mo. 65251
Filed Dec. 19, 1996, Ser. No. 769,952
Int. Cl.[6] B65D *85/24*
U.S. Cl. 206—378 2 Claims

1. A socket holder having a body including a bottom and a planar top surface, said top surface including a plurality of socket holding studs projecting from said surface, said socket holding studs being formed to receive closely a socket working end with a discrete size-on-size fit, said body being rectangular, with two long sides and two end walls, said body including a cavity extending lengthwise of said body and spaced from said bottom and top surface and side walls, and opening through one of said end walls, said cavity having a cruciform chamber at its open end to receive a ratchet driver.



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5,743,396
ROPE STOWAGE DEVICE AND METHOD
Brian Malcolm Short, and John Kenneth Yeardley, both of London, England, assignors to Bridon PLC, United Kingdom
Filed Apr. 24, 1995, Ser. No. 427,135
Int. Cl.[6] B65D *85/00*
U.S. Cl. 206—388 12 Claims



1. A method of stowing a rope comprising the steps of:
placing a first looped portion of the rope in a longitudinally extending cavity;
successively placing looped portions of the rope in additional longitudinally extending cavities, wherein the rope is not bound within any of the cavities and is substantially freely movable therein, and wherein successive portions of the rope are stowed in the additional cavities in such a manner that free ends of the rope extend outwardly from their respective cavities for easy access; and
forming at least one of said free ends to provide a spliced eye.
2. A device for stowing a rope comprising:
a plurality of members disposed in a juxtaposed relationship, each member defining a longitudinally extending cavity for receiving a looped portion of the rope therein;
each member being tubular and including at least one open end through which a looped portion of the rope can be inserted for stowage in the cavity and withdrawn for use;
a base member on which the tubular members are disposed and secured; and
the base member including handle means for enabling said device to be lifted.
12. A device for stowing a rope comprising:
a plurality of members disposed in a juxtaposed relationship, each member defining a longitudinally extending cavity for receiving a looped portion of the rope therein;
each member being tubular and including at least one open end through which a looped portion of the rope can be inserted for stowage in the cavity and withdrawn for use;
a base member on which the tubular members are dispersed and secured; and
the base member including means for enabling said device to be towed.

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5,743,397
TOILET PAPER STORAGE RECEPTACLE
Vickie Traver, 710 5th Ave. SW #2, Albany, Oreg. 97321
Filed Jan. 3, 1995, Ser. No. 367,741
Int. Cl.[6] B65D *85/672*
U.S. Cl. 206—391 2 Claims



1. A receptacle in combination with a multiple roll package of a plurality of tangentially adjacent toilet paper rolls, said rolls having an average diameter, said package having a wrapper which defines the outer dimensions of said package, said receptacle having a front, a back, a first end and a second end, a top and a bottom, and comprising:
a bottom wall,
a first vertical tubular container comprising a first wall at said first end extending from said front to said back, said first wall being generally C-shaped in cross section, connected to said bottom wall, having a top and having a first diameter,
a second vertical tubular container comprising a second wall at said second end extending from said front to said back, said second wall being generally C-shaped in cross section and connected to said bottom wall, having a top and having a second diameter,
a first vertical connector wall at said front of said receptacle between said first and second walls, attached to said bottom wall and to said first and second walls from said bottom wall to said tops of said first and second walls separating and spacing them apart at said front of said receptacle and following in cross section a curvilinear path, said first vertical connector wall having a top,
a second vertical connector wall at said back of said receptacle between said first and second walls opposite said first vertical connector wall and attached to said bottom wall separating and spacing said first and second walls apart, said second vertical connector wall having a top,
said first vertical tubular container being in open communication with said second vertical tubular container from said bottom wall to the tops of said first vertical tubular container and said second vertical tubular container,
said package passing through the communication between said first vertical tubular container and said second vertical tubular container,
each top of said first wall, said second wall, said first vertical connector wall, and said second vertical connector wall having that wall's substantial cross section,
said first and second diameters being approximately the same value and in close approximation to the average diameter of said rolls sufficient for close fit, removable storage of said package within said receptacle,
said first vertical connector wall and said second vertical connector wall having a cross sectional width between them that is smaller than said average diameter of said toilet paper rolls.

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5,743,398
FLORAL WRAPPER UTILIZING A BREATHABLE PACKAGING MATERIAL
Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc.
Continuation-in-part of Ser. No. 188,183, Jan. 28, 1994, Pat. No. 5,388,386, which is a continuation of Ser. No. 968,798, Oct. 30, 1992, Pat. No. 5,369,934, which is a continuation of Ser. No. 865,563, Apr. 9, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned, said Ser. No. 325,747 is a continuation-in-part of Ser. No. 253,648, Jun. 3, 1994, abandoned, which is a continuation of Ser. No. 965,585, Oct. 23, 1992, abandoned, which is a continuation of Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned, said Ser. No. 325,747 is a continuation-in-part of Ser. No. 108,093, Aug. 17, 1993, Pat. No. 5,472,752, which is a continuation of Ser. No. 24,573, Mar. 1, 1993, abandoned, which is a continuation of Ser. No. 464,694, Jan. 16, 1990, Pat. No. 5,208,027, which is a continuation of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned. This application Oct. 19, 1994, Ser. No. 325,747
Int. Cl.[6] B65D *85/52;65/16;81/26;* A01G *9/02*
U.S. Cl. 206—423 4 Claims

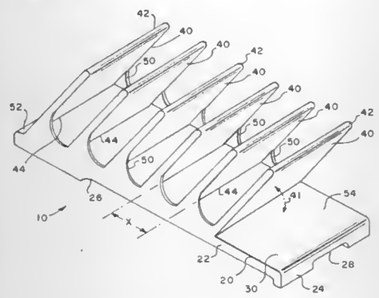


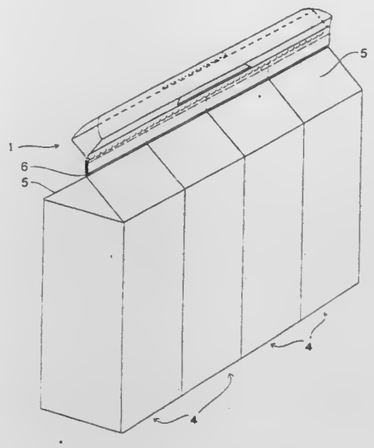

1. A floral package, comprising
a sheet of material having an upper surface and a lower surface, the sheet of material having controlled atmosphere characteristics, the sheet of material further comprising a desiccant, an antimicrobial agent, a non-fogging agent and a bonding material, the bonding material disposed on at least one surface of the sheet of material; and
a floral grouping comprising a bloom portion and a stem portion,
wherein the sheet of material is wrapped about the floral grouping so as to encompass the bloom portion of the floral grouping and a substantial portion of the stem portion and the sheet of material sealed thereabout via the bonding material thereby sealing the floral grouping in the sheet of material such that the controlled atmosphere characteristics of the sheet of material in combination with the desiccant, the antimicrobial agent and the non-fogging agent provide both a prolongation of the freshness of the floral grouping and optimal visual display of the floral grouping by preventing fogging of the sheet of material and absorbing excess moisture and inhibiting growth of microorganisms on the floral grouping.

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**5,743,399**
**PLANT TRAY CARRIER**
**David Beckwith, 3416 Lovers La., Dallas, Tex. 75225-7630**
**Continuation of Ser. No. 257,651, Jun. 9, 1994, abandoned. This application Dec. 21, 1995, Ser. No. 576,042**
**Int. Cl.[6] B65D** *85/52*
**U.S. Cl. 206—423** **7 Claims**





1. A tray carrier comprising:
a base portion and sidewalls;
first and second tray shelves extending upwardly from the plane of said base portion, said first and second tray shelves extending away from the midpoint of said base portion in opposing inclined relationship on opposite sides of said midpoint;
first and second angled surface members, each of said first and angled surface members orthogonally connected to said first and second tray shelves, respectively; and
a handle means connected to said sidewalls for lifting and carrying the tray carrier;
wherein a first plant tray supported by said first tray shelve and said first angled surface member is in an opposingly inclined relationship with a second plant tray supported by said second tray shelve and said second angled surface member.

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**5,743,400**
**CARRIER AND/OR CONNECTOR FOR A SERIES OF PACKAGES**
**Finn R. Hansen, Hønefoss, and Björn Björge, Asker, both of Norway, assignors to Dalwell AB, Backefors, Sweden**
**PCT No. PCT/SE94/00902, § 371 Date Mar. 29, 1996, § 102(e) Date Mar. 29, 1996, PCT Pub. No. WO95/09781, PCT Pub. Date Apr. 13, 1995**
**PCT Filed Sep. 30, 1994, Ser. No. 619,693**
**Claims priority, application Sweden, Oct. 1, 1993, 9303230; Aug. 18, 1994, 9402766**
**Int. Cl.[6] B65D** *71/00*
**U.S. Cl. 206—428** **9 Claims**

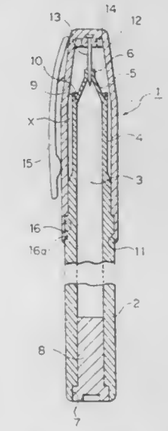
1. A carrier in combination with at least one gabled top package having top surfaces that converge to form a flange,
said carrier comprising:
at least six longitudinal sections including two central sections, two intermediate sections and two outer sections, said outer sections being located along opposed edges of said carrier, said central sections being located adjacent one another and between said outer sections, and each one of said intermediate sections being interposed between and connecting one said central section and one said outer section, folding indications being interposed between each adjacent pair of longitudinal sections, said longitudinal sections being folded about said folding indications to form a sleeve with a hollow interior and with said outer sections extending therefrom; and
said formed sleeve has a substantially quadrilateral shape transverse cross section, defined by both said central and intermediate sections, with a reference vertex located between said two central sections and an opposed vertex being located between said two intermediate sections, and said formed sleeve being collapsible from an initial position in which said reference vertex is spaced from said opposed vertex by a first distance, to a collapsed position in which said reference vertex is located adjacent said opposed vertex; and
said flange of said at least one gabled top package being interposed between and secured to said outer sections.

9. A carrier for at least one gabled top package having top surfaces that converge to form a flange, said carrier comprising:
a substantially flat sheet having folding indications thereon for dividing the flat sheet into at least six longitudinal sections, said six longitudinal sections including two central sections, two intermediate sections and two outer sections, said outer sections being located along opposed edges of said carrier and each having at least one transverse perforation formed therein which extends from said opposed edges of said carrier towards an adjacent intermediate section to subdivide said outer section into at least two individual sections each having a longitudinal length at least equal to a longitudinal length of said flange of said at least one gabled top package, said central sections being located adjacent one another and between said outer sections, and each one of said intermediate sections being interposed between and connecting one said central section and one said outer section, said outer sections further being provided with a longitudinal tear line that intersects with and extends perpendicular to said at least one transverse perforation, each of said longitudinal sections being foldable about said folding indications to form an elongate sleeve, and said two outer sections being suitable for securing said at least one gabled top package to said carrier;
wherein, when said substantially flat sheet is folded to form said sleeve, said formed sleeve has a substantially quadrilateral shape transverse cross section, defined by both said central and intermediate sections, with a reference vertex located between said two central sections and an opposed vertex located between said two intermediate sections, and said formed sleeve is collapsible from an initial position in which said reference vertex is spaced from said opposed vertex by a first distance, to a collapsed position in which said reference vertex is located adjacent said opposed vertex, and a desired number of individual sections are formed in said carrier which corresponds to a desired number of gabled top packages to be carried by said carrier such that, when said substantially flat sheet is folded to form said sleeve and secured to said desired number of gabled top packages:
i) each said gabled top package is secured to said carrier by a pair of opposed individual sections, and said pair of opposed individual sections includes an individual section from each of said outer sections; and
ii) each said gabled top package is individually removable from said carrier, along with a corresponding portion of said pair of opposed individual sections, by tearing said carrier along said at least one transverse perforation and said longitudinal tear line.



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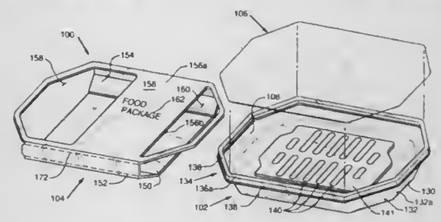
**5,743,401**
**CONTAINER FOR ADHESIVE**
**Shin Takahashi, Nagoya, Japan, assignor to Toagosei Co., Ltd., Tokyo, Japan**
**Filed Jun. 30, 1997, Ser. No. 885,901**
**Claims priority, application Japan, Jul. 4, 1996, 8-175016**
**Int. Cl.[6] B65D** *59/02;59/06*
**U.S. Cl. 206—447** **4 Claims**



1. A container for adhesive comprising:
a container body having a filling portion which contains α-cyanoacrylate adhesive and a nozzle connecting to the filling portion for pouring the α-cyanoacrylate adhesive; and
a cap for covering at least said nozzle, wherein a press portion for sending the α-cyanoacrylate adhesive from said filling portion to the nozzle is formed on said filling portion and having a thick wall thinner than the other portion of said filling portion, and said cap covers said press portion and has a thick wall.

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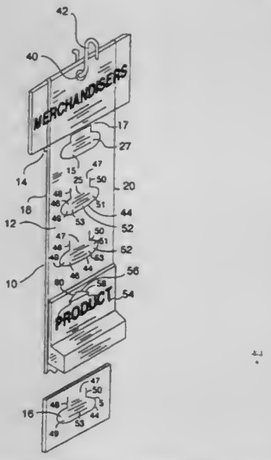
**5,743,402**
**FOOD PACKAGE INCLUDING A TRAY AND A SLEEVE**
**Paul W. Gics, Sewickley Heights, Pa., assignor to Gics & Vermee, L.P., Sewickley, Pa.**
**Filed Mar. 18, 1997, Ser. No. 819,889**
**Int. Cl.[6] B65D** *85/00*
**U.S. Cl. 206—459.5** **46 Claims**




1. A food package for containing a food product, said food package comprising:
a plastic tray having a base with an outer surface and an inner surface and a sidewall extending from said base, said sidewall having an outer surface and an inner surface and defining a tray opening and said sidewall further including a flange having a first portion extending generally perpendicularly from said sidewall; and
a paperboard sleeve including (i) a bottom section disposed adjacent said outer surface of said base; (ii) a side section disposed adjacent said outer surface of said sidewall; and (iii) a top section adhesively secured to said first portion of said flange of said sidewall, said top portion substantially covering said tray opening.

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**5,743,403**
**INVERTED T TAB MEMBER HANGING STRIP**
**Donald T. Crysdale, 2800 E. Edgewood Dr., Shorewood, Wis. 53211, assignor to Donald T. Crysdale, Milwaukee, Wis.**
**Filed Jun. 30, 1995, Ser. No. 497,057**
**Int. Cl.[6] B65D** *73/00;* **A47G** *29/00*
**U.S. Cl. 206—482** **7 Claims**




1. A point-of-purchase hanging strip for holding, displaying and dispensing at least one product, said hanging strip comprising:
(a) an integrally formed elongated transparent and flexible plastic suspension panel including a top first end and a bottom second end, said panel first end including a T-shaped first tab member extending from the free edge of said first end, said first tab member including a pair of hemispherical limbs that in part define an elliptical head portion of said tab member and a base portion extending from lower ends of said limbs, said first end further including a slot, a portion of said suspension panel at said first end being folded over to form a channel and said first tab member being inserted through said slot to both maintain said channel and define an engaging means in the shape of an inverted T to engage an opening in a product;
(b) a stability member received within said channel for stabilizing opposite sides of said suspension panel, wherein said stability member provides indicia relating to the at least one product; and
(c) said suspension panel further having vertically spaced integral means for supporting at least one product, said integral means comprising a plurality of spaced die-cut portions defining second tab members, said second tab members each being generally shaped as an inverted T and also including a pair of hemispherical limbs that in part define an elliptical head portion of each said second tab member and a base portion extending from upper ends of said limbs, said base portion being hinged to said suspension panel, at least one of said tab

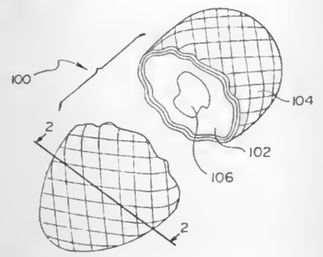
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members extending outwardly of said suspension panel to engage an opening in a product.

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**5,743,404**
**COATED CONTAINER**
**Connie Melashenko, and Robert Melashenko, both of 1673 Dwight St., Redlands, Calif. 92373**
**Filed Mar. 21, 1996, Ser. No. 619,007**
**Int. Cl.[6] A63H *33/30*; A23L *1/27*; A47G *35/00***
**U.S. Cl. 206—524.3** **19 Claims**




1. A container comprising:
(a) a hollow-substrate; and
(b) a dried coating adhered to at least a portion of said substrate, where said coating comprises a mixture of a base material and an adhesive, with said dried coating being absorbent with respect to nontoxic dyes.

13. A method of producing a container comprising the step of coating a hollow substrate with a coating material where said coating material comprises a mixture of a base material and an adhesive, with said coating material being absorbent with respect to nontoxic dyes when dried.

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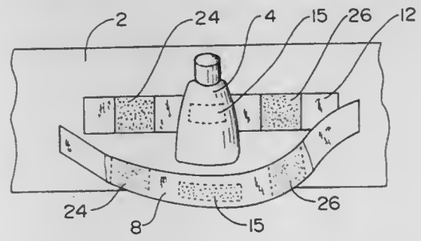
**5,743,405**
**FOOD STORAGE CONTAINER**
**Brenda C. Reid, 203 Atlanta St., Barnesville, Ga. 30204**
**Continuation-in-part of Ser. No. 565,942, Dec. 1, 1995, abandoned. This application Sep. 5, 1996, Ser. No. 707,609**
**Int. Cl.[6] B65D *30/20***
**U.S. Cl. 206—541** **9 Claims**




1. A food storage container comprising:
a container body including two sides separated by a shared edge defining an axis about which said two sides are adapted for movement between open and storage positions, the open position being defined by a substantially planar disposition of said two sides;
first and second seal portions disposed about the nonshared periphery of the first container side and said second seal portion is disposed about the nonshared periphery of the second container side, wherein said first and second seal portions are cooperatively disposed to form a substantially airtight resealable seal about the otherwise nonshared periphery of the container; and
a pair of symmetrically-disposed service flaps adapted for movement between active and stowed positions, wherein said service flaps are responsively attached to said two sides to fold out into the active position when said two sides are motivated to the open position and into the stowed position when said two sides are motivated to the closed position, and wherein said service flaps include a substantially planar disposition with portions that extend beyond the edges of the two sides when in the active position.

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**5,743,406**
**NAIL POLISH BOTTLE HOLDER FOR USE IN MANICURING PANS**
**Bruce Anthony Wright, 138 Roy Thomason Rd., Simpsonville, S.C. 29681**
**Continuation-in-part of Ser. No. 266,898, Jul. 1, 1994, abandoned. This application Dec. 2, 1996, Ser. No. 752,967**
**Int. Cl.[6] B65D *1/34***
**U.S. Cl. 206—565** **3 Claims**



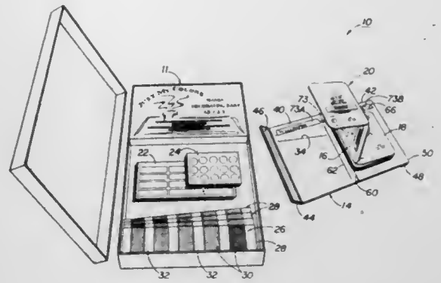

1. An improved foot manicure pan for holding bottles comprising: a bottom wall and at least three side walls in connection with said bottom wall so as to form a partially enclosed space, at least two of said side walls extending outwardly so as to form an angled surface with said bottom wall and so adapted to support a bottle that may be tilted against at least one of said side walls, said partially enclosed space of size adapted to enclose a human foot, at least one of said side walls having a pair of securing straps: a first inner strap in close connection with said side wall and a second outer strap about parallel to said first strap, said first strap having an outer surface facing away from said side wall and said second strap having an inner surface facing said first strap, complimentary portions of hook and loop material on said outer and said inner surfaces and sized so that said portions of hook and loop material may be mated to one another so as to form a snug fitting loop around a bottle.

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**5,743,407**
**COLOR REFERENCE SYSTEM FOR DECORATORS**
**Martha Williams, 600B N. Main St., Alpharetta, Ga. 30201**
**Filed Nov. 29, 1995, Ser. No. 564,565**
**Int. Cl.[6] G09B *25/00***
**U.S. Cl. 206—575** **9 Claims**

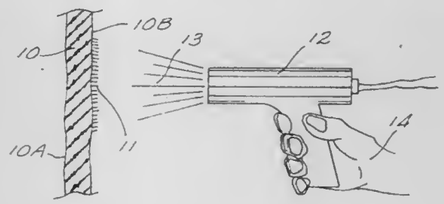
1. A decorator reference system, comprising:
a color reference card;
a character, represented by first printed indicia, that is to be matched with a color sample label, said character being positioned at a first selected position on said color reference card;
a first color sample label that is operative to be placed on said color reference card;
second printed indicia being positioned at a second selected position on said color reference card, said second printed indicia instructing a user to place said first color sample label at said second selected position and said second printed indicia being located proximate to said first printed indicia, thereby placement of said first color sample label at said second printed indicia associates said first color sample label with said character represented by said first printed indicia;
an area reference card;
third printed indicia positioned on said area reference card that represents items of an area of a room to be matched with said color sample label; and
fourth printed indicia positioned on said area reference card, said fourth printed indicia defining a perimeter upon which said character is to be placed and said fourth printed indicia being positioned proximate to said third printed indicia, thereby providing a decorator reference system that establishes an association between a color sample label placed at said second selected position of said color reference card and said third printed indicia that represents said items to be matched with a color sample label of said area reference card.






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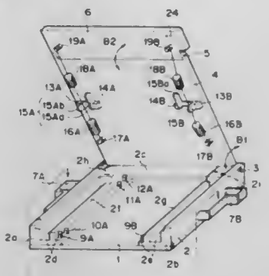
**5,743,408**
**LEATHER AUTOMOBILE TRIM**
**Mark Langdon Hill, P.O. Box 228, Tucson, Ariz. 85702**
**Filed May 16, 1996, Ser. No. 648,836**
**Int. Cl.[6] B65D *69/00***
**U.S. Cl. 206—575** **22 Claims**




1. A leather panel comprising:
a) a unit of pre-shrunk leather having a finished first surface and an unfinished second surface;
b) a layer of adhesive applied to the second surface of said unit of leather; and,
c) a covering tape having an adhesive on a first side thereof, the first side of said tape being secured to said layer of adhesive while said layer of adhesive is tacky.

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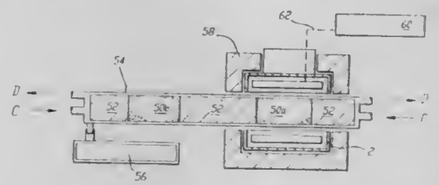
**5,743,409**
**CASE FOR HOUSING A SUBSTRATE**
**Kanefumi Nakahara, Yokohama, and Tsuneaki Orikasa, Natori, both of Japan, assignors to Nikon Corporation, Tokyo, Japan**
**Continuation of Ser. No. 283,518, Aug. 1, 1994, abandoned. This application Feb. 22, 1996, Ser. No. 605,835**
**Claims priority, application Japan, Aug. 12, 1993, 5-200808**
**Int. Cl.[6] B65D *85/46***
**U.S. Cl. 206—710** **4 Claims**




1. A case for housing a substrate comprising:
a housing portion provided with an open front end for receiving a substrate;
a front lid pivotally connected to said case portion, said front lid adapted for closing over the open front end; and
predetermined portions of said housing portion and said front lid are made of styrene-denaturalized polyphenylene ether formed with an electrically conductive copolymer comprising polyether and polyamide.

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**5,743,410**
**SUPRACONDUCTING MAGNETIC SEPARATOR**
**Adam Antoni Stadtmuller, Chalfont St. Peter, Great Britain, assignor to Carpco, Inc., Jacksonville, Fla.**
**PCT No. PCT/GB94/00990, § 371 Date Apr. 1, 1996, § 102(e) Date Apr. 1, 1996, PCT Pub. No. WO94/26418, PCT Pub. Date Nov. 24, 1994**
**PCT Filed May 9, 1993, Ser. No. 535,019**
**Claims priority, application United Kingdom, May 7, 1993, 9309426**
**Int. Cl.[6] B03C *1/00***
**U.S. Cl. 209—213** **11 Claims**




1. A separator (48) comprising a vessel (8) defining a separation zone and at least two separating chambers (50) containing liquid permeable magnetisable separating packing alternately positionable in said separation zone, a super-conducting magnet (2), a super-conducting coil (4) located in said vessel (8) and surrounding said separation zone for providing a magnetic field therein, a tube (6) for holding said coil (4) and liquid helium to provide a liquid helium reservoir around said coil (4), at least one radiation shield (10, 12) between said tube (6) and said vessel (8), and electric circuit means connected to said coil via current leads (20) for

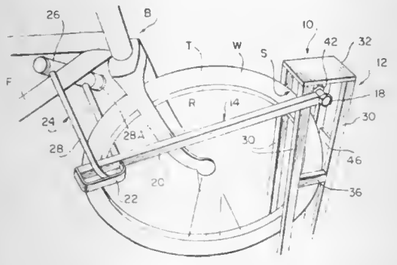
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energising said coil, said vessel (**8**) including a neck assembly (**16**) through which said current leads (**20**, **20***a*, **20***b*) said pass to said coil (**4**) and via which the reservoir is supplied with liquid helium, characterised in that, in use, said neck assembly (**16**) is closed to passage of liquid helium such that said magnet (**2**) defines a closed system with no helium circulation between said reservoir and the exterior of said vessel (**8**), and in that said tube (**6**) is sized to provide a reservoir of sufficient capacity for operation without helium addition to said magnet (**2**) for a number of months, and wherein a helium reliquefier (**46**) is positioned in said neck assembly (**16**).

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**5,743,411**
**OPEN FRAME, SELF STANDING BICYCLE PARKING MODULE**
**E. Gerry Hawkes, Woodstock, Vt., assignor to Bike Track, Inc., Woodstock, Vt.**
**Filed Apr. 7, 1995, Ser. No. 418,626**
**Int. Cl.[6] A47F** *7/04*
**U.S. Cl. 211—20** **18 Claims**



1. An open frame, self standing bicycle parking module comprising:

opposed, identical, flat rectangular, horizontal top and bottom plates, upstanding vertical side rails interposed between said horizontal top and bottom plates, at respective corners thereof, and fixed at opposite ends to facing surfaces of said horizontal top and bottom plates and forming a parallelepiped, unitary, rigid, open frame structure defining an open front slot sized to receive a bicycle wheel rim and tire, and resilient means mounted to said open frame structure adjacent said open front slot and spanning across said slot and being deflectable to permit passage of the wheel and rim and for positioning behind the rim to maintain the bicycle wheel within the front open slot.

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**5,743,412**
**MODULAR PARTS SUPPLY RACK**
**William L. Noble, Wolverine, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.**
**Filed Nov. 13, 1996, Ser. No. 748,672**
**Int. Cl.[6] A47F** *7/00*
**U.S. Cl. 211—59.2** **4 Claims**

1. A modular parts supply rack having a loading end and a delivery end spaced from the loading end, for supplying a plurality of containers filled with small parts from the loading end to the delivery end for use by an assembly line operator and for return of empty containers from the delivery end to the loading end, said rack comprising

a pair of laterally spaced-apart loading end upright bars,

a pair of laterally spaced-apart delivery end upright bars,

upper, intermediate and lower vertically spaced apart loading end horizontal support bars extending between and having opposite ends adjacent said loading end upright bars, said upper and intermediate delivery end horizontal support bars preventing said containers from sliding off said delivery end of said supply rack,

first fastening means adjustably connecting the opposite ends of said loading end support bars to said respective loading end upright bars,

upper, intermediate and lower vertically spaced-apart delivery end horizontal support bars extending between and having opposite ends adjacent said delivery end upright bars,

second fastening means adjustably connecting the opposite ends of said delivery end support bars to said respective delivery end upright bars,

a pair of laterally spaced-apart upper slide bars extending between and having opposite ends adjacent said respective upper support bars,

third fastening means adjustably connecting the opposite ends of said upper slide bars to said respective upper support bars,

a pair of laterally spaced-apart intermediate slide bars extending between and having opposite ends adjacent said intermediate support bars,

fourth fastening means adjustably connecting the opposite ends of said intermediate slide bars to said respective intermediate support bars,

a pair of laterally spaced-apart lower slide bars extending between and having opposite ends adjacent said lower support bars,

fifth fastening means connecting the opposite ends of the lower slide bars to said respective lower support bars,

the upper and intermediate loading end support bars being at a higher level than the respective upper and intermediate delivery end support bars so that the slide bars connected thereto slope downwardly toward the delivery end,

the lower loading end support bar being at a lower level than the lower delivery end support bar so that the slide bars connected thereto slope downwardly toward the loading end,

all of said bars being of the same circular cross-section and diameter and all of said first, second, third, fourth and fifth fastening means being of identical construction and interchangeable.

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**5,743,413**
**EXPANDABLE SHELF KIT/LOG HOLDER**
**Ronald C. Noll, 20749 University Blvd., Shaker Heights, Ohio 44122**
**Filed Apr. 6, 1995, Ser. No. 418,587**
**Int. Cl.[6] A47F** *7/00*
**U.S. Cl. 211—60.1** **15 Claims**

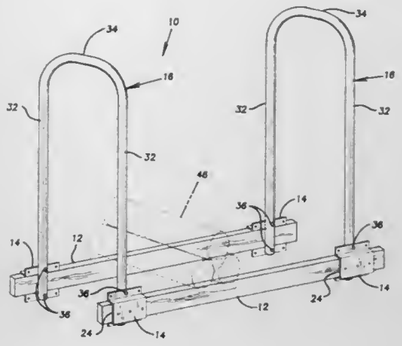
1. An adjustable rack for receiving articles, said adjustable rack comprising:

a pair of horizontally disposed frame members, said frame members being generally parallel and laterally spaced apart;

a plurality of brackets each having a bottom wall, side walls generally perpendicularly extending from opposite sides of said bottom wall to form a channel sized and shaped for receipt of said horizontally disposed frame members, and flanges generally perpendicularly and outwardly extending from said side walls at an open end of said channel, said channels of said brackets being horizontally disposed and receiving said horizontally disposed frame members, and

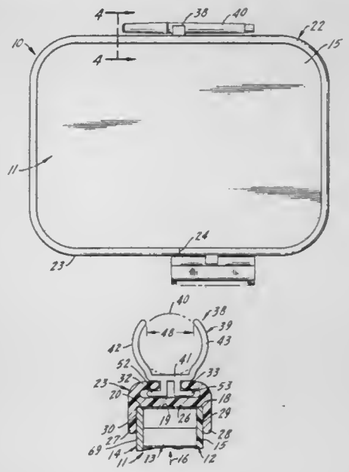
a pair of inverted U-shaped supports mounted between an associated pair of said brackets to connect and space apart said horizontally disposed frame members, wherein each of said U-shaped supports are bent tubes.





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**5,743,414**
**BOARD EDGING SYSTEM AND METHOD OF MANUFACTURE THEREOF**
**Rodney Jay Baudino, Woodridge, Ill., assignor to Sanford Corporation, Bellwood, Ill.**
**Filed Feb. 5, 1996, Ser. No. 596,571**
**Int. Cl.[6] A47F** *5/00*
**U.S. Cl. 211—69.1** **13 Claims**



1. A board edging system for a board of a given size, said system including a board, a continuous, integral band surrounding the periphery of said board;

said band having a length in an as-formed condition which is less than the periphery of the board;

said band being formed from a soft flexible material having the characteristics with respect to compressibility, resiliency and plastic memory of rubber, vinyl or plastic; and

means formed in said band for attaching an accessory to said band, said accessory being adapted for use with said board.

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**5,743,415**
**MOUNTABLE ADJUSTABLE HOLDER APPARATUS FOR HAIR APPLIANCES**
**Kirsten Ann Smart, 4123 N. Campbell, Chicago, Ill. 60615**
**Filed Sep. 27, 1995, Ser. No. 534,563**
**Int. Cl.[6] A47F** *5/00*; *7/00*
**U.S. Cl. 211—70.6** **32 Claims**



1. A mountable adjustable holder apparatus for hair appliances comprising:

a. a base having at least one aperture, each of said at least one aperture having a plurality of predetermined angulatingly discrete locking positions relative to the base;

b. means for mounting the base on a permanent object;

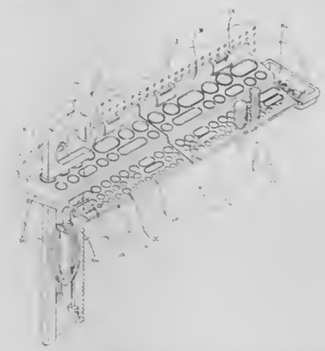
c. at least one appliance securing member; and

d. means for attaching each of the at least one appliance securing member selectively to one of the plurality of predetermined angulatingly discrete locking positions of the at least one of the aperture in the base,

whereby, the appliance securing members may be attached to the base at selected locking positions relative to the base.

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**5,743,416**
**TOOL RACK**
**Zvi Yemini, Tel Aviv, Israel, assignor to Zag Ltd., Rosh Haayin, Israel**
**Filed Dec. 2, 1996, Ser. No. 755,880**
**Int. Cl.[6] A47F** *7/00*
**U.S. Cl. 211—70.6** **11 Claims**



1. A tool rack assembly selectively mountable either directly to a wall or on a vertical peg-board, the tool rack assembly comprising:

(a) a rack integrally formed from molded polymer material, the rack having:

(i) an upper sheet-like element arranged substantially horizontally and having a plurality of apertures for receiving tools, said upper sheet-like element having a rear edge,

(ii) a lower sheet-like element spaced below said upper sheet-like element, said lower sheet-like element having a plurality of apertures corresponding to said apertures of said upper sheet-like element.

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(iii) side portions connecting said upper and lower sheet-like elements for maintaining them in vertically spaced relation, and

(iv) a strip extending along said rear edge to form a vertical flange, said strip having a number of attachment holes; and

(b) a plurality of peg-board brackets engagable within said attachment holes for attaching said tool rack to the peg-board, each of said peg-board brackets including:

(i) at least one curve-ended peg for locking within a hole of the peg-board,

(iii) a straight lower peg positiooed below said curve-ended peg for engaging one of said attachment holes of said flange, and

(iii) a lower edge positioned relative to said straight lower peg so as to abut said upper sheet-like member when said lower peg is engaged within said attachment hole,

wherein said upper sheet-like member features a ridge associated with each of said attachment holes for retaining said peg-board brackets with said lower peg engaged within said attachment hole.

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**5,743,417**

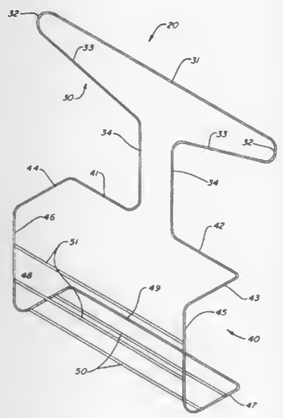
**IRONING BOARD CADDY**

**S. Kent Mathis, 1070 Mattison, Conway, Ark. 72032**

**Filed Aug. 15, 1996, Ser. No. 698,502**

**Int. Cl.[6] A47F** *5/08*

**U.S. Cl. 211—119** **8 Claims**



1. An ironing board caddy for the convenient storage of ironing supplies and accessories on an ironing board of the type having an essentially flat top surface, a bottom surface, and at least one end of defined width and thickness, comprising:

a hanging member having an opening sized to receive the defined width and thickness of the end of the ironing board whereby said hanging member is adapted to hanging the caddy from the end of the ironing board, to manually carrying the caddy, and to hanging the caddy from a vertical surface for storage when not used in combination with the ironing board;

a basket for receiving the ironing supplies and accessories; and

suspension means for suspending said basket from said hanging member, said suspension means suspending said basket under the end of the ironing board when the caddy is attached to the ironing board.

**5,743,418**

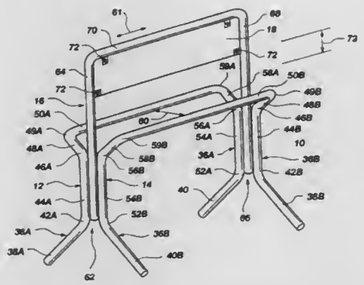
**SKI SECURITY SYSTEM**

**Christian Robert Ahrens, 6810 S. Brookhill Dr., Salt Lake City, Utah 84212**

**Continuation-in-part of Ser. No. 180,625, Jan. 13, 1994, Pat. No. 5,472,101. This application Dec. 4, 1995, Ser. No. 566,938**

**Int. Cl.[6] A47F** *5/00*

**U.S. Cl. 211—206** **7 Claims**



1. An accessory rack for standing on a surface to support one or more accessories, the rack comprising:

a pair of continuous tubular members of substantially uniform cross section,

each tubular member comprising a top portion extending substantially horizontally to an elbow portion at each end thereof,

the top portions supported in spaced-apart, parallel relation by the elbow portions,

each elbow portion curving downwardly and inwardly to a first knee portion curving substantially downwardly to a contiguous leg portion,

each leg portion angled with respect to the respective arm portion to extend downwardly to a second knee portion curving outwardly, the respective leg portions being fastened together proximate each of the ends;

each foot portion extending downwardly and outwardly to a distal end resting on the surface; and

the top portions and leg portions configured to provide an unobstructed space extending from the top potions to the surface.

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**5,743,419**

**CONTAINER CLOSURE WITH A REINFORCED RESILIENT BLADE**

**Roger M. King, Latimer, United Kingdom, assignor to Beeson and Sons Limited, Rickmansworth, United Kingdom**

**Continuation-in-part of Ser. No. 380,201, Jan. 30, 1995, Pat. No. 5,588,545, which is a continuation of Ser. No. 121,970, Sep. 15, 1993, abandoned, which is a continuation of Ser. No. 796,946, Nov. 22, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 470,351**

**Claims priority, application United Kingdom, Sep. 23, 1991, 9120264; Oct. 17, 1991, 9122097**

**Int. Cl.[6] B65D** *55/02*

**U.S. Cl. 215—217** **6 Claims**

1. A child resistant container closure assembly comprising:

a container neck and a container closure;

said container neck carrying a first screw thread;

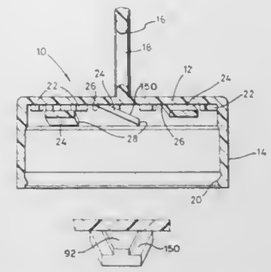
said container closure comprising an inner part and an outer part;

said inner part carrying a second screw thread for screw threaded engagement with said first screw thread of said container neck;

co-operating retaining projections on the inner and outer parts for retaining the inner part within the outer part, and for permitting limited axial movement of the inner part within the outer part;

a first set of castellations on the inner part;





a second set of castellations on the outer part arranged to inter-engage the first set of castellations on the inner part when the outer part is moved axially towards the inner part to permit full torque to be applied to the inner part;

a set of resilient blades extending from a first of the inner and outer parts towards a second of the inner and outer parts, said resilient blades bearing against said second of said inner and outer parts to urge said outer part axially in a direction away from said inner part such that said first and second sets of castellations are normally held out of inter-engagement;

each of said resilient blades having a remote end and comprising an abutment surface at said remote end, each of said resilient blades having a longitudinal cross-section which tapers towards said remote end, and a profile at an acute angle between each said resilient blade and the closure part from which said resilient blade extends being radiused;

said second of said inner and outer parts comprising a set of adjacent ratchet projections, each of said ratchet projections comprising a stop surface and a ramp surface, said stop surface being substantially radial and being constructed and arranged to engage the abutment surface of one of said resilient blades when the outer part is rotated in a first direction to apply the container closure to said container neck, thereby to permit till torque to be applied to said inner part in said first direction of rotation;

each said ramp surface being constructed and arranged to cam one of the resilient blades over said ratchet projection when the outer part is rotated in a second direction opposite to said first direction so that said blades can slip relative to the ratchet projections if said outer part is rotated in said second direction without the first and second sets of castellations being in inter-engagement, said resilient blades transmitting only a limited torque to said ratchet projections owing to frictional engagement of said resilient blades slipping over said ramp surfaces of said ratchet projections; and

wherein at least one of said resilient blades is provided with at least one reinforcing rib extending longitudinally along said at least one resilient blade.

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**5,743,420**

**PLASTIC CLOSURE**

**Manfred Löffler, Tellig, and Hans-Joachim Preuss, Monsheim, both of Germany, assignors to Alcoa Deutschland GmbH, Worms/Rhein, Germany**

**PCT No. PCT/EP93/03360, § 371 Date Oct. 30, 1995, § 102(e) Date Oct. 30, 1995, PCT Pub. No. WO94/16962, PCT Pub. Date Aug. 4, 1994**

**PCT Filed Dec. 1, 1993, Ser. No. 495,446**

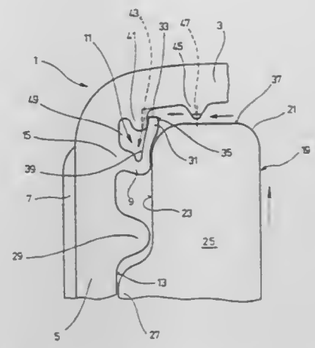
**Claims priority, application Germany, Jan. 20, 1993, 43 01 306.6**

**Int. Cl.[6] B65D** *53/00*

**U.S. Cl. 215—270** **2 Claims**

1. Plastic closure for closing a mouth region of a container, said closure including a lid allocated to the container mouth, an annular side wall connected with and proceeding from the lid, and sealing means for closing the container, characterized in that the sealing means has a circumferential pivotable sealing lip projecting from a support of said closure, said lip coacting with a side wall surrounding the container mouth of the container, so that in the closing of the container the lip is swung out of a rest position into a sealing position in which sealing position said lip is clamped between said support and the side wall of the container so that said sealing lip of said sealing means is subjected to compression in a direction outwardly toward said support, from an inner portion of said sealing lip which engages said side wall of the container,

characterized by a stop coating with the face of the container, wherein the stop has individual projections distributed along an imaginary circular line, the interspaces of which serve as gas passages.



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**5,743,421**

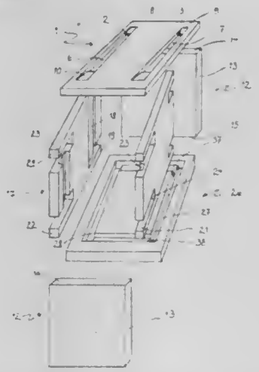
**INSTANT CRATE**

**Carlos Gonzalez, 3924 Tedrich Blvd., Fairfax, Va. 22031, and Claudio Garcia, Lamartine #121 Col. San Jeronimo, Monterrey, Nuevo Leon CP 64630, Mexico**

**Filed Nov. 22, 1995, Ser. No. 561,779**

**Int. Cl.[6] B65D** *6/16;25/24;90/12*

**U.S. Cl. 220—4.28** **3 Claims**



1. A knock-down, reusable container, having two side walls, two end walls, a top panel and a base, wherein:

said side walls each having a pair of opposed parallel length defining edges, and having a pair of opposed parallel width defining edges, each said side wall including a slot extending inwardly from each width defining edge and being adjacent and substantially parallel to one of said length defining edges, each said side wall further having a groove extending from each slot away parallel to the width defining edges and in a direction distal from the length defining edge to which the respective slot is adjacent;

said base having a pair of opposed parallel base-length defining edges, and having a pair of opposed parallel base-width

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defining edges, said base including a first and a second elongated aperture extending parallel to said base-length defining edges and a first base groove adjacent one of said base-width defining edges and a second base groove adjacent the other of said base-width defining edges, each groove extending between adjacent end portions of said first and second elongated apertures and parallel to said base width defining edges;

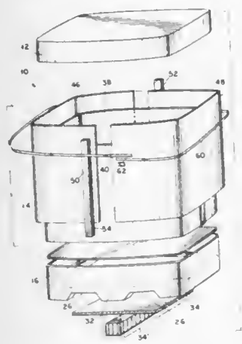
whereby one of said side walls extends through said first elongated aperture and forms a first rib extension, the other of said side walls extends through the second elongated aperture and forms a second rib extension, said first and second rib extensions are of substantially rectangular form and extend along the length of said base directly adjacent to said elongated apertures, wherein said first and second rib extensions support said base in spaced relation to a supporting surface;

one of said end walls engages one side wall groove of each side wall and rests upon said base within said first base groove, the other of said end walls engages the other groove of each side wall and rests upon said base within said second base groove;

said base extends laterally beyond each of said end walls to form horizontally extending third and fourth rib extensions, said third and fourth rib extensions being substantially rectangular and extending orthogonal to respective said end walls, said base also extends laterally beyond each of said side walls to form horizontally extending fifth and sixth rib extensions, said fifth and sixth rib extensions being substantially rectangular and extending orthogonal to respective said side walls.

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**5,743,422**
**COLLAPSIBLE BULK CONTAINER AND METHOD OF MAKING THE SAME**
**James Albert Hale, Red Bank, N.J., assignor to Greif Bros. Corporation, Delaware, Ohio**
**Continuation of Ser. No. 56,954, May 3, 1993, abandoned, which is a continuation of Ser. No. 927,866, Aug. 10, 1992, Pat. No. 5,244,108. This application Jul. 8, 1994, Ser. No. 272,906**
**Int. Cl.[6] B65D** *6/16*
**U.S. Cl. 220—4.33** **8 Claims**



1. An easily collapsible to save space container that may be readily reassembled without special tools comprising:

a plurality of reusable identical and nestable U-shaped continuously slightly curved and convex relatively rigid molded sidewalls and rounded corners, each sidewall being defined between two longitudinal edges;

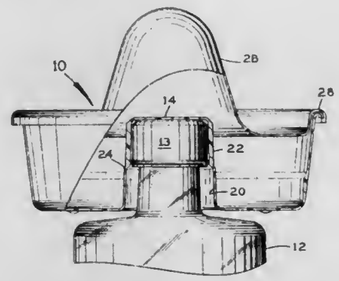
an equal plurality of reusable H-shaped connectors for connecting said sidewalls by said edges to form a generally rectangular tubular body with slightly curved and convex sidewalls connected with rounded corners each of said edges being located intermediate a sidewall and between a pair of rounded corners, said connectors having grooves so shaped and dimensioned to form an interference fit with said edges so that the side walls and connectors may be assembled and disassembled without special tools;

a top member including a top plate and a top skirt extending below said top plate and arranged and constructed to form an interference fit with said tubular body when said tubular body is telescopically joined to said top member; and

a bottom member including a bottom plate and a bottom skirt extending above said bottom plate and arranged and constructed to form an interference fit with said tubular body when said tubular body is telescopically joined to said bottom member.

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**5,743,423**
**SNAP-ON PACKAGE**
**Richard E. Franco, 121 SW. 5th Ct., Pompano Beach, Fla. 33060**
**Filed Mar. 11, 1997, Ser. No. 815,474**
**Int. Cl.[6] B65D** *6/00;21/02*
**U.S. Cl. 220—23.86** **4 Claims**



1. A snap-on package comprising:

A. a container;

B. an impression within said container comprising:

1) a series of tubes,

a) wherein said tubes are concentric and have different diameters,

b) wherein said tubes are substantially cylindrically shaped,

c) wherein said tubes are adjacent to each other,

d) wherein said tubes are located so that the tube with the largest diameter is located outermost in the impression and the smallest diameter tube is located innermost in the impression, wherein the uppermost of said tubes has its top closed by a closure;

2) a ring,

a) wherein said ring is located between said adjacent tubes,

b) wherein said ring has an outer edge with an outside diameter equal to that of the larger adjacent tube, wherein said outer edge is connected to the edge of the larger, adjacent tube,

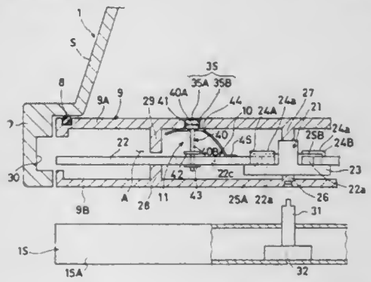
c) wherein said ring has an inside edge with an inside diameter equal to that of the smaller adjacent tube, wherein said outer edge is connected to the edge of the smaller adjacent tube

(3) a closure,

a) wherein said closure is attached to edge of the smallest tube.



**5,743,424**
**SEALABLE CONTAINER**
**Masanao Murata; Tsuyoshi Tanaka, and Teruya Morita, all of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan**
**Filed Jan. 4, 1996, Ser. No. 582,727**
**Claims priority, application Japan, Jan. 9, 1995, 7-018464**
**Int. Cl.[6] B65D** *51/16*
**U.S. Cl. 220—203.13** **4 Claims**



1. A sealable container for accommodating semiconductor wafers, which comprises:

a hollow main body having an opening for insertion or removal of the semiconductor wafers,

a lid member plugging said opening, said lid member having a vent hole formed therein communicating an interior portion of said main body with an exterior thereof,

lock means including a cam member and a rocker arm moveable by rotary movement of the cam member, said rocker arm locking and releasing said lid member in said opening of said main body,

a pressure-equalizing mechanism allowing an interior portion of said main body to be communicable with an exterior portion thereof, said pressure-equalizing mechanism having a valve opening or closing said vent hole, wherein said valve comprises:

a valve head slidably fitted in a recess which communicates with said vent hole in said lid member and which has a diameter larger than that of said vent hole,

an annular seal arranged on said valve head, said annular seal sealing said vent hole,

a valve rod extending vertically from said valve head on an opposite side of said annular seal with a smaller diameter than that of said valve head, said valve rod being connected with said valve head and slidably extending through an elongated slot longitudinally formed in said rocker arm, and

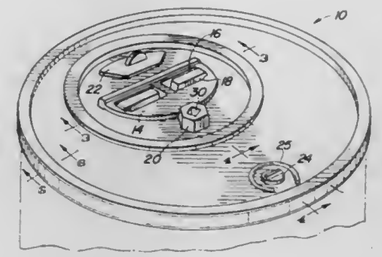
a pair of protuberant stoppers rigidly secured to said valve rod axially apart from each other a distance such that said rocker arm is interposed therebetween.

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**5,743,425**
**PERMANENTLY ATTACHABLE BUCKET LID WITH AIRTIGHT SEAL**
**John N. Ellis, 2535 N. 52nd St., #13, Phoenix, Ariz. 85008**
**Filed Jan. 26, 1995, Ser. No. 378,833**
**Int. Cl.[6] B65D** *51/18*
**U.S. Cl. 220—254** **20 Claims**

1. A device for providing an airtight seal for a bucket having a lipped edge rim and an opening, said device comprising:

a lid of substantially the same size as the opening of the bucket wherein said lid comprises a depending inner skirt member, a first outer skirt member, and a second outer skirt member, whereby a permanent attachment is formed between said lid and the bucket when the inner skirt member is positioned within the opening of the bucket and at least a portion of the first outer skirt member is positioned beneath the lip of the bucket;



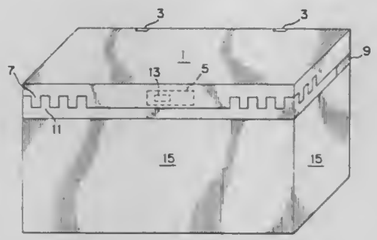
a pour spout and cooperating plastic seal positioned on an outer periphery of said lid;

a threaded access opening formed through said lid of dimension to allow access to materials contained within the bucket, said threaded access opening having a straight edge paint scraper formed on a lower plane of a circumference of said access opening and projecting inwardly toward said opening; and

a cap threadably attached to said access opening comprising a surfaced uppermost surface, a handle grasp member detachable from said cap, a tool grip secured to said recessed uppermost surface having a chamfered exterior shape and a central recessed portion for receiving a ratchet type tool, an air inlet opening, and a cooperating plastic seal capable of sealing said air inlet opening.

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**5,743,426**
**REUSABLE SHIPPING AND PACKAGING CONTAINER**
**James William Mosley, 1610 Gatehouse Cir., N #B1, Colorado Springs, Colo. 80904**
**Filed Jul. 16, 1996, Ser. No. 680,797**
**Int. Cl.[6] B65D** *1/24*
**U.S. Cl. 220—522** **6 Claims**



1. A reusable plastic shipping container comprising:

an upper openable lid having an inside lid pocket, said pocket adapted to receive a data recorded medium having computer readable instructions thereon;

said lid also having corner flush mounted teeth; and

a main container body on which said lid is fitted, said body having flush mounted corner teeth which can engage said lid's teeth in a sealing relationship.

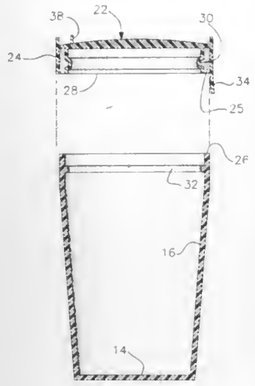
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**5,743,427**
**CLOSURE MEMBER FOR BEVERAGE OR FOOD CONTAINERS**
**Donald T. Monus, 604 7th St. SE., Largo, Fla. 34641-2175**
**Continuation-in-part of Ser. No. 450,049, May 25, 1995, Pat. No. 5,613,616. This application Aug. 7, 1996, Ser. No. 693,773**
**Int. Cl.[6] B65D** *39/00*
**U.S. Cl. 220—791** **4 Claims**

1. A lid and container combination, comprising:

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a container having a bottom wall and a side wall mounted about a periphery of said bottom wall, said side wall projecting upwardly from said bottom wall, and a cavity defined collectively by said bottom wall and side wall;

a lid having a central part and a peripheral depending skirt for releasably engaging an outer surface of a rim of said container;

a perforated section formed in said central part of said lid;

a pull tab formed integrally with said perforated section;

an exit opening formed by pulling said pull tab;

said exit opening uncovering a portion of said rim so that a fluid being consumed through said exit opening flows over said rim but not over said central part of said lid;

said peripheral depending skirt having an internal diameter substantially equal to an external diameter of said rim of said container;

an annular insert depending from said central part of said lid, said annular insert being spaced radially inwardly from said depending skirt by a distance substantially equal to a thickness of said rim of said container;

said insert having an external diameter substantially equal to an internal diameter of said rim of said container;

a groove of predetermined depth formed in an outer peripheral edge of said insert;

a protrusion formed in said side wall of said container, said protrusion extending radially inwardly toward a center of said container a predetermined distance substantially equal to the predetermined depth of said groove;

said protrusion and said groove interlocking with one another when said lid is attached to said rim of said container, said interlocking being below said central part of said lid so that removal of said pull tab to create said exit opening has no affect upon said interlocking;

said lid and said container being made of a flexible, resilient material;

said insert adapted to flex momentarily upon attachment of said lid to said container;

said insert adapted to resume a position of repose upon full seating of said protrusion into said groove; and

a first seal defined by said seating of said protrusion into said groove;

said protrusion being positioned a predetermined distance downwardly from said rim of said container; and

a second seal being provided where said rim of said container abuts a bottom surface of said lid.

**5,743,428**

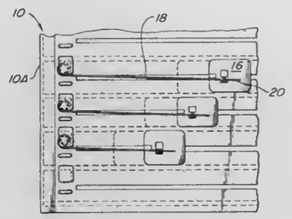
**PRINTED SPRINGS AND METHOD OF MANUFACTURE**

**Alexander Rankin, VI, Dresher, Pa., assignor to Vulcan Spring & Mfg. Co., Telford, Pa.**

**Division of Ser. No. 496,193, Jun. 28, 1995, Pat. No. 5,649,363. This application Feb. 6, 1997, Ser. No. 795,869**

**Int. Cl.[6] G07F *11/00***

**U.S. Cl. 221—6** **7 Claims**



1. In a merchandise dispenser for storing and dispensing a plurality of like items of merchandise, the dispenser having at least one opening to allow a front one of the merchandise items to be dispensed, the remaining merchandise being aligned behind the front one item within the dispenser and being biased forward toward the opening, the improvement wherein a metal spring provides a force to bias the merchandise forward, said metal spring having indicia at spaced intervals, said indicia capable of being read to provide inventory information of the merchandise stored in the dispenser.

**5,743,429**

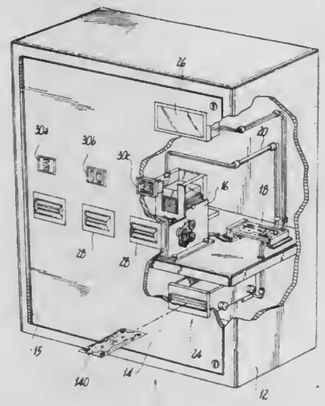
**DEVICE FOR DISPENSING CREDIT CARDS**

**Jacob Morofsky, So. Farmingdale, N.Y., assignor to Debit Dial Vending Corp., Deer Park, N.Y.**

**Filed Sep. 26, 1995, Ser. No. 534,012**

**Int. Cl.[6] G07F *11/00***

**U.S. Cl. 221—7** **10 Claims**



1. A card dispenser comprising a hopper for holding a stack of cards, a table arranged below and spaced from said hopper and on which said stack of cards rest, said table having an opening exposing the bottom surface of the bottommost one of said cards in said stack and means adapted to engage the bottom surface of said bottommost one of said cards for pushing the card from beneath said stack over said table and through the space between said hopper and table, said table being movable between a first position in which the bottommost one of said cards is in contact with the means for pushing said card from beneath said stack and a second position in which the bottommost card is spaced from and not in contact with said means for pushing said cards, means for normally biasing said table in said second position and means for selectively moving said table into said first position, whereby only selected ones of said cards are dispensed.



**5,743,430**

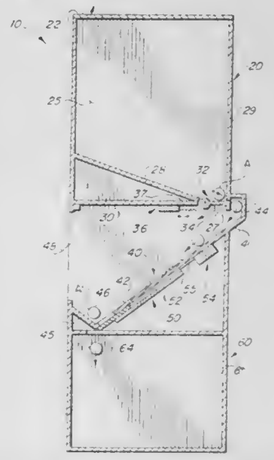
**AUTOMATIC DRINKING STRAW DISPENSING DEVICE**

**Oscar Freixas, 11277 SW. 88th St., #K-105, Miami, Fla. 33176**

**Filed Mar. 7, 1996, Ser. No. 612,428**

**Int. Cl.[6] A47F *1/00***

**U.S. Cl. 221—97** **23 Claims**



1. An automatic drinking straw dispensing device comprising:

a primary receptacle, said primary receptacle being structured and disposed to contain a plurality of straws therein,

a generally elongate slot formed in said primary receptacle and structured to permit the passage of the drinking straws therethrough,

a dispensing platform, said dispensing platform being disposed in dispensing communication with said elongate slot such that the drinking straws which pass through said elongate slot are directed onto said dispensing platform,

single straw dispensing means structured and disposed to selectively permit only one of the drinking straws to exit said primary receptacle through said elongate slot at one time,

said dispensing platform being further structured to retain a dispensed one of the drinking straws in an accessible, retrievable orientation, and

recycling means structured and disposed to remove the dispensed one of the drinking straws from said dispensing platform if not retrieved, and thereby prevent more than one of the drinking straws from backing up on said dispensing platform and ensuring that a fresh one of the drinking straws is available for retrieval.

**5,743,431**

**FLUID DISPENSER AND ACTIVATOR ADAPTER AND METHOD OF USE**

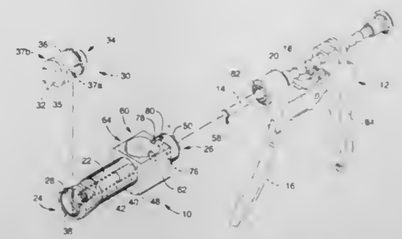
**Steven J. Brattesani, 2561 Chestnut St., San Francisco, Calif. 94123**

**Continuation-in-part of Ser. No. 543,176, Oct. 5, 1995, Pat. No. 5,692,642. This application Jul. 16, 1996, Ser. No. 683,057**

**Int. Cl.[6] B67D *5/46***

**U.S. Cl. 222—1** **20 Claims**

18. A method of dispensing fluid materials, comprising the steps of:



(a) providing a dispenser adapter, said dispenser adapter comprising a cartridge holder, said dispenser adapter comprising a plunger slidably associated with said cartridge holder, said dispenser adapter including a socket, said dispenser adapter including an activation chamber;

(b) coupling said dispenser adapter to a dispensing device;

(c) placing a cartridge of fluid material within said activation chamber;

(d) applying an activating pressure to said cartridge in said activation chamber;

(e) transferring the activated cartridge from said activation chamber to said socket;

(f) transferring force from said dispensing device to said plunger on said dispenser adapter; and

(g) forcing, by said plunger, fluid material from said cartridge in said cartridge holder.

**5,743,432**

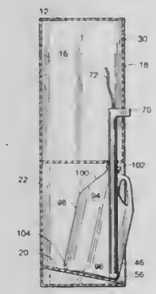
**LIQUID DISPENSING SYSTEM**

**David J. Barbe, Winterville, N.C., assignor to U.N.X. Incorporated, Greenville, N.C.**

**Division of Ser. No. 497,604, Jun. 30, 1995, Pat. No. 5,628,430. This application Mar. 13, 1997, Ser. No. 853,224**

**Int. Cl.[6] B67D *5/64***

**U.S. Cl. 222—1** **2 Claims**



1. A method of withdrawing substantially all of the liquid from a container having a mouth and bottom and at least one side wall joined at a curved juncture comprising,

a. positioning said container with said mouth vertically over said curved juncture;

b. slidable positioning a probe having a distal end above said mouth, said distal end having a curved outer face conforming to the shape of said curved juncture, said curved outer face having a centrally located inlet and an outer edge;

c. interconnecting said inlet and said outer edge with at least one radial groove along said curved outer face;

d. moving said probe downwardly through said mouth;

e engaging said curved outer face with said curved juncture; and

f. channeling liquid radially along said at least one groove from said outer edge to said centrally located inlet for withdrawal of liquid from said container upwardly through said probe.

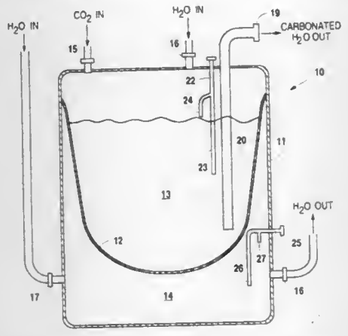
VOL 1209 ISS 4 AP 28 1998 UMI



## 5,743,433
## COMBINATION CARBONATOR AND PLAIN WATER BOOSTER

**John T. Hawkins, Adkins, Tex.; W. David Vinson, Peachtree City, Ga.; Thomas L. Guy, III, and Samuel Durham, both of San Antonio, Tex., assignors to The Coca-Cola Company, Atlanta, Ga.**

**Filed Oct. 31, 1995, Ser. No. 550,614**
**Int. Cl.[6] B67D** *5/08*
**U.S. Cl. 222—64** **11 Claims**

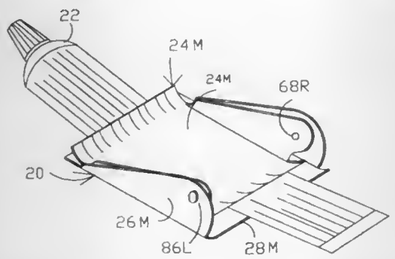



1. A carbonator and plain water booster, comprising:
a tank, said tank, comprising:
a first plain water inlet port for inletting water into a carbonated water chamber and a $CO_2$ inlet port for inletting $CO_2$ into said carbonated water chamber to facilitate the formation of carbonated water,
a carbonated water outlet port for outletting carbonated water from said carbonated water chamber
a second plain water inlet port for inletting water into a plain water chamber, and
a plain water outlet port for outletting pressurized plain water from said plain water chamber; and
a bladder disposed within said tank for separating said tank into said carbonated water chamber and said plain water chamber and for transferring the pressure created within said carbonated water chamber by the $CO_2$ and the carbonated water to the plain water within said plain water chamber to pressurize the plain water within said plain water chamber.

## 5,743,434
## COLLAPSIBLE TUBE COMPRESSING DEVICE

**Homer Edwin Light, R.D. #3, Box 703B, Annville, Pa. 17003**

**Continuation-in-part of Ser. No. 573,203, Dec. 15, 1995, abandoned. This application Jun. 5, 1996, Ser. No. 660,675**
**Int. Cl.[6] B65D** *35/28*
**U.S. Cl. 222—103** **2 Claims**

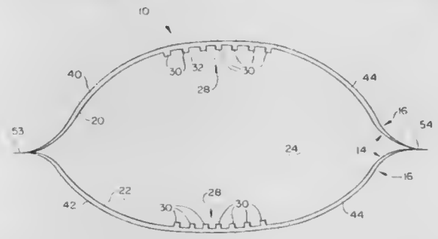



1. A tube squeezing device adapted for efficient expelling of flowable contents of a collapsible tube and requiring only essentially single-hand manipulation comprising:
a. a first planar, generally rectangular rigid base member;
b. a first pair of laterally aligned, upstanding flanges, conjoined along opposing lateral edges of said base member defining a channel and each being a tapered from one longitudinal end to another longitudinal end;
c. a bore hole provided in each such flange forming a first set and defining ends of a horizontal and transverse phantom line drawn therebetween;
d. a second planar generally rectangular rigid presser lever member having a second pair of laterally aligned, upstanding flanges, along opposing lateral edges, and each flange being tapered from one longitudinal end to another longitudinal end, sized to nest freely between the first pair of lateral flanges and to move in overlying relationship to said base member;
e. a second set of bore holes with one provided in each flange of the second member opposing the first set;
f. a pair of pivot pins positioned transversely of and proximal to the one longitudinal end of said first and second pair of flanges, axially aligned, and adapted to engage the opposing bore holes, of said first and second pair of flanges said bore holes defining a transverse axis of pivoting for the lever member, serving to permit the reciprocating movement of said lever member at a pivoting end thereof with respect to said base member; and,
g. the pivoting end of said longitudinal lever member is also provided with an cross section that defines a variable transverse gap between the members at the pivotable end with a maximal transverse gap occurring when the lever member forms an obtuse angle of 180° and with a minimal transverse gap occurring when the lever member reaches a substantially acute vertical angle of zero degrees thus providing maximum tube compression.

## 5,743,435
## BAG-IN-BOX AND METHOD AND APPARATUS FOR MAKING THE SAME

**Mladomir Tomic, Appleton, Wis., assignor to Reynolds Consumer Products, Inc., Appleton, Wis.**

**Continuation of Ser. No. 678,020, Jul. 10, 1996, abandoned. This application Jun. 13, 1997, Ser. No. 876,142**
**Int. Cl.[6] B65D** *35/56*
**U.S. Cl. 222—105** **11 Claims**




1. A collapsible bag comprising:
an outer bag of first and second panel sections heat sealed together to form a first enclosed region;
an inner bag inside of the outer bag positioned in the first enclosed region and including third and fourth panel sections having inner and outer surfaces and heat sealed together and to the first and second panel sections to form a second enclosed region holding a liquid;
the first and third panels having a hole to provide access to the liquid in the second enclosed region;
a spout sealed to the first and third panel sections over the hole;
the fourth panel section having a first plurality of ribs formed integrally as a portion of the inner surface thereof parallel to a length of the fourth panel section and facing the second enclosed region and without any reinforcement thereof; and

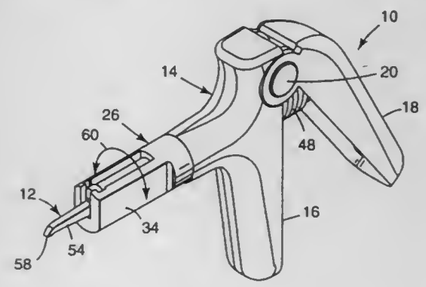


the third panel section having a second plurality of ribs formed integrally as a portion of the inner surface thereof facing the second enclosed region, the ribs on said third and fourth panel sections not interlocking with one another as the bag collapses.

## 5,743,436
## APPLICATOR FOR DISPENSING MATERIAL FROM A DUAL CHAMBER CARTRIDGE

**Malcolm W. Wilcox, Woodbury; Thomas W. Martin, Little Canada, and Roger J. Carufel, Marine on St. Croix, all of Minn., assignors to Minnesota Mining & Manufacturing Co., St. Paul, Minn.**

**Filed Dec. 8, 1995, Ser. No. 569,647**
**Int. Cl.[6] B67D** *5/52*
**U.S. Cl. 222—137** **10 Claims**



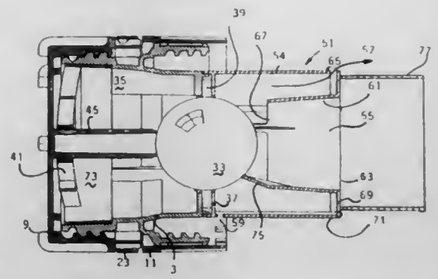

1. An applicator assembly comprising a dual chamber cartridge having two chambers each with a longitudinal axis and an applicator for dispensing material from said dual chamber cartridge, said applicator including:
a body having a handle;
a holder for removably receiving said dual chamber cartridge;
a pair of elongated, side-by-side plungers each having a longitudinal axis; and
drive means for advancing said pair of plungers in a certain direction toward said cartridge when received in said holder, said pair of plungers being pivotally connected to said body for selective movement in an arc about said certain direction, said holder pivotally connecting said cartridge to said body for selective movement in said arc in order to vary the rotative orientation of said cartridge relative to the handle, said longitudinal axes of said plungers being aligned with respective longitudinal axes of said chambers during a dispensing operation regardless of the rotational orientation of said cartridge.

## 5,743,437
## CLOSURE FOR CONTAINERS FOR LIQUID

**David Moore, Elmesthorpe, and Christopher Harris, Oakham, both of United Kingdom, assignors to Monsanto Europe S.A., Brussels, Belgium**

**Filed Jul. 8, 1994, Ser. No. 272,187**
**Claims priority, application European Pat. Off., Jul. 8, 1993, 93870128**
**Int. Cl.[6] B65D** *49/02*
**U.S. Cl. 222—147** **12 Claims**

1. A reusable closure for removable attachment within the neck of a returnable and reusable container for storing liquid, comprising:
a) a valve body for attachment to the inside surface of the neck of said container;
b) a ball disposed within said valve body;
c) a valve seat disposed within said valve body, said valve seat having a circular opening defining a resting position for said ball while said container is in a substantially upright position, said ball rolling away from said resting position when said container is in an inclined or inverted position;
d) sealing means around said valve seat for forming a tight seal between said ball and said valve seat while said container is in a substantially upright position;
e) retention means for keeping said ball disposed within said valve body while said container is in an inclined or inverted position;
f) a cylindrical flow control element comprising a first end connected to said valve body and a second end extending into said container;
g) a hollow conically Shaped element having a tapered end, a wide end, and an inner passageway, said hollow conically shaped element arranged within said cylindrical flow control element so as to define an outer passageway between said hollow conically shaped element and said cylindrical flow control element, said wide end being adjacent to said second end of said cylindrical flow control element, and said tapered end directed toward said neck of said container,
said inner passageway of said hollow conically shaped element comprising a conduit for flowing liquid, said tapered end of said hollow conically shaped element having an opening defining a liquid outlet orifice adjacent to said circular opening of said valve seat,
said outer passageway comprising an air flow pathway;
h) a transversal skirt radially extending around said base of said conically shaped element to define a bridge between said base of said conically shaped element and the second end of said cylindrical flow control element, said transversal skirt including at least one hole defining an air flow orifice.




## 5,743,438
## UNDER SHELF RACK FOR WATER CONTAINER

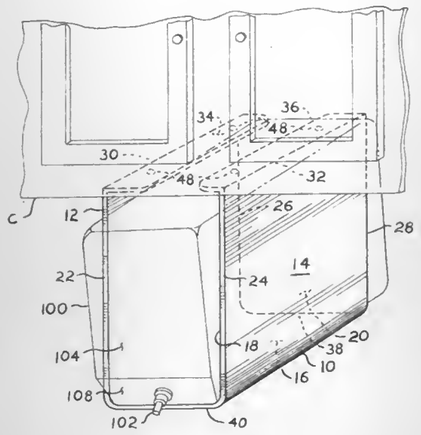
**Edward L. Sokolnicki, 217 Sunnybrook Rd., Jackson, N.J. 08527**

**Filed Feb. 6, 1996, Ser. No. 597,103**
**Int. Cl.[6] B67D** *5/06*
**U.S. Cl. 222—181.1** **9 Claims**

1. A liquid dispensing apparatus comprising:
a storage rack adapted for installation beneath a generally horizontal overlying surface and formed of a generally U-shaped thin sheet of material having a generally vertical and flat first side including a first front side edge, an opposite first rear side edge and a generally horizontal first upper edge; an opposite generally vertical and flat second side generally parallel to said first side, said second side including a second front side edge, an opposite second rear side edge, and a generally horizontal second upper edge; a generally flat floor panel extending between said first side and said second side, said floor panel including a front floor edge and a rear floor edge; a first mounting flange extending generally horizontally from said first upper edge; and a second mounting flange extending generally horizontally from said second upper edge; said first rear side edge substantially equal in length to said second rear

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side edge, said first front side edge substantially equal in length to said second front side edge, with each said first and second side edge longer than each said first and second rear side edge to provide a downward and forward slope to said floor panel; said first front side edge, said second front side edge, and said front floor edge defining a forward unobstructed open end; and said first rear side edge, said second rear side edge, and said rear floor edge defining an opposite rearward unobstructed open end;

each said side and said floor panel including an inner surface with a non-slip material having a high coefficient of friction disposed over at least a portion thereof; and

a liquid container having a generally rectangular parallelipiped configuration with a bottom surface and a dispensing spigot end with an offset dispensing spigot extending therefrom and adjacent to said bottom surface; whereby

said liquid container is removably placed within said storage rack with said offset dispensing spigot disposed adjacent said forward open end and adjacent said floor panel of said rack and said downward and forward slope of said floor panel providing for efficient drainage of liquid from said liquid container as the liquid is depleted.

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**5,743,439**

**CLAMPING DEVICE AND CONTAINER HAVING A CLOSURE DEVICE SECURED IN POSITION BY THE CLAMPING DEVICE**

**Ivan Semenenko, Moreton-in-Marsh, United Kingdom, assignor to Matcon Limited, Moreton-in-Marsh, United Kingdom**

**Filed Jul. 10, 1995, Ser. No. 500,057**

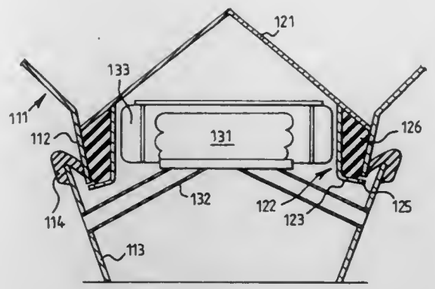
**Claims priority, application United Kingdom, Jul. 11, 1994, 9413914; Jul. 11, 1994, 9413922; Jul. 11, 1994, 9413929; Nov. 29, 1994, 9424097; Dec. 19, 1994, 9425532**

**Int. Cl.[6] B67D** *5/06*

**U.S. Cl. 222—185.1** **12 Claims**

1. A clamping device for clamping a closure device in an aperture of a container for flowable material, comprising:

a first member including a body having first and second projections spaced apart along a longitudinal direction of the body; and




a second member having latching means for engaging a portion of the closure device to clamp the closure device in the aperture, wherein the latching means and the first and second projections cooperate to retain the second member on the first member.

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**5,743,440**

**DISPENSING ASSEMBLY INCLUDING A BUILT-DISPENSING HEAD RETRACTED INSIDE THE BODY OF THE CONTAINER AND METHOD FOR MANUFACTURING THE DISPENSING ASSEMBLY**

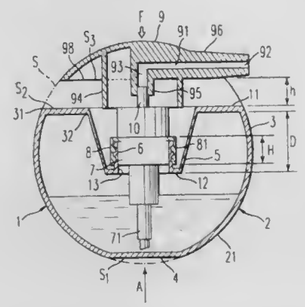
**Vincent De Laforcade, Rambouillet, France, assignor to L'Oreal, Paris, France**

**Filed May 20, 1996, Ser. No. 650,714**

**Claims priority, application France, May 18, 1995, 95 05921**

**Int. Cl.[6] B65D** *37/00*

**U.S. Cl. 222—209** **22 Claims**




1. An assembly for dispensing product, comprising a container having a body with a closed end wall; a cone-frustum-shaped throat having a larger cross section and a smaller cross section, the larger cross section being attached to an opposite end from the end wall of the container and the smaller cross section being attached to a neck; a dispensing member mounted on the neck of the container communicating with a dispensing orifice; and means for actuating the dispensing member to cause dispensing of a dose of product contained in the container, characterized in that while the assembly is being used the neck extends outwardly of the container and the core frustum extends inwardly of the body of the container so that the neck and at least part of the dispensing member are housed inside the cone frustum.



**5,743,441**

**DEVICE FOR PACKAGING AND DISPENSING A LIQUID, A GEL, OR A PASTE, AND HAVING A DOME-SHAPED APPLICATOR**

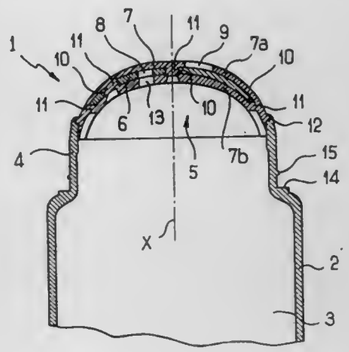
**Gilles Baudin, Eragny, and Nicolas Albisetti, Sevran, both of France, assignors to L'Oreal, Paris, France**

**Filed Jun. 24, 1996, Ser. No. 668,745**

**Claims priority, application France, Jul. 10, 1995, 95 08305**

**Int. Cl.[6] B65D** *37/00*

**U.S. Cl. 222—212** **11 Claims**




1. A device for packaging and dispensing a substance selected from the group consisting of a liquid, a gel, or a paste, the device comprising both a reservoir suitable for containing said substance and suitable for being put under pressure to dispense said substance, and a dome-shaped applicator communicating internally with said reservoir and provided with a plurality of outlet orifices for the substance to be dispensed, the substance being caused to flow through at least one of the plurality of outlet orifices by applying pressure to the substance upstream from said plurality of outlet orifices, wherein the applicator includes an elastic outer member adapted for applying the substance to a large surface of the skin, with a plurality of substance-dispensing orifices passing therethrough, and a dome-shaped inner supporting wall on which said membrane rests in the absence of said product being put under pressure for the purpose of being dispensed, the inner supporting wall having a plurality of feed orifices that are offset relative from said plurality of dispensing orifices such that, when the outer membrane is at rest, it isolates said plurality of feed orifices from the outside, the outer membrane also being capable of moving elastically away from said inner supporting wall under the effect of pressure applied to the substance for the purpose of dispensing it, thereby allowing said substance to flow from the plurality of feed orifices towards said plurality of dispensing orifices and allowing the substance to move out from the applicator.

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**5,743,442**

**LIQUID DISPENSING SYSTEM**

**David J. Barbe, Winterville, N.C., assignor to U.N.X. Incorporated, Greenville, N.C.**

**Division of Ser. No. 497,604, Jun. 30, 1995, Pat. No. 5,628,430. This application Mar. 13, 1997, Ser. No. 816,989**

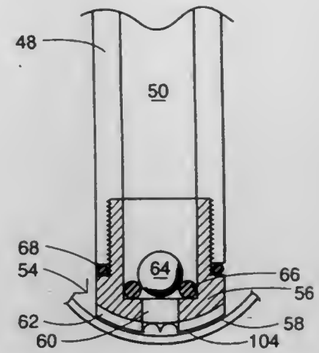
**Int. Cl.[6] B67D** *5/64*

**U.S. Cl. 222—382** **1 Claim**

1. A horizontal rigid probe in combination with a tilted container having a mouth and a bottom and at least one side wall joined at a curved juncture, comprising:

a. a distal end of said probe having a curved outer face engaged with and conforming to said curved juncture, said curved outer face having a centrally located inlet and an outer edge;

b. at least one radial groove along said curved outer face interconnecting said inlet and said outer edge, for channeling liquid radially along said at least one groove from said outer edge to said inlet for withdrawal of liquid upwardly through said probe from said tilted container.




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**5,743,443**

**SLIT VALVE FOR CLOSING OFF CONTAINERS**

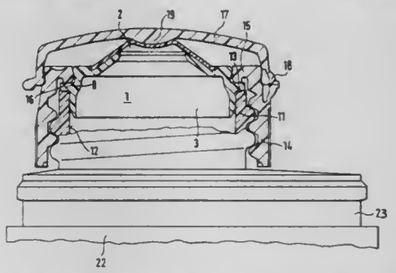
**Johannes Hins, Sundern, Germany, assignor to Georg Menshen GmbH & Co. KG, Finnentrop, Germany**

**Filed May 14, 1996, Ser. No. 645,705**

**Claims priority, application Germany, May 17, 1995, 295 08 151.1**

**Int. Cl.[6] B65D** *35/52*

**U.S. Cl. 222—490** **10 Claims**




1. A slit valve for closing off a container opening comprising a diaphragm part having a slit-shaped pour opening and made of a first thermoplastic elastomer material having resilient property, said diaphragm part being integrally molded onto a base part of a second thermoplastic material different from said first thermoplastic elastomer material so as to be formed as one piece therewith.

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**5,743,444**

**TWIST DISPENSING CLOSURE**

**James M. Beck, Buffalo Grove, and John Sekowski, Long Grove, both of Ill., assignors to Creative Packaging Corp., Buffalo Grove, Ill.**

**Filed Dec. 6, 1996, Ser. No. 761,395**

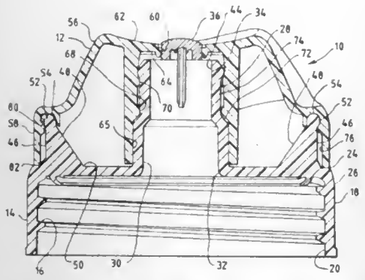
**Int. Cl.[6] B65D** *47/06*

**U.S. Cl. 222—521** **7 Claims**

1. A twist dispensing closure comprising, a base part adapted to be affixed to a container holding product to be dispensed, a spout part matingly engageable with said base part and movable thereon from an opened position to a closed position, said base part including a platform with a centrally located post, at least one cam follower positioned on and extending above said platform at a location spaced from said post, said spout part having a depending skirt with a terminal edge and an internal surface, at least one

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channel provided on said internal surface extending along an incline from a first location proximate the terminal edge to a second location spaced from said terminal edge, said cam follower being matingly engageable within said channel, whereby rotation of said spout part with respect to said base part will cause said cam follower to move within said channel and thereby separate the spout part from the base part to open the spout and permit product to be dispensed through the closure.

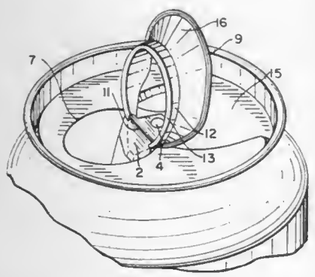
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**5,743,445**

**OPENING AND POURING DEVICE INCLUDING VOLUME POURING SPOUT FOR A CONTAINER FOR A LIQUID AND METAL COVER CONTAINING SAME**

**Jacques Benarrouch, 23, rue Clement Michut, 69100 Villeurbanne, France**

**Filed May 6, 1996, Ser. No. 643,483**
**Claims priority, application France, Jun. 6, 1995, 95 06880**
**Int. Cl.[6] B65D *47/10***
**U.S. Cl. 222—541.9** **10 Claims**



1. An opening and pouring device for a container for a liquid, said container having cover (A) provided with an openable protective cap (**6**) defined by a precut perimeter (**7**) in said cover (A), wherein said opening and pouring device comprises a metal hand lever riveted to the cover (A) acting as means for opening said cover by staving in said protective cap (**6**) and wherein said metal hand lever includes:

a volume pouring spout (**1**) acting as a drive arm thereof for staving in said protective cap (**6**) provided with a lip (L) and an open clipping ring (**12**) having a clipping flange (**13**) of semicircular cross-section consisting of an outer lateral thickened portion,

a riveting tongue (**3**) connected to the volume pouring spout (**1**) provided with a riveting hole (**5**) for facilitating the riveting of the metal hand lever to the cover (A),

a hammer (**2**) integrated in the hand lever, acting as resistant arm of the metal hand lever and provided with a reinforced nose (**10**) for staving in the protective cap (**6**) along said precut perimeter (**7**) during an initial period of radial rotation of the metal hand lever, and

means for facilitating radial rotation of said hand lever comprising a strip (**11**) of spreadable excess metal provided as an integral part of the riveting tongue (**3**) and situated between the riveting hole (**5**) of said riveting tongue (**3**) and a side of the hammer (**2**) opposite the staving nose (**10**);

so that after staving in the protecting cap (**6**) by rotation of said hand lever about a sliding rotation axis over a 180° maximum angular rotation of the hand lever, the pouring spout (**1**) is placed in an operating position by clipping with a pressure said open clipping ring (**12**) exactly in an opening in the cover (A) provided by staving in the protective cap (**6**) and passing the hammer (**2**) under an inner face of the cover (A) after spreading of the strip (**11**) of excess metal.

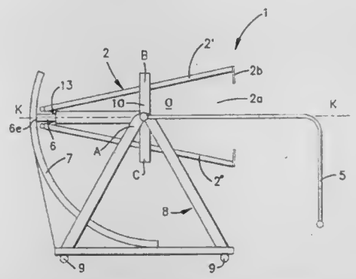
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**5,743,446**

**DEVICE TO FACILITATE THE ACT OF PUTTING ON HOSIERY**

**Emilio Roda-Balzarini, Via Bottogno 11b, 6962 Viganello, Switzerland**

**Filed Sep. 16, 1996, Ser. No. 714,427**
**Claims priority, application Switzerland, Sep. 22, 1995, 02677/95**
**Int. Cl.[6] A57G *25/90***
**U.S. Cl. 223—112** **5 Claims**



1. Device (**1**) to help an elderly, feeble or disabled person to put on hosiery (**14**), characterized in that it comprises:

a) hollow means (**2**) having an essentially tubular shape and having hole (**2***a*) which allows along its longitudinal axis (K—K) insertion and admission of the end of the lower limb (**3**) up to a predetermined distance, said hole having outside edge (**2***b*) which allows an item of hosiery (**4**) to be put on around it and slid axially along the outside of hollow tubular means (**2**) up to a desired length;

b) means (**5**, **6**, **7**, **15**, **16**, **17**, **19**) capable of varying the dimensions of hole (**2***a*) within predetermined limits;

c) means (**5**, **15**) capable of rotating said tubular means around an axis perpendicular to its own longitudinal axis (K—K);

d) support means (**8**) for holding up device (**1**).

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**5,743,447**

**PORTABLE VARIABLE CAPACITY BACKPACK**

**Virginia B. McDermott, 216 Williamsburg Rd., Ardmore, Pa. 19003**

**Filed Oct. 9, 1996, Ser. No. 728,360**
**Int. Cl.[6] A45F *3/04***
**U.S. Cl. 224—153** **7 Claims**

1. A portable, variable capacity backpack comprising:

a resealable storage compartment component, including

a rigid base, having an exterior surface and an interior surface;

a first continuous wall defining a top wall, a front wall, a rear wall, and side walls, said first continuous wall further defining at least one access opening having a resealable closure, said first continuous wall including expansion means for expanding the surface area of said first continuous wall, said expansion means comprising an annular sleeve of a foldable material, having an upper portion and a lower portion, the upper portion being contiguously and circumferentially attached to said first continuous wall and the lower portion being contiguously and circumferentially attached to said rigid base in a manner so as to complete an enclosed chamber within said first continuous wall, and fastening means for circumferentially and removably affixing said upper portion of said annular sleeve to said lower portion;

said at least one access opening and said resealable closure disposed in said top wall and extending along and terminating at upper portions of said side walls;

shoulder harness means for enabling said storage compartment component to be carried on the back of a user, said shoulder harness means configured and dimensioned to be worn over each shoulder of a user and being attached to said rear wall, and further having a quick release fastener comprising mating component parts, one component part being attached to said shoulder harness means and a different one component part being attached to said rear wall, thereby defining a detachable shoulder harness means;

a unitary reinforcing bar mounted to said top and side walls within said chamber;

a carrying handle attached to said reinforcement bar by a plurality of rivets passing through each said reinforcing bar, said first continuous wall and said handle;

a plurality of wheel assemblies attached to said exterior surface of said rigid base;

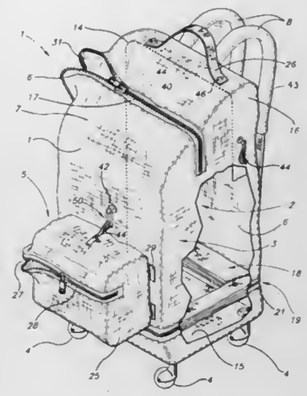
at least one detachable compartment, having a second flexible continuous wall defining a second top wall, a second front wall, a second rear wall, a plurality of second side walls, a second base, and an exterior surface, said continuous wall further defining at least one second access opening having a resealable second closure;

attachment means for removably attaching said detachable compartment to said storage compartment component; and,

a quick-release tether, having a first part and a second part complementarily mounted between said storage compartment and said detachable compartment;

whereby said fastening means may be fastened upon bringing said upper portion of said annular sleeve into proximity with said lower portion thereby defining a collapsed state of the expansion means and thereby decreasing the volume of said chamber and whereby further the fastening means may be unfastened to reverse such state thereby increasing the volume of said chamber.





**5,743,448**

**RAINCOAT CONCEALING BACKPACK**

**Cheng-Chung Tsai, 5Fl-2, No. 163, Sec.2, Keelung Rd., Taipei, Taiwan**

**Filed Jan. 16, 1997, Ser. No. 784,466**
**Claims priority, application Taiwan, May 31, 1996, 85208157**
**Int. Cl.[6] A45F *4/02***
**U.S. Cl. 224—153** **4 Claims**



1. A raincoat concealing backpack comprising:

a backpack including a pair of shoulder straps, a front surface of said backpack includes a peripheral zipper along two lateral sides and a top side of said backpack, opening said peripheral zipper allows said front surface of said backpack to fold down,

inside said front surface, a secondary interior surface has a raincoat affixed thereto, said raincoat is stored between said front surface and said secondary interior surface such that said raincoat is deployed by a user opening said peripheral zipper; and

a rear exterior of said raincoat includes a containing pouch, an upper edge of said containing pouch is positioned below a seam joining said raincoat and said secondary interior surface of said backpack, and

an opening of said containing pouch comprises two single-sided zippers,

a cover is included on said rear exterior of said raincoat, said cover corresponds in position to said containing pouch, a lower portion of said cover includes two single-sided zippers that correspond to said two single-sided zippers of said containing pouch; such that

said two single-sided zippers of said containing pouch mate with said two single-sided zippers of said cover to affix said cover to said containing pouch so that said backpack can be placed inside the containing pouch and said cover covers said backpack while a user wears said raincoat.

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**5,743,449**

**NECK-SUPPORTED MAP HOLDER**

**Timothy B. McBride, 1110 Vermong Ave., NW., Washington, D.C. 20005**

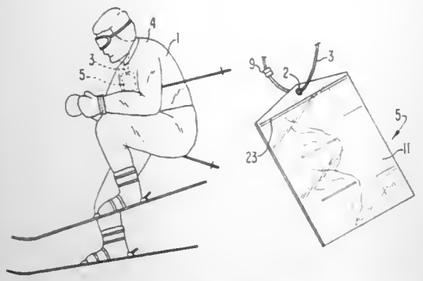
**Continuation of Ser. No. 606,624, Oct. 31, 1990, Pat. No. 5,178,311. This application Nov. 3, 1992, Ser. No. 970,862**
**Int. Cl.[6] A45F *3/02***
**U.S. Cl. 224—191** **18 Claims**

1. A method of carrying and reading a map, comprising the steps of:

placing a holder containing the map around the neck of a person, said holder including (1) a neck-surrounding member to be removably retained around the neck of the person; and (2) a map supporting member, for supporting the map, such that the

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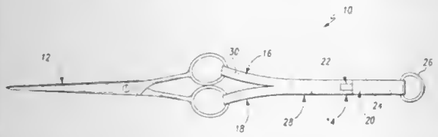
map is exposed, in the supporting member, to be read by said person, said supporting member being attached to and held by said neck-surrounding member, said neck-surrounding member achieving a sufficient length such that the map contained by the supporting member can be read by said person around whose neck the holder is placed, without the neck-surrounding member having to be removed from the person's neck, the holder being placed such that the neck-surrounding member is located around the neck of said person, with the supporting member tucked away in a protected and non-visible location to prevent damage to the map from exposure to adverse conditions;

grabbing the holder, removing the supporting member from said protected and non-visible location, and positioning the supporting member so that the map can be read by the person around whose neck the holder is placed, in a single maneuver, while the neck-surrounding member is maintained around the neck of the person, said grabbing, said removing and said positioning being performed by said person; and

reading the map by the person around whose neck the holder is placed, while the neck-surrounding member is maintained around the neck of the person and the map is maintained in the supporting member, so that the map is read without removing the neck-surrounding member from around the neck of the person, the supporting member being maintained in its protected and non-visible location and removed therefrom, positioned so that the map can be read by the person, and the map is read by the person, all without removing the neck-surrounding member from around the neck of the person.

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**5,743,450**
**SCISSORS RETAINING APPARATUS**
**Scotty Allen Plate, P.O. Box 84, Bath, Ill. 62617**
**Filed Dec. 5, 1996, Ser. No. 760,836**
**Int. Cl.[6] A45C** *3/14*
**U.S. Cl. 224—220** **3 Claims**



1. A scissor retaining device for a pair of scissors having finger holes at one end and a point at the other end, said device comprising:

(a) a band of material;

(b) a wrist portion at one end of said band for disposing about the wrist of a person;

(c) a wrist securing means for securing said wrist portion of said band to the wrist of a person;

(d) a retaining strap portion extending substantially parallel from the opposite end of said band for disposing about the finger holes of a pair of scissors;

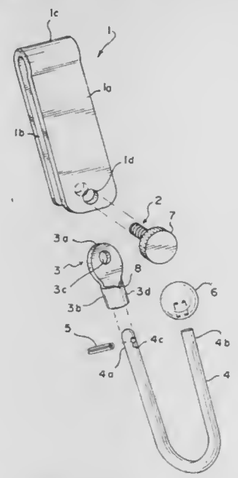
(e) a retaining strap securing means for securing said retaining strap portion to the finger holes of a pair of scissors;

(f) a first piece of triangular material and a second piece of triangular material of a similar shape, joined together to form a sheath for placement over the point of the scissors and secured to said wrist portion; and

(g) a sheath securing means for securing said sheath to said wrist portion.

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**5,743,451**
**TOOL BELT TOOL TOTE**
**Peter P. Kahn, P.O. Box 440, Montauk, N.Y. 11579**
**Filed Jan. 28, 1997, Ser. No. 790,252**
**Int. Cl.[6] A45F** *5/00*
**U.S. Cl. 224—268** **16 Claims**



1. A tool-belt tool tote device comprising:

a clip having a front face and a rear face, said front face and said rear face being perforated with matching apertures in register;

a hook having a first end and a second end, said first end having a bore therethrough;

a terminal swivel comprising a flat, rounded top portion and further comprising a hollow cylinder having a top end and being configured to receive said first end of said hook;

a clinch pin dimensioned to be received in and retained by said bore in said first end of said hook; and

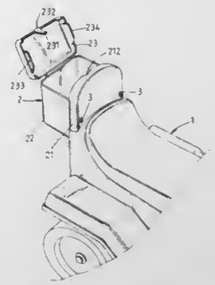
a fastening means for securing said terminal swivel to said clip.

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**5,743,452**
**STORAGE CASE MOUNTING STRUCTURE FOR BABY CARTS**
**Yu-Mean Liu, 2F., No. 34, Lane 200, Tung Hwa Street, Taipei, Taiwan**
**Filed Apr. 2, 1997, Ser. No. 831,969**
**Int. Cl.[6] B60R** *7/00*
**U.S. Cl. 224—275** **1 Claim**

1. A storage case mounting structure comprising an upright back frame raised from a rear side of a set of a baby cart, and a storage case fixedly fastened to said upright back frame to serve as a seat back, said storage case comprising a case body adapted for holding things and having a front side, a back side, two opposite lateral sides, a top opening, and an upright locating wall disposed on the inside behind said front side and defining a retaining hole, a hollow, bottom-open coupling block raised from the front side of said case body and sleeved onto said upright back frame of said baby cart and fixedly secured thereto by fastening means and having a back recess disposed above the front side of said case

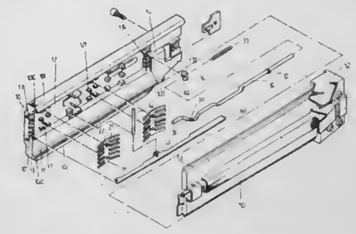




body, and a cover hinged to the back side of said case body and adapted to close said top opening, said cover comprising a back side hinged to the back side of said case body, to springy downward flanges extending from two opposite lateral sides thereof and adapted to be inserted into the top opening of said case body and forced into close contact with the to opposite lateral sides of said case body, a raised block raised from a front side thereof in the middle corresponding to the back recess of said coupling block, and a springy retainer rod extended from said raised block and adapted to be forced into engagement with the retaining hole of the upright locating wall of said case body when said cover is closed on said case body.

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**5,743,453**
**MAGAZINE FOR A STAPLE TACKER**
**Hung-Ming Chuang, Taichung, Taiwan, assignor to Newco Pneumatic Corp., Taichung, Taiwan**
**Filed Jan. 21, 1997, Ser. No. 785,772**
**Int. Cl.[6] B25C** *1/04*
**U.S. Cl. 227—109** **3 Claims**



1. A magazine for a staple tacker and comprising:

a base portion having a bottom with two side walls extending laterally from two opposite sides of the bottom, each of said side walls having a groove defined in an inner surface thereof, said bottom having a recessed area defined therein by a first end wall and a second end wall, said first end wall and said second end wall having a plurality of notches defined therein, a passage defined in said second end wall and communicating with said recessed area;

at least two resilient elements disposed on said recessed area and each of said resilient elements having a plurality of flexible ribs extending laterally from two opposite sides thereof;

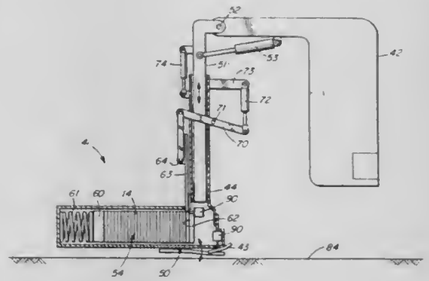
a plurality of positioning plates mounted between said notches of said first end wall and said second end wall, each of said positioning plates contacting said flexible ribs corresponding thereto and having a slot defined transversely therein for a pin to be movably extended therethrough;

a control member extending through said passage and having a receiving section and a pressing section which extends from said receiving section, said receiving portion extending inclinedly from an axis of said control member and said pressing section extending toward a direction opposite to that of said receiving section corresponding to said axis of said control member, and

a cover having two side flanges extending from two opposite sides thereof so as to be slidably received in said grooves of said base portion, said cover having an end cap disposed to an end thereof so as to push the control member extending from said second end of said base portion toward said first end of said base portion wherein said receiving section is moved to a position of said pin when said control member is pushed by said end cap such that said positioning plates are raised toward said cover by said flexible ribs of said resilient elements.

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**5,743,454**
**METHOD AND APPARATUS FOR INSTALLING STAKES IN NETTING FOR GROWING TURF**
**Macky Banns, Pitt Meadows, Canada, assignor to Highland Redi-Green Turf Farm Ltd., Pitt Meadows, Canada**
**Filed Jul. 21, 1995, Ser. No. 505,646**
**Int. Cl.[6] B25C** *5/02;5/06;* **F16B** *15/08*
**U.S. Cl. 227—120** **10 Claims**



1. Stake installer apparatus having a frame which is operable to be connected to a ground moving vehicle used to lay netting on a ground surface, said apparatus comprising a foot plate for contacting said ground surface and said netting, a magazine for holding a plurality of stakes, a slide for contacting one of said plurality of stakes and operatively installing said stake into said ground surface through said netting after said netting has been laid on said ground surface, the operation of said slide being initiated when said foot plate contacts said ground surface, said installer apparatus being rotatable on a frame such that said foot plate remains substantially stationary relative to said netting while said foot plate is in contact with said netting.

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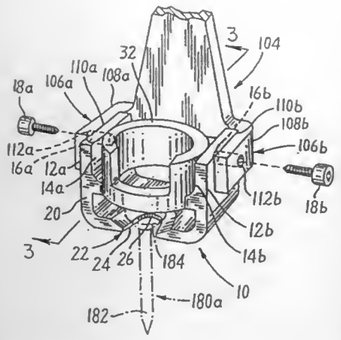
**5,743,455**
**ADAPTER FOR FASTENER DRIVING TOOL AND METHOD THEREOF**
**Brett Holliday, Turkhill Rd., Brewster, N.Y. 10509**
**Filed Jun. 21, 1996, Ser. No. 668,548**
**Int. Cl.[6] B25C** *7/00*
**U.S. Cl. 227—142** **13 Claims**

1. An adapter for a fastener driving tool for controlling depth penetration of fastening means fired from the fastener driving tool, comprising:

a lip portion adapted for attachment to a firing portion of the fastener driving tool, said lip portion extending downward from the firing portion and substantially across the width of said firing portion, said lip portion having front and back sides and a recess extending from the front side of the lip portion toward the back side of the lip portion, said recess being U-shaped to allow for a piercing portion of said fastening means to pass through the recess and having edges to allow

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for engagement of an engaging portion of said fastening means when said fastening means is fired from the fastener driving tool.

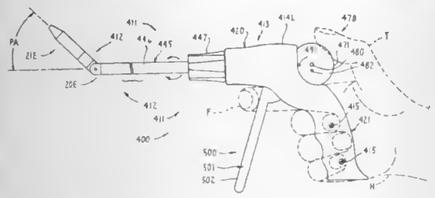
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**5,743,456**

## HAND ACTUABLE SURGICAL HANDPIECE

**Christopher Scott Jones, Palo Alto; Phillip R. Sommer, Newark, and Charles L. Nelson, Santa Clara, all of Calif., assignors to Stryker Corporation, Kalamazoo, Mich.**

**Continuation of Ser. No. 168,777, Dec. 16, 1993, abandoned.**
**This application Oct. 3, 1995, Ser. No. 538,748**
**Int. Cl.[6] A61B** *17/068*
**U.S. Cl. 227—176.1** **24 Claims**



1. A surgical handpiece comprising:
a handle unit;
means carried by said handle unit for engaging a patient;
a hand actuable element mounted on said handle unit for rotation relative to said handle unit about first and second mutually transverse axes;
first means operatively connected to said hand actuable element and responsive to rotation of said hand actuable element relative to said handle unit about said first axis for imparting first degree of freedom movement to said patient engaging means;
second means operatively connected to said hand actuable element and responsive to rotation of said hand actuable element relative to said handle unit about said second axis for imparting second degree of freedom movement to said patient engaging means.

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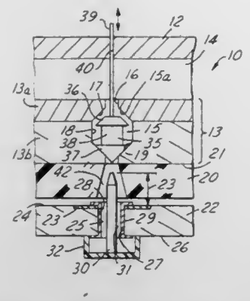
**5,743,457**

## CONTROLLED ZONE SOLDER DISPENSING

**Walter Benedette; Medhat Said, both of Dearborn, and Andrew Z. Glovatsky, Ypsilanti, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Apr. 1, 1996, Ser. No. 627,793**
**Int. Cl.[6] B23K** *3/06*
**U.S. Cl. 228—33** **18 Claims**

1. A solder dispensing apparatus for depositing fluid solder into and around a pin-in-through-hole joining zone of an electronic circuit board, comprising:



(a) a valve assembly defining a valve chamber with an inlet and an outlet, and having the valve member actuated by the pin of said pin-in-through-hole joining zone when said valve is positioned at said zone against said board, said valve member moving from a first position closing off fluid flow from said outlet to a second position permitting fluid flow through the outlet;
(b) means for measuring a predetermined body of fluid solder that is released from said chamber when said valve member is in said second position with the assembly positioned at said zone against said board; and
(c) means to contain the released fluid solder in a predetermined shape and in and around said pin-in-through-hole joining zone while said solder solidifies.

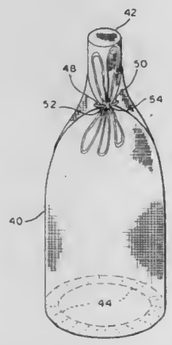
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**5,743,458**

## STRETCHABLE GIFT WRAP

**Judith A. French, 402 Lakeview Ave., Duluth, Minn. 55812**

**Filed Oct. 23, 1996, Ser. No. 735,555**
**Int. Cl.[6] B65D** *65/22*
**U.S. Cl. 229—87.03** **6 Claims**



1. Stretchable gift wrap, comprising:
a sleeve of finely woven, generally opaque elastic fabric material adapted to stretch to substantially twice its unstretched dimension in all directions,
said sleeve including a lower open end and a closed upper end having opposite first and second corners, said second corner being secured to said upper end to form a first trim attachment loop, and
a second trim attachment loop formed by folding and stretchably drawing said first corner of said upper end of said sleeve partially across said upper end thereof, with said first corner and said second corner being secured together.

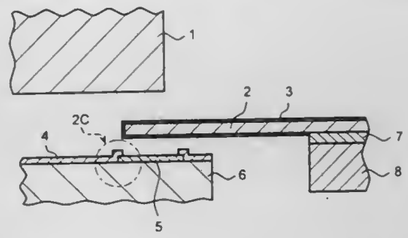


**5,743,459**

## METHOD FOR FABRICATING SEMICONDUCTOR DEVICE WITH STEP OF BONDING LEAD FRAME LEADS TO CHIP PADS

**Michitaka Urushima, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Oct. 16, 1995, Ser. No. 543,625**
**Claims priority, application Japan, Oct. 14, 1994, 6-276062**
**Int. Cl.[6] H01L** *21/60*
**U.S. Cl. 228—180.21** **3 Claims**



1. A method for bonding an inner lead to a pad of a semiconductor device using a bonding tool having a contacting surface; wherein
said inner lead includes a first portion for bonding to said pad, a second portion, and a metal plating; and
said semiconductor device includes a base film for operatively engaging said second portion, said base film being spaced laterally away and upwardly disposed from said pad, said method comprising the steps of:
forming said inner lead such that said first portion is at a level lower than said second portion;
roughening a surface of said inner lead which contacts said pad such that at least some of said metal plating is punctured;
placing said inner lead over said pad, said pad including a passivation film having edges formed over a peripheral portion of said pad;
placing said bonding tool such that said contacting surface is located inside at least one said edge of said passivation film, said contacting surface of said bonding tool being of a sufficient width to make the plastic deformation of said inner lead uniform; and
pressing said inner lead against said pad with said bonding tool such that said inner lead is substantially evenly bonded to said pad.

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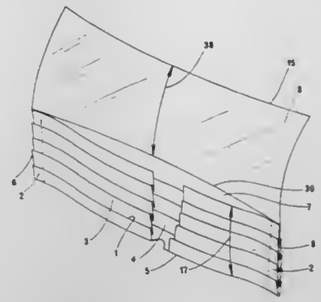
**5,743,460**

## PLEATED PAPER WRAPPER FOR ELONGATE OBJECTS

**Gilbert Capy, La Botte 69640, Jarnioux, France, and Akiva Buchberg, 5030 Pine Tree Dr., Miami Beach, Fla. 33140**

**PCT No. PCT/FR95/00157, § 371 Date Jul. 17, 1996, § 102(e) Date Jul. 17, 1996, PCT Pub. No. WO95/21778, PCT Pub. Date Aug. 17, 1995**
**PCT Filed Feb. 10, 1995, Ser. No. 676,197**
**Claims priority, application France, Feb. 11, 1994, 94 01785**
**Int. Cl.[6] B65D** *65/12*
**U.S. Cl. 229—87.03** **5 Claims**

1. A wrapper for an article to be wrapped made from a pleated, flexible, thin film, the wrapper comprising a base, a front, substantially rectangular face and rear substantially rectangular face each having a top having edges, and having opposed lateral sides and pleats on the faces, the pleats having opposed ends corresponding to the opposed sides and being secured at the ends, the wrapper forming a rectangular bag having an opening defined by the edges of the top of the faces, a flap having a free end made from a flat, thin film which extends from one of the edges of the rectangular faces, the base having a pleat, the faces being connected together by the pleat of the base which is parallel to the pleats on the faces, the lateral sides being secured together at the ends of the pleats and the rear face being extended, on the bag opening, by the flap whereby the article to be wrapped is wrapped by initially separating the opening by pulling the edges widely apart, partially unfolding the pleats of the faces so as to make the bag of a size which is sufficient for the article to be wrapped to be placed therein, placing the article to be wrapped in the bag, covering the article with the flap, wedging the free end of the flap between the article to be wrapped and the front face, and, finally, the sides of the wrapper corresponding to the ends of the pleats are pulled so as to partially re-form the pleats around the article and to lock the flap in its closed position.



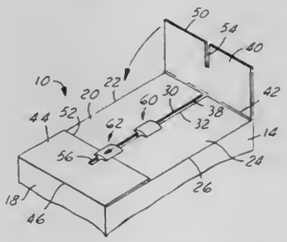
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**5,743,461**

## SHIPPING CONTAINER

**Lawrence J. Timmins, Riverview, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.**

**Filed Jan. 27, 1997, Ser. No. 791,442**
**Int. Cl.[6] B65D** *5/42*
**U.S. Cl. 229—125.39** **8 Claims**



1. A rectangular shipping container made of fibrous material comprising
a pair of laterally spaced-apart vertical side walls and laterally spaced-apart vertical end walls,
adjacent ones of said walls being connected to each other,
each wall having a lower edge,
first and second foldable bottom flaps hingedly connected to the lower edges of the respective side walls,
each of said first and second flaps having an unattached inner edge spaced from and parallel to the lower edge of the side wall to which it is connected,
said first and second flaps being folded inwardly of the container to horizontal positions in which the inner edges of said first and second flaps are closely spaced apart and define an elongated, open-ended channel, said first and second flaps forming a closed bottom for the container,
third and fourth foldable bottom flaps hingedly connected to the lower edges of the respective end walls,
each of said third and fourth flaps having an unattached inner edge spaced from and parallel to the lower edge of the end wall to which it is connected.

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said third and fourth flaps being folded inwardly of the container to horizontal positions underlying the first and second flaps in which the inner edges of the third and fourth flaps are widely spaced apart,

said third flap having a first slot extending from the inner edge thereof toward the lower edge of the end wall to which said third flap is connected,

said fourth flap having a second slot extending from the inner edge thereof toward the lower edge of the end wall to which said fourth flap is connected,

said slots underlying and extending parallel to said channel,

a first retainer slidably engaged in said channel and in said first slot and engaging said first, second and third flaps to hold them in their horizontal positions, and

a second retainer slidably engaged in said channel and in said second slot and engaging said first, second and fourth flaps to hold them in their horizontal positions,

said retainers being slidable in said channel toward one another far enough to withdraw from said slots and release said third and fourth flaps and then slidable out of said channel through either end thereof to release said first and second flaps.

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**5,743,462**

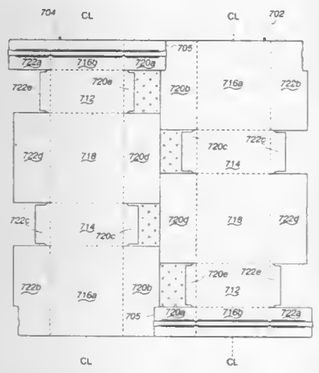
**NESTABLE BLANK FOR FORMING A SIDE-FILLED, FLIP-TOP RECLOSABLE CARTON**

**James L. Stone, Grand Rapids, Mich., assignor to Tenneco Packaging, Evanston, Ill.**

**Continuation-in-part of Ser. No. 501,996, Jul. 13, 1995, Pat. No. 5,505,374. This application Nov. 28, 1995, Ser. No. 563,609**

**Int. Cl.[6] B65D** *5/06*

**U.S. Cl. 229—227** **19 Claims**




1. A nested blank arrangement, comprising:

first and second unitary, continuous blanks each for forming a side-filled, flip-top reclosable carton having opposing top and bottom walls, opposing front and back walls, and opposing first and second side walls, each of said blanks including

at least five panels hingedly connected to each other along generally horizontal fold lines, each of said panels including opposing first and second vertical edges, said panels including inner and outer front panels for forming said front wall, a back panel for forming said back wall, a top panel for forming said top wall, and a bottom panel for forming said bottom wall, said inner front panel being connected to the bottom panel, said bottom panel being connected to said back panel, said back panel being connected to said top panel, and said top panel being connected to said outer front panel, and

first and second side closure flaps hingedly connected to each of said panels along said respective first and second vertical edges, said first and second side closure flaps cooperating to form said opposing first and second side walls of said carton; and

said first blank being vertically oriented in a first direction, said second blank being vertically oriented in a second direction opposite to said first direction, said first and second blanks being horizontally adjacent to each other, one or more of said first side closure flaps of said first blank horizontally nesting with and bordering on one or more of said first side closure flaps of said second blank such that a horizontal distance between said first vertical edges of said first blank and said first vertical edges of said second blank is less than twice a horizontal dimension of the first side closure flap having a largest horizontal dimension.

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**5,743,463**

**AUTOMATIC WATER COMBINATION FAUCET**

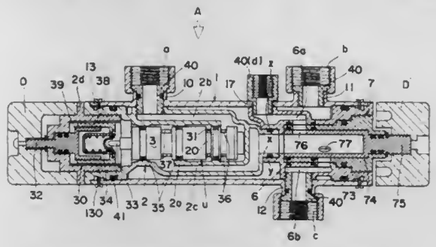
**Yuseki Ueno; Shigeru Iwai, and Katsumi Matsuzawa, all of Tokyo, Japan, assignors to NTC Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 502,145, Jul. 13, 1995, abandoned. This application Feb. 3, 1997, Ser. No. 792,399**

**Claims priority, application Japan, Dec. 21, 1994, 6-335823; Dec. 28, 1994, 6-338852; Feb. 15, 1995, 7-050545**

**Int. Cl.[6] G05D** *23/13*

**U.S. Cl. 236—12.2** **2 Claims**




1. An automatic water combination faucet comprising:

an outer hollow body (**1**) having a cold water inlet hole (**11**) to be connected to a cold water line, a hot water inlet hole to be connected to a hot water line, a mixed water outlet (**12**) to be connected to a mixed water line, and opposite open end portions (**1***a*, **1***b*);

a mixing valve unit (u) for mixing cold water and hot, water in a predetermined mixinq ratio;

an inner body (**2**) fitted in the outer hollow body (**1**), said inner body (**2**) having an inner chamber for receiving the mixing valve unit (u), a first pipe (**2***b*) having one end communicated with the hot water inlet hole (**10**) and the other end communicated with the inner chamber, and a second pipe (**2***c*, **2***e*) having one end communicated with one of the cold water inlet hole (**11**) or the mixed water outlet hole (**12**) and the other end communicated with the inner chamber;

an annular chamber formed between the outer hollow body (**1**) and the inner body (**2**), said annular chamber being communicated with the other of the cold water inlet hole (**11**) or the mixed water outlet hole (**12**);

said inner body (**2**) further having a communication hole (**20**, **26**) for communicating the annular chamber with the inner chamber, and a connecting portion fixed to one of the open end portions (**1***a*, **1***b*) of the outer hollow body (**1**) so that one side of the annular chamber is closed;

a lid member (**14**) fixed to the other of the open end portions (**1***a*, **1***b*) of the outer hollow body (**1**) for closing the other side of the annular chamber; and

an operating dial (D) fixed to the connecting portion of the inner body (**2**) for controlling the mixing ratio of the mixing valve unit (u);

further comprising an additional outlet hole (**17**) formed in the outer hollow body (**1**), a third pipe (**6***a*) for communicating the one end of the second pipe (**2***c*) with the additional outlet hole (**17**), a fourth pipe (**6***b*) for communicating the one end of the second pipe (**2***c*) with the mixed water outlet hole (**12**),



and a switching valve (**74**) for alternatively communicating one of the third pipe (**6***a*) and the fourth pipe (**6***b*) with the second pipe (**2***c*).

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**5,743,464**

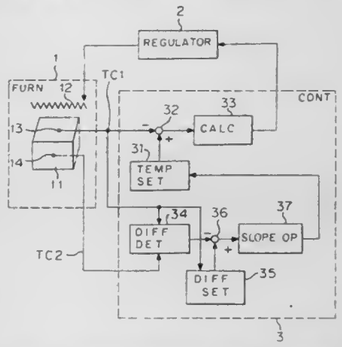
**SYSTEM FOR CONTROLLING WORK TEMPERATURE BY A PROGRAMMED CONTROLLER**

**Isamu Koyama, Tokyo, Japan, assignor to Ohkura Electric Co., Ltr., Tokyo, Japan**

**Filed Apr. 17, 1997, Ser. No. 843,898**

**Int. Cl.[6] F23N** *5/20*; **G05D** *15/00*

**U.S. Cl. 236—46 R** **4 Claims**




1. A system for controlling temperature of a work in furnace, comprising a controller controlling furnace temperature along at least a slope of temperature change with time; a port receiving quick-response temperature at a quickly-responding portion of the work; another port receiving slow-response temperature at a slowly-responding portion of the work; a detector determining work temperature-difference between said quick-response and slow-response temperatures; a setter setting a difference pattern along which said work temperature-difference is to vary with said quick-response temperature; a comparator comparing the work temperature-difference against said difference pattern at each received quick-response temperature; and a slope operator responsive to output from said comparator for modifying said slope so as to control the work temperature-difference in line with the difference pattern.

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**5,743,465**

**METHODS AND APPARATUS FOR EFFECTING WIRELESS CONTROL OF AN AIR CONDITONER**

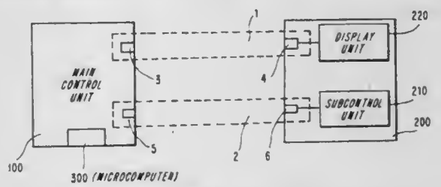
**Sang-Jin Jeong, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Aug. 16, 1996, Ser. No. 698,656**

**Claims priority, application Rep. of Korea, Aug. 22, 1995, 95-25963**

**Int. Cl.[6] G05D** *23/19*

**U.S. Cl. 236—51** **1 Claim**




1. A method of controlling an operation of a room air conditioner which includes a variable speed fan, the method comprising the steps of:

A) manually inputting into a sub-control means, desired operating conditions, including desired room temperature, desired room humidity and desired fan speed;

B) transmitting the desired operating conditions by wireless from a transmitter on the sub-control means to a receiver on a main control means;

C) causing the main control means to operate the air conditioner in accordance with the desired operating conditions;

D) determining actual operating conditions including actual room temperature, actual room humidity and actual fan speed;

E) transmitting the actual operating conditions by wireless from a transmitter on the main control means to a receiver on the sub-control means; and

F) displaying the actual room temperature, actual room humidity and actual fan speed on a display disposed on the sub-control means.

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**5,743,466**

**HEATING SYSTEM ESPECIALLY FOR MOTOR VEHICLES**

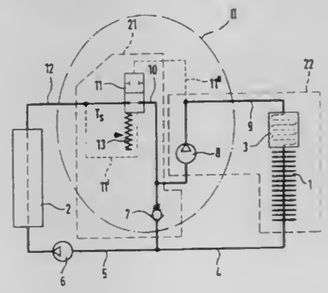
**Michael Humburg, Göppingen, Germany, assignor to J. Eberspächer GmbH & Co., Esslingen, Germany**

**Filed Nov. 30, 1995, Ser. No. 565,681**

**Claims priority, application Germany, Dec. 23, 1994, 44 46 152.6**

**Int. Cl.[6] B60H** *1/02*

**U.S. Cl. 237—12.3 B** **14 Claims**




1. A heating system for motor vehicles, comprising:

a heat exchanger providing a radiating function;

a fluidic heat carrier circuit, said heat exchanger being thermally coupled with said carrier circuit;

an internal combustion engine first heat source;

a second heat source in the form of a burner; and

valve switch over means for connecting the heat carrier medium of the fluidic heat carrier circuit for directing the carrier medium past each of said first heat source and said second heat source, in a first state, and passing said heat carrier medium of said fluidic heat carrier circuit essentially only past said second heat source in a second state, said valve switch over means including a valve arrangement having a thermal setting element which is thermally coupled to said heat carrier medium disposed adjacent to said first heat source for setting said first state of said valve arrangement or for switching over from said first state to said second state upon reaching a threshold value temperature of the heat carrier medium.

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**5,743,467**

## AUTOMOBILE HEATING SYSTEM

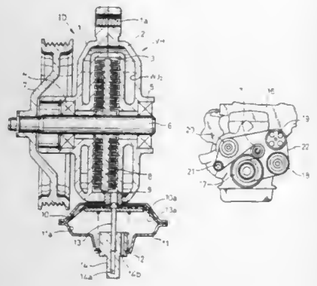
**Takashi Ban; Hidefumi Mori, and Kiyoshi Yagi, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan**

**Filed Nov. 12, 1996, Ser. No. 747,317**

**Claims priority, application Japan, Nov. 13, 1995, 7-294507**

**Int. Cl.[6] B60H** *1/02*

**U.S. Cl. 237—12.3 R** **11 Claims**



**1**. An automobile heating system to be used in combination with an engine comprising:

an engine housing provided with a main heat receiving chamber formed therein;

an auxiliary machine for the automobile, provided with a machine housing, and a drive shaft having a pulley mounted thereon to receive a drive power from said engine of the automobile, said auxiliary machine including at least one of an automotive idler, a power steering system of said automobile, and an automotive alternator;

a radiator for said engine;

a liquid conduit for permitting a heat exchanging liquid medium to flow through said engine housing and said radiator, said liquid conduit fluidly connecting said main heat receiving chamber of said engine housing to said radiator;

a thermostat provided in said liquid conduit to control opening and closing of said conduit;

a heater core for receiving heat from the liquid medium during circulation of said liquid medium through a medium passage passing through said main heat receiving chamber, said liquid conduit, the radiator and the heater core; and

wherein a separate auxiliary heat source is mounted on said engine housing and comprises:

a heater housing means defining therein a heat generating chamber containing therein a given amount of viscous fluid, and an auxiliary heat receiving chamber contiguous with said heat generating chamber and permitting said heat exchanging liquid medium to flow therethrough; and

a heater drive shaft rotatably supported on said heater housing means, and rotating so as to urge the viscous fluid contained in said heat generating chamber to generate heat to be supplied to said heat exchanging liquid medium flowing through said auxiliary heat receiving chamber, said auxiliary machine and said auxiliary heat source being integrally formed to have such a construction that said drive shaft of said auxiliary machine and said heater drive shaft are formed as a single common shaft.

**5,743,468**

## SPRAYING APPARATUS AND NOZZLE DEVICES

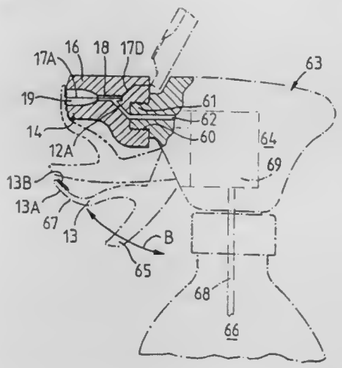
**Kevin O. Laidler, West Midlands, United Kingdom, assignor to Incro Limited, United Kingdom**

**Filed Oct. 3, 1996, Ser. No. 725,180**

**Claims priority, application United Kingdom, Apr. 6, 1995, 9507185; Feb. 28, 1996, 9605118**

**Int. Cl.[6] B05B** *15/02;1/00*

**U.S. Cl. 239—115** **13 Claims**




**11**. Spraying apparatus having a nozzle device (**10**) comprising a unitary-moulded plastic body comprising a lid and a base, each comprising a respective main web having an abutment surface to abut the abutment surface of the other main web and define therewith a nozzle opening open at the periphery of the body, a feed passage connecting said nozzle opening with a junction so that separation of said lid and base exposes said surfaces and the surface portions bounding said nozzle opening, feed passage and junction and a junction end of an inlet formed in the base, for wiping, wherein said surfaces and webs are shaped to provide sealing means and interengaging guide means both comprising complimentary shaped male and female formations which extend from said periphery to border said portions of said surfaces for determining the positions of said surface portions and effecting sealing around said surface portions, when the lid is held in abutment with the base by resilient retaining means.

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**5,743,469**

## DEVICE FOR CLEANING FLUE GASES IN FLUE GAS DESULPHURIZATION INSTALLATIONS BY SPRAYING A LIME SUSPENSION INTO THE FLUE GAS

**Bernhard Reintanz, Karlsbader Str. 10, D-34225 Baunatal, Germany**

**PCT No. PCT/DE93/00914, § 371 Date Jun. 6, 1995, § 102(e) Date Jun. 6, 1995, PCT Pub. No. WO94/15700, PCT Pub. Date Jul. 21, 1994**

**PCT Filed Sep. 24, 1993, Ser. No. 464,643**

**Claims priority, application Germany, Jan. 14, 1993, 43 00 751.1**

**Int. Cl.[6] B05B** *1/26*

**U.S. Cl. 239—518** **12 Claims**

**1**. Spraying device for cleaning flue gases of flue-gas desulphurization installations by spraying a lime milk suspension into the flue gas, comprising

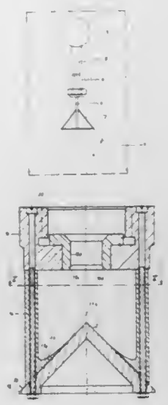
a feed tube for the lime milk suspension, having an outlet opening,

a conical jacket having a conical tip with a plane conical surface associated with the feed tube in the direction of flow of the suspension to be distributed,

the conical tip is aligned in the direction of the feed tube,

the conical tip of the conical jacket has a spacing from the outlet opening of the feed tube, and the spacing of the conical tip from the outlet opening is dimensioned such that the smaller





the diameter of the outlet opening, the smaller the spacing from the outlet opening which is selected; and

wherein the outlet opening of the feed tube has a tearing edge in the form of a conical frustum.

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**5,743,470**

## FUEL INJECTION VALVE FOR INTERNAL COMBUSTION ENGINES

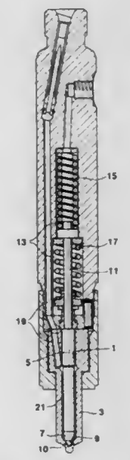
**Siegfried Schlaf, Weil Der Stadt/Merklingen, and Friedrich Boecking, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Dec. 19, 1996, Ser. No. 770,099**

**Claims priority, application Germany, Dec. 19, 1995, 195 47 423.6**

**Int. Cl.[6] F02M** *45/00;61/06*

**U.S. Cl. 239—533.4** **12 Claims**




**1**. A fuel injection valve for internal combustion engines, having a valve member (**5**), which is axially displaceable in a bore (**1**) of a valve body (**3**) and on an end toward the combustion chamber of the engine has a conical valve sealing face (**7**), with which the valve sealing face cooperates with a conical valve seat face (**9**) on the closed end of the bore (**1**) of the valve body (**3**) toward the combustion chamber, and between the cone angles of the valve sealing face (**7**) and the valve seat face (**9**) a seat angle difference is provided, by which an encompassing seat edge (**25**) is formed between the valve member (**5**) and the valve body (**3**), and having at least one injection port in the region of the valve seat phase (**9**) adjoining the seat edge (**25**) downstream thereof, the annular gap adjoining the seat edge (**25**) downstream thereof, between the valve seat face (**9**) and the valve sealing face (**7**) of the valve member (**5**), is enlarged by an encompassing radial recess (**27**) between the seat edge (**25**) and the inlet opening of the injection port (**10**).

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**5,743,471**

## SOLID STATE SHEAR EXTRUSION PULVERIZATION

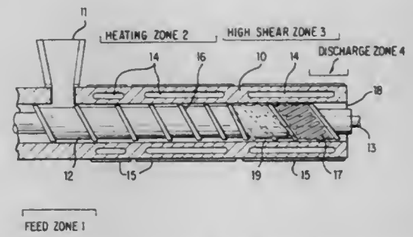
**George Ivanov, Chicago, Ill., assignor to Illinois Institute of Technology, Chicago, Ill.**

**Continuation-in-part of Ser. No. 101,468, Aug. 2, 1993, Pat. No. 5,415,354. This application May 15, 1995, Ser. No. 440,969**

**The portion of the term of this patent subsequent to Mar. 7, 2012, has been disclaimed.**

**Int. Cl.[6] B02C** *23/00;23/28;19/22*

**U.S. Cl. 241—16** **17 Claims**




**1**. An apparatus for solid state shear extrusion of a polymeric material comprising:

an elongated hollow barrel having a feed zone, a heating zone adjacent said feed zone, a powder formation zone adjacent said heating zone, and a powder discharge zone adjacent said powder formation zone;

at least one screw housed within said elongated hollow barrel;

feed means for feeding said polymeric material to said feed zone;

temperature adjustment means for heating said polymeric material to a temperature less than its decomposition temperature in said heating zone and for maintaining said polymeric material above its phase transition temperature and below its melting point in said powder formation zone; and

high shear friction means for applying normal and shear forces sufficient to form a powder in said powder forming zone.

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**5,743,472**

## MATERIAL REDUCTION APPARATUS

**Robert M. Williams, Jr., St. Louis, and Paul H. Becherer, Festus, both of Mo., assignors to Williams Patent Crusher & Pulverizer Company, St. Louis, Mo.**

**Filed Jan. 28, 1997, Ser. No. 790,075**

**Int. Cl.[6] B02C** *13/31*

**U.S. Cl. 241—32** **4 Claims**

**1**. Material shredding apparatus comprising:

a) a housing assembly with material inlet and shredded material outlet;

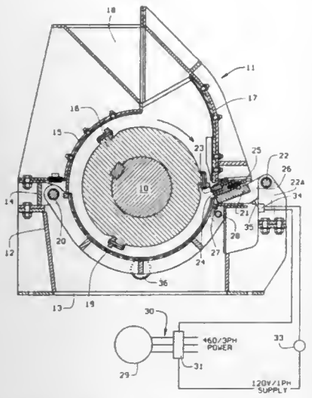
b) a shaft mounted rotor having material feed elements spaced around the periphery of said rotor;

c) material shredding cutter carried by a support arm having a pivot attachment to said housing adjacent said rotor;

d) shredded material screen pivotably mounted on said housing assembly to assume a position between said rotor and said shredded material outlet, said screen having a support element thereon in position to abut with said cutter carrier support arm;

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e) separate pivot means for said shredding cutter support arm and for said material screen, said separate pivot means being spaced apart for allowing said shredding cutter support arm and said material screen to independently separate from said shaft mounted rotor in said housing assembly; and

f) a shear pin in said housing assembly in position to releasably hold said material screen adjacent said rotor and said support element in abutment with said support arm and shear in response to a load to allow said material screen and said support arm to separate.

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**5,743,473**

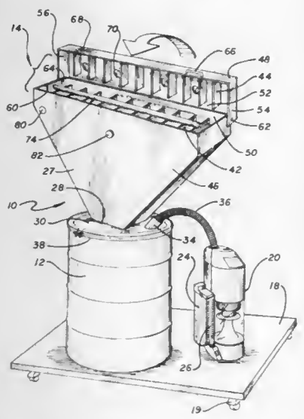
**APPARATUS FOR CRUSHING GLASSWARE**

**John Michael Gregg, 6545 Churchill Dr., Huntington Beach, Calif. 91648**

**Filed Dec. 5, 1996, Ser. No. 761,732**

**Int. Cl.[6] B02C** *19/14*

**U.S. Cl. 241—33** **10 Claims**



1. An apparatus for crushing a product which produces injurious substances upon crushing, comprising:

a housing for accommodating the product including a chamber for receiving the product;

means operable in said chamber for crushing the product comprising a plurality of blades in said chamber and a lid for said chamber containing a plurality of blades which are closeable onto product placed in said chamber, thereby crushing said product;

a flat funnel compartment depending from said chamber having a wide end on said chamber and a narrow end distal therefrom, the wide end being integral with the chamber;

a lid for a storage drum integral with the narrow end of said flat funnel and having an opening therethrough coterminous with the narrow end of said flat funnel; and

an opening in said drum lid through which a source of suction can be applied.

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**5,743,474**

**MACERATOR**

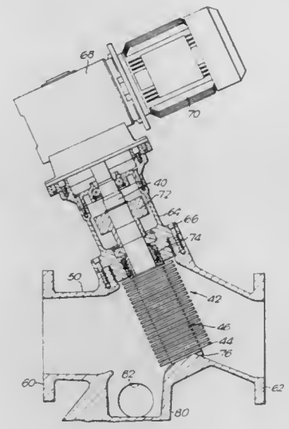
**Christopher Stevenson, Bredbury Park, United Kingdom, assignor to Mono Pumps Limited, United Kingdom**

**Filed Nov. 2, 1995, Ser. No. 556,757**

**Claims priority, application United Kingdom, Nov. 23, 1994, 9423623**

**Int. Cl.[6] B02C** *18/40*

**U.S. Cl. 241—46.06** **1 Claim**



1. A macerator comprising a macerating chamber, an inlet and an outlet to said chamber for the inflow of material to be macerated and the outflow of macerated material, respectively, side walls of said chamber, a macerator stack mounted in said chamber, said macerator stack comprising first and second parallel contra-rotating shafts extending through said chamber between said side walls, a plurality of alternate cutters and spacers of the same nominal axial thickness mounted on each of said first and second shafts, to form a stack, the cutters of the first shaft being interleaved with those of the second shaft, at least one tooth formed on each cutter, each tooth having a front cutting face, the portion of the macerator chamber between the inlet and the macerator stack forming an inlet chamber, said parallel shafts having axes included in a plane which is inclined at an angle to the horizontal, with the upper part of the plane nearer to the inlet than the lower part of the plane and a sump forming a lower part of said inlet chamber, said sump being at a location directly below the inclined macerator stack within the macerator chamber, effective to cause relatively heavy solid material to be caused to drop or be rejected by the cutters and drop into the sump, whereby it does not pass into the cutters with the remainder of the inflowing material.



**5,743,475**

**TUBULAR MILL FOR GRINDING NATURAL AND SYNTHETIC RAW MATERIALS IN PARTICULAR FOR THE CEMENT INDUSTRY**

**Paolo Catani, Bergamo, Italy, assignor to Italcementi S.p.A., Bergamo, Italy**

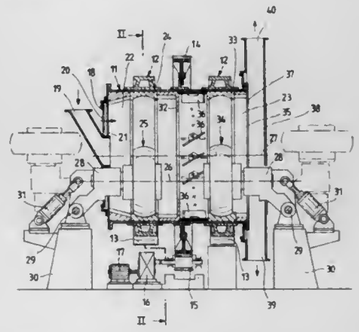
**PCT No. PCT/EP94/04311, § 371 Date Jun. 20, 1996, § 102(e) Date Jun. 20, 1996, PCT Pub. No. WO95/17967, PCT Pub. Date Jul. 6, 1995**

**PCT Filed Dec. 23, 1994, Ser. No. 663,115**

**Claims priority, application Italy, Dec. 27, 1993, MI93A2739**

**Int. Cl.[6] B02C** *17/10*

**U.S. Cl. 241—57** **15 Claims**



1. A tubular mill for grinding natural and synthetic raw materials, comprising:

a rotary cylindrical drum having a horizontal axis and at least two grinding chambers containing grinding elements in which at least one grinding chamber contains grinding elements comprising a roller which when in an operating position has an axis of rotation thereof essentially parallel to the axis of said drum and an independent first external pressure support which supports said roller, said roller being idle and, at least along one of its outer generating lines, engaging an annular grinding track rigid with the inner wall of said drum, wherein said external support comprises an extraction support movable by an actuator element for extraction of said roller, and a feed mouth having said drum provided at one end of said feed mouth for the material to be ground and said drum having a local aperture introducing one of ventilation air and ventilation gas, and a first duct provided at a second end of said drum for discharge of the ground material and a second duct withdrawing said one of said ventilation air and said ventilation gas, and

an adjusting mechanism provided between said two grinding chambers, said adjusting mechanism advancing the material which flows inside said drum.

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**5,743,476**

**CONCRETE CRUSHER**

**Sumio Morikawa; Toshiji Ohga, and Nobuyuki Zakohji, all of Osaka, Japan, assignors to Ohyodo Komatsu Co., Ltd., Osaka, Japan**

**Filed Jan. 22, 1997, Ser. No. 785,950**

**Claims priority, application Japan, Nov. 7, 1996, 8-295275**

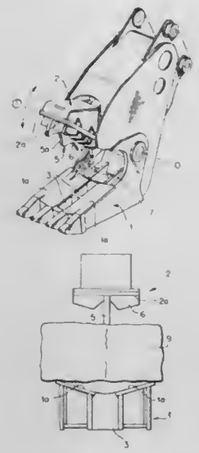
**Int. Cl.[6] B02C** *1/02*

**U.S. Cl. 241—101.73** **2 Claims**

1. In a concrete crusher comprising

a lower fixed jaw, and

an upper movable jaw connected by a pivot to the lower fixed jaw for upper jaw closing movement toward and upper jaw opening movement away from the lower fixed jaw, the lower fixed jaw having a crushing surface on which a concrete piece can be received,



the lower fixed jaw crushing surface having a waste passage opening located centrally therein,

the upper movable jaw carrying a main crushing blade disposed orthogonal to a jaw pivot axis, the waste passage extending orthogonal to said pivot axis so that the main crushing blade can enter the waste passage opening in a terminal part of main crushing blade closing movement, the improvement wherein

the lower fixed jaw crushing surface inclines downwardly from each of opposite crushing surface side margins to a crushing surface low point at said waste passage opening thereby defining a V-shaped crushing surface profile so that the concrete piece when received on said crushing surface locates symmetrically of a crushing surface centerline.

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**5,743,477**

**INSECTICIDAL PROTEINS AND METHOD FOR PLANT PROTECTION**

**Terence A. Walsh, Zionsville, Ind.; Robert A. Houtchens, Milford, Mass.; James A. Strickland, Midland, Mich.; Gregory L. Orr, Ashley, Mich., and Donald J. Merlo, Midland, Mich., assignors to DowElanco, Indianapolis, Ind.**

**Filed Aug. 27, 1992, Ser. No. 936,163**

**Int. Cl.[6] A01N** *63/00;* **C12N** *9/20*

**U.S. Cl. 424—94.6** **5 Claims**

1. A method of protecting a plant or a part thereof against insect infestation by one or more corn rootworms, potato beetles, armyworms, borers, cutworms, wireworms, earworms and aphids, comprising presenting to a loci wherein said insect(s) is to be controlled or combated an insect controlling amount of a naturally occurring plant non-specific lipid acyl hydrolase, said plant non-specific lipid acyl hydrolase having an amino acid sequence that includes the serine hydrolase active site motif Gly-Xxx-Ser-Xxx-Gly, said plant non-specific lipid acyl hydrolase being one that is inactivated by treatment with diisopropyl fluorophosphate, and said plant non-specific lipid acyl hydrolase being derived from a plant species other than that of the plant or plant part to be protected.

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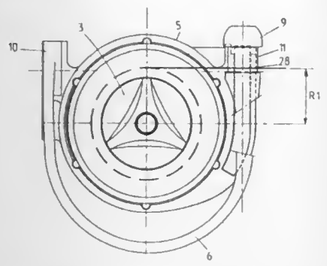


**5,743,478**

## FISHING REEL WITH ADAPTABLE LINE GUIDE ROLLER

**Alain Plestan, Marignier, France, assignor to Mitchell Sports, Paris, France**

**Filed Aug. 3, 1995, Ser. No. 509,762**
**Claims priority, application France, Aug. 12, 1994, 94 10126**
**Int. Cl.[6] A01K** *89/01*
**U.S. Cl. 242—231** **13 Claims**




1. A fishing reel comprising:

a spool having a line collecting portion positioned about an axial centerline for storing a predetermined maximum amount of wound fishing line spaced from the centerline by a predetermined maximum radial distance;

a line recovery device rotatably secured around the spool, the line recovery device including a bail arm movable between open and closed positions for paying out line from the spool and for wrapping line around the line collecting portion, respectively, and

a line guide roller mounted around a portion of the bail arm, the line guide roller being substantially cylindrical and having first and second tapered portions extending from first and second ends thereof and converging with one another at a central part of smaller diameter than the first and second ends, the line guide roller having a length of between one-half and one-quarter of the predetermined maximum radial distance.

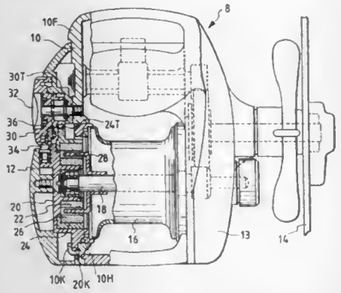
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**5,743,479**

## DUAL BEARING FISHING REEL HAVING A SIDE PLATE COVERING A PORTION OF A SIDE OF THE REEL BODY

**Takeo Miyazaki; Toshiro Ono, both of Tokyo, and Shinichi Asano, Chiba, all of Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan**

**Filed Jul. 18, 1996, Ser. No. 683,308**
**Claims priority, application Japan, Aug. 2, 1995, 7-216727**
**Int. Cl.[6] A01K** *89/015*
**U.S. Cl. 242—312** **5 Claims**




1. A dual bearing fishing reel comprising:

(a) a reel body defining a first side, a second side opposite the first side, and a front side extending between the first side and the second side, said reel body further defining a front portion, which includes the front side and a front section of each of the first side and the second side, and a remaining portion, which is disposed behind the front portion of said reel body, said reel body comprising:

a frame having an opening in the remaining portion on the first side of said reel body;

a first side plate detachably mounted to said frame on the first side of said reel body; and

a second side plate mounted to said frame on the second side of the reel body; and

(b) a handle mounted adjacent to said second side plate on the second side of said reel body;

(c) a spool detachably mounted in the remaining portion of said reel body; and

(d) a support rotatably supporting said spool and mounted between said first side plate and said second side plate;

wherein the opening in said frame is sufficiently large to receive said spool in an operation for removing said spool from or inserting said spool into said reel body;

wherein said frame extends at least partially across the front side of said reel body, extends completely across the front section of the first side of said reel body, and extends completely across an edge extending between the front side and the front section of the first side of said reel body;

wherein said first side plate, when mounted to said frame, extends completely across the first side in the remaining portion of said reel body, thereby completely covering the opening in said frame; and

wherein an outer perimeter of said frame in the remaining portion on the first side of said reel body substantially coincides with an outer perimeter of said first side plate in the remaining portion on the first side of said reel body.

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**5,743,480**

## SAFETY BELT ARRANGEMENT IN MOTOR VEHICLES HAVING A BELT TENSIONER

**Robert Kopetzky, Lonsee; Robert Wittmann, Neu-Ulm; Georg Bannert, Ummendorf; Martin Wifling, Blaustein; Thomas Kempfle, Bibertal-Schneckenhofen; Ulrich Diepold, Ulm; Andreas Wengert, Mutlangen, and Christian Husung, Heuchlingen, all of Germany, assignors to Takata (Europe) Vehicle Safety Technology GmbH, Germany**

**Filed Jan. 31, 1996, Ser. No. 594,579**
**Claims priority, application Germany, Feb. 1, 1995, 195 03 150.4**
**Int. Cl.[6] B60R** *22/46*
**U.S. Cl. 242—374** **17 Claims**

1. A safety belt arrangement in motor vehicles having a belt tensioner comprising:

a holder to be secured to the vehicle chassis, with a belt winding reel with a safety belt wound thereon being rotatably mounted on the holder;

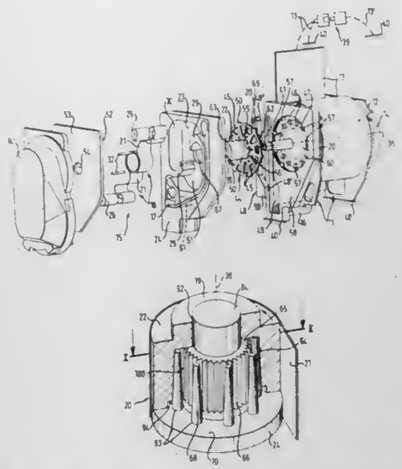
a belt retraction spring arrangement by means of which the safety belt is continuously lightly pretensioned in the drawing direction so that it only loosely lies against the vehicle occupant secured by it;

a fixing arrangement, in particular between the belt winding reel and the holder on the vehicle chassis, which, on suddenly pulling on the belt and/or with an accident-dependent acceleration, blocks the safety belt against being pulled out;

an auxiliary drive connected via a clutch to the belt winding reel, the auxiliary drive being normally separated drivewise by the disengaged clutch from the belt winding reel, but being activated abruptly with an accident-dependent acceleration and being rotationally fixedly coupled to the belt winding reel via the then engaged clutch in order to reel up the safety belt by a length such that the safety belt lies tightly against the vehicle occupant before the vehicle occupant secured by it falls into the safety belt;

with the auxiliary drive having:





a pressure source, in particular a pyrotechnical pressure source, which can be triggered or ignited with an accident-dependent response of an acceleration sensor and which, on being triggered, abruptly builds up a high pressure in a pressure space;

a torque generating device acted on by the pressure in the pressure space; and

a drive shaft or a drive reel connected to the torque generating device which is rotationally fixed connected to the belt winding reel via the clutch,

wherein the torque generating device has at least one flexible draw band, in particular consisting of spring steel, which is secured at the one end, at a first mounting point, to the circumference of the drive shaft, or to a drive reel concentrically mounted thereon, and is partially wound onto the drive shaft or onto the drive reel, and is secured at the other end, at a second mounting point, to the peripheral wall of a band running chamber disposed within a housing and arranged around the drive shaft or the drive reel with the housing including an end wall portion adjacent the belt reel,

wherein the band running chamber has a width corresponding to the width of the draw band, in such a way that the draw band, which divides the band running chamber into two partial spaces sealed off from one another, extends through the band running chamber,

wherein the partial space, which brings about an unwinding of the draw band from the rotating shaft or drive reel when subjected to pressure, is connected to the pressure space and the other partial space is vented, and

wherein, for the decoupling of the partial spaces pressure-wise, at least one sealing wall is provided between the housing and the periphery of the drive shaft or of the drive reel concentrically mounted thereon, or the flexible draw band wound thereon,

the drive shaft, or the drive reel, containing a hollow coupling space, the peripheral wall of which is formed as a rotary engagement surface and in which a rotary clutch member rotationally fixedly connected to the belt winding reel is concentrically arranged, with its peripheral wall being formed as a clutch engagement surface; and

an intermediate space between the rotary engagement surface and the clutch engagement surface in which coupling elements which are normally out of engagement with the clutch engagement surface are arranged which produce a rotationally fixed coupling engagement between the rotary engagement surface and the clutch engagement surface when the drive shaft or the drive reel starts a rotary process in the event of triggering of the pressure source,

wherein the coupling elements are coupling pins which are radially movably held, which extend axially into the intermediate space and which stand at least approximately in contact with the rotary engagement surface and also move radially inwardly against the clutch engagement surface on the start of their rotation in the case of a triggering of the pressure source and are clamped or latched between the rotary engagement surface and the clutch engagement surface in such a way that a rotationally fixed coupling engagement is present between the rotary engagement surface and the clutch engagement surface, and

the coupling pins are releasable relative to their holder with a predetermined loading during a triggering, and in particular are designed to be sheared off, and the coupling pins are initially releasably mounted in the end region axially remote from the housing end wall portion in mounting recesses of a centering ring which is rotationally fixedly connected to the drive shaft, or to the drive reel, and are axially subsequently in peripheral engagement with fixed abutment surfaces of the housing in such a way that, on the start of rotation of the drive shaft, or of the drive reel, and on co-movement of the coupling pins caused thereby, the mounting of the coupling pins at the centering ring is released and the coupling pins come into an angular position relative to the centering ring where they are displaced radially inwardly towards the clutch engagement surface.

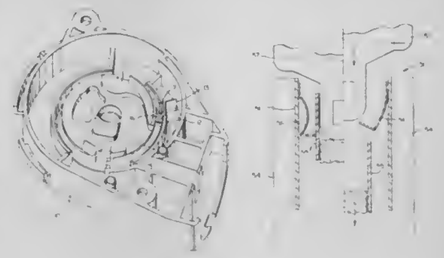
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**5,743,481**

## SAFETY DEVICE IN CONJUCTION WITH A TENSIONING MECHANISM OF A SAFETY BELT SYSTEM, INCLUDING AUDIBLE ACTUATION INDICATION

**Matthias Bäker, Hamburg, Germany, assignor to Autoliv Development AB, Vargarda, Sweden**

**Division of Ser. No. 497,075, Jun. 30, 1995, Pat. No. 5,660,347. This application Feb. 7, 1997, Ser. No. 796,322**
**Claims priority, application Germany, Jun. 30, 1994, 44 22 665.9; Jan. 10, 1995, 195 00 506.6**
**Int. Cl.[6] B60R** *22/18;22/46;* **B60Q** *5/00;* **G08B** *3/02*
**U.S. Cl. 242—374** **7 Claims**



1. A safety alarm device for a vehicle safety belt system comprising:

a tensioning mechanism for tensioning the safety belt in an emergency situation of the vehicle;

said safety belt system including a functional component which is moved during a normal use of the safety belt system,

signal means for indicating actuation of said tensioning mechanism, said signal means, after said actuation, extending into a path of movement of the functional component of said safety device so that upon subsequent operation of said safety belt system, said signal means generates an audible signal.

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**5,743,482**

## PHOTO FILM WINDING METHOD AND APPARATUS

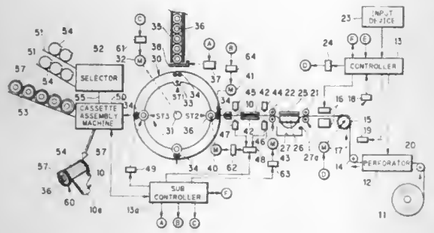
**Chiaki Suzuki; Takeshi Kanaoka; Takayuki Kambara, and Susumu Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Jun. 21, 1996, Ser. No. 667,469**

**Claims priority, application Japan, Jun. 23, 1995, 7-157483; Dec. 25, 1995, 7-337413**

**Int. Cl.[6] B65H** *19/26*

**U.S. Cl. 242—533.4** **16 Claims**




**1**. A photo filmstrip winding method of winding a photo filmstrip about a spool, said photo filmstrip being different in a length from a front end to a rear end according to a strip type, said method comprising steps of:

(A) retaining said front end on said spool;

(B) winding said photo filmstrip about said spool at high speed by rotating said spool fast;

(C) after said step (B), winding said photo filmstrip about said spool at low speed by rotating said spool slowly;

(D) during said step (C), detecting said rear end at a first sensor, said first sensor being disposed a first distance away from said spool rotated in said step (C); and

(E) stopping said spool from rotating upon detecting said rear end in said step (D), to regularize a length of an unwound portion of said photo filmstrip irrespective of said length of said photo filmstrip,

wherein said step (B) is effected for a predetermined time irrespective of said strip type, and said predetermined time is enough to wind said photo filmstrip until said rear end of said photo filmstrip of a strip type of a shortest length comes to said first sensor.

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**5,743,483**

## ANTI-VIBRATION SYSTEM FOR HIGH SPEED WINDING OF SHEET MATERIAL AND METHOD THEREFOR

**Philip G. Scherer, Fort Lauderdale, and Werner K. Diehl, Parkland, both of Fla., assignors to Illinois Tool Works Inc., Glenview, Ill.**

**Filed Mar. 27, 1997, Ser. No. 825,268**

**Int. Cl.[6] B65H** *18/16;18/26*

**U.S. Cl. 242—533.6** **8 Claims**

**1**. A system for controlling vibration of an axially rotatable mandrel useable for winding sheet material thereabout, the system comprising:

a first roller member rotatably contactable with at least one of the mandrel and sheet material wound about the mandrel, the first roller member movable away from the mandrel to accommodate increasing amounts of sheet material wound about the mandrel;

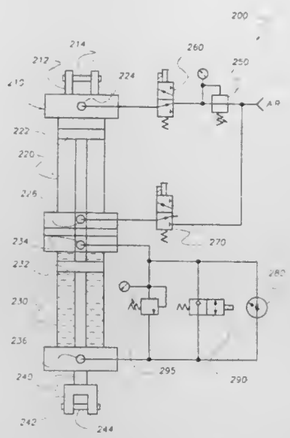
a second roller member rotatably contactable with at least one of the mandrel and sheet material wound about the mandrel, the second roller member movable away from the mandrel to accommodate increasing amounts of sheet material wound about the mandrel;

a third roller member rotatably contactable with at least one of the mandrel and sheet material wound about the mandrel, the third roller member movable away from the mandrel to accommodate increasing amounts of sheet material wound about the mandrel;

the first roller member, the second roller member and the third roller member arranged about the mandrel axis so that the mandrel and any sheet material wound about the mandrel is supportably captured therebetween;

the first roller member biasable toward the mandrel with pneumatic pressure from a first air over oil cylinder, the first roller member movable away from the mandrel against hydraulic resistance from the first air over oil cylinder, the second roller member biasable toward the mandrel with pneumatic pressure from a second air over oil cylinder, and the second roller member movable away from the mandrel against hydraulic resistance from the second air over oil cylinder,

whereby the first roller member, the second roller member and the third roller member at least substantially reduce vibration of the rotatable mandrel.



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**5,743,484**

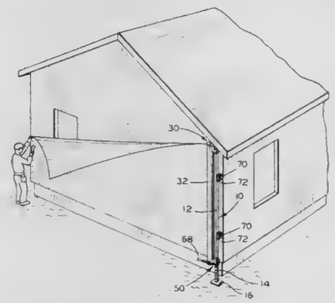
## BUILDING WRAP DISPENSER AND METHOD OF USE

**Jeffrey W. Baskett, Seattle, Wash., assignor to K2, Inc., Adrian, Mich.**

**Filed Apr. 21, 1997, Ser. No. 845,128**

**Int. Cl.[6] B65H** *16/06;75/18*

**U.S. Cl. 242—557** **10 Claims**



**1**. A device for supporting a supply roll of sheet material in an axial vertical position and for dispensing the sheet material to apply the same to the vertical surfaces of a building comprising:

a vertically extending columnar member having a ground engaging base;

a lower spindle releasably secured to said columnar member for rotatingly supporting the lower end of the roll of sheet material to enable the sheet material to be dispensed therefrom;

an upper spindle secured to said columnar member in spaced apart relation in respect of said lower spindle for rotatingly supporting the upper end of the roll of sheet material

means for metering the rotation of at least one of said lower or upper spindle to control the dispensing of the sheet material from the supply roll; and

bracket members extending laterally from said columnar member and having apertures formed therein for receiving fasteners for releasably securing said columnar member to a vertical surface of a building to which the sheet material is to be applied.



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**5,743,485**

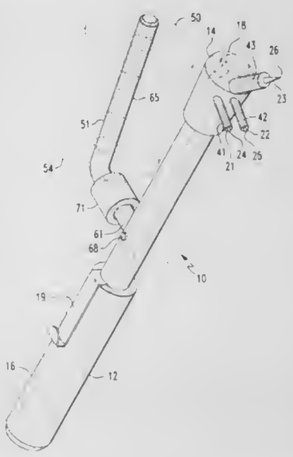
## WALL SURFACE-ATTACHABLE TOOL FOR HANDS-FREE SUPPORT OF ROLL OF WALLPAPER BORDER

**James E. Martorelli, Palm Bay, and Thomas E. Sepanik, Indialantic, both of Fla., assignors to Jim's Wallpaper and Painting, Palm Bay, Fla.**

**Filed Aug. 21, 1996, Ser. No. 701,251**

**Int. Cl.[6] B65H** *16/02*

**U.S. Cl. 242—597.7** **17 Claims**



**1**. A tool for retaining a roll of web material relative to a generally vertical surface comprising:

a generally elongate body member having a handle end portion and a distal end portion;

a plurality of elements affixed to said distal end portion of said generally elongate body member, said elements being configured to pierce said vertical surface and cause said handle end portion of said generally elongate body member to be urged away from said generally vertical surface, such that said generally elongate body member is self-attached to said generally vertical surface by said plurality of elements piercing said vertical surface and said handle end portion of said generally elongate body member being urged away from said generally vertical surface; and

a shaft member supported on said generally elongate body member in spaced apart relation to said generally elongate body member, said shaft member adapted to receive said roll of web material, so that with said generally elongate body member being self-attached to said generally vertical surface, said roll of web material will be retained thereby in spaced apart relation to said vertical surface.

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**5,743,486**

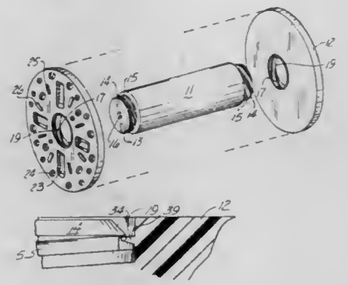
## KNOCKDOWN REEL

**Leonard C. Bulman, Postville, Iowa, assignor to Reel-Core, Inc., Waukon, Iowa**

**Filed Dec. 12, 1996, Ser. No. 764,779**

**Int. Cl.[6] B65H** *75/14;75/22*

**U.S. Cl. 242—608.5** **2 Claims**



**1**. A snap-fit reel assembly comprising:

a core having threaded ends, each end being provided with a first resilient tapered annular locking ring disposed on an outboard end of each threaded end; and

a pair of flanges wherein each flange is adapted to be removably connected to one of the threaded ends of the core, each flange including a threaded opening and a second resilient tapered annular ring spaced from one face of each flange, whereby fully threadable engagement of the core and the flanges results in a snap lock fit between the first and second locking rings.

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**5,743,487**

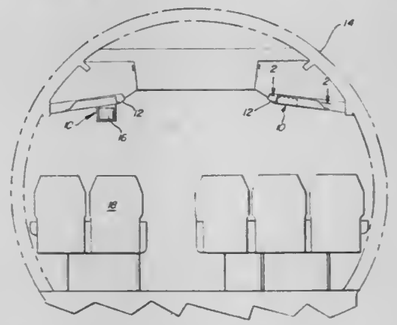
## AIRCRAFT VIDEO MONITOR DEPLOYMENT AND RETRACTION APPARATUS

**Mark X. Rice, Buena Park, Calif., assignor to Hollingsead International, Inc., Santa Fe Springs, Calif.**

**Filed Apr. 12, 1996, Ser. No. 631,102**

**Int. Cl.[6] A47B** *46/00;* **B64D** *11/00*

**U.S. Cl. 244—1 R** **17 Claims**



**1**. In a video monitor deployment and retraction apparatus for use in an aircraft overhead storage compartment, the combination comprising:

a) a monitor frame adapted to be mounted in the compartment;

b) a monitor-drive shaft rotatably mounted in the frame;

c) a monitor movable between a stored position and a deployed position;

d) a first coupling mechanism for connecting the monitor to the monitor-drive shaft, when enabled, to cause the monitor to rotate with the shaft while allowing the monitor to move

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through a predetermined angle in either direction relative to the shaft in response to an external force applied to the monitor;

e) an electric motor;

f) a second coupling mechanism for coupling the motor to the monitor-drive shaft, when enabled, whereby the motor, when energized, rotates the monitor-drive shaft and monitor to the deployed position;

g) a first position sensor for sensing when the monitor is in the deployed position;

h) means responsive to the first position sensor for deenergizing the motor;

i) a spring coupled to the monitor-drive shaft for biasing the shaft in a direction to return the monitor to the stored position when the second coupling mechanism is disabled;

j) a second position sensor comprising a bump sensor for sensing when the monitor has moved through said predetermined angle relative to the monitor-drive shaft; and

k) means responsive to the bump sensor for disabling the second coupling meehanism.

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**5,743,488**

**AERODYNAMIC LOW DRAG STRUCTURE**

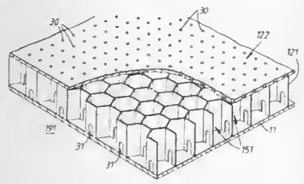
**Stephen C. Rolston, Bristol, United Kingdom, and Edward M. Ashford, Craigavon, Northern Ireland, assignors to Short Brothers PLC, Belfast, Northern Ireland**

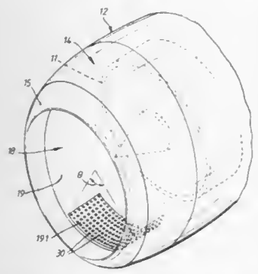
**Filed Dec. 5, 1995, Ser. No. 567,222**

**Claims priority, application United Kingdom, Dec. 5, 1995, 9424495**

**Int. Cl.[6] B64D *33/02***

**U.S. Cl. 244—53 B** **21 Claims**





1. An aeroengine nacelle structure including an intake duct, comprising

a lipskin defining an intake throat leading into the intake duct and including a noise attenuation panel having a facing component part with a front face which forms a boundary surface of the intake duct and which is subjected to fluid flow over it in a boundary layer adjacent the boundary surface, the facing component part of the noise attenuation panel having a plurality of flow apertures which extend through the facing component part at a downstream region of the attenuation panel and at an upstream region of the attenuation panel, the noise attenuation panel further having a cellular component part adjoining a rear face of the facing component part, the cellular component part having fluid communication path means for withdrawing gaseous fluid from a high pressure region of the boundary layer through the apertures at the downstream region of the attenuation panel, conveying within the cellular component part and discharging through the apertures at the upstream region of the attenuation panel into a low pressure region of the boundary layer to control boundary layer separation of the boundary layer from the boundary surface of the attenuation panel arising from shockwave induced pressure gradients in the boundary layer.

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**5,743,489**

**AIRCRAFT WITH TWO ALTERNATINGLY OPERATED PROPELLERS OF DIFFERENT RADIUS**

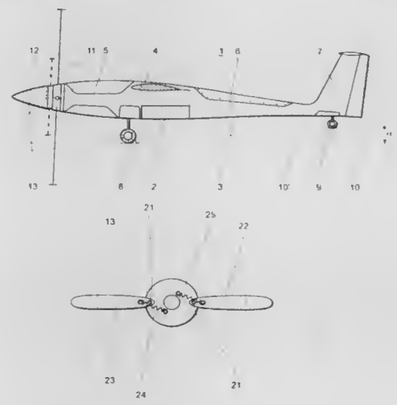
**Reiner Stemme, Berlin, Germany, assignor to Stemme GmbH & Co. KG, Berlin, Germany**

**Filed Jun. 5, 1995, Ser. No. 469,004**

**Claims priority, application Germany, Jun. 6, 1994, 44 20 219.9**

**Int. Cl.[6] B64C *39/00***

**U.S. Cl. 244—62** **14 Claims**



1. In an aircraft having at least one drive motor coupled to first and second propellers for forward thrust of the aircraft, the improvement wherein:

the first propeller is dimensioned for takeoff and landing conditions and for flight conditions below a predetermined first flight altitude and includes blades that are foldable or collapsible so that their maximum extension, starting from their rotary axis, is smaller in a resting position than their corresponding maximum extension in an operating position; and the second propeller has a radius which is larger than a radius of the first propeller and is dimensioned for a second flight altitude which is substantially greater than the first flight altitude; and further including means for alternatingly coupling the two propellers with the at least one drive motor so that the two propellers are respectively individually adapted to the power of the at least one drive motor for a full utilization of the power of the at least one drive motor for forward thrust.

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**5,743,490**

**FLAP/SLAT ACTUATION SYSTEM FOR AN AIRCRAFT**

**Gary D. Gillingham, Cherry Valley, and Gary L. Miles, Stillman Valley, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.**

**Filed Feb. 16, 1996, Ser. No. 602,190**

**Int. Cl.[6] B64C *13/26***

**U.S. Cl. 244—75 R** **7 Claims**

1. In an aircraft having right and left wings extending in opposite directions from a centerline of said aircraft, each of said wings including a flight control panel thereof movable to its respective wing, an actuation system comprising:

a) a right wing control panel actuator having a rotatable input for receiving a driving torque;

said right control panel actuator being operably connected between said right wing and said flight control panel of said right wing for moving said right control panel relative to said right wing when said driving torque is applied to said rotatable input of said right control panel actuator;

b) a left wing control panel actuator having a rotatable input for receiving a driving torque;

said left control panel actuator being operably connected between said left wing and said flight control panel of said left wing for moving said left control panel relative to said left wing when said driving torque is applied to said rotatable input of said left control panel actuator;

c) power drive means operably connected between said rotatable inputs of said right and left control panel actuators for providing driving torque simultaneously to said inputs of said actuators for symmetrically positioning said right and left control panels relative to said right and left wings respectively;

said power drive means including a power drive unit having a first output operably connected by a right driveline portion of said power drive means to said right control panel actuator, and further having a second output operably connected by a left driveline portion of said power drive means to said left control panel actuator;

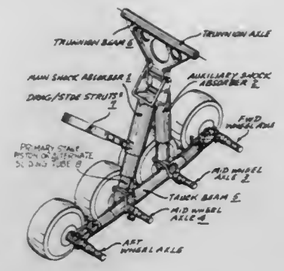
said right driveline portion of said power drive means including a selectively engagable right asymmetry brake disposed between said power drive unit and said right control panel actuator for stopping rotation of said right driveline when said right asymmetry brake is engaged;

said left driveline portion of said power drive means including a selectively engagable left asymmetry brake disposed between said power drive unit and said left control panel actuator for stopping rotation of said left driveline when said left asymmetry brake is engaged; and

d) control means operably connected between said control surfaces and said asymmetry brakes for sensing an asymmetry between the positions of the right and left control panels relative to their respective right and left wings, and for engaging said asymmetry brakes when said asymmetry between the positions of the right and left control surfaces exceeds a predetermined maximum allowable value.








a semi-articulating secondary single stage shock absorber;

said primary two-stage shock absorber and said semi-articulating secondary single stage shock absorber mounted utilizing the second and third axles of said four axle eight wheel truck beam as a pivot joint.

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**5,743,492**

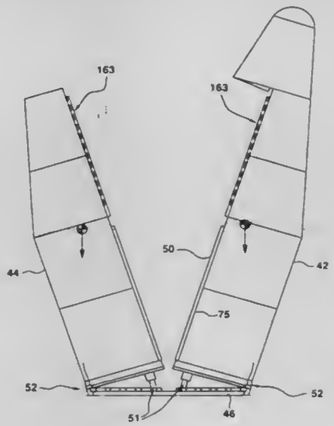
**PAYLOAD HOUSING AND ASSEMBLY JOINT FOR A LAUNCH VEHICLE**

**Allan L. Chan, Pleasanton; Robert M. Heath, Sunnyvale; Steven D. Mettler, Santa Clara; Chau N. Pham, Milpitas; Douglas B. Pereyda, Los Gatos; Robert J. MacDonald; Kenneth W. Epstein, both of San Jose, and David P. Kennon, Saratoga, all of Calif., assignors to Lockheed Martin Corporation, Bethesda, Md.**

**Continuation-in-part of Ser. No. 198,818, Feb. 18, 1994, Pat. No. 5,529,264. This application Aug. 4, 1995, Ser. No. 511,170**

**Int. Cl.[6] B64G *1/22*; B64F *1/04***

**U.S. Cl. 244—118.2** **19 Claims**




1. A shroud for a launch vehicle comprising:

a first shell section;

a second shell section connected to the first shell section to form a housing having a closed upper end and an open lower end and defining a payload cavity;

a base ring on which the first and second shell sections are mounted;

a pair of longitudinally extending explosive seam means extending upwardly in a longitudinal plane between the first and second shell sections from the base ring along opposite sides of the housing for connecting the first and second shell sections;

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**5,743,491**

**VERY LARGE AIRCRAFT LANDING GEAR HAVING EIGHT WHEEL TRUCK**

**Michael J. Meneghetti, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed Dec. 8, 1994, Ser. No. 352,337**

**Int. Cl.[6] B64C *25/22*; *25/34*; *25/58***

**U.S. Cl. 244—104 FP** **1 Claim**

1. An eight wheel truck assembly comprising a four axle eight wheel truck beam, said eight wheel track assembly further comprising:

a primary two-stage shock absorber; and,

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a peripheral explosive seam extending along the periphery of the housing between the base ring and the shell sections in a plane perpendicular to the longitudinal plane;

hinge means for pivotally securing the shell base ring; and

spring means for exerting an outward force on the shell sections for pivotal movement of the shell sections relative to the base ring.

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**5,743,493**

**BOUNDARY LAYER CONTROL IN AERODYNAMIC LOW DRAG STRUCTURES**

**John A. I. McCaughan, Belfast, Northern Ireland, assignor to Short Brothers PLC, Belfast, Northern Ireland**

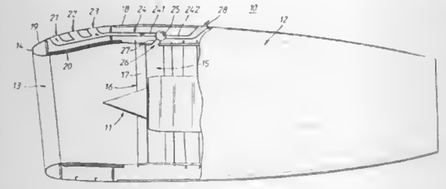
**PCT No. PCT/GB95/00045, § 371 Date Oct. 31, 1995, § 102(e) Date Oct. 31, 1995, PCT Pub. No. WO95/19290, PCT Pub. Date Jul. 20, 1995**

**PCT Filed Jan. 11, 1995, Ser. No. 522,284**

**Claims priority, application United Kingdom, Jan. 13, 1994, 9400555**

**Int. Cl.[6] B64C** *1/38*

**U.S. Cl. 244—130** **8 Claims**



1. An aerodynamic low drag structure which has a skin and which in movement of the structure relative to a surrounding gaseous fluid medium produces at a flow control region of the skin laminar flow of the gaseous fluid in a boundary layer adjacent the skin, characterised by the provision of a first inlet opening in the skin in the flow control region, first gaseous fluid conveying means within the structure by which fluid withdrawn from the boundary layer into the first inlet opening is conveyed along a first fluid flow path within the structure for discharge from the structure at a discharge opening downstream of the first inlet opening, a second inlet opening in the skin of the structure in a gaseous fluid ram region of the skin in which the skin is subjected to gaseous fluid of the surrounding medium at a predetermined ramming pressure, second gaseous fluid conveying means within the structure in which gaseous fluid under ramming pressure is conveyed from the second inlet opening in the skin along a second fluid flow path within the structure to the discharge opening or a further discharge opening and impelling means so positioned and arranged that the flow of fluid under ramming pressure in the second fluid flow path causes the fluid in the first fluid flow path to be impelled along the first fluid flow path from the first inlet opening to the discharge opening thereby to cause fluid to be withdrawn from the boundary layer in the flow control region and to be discharged from the discharge opening:

an aero engine nacelle, the skin defining a nacelle skin having an outer skin portion which produces at the flow control region thereof laminar flow of air in a boundary layer adjacent the outer skin portion and an inner skin portion which defines an air intake duct for the flow to intake air, wherein the first inlet opening is provided in the outer skin portion at the flow control region thereof.

**5,743,494**

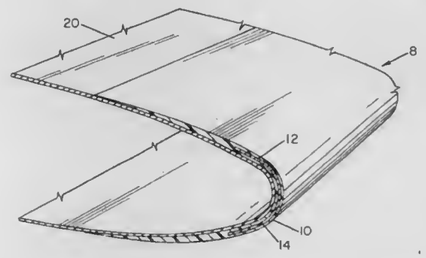
**POLYURETHANE DEICER**

**Michael John Giamati, Akron; Robert Willard Ray, Jr., Cuyahoga Falls, and Terry Lee Sluss, Louisville, all of Ohio, assignors to The BFGoodrich Company, Richfield, Ohio**

**Continuation of Ser. No. 399,791, Mar. 7, 1995, Pat. No. 5,544,845. This application Aug. 9, 1996, Ser. No. 694,889**

**Int. Cl.[6] B64D** *15/00;15/12;15/18*

**U.S. Cl. 244—134 E** **39 Claims**




1. An ice protection apparatus for an airfoil comprising an active element layer disposed between a resilient top layer and a bottom layer, said layers being cured into a unitary matrix, said top layer comprising a thermoset polyurethane derived from: a) a thermoplastic polyurethane cross-linked with a curing agent, and b) a UV protector.

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**5,743,495**

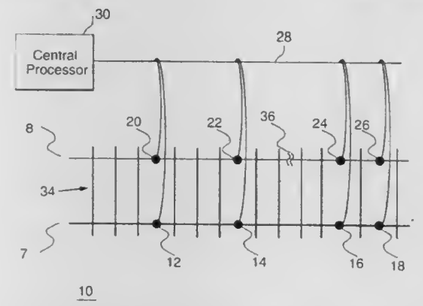
**SYSTEM FOR DETECTING BROKEN RAILS AND FLAT WHEELS IN THE PRESENCE OF TRAINS**

**Kenneth Brakeley Welles, II, Scotia, and Irfan Ali, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Feb. 12, 1997, Ser. No. 799,502**

**Int. Cl.[6] B61L** *23/04*

**U.S. Cl. 246—121** **18 Claims**




1. A robust system for detecting railway hazards utilizing motion detecting sensors, the system comprising:

a plurality of motion detecting sensors disposed along a monitored portion of each rail of a railway to generate a respective motion signal in correspondence with rail movement induced by trains moving along said rail; and

a central processor coupled to each of said motion detecting sensors along said monitored portion of each rail, said central processor being adapted to collect and process data from each of said motion detecting sensors so as to detect breaks in each of said rails;

each of said plurality of sensors on a respective rail being disposed at a distance from each adjacent one of said plurality of sensors such that a respective detection band of each of said plurality of sensors extends at least to an adjacent sensor so as to allow sensing redundancy within said plurality of sensors.



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**5,743,496**

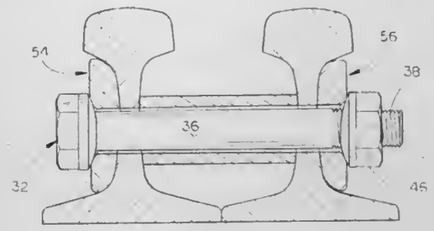
**RAILROAD FROG CROSSING BOLT AND NUT ASSEMBLY FOR CLAMPING RAILROAD RAIL SECTIONS TOGETHER**

**Samuel G. Atkinson, Jr., Omaha, Nebr., assignor to Upcor, Inc., Davenport, Iowa**

**Filed Feb. 19, 1997, Ser. No. 801,014**

**Int. Cl.[6] E01B** *7/10*

**U.S. Cl. 246—463** **5 Claims**




1. A railroad frog crossing bolt and nut assembly for clamping railroad rail sections together, each of said rail sections having a base portion and a top head portion separated by an integrally formed web portion having at least one bolt opening extending therethrough which registers with the bolt opening in the web portion of the other rail section, each of said web portions having oppositely disposed inner and outer side wall portions, comprising:

a bolt having a head from which extends an elongated shank having an unthreaded shank portion extending from said head and terminating at a threaded shank portion;

the juncture of said unthreaded shank portion and said head being radiused to provide a first annular radiused surface;

a nut adapted to be threadably mounted on said threaded shank portion and having inner and outer surfaces;

said inner surface of said nut being radiused to provide a second annular radiused surface;

a first member positioned adjacent said outer side wall portion of said web of one of said rail sections and having inner and outer surfaces;

said first member having a bolt opening formed therein which extends therethrough between said inner and outer surfaces thereof;

said outer surface of said first member having a recessed countersink area formed therein extending around said bolt opening adapted to receive one of said first and second radiused surfaces;

a second member positioned adjacent said outer side wall portion of said web of the other of said rail sections and having inner and outer surfaces;

said second member having a bolt opening formed therein which extends therethrough between said inner and outer surfaces thereof;

said outer surface of said second member having a recessed countersink area formed therein extending around said bolt opening adapted to receive the other of said first and second radiused surfaces.

**5,743,497**

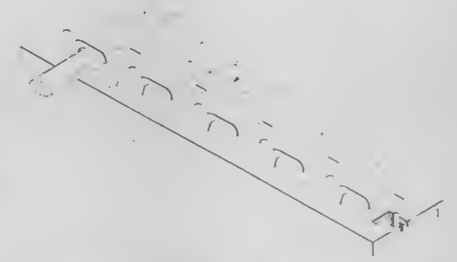
**WIRE INSTALLATION STRIP**

**Douglas C. Michael, 03953 County Rd. M-50, Edon, Ohio 43518**

**Filed Feb. 13, 1996, Ser. No. 600,757**

**Int. Cl.[6] F16L** *3/22*

**U.S. Cl. 248—68.1** **16 Claims**



1. A wire installation strip for installing electrical wire, comprising:

a base having an elongated top surface and opposing side surfaces;

a plurality of retention hooks to retain the electrical wire, each retention hook including a first leg extending upwardly from said base, a second leg extending over from said first leg and parallel to the top surface of said base, and a detent angled downwardly from said second leg towards said base, said second leg spaced from said base a selected distance defining an opening having a central axis, said central axis of said opening of each retention hook positioned generally parallel to one another,

wherein an electrical wire is captured and retained by said wire installation strip when the electrical wire is inserted into the opening of a retention hook, and

wherein an interior surface of said retention hook formed by said first leg, said second leg and said detent is sized and contoured to include angled interior top corners to conform to an exterior top surface of the electrical wire.

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**5,743,498**

**PIPE ANCHORING SYSTEM**

**Mark Kampf, Crystal Lake, Ill., assignor to Ireco, Inc., Chicago, Ill.**

**Filed Feb. 12, 1997, Ser. No. 797,981**

**Int. Cl.[6] E21F** *17/02*

**U.S. Cl. 248—74.4** **13 Claims**

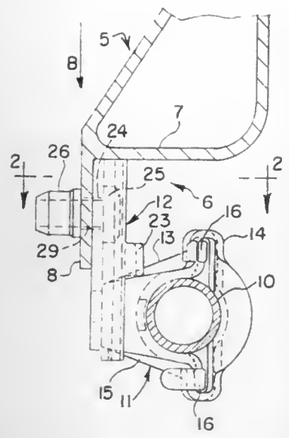
1. In combination, a pipe anchor base and fastened thereto a bracket for mounting the pipe anchor base to a right angle structural part within two legs thereof one of which has a bolt receiving hole extending therethrough,

said pipe anchor base comprising a longitudinally extending pipe receiving saddle portion having an interior in which a longitudinally extending pipe may be seated and clamped by means of a mating wedge clamp, a pair of spaced, upstanding and parallel flanges adjacent opposite sides or ends of said saddle portion, and longitudinally extending wedge clamp receiving and retaining flanges projecting laterally on opposite sides of said saddle portion, and

said bracket being in the form of a flat generally rectangular plate having an integral locator flange extending along one side thereof for aligning said bracket and said anchor base together in a first direction and having two-sided locator means for aligning said bracket and said anchor base together in a second direction at a right angle to said first direction, said bracket having a pair of spaced bolt-receiving holes therein longitudinally aligned at a right angle to said saddle portion of said pipe anchor base.

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said bracket being welded to said pair of upstanding flanges on said anchor base with the inner side of said locator flange either abutting one pair of the longitudinal ends of said flanges on said anchor base or abutting the outer side of one of said flanges in said first direction, with one side edge of said two-sided locator means engaging one side of said anchor base in said second direction and with one of said bolt receiving holes being located free and clear of said anchor base so as to be registerable with said bolt receiving hole in one leg of said right angle structural part when said bracket is placed flatwise against the inside of said leg, and

said bracket prior to being welded to said pair of upstanding flanges on said anchor base being weldable to said anchor base in an alternate orientation in which the other side of said two-sided locator means engages said anchor base whereby the other of said bolt receiving holes is free and clear of said anchor base.

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**5,743,499**
**ARM SUPPORT FOR COMPUTER OPERATOR**
**Te-Ming Wang, Fl. 1, No. 25, Ln 154, Shin Yi Rd., Pei Tou, Taipei, Taiwan, 112**
**Filed Jan. 7, 1997, Ser. No. 779,434**
**Int. Cl.[6] B68G *5/00*; B43L *15/00***
**U.S. Cl. 248—118** **8 Claims**



1. An arm support adapted to support an arm of a user in a suspended manner, comprising:

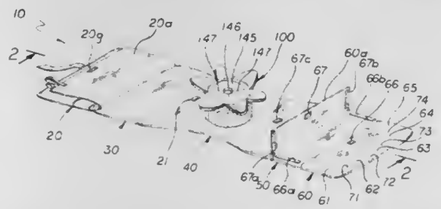
anchoring means adapted to be mounted to a fixed plate;

swivelling means comprising an elongated member having a proximal end pivoted to the anchoring means and an opposite distal end defining a stop; and

sliding means comprising a slider mounted on the elongated member to be movable between the anchoring means to which the proximal end is pivoted and the stop defined by the distal end of the elongated member and an arm rest rotatably mounted to the slider, defining a top face to support the arm of the user thereon, said anchoring means including an anchoring body adapted to be mounted to the fixed plate, the anchoring body comprising a bore and two lateral slits in communication with the bore and wherein the elongated member of the swivelling means comprises two strips each having a proximal end with a hole formed thereon, the proximal ends of the strips being movably fit into the slits to have the holes thereof received within the bore, a pivot axle received within the bore and extending through the holes of the strips so as to pivot the swivelling means to the anchoring means

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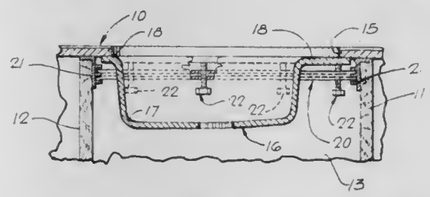
**5,743,500**
**METHOD AND APPARATUS FOR HOLDING BOTTLES**
**Donald L. Northway, and Margaret Northway, both of P.O. Box 292, Genoa, Nev. 89411**
**Filed Nov. 27, 1996, Ser. No. 755,574**
**Int. Cl.[6] A47G *23/02***
**U.S. Cl. 248—146** **2 Claims**



1. A bottle holding apparatus comprising: a first weighted pad having a defined width, length, and thickness carrying at least one closeable pocket; a second weighted pad connected to said first weighted pad; a third pad connected to said second weighted pad and carrying attaching means suitable to attach to a removable bottle holding means; a bottle holding means removably attached to said attaching means; a fourth weighted pad attached to said third pad; and a fifth weighted pad carrying at least one implement pouch attached to said fourth pad.

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**5,743,501**
**MOUNTING SYSTEMS FOR UNDER MOUNT SINKS**
**William M. Rapp, Arlington Heights, Ill., assignor to Vance Industries, Inc., Chicago, Ill.**
**Filed Apr. 30, 1996, Ser. No. 641,172**
**Int. Cl.[6] F16M *11/00***
**U.S. Cl. 248—201** **5 Claims**



1. An assembly for mounting a sink or basin on the underside of a countertop mounted on suitable support structure; the sink or basin having a bowl bordered by a laterally extending rim flange, comprising:

a pair of like, rigid, elongated, unitary and linear mounting rails adapted to be positioned along opposite sides of the associated sink or basin bowl to engage the underside of the bowl's rim flange;

each rail having a planar upper wall formed with plural openings spaced along the length thereof;

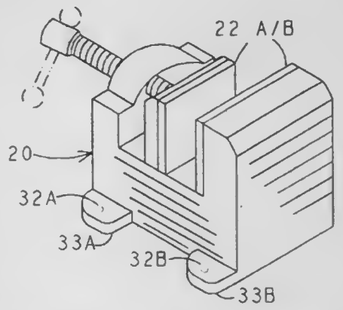


a rigid mounting bracket adapted to be stationarily secured to said support structure for the associated countertop countertop, said bracket located adjacent opposite ends of each of said rails and comprising connective means interlocking with each rail for holding the same in co-planar, parallelism adjacently beneath said rim flange; and

a plurality of axially adjustable, leveling devices supported on each rail to extend through selected of said openings in said upper wall, whereby to engage a the rim flange of the associated said bowl and to tightly clamp the same against the underside of said associated countertop.

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**5,743,502**
**BENCH VICE SUPPORT PLATFORM**
**Gary Lee Humma, 1406 Fredrick Blvd., Reading, Pa. 19605**
**Filed Jan. 16, 1997, Ser. No. 783,365**
**Int. Cl.[6] B23Q *1/25***
**U.S. Cl. 248—231.31** **5 Claims**



1. An apparatus for securing a work bench tool to conventional work table supporting ledges in a dependable, but displaceable, manner during tool use, the apparatus comprising:

(a) a tool support member including a rigid planar component of a generally rectangular configuration and having a plurality of depending skirts located about its periphery of the rigid planar complement on at least two lateral edges of the rigid planar component, the lateral edge skirts being adapted to maintain the rigid planar component spaced apart from the work table supporting ledge;

(b) a lower component having a substantially identical pair of sidewall elements affixed along the two lateral edges and disposed at right angles of the planar component, each of the side wall elements defining a three-segment planar element with the middle segment being fixed at substantially right angle to a first outer segment at a first end thereof, the first outer segment abutting and being secured to one of the lateral edge skirts of the rigid planar component; the first outer segment further having an elongate inwardly projecting ledge for stabilizing contact with the work tablet ledge; a second outer segment attached to the middle segment at a second end thereof and diverged from the first out segment to present a variable gap between the first outer segment and the second outer segment; an array of abutting linear serrations located along an inner edge of the second outer segment; and

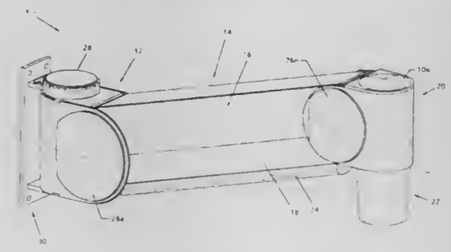
(c) a handle member defining a substantially rectangular configuration having opposing elongate sidewalls with an anchoring rigid bar element spanning and connecting with longitudinal ends of the elongate sidewalls at their lower handle end;

(d) a spindle member spanning and connecting the opposing elongate sidewalls and positioned at the upper longitudinal ends thereof and pivotally supported by the elongate opposing sidewalls; and

(e) the handle member further including a pair of opposing detent means affixed and directed inwardly of the opposing elongate sidewalls of the handle member located proximal to the spindle member, and aligned to travel along an inner surfaces of the opposing sidewalls in sliding contact with the array of abutting linear serrations located on each of the second outer segments of the sidewall elements.

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**5,743,503**
**COMPUTER SUSPENSION SYSTEM**
**Donald M. Voeller, Eagan, and Harry C. Sweere, Minneapolis, both of Minn., assignors to Ergotron, Inc., St. Paul, Minn.**
**Filed Mar. 8, 1996, Ser. No. 613,959**
**Int. Cl.[6] E04G *3/00***
**U.S. Cl. 248—284.1** **20 Claims**



1. A suspension system for providing stable support and movement to a computer component comprising:

a. a support bracket attachable to mounting surface;

b. a pivotable arm mount bracket pivotally attached to said support bracket for providing an azimuthal pivoting adjustment comprising:

(1) a threaded bolt attached to said pivotable arm mount bracket at an angle; and,

(2) a sliding member that threadingly engages said threaded bolt, said sliding member comprising a pivot;

c. a four bar linkage with an inboard end and an outboard end, said inboard end attached to said pivotable arm mount bracket, said four bar linkage providing for vertical adjustment of said outboard end of said four bar linkage;

d. a pivot bearing mount bracket attached to said outboard end of said four bar linkage;

e. a pivot bearing assembly that rotatingly attaches to said pivot bearing mount bracket providing rotational movement about a vertical axis, said pivot bearing assembly being attached to the computer component; and,

f. a first gas spring with an inboard end and an outboard end, said inboard end being attached to said pivot of said sliding member and said outboard end being attached to said four bar linkage.

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**5,743,504**
**VESSEL HOLDING ADAPTER**
**Joseph A. Miller, 35 Chimney Cove, Hilton Head Island, S.C. 29928**
**Filed Jun. 3, 1996, Ser. No. 655,689**
**Int. Cl.[6] A47K *1/08***
**U.S. Cl. 248—311.2** **9 Claims**

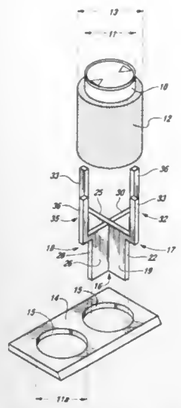
1. An adapter for retaining a standard-size container encased in a larger size holder in a receptacle cavity sized to hold a standard-size container comprising a pair of adapter segments each having a cavity fitting lower portion integral with and depending below a holder retaining upper portion,

said lower portion comprising a plate with a width dimension between opposite side edges sized for placement of said plate within said receptacle cavity transversely thereof,

said upper portion comprising a pair of arms each extending upwardly of a top edge of said lower portion plate beyond respective side edges of said plate with a separation between

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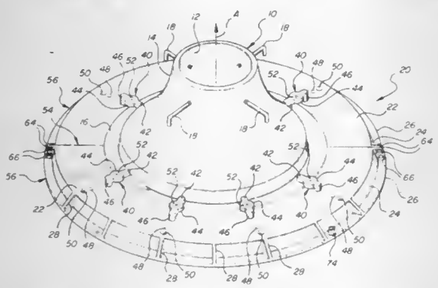
opposite facing surfaces of said arms being a distance accommodating placement therebetween of said larger size holder,

each adapter segment containing a slot extending partially longitudinally of said adapter segment lower portion plate midway of said plate side edges with the slot in one adapter segment of said pair extending upwardly from the bottom edge of the lower portion plate of said one adapter segment and the slot in the other adapter segment of said pair extending downwardly from the top edge of the lower portion plate of said other adapter segment,

whereby said adapter segments of said pair form a unitary adapter device with the respective adapter segments in nesting engagement transversely of each other upon arranging the adapter segments with the slot of each adapter segment of said pair straddling a portion of the lower portion plate of the other of the adapter segments of said pair.

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**5,743,505**
**BASE EXTENSION FOR TREE OR DISPLAY STAND**
**Hugh M. Sofy, Troy, Mich., assignor to HMS Mfg. Co., Troy, Mich.**
**Filed Oct. 19, 1995, Ser. No. 543,878**
**Int. Cl.[6] A47G *29/00***
**U.S. Cl. 248—346.01** **33 Claims**



1. A base extension assembly (**20**) for a display stand (**10**), said assembly (**20**) comprising:

a platform (**22**) having a broad surface area for receiving the display stand (**10**);

a leg (**24**) extending downwardly from said platform (**22**) to support said platform (**22**) above a floor surface over said broad surface area;

anchor means (**40**) for releasably securing the display stand (**10**) to said platform (**22**);

and characterized by partition means (**54**) sectioning said platform (**22**) into a plurality of segments (**56**) each smaller than said broad surface area, and storage means releasably joining each of said segments (**56**) to one another in a disassembled condition occupying a surface area smaller than said broad surface area for compact storage and shipment of said assembly (**20**).

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**5,743,506**
**CARPET PROTECTOR**
**William E. Adams, Butler County, Pa., assignor to Adams Mfg. Corp., Portersville, Pa.**
**Continuation-in-part of Ser. No. 38,078, Apr. 28, 1995, Pat. No. Des. 379,582, and a continuation-in-part of Ser. No. 38,084, Apr. 28, 1995, Pat. No. Des. 379,922, and a continuation-in-part of Ser. No. 38,637, May 10, 1995. This applicatinn Dec. 21, 1995, Ser. No. 576,514**
**Int. Cl.[6] A47B *91/00***
**U.S. Cl. 248—346.11** **17 Claims**



1. A carpet protector to support furniture and reduce damage to a carpet, comprising:

a. a rigid base having an upper surface and a lower surface and the lower surface of said base having a plurality of protrusions attached thereto and extending away therefrom; the protrusions being configured to extend into and engage the carpet on which said base is placed; and

b. a deformable receiving portion having an upper surface and a lower surface wherein:

i. the upper surface of said receiving portion includes a plurality of ridges on which a furniture leg is placed;

ii. the lower surface of said receiving portion is engageable with the upper surface of said base; and

iii. said receiving portion will deform when a furniture leg is placed on the upper surface thereof and conform to the furniture leg.

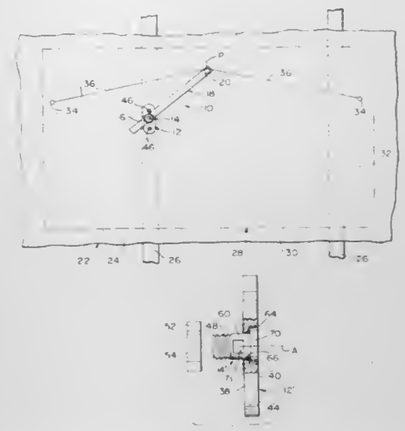
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**5,743,507**
**UNIVERSAL PICTURE HANGER WITH WALL STUD MOUNTED HANGER BASEPLATE**
**S. Everett Rushing, 5417 Robinson Rd. Ext., Jackson, Miss. 39204**
**Filed Aug. 16, 1996, Ser. No. 698,705**
**Int. Cl.[6] A47G *1/16***
**U.S. Cl. 248—495** **1 Claim**

1. A universal picture hanger comprising:

a wall stud mountable baseplate having opposite flat front and rear surfaces, means for fixedly mounting said baseplate flat rear surface to a building wall at a wall stud location, a stud mounted to said flat front surface of said baseplate and extending perpendicular thereto, a rectangular cross-section elongated picture hanging rod having opposed flat front and rear surfaces and opposite inboard and outboard ends, a hanging lug projecting at right angles outwardly of said picture hanging rod flat front surface at said outboard end, and common means for selectively rotatably and longitudinally

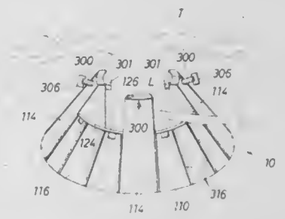




coupling said picture hanging rod to said stud along the longitudinal axis of said rod and for frictionally locking said rod longitudinally and rotatably to said baseplate thereby allowing said hanging lug to adjust through 360° of rotation about said baseplate and radially over the extent of the picture hanging rod from said lug to said inboard end, and wherein said stud is mounted to said baseplate for rotation about its axis, and wherein said common means comprises a rectangular transverse hole provided within said stud and sized to and slidably receiving said rod to permit longitudinal adjustment in the position of the picture hanging rod on said stud by radially extending and retracting the hanger lug on said outboard end of said rod, and wherein a nut on said stud compresses a flat facing surface of said rod against the flat front surface of said baseplate.

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**5,743,508**
**TREE STAND WITH UPWARD/EXTENDING SUPPORT MEMBERS FORMING PART OF A WATER BASIN**
**Ramon A. Fiveash, 5938 Woodway Place Ct., Houston, Tex. 77057**
**Filed Feb. 2, 1996, Ser. No. 595,831**
**Int. Cl.[6] A47G *35/12***
**U.S. Cl. 248—527** **8 Claims**



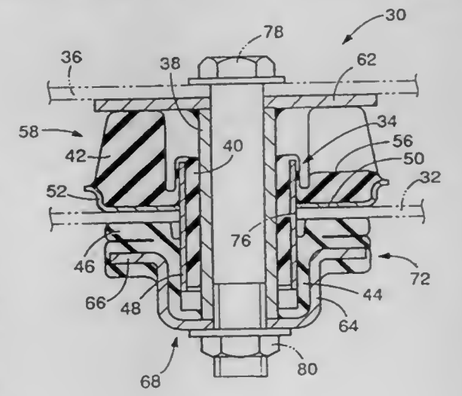
8. A tree stand comprising:

an outer container including a base having sidewalls joined to the base wherein said sidewalls inwardly slope away from the base to define a container opening; and

a plurality of spaced, substantially rigid tree support members secured to the base and extending upwardly therefrom to terminate a distance beyond the container opening to define a tree trunk opening such that the spaced tree support members define a space available within the container for the base of a tree trunk and wherein the tree support members in combination with inner surfaces of the sidewalls define a space available for containing fluid for a cut tree.

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**5,743,509**
**ELASTIC MOUNT HAVING TWO AXIALLY COMPRESSED ELASTIC MEMBERS**
**Ryouji Kanda, Komaki, and Hideki Nishimura, Minokamo, both of Japan, assignors to Tokai Rubber Industries, Ltd., Japan**
**Filed Jul. 15, 1996, Ser. No. 683,633**
**Claims priority, application Japan, Jul. 17, 1995, 7-179993**
**Int. Cl.[6] F16M *13/00***
**U.S. Cl. 248—635** **10 Claims**



1. A generally cylindrical elastic mount to be interposed between a first structure having a mounting hole and a second structure., for connecting the first and second structures to each other in a vibration damping manner, said elastic mount comprising:

a first support member including an axial portion to be axially extended through the mounting hole of the first structure, and a radial portion to be abutted on the first structure;

a cylindrical second support member disposed radially inwardly of said axial portion of said first support member such that axial opposite end portions of the second support member are exposed axially outwardly of said axial portion;

fixing means for fixing said second support member to the second structure;

a first squeezer member fixed to one of said axial opposite end portions of said second support member, and extending in a radial direction of said second support member, said first squeezer member being opposed to said radial portion of said first support member in an axial direction of said second support member;

a first elastic member to be axially compressed between said radial portion of said first support member and said first squeezer member in said axial direction;

a second squeezer member fixed to the other of said axial opposite end portions of said second support member, said second squeezer member including a radial portion which extends in said radial direction and which is to be opposed to the first structure in said axial direction, and an axial portion which extends in said axial direction and which is opposed to said axial portion of said first support member in said radial direction;

a second elastic member to be axially compressed between said radial portion of said second squeezer member and the first structure in said axial direction; and

a third elastic member radially compressed between said axial portions of said second squeezer member and said first support member in said radial direction.

VOL 1209 ISS 4 AP 28 1998 UMI

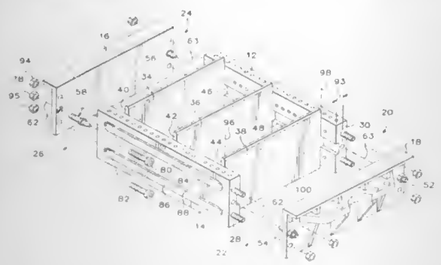


5,743,510

## SELF-ALIGNING MOLD BOX ASSEMBLY

Llewellyn L. Johnston, Vancouver, Wash., assignor to Columbia Machine, Vancouver, Wash.

Filed Dec. 21, 1994, Ser. No. 361,790
Int. Cl.[6] B28B 7/24
U.S. Cl. 249—155 18 Claims



1. A self-aligning mold box assembly in which molded products are formed comprising:

a pair of opposed substantially parallel end plates;

a pair of opposed substantially parallel mounting brackets positioned at opposite ends of the end plates which together with the end plates form a substantially rectangular mold box having a corner portion defined adjacent the juncture of each mounting bracket with each end plate;

at least one partition plate extending from one end plate to the other between the mounting brackets;

an alignment pin extending from one of said end plates and said mounting brackets at each corner portion;

an alignment bore formed on the other of said end plates and said mounting brackets at each corner portion, each alignment pin being coaxial with an associated alignment bore said bores being sized and positioned so that when each bore has its associated alignment pin therein, the mold box assembly is sufficiently aligned to form molded products; and

a pair of coaxial securing bores formed in each corner portion, one bore being formed in an end plate and the other being formed in a mounting bracket, and a bolt received in said securing bores separate from the alignment pin.

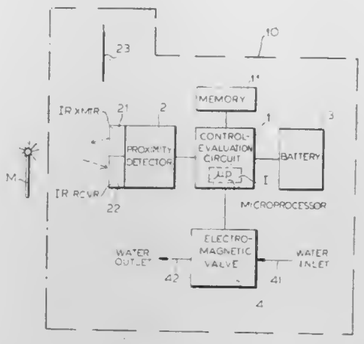
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5,743,511

## CONTROL DEVICE FOR A SANITARY FIXTURE

Heinz-Dieter Eichholz, Iserlohn; Hans-Jürgen Ludewig, Rintein, and Hans-Peter Rudrich, Windischeschenbach, all of Germany, assignors to Friedrich Grohe AG, Hemer, Germany

Filed Jan. 24, 1996, Ser. No. 590,583
Claims priority, application Germany, Jan. 25, 1995, 195 02 214.9
Int. Cl.[6] F16K 31/02; E03C 1/05
U.S. Cl. 251—129.04 20 Claims




1. A control device for a sanitary fixture comprising:

a detection unit responsive to presence of a user of a sanitary fixture and including at least an electrically operated transmitter and a receiver responsive to signals from said transmitter;

a control and evaluating circuit connected to said detection unit for controlling electrical energization thereof and evaluating an output from said receiver for operating the sanitary fixture in a normal mode of operation;

an electric energy source packaged with said unit and said circuit and connected to said circuit for supplying electrical energy for said detection unit and said circuit;

means connected with said circuit for activating an energy-sparing mode of operation of said device in response to initiation of said energy-sparing mode of operation by a fabricator of the device; and

means for operating said circuit and said unit in said energy-sparing mode at low drain of said source substantially below a current drain during said normal mode, said energy-sparing mode being deactivated upon installation of the device for operation thereof in said normal mode.

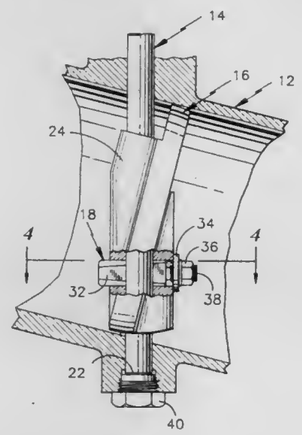
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5,743,512

## WEDGE LOCK BUTTERFLY VALVE

Michael D. Greenberg, Bloomfield, Conn., assignor to United Technologies Corporatinn, Windsor Locks, Conn.

Filed Oct. 26, 1995, Ser. No. 548,826
Int. Cl.[6] F16K 1/22
U.S. Cl. 251—307 18 Claims




1. A wedge lock valve comprising:

(a) a valve housing;

(b) a disc rotatably movable within said housing, said disc having a first aperture extending generally axially through said disc, and a second aperture extending generally diametrically through said disc, wherein the second aperture is offset relative to and intersects said first aperture;

(c) a valve shaft positionable in a selected position in said valve housing and extending through said second aperture; and

(d) an aligning means for movably positioning said disc along said valve shaft to secure said disc in a selected position relative to said valve shaft, said aligning means including a notch in said valve shaft, wherein said notch is adapted to be aligned with said first aperture and a pin extending through said first aperture, said pin having a tapered flat portion along its length for matingly engaging a surface of said notch, wherein said valve shaft has a greater hardness than said pin and said surface of said notch is serrated.

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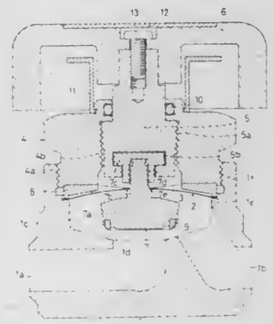


5,743,513

## DIAPHRAGM VALVE

Kazuhiro Yoshikawa, and Tetsuya Kojima, both of Osaka, Japan, assignors to Fujikin Incorporated, Osaka, Japan

Filed Jan. 11, 1996, Ser. No. 584,072
Claims priority, application Japan, Feb. 15, 1995, 7-027136
Int. Cl.[6] F16K 31/44
U.S. Cl. 251—335.2 6 Claims




1. A diaphragm valve comprising:

a body defining a concave valve chamber having a valve seat at a bottom thereof, said valve chamber being interconnected to an inflow passage and an outflow passage;

a metallic main diaphragm provided in the valve chamber opposite the valve seat for maintaining airtightness of the valve chamber and being elastically deformable in a vertical direction to seal and unseal the valve seat and thereby disconnect and connect the inflow and outflow passages;

a bonnet fixed to the body for securely holding an outer circumferential edge portion of the main diaphragm against the body; and

a stem supported by the bonnet to move up and down therethrough for elastically deforming the main diaphragm;

wherein at a top surface of said main diaphragm is arranged a metallic sub-diaphragm having an outer circumferential edge portion which is elastically deformable in the vertical direction, and a center portion which is fixed relative to a center portion of the main diaphragm, so that the sub-diaphragm can contact the top surface of the main diaphragm to support a bend of the main diaphragm when it is elastically deformed.

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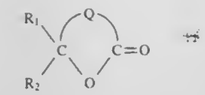
5,743,514

## SATURATED LACTONE PEROXIDE BLEACHING SOLUTIONS AND METHOD OF PREPARING AND USING THE SAME

Wayne M. Rees, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 346,597, Nov. 29, 1994, abandoned.
This application Aug. 14, 1997, Ser. No. 911,028
Int. Cl.[6] C09K 3/00
U.S. Cl. 252—186.39 20 Claims

1. A method of improving the bleaching performance of a peroxide comprising the step of applying a bleaching solution to a substrate, the bleaching solution comprising (i) from about 0.1% to about 10% by weight of a lactone represented by the formula (I):




wherein $R_1$ and $R_2$ are independently selected from the group consisting of hydrogen, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, aryl, and aralkyl and Q is an alkylene radical having 2 to 4 carbon atoms, any carbons of which may be substituted by any of an alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, alkene having 1 to 6 carbon atoms, aryl, aralkyl and hydroxy (ii) from about 1% to about 10% by weight of hydrogen peroxide; (iii) an effective amount of at least one alkaline agent to provide said solution with a pH of at least about 7; and (iv) the balance comprising a solvent, wherein said lactone is present in an amount effective to increase a bleaching rate of the bleaching solution compared to the bleaching solution if said lactone were absent.

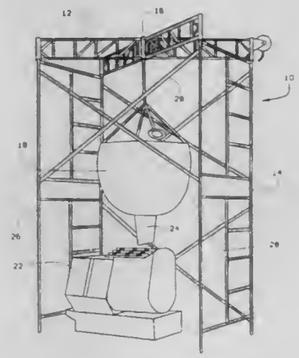
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5,743,515

## MATERIAL HANDLING APPARATUS

William Roy Wodell, 2721 S. Kingshighway Blvd., St. Louis, Mo. 63139

Filed Mar. 29, 1996, Ser. No. 627,698
Int. Cl.[6] B66D 1/00
U.S. Cl. 254—334 16 Claims




1. A material handling apparatus for attaching to a scaffold for lifting and suspending a bag of bulk material, comprising:

a support adapted to attach to the scaffold, wherein said support forms a cross-piece over the top of the scaffold, wherein said support further comprises a hub, said hub located generally centrally on said cross-piece, said cross-piece has at least one side that rotates about said hub to form a generally straight piece;

a load connector extending downwardly from said support adapted for engaging the bag of bulk material; and

a locking element connected to said support, said locking element adapted to engage and disengage said load connector for reciprocally restricting and allowing movement of said load connector.

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### 5,743,516
### SHOCK ABSORBING DEVICE FOR RUNNING TROLLEYS FOR FILM STRETCHING PLANTS IN PARTICULAR

**Paul Lindner, Henndorf, Austria, and Ulrich Rühlemann, Grabenstätt, Germany, assignors to Bruckner Maschinenbau GmbH, Siegsdorf, Germany**

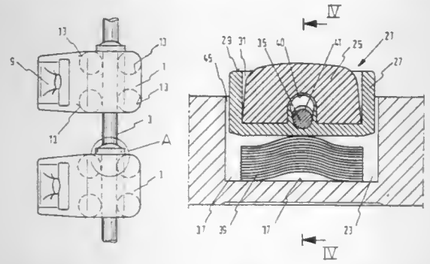
**PCT No. PCT/EP95/04379, § 371 Date Jul. 9, 1996, § 102(e) Date Jul. 9, 1996, PCT Pub. No. WO96/16278, PCT Pub. Date May 30, 1996**

**PCT Filed Nov. 7, 1995, Ser. No. 669,422**

**Claims priority, application Germany, Nov. 17, 1994, 44 41 020.4**

**Int. Cl.[6] B60G** *11/34*

**U.S. Cl. 267—30** **13 Claims**



1. A shock absorber device for running trolleys, comprising:

first and second shock absorbers carried by said device, said second shock absorber being activatable only after a minimum release limit force value is exceeded, said first shock absorber being deactivated when a maximum shock absorption value is reached;

said first and second shock absorbers having spring characteristics affording a differential force value between said minimum value for activating said second shock absorber and said maximum value for deactivating said first shock absorber, said minimum value being greater than said maximum value such that a propulsive force for advancing the running trolleys is higher than said maximum shock absorber value at an end of a range of effectiveness of said first shock absorber and lower than said minimum release value at commencement of a range of effectiveness of said second shock absorber.

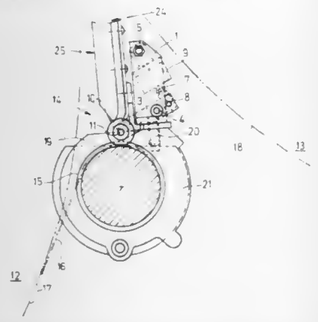
### 5,743,517
### LOOSE SIGNATURE EJECTOR ASSEMBLY IN A FOLDING APPARATUS

**Eugene John Bergeron, 885 State St., Portsmouth, N.H. 03801**

**Filed May 14, 1996, Ser. No. 645,855**

**Int. Cl.[6] B42C** *1/00*

**U.S. Cl. 270—45** **9 Claims**



1. A signature ejecting assembly in a folding apparatus comprising:

a first rotatably mounted surface, the first rotatably mounted surface being driven; and

a second rotatably mounted surface, the second rotatably mounted surface being movably mounted on a bracket, the first and second rotatably mounted surfaces being located within a product transfer area of the folding apparatus, the second rotatably mounted surface exerting a positive drive upon signatures, to thereby eject signatures from the product transfer area, the second rotatably mounted surface being movable against the first rotatably mounted surface, wherein movement of the second rotatably mounted surface against the first rotatably mounted surface creates a nip.

### 5,743,518
### PAPER STACKING APPARATUS FOR IMAGE READING APPARATUS AND IMAGE READING APPARATUS WITH PAPER STACKING APPARATUS

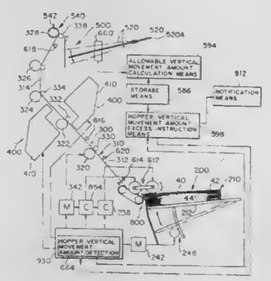
**Yoshihiro Takashimizu; Masahiro Yoshida; Toshiaki Anzai, and Toshio Saito, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 407,472, Mar. 20, 1995, abandoned. This application Apr. 21, 1997, Ser. No. 845,050**

**Claims priority, application Japan, Apr. 7, 1994, 6-069828**

**Int. Cl.[6] B65H** *5/22*

**U.S. Cl. 271—4.1** **17 Claims**



1. A paper stacking apparatus for an image reading apparatus for stacking a paper sheet discharged from a paper transport mechanism of said image reading apparatus along which an optical image reading mechanism is disposed, comprising:

a paper stacker including, at a bottom portion thereof, a stacker table for receiving thereon paper sheets discharged from said paper transport mechanism to stack the paper sheets;

a paper stacker position variation mechanism for varying the position of said paper stacker;

a paper discharge roller mechanism provided at a terminal end of said paper transport mechanism and having a projection extending into a paper transport path of said paper transport mechanism;

a paper trailing end guide mechanism disposed to extend into said paper stacker for guiding a trailing end of a paper sheet to be stacked into said paper stacker; and

a paper side edge guide mechanism for guiding side edges of a paper sheet being stacked into said paper stacker while controlling a lateral movement of the paper sheet in a widthwise direction.



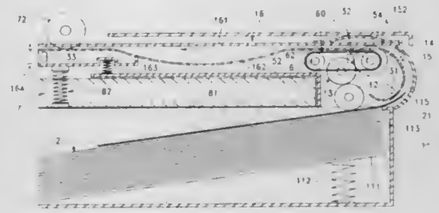
### 5,743,519
### U-TURN HIGH CAPACITY SHEET FEEDER FOR FAX MACHINE OR PRINTERS

**Joseph Chang; Shih-Chin Chang; Joe-Te Hsiung, and C. Y. Chang, all of 1F, No. 26, Industry E. 9th Rd., Science-Based Industrial Park, Hsin Chu, Taiwan**

**Filed May 8, 1995, Ser. No. 436,724**

**Int. Cl.[6] B65H** *5/00;1/22;5/34*

**U.S. Cl. 271—10.11** **6 Claims**



1. A U-turn high capacity sheet feeder having:

a sheet storing tray for holding a stack of sheets of paper, said sheet storing tray having a stack advancing means for advancing said stack of sheets of paper;

a transfer roll;

a feed roll and a drive mechanism controlled to separate an individual sheet of paper from said stock held by said sheet storing tray to said transfer roll for allowing said sheet to be further driven by said transfer roll to a host machine;

a U-turn baffle channel for guiding the individual sheet of paper moving away from said sheet storing tray to said transfer roll;

a pivotable baffle channel for guiding the individual sheet of paper from said U-turn baffle channel to said host machine and for supporting the individual sheet of paper against a feed roll of said host machine;

a control mechanism for determining the timings of the engagement of the sheet separating feed roll and the drive mechanism for transporting individual sheets of paper one by one into a feed zone of said host machine in conjunction with a feeding cycle of said host machine;

a housing, which receives said sheet storing tray, said transfer roll, said sheet separating feed roll and said drive mechanism, said U-turn baffle channel, said pivotable baffle channel, and said control mechanism;

and said housing comprises a first arm for supporting said sheet storing tray, and a second arm suspended above said first arm for supporting said sheet separating feed roll, said drive mechanism, said transfer roll, and said pivotable baffle channel, said second arm being insertable into a tray area of said host machine, said first arm and said second arm being connected by said U-turn baffle channel.

### 5,743,520
### APPARATUS FOR STACKING INDIVIDUALLY FED-IN SHEETS

**Ulrich Barthold, Baltmannsweiler-Hohengehren, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 18, 1996, Ser. No. 769,017**

**Claims priority, application Germany, Dec. 20, 1995, 195 47 669.7**

**Int. Cl.[6] B65H** *31/26*

**U.S. Cl. 271—189** **6 Claims**

1. Apparatus for stacking individually fed sheets (**5**), comprising a collector bin (**2**) for the fed sheets (**5**) that is made up of a sheet support (**4**) and a sheet stop (**6**), a retaining apparatus (**8**) for the fed sheets (**5**) arranged facing the sheet support (**4**), and a stop finger (**10**) that can be pivoted into the paper path, characterized in that a jogger wheel (**12**), with which the fed sheets (**5**) can be transported toward said sheet stop (**6**), is installed above said sheet support (**4**) rotatably about a shaft (A); and that a holding element (**14**) for said stop finger (**10**) can be moved on the shaft (A) independently of the rotary movement of said jogger wheel (**12**); and that a stopgap closure element (**16**) is also arranged on said holding element (**14**) in such a way that said stop finger (**10**) or said stopgap closure element (**16**) can be introduced into the paper path.

### 5,743,521
### SHEET THICKNESS DETECTING DEVICE FOR DETECTING THICKNESS FROM THE CHANGE IN DISTANCE BETWEEN ROLLERS

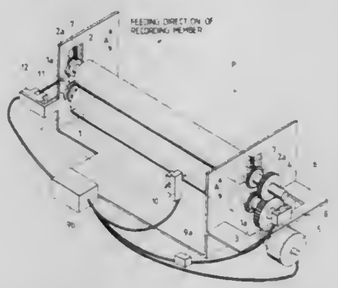
**Atsushi Munakata, Yokohama, and Toshiro Tomono, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 324,490, Oct. 18, 1994, abandoned. This application Feb. 11, 1997, Ser. No. 798,932**

**Claims priority, application Japan, Oct. 22, 1993, 5-264915; Nov. 10, 1993, 5-305947**

**Int. Cl.[6] B65H** *7/12*

**U.S. Cl. 271—263** **15 Claims**



1. A sheet thickness detecting device for detecting the thickness of sheets by detecting a change in distance between respective axes of a pair of rollers for pinching and feeding the sheets, said sheet thickness detecting device comprising:

a pair of rollers for pinching and feeding a sheet;

distance detecting means for detecting a distance between said pair of rollers;

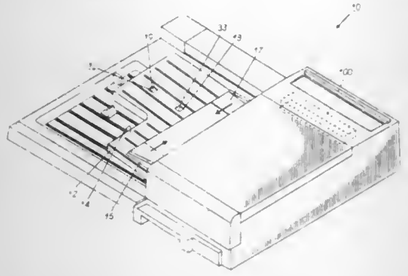
angle detecting means for detecting a state that one of said rollers is positioned only at a single predetermined angle of rotation; and

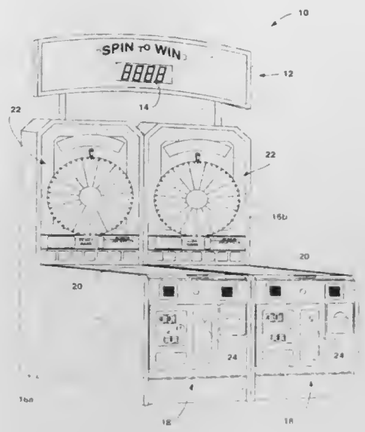
judging means for judging the thickness of the sheet in accordance with a signal supplied from said distance detecting means when the sheet is not pinched by said pair of rollers in a position of the predetermined angle of rotation detected by said angle detecting means and a signal supplied from said distance detecting means when the sheet is pinched by said pair of rollers in the position of the predetermined angle of rotation.

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5,743,522
**DOCUMENT OR COPY SHEET TRAY SHEET SET SENSOR ACTUATOR**
**Robert F. Ruhscha, Fairport, and John D. Gramlich, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**
**Filed Nov. 14, 1996, Ser. No. 749,305**
**Int. Cl.[6] B65H** *7/02*
**U.S. Cl. 271—265.02** **5 Claims**






1. In a sheet feeding system, for an imaging system, with a sheet input tray in which sheets are loaded onto the upper surface of said sheet input tray to be fed in a downstream feeding direction therefrom, said sheet input tray having a sheet sensor system for automatically providing different electrical control signals in response to different sheet sizes and different orientations of the sheets loaded onto said sheet input tray, the improvement in said sheet sensor system comprising at least one mechanical sheet sensor actuator projecting into said sheet input tray at a preset position to be engaged and moved to a sensor actuation position by said sheets loaded onto said sheet input tray when said sheets loaded onto said sheet input tray extend into said preset position of said actuator in said sheet input tray, said actuator being movably mounted to normally project upwardly through an aperture in said sheet input tray at said preset position until operatively engaged by said sheets loaded into said sheet input tray extending into said preset position, said actuator having a three-dimensional solid geometric shape tapering upwardly from a relatively large base up to a relatively small tip to provide laterally angled sheet engagement surfaces on at least three different lateral sides thereof, said laterally angled sheet engagement surfaces of said actuator being sufficiently angled to push down said actuator and prevent jamming or damage to said actuator from stacks of sheets being manually inserted into said sheet input tray from different angles and directions, including stack insertion laterally of said downstream sheet feeding direction.

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5,743,523
**MULTI-GAME SYSTEM WITH PROGRESSIVE BONUS**
**Bryan M. Kelly, Dublin; Norman B. Petermeier, Saratoga; Matthew E. Kelly, Dublin, all of Calif., and J. Richard Oltmann, Scottsdale, Ariz., assignors to RLT Acquisition, Inc., Pleasanton, Calif.**
**Continuation of Ser. No. 409,842, Mar. 27, 1995, abandoned, which is a continuation of Ser. No. 176,862, Jan. 3, 1994, Pat. No. 5,409,225, which is a continuation of Ser. No. 956,057, Oct. 2, 1992, Pat. No. 5,292,127. This application Aug. 7, 1996, Ser. No. 695,128**
**Int. Cl.[6] A63F** *7/00*
**U.S. Cl. 273—138.1** **50 Claims**

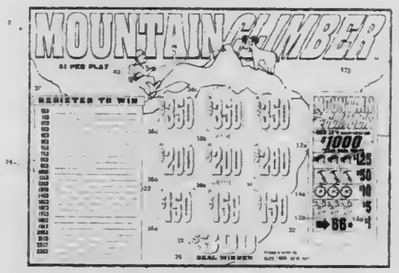
1. A multi-station game system with progressive bonus comprising:

a plurality of individual game stations, where each game station is capable of dispensing redemption tickets based upon at least one skilled operation performed by a player of said game station where said skilled operation affects the movement of a physical playing piece associated with said game station; and

a progressive bonus apparatus coupled to said plurality of game stations and operative to display a progressive score and further operative to provide at least one bonus redemption ticket based upon said progressive score to a player of a game station when a bonus condition is met

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5,743,524
**SEAL CARD GAME WITH RANDOM ADVANCED PLAYER SELECTION**
**Charles A. Nannicola, 9216 Sunview Dr., Warren, Ohio 44484**
**Filed Jul. 1, 1996, Ser. No. 673,554**
**Int. Cl.[6] A63F** *3/06*, **B42D** *15/00*
**U.S. Cl. 273—139** **1 Claim**




1. A seal card game with random advanced player selection, which includes:

(a) a plurality of individual play cards each including:

(1) a plurality of symbol combinations,

(2) a plurality of break-open windows each having open and closed positions respectively revealing and concealing a respective symbol combination;

(3) a plurality of graphic symbol combinations designating instant winners, each said winning graphic symbol combination corresponding to a respective instant winner award amount; and

(4) a plurality of numerical symbol combinations comprising multiple-digit numerals and qualifying respective cardholders for advanced level play; and

(b) a master seal card, including:

(1) a sign-up register with said advanced play qualification symbol combinations;



(2) a plurality of player signature lines adjacent respective advanced play qualification symbol combinations for signing by advanced play qualification symbol combination cardholders;

(3) a seal award winner symbol combination corresponding to a respective advanced play qualification symbol combination and a seal award window having open and closed positions respectively revealing and concealing said seal award symbol combination;

(4) a seal winner award amount payable to said seal winner symbol combination cardholder;

(5) a plurality of advanced play levels arrayed in a grid comprising a plurality of rows each corresponding to a respective advanced play level and including a plurality of break-open windows each having open and closed positions respectively revealing and concealing symbols thereunder, one of said windows in each level having a win symbol thereunder comprising a respective advanced play qualification symbol combination; each said win symbol identifying a player who has the individual play card with the corresponding advanced play qualifying symbol combination as the winner of a respective award value associated with said level and as being entitled to pick a window at the next level, if any;

(6) said win symbols only appearing once each in said grid;

(7) a plurality of identical advance indicator symbols unique from said win symbols, one of said advance indicator symbols being printed in each row and selectively concealed under a respective break-open window; and

(8) said advanced play levels having progressively higher award amounts associated therewith.

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5,743,525
**SPORTING EVENT WAGERING SYSTEM**
**George N. Haddad, 275 Victoria St., Costa Mesa, Calif. 92627**
**Filed Jul. 1, 1996, Ser. No. 675,276**
**Int. Cl.[6] A63F** *9/24*
**U.S. Cl. 273—139** **11 Claims**

1. A method of wagering on a sporting or racing event having a plurality of entrants, said method comprising:

selecting a number between zero and nine prior to the event;

wagering on the selected number;

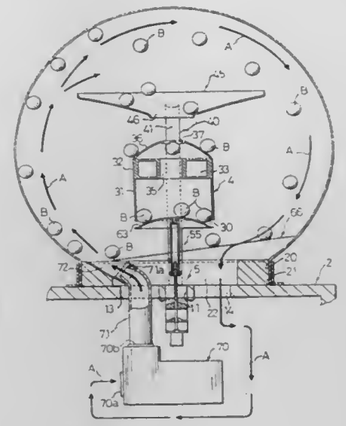
at conclusion of the event, adding predetermined criterion numbers of the entrants to obtain a sum; and

comparing the least significant digit of said sum thus obtained with the selected number to determine the outcome of the wager.

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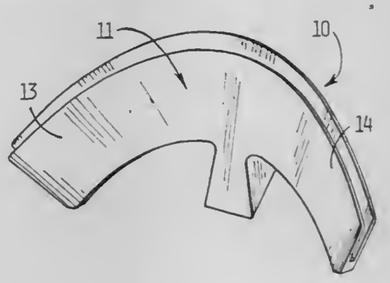
5,743,526
**BINGO GAME MACHINE**
**Haruo Inoue, Tokyo, Japan, assignor to Eagle Co. Ltd., Tokyo, Japan**
**Filed Dec. 23, 1996, Ser. No. 771,997**
**Claims priority, application Japan, Sep. 9, 1996, 8-261329; Sep. 10, 1996, 8-262462; Oct. 17, 1996, 8-297204**
**Int. Cl.[6] A63F** *3/06*; *9/00*
**U.S. Cl. 273—144 R** **22 Claims**

1. A bingo game machine comprising a base, a spherical vessel attached on an upper wall of the base, plural discrimination balls accommodated within the vessel, elevating means for elevating these discrimination balls, means for catching the elevated discrimination balls to detect them, a ball storage member for storing the discrimination balls discriminated by a detecting means into a ball storage portion, and a ball discharge unit provided, in a longitudinal direction, with a working rod member having an opening/closing cover for opening a lower end opening of the ball storage member, thus to continuously carry out elevation, detection, storage and discharge of the discrimination balls within the vessel.



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5,743,527
**PLAYING CARD HOLDER**
**Peter John Harley, 2 Liverpool Street, North Fitzroy, Victoria, Australia, 3068**
**PCT No. PCT/AU95/00060, § 371 Date Aug. 7, 1996, § 102(e) Date Aug. 7, 1996, PCT Pub. No. WO95/21007, PCT Pub. Date Aug. 10, 1995**
**PCT Filed Feb. 7, 1995, Ser. No. 696,853**
**Claims priority, application Australia, Feb. 7, 1994, PM 3706**
**Int. Cl.[6] A63F** *1/10*
**U.S. Cl. 273—150** **10 Claims**




1. A playing card holder comprising:

(a) a generally upstanding slotted body extending into wings, each of the wings having a bottom end defining a resting point for resting on a flat support surface, the slotted body being formed from a front plate and a rear plate with a substantially parallel sided elongated depression therebetween for receiving playing cards therein, the elongated depression being so curved and dimensioned that a playing card received in the depression is curved so that it is grasped lightly at three points, two of said three points being at the rear plate and the remaining one point of said three points being at the front plate, whereby the playing card is lightly restrained against movement; and

(b) a pillar which supports the slotted body, the pillar having a bottom to contact and rest on the flat support surface, the bottom ends of the wings and the bottom of the pillar being in

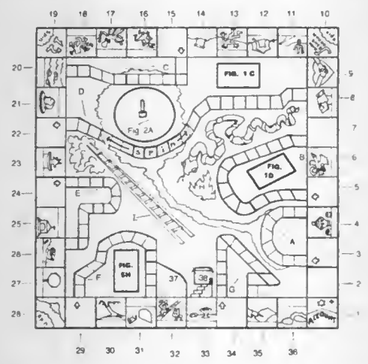
VOL 1209 ISS 4 AP 28 1998 UMI



a same plane, whereby the slotted body is supported at the election of a user by one of:
i) grasping the pillar by the fingers of one hand, and
ii) resting the bottom ends of the wings and the bottom of the pillar directly on the flat support surface.

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**5,743,528**
**INTEGRATED BOARD GAME APPARATUS**
**Anne Cecilia Downey-Jerome, 4008 Seven Hills Rd., Castro Valley, Calif. 94546**
**Filed Jun. 5, 1995, Ser. No. 461,689**
**Int. Cl.[6] A63F *3/00***
**U.S. Cl. 273—249** **20 Claims**



1. A Scriptural learning system representing sin and salvation in a lighthearted and contemporary context, the object of the game being to budget player movement and memorization of Bible verses with the random pacing of a direction selection spinner, and comprising in combination:
a rectangular game board having equilateral sides, a planar surface printed with maplike pictorial graphics, wherein a central geographic area thereof contains an insertion hole which is centered in said geographic area in the center of a circle;
a direction selection spinner with a circular platform having a central spindle which is secured beneath said board and tightened through said hole, wherein said top graphics on the board contain a circle encompassing said hole with a diameter line printed on the middle thereof dividing said semicircle into two semicircular portions: FORWARD and BACK, and the upper portion of said spinner is fashioned to resemble a boat with a prow and a pointer which boatlike upper portion is manually rotatable, compassing the platform;
an endless peripheral path of substantially square consecutive sectors having written instructions thereon and which peripheral path is square and having four corners thereon and said peripheral path being contiguous with central path tours, which tours extend away from the peripheral path and return thereto, said tours having various indicia thereon;
a plurality of peripheral path corner sectors with instructions to spin said direction selection spinner;
at least one central path tour beginning and ending on the peripheral path, and interrupted by a special sequential tour path portion keyed to the spinner;
a plurality of distinguishable moveable disciple game piece sets consisting of a primary playing token fashioned to resemble a disciple in modern garb, said primary token capable of movement on said peripheral paths and contiguous central tour paths, a win token racer fashioned to resemble a sheep said win token capable of movement on a win register, a loss token racer fashioned to resemble a goat said loss token capable of movement on a loss register, said game piece bases being color coded to each other, and which sets represent individual players;
a means for randomly selecting a number corresponding to distance movement of a token along the peripheral path and central path tours;
a plurality of tickets for admission to the central path tours, said tickets printed with identifying tour logos which correspond to tour logos printed on the game board;
a deck of FAITH activity cards printed on one side with Bible verse or bonus instructions, and on the reverse side with one of a plurality of types of FAITH card indicia corresponding to indicia on tour paths;
a deck of DOUBT cards printed on one side with historical puns and on the reverse side with a plurality of DOUBT card indicia correlated to indicia on tour paths;
a win register, independent of the paths, upon which a player's win racer is placed and moved toward an end win position;
a loss register, independent of the paths, upon which loss racers are placed and moved toward an end loss position;
an ACCOUNT/START station located at a peripheral path corner position; and
at least one specialty station, near the ACCOUNT/START station, said specialty station accessed by specific FAITH cards.

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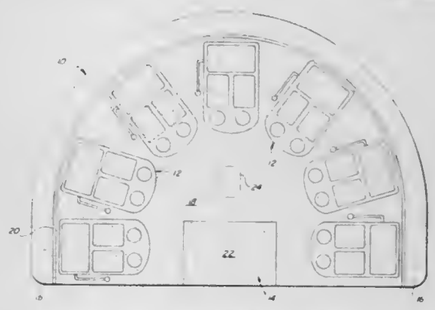
**5,743,529**
**BOARD GAME TO TEACH STEPS IN HOME CONSTRUCTION**
**Edward L. Haynes, 62 Back Bay Rd., Bowling Green, Ohio 43402**
**Filed Feb. 4, 1997, Ser. No. 800,647**
**Int. Cl.[6] A63F *3/00***
**U.S. Cl. 273—256** **16 Claims**



1. A game for teaching the construction of a residential dwelling in an entertaining manner, said game comprising:
a) a game board having a plurality of playing spaces arranged in a first or parametrical playing path around the perimeter of the game board, and a second or inner playing path proximate the middle of the game board but connected to said outer playing path, and a money station;
b) a simulated currency;
c) a random number generator means;
d) a plurality of visually distinguishable game pieces representing families wishing to construct a home, one for each player, said game pieces marking the location of a player on the game board;
e) a plurality of construction frames, one for each player, each of said construction frames having spaces to accept a predetermined number of construction flags; and
f) a plurality of construction flags obtained by players as they proceed around said game board, the first player to obtain said predetermined number of constructions flags, and thus fill all the holes in said construction frame, being the winner of the game.



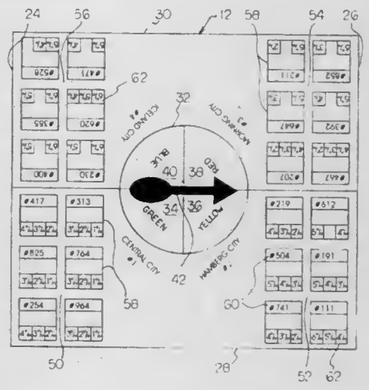
**5,743,530**
**METHOD AND APPARATUS FOR A CARD GAME**
**Alan T. Sklad; Daniel A. Sklad, both of Phoenix, and George A. Wolfe, Tempe, all of Ariz., assignors to Sklad Enterprises, Inc., Phoenix, Ariz.**
**Filed Mar. 24, 1997, Ser. No. 823,221**
**Int. Cl.[6] A63F *1/00***
**U.S. Cl. 273—274** **14 Claims**



1. A game for a one or more players comprising:
providing a modified pinochle deck of cards consisting of fifty-one cards, including three jokers in combination with forty-eight cards organized in four suits, each suit having six pairs of cards, each of the six pairs being of the same face value, wherein the face value of five of the pairs are aces, kings, queens, jacks and tens while the face value of the sixth pair is eight or less;
each player placing a first wager to participate in the game;
dealing two cards to each player and dealing a hole card;
giving each player the chance to double down the first wager with a second wager;
providing a hand for each player, the hand comprising the hole card and the two cards each player was dealt; and
resolving each player's first and second wagers based on said hand, wherein if a player's hand comprises a predetermined arrangement of cards, that player wins a corresponding preselected amount.

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**5,743,531**
**MATHEMATICAL INVESTMENT GAME**
**Elsie Rosa, 235 E. 96th St., #3A, New York City, N.Y. 10128**
**Filed Nov. 24, 1995, Ser. No. 562,407**
**Int. Cl.[6] A63F *3/00***
**U.S. Cl. 273—278** **7 Claims**



1. A new and improved mathematical investment game comprising, in combination:
a game board formed in a generally rectangular configuration with a first side edge, a second side edge, a front edge and a rear edge, the game board having a central region including a large circle divided into first, second, third and fourth equally sized quadrants, an arrow shaped spinner including a central pivot pin being rotatably coupled to the centerpoint of the circle, the first quadrant including the indicia GREEN imprinted therewithin, the indicia CENTRAL CITY #1 being imprinted upon the board outside the first quadrant of the circle, the second quadrant including the indicia YELLOW imprinted therewithin, the indicia HAMBERG CITY #2 being imprinted upon the board outside of the second quadrant of the circle, a third quadrant including the indicia RED imprinted thereupon, the indicia MORNING CITY #3 being imprinted upon the board outside the third quadrant of the circle, the fourth quadrant of the circle including the indicia BLUE imprinted therewithin, the indicia ICELAND CITY #4 being imprinted upon the board outside the fourth quadrant of the circle, the game board including first, second, third and fourth corner regions located adjacent to correspondingly numbered quadrants of the circle, each corner region including two columns of three property squares, each property square having indicia including # followed by a unique three digit numeral, each property square further having indicia including between two and three single numerals ranging between one and six, each numeral being followed by %;
a hand held calculator formed in a generally rectangular configuration and including an angled upper surface with a key pad and a liquid crystal display;
a plurality of color chips comprising green, yellow, red and blue color groupings;
a numeric die having six sides and including between one and six dots on each side, a YES/NO die having three sides including the indicia YES and three sides including the indicia NO;
play money including a plurality of bills with varying denominations, the varying denominations being imprinted upon the bills as numerals, the numerals including 1, 5, 10, 20, 50, 100, 500, 1,000, 5,000 and 10,000;
a plurality of I.D. cards, each I.D. card having indicia including a property number and percentage rate corresponding to the indicia on a property square, each I.D. card having a rear surface including the indicia SOLD imprinted thereupon, a plurality of agreement sheets, each agreement sheet including a carbon copy attachment, a bag including the indicia LOTTO thereupon, a bag including the indicia INTEREST thereupon, a plurality of small cards, the small cards having indicia including lose 1-4%, gain 1-10%, try again, and pick a percentage free; and
the game having rules indicating that the game commences with each player being assigned twenty thousand dollars in play money, each player initially spinning the arrow to randomly select a color quadrant, the color quadrant selected determining the corner region and color chip assigned to each player, the green chips being designated eight percent, the yellow chips seven percent, the red chips six percent and the blue chips five percent, after the initial selection of a color quadrant each player in turn spinning the arrow to randomly select a corner region for an individual turn, a player rolling the numeric die to select a property square in the selected corner region, the yes/no die then being rolled, a yes result requiring the player to purchase a percentage of the property, the properties being worth varying amounts, the amount to be paid being calculated by multiplying the property value by a determined percentage amount, the object of the game being to sell at least four properties, the player with the most money after all of the players have sold at least four properties being deemed the winner of the game.

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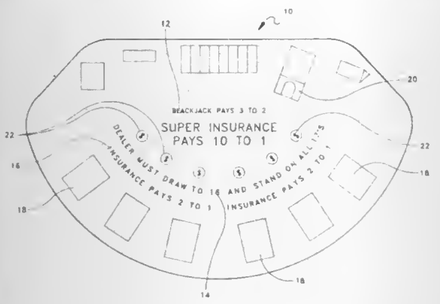


**5,743,532**

## METHOD OF MAKING A SIDE BET DURING BLACKJACK

William M. Lafferty, 109 Diana Dr., Woonsocket, R.I. 02895

Filed Jul. 2, 1997, Ser. No. 887,436
Int. Cl.[6] A63F *1/00*
U.S. Cl. 273—292 6 Claims




1. In a method of playing blackjack wherein

a player makes an initial wager,

a dealer distributes two cards to the player and two cards to the dealer, one of the cards to the dealer being revealed and the other being face down,

the player requests additional cards until the player achieves a desired numerical value of cards less than or equal to a value of "21", the game terminating when the numerical value is greater than "21" thereby resulting in the player losing the initial wager,

the dealer takes additional cards to achieve a desired numerical value of cards less than or equal to a value of "21" and greater than the value of the player's cards or greater than or equal to "17", and

the initial wager and a predetermined amount is awarded to the player or the initial wager is awarded to the dealer according to a compared numerical value of the dealer's cards versus the player's cards;

wherein the improvement to the method comprises the steps of, prior to the player requesting additional cards, the player being given the opportunity to place a side bet only if the dealer's revealed card has a value of "10", the player being awarded a predetermined amount when the dealer's face down card has a value of "11", the player losing the side bet when the dealer's face down card has a value other than "11".

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**5,743,533**

## BACK UP TURN FUNCTION FOR DART MACHINE

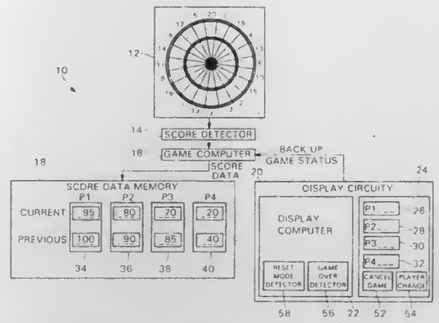
Robert H. Wiles, Yarmouth, Me., and John C. Nydick, Havertown, Pa., assignors to Merit Industries, Inc., Bensalem, Pa.

Filed Aug. 2, 1996, Ser. No. 691,971
Int. Cl.[6] F41J *5/00*
U.S. Cl. 273—371 16 Claims

1. In a dart game machine including electronically stored game score data which is automatically updated based upon each player's turn throwing one or more darts, a method of returning the score data to a previous state, the method comprising:

(a) activating a reset mode upon the happening of an event in the game;

(b) backing up the game by one or more turns to the beginning of a player's turn; and




(c) replacing current game score data with game score data in effect just before the turn in which the game is backed up to.

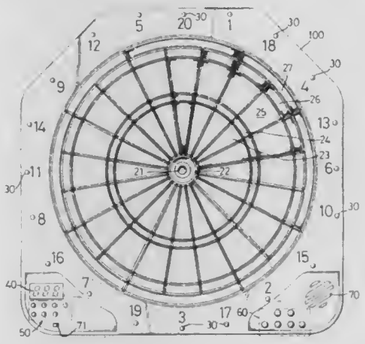
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**5,743,534**

## DARTS TARGET WITH TARGET INDICATION AND ELECTRICAL SCORING

John C. Pan, No. 81, Tehsheng Rd., Taya Hsaing, Taichung Hsien, Taiwan

Filed Oct. 28, 1996, Ser. No. 738,548
Int. Cl.[6] F41J *3/02*
U.S. Cl. 273—371 15 Claims



1. A darts target with target indication and electrical scoring comprising:

a target defining a plurality of target areas;

a plurality of pilot lamps arranged at positions on the target for highlighting the corresponding target areas, the plurality of pilot lamps constructing a matrix circuit connected with a display output port of a microcomputer disposed within the target; and

a control panel disposed below the target, the control panel including an indicator for displaying a score and a set of function keys for selecting various game modes,

the function keys being capable of selecting a random given mode, in which the microcomputer randomly controls any target area to be highlighted as an effective target in order to record a score only when the effective target is hit.

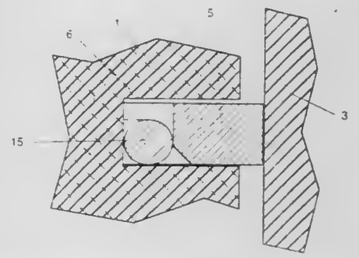


**5,743,535**

## COMPRESSION PISTON RING SEAL

Sydney Gilbert Hodgins, Port Augusta, Australia, assignor to Auto-Motive Improvements Pty Ltd., Fullarton, Australia

PCT No. PCT/AU94/00473, § 371 Date Sep. 26, 1996, § 102(e) Date Sep. 26, 1996, PCT Pub. No. WO95/27133, PCT Pub. Date Oct. 12, 1995
PCT Filed Aug. 15, 1994, Ser. No. 718,437
Claims priority, application Australia, Mar. 31, 1994, PM4831
Int. Cl.[6] F16J *9/06*
U.S. Cl. 277—165 4 Claims



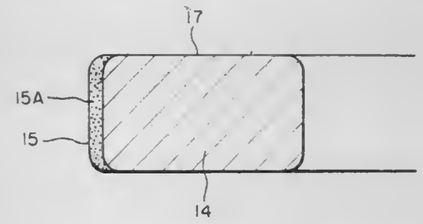
1. A piston having a diameter and of a type including a compression ring groove having an axial width and a radial depth, a compression ring having an axial thickness about equal to the axial width of the compression ring groove and being mounted in the compression ring groove, the compression ring being of a cross-sectional shape having an inner surface and upper and lower faces and a recess between its inner surface and its lower face, a sealing means in the compression ring groove behind the compression ring wherein the sealing means is an O-ring of a heat resistant elastomeric material, of a cross-sectional shape selected from the group consisting of circular and oval, and wherein the O-ring has an axial dimension of between about 50% and 100% of the axial thickness of the compression ring, said O-ring being configured to at least partially deform into the recess during the compression stroke of the piston.

**5,743,536**

## PISTON RING

Toshiro Komuro; Masaki Ooya, and Terno Imai, all of Kashiwazaki, Japan, assignors to Kabushiki Kaisha Riken, Tokyo, Japan

Division of Ser. No. 291,075, Aug. 17, 1994. This application Oct. 3, 1996, Ser. No. 724,898
Int. Cl.[6] F16J *9/26*
U.S. Cl. 277—235 A 7 Claims



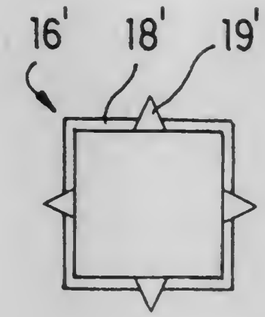

1. A piston ring comprising a substrate in the form of a ring and having an outer peripheral surface and a coating provided on the peripheral surface, said coating comprising chromium nitride and having a structure of columnar crystals in a tension fracture surface of the coating, the columnar crystal being aligned toward the coating surface from the substrate surface.

**5,743,537**

## METAL LAMINATE GASKET WITH CONNECTING DEVICE

Kenji Yamada, Tokyo, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1996, Ser. No. 764,174
Claims priority, application Japan, Dec. 21, 1995, 7-349910
Int. Cl.[6] F16J *15/08*
U.S. Cl. 277—236 5 Claims




1. A metal laminate gasket comprising:

a first metal plate having a main portion and a hollow member extending substantially perpendicularly from the main portion, said hollow member having a polygonal shape with linear sides and a plurality of projections formed at one end of the hollow member to project from at least some of the linear sides, each of the projections having a bottom portion with a length less than that of the linear side and connected to one of the linear sides, and

a second metal plate situated under the first metal plate to constitute the metal laminate gasket together with the first plate, said second plate having a hole in a polygonal shape with a size slightly larger than an outer size of the hollow member so that when the first and second plates are assembled, the hollow member is fitted in the hole and the projections are bent around the hole under the second plate to thereby securely connect the first and second plates.

**5,743,538**

## CHUCK ASSEMBLY HAVING A PULL UP FEATURE

Peter J. Schmitt, Ontario; Eugene A. Swain, Webster; Kamran U. Zaman, Pittsford, and Alan D. Smith, W. Henrietta, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 5, 1996, Ser. No. 692,108
Int. Cl.[6] B23B *31/40*, B66C *1/56*
U.S. Cl. 279—2.17 9 Claims

1. A chuck assembly defining a longitudinal axis for internally holding a hollow substrate having an open first end and a second end comprising:

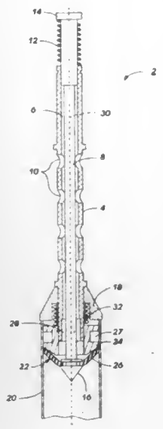
(a) an alignment shoulder positioned along the longitudinal axis;

(b) an end portion, positioned along the longitudinal axis, that is adapted to be inserted into the substrate through the open first end and comprised of a polymeric member, wherein the polymeric member has a changeable width including a smaller width to permit insertion of the polymeric member into the substrate and a larger width to contact the polymeric member with the substrate inner surface, and the entire polymeric member is moveable along the longitudinal axis; and

(c) a width changing apparatus fastened to the polymeric member, wherein the polymeric member, which is in contact with the substrate inner surface, pulls the substrate a distance along

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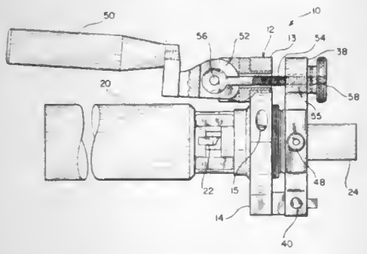
the longitudinal axis towards the alignment shoulder when the polymeric member moves towards the alignment shoulder.

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**5,743,539**
**QUICK SETTING AND RELEASE ACTUATOR FOR WORK HOLDER**

**Jerald W. VanderPol, Shingle Springs; Mark A. Marshall, Sacramento; Donald T. Stanley, Lincoln, and Clement Tremblay, Citrus Heights, all of Calif., assignors to Tri Tool Inc., Rancho Cordova, Calif.**

**Filed Jun. 10, 1996, Ser. No. 660,884**
**Int. Cl.[6] B23B** *31/20;5/16*
**U.S. Cl. 279—58** **27 Claims**



1. A quick setting and release actuator for cooperating with an axially movable chuck for a tubular workpiece comprising:

an anchor member;

a thrust member carrier pivotally mounted for forward and rearward pivotal motion relative to the anchor member about an arcuate path such that the carrier approaches and recedes from the anchor member during at least part of its forward and rearward pivotal motion, respectively;

at least one thrust member mounted on the carrier and which is movable with the carrier towards and away from the anchor member upon forward and rearward pivotal motion of the carrier; and

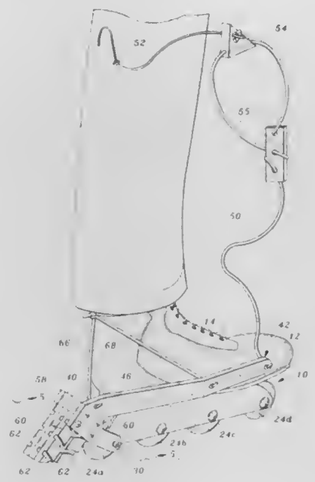
a locking device for securing the carrier at a forward pivoted position and for preventing pivotal motion of the carrier away from the anchor member at said forward pivoted position; and

wherein said at least one thrust member is mounted for pivotal motion relative to the carrier.

**5,743,540**
**IN-LINE ROLLER SKATE BRAKE SYSTEM**

**Donald Wilhelm, III, 1918 Marguerite Ave., Pleasant Hill, Calif. 94523**

**Filed Apr. 9, 1996, Ser. No. 631,698**
**Int. Cl.[6] A63C** *17/14*
**U.S. Cl. 280—11.2** **14 Claims**



1. In combination:

an in-line roller skate including elongated platform means having a front end and a back end for supporting a skater's foot, frame means connected to said elongated platform means, extending along said elongated platform means, and projecting downwardly from said elongated platform means, and a row of in-line wheels, including a rear wheel rotatably mounted on said frame means;

a rear wheel support extending through said rear wheel and through said frame means rotatably supporting said rear wheel;

a brake actuator arm pivotally mounted relative to said frame means, said brake actuator arm having a first arm segment pivotally connected to said rear wheel support and extending upwardly and rearwardly from said rear wheel support and a second arm segment connected to said first arm segment at a location on said first arm segment spaced from said rear wheel support, said second arm segment extending forwardly from said first arm segment a substantial distance adjacent to and along said elongated platform means in the general direction of the front end of said elongated platform means and having a distal end adjacent to the front end of said elongated platform means;

a brake pad support affixed to said first arm segment at a location spaced from said rear wheel support;

brake pad means supported by said brake paid support extending laterally from said first arm segment behind said rear wheel and extending downwardly from said brake pad support;

biasing means connected to said brake actuator arm biasing said brake actuator arm to maintain said brake pad means out of engagement with a skate support surface until sufficient upwardly directed force is applied to said brake actuator arm at or adjacent to the distal end of said second arm segment to overcome the bias exerted by said biasing means to pivot said brake actuator arm and bring said brake pad means into braking engagement with the skate support surface behind said in-line roller skate; and

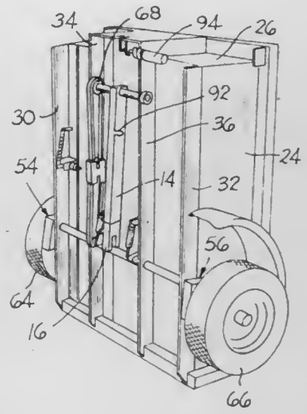
a support arm pivotally connected to said rear wheel support at a location spaced from said brake actuator arm, said support arm being fixedly attached to said brake pad support.



**5,743,541**
**STOWABLE UTILITY TRAILER**

**Michael James Cook, 8112 Pierpoint Dr., Harrison, Tenn. 37341**

**Filed Jun. 11, 1996, Ser. No. 661,826**
**Int. Cl.[6] B62D** *63/06*
**U.S. Cl. 280—43.13** **19 Claims**



1. A stowable trailer readily convertible between an operative towable configuration, and a stowable configuration, comprising a bed including a floor, a pair of opposite spaced apart sides, a front and a rear end, a tow bar having a free end extending from the front of the trailer when the trailer is in the operative towable configuration and a second end, a stud shaft, means for journally mounting said stud shaft beneath the floor, means for fastening said second end of said tow bar to said stud shaft for rotating said stud shaft and permitting said tow bar to be manually rotated from said operative configuration to a stowable position with the free end beneath said floor, a pair of wheels including at least portions extending beyond said floor in the operative configuration for engaging a road surface, one wheel extending beyond each side of said bed, a wheel support shaft, means for journally mounting said wheel support shaft beneath said floor spaced from said stud shaft, means for connecting said wheels to said support shaft for permitting said wheels to rotate relative to said support shaft, and motion transfer means responsive to rotation of said stud shaft for rotating said wheel support shaft relative to said bed when said bed is set on said rear end to move said wheels from the operative configuration to the stowable configuration with substantially no part of said wheel extending beyond said floor.

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**5,743,542**
**REFUSE CONTAINER HAVING RETRACTABLE WHEEL ASSEMBLY**

**Rex Mast, Orrville, and Trevor Rasmussen, Fairlawn, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio**

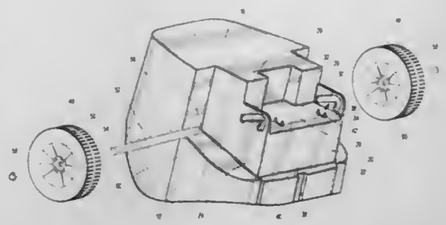
**Filed Jan. 31, 1996, Ser. No. 594,153**
**Int. Cl.[6] B62B** *1/00*
**U.S. Cl. 280—47.26** **30 Claims**

1. A wheeled storage container comprising:

a container comprising sidewalls that extend from an upper rim to a bottom floor surface and define between the sidewalls an internal storage compartment;

a wheel assembly comprising an elongate axle rod and first and second spaced apart wheels connected to opposite ends of the axle rod;

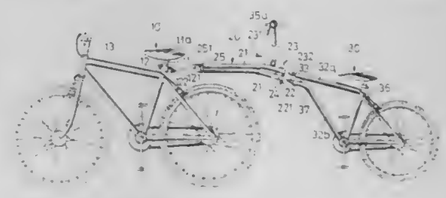
at least one axle rod receiving slot formed in a lower end of the container, the slot having a concave shape relative to the bottom floor surface, the slot further having an inboard end and an outboard end and a width dimension sufficient to closely receive the wheel assembly axle rod therethrough, the axle rod moving along the slot from an inwardmost nested position to an outwardmost operational position, whereby increasing the distance between the wheels and an axial centerline of the container body.



**5,743,543**
**BICYCLE**

**Ping-Jan Chiu, No. 1146, Chung-Shan Rd., Ta-Chia Chen, Taichung Hsien, Taiwan**

**Filed Jun. 10, 1996, Ser. No. 661,137**
**Int. Cl.[6] B62K** *27/00*
**U.S. Cl. 280—231** **4 Claims**



1. A bicycle comprising:

a first bicycle body including a vertical seat post for mounting a seat, and a first joint member which is provided on said seat post, said first joint member including a fastening block which is sleeved on said seat post, and a projecting portion which extends rearwardly from said fastening block;

a connecting frame extending longitudinally and rearwardly from said projection portion, said connecting frame having a front end with a second joint member to be releasably connected to said projecting portion, and a rear forked end with a pair of separate first connecting portions, said second joint member of said connecting frame being pivoted to said projecting portion of said first joint member;

a second bicycle body including a top tube and bottom tube, both of which respectively have ends forming second connecting portions, said second connecting portions being respectively connected to said first connecting portions; and

fastening means for fastening said first connecting portions to said second connecting portions.

**5,743,544**
**WHEELCHAIR DRIVE SYSTEM WITH RATCHET AND WHEEL LOCK**

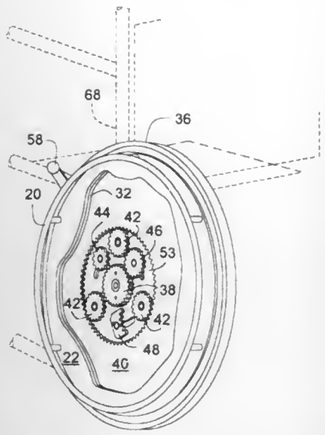
**Michael J. Weaver, 105 Airport Rd., Lot 145, St. Simons Island, Ga. 31522**

**Filed May 31, 1996, Ser. No. 656,105**
**Int. Cl.[6] B62M** *1/14*
**U.S. Cl. 280—249** **12 Claims**

1. A single-speed geared hub-and-wheel assembly having an axis for use with a manually operated wheelchair vehicle, whereby individuals with limited strength or impairment of function can more easily propel themselves, the assembly comprising:

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(a) an axle, defining the axis around which the hub-and-wheel assembly rotates

(b) a drive wheel assembly, including a drive wheel, an internal gear, and a tire, said internal gear being supported by a plurality of circumferentially spaced supporting gears

(c) a driver, supported on said axle and rigidly connected to a handring, forming a driver assembly which is rotatable forward or rearward by manually rotating said handring; and

(d) a drive engagement gear between said driver and said drive wheel assembly.

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**5,743,545**

**WHEELCHAIR WITH ADJUSTABLE FRAME**

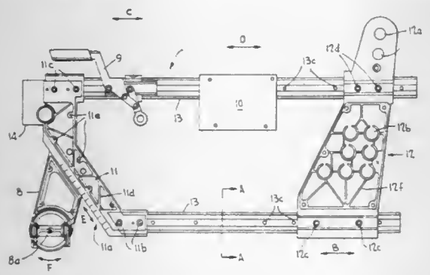
**Karl-Heinz Kunze, Kiel, and Peter Mackert, Lammershagen, both of Germany, assignors to Orthopedia GmbH, Kiel, Germany**

**Filed Sep. 7, 1995, Ser. No. 525,376**

**Claims priority, application European Pat. Off., Sep. 13, 1994, 94114370**

**Int. Cl.[6] B62M *1/14***

**U.S. Cl. 280—250.1** **23 Claims**




1. Wheelchair comprising two facing, interconnected, adjustable sideframes to which are fitted a seat and backrest, wherein each sideframe includes a front rigid frame part and a rear rigid frame part which are adjustably interconnected in a longitudinal direction of the wheelchair by two elongated frame sections, said two elongated frame sections being fit into corresponding guides on each of the front rigid frame part and the rear rigid frame part so that each rigid frame part in totality can be displaced in the longitudinal direction of said two elongated frame sections and can be fixed in different longitudinal positions along said two elongated frame sections, and wherein on the rear rigid frame part of each sideframe a driving wheel is fitted and on the front rigid frame part of each sideframe a guide wheel is fitted.

**5,743,546**

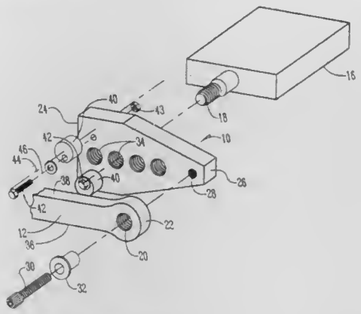
**BICYCLE CRANK ARM SHORTENER**

**Paul G. Borthwick, 214 Rainbow Dr., Marshalltown, Iowa 50158**

**Filed Mar. 12, 1996, Ser. No. 614,049**

**Int. Cl.[6] B62M *3/02***

**U.S. Cl. 280—259** **7 Claims**




6. A bicycle crank arm shortener.

said shortener having inner and outer ends, opposite sides, and opposite side edges, said shortener including crank arm fastening means at said outer end for connecting said shortener to a pedal fastening means on a crank arm, and said shortener including a plurality of pedal fastening means along the shortener longitudinal length for selectively positioning a pedal longitudinally inwardly of said crank arm fastening means, and

a pair of adjustable spaced apart cam means on one side of said shortener at the inner end to receive crank arms having varying widths there between with said cam means engaging a crank arm along its opposite side edges.

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**5,743,547**

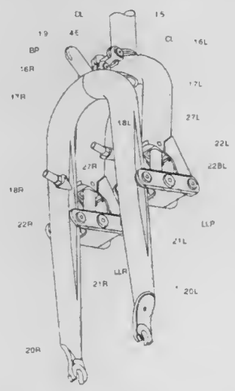
**HIGH EFFICIENCY, HIGH PERFORMANCE LEADING LINK FORK DESIGN FOR BICYCLE FRONT WHEEL SUSPENSIONS**

**Darrell W. Voss, 687 Coal Creek Rd., and Gary G. Klein, 103 Smith Dr., both of Chehalis, Wash. 98532**

**Filed Apr. 6, 1994, Ser. No. 224,478**

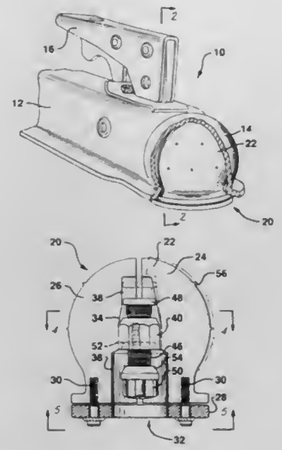
**Int. Cl.[6] B62K *25/08***

**U.S. Cl. 280—277** **25 Claims**




1. A front fork bicycle suspension device comprising a fixed fork with steerer tube, bearings, crown and fork blades, said fork blades being hollow shortened fixed fork blades, a front moving fork assembly with integral front blades having upper and lower ends and wheel attachments at the lower end of each front blade, respectively, lower linkage means including a pair of lower links linking said front moving fork to said fixed fork blades, said lower links having forward and rear ends, the forward end of each lower link being pivotally attached to each of the moving fork blades intermediate said upper and lower ends of said front moving fork, and the rear end of the each lower link being pivotally attached near the lower end of the respective fixed fork shortened blade, respectively, and an upper link means having a forward end which is pivotally connected at the upper end of said moving fork and a rear end which is pivotally connected to said fixed fork near the lower end of said steerer tube, said lower links having lengths, positions and angles which are configured such that for a stroke starting from a full extension, the wheel attachments move upwards and substantially rearward initially, gradually moving more directly upwards as the stroke progresses to full stroke.






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**5,743,548**

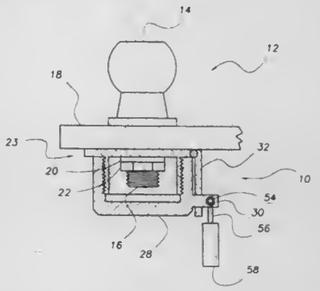
**TRAILER BALL GUARD**

**Terrance Gaspard, 1343 Holiday Pl., New Orleans, La. 70114**

**Filed Aug. 22, 1995, Ser. No. 517,921**

**Int. Cl.[6] F16B *41/00***

**U.S. Cl. 280—507** **3 Claims**




1. A trailer ball guard for use with a trailer hitch having a tow bar connected to a towing vehicle and a ball having a threaded ball shaft mounted atop the tow bar by a mounting washer and a mounting nut threaded onto the ball shaft, said trailer ball guard comprising:

a sleeve assembly adapted to be connectable between said tow bar and said mounting nut threaded onto said ball shaft;

a cap connectable to said sleeve assembly; and

a locking mechanism in connection between said sleeve assembly and said cap adapted for lockably entrapping said ball shaft and said mounting nut therebetween;

said locking mechanism including a hasp bolt extending from said cap, said hasp bolt defining an eyelet therethrough; and

a hasp having a first end pivotedly connected to said sleeve assembly, said hasp forming a bolt aperture for disposing said hasp bolt;

said hasp bold being disposable through said bolt aperture and adapted to receive a bolt of a padlock through said eyelet in a manner to lock said cap to said sleeve assembly.

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**5,743,549**

**TRAILER LOCKING DEVICE**

**Emmanuel Jackson, 5 Grey Fox Sq., Taylors, S.C. 29687**

**Filed Feb. 1, 1996, Ser. No. 595,739**

**Int. Cl.[6] B60D *1/06***

**U.S. Cl. 280—507** **17 Claims**

1. A trailer locking device adapted to be fixedly inserted into a cup of a trailer hitch, said locking device comprising:

a body;

said body formed by an outer shell and a base, said outer shell formed by a plurality of moveable plates, said moveable plates being moveable with respect to said base and expandable between a cup engaging and cup nonengaging position, and wherein said outer shell is capable of engaging and disengaging a top and a side of a cup of a trailer hitch, said outer shell defining an inner cavity; and

a locking element received within said inner cavity, said locking element being moveable towards and away from said outer shell, said locking element being configured to be moved into contact with said movable plates causing said shell to expand and assume said cup engaging position;

a key receiving member connected to said locking element, said key receiving member being adapted to receive a key, said key receiving member being capable of moving said locking element towards and away from said outer shell, and wherein said locking element engages said outer shell to move said outer shell to a cup engaging position and said locking element disengages said outer shell to cause said outer shell to move to a cup nonengaging position.

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**5,743,550**

**ELECTRONICALLY CONTROLLED SAFETY BINDING FOR SKIS AND SNOW BOARD**

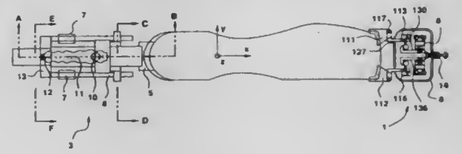
**Otto Frohwein, Nadistrasse 12, D-80809 München, Germany**

**Filed Jan. 30, 1995, Ser. No. 387,654**

**Claims priority, application Germany, Feb. 12, 1994, 44 04 537.9; Dec. 23, 1994, 44 46 260.3**

**Int. Cl.[6] A63C *9/08***

**U.S. Cl. 280—612** **10 Claims**




1. An electronically controlled safety binding, comprising:

a hold-down member rotatable about a first axis and biased towards an open position;

a locking rod connected to said hold-down member to be rotatable therewith, said locking rod also being movable axially in a transverse direction with respect to the first axis;

a spring biasing said locking rod against movement in the transverse direction;

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a locking roll connected to the locking rod to be rotatable and movable therewith;

a locking lever having a resistance portion pressed against the locking roll for holding said locking rod and said locking roll in a locked position to prevent said hold-down member from rotating into the open position, said locking lever also being rotatable about a second axis in response to forces transmitted to said hold-down member, wherein a first predetermined amount of force transmitted to said hold-down member rotates said locking lever sufficiently to cause said locking roll to move over the resistance portion of said locking lever and release said hold-down member into the open position;

a piezoelectric crystal which triggers, in response to a second predetermined amount of force transmitted to said hold-down member, an ignition of an explosive charge; and

a bolt movable in response to the ignition of the explosive charge and adapted to move the locking roll over the resistance portion of said locking lever to release the hold-down member into the open position.

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**5,743,551**

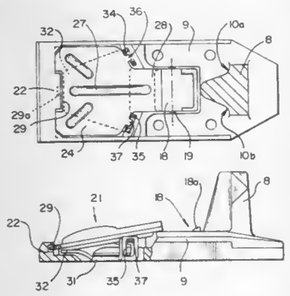
**RETENTION ELEMENT FOR A BOOT ON A GLIDING BOARD**

**Gilles Renaud Goud, Annecy; Pierre Vuillermet, Annecy le Vieux, and Philippe Schary, Cruseilles, all of France, assignors to Salomon S.A., Metz-Tessy, France**

**Filed Sep. 6, 1995, Ser. No. 524,026**

**Int. Cl.[6] A63C *9/08***

**U.S. Cl. 280—634** **14 Claims**




1. A retention element for retaining a boot on a gliding board, said retention element comprising:

a retention jaw adapted to maintain an end of the boot supported against the gliding board;

a body carrying said jaw, said body being adapted to be supported with respect to the gliding board;

a base plate carrying said body, said base plate being adapted to be affixed to the gliding board;

a spring carried by said body, said retention jaw being mounted to move in opposition to a return force exerted by said spring; and

a compensation mechanism to lower said return force of said spring, said compensation mechanism comprising:

a support plate for supporting at least a portion of the boot, said support plate having a first support zone in constant support with respect to said base plate at a first longitudinal end of said support plate, said support plate further second support zone and two carrying zones at a second longitudinal end of said support plate, each of said two carrying zones being situated laterally on a respective side of said second support zone and being positioned for limited upward vertical movement by engagement with an abutment fixed with respect to said base plate upon lateral rocking of said support plate from a non-laterally rocked support position; wherein two lines of support about which said support plate is pivotal are defined by a respective one of said carrying zones at said second end of said support and said first support zone at said first end of said support plate;

an activation element having a portion mounted to have a vertical component of movement with respect to said base plate, said second support zone of said support plate resting upon said portion of said activation element; and

a connection between said activation element and said jaw to transmit movement of said activation element to said jaw.

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**5,743,552**

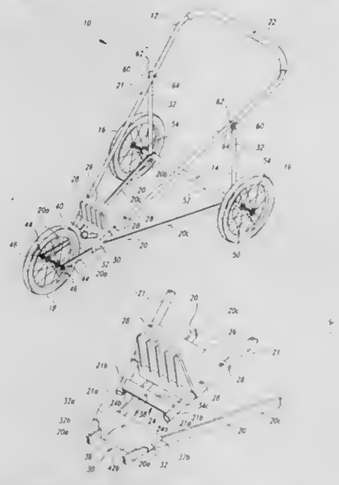
**BABY STROLLER**

**Philip A. Baechler; Michael F. Arnold, and Joseph P. Delorme, all of Yakima, Wash., assignors to Racing Strollers, Inc., Yakima, Wash.**

**Filed Jan. 5, 1996, Ser. No. 583,566**

**Int. Cl.[6] B62B *7/06***

**U.S. Cl. 280—642** **28 Claims**



1. A foldable baby stroller, comprising:

a forward wheel having a laterally extending axle with left and right axle end portions;

a laterally extending tubular rear axle, said axle having left and right ends;

a left rear wheel mounted to said left axle end;

a right rear wheel mounted to said right axle end;

left and right laterally spaced-apart base frame members, said left and right base frame members each having a forward end portion and a rearward end portion, said forward end portion having a flat portion with a notch therein sized to receive a corresponding one of said left and right forward wheel axle end portions therein with said forward wheel positioned between said forward end portions of said left and right base frame members, said forward end portions of said left and right base frame members being rigidly connected together by a base frame attachment member extending therebetween at a location rearward of said front wheel, said rearward end portion having a flat portion with a hole formed therein sized to rotatably receive said rear axle therein;

a spacer tube coaxially mounted on said rear axle between said rearward end portions of said left and right base frame members and extending fully therebetween, said spacer tube having left and right end walls sized relative to said holes in said rearward end portions of said base frame members to prevent inward movement of said rearward end portions of said base frame members on said rear axle;

left and right generally upright frame members each having an upper end portion and a lower end portion, said lower end portion of said left upright frame member being fixedly attached to said rear axle toward said left end thereof and laterally outward of said rearward end portion of said left base frame member to prevent laterally outward movement of said rearward end portion of said left base frame member on said rear axle, and said lower end portion of said right upright frame member being fixedly attached to said rear axle toward said right end thereof and laterally outward of said rearward end portion of said right base frame member to prevent laterally outward movement of said rearward end portion of said right base frame member on said rear axle;

left and right inclined upper frame members, each having a lower forward end portion and a raised rearward end portion, the raised rearward end portions being attached together to form a handle for gasping by a user, said forward end portions of said left and right upper frame members being rigidly connected together to move as a unit by an upper frame attachment member extending therebetween and being removably attached to said left and right base frame members toward said forward end portions thereof, said upper end portions of said left and right upright frame members being pivotally attached to said left and right upper frame members, respectively, at a position toward said rearward end portions of said left and right upper frame members;

a coupler attached to at least one of said left and right base frame members, said coupler including a lower coupler member and an upper coupler member spaced apart therefrom to define a substantially unobstructed receiver opening therebetween sized to releasably receive therein said forward end portions of said left and right upper frame members and said upper frame attachment member; and

a lock pin, at least said upper coupler member and said upper frame attachment member each having a hole therein sized and aligned to receive said lock pin to releasably secure said forward end portions of said left and right upper frame members in said receiver opening.



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**5,743,553**

**ACTIVE SUSPENSION SYSTEM**

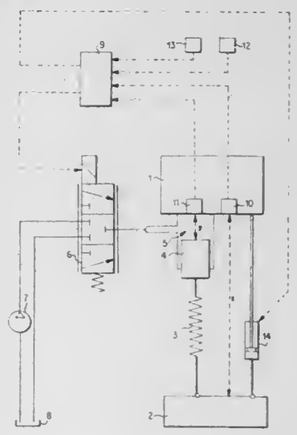
**Guenter Nagel, Esslingen, and Martin Winkler, Schwaikheim, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany**

**Filed Apr. 24, 1995, Ser. No. 427,047**

**Claims priority, application Germany, Apr. 22, 1994, 44 14 022.13**

**Int. Cl.[6] B60G *11/26***

**U.S. Cl. 280—707** **9 Claims**



1. An active suspension system for motor vehicles, comprising:

a suspension unit arranged between a sprung mass and an unsprung mass, said suspension unit having a passive, uncontrolled spring element and, arranged in series with said spring element, a hydraulic displacer unit having a controllable stroke adjustment;

displacement sensors associated with the suspension unit, said displacement sensors generating both a first signal representing a respective stroke position (x) of the unsprung mass relative to the sprung mass, and a second signal representing a respective stroke position (y) of the displacer unit;

a further sensor generating a third signal representing a vertical acceleration of the sprung mass;

a regulation system generating a fourth signal, $(x-y)_{a,real}$, representing a difference between the first and second signals, said difference representing a suspension force of the uncontrolled spring element, and controlling the stroke adjustment of the displacer unit in accordance with a comparison of said fourth signal with a required value, $(x-y)_{required}$, and the third signal for only dampening vertical motions of the sprung mass.

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**5,743,554**

**AIRBAG ARRANGEMENT**

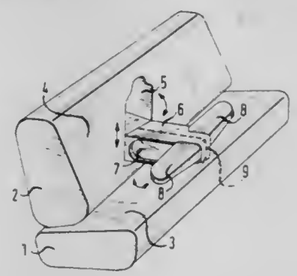
**Matthias Friedrich, Hiddenhausen, and Volkmar Wölfl, Vlotho, both of Germany, assignors to van Riesen GmbH u. Co. KG, Germany**

**Filed Jul. 12, 1996, Ser. No. 682,849**

**Claims priority, application Germany, Jul. 13, 1995, 195 25 441.4**

**Int. Cl.[6] B60R *21/22***

**U.S. Cl. 280—730.1** **7 Claims**




1. An airbag arrangement for a vehicle seat of a motor vehicle, characterized in that an airbag is arranged at an end of a carrier fastened on a side of the vehicle seat or on a back rest surface of the vehicle seat such that a person seated neighbouring the carrier is essentially protected towards the front by the airbag, said carrier being pivotably mounted about an axis from a rest position into a working position and vice versa, said axis lying approximately parallel to a cutting axis formed between a seat surface and the back rest surface; and that the carrier together with airbag located thereon, in the rest position, lies in a recess in the seat surface or the back rest surface and is flushly occluded with this surface.

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**5,743,555**

**AIR ACTUATED HORN SWITCH FOR A VEHICLE STEERING WHEEL ASSEMBLY**

**Sheryar Durrani, Canton, Mich., assignor to Breed Automotive Technology, Inc., Lakeland, Fla.**

**Filed Jun. 25, 1996, Ser. No. 674,654**

**Int. Cl.[6] B60R *21/16***

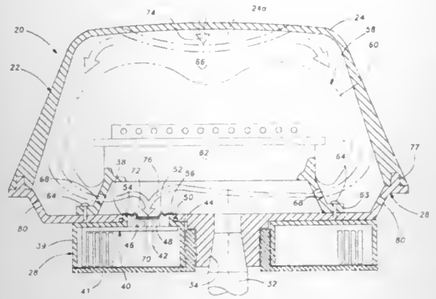
**U.S. Cl. 280—731** **11 Claims**

1. A steering wheel assembly comprising:

a steering wheel body having a hole;

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a flexible outer cover, said cover and steering wheel body defining a substantially airtight chamber;

a clock spring having a collar and a ribbon cable having circuits traces at an end thereof adjacent said collar, said collar received in said hole and said traces controlling a horn function;

a movable member in line with said hole and including an electrically conductive material on a side of the moveable member which is distal from the flexible outer cover, said electrically conductive material selectively contacting said circuit traces which control a horn function; and

wherein compressing said cover drives said movable member and said electrically conductive material against said traces to actuate said horn function.

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**5,743,556**

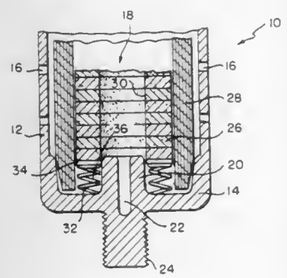
**INFLATOR FLOW INHIBITOR**

**David W. Lindsey, 1534 Shadow Valley Dr., Ogden, Utah 84403, and Darrin L. Johnson, 16158 E. Glenbrook Blvd., Fountain Hills, Ariz. 85268**

**Filed Apr. 2, 1997, Ser. No. 832,427**

**Int. Cl.[6] B60R *21/28***

**U.S. Cl. 280—736** **17 Claims**



1. An inflator of a vehicle safety restraint system having a flow inhibitor system which forces ignition gases through a gas generant of the inflator, comprising:

a housing having a gas generant chamber;

means for generating an ignition gas located in the housing;

a gas generant disposed within the gas generant chamber for generating an inflation gas;

means for supporting the gas generant disposed in the housing, the supporting means being disposed within a region of the gas generant chamber; and

means for inhibiting the flow of the ignition gas into the region of the supporting means, wherein the inhibiting means is disposed adjacent the supporting means, such that the ignition gas does not enter the region of the supporting means but passes solely through the gas generant.

**5,743,557**

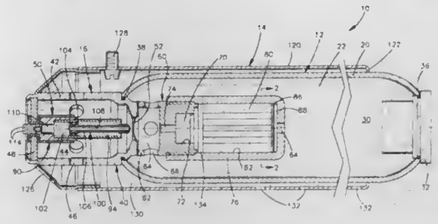
**HYBRID INFLATOR**

**Ron J. Butt, Castlerock, Colo., assignor to Amphenol-Tuchel Electronics GmbH, Heilbrunn, Germany**

**Filed May 7, 1996, Ser. No. 643,927**

**Int. Cl.[6] B60R *21/26***

**U.S. Cl. 280—737** **17 Claims**



1. A hybrid inflator apparatus for inflating a vehicle occupant protection device, said apparatus comprising:

a) a container for storing gas;

b) a gas stored in said container at an elevated pressure, said gas being predominantly an inert gas;

c) a body of ignitable material within said apparatus for heating said stored gas;

d) an elevated pressure environment for said body of ignitable material; and

e) an igniter for igniting said body of ignitable material;

said body of ignitable material consisting essentially of a solid organic polymer which is self-combustible at elevated pressure and is self-extinguishing at atmosphere pressure.

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**5,743,558**

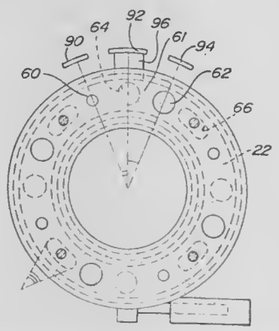
**AIR CUSHION MODULE WITH ROTATING VENT RING**

**Brian T. Seymour, Bloomfield, Mich., assignor to Takata, Inc., Auburn Hills, Mich.**

**Filed Feb. 11, 1997, Ser. No. 799,695**

**Int. Cl.[6] B60R *21/28***

**U.S. Cl. 280—739** **10 Claims**



1. A compact variable venting air cushion module for a motor vehicle comprising:

a generally cylindrical inflator for providing inflation gas, said inflator having an annular flange extending therefrom;

an inflatable air cushion having a mouth for receiving inflation gas from said inflator;

a base plate for mounting said module to said vehicle;

said flange, said base plate, and said air cushion having a first set of coordinated vent apertures which are aligned, and a second set of coordinated vent apertures which are aligned;

a rotatably mounted vent ring being rotatable from a first relatively rotated position to a second relatively rotated position, said vent ring having venting apertures which align with said first set of coordinated vent apertures when said vent ring is in said first relatively rotated position thereby providing a first venting area, said venting apertures aligning with said second set of coordinated vent apertures when said vent ring is in said second relatively rotated position thereby providing a second venting area;

fasteners for connecting said air cushion, said base plate, said vent ring, and said inflator relative to one another; and

a device for providing rotational movement of said vent ring, said device selectively rotating said vent ring from said first relatively rotated position to said second relatively rotated position.



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**5,743,559**

**INFLATOR FOR AIR BAGS**

**Yoshihiro Nakajima; Hidetoshi Ishida, both of Hyogo, and Satoshi Sakamoto, Osaka, all of Japan, assignors to Daicel Chemical Industries, Ltd., Japan**

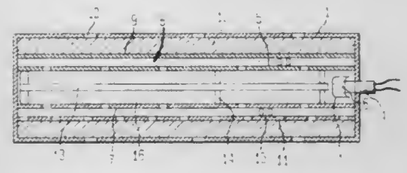
**PCT No. PCT/JP95/00099, § 371 Date Nov. 8, 1995, § 102(e) Date Nov. 8, 1995, PCT Pub. No. WO95/20508, PCT Pub. Date Aug. 3, 1995**

**PCT Filed Jan. 27, 1995, Ser. No. 525,797**

**Claims priority, application Japan, Jan. 27, 1994, 6-007651**

**Int. Cl.[6] B60R *21/28*, C06C *7/00***

**U.S. Cl. 280—741** **15 Claims**



1. An inflator for air bags, comprising:

a first housing having first gas ports formed therein,

a second housing having second gas ports formed therein, the second housing disposed within the first housing

a third housing having third gas ports formed therein, the third housing disposed within the second housing; a gas generant disposed between the second housing and the third housing, and

an ignition assembly for igniting the gas generant, the ignition assembly comprising:

a charge disposed at an end of the third housing,

an igniter for igniting the charge, and

a booster rod formed from non-explosive material extending from a position near the charge along substantially an entire length of the third housing, the booster rod spaced apart from the third housing and having at least one hollow formed substantially along a length thereof, the booster rod comprising magnesium, polytetrafluoroethylene, and a fluororubber copolymer; and

a filter member disposed in a space between the first and second housings.

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**5,743,560**

**SPIRAL WRAPPED INNER TUBE FOR GAS GENERATOR FILTER**

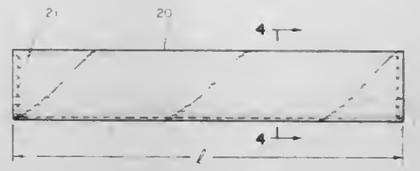
**Scott A. Jackson, Centerville; Paul Philpot, Layton, and Bradley W. Smith, Ogden, all of Utah, assignors to Autoliv ASP, Inc., Ogden, Utah**

**Filed Oct. 9, 1996, Ser. No. 723,458**

**Int. Cl.[6] B60R *21/26***

**U.S. Cl. 280—741** **5 Claims**

1. An inflator assembly of a filter device and tubular gas generator, said gas generator comprising a filter device coaxially arranged within an outer perforated tube, sealing means for sealing each axial end of said outer tube, a gas-generating material contained within and in contact with said filter device and means for igniting the gas generating material to generate pressurized gases, said filter device being arranged within said outer tube to filter the gases, retain the slag during combustion of said gas-generating material, and support the gas generating material during the expected lifetime of the inflator, said filter device comprising a filter element composed of multiple roll formed layers of filter material, said filter element being constructed in the form of a hollow cylindrical roll having a spirally wound inner core member and additional layers of filter material radially wrapped coextensively with the length of said inner core member.



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**5,743,561**

**LIGHT MOTORCYCLE ROLL BAR**

**Sinil Kim, 548 Ford Ave., Solana Beach, Calif. 92075**

**Filed Sep. 14, 1995, Ser. No. 528,443**

**Int. Cl.[6] B60R *21/13***

**U.S. Cl. 280—756** **8 Claims**



3. A rigid roll-bar subframe structure with a conventional two-wheeled motorcycle mainframe, contigured to provide both head and shoulder protection to a motorcyclist for improved safety, the roll-bar structure comprising:

left and right laterally opposed symmetrically spaced apart tubular, metal sections arranged offset from a longitudinal center line of the motorcycle mainframe;

at least one transverse member interconnecting said left tubular, metal section to said right tubular, metal section, thereby maintaining a fixed interval of spacing between said tubular, metal sections;

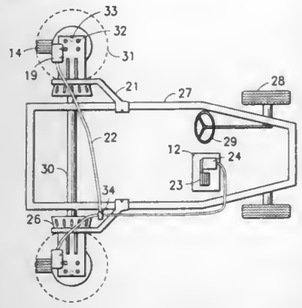
an attaching means for securing at least one frontal terminus and one aftward terminus of said left tubular, metal section to a left side of said motorcycle mainframe, and for securing at least one frontal terminus and one aftward terminus of said right tubular, metal section to a right-side of said motorcycle mainframe, thereby mounting said roll-bar structure rigidly upon said motorcycle mainframe for the safety protection of a motorcyclist; and

wherein both said right and left tubular, metal sections are H-shaped members as viewed in side-elevation.

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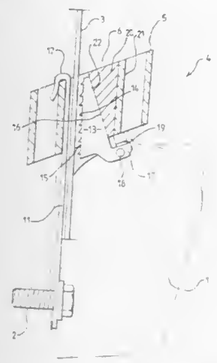


5,743,562
**SIMULATOR FOR TEACHING VEHICLE SPEED CONTROL AND SKID RECOVERY**
Frederik R. Mottola, 390 Maple Ave., Cheshire, Conn. 06410
Division of Ser. No. 255,172, Jun. 7, 1994, Pat. No. 5,626,362.
This application Feb. 24, 1997, Ser. No. 805,344
Int. Cl.[6] B60P *3/06*
U.S. Cl. 280—767 2 Claims



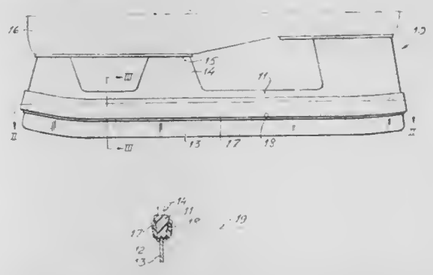

1. A process for exposing drivers to the effects excessive speed has upon an automotive vehicle negotiating a horizontal roadway curve using a vehicle equipped with at least one castering wheel, comprising:
establishing a course configuration including at least one curve;
steering said vehicle along said course towards said curve with said castering wheel locked; and
releasing said castering wheel as said vehicle is steered into said curve allowing said wheels to caster in a direction opposite to said curve, producing a simulated skid.

5,743,563
**SAFETY-BELT ARRANGEMENT**
Alois Juchem, Maisach; Marcus Fiege, Munich; Rafael Oberlaender, Elmshorn, and Holger Dohse, Hamburg, all of Germany, assignors to Autoliv Development AB, Vargarda, Sweden
PCT No. PCT/SE95/00290, § 371 Date Nov. 22, 1996, § 102(e) Date Nov. 22, 1996, PCT Pub. No. WO95/25648, PCT Pub. Date Sep. 28, 1995
PCT Filed Mar. 22, 1995, Ser. No. 704,600
Claims priority, application United Kingdom, Mar. 22, 1994, 9405692.6
Int. Cl.[6] B60R *22/36*
U.S. Cl. 280—806 15 Claims



8. A safety-belt arrangement in a motor vehicle having a chassis, said safety-belt arrangement comprising a retractor mechanism and a safety-belt having a web and being associated with said retractor mechanism, said retractor mechanism being provided with means which fix the retractor mechanism in position on the chassis, and a web-grabber, adapted to grab the web of the safety-belt, said web-grabber comprising a housing defining a through-passage through which said web of said safety-belt passes, said web-grabber further comprising an element movable from a release position to a web-grabbing position, a strap for securing said housing to part of the chassis, one end of said strap engaging part of said housing, an intermediate part which passes through the passage defined through said housing, and a further part secured to the chassis of the motor vehicle.

5,743,564
**SHOCK-ABSORBING DEVICE FOR A SKATE**
Olavi Aarnio, Lugna gatan 15, S-128 38, and Erik Östnaes, Rottnevägen 8, S-128 48, both of Enskede, Sweden
Filed Nov. 22, 1995, Ser. No. 562,362
Int. Cl.[6] A63C *3/12*
U.S. Cl. 280—811 20 Claims

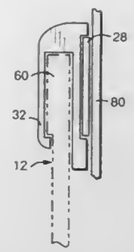


1. A shock-absorbing device for an ice skate, wherein the ice skate includes:
a blade having a bottom, the blade having a front end toward the front of the skate and a rear end toward the rear of the skate and the blade extending from the front end to the rear end of the blade;
a blade support above the bottom of the blade, the blade support being connectable to a foot of a wearer, the blade support including a lower part close to the blade, the blade support having opposite lateral sides and a groove;
the shock absorbing device comprising a surface covering of elastically compressible material adapted to be disposed in the groove and applied on the opposite lateral sides of and at least on the lower part of the blade support situated close to the blade, and extending along the blade support continuously from the front end of the blade to the rear end of the blade; the covering being shaped and positioned to be hit by a puck that would hit the blade support if the covering was not present, the compressible material being able to absorb kinetic energy of the puck through elastic compression of the compressible material.

5,743,565
**NOTE PAD HOLDER**
Jack Zimmanck, 1112 Applebriar, Marlboro, Mass. 01752
Filed Feb. 21, 1997, Ser. No. 804,323
Int. Cl.[6] B42D *17/00*
U.S. Cl. 281—44 13 Claims

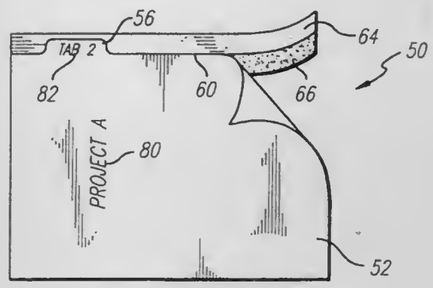
1. A note pad holder for removably holding a note pad of the type having a binding which grips a pad comprising a number of sheets of paper proximate or along one edge of the pad, the binding having an overlap portion which overlaps a small portion of the pad along the gripped edges of the sheets thereof to create an edge binding strip which is thicker than the remainder of the note pad, the note pad holder comprising:





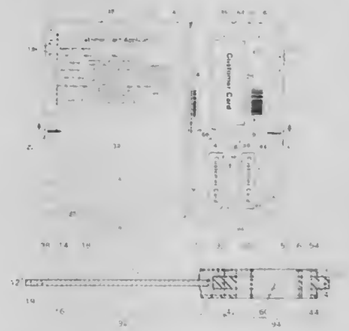

an elongated, generally "U" shaped channel defining an opening which is smaller than the thickness of the pad edge binding strip, the channel comprising a base section and front and rear wall sections extending therefrom, to define generally parallel interior wall surfaces, with the front interior wall surface at least as long as the width of the binding overlap portion, the front wall ending in a binding-retaining section defining a binding-retaining wall surface extending from the front interior wall surface toward the rear interior wall surface, and ending at a distance from the rear interior wall surface which is less than the thickness of the pad edge binding strip, and at least about as great as the thickness of the remainder of the note pad, to retain the pad edge binding strip within the channel.

5,743,566
**INDEX DIVIDER SHEET ASSEMBLY AND THE LIKE**
Jeffrey C. Hunter, Riverside; Sonia Owen, Covina, and Gustav Allen Ray, Huntington Beach, all of Calif., assignors to Avery Dennison Corporation, Pasadena, Calif.
Continuation-in-part of Ser. No. 348,370, Dec. 1, 1994, Pat. No. 5,558,454, which is a continuation-in-part of Ser. No. 116,058, Sep. 2, 1993, abandoned. This application Aug. 16, 1996, Ser. No. 698,710
Int. Cl.[6] B42D *1/00*
U.S. Cl. 283—36 52 Claims




1. An index tab sheet assembly, comprising:
an index tab sheet having an edge and a tab, said sheet having straight edges free from perforation tie protrusions on at least three edges thereof;
a strip positionable relative to said edge to extend laterally or longitudinally out from at least a portion of said edge and to thereby improve individual sheet feeding of said sheet into a printer or copier; and
attaching means for releasably attaching said strip to said sheet such that after said sheet has been, individually and separately relative to other similar sheets, fed into and printed on by the printer or copier, said strip can be separated from said sheet.

5,743,567
**INTEGRAL PRINTED SHEET PRODUCTS**
Richard O. Warther, West Chester, Pa., assignor to Vanguard Identification Systems, Inc., Exton, Pa.
Continuation-in-part of Ser. No. 482,634, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 191,975, Feb. 4, 1994, Pat. No. 5,495,981, which is a continuation-in-part of Ser. No. 620,236, Nov. 29, 1990, Pat. No. 5,180,824, which is a continuation-in-part of Ser. No. 502,005, Mar. 30, 1990, Pat. No. 5,978,146. This application Sep. 30, 1996, Ser. No. 724,077
Int. Cl.[6] B42D *15/00*
U.S. Cl. 283—61 30 Claims



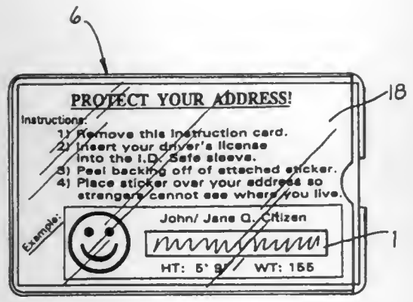
1. An integral printed sheet product comprising:
a planar core having first and second opposing major planar sides, the core being formed by first and second strips of different materials positioned side-by-side, the second core strip being printed on the first major side of the core with a plurality of variable data fields, the variable data fields being spaced apart from one another on the second core strip, each variable data field of the plurality being printed with a unique code, the codes printed in all of the variable data fields of the sheet product being identical;
a first cover strip integrally secured to each of the first and second core strips holding the first and second core strips in side by side position, the first cover strip only partially covering the second major planar side of the core and at least partially covering each of the first and second core strips while extending completely across the second major side of the core and the first and second core strips; and
scoring extending at least sufficiently through the sheet product in the second core strip to define at least a first card element removable from a remainder of the sheet product, the scoring separating at least first and second variable data fields of the plurality, the first removable card element including at least the second variable data field and only a portion of the second core strip, at least the first variable data field being left on an integral remainder of the sheet product including at least the first core strip.

5,743,568
**BLOCKING LABEL FOR IDENTIFICATION PROTECTIVE COVERS**
Steele Clarke Smith, III, 2166 W. Broadway, #100, Anaheim, Calif. 92804
Filed May 31, 1996, Ser. No. 656,052
Int. Cl.[6] B42D *15/00*
U.S. Cl. 283—65 17 Claims

1. A method for blocking a selected information in an information bearing insert, comprising the steps of:
selecting a protective cover made of a selected plastic material having a four edged front sheet and a four edged rear sheet, at least one sheet having a clear surface, the front and rear sheets continuously sealed on three edges leaving an edge open;

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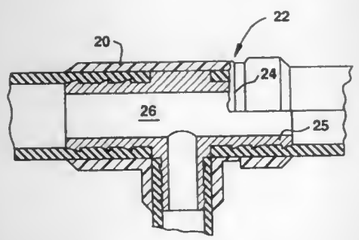

sliding an insert into the open edge between the front sheet and the rear sheet of the protective cover, the insert having an information bearing surface;

choosing a blocking label having an opaque material, an adhesive coated on one side of the opaque material, the adhesive having a composition compatible in adhesive property with the selected plastic material of the protective cover and the opaque material; and,

covering a selected portion of the protective cover with the opaque plastic material, the portion on top of an information in the insert selected to be blocked, the information viewable through the clear surface of the protective cover.

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**5,743,569**
**REPAIRABLE MOLDED-IN-PLACE HOSE CONNECTIONS**
**Dennis J. Deters, Ottawa, and Phillip B. Meyer, Bowling Green, both of Ohio, assignors to Cooper Tire & Rubber Company, Findlay, Ohio**
**Filed Oct. 15, 1996, Ser. No. 730,075**
**Int. Cl.[6] F16L *33/207***
**U.S. Cl. 285—3** **2 Claims**




1. In a connecting and/or branching device for use in a fluid system which comprises:

a rigid inner tubular connector having inner and outer surfaces,

at least one flexible hose having a wall with inner and outer surfaces, and an end portion of the hose inner surface extending over an outer surface of said rigid inner tubular connector, and

a substantially rigid outer cover band having an internal diameter which surrounds said end portion of said at least one flexible hose, said outer cover being made of an essentially rigid polymer molded about said hose end portion and contracted during cooling in place on the hose outer surface, providing a compressive action on said hose end to form a mechanical bonding between the at least one flexible hose and the rigid inner connector;

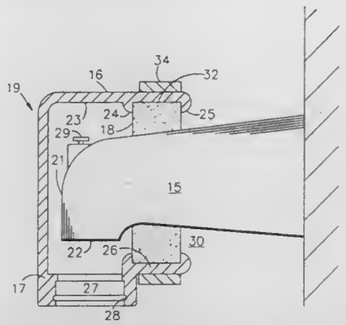
the improvement comprising

a radially directed circular hole extending through said band to direct fracture thereof so as to provide a controlled breakage thereof which uncovers said end portion of said one hose for removal of said one hose from said rigid inner connector and placement of another hose onto said rigid inner connector,

whereby a clamp can be attached to such other hose for forming a pressure seal to said rigid inner connector.

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**5,743,570**
**UNIVERSAL COUPLING FOR BATH ACCESSORY**
**Thomas A. Garland, 76 Reservoir Cr., Jamestown, R.I. 02835**
**Filed Mar. 7, 1997, Ser. No. 812,519**
**Int. Cl.[6] F16L *21/03***
**U.S. Cl. 285—8** **8 Claims**




1. An adapter coupling for connecting the hose of a bath accessory to a faucet, said faucet having a generally horizontally extending body portion and a downwardly opening spout, said coupling comprising:

a generally L-shaped, flexible housing having a cylindrical inlet end, and an outlet end, said inlet end being received over the body portion of the faucet such that the outlet end generally aligns with said spout of said faucet, said cylindrical inlet end having circumferentially continuous cylindrical interior and exterior walls, said interior wall having a diametrical dimension which is substantially greater than the outer dimensions of said body portion of said faucet;

a flexible, disc shaped sealing element received within the inlet end of the housing, said sealing element having an axial opening for receiving the body portion of the faucet therethrough and further having a cylindrical outer peripheral edge which engages with, and presses radially outwardly against, the interior wall of the inlet end of the housing, said sealing element forming a seal between the outer surface of the body portion of the faucet and the interior wall of the inlet end of the housing; and

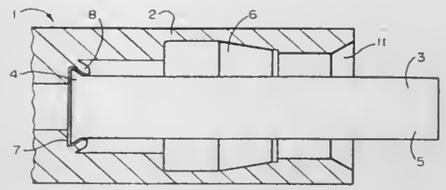
a fixed diameter cylindrical collar which is received around the inlet end of the housing, said collar maintaining a fixed circumference of the inlet end of the housing when water is forced under pressure through said housing.

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**5,743,571**
**FITTING WITH FLOATING TUBE SUPPORT AND METHOD OF MANUFACTURE**
**Charles Gaitros, Old Fort, and Daniel Stephens, Clyde, both of Ohio, assignors to Seawin, Inc., Fremont, Ohio**
**Filed Feb. 18, 1997, Ser. No. 800,564**
**Int. Cl.[6] F16L *35/00***
**U.S. Cl. 285—39** **13 Claims**

1. A fitting comprising a body having a longitudinal passage, said passage having a stop shoulder extending perpendicular to the longitudinal axis of said passage and an other shoulder axially outwardly spaced from said stop shoulder, said other shoulder having an inner diameter substantially corresponding to the outer diameter of said stop shoulder, a tube support having one end

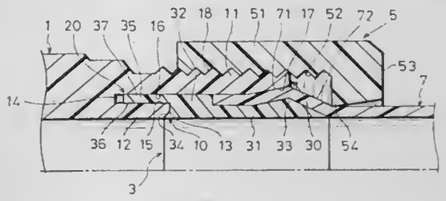





engageable with said stop shoulder, a radially outwardly protruding flange adjacent said one end of said tube support, the outermost diameter of said flange being less than the inner diameter of said other shoulder and the axial spacing between said one end of said tube support and the axial outermost end of said flange being less than the axial spacing between said stop shoulder and said other shoulder, and a trepan formed in said other shoulder, said trepan being deformed radially inwardly into overlying relation with the axial outermost end of said flange on said tube support for trapping said flange between said stop shoulder and said trepan.

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**5,743,572**
**PIPE JOINT MADE OF RESIN**
**Kiyoshi Nishio, Sanda, Japan, assignor to Nippon Pillar Packing Co., Ltd., Osaka, Japan**
**Filed Jul. 18, 1997, Ser. No. 896,764**
**Claims priority, application Japan, Aug. 9, 1996, 8-211385**
**Int. Cl.[6] F16L *25/00***
**U.S. Cl. 285—331** **12 Claims**




1. A pipe joint made of resin comprising:

a joint body which is made of synthetic resin and which has a cylindrical pipe receiving port at one end;

a cylindrical portion which is disposed on said joint body and radially spaced therefrom forming an annular groove therebetween and which is projected into said pipe receiving port concentrically with said pipe receiving port terminating in said pipe receiving port in a tip end;

a primary seal receiving face which is formed in a flaringly tapered manner on an inner peripheral portion of said tip end of said cylindrical portion;

secondary seal inner and outer receiving faces, said secondary seal inner receiving face being formed by a small-diameter wall face of said annular groove between said pipe receiving port and said cylindrical portion, said secondary seal outer receiving face being formed by a large-diameter wall face of said annular groove;

a sleeve-like inner ring which is made of synthetic resin, which has a connecting portion and a projected portion terminating in a tip end, and which is inserted into said pipe receiving port, said connecting portion being pressingly inserted into the one end of a pipe made of synthetic resin connected to the one end, said projected portion projecting from the one end of said pipe;

a primary seal urging face which is formed in a tapered manner on an inner peripheral portion of said tip end of said projected portion of said inner ring, and which is pressingly contacted with said primary seal receiving face;

a projected cylindrical portion projected from an outer peripheral portion of the tip end of said projected portion of said inner ring, and which is pressingly inserted into said annular groove;

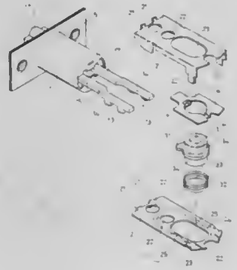
secondary inner and outer urging faces, said secondary inner urging face being formed by an inner peripheral face of said projected cylindrical portion and pressingly contacted with said secondary seal inner receiving face, said secondary outer urging face being formed by an outer peripheral face of said projected cylindrical portion and pressingly contacted with said secondary seal outer receiving face;

a pressing ring which is screwed on said pipe receiving port of said joint body; and

a pressing portion which is disposed on said pressing ring, and said pipe joint body, sleeve-like ring, pipe, pressing ring and pressing portion being so constructed and arranged that when said pressing ring is screwed on said pipe receiving port said pressing portion engages said pipe and applies a pressing force in said insertion direction to said pipe and inner ring.

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**5,743,573**
**ADJUSTABLE DEAD BOLT ASSEMBLY FOR TUBULAR DOOR LOCKS**
**Lan Shi Huang, Kaohsiung, Taiwan, assignor to Taiwan Fu Hsing Industry Co., Ltd., Kaohsiung Hsien, Taiwan**
**Filed Dec. 5, 1996, Ser. No. 761,754**
**Int. Cl.[6] E05C *1/00***
**U.S. Cl. 292—1.5** **3 Claims**



1. An adjustable dead bolt assembly, comprising:

a lock case mounted to a face plate, a dead bolt being partially and slidably received in the lock case and including a pair of operative rods attached to the dead bolt to move therewith, each said operative rod including a first protrusion and a second protrusion projecting therefrom;

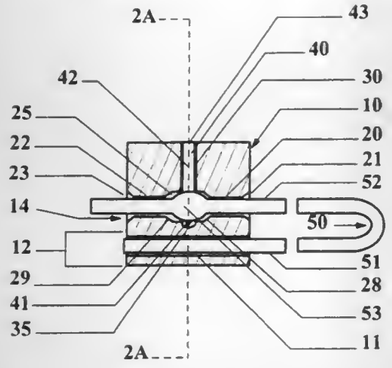
a pair of plates fixed to the lock case, each said plate including an oblong hole defined therein, at least one of the plates including a recessed section formed in an inner side thereof, the recessed section including a sidewall extending along at least one of two lateral sides defining part of the oblong hole, said at least one of the plates including at least one inwardly directed protruded section formed in the sidewall of the recessed section, the protruded section being located midway along a lateral side of the oblong hole and directed inwardly towards the oblong hole; and

an actuating wheel slidably mounted between the plates and slidable along the oblong holes, said actuating wheel including a pair of teeth for selectively engaging with the first protrusions and the second protrusions, said actuating wheel further including a shoulder formed on a first side thereof, a spring being mounted around the shoulder in a compressed manner such that the spring is expandible into the recessed section around the oblong hole for positioning the actuating wheel.

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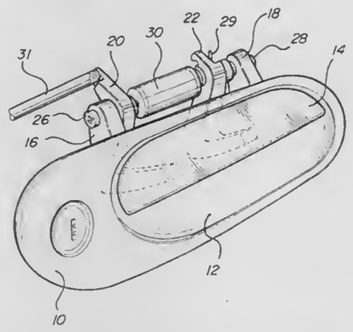
**5,743,574**
**ONE-PIECE PIERCE-LOCK DOUBLE-ENGAGEMENT CABLE-SEAL**
**Raymond F. Kohn, Magnolia, Tex., assignor to PCI-Products Company International, Inc., Houston, Tex.**
**Filed Dec. 6, 1996, Ser. No. 761,303**
**Int. Cl.[6] B65D** *27/30;33/34;55/06*
**U.S. Cl. 292—315** **8 Claims**




1. A one-piece permanently secured double engagement cable type seal-lock comprising:
(a) a locking body, a multi-stranded flexible cable, and a locking pin,
(b) said locking body having one end of said multi-stranded flexible cable permanently fixed or attached to said locking body by a suitable permanent attachment means and, prior to installation, having the opposite end of said multi-stranded flexible cable free and unattached from said locking body,
(c) said locking body having a longitudinal through hole having a diameter approximately similar to the uniform diameter of said multi-stranded flexible cable but of sufficient diameter to permit the unobstructed free passage of said unattached free end of said multi-stranded flexible cable into and through said locking body,
(d) said longitudinal through hole having a centrally located and horizontally aligned annular recessed groove of sufficient length and diameter to create an expansion cavity within said locking body, with said centrally located expansion cavity resulting in said longitudinal through hole having a first guide hole and a second guide hole, each of which is generally horizontally aligned with, located adjacent to, and located on either side of, said expansion cavity,
(e) said locking body having a locking pin guide hole positioned approximately perpendicular to, and centrally located and vertically aligned with, said expansion cavity, with said locking pin guide hole being a blind hole which passes into and through said expansion cavity to further create a locking pin tip recess within the opposite internal wall of said expansion cavity,
(f) a locking pin made from a suitable material having sufficient strength and rigidity to prevent bending or deflection when forcibly pressed or driven into and through said multi-stranded flexible cable member,
(g) said locking pin having a tapered point at one end suitably fashioned to facilitate the penetration and expansion of said multi-stranded flexible cable member, while the opposite end of said locking pin suitably fashioned to provide a surface which facilitates the urging or the application of pressure or force upon said locking pin by any suitable means for the purpose of facilitating said penetration and expansion of said multi-stranded flexible cable member,
(h) said locking pin held in place within said locking pin guide hole by a suitable friction means which holds said locking pin within said locking pin guide hole prior to, and after installation, while permitting slidable movement of said locking pin within said locking pin guide hole upon the urging or the application of pressure or force upon the exposed end of said locking pin,
(i) with said locking body positioned in proximity of a hasp to be sealed, said unattached free end of said multi-stranded flexible cable is threaded into and through the aperture of said hasp, then said unattached free end of said multi-stranded flexible cable is looped around and inserted into said longitudinal through hole via said first guide hole of said locking body and pushed completely through said longitudinal through hole, thus having said multi-stranded flexible cable create a closed loop or shackle and securing said hasp, whereupon the exposed end of said locking pin is pushed downward, by any suitable means for applying such downward pressure, thereby causing said locking pin to pierce and penetrate the portion of said multi-stranded flexible cable located within said expansion cavity, thus staking said multi-stranded flexible cable in place and simultaneously creating a cable bulge within said expansion cavity at the point where said multi-stranded flexible cable is penetrated by said locking pin, thus creating a dimensional differential between the larger diameter of said cable bulge and the lessor diameters of said first and second guide holes of said longitudinal through hole, thus permanently securing said multi-stranded flexible cable within said locking body.

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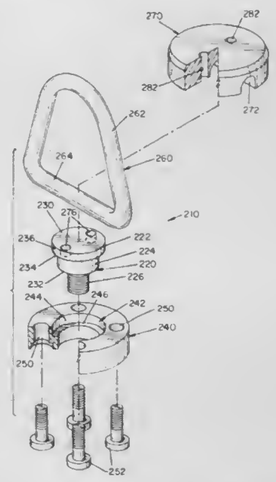
**5,743,575**
**FLUID-DAMPED AUTOMOTIVE DOOR LATCH ACTUATOR**
**Robert W. McFarland, Rochester Hills, Mich., assignor to ADAC Plastics, Inc., Grand Rapids, Mich.**
**Filed Jan. 27, 1997, Ser. No. 789,004**
**Int. Cl.[6] E05B** *3/00*
**U.S. Cl. 292—336.3** **6 Claims**




1. A fluid-damped automotive door latch actuator comprising:
first and second spaced body supports;
a shaft rotatably mounted between said supports;
a manually operated handle;
at least one crank member connected to said handle and mounted for rotation with said shaft;
bias means for resiliently urging the handle toward a rest position;
a first damper element mounted between said supports and in fixed relationship thereto;
a second damper element mounted on said shaft for rotation therewith relative to said first damper element; and
means for trapping a quantity of fluid between said first and second damper elements to damp movements of said handle relative to said body supports.



**5,743,576**
**HOIST DEVICE**
**Jack H. Schron, Jr., Chagrin Falls; Harry P. Fuller, Newbury, and James C. Klingenberg, Concord, all of Ohio, assignors to Jergens, Inc., Cleveland, Ohio**
**Continuation-in-part of Ser. No. 542,947, Oct. 13, 1995, Pat. No. 5,634,734. This application Mar. 7, 1997, Ser. No. 813,628**
**Int. Cl.[6] B66C** *1/66;* **F16G** *15/08*
**U.S. Cl. 294—1.1** **18 Claims**




16. A hoist device for fixed engagement to a threaded bore on an outer surface of a load member, said hoist device comprising: a load engaging stud with a force supporting head; a cylindrical body portion with a lower, annular bearing shoulder and a threaded shank depending from said annular shoulder of said body portion; a base member having a body portion with a central passage through said base member and allowing a free swivel engagement of said base member with said load engaging stud when said stud is fixed to said load member, said lower bearing shoulder for being drawn against said outer surface of said load member; and a hoist ring having an upper bight portion and a lower connecting portion, said connecting portion fixedly secured to said base member while allowing said base member to swivel around said stud, said stud including a tool driving portion in said force supporting head, said tool driving portion including at least one tool engaging portion in said stud whereby an elongated tool can be extended into said tool engaging portion to rotate said stud until said lower shoulder engages said surface of said load member.

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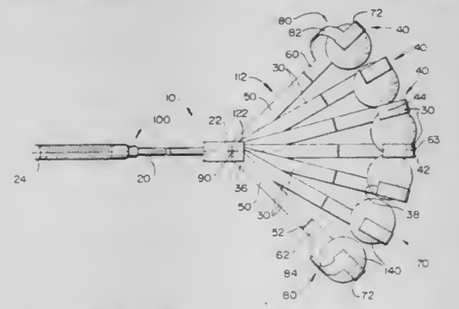
**5,743,577**
**EXTENSION HANDLE APPARATUS**
**Robert D. Newman, Jr.; Robert D. Newman, Sr., both of P.O. Box 377, Greenwood, Mo. 64034, and Buford Guittar, Greenwood, Mo., assignors to Robert D. Newman, Sr., and Robert D. Newman, Jr., both of Greenwood, Mo.**
**Filed Jul. 19, 1996, Ser. No. 685,456**
**Int. Cl.[6] B25J** *1/02;* **F16B** *7/14*
**U.S. Cl. 294—19.1** **8 Claims**



1. A tool reach extension pole comprising:
an outer handle tube presenting an open distal end and a longitudinally extending slot of predetermined width;
an inner slider tube telescopically received within the handle tube for relative longitudinal shifting movement, the slider tube including a proximal end received in the open distal end of the handle tube and an opposed distal end, and defining a radially extending hole adjacent the proximal end;
a locking pin received in the radially extending hole of the slider tube and extending through the slot of the handle tube, the locking pin including a head having a width greater than the predetermined width of the slot in the handle tube;
a locking grip supported on the handle tube for relative rotational and longitudinal shifting movement, the locking grip presenting a cylindrical inner surface including a circumferentially extending eccentric slot, the head of the locking pin being received in the slot so that longitudinal shifting movement of the locking grip relative to the handle tube is transmitted to the slider tube by the locking pin, and rotational movement of the locking grip relative to the handle tube shifts the locking pin within the slider tube hole between a locked position in which the handle tube and slider tube are locked against relative longitudinal shifting movement, and an unlocked position in which the handle tube and slider tube are longitudinally shiftable relative to one another.

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**5,743,578**
**COLLAPSIBLE GOLF BALL RETRIEVER**
**William F. Schuermann, 26001 Budde Rd., Apt. 4104, Spring, Tex. 77380**
**Filed Dec. 21, 1996, Ser. No. 774,405**
**Int. Cl.[6] A63B** *57/00*
**U.S. Cl. 294—19.2** **13 Claims**




1. A collapsible golf ball retriever comprising:
a handle having a handle connecting end and an opposing handle grip end;
a plurality of fingers each having an upper surface, a lower surface, an attachment end, a free end, and a cage portion distal said attachment end;
said cage portions constructed to cooperatively receive and maintain a golf ball therein;
said attachment ends of said plurality of fingers pivotally connected to said handle connecting end at a common axis of rotation;
said plurality of fingers each comprising an elongated extension portion extending from said attachment end to said cage portion;
said elongated extension portion having a bend therein; and
said bend forming an obtuse angle in said upper surface.

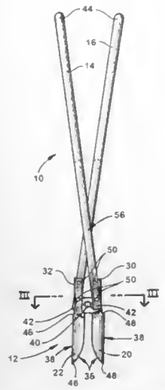
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**5,743,579**
**DIGGING TOOL**
**Carl W. Ranburger, 12955 68th St., Alto, Mich. 49302**
**Filed Dec. 5, 1996, Ser. No. 760,975**
**Int. Cl.[6] A01B** *1/18*
**U.S. Cl. 294—50.8** **7 Claims**

1. A digging tool comprising:

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a first blade, the first blade having a tip and an opposing heel, having a length between the tip and the heel, having a first handle coupler that extends from the heel in a direction generally away from the tip, having a pivot connector, and having a face;

a first handle that has a first end connected with said first handle coupler and that extends generally linearly away from said first blade to an opposing grip end;

a second blade, the second blade having a tip and an opposing heel, having a length between the tip and the heel, having a second handle coupler that extends from the heel in a direction generally away from the tip, having a pivot connector, and having a face, said first and said second blades being arranged in face-to-face orientation with the first handle coupler spaced apart from the second handle coupler, and being pivotally connected to move clamshell style between open and closed positions; and

a second handle that has a first end connected with said second handle coupler and that extends generally linearly away from said second blade to an opposing grip end, said first handle being angled relative to said first handle coupler and said second handle being angled relative to said second handle coupler, so said first and said second handles slightly diverge away from one another, without overlapping, from each said blade to said grip end of each said handle, when in said closed position, and so said first and said second handles converge toward one another, from each said blade to an overlap point and then diverge away from one another from said overlap point to said grip end of each said handle, when in said open position.

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**5,743,580**

**HANDLE AND POST ASSEMBLY WITH A PLURALITY OF ATTACHMENTS**

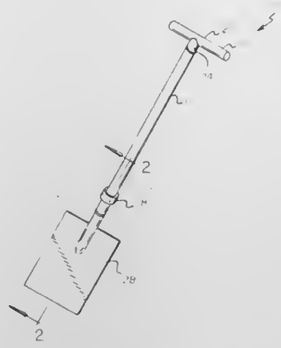
**Steve C. Evans, 17741 Altamirano, Huntington Beach, Calif. 92647**

**Filed Nov. 18, 1996, Ser. No. 752,175**
**Int. Cl.[6] A01B** *1/20*
**U.S. Cl. 294—51** **3 Claims**

**1**. A handle and post assembly with a plurality of attachments comprising, in combination:

a straight post with an elongated cylindrical configuration having a first lower end with a threaded periphery, a second upper end including a bore formed coaxially therein with a threaded inner surface, and an annular flange integrally formed adjacent the first lower end thereof;

a cylindrical handle with a T-shaped configuration having a straight horizontally oriented bar and a short vertically oriented bar integrally coupled at a first end thereof to a central extent of the horizontally oriented bar and having a second end with a threaded periphery for releasably engaging the threaded bore of the second end of the post; and



a plurality of attachments including:

a spade attachment formed of a rectangular plate which resides within a vertical plane and a rod having a first half integrally coupled to a central extent of the plate wherein the first half of the rod tapers toward the plate, the rod further having a second half coaxially coupled to the first half with a bore formed coaxially therein with a threaded inner surface for releasably engaging the threaded first end of the post,

a shovel attachment formed of a generally rectangular plate with a triangular front portion, the shovel attachment further having a rod with a first half integrally coupled to a central extent of the plate wherein the first half of the rod tapers toward the plate, the rod further having a second half coaxially coupled to the first half with a bore formed coaxially therein with a threaded inner surface for releasably engaging the threaded first end of the post,

a broom attachment formed of a rectangular plate which resides in a horizontal plane having a plurality of vertically oriented bristles each coupled at a top end thereof to a bottom surface of the plate, the broom attachment further including a mounting plate coupled to a side edge of the rectangular plate and extending at a 45 degree angle with respect to a horizontal, the broom attachment further having a rod with a first half integrally coupled to a central extent of the mounting plate wherein an axis about which the first half of the rod is formed also forms a 45 degree angle with the horizontal, the rod further having a second half coaxially coupled to the first half with a bore formed coaxially therein with a threaded inner surface for releasably engaging the threaded first end of the post,

a squeegee attachment formed of a rectangular plate which resides in a vertical plane having a rubber strip coupled at a top end thereof to a bottom edge of the plate in coplanar relationship therewith, the squeegee attachment further including a mounting plate coupled to a side surface of the plate and extending at a 45 degree angle with respect to a horizontal, the squeegee attachment further having a rod with a first half integrally coupled to a central extent of the mounting plate wherein an axis about which the first half of the rod is formed also forms a 45 degree angle with the horizontal, the rod further having a second half coaxially coupled to the first half with a bore formed coaxially therein with a threaded inner surface for releasably engaging the threaded first end of the post,

a weighted rake attachment formed of a rectangular container with an aperture for allowing water to be inserted therein and a cap situated on a top surface thereof for being removably coupled over the aperture for precluding water from exiting the container during use, the weighted rake attachment having a plurality of vertically oriented teeth each coupled at a top end thereof to a bottom surface of the plate, the weighted rake attachment further having a mounting plate coupled to a side edge of the rectangular plate and extending at a 45 degree angle with respect to a horizontal, the rake attachment further having a rod with a first half integrally coupled to a central extent of the mounting plate wherein an axis about which the first half of the rod is formed also forms a 45 degree angle with the horizontal, the rod further having a second half coaxially coupled to the first half with a bore formed coaxially therein with a threaded inner surface for releasably engaging the threaded first end of the post, and

a second rake attachment having a mounting plate with a rod having a first half integrally coupled to a central extent thereof, the rod further having a second half coaxially coupled to the first half with a bore formed coaxially therein with a threaded inner surface for releasably engaging the threaded first end of the post, wherein a plurality of teeth are coupled to the plate and extended therefrom.



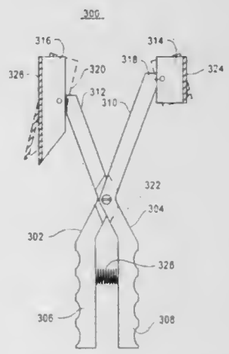
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**5,743,581**

**SEMICONDUCTOR PROCESS CHAMBER EXHAUST PORT QUARTZ REMOVAL TOOL**

**Bradley Mitchell Curelop, Sunnyvale, and James Hann, Santa Clara, both of Calif., assignors to Applied Materials Incorporated, Santa Clara, Calif.**

**Filed Mar. 18, 1997, Ser. No. 819,962**
**Int. Cl.[6] B25B** *27/06*
**U.S. Cl. 294—97** **15 Claims**



**1**. A gripping tool for gripping and maintaining non-slipping gripping engagement between said tool and a quartz insert located within a gas exhaust port of a semiconductor process chamber, said quartz insert having a through bore, said through bore containing a first side of a first length and a second side of a second length, said second side being parallel to said first side, said gripping tool comprising:

a first elongated member having a first handle portion, a first middle portion, and a first end portion, said first middle portion being disposed between said first handle and said first end portions;

a second elongated member having a second handle portion, a second middle portion, and a second end portion, said second middle portion being disposed between said second handle and said second end portions, said first and second elongated members being pivotally attached at said first and said second middle portions;

a first head pivotally attached to said first end portion, said first head having a first face for engaging said first side of said quartz insert, said first face comprising an elastomeric material for gripping said first side of said quartz insert; and

a second head pivotally attached to said second end portion, said second head having a second face for engaging said second side of said quartz insert, said second face comprising an elastomeric material for gripping said second side of said quartz insert;

said first and second handle portions configured to receive a force for engaging said first and second faces with said first and second side surfaces of said quartz insert, respectively.

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**5,743,582**

**MULTI-PURPOSE TOOL INCLUDING TWEEZERS AND METHOD FOR MAKING SAME**

**Howard G. Berg, Gresham, and Benjamin C. Rivera, West Linn, both of Oreg., assignors to Leatherman Tool Group, Inc., Portland, Oreg.**

**Division of Ser. No. 563,922, Nov. 29, 1995. This application Feb. 27, 1997, Ser. No. 807,638**
**Int. Cl.[6] B25B** *7/00*
**U.S. Cl. 294—99.2** **4 Claims**



**1**. A multi-purpose folding tool, comprising:

(a) a handle having a pair of sidewalls defining a cavity therebetween;

(b) a tool pivot shaft mounted in said handle and extending toward one of said sidewalls; and

(c) a pair of tweezers having a base portion located generally in a first plane oriented parallel with said side walls and movable about said tool pivot shaft with respect to said handle, between a stowed position and a deployed position, in said first plane, said pair of tweezers including a pair of elongate resiliently flexible legs attached to said base portion and extending away from said pivot shaft, each of said legs having a width and a lesser thickness, said width of each of said legs being oriented generally normal to said first plane.

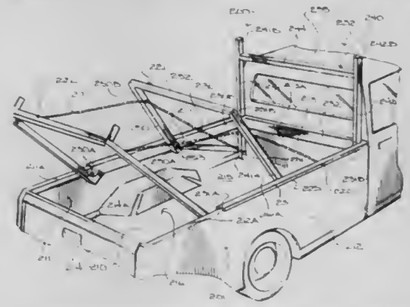
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**5,743,583**

**AUXILIARY LOAD SUPPORTING APPARATUS**

**William E. Lowe, 10022 Dapple Grey Trail, Dewey, Ariz. 86327**

**Continuation-in-part of Ser. No. 547,469, Oct. 24, 1995, abandoned. This application Dec. 3, 1996, Ser. No. 759,752**
**Int. Cl.[6] B60P** *3/00*
**U.S. Cl. 296—3** **16 Claims**



**1**. An auxiliary load supporting apparatus for a bed of a vehicle, comprising:

a base mounted to said bed;

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a first framework mounted to said base and having a transom superjacent said bed;

a second framework pivotally mounted to said base spaced from said first framework and having a transom movable between a first position and a second position superjacent said bed;

a third framework pivotally mounted to said base spaced from said second framework and having a transom movable between a first position and a second position superjacent said bed;

whereby said transom of said first framework, said transom of said second framework in said second position, and said transom of said third framework in said second position define a plane superjacent said bed along which equipment may be placed for storage and transport.

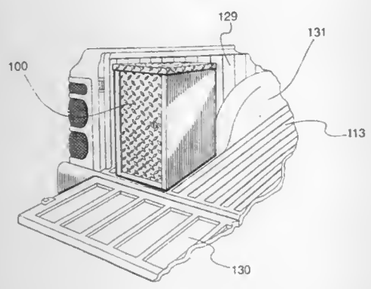
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**5,743,584**

**VEHICLE MOUNTED STORAGE UNIT**

**Sandra L. Lance, St. Charles, and Marshall R. Lance, Geneva, both of Ill., assignors to Geneva Manufacturing Co., S. Elgin, Ill.**

**Continuation of Ser. No. 457,875, Jun. 1, 1995, abandoned.**
**This application May 21, 1997, Ser. No. 861,183**
**Int. Cl.[6] B60R** *11/06*
**U.S. Cl. 296—37.6** **6 Claims**




6. A vehicle mounted storage unit adapted to be mounted to a rear bed of a pickup truck having a sidewall, a wheel well having a portion which extends outwardly from said sidewall by a first distance, and a tailgate that is spaced from a rear portion of said wheel well by a second distance, said vehicle mounted storage unit comprising:

a cabinet having a width not greater than said first distance and a length not greater than said second distance, said cabinet being adapted to be disposed adjacent said sidewall of said pickup truck and between said wheel well and said tailgate of said pickup truck, with no portion of said cabinet extending outside of a space bounded by a first vertical plane coinciding with an interior portion of said sidewall of said pickup truck, a second vertical plane coinciding with said outwardly extending portion of said wheel well, a third vertical plane coinciding with said rear portion of said wheel well, and a fourth vertical plane coinciding with an interior portion of said tailgate;

at least one drawer disposed in said cabinet; and

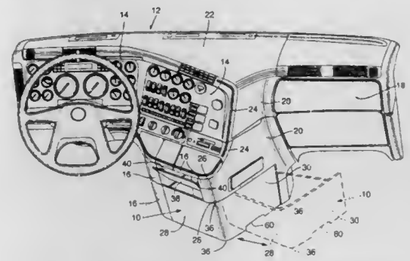
a plurality of drawer support members for supporting said drawer, said drawer support members supporting said drawer so that said drawer is movable in a direction parallel to said first and second vertical planes between an open position and a closed position, a portion of said drawer extending beyond said fourth vertical plane and outside of said bounded space when said drawer is in its open position, said drawer being disposed between said first and second vertical planes when said drawer is in its open position, said portion of said drawer not extending outside of said bounded space when said drawer is in its closed position.

**5,743,585**

**TRUCK CAB CONSOLE WITH INTEGRAL TRASH CONTAINER**

**Michael G. Pranger, Hillsboro, and Mark S. Hurayt, Aloha, both of Oreg., assignors to Freightliner Corporation, Portland, Oreg.**

**Filed Jun. 14, 1996, Ser. No. 662,248**
**Int. Cl.[6] B60R** *7/06*
**U.S. Cl. 296—37.12** **19 Claims**



1. A trash container apparatus for a truck cab comprising:

a console having a front surface;

a trash container having an inside for receiving trash therein, and at least one front side, said at least one front side being of a contour which integrates with the front surface of the cab console and the cab console shielding the inside of the container from view by the occupants of the cab when said trash container is in a closed position;

the console defining a trash container access opening through which trash is deposited into the trash container when the trash container is in a closed position;

said trash container being selectively movable from a closed position to an open position, when in the open position the trash container a positioned away from the front surface of the cab console to allow access to the inside of the container to remove any accumulated trash;

upright trash door positioned to allow access through a trash-receiving opening covered by the door to the inside of the trash container for disposing trash therein when the trash container is in the closed positioned: and

the trash container has two front sides, a first of said front sides substantially facing a driver's seat in the cab and a second front side substantially facing a passenger seat in the truck cab, wherein the trash door is positioned on the cab console substantially above the trash container and above the first of said front sides and is pivotable about a hinge to move it from a closed position to an open position to allow access through the trash-receiving opening to the inside of the trash container for disposing trash therein, and wherein the two front sides are visible to an occupant in the cab when the trash container is in the closed position.

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**5,743,586**

**HARD SHELL TONNEAU COVER**

**James A. Nett, Oklahoma City, Okla., assignor to Covercraft Industries, Pauls Valley, Okla.**

**Filed Feb. 6, 1997, Ser. No. 796,245**
**Int. Cl.[6] B60F** *7/02*
**U.S. Cl. 296—100** **3 Claims**

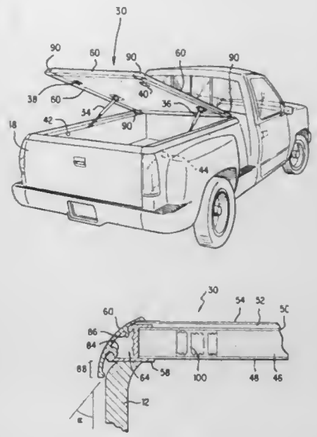
1. A cover for a pickup truck bed having side walls and a bed interior, the cover comprising:

a panel structure defining a generally flat panel with side edges;

a plurality of side brackets, each side bracket secured to a respective side edge of the flat panel, each side bracket having a bottom surface adapted to be disposed adjacent the top edge of the truck bed side walls; and

a plurality of side molding pieces, each side molding piece secured to a respective side bracket and having a portion extended below the bottom surface of the side bracket, the extended portion adapted to extend adjacent and overlap a portion of the truck side wall upon the bottom surface of the associated bracket being disposed adjacent the top edge of the truck bed side walls.





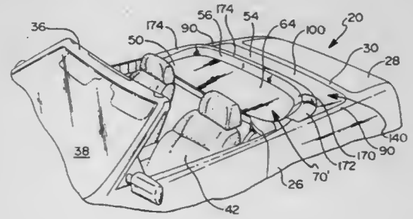
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**5,743,587**

**APPARATUS FOR USE IN AN AUTOMOTIVE VEHICLE HAVING A CONVERTIBLE ROOF SYSTEM**

**Michael P. Alexander, Grosse Ile, Mich.; George A. Gaffoglio, Laquna Niguel, Calif.; Christopher I. Ito, Canton, Mich., and Darin Kirschner, Stevenson Ranch, Calif., assignors to ASC Incorporated, Southgate, Mich.**

**Continuation of Ser. No. 175,149, Dec. 29, 1993, abandoned.**
**This application Mar. 19, 1997, Ser. No. 820,750**
**Int. Cl.[6] B60J** *7/08*
**U.S. Cl. 296—108** **62 Claims**



1. An apparatus for use in an automotive vehicle having a convertible roof system, said automotive vehicle further having a body with a passenger compartment, said apparatus comprising:

a roof movable from a retracted position to an extended position disposed above said passenger compartment;

an escutcheon disposed proximate with said roof and having a substantially transversely oriented segment, said escutcheon further being movable between a functional position and a hidden position, said functional position allowing said escutcheon to be substantially visible external to said automotive vehicle and said hidden position allowing said escutcheon to be substantially hidden from view external to said automotive vehicle, said escutcheon being located in said functional position when said roof is in said retracted position and said escutcheon being located in said hidden position when said roof is in said extended position, said escutcheon having a substantially C-shape when disposed in said functional position and observed in a top view; and

a tonneau cover movably coupled to said body of said automotive vehicle and being disposed against a portion of an exterior surface of said roof when said roof is disposed in said extended position;

said escutcheon being coupled to said tonneau cover and being located against said roof when said roof is disposed in said retracted position below said escutcheon.

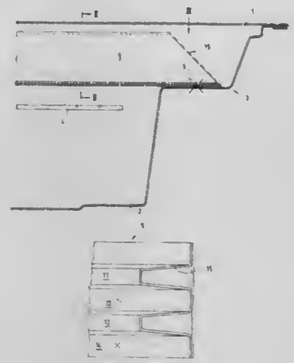
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**5,743,588**

**METALLIC SECTION AS REINFORCEMENT OF A MOTOR VEHICLE DOOR**

**Martin Ufrecht, Machabaerstrasse, Germany, assignor to Ford Global Technologies, Inc., Dearborn, Mich.**

**Continuation of Ser. No. 493,729, Jun. 22, 1995, abandoned.**
**This application Oct. 31, 1997, Ser. No. 960,542**
**Claims priority, application Germany, Jun. 23, 1994, 44 21 934.2**
**Int. Cl.[6] B60J** *5/04*
**U.S. Cl. 296—146.6** **4 Claims**



1. An elongated metallic beam section for reinforcing a motor vehicle door, the section having two ends and being engagable with the vehicle door;

the metallic beam section having a flat bearing surface for attachment to the vehicle door and defining a hollow cross section terminating at an axially extending flat slope at at least one end;

the metallic beam section being formed from cold rolled steel having a corrosion resistant coating on at least one side and having a snot weld formed adjacent to the flat bearing surface within the hollow section defined at the at least one end flat slope for securing the metallic beam section to the door.

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**5,743,589**

**TRUCK BED WIND DEFLECTOR**

**Raymond J. Felker, 402 Princess Dr., Corpus Christi, Tex. 78410**

**Filed Aug. 12, 1996, Ser. No. 695,649**
**Int. Cl.[6] B62D** *35/00*
**U.S. Cl. 296—180.5** **2 Claims**

1. A wind deflector for use in a truck, the wind deflector comprising:

a. a substantially rectangular, substantially planar first section;

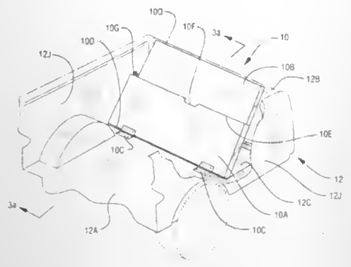
b. a substantially rectangular, substantially planar second section;

c. structure forming a slot within the first section;

d. structure forming a cavity within the first section, the cavity in physical communication with the slot and configured to contain the second section;

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e. the second section being extendable and retractable through the slot;

f. the wind deflector adapted to extend between a top edge of a tailgate and a bed of the truck, forming an inclined surface over which air flows when the truck is in forward motion; and

g. a securing means for securing the second section in a fully extended position and for preventing separation of the second section from the first section, even when the wind deflector is not in contact with both the top edge of the tailgate and the bed of the truck.

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**5,743,590**

**FRONT END FOR AN AUTOMOBILE WITH A SUPPORTING STRUCTURE**

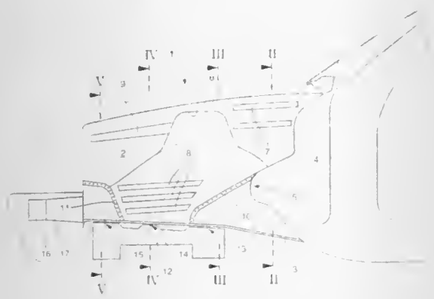
**Karl-Heinz Baumann, Bondorf, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany**

**Filed Nov. 20, 1996, Ser. No. 754,008**

**Claims priority, application Germany, Nov. 20, 1995, 195 43 193.6**

**Int. Cl.[6] B62D** *21/00;25/08*

**U.S. Cl. 296—194** **16 Claims**



1. A front end for an automobile with a supporting structure having a side member section and a wheel arch on both sides of said automobile, as well as a plurality of reinforcing sections, with an integral support being connected to the supporting structure from below in order to receive parts of a front axle assembly, wherein on each side of said automobile, said wheel arch, said side member section, and at least partially said plurality of reinforcing sections are formed integrally as a one-piece stable wheel arch shell, said one-piece stable wheel arch shell having a fold in a vicinity of its lower edge, said fold being horizontally arranged in a mounted state and being directly connected to said integral support.

**5,743,591**

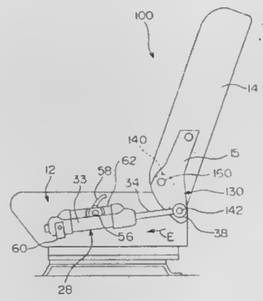
**VEHICLE SEAT HAVING HYDRAULIC ACTUATOR**

**Omar D. Tame, W. Bloomfield, Mich., assignor to Atoma International, Inc., Markham, Canada**

**Filed Oct. 4, 1996, Ser. No. 726,350**

**Int. Cl.[6] B60N** *2/42*

**U.S. Cl. 297—216.1** **13 Claims**



1. A vehicle seat comprising:

a seat cushion assembly constructed and arranged to support an occupant seated thereon,

a seat back cushion assembly constructed and arranged to support the back of an occupant seated on said seat cushion assembly,

a first mounting assembly constructed and arranged to mount said seat cushion assembly on a vehicle floor assembly,

a second mounting assembly constructed and arranged to mount said seat back cushion assembly on said seat cushion assembly,

an adjusting mechanism operatively embodied in one of said first and second mounting assemblies constructed and arranged to enable the cushion assembly mounted by said one mounting assembly to be moved in opposite directions through a range of adjustable positions with respect to the assembly on which the one mounting assembly mounts the cushion assembly,

said adjusting mechanism including an extensible and retractable unit constructed and arranged such that said extensible and retractable unit extends when said one cushion assembly mounted by said one mounting assembly is moved in one opposite direction and retracts which said one cushion assembly mounted by said one mounting assembly is moved in another opposite direction,

said adjusting mechanism including a locking and releasing device constructed and arranged to be moved between (1) a locking position wherein said locking and releasing device is operable to lock said extensible and retractable unit to prevent movement in either direction of the cushion assembly enabled to be moved thereby and (2) a releasing position wherein the locking and releasing device is operable to release said extensible and retractable unit to permit the cushion assembly enabled to be moved thereby to be manually moved in relatively unrestricted fashion in one direction and returned in relatively unrestricted fashion in the opposite direction, and

a vehicle crash sensing system operatively connected with said extensible and retractable unit constructed and arranged to provide control of the movement of the cushion assembly mounted by said one mounting assembly in response to the sensing of a crash condition which occurs while said locking device is in said releasing position.



**5,743,592**

**LEG FOR AN AIRCRAFT SEAT, A LEG ASSEMBLY INCLUDING SUCH A LEG, AND A SEAT INCLUDING SUCH A LEG ASSEMBLY**

**Pierre-Francois Bedouch, Issoudun, France, assignor to Societe Industrielle et Commerciale de Materiel Aeronautique, Issoudun, France**

**Filed May 30, 1996, Ser. No. 655,567**

**Claims priority, application France, May 31, 1995, 95 06486**

**Int. Cl.[6] B60N** *2/42*

**U.S. Cl. 297—216.2** **37 Claims**



1. A leg for an aircraft seat comprising over at least a portion of its length at least one segment for absorbing energy by buckling, in cross-section said segment comprising a U-shape defined by a web extending in a transverse direction and two flanges extending in a longitudinal direction, and an I-shape defined by a center portion and two end portions, wherein said web of said U-shape is common with one of said two end portions of said I shape.

**5,743,593**

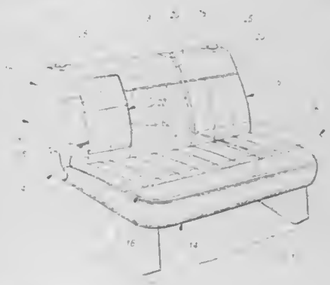
**VEHICLE SEAT WITH INTEGRAL CHILD SEAT**

**Brandon Russell Vogt, Bloomfield Hills, Mich., assignor to Lear Corporation, Southfield, Mich.**

**Filed Aug. 9, 1996, Ser. No. 700,727**

**Int. Cl.[6] A47C** *15/00*

**U.S. Cl. 297—238** **19 Claims**



16. A seat assembly comprising:

a backrest pivotable between a use position and a storage position generally adjacent a seat;

an auxiliary seat including a bottom cushion pivotable between a deployed position and a stowed position substantially recessed within the backrest;

a first latch fixedly connected to the bottom cushion and pivotable about a pivot point between the deployed position and the stowed position, the first latch having an opening and a groove extending from the opening, the opening including an arcuate border having a substantially constant radius from the pivot point; and

a second latch including a lower bracket arm and an upper bracket arm connected to the backrest, the upper bracket arm including a latch finger and a crank, the second latch being movable between a first position where the latch finger engages a catch in the lower bracket arm to lock the backrest in the use position and a distal end of the crank extends into the opening of the first latch, and a second position where the latch finger does not engage the catch and the distal end of the crank extends into the groove of the first latch;

the first latch inhibiting movement of the second latch from its first position when the first latch is not in the stowed position.

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**5,743,594**

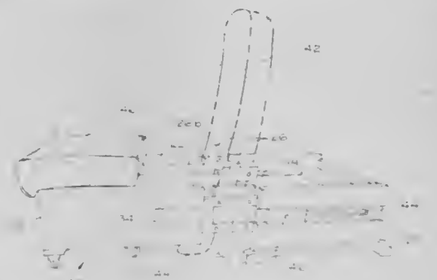
**SUPINE RECLINER AND MECHANISM**

**Wesley D. Suskey; Todd S. Zeier, both of Sheboygan, and Randall L. Dorner, Howards Grove, all of Wis., assignors to Nemschoff Chairs, Inc., Sheboygan, Wis.**

**Continuation-in-part of Ser. No. 446,916, Apr. 10, 1995. This application May 22, 1995, Ser. No. 445,693**

**Int. Cl.[6] B60N** *2/02*

**U.S. Cl. 297—354.13** **24 Claims**



20. An extendable chair, comprising:

a seat and a back rest member movable between sitting and substantially horizontal positions;

a stationary frame having an interior cross dimension;

a movable frame having a structural height dimension and an exterior cross dimension less than said stationary frame interior cross dimension, said movable frame linearly separable from said stationary frame;

a connector slidably engaging said stationary and movable frames and linearly extendable from said stationary frame, said connector non-coplanar with said stationary and movable frames and having a structural height dimension less than said height dimension of said movable frame; and

an attachment member pivotally coupling said connector and said back rest member, such that upon extending said connector said back rest member is horizontally positionable

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**5,743,595**

**ADJUSTABLE SEAT ARM**

**Stanley Raymond Kirdulis, Darlington, Wis., assignor to Flexsteel Industries, Inc., Dubuque, Iowa**

**Continuation of Ser. No. 783,620, Jan. 14, 1997, abandoned. This application Jul. 14, 1997, Ser. No. 892,425**

**Int. Cl.[6] A47C** *7/54*

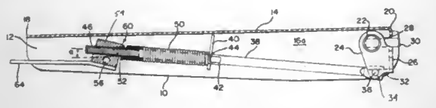
**U.S. Cl. 297—411.38** **13 Claims**

1. An improved seat arm for a reclinable vehicle seat having a seat back pivotable relative to a base comprising:

an arm having a length and locatable at an angle from the seat back, said arm having a forward end and a rearward end with

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a pivot near the rearward end, said pivot providing said arm with angular movement;

said arm having a housing with an end wall having a recess adaptable to receive an arm index pin;

a control rod being pivotally mounted to an anchor point near said rearward end;

said housing further having an offset pin supporting portion with a first aperture, said first aperture receiving a control rod pin;

said control rod pin being operatively connected to said control rod at a pin end;

said control rod extending in a direction generally toward said forward end;

said control rod having a threaded portion at said forward end;

said control rod further having a stop between said ends;

said control rod receiving an eyeletted spring, said spring operatively acting against a spring plate;

a locker for controlling said angular movement of said arm by selectively engaging and releasing said control rod, said locker located at a distance from said control pin;

said locker being pivotally mounted so as to receive said control rod in a second aperture having a threaded portion and a slidable portion, said second aperture further being biased into engagement with said threaded portion of said control rod by action of said spring on said locker;

a lever being operatively connected to said locker to enable manipulation of said locker by pivoting into a disengaged position whereby said control rod passes through said slidable portion of said second aperture;

said locker operative on said control rod to change said distance from said locker to said control rod pin, displacement of said control rod pin and said arm index pin and the relative difference between said locker—rod pin distance and said length of said arm providing a linkage which changes said angle of said arm relative to the seat back, thereby adjusting said arm.

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**5,743,596**

**SAFETY FIXTURE FOR REMOVABLE SEAT OF THE VEHICLE**

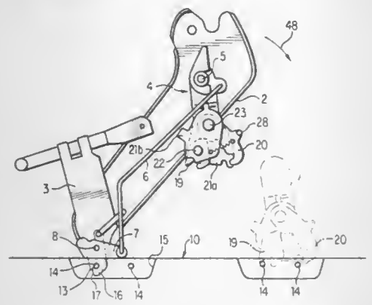
**Jean-Pierre Chabanne, Champvallon, France, assignor to Irausa Ingeniera S.A., Burgos, Spain**

**Filed Jun. 24, 1996, Ser. No. 668,740**

**Claims priority, application France, Jun. 22, 1995, 95 07804**

**Int. Cl.[6] B60N** *2/44*

**U.S. Cl. 297—463.1** **6 Claims**



1. A safety fixture for a removable vehicle seat of the type having four legs consisting of two front legs and two rear legs, each leg being equipped with means for being affixed to at least one of two transverse rods fixed in a front or rear floor well of a vehicle, the means for affixing each front leg comprising a hook-shaped part interacting with one of the two parallel transverse rods fixed in the front floor well, a mobile catch for immobilizing each front leg on the rod, means for returning the catch, manual means for unlocking the catch, wherein the means for affixing each rear leg comprises first and second hook-shaped parts configured to simultaneously interact with a separate one of the two parallel transverse rods fixed in the rear floor well of the vehicle, the first and second hook-shaped parts being formed, respectively, on a front catch and on a rear catch, the front catch articulates at a front and toward a base of a common support and includes, a triangular heel opposite the first hook-shaped part and a rear upper part of the front catch, the triangular heel delimited by two limit stop faces, respectively and upper face for immobilizing the front catch in a locked position, and a rear face for immobilizing the front catch in an open position, the rear catch articulates proximate to a top and substantially at a middle of the common support and includes a triangular protuberance on a front face of the rear catch and between the articulation and the second hook-shaped part, the triangular protuberance being delimited by two limit stop faces, respectively a front face for immobilizing the rear catch in an open position, and a lower face for immobilizing the rear catch in a locked position.

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**5,743,597**

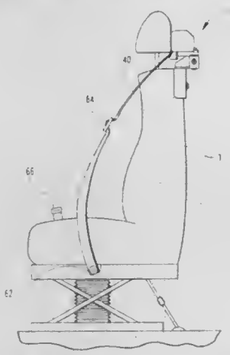
**PIVOTABLE LATERALLY MOVEABLE BELT MOUNT**

**Chris P. Jessup, Sheridan, and Jeffry L. Williams, Zionsville, both of Ind., assignors to Indiana Mills and Manufacturing, Inc., Westfield, Ind.**

**Filed May 7, 1996, Ser. No. 643,868**

**Int. Cl.[6] A62B** *35/00;* **B60R** *22/26;22/34*

**U.S. Cl. 297—474** **16 Claims**



1. An adjustable seat belt system to secure a person in a seat within a vehicle comprising:

a belt anchor mountable in a vehicle;

a three-point belt assembly including a belt having a first end mountable to the vehicle and a second end secured to said belt anchor, said assembly including first connector means movably mounted to said belt between said first end and said second end, said assembly further including second connector means mountable to the vehicle with said second connector means releasably lockable with said first connector means when said first connector means with belt is moved across said seat and engaged with said second connector means;

a first mounting bracket mountable to the vehicle;

a second mounting bracket movably mounted laterally with respect to said first mounting bracket with said belt anchor mounted to said second mounting bracket; and,

a controller associated with said first mounting bracket and said second mounting bracket and operable to cause controllable relative motion between said first mounting bracket and said second mounting bracket, said second mounting bracket moving said belt anchor with said belt to controllably position said belt.



**5,743,598**

**ANTI-SKID CONTROL APPARATUS**

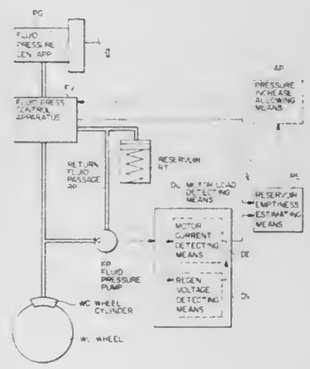
**Hiroshi Toda; Masaru Kamikado; Satoshi Yokoyama, and Masahiko Sakabe, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Jun. 21, 1996, Ser. No. 667,732**

**Claims priority, application Japan, Jun. 22, 1995, 7-156328**

**Int. Cl.[6] B60T** *8/88;13/18*

**U.S. Cl. 303—11** **4 Claims**



1. An anti-skid control apparatus comprising:

a wheel brake cylinder for applying braking force to a wheel of a vehicle;

fluid pressure generating apparatus for supplying brake fluid to the wheel brake cylinder to apply thereto fluid pressure;

fluid pressure control apparatus provided between the fluid pressure generating apparatus and the wheel brake cylinder for controlling fluid pressure in the wheel brake cylinder;

a reservoir communicated with said fluid pressure control apparatus, said reservoir having a capacity for storing a predetermined amount of brake fluid, and said reservoir storing the brake fluid in said wheel brake cylinder through said fluid pressure control apparatus to decrease the pressure in said wheel brake cylinder;

a return passage for communicating said reservoir with said wheel brake cylinder;

a pressure pump disposed in said return passage, said pressure pump having an inlet port communicated with said reservoir and an outlet port communicated with said wheel brake cylinder for discharging a pressurized brake fluid thereto, said pressure control apparatus blocking the communication between said fluid pressure generating apparatus and said wheel brake cylinder whereby said pressure pump discharges the brake fluid stored in said reservoir into said return passage to gradually increase the pressure in said wheel brake cylinder;

an electric motor for driving said pressure pump;

motor load detecting means for detecting motor load on said electric motor during driving of said pressure pump, said motor load being at a minimum level upon idle operation of said pressure pump; and

reservoir emptiness estimating means for determining that no brake fluid remains in the reservoir in response to a sharp decrease in the motor load detected by the motor load detecting means while gradually increasing the pressure in the wheel cylinder.

**5,743,599**

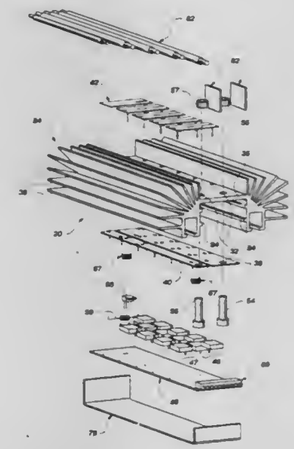
**ELECTROMAGNETIC RETARDER CONTROL APPARATUS AND METHOD**

**Robert Henderson; Scott Kimbrough, and Lawrence Smiltneek, all of Salt Lake City, Utah, assignors to K-Tronics, Inc., Salt Lake City, Utah**

**Filed Apr. 8, 1996, Ser. No. 629,394**

**Int. Cl.[6] B60T** *13/66*

**U.S. Cl. 303—20** **21 Claims**



1. A controller for controlling supply of electrical current from a current source to a plurality of coil means of an electromagnetic retarder, said controller comprising

a plurality of switch means, each coupled between the current source and a respective one of the coil means, for passing current thereto when energized and for blocking the passage of current to the respective coil means when de-energized,

control means for selectively energizing and de-energizing each switch means so that one switch means is de-energized about the same time as another switch means is energized, and

means for maintaining the flow of current to a coil means for a short time following de-energization of the respective switch means.

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**5,743,600**

**WHEEL BRAKING SYSTEM WITH A RETRACTING APPARATUS**

**Atsushi Yasuda, Aichi pref., and Tosbihiro Nakano, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Continuation of Ser. No. 515,028, Aug. 14, 1995, abandoned, which is a continuation of Ser. No. 295,050, Aug. 26, 1994, abandoned. This application Aug. 27, 1996, Ser. No. 703,813**

**Claims priority, application Japan, Aug. 26, 1993, 5-211824**

**Int. Cl.[6] B16D** *65/18;* **B60T** *8/40*

**U.S. Cl. 303—116.1** **6 Claims**

1. A wheel braking system having a brake pedal operatively connected to a master cylinder and a wheel brake cylinder communicated with said master cylinder through a brake fluid supply passage and operatively mounted on a wheel whereby upon operating said master cylinder by depressing said brake pedal a braking operation is initiated for applying a braking force to said wheel comprising:

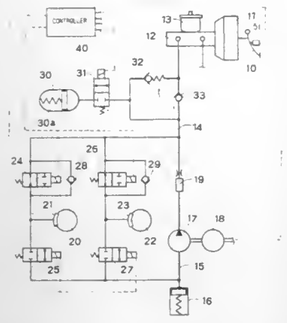
control means for controlling an anti-skid control operation;

switch means adapted to be switched from a first position to a second position upon depression of said brake petal and connected to said control means;

suction means connected to said control means for producing a negative pressure in said wheel brake cylinder upon switching

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of said switch means to the first position upon termination of the braking operation to move a piston in the brake cylinder away from a brake member; and

initial pressure supply means operably connected to said control means for supplying a predetermined amount of brake fluid into said wheel brake cylinder when the braking operation is initiated and said switch means is switched to said second position.

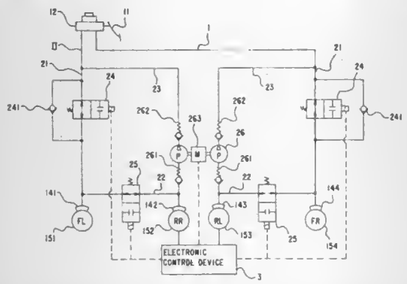
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**5,743,601**

**VEHICLE ANTILOCK BRAKE CONTROL DEVICE**

**Hisayoshi Mori, and Kei Fukuyo, both of Hamakita, Japan, assignors to Nisshinbo Industries, Inc., Tokyo, Japan**

**Filed Feb. 6, 1996, Ser. No. 596,034**
**Claims priority, application Japan, Feb. 17, 1995, 7-053242**
**Int. Cl.[6] B60T** *8/58*
**U.S. Cl. 303—187** **2 Claims**



1. A vehicle antilock brake control system comprising:

two independent brake circuits for connecting a master cylinder to wheel cylinders of a wheel brake of respective diagonal front and rear wheels, each circuit including

only two selector valves,

a first brake line that connects the master cylinder to the wheel cylinder of a front wheel having one of said only two selector valves installed in said first brake line,

a second brake line on a wheel cylinder side of said one selector valve that connects from said first brake line to a wheel cylinder of a rear wheel having the other of said only two second selector valves installed in said second brake line,

a reflux line connected between said second brake line on a wheel cylinder side of said other selector valve and said first brake line on a master cylinder side of said one selector valve, and

a hydraulic pump, installed in said reflux line, for returning brake fluid from said second brake line to said first brake line; and

an electronic control circuit for controlling flow of brake fluid into each wheel cylinder relative to an amount of brake fluid being drawn from each wheel cylinder by each of said hydraulic pumps, and for controlling opening and closing of each of said selector valves to control individually brake pressure of each of the wheel cylinders of the respective front wheel and the rear wheel connected thereto by said second brake lines.

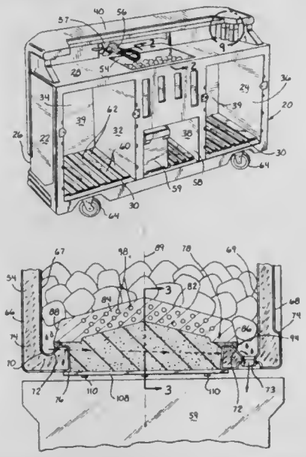
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**5,743,602**

**COLD PLATE AND SEAL**

**Larry D. Maddux, Westminster; Jeff Nicholson, Huntington Beach, and Fred Windisch, Lakewood, all of Calif., assignors to Cambro Manufacturing Company, Huntington Beach, Calif.**

**Filed Aug. 8, 1996, Ser. No. 695,236**
**Int. Cl.[6] A47B** *96/18;* **A47F** *9/00*
**U.S. Cl. 312—140.1** **20 Claims**



1. A cold plate for cooling fluids flowing therethrough comprising:

at least one major first surface for contact with a cold material; said at least one major first surface having a bottom peripheral edge,

a plurality of channels disposed within said cold plate in heat transfer relationship with said at least one major first surface;

means for connecting to said channels for flow of fluids therethrough; and,

a peripheral flange attached to said bottom peripheral edge of said at least one major surface, said flange having at least one reduced edge in sealing contact with at least one second sloping surface; wherein said peripheral flange is adapted to space said major first surface from said at least one second sloping surface.

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**5,743,603**

**COMBINATION CREDENZA AND DESK**

**James O. Kelley, Spring Lake; Ralph Byma, Zeeland, and Gregg J. Persons, Wyoming, all of Mich., assignors to Sligh Furniture Co., Holland, Mich.**

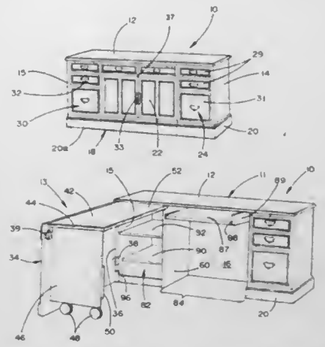
**Filed Apr. 14, 1995, Ser. No. 421,991**
**Int. Cl.[6] A47B** *17/03;19/08*
**U.S. Cl. 312—195** **18 Claims**

1. A furniture unit providing a combination credenza and desk, comprising:

a stationary desk with a front, an opposing back, and two opposing ends, said desk having a desk top, having a first side panel that extends between said desk top and a supporting floor and that extends between said front and said back, having an opposing second side panel that extends between said desk top and the floor, that extends between said front and said back, and that is spaced apart from said first side panel, and having a kneehole opening that extends from said from toward said back and is interposed between said first and said second side panels; and

a moveable return that is pivotally connected with the front of the desk, near one of said two opposing ends, the return having a vertical face panel with a rear side, and having a work surface mounted on the rear side of the face panel, the return being pivotal between a closed position, wherein the face panel covers the kneehole opening and the return work surface is concealed within the desk, behind the face panel, and an open position, wherein the face panel is pivoted outwardly from the front of the desk to expose the kneehole opening and wherein the work surface extends forwardly from the desk, alongside the kneehole opening, the work surface further having an inner corner that is positioned adjacent the kneehole opening when the return is in the open position.





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**5,743,604**

**Patent Not Issued For This Number**

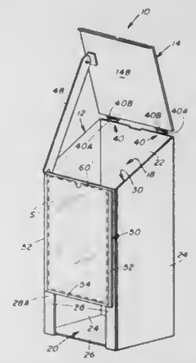
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**5,743,605**

**INFORMATION DISPLAY AND ARTICLE STORAGE AND DISPENSING APPARATUS**

**James F. Marino, 2620 St. Tropez Pl., La Jolla, Calif. 92037**

**Filed Sep. 9, 1996, Ser. No. 708,794**
**Int. Cl.[6] A47G** *29/00*
**U.S. Cl. 312—211** **11 Claims**



1. A dual-purpose storage and display apparatus for storing articles, dispensing the articles, and displaying information, said apparatus comprising:

(a) a storage and dispensing bin including

(i) a main enclosure having a rear wall, a pair of opposite side walls connected to said rear wall and a bottom wall connected to said rear wall and opposite side walls such that said main enclosure has an open front and an open top, and

(ii) a front panel mounted to front edge portions of said opposite sides of said main enclosure and extending across said open front of said main enclosure, said main enclosure and front panel together defining an interior chamber in said bin for storing articles therein, said front panel having a dispensing opening through which articles can be removed by users from said interior chamber of said bin;

(b) an information display device mounted to said front panel of said bin and adapted to hold and display information intended for the users who remove articles from said bin, said information display device being disposed on said front panel above said dispensing opening through said front panel;

(c) first connection elements defined along opposite side edges of said front panel; and

(d) second connection elements defined along opposite front edges of said main enclosure, said first connection elements slidably interfitting with said second connections elements so as to permit said front panel to be slidably lifted and raised relative to said main enclosure in order to remove empty packages from said interior chamber and to replenish said interior chamber with new full packages of articles.

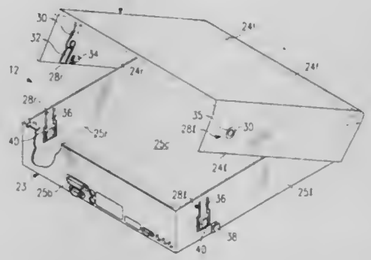
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**5,743,606**

**COMPUTER CABINET LATCHING MECHANISM**

**Erica Scholder, Austin, Tex., assignor to Dell U.S.A., L.P., Austin, Tex.**

**Filed Aug. 16, 1996, Ser. No. 698,817**
**Int. Cl.[6] A47B** *81/00*
**U.S. Cl. 312—223.2** **9 Claims**



1. A computer cabinet for storing components, the cabinet comprising:

a chassis including a side panel and a bottom panel;

a cover including a side panel and a top panel, wherein the cover can be selectively closed onto the chassis so that the cover side panel is located outside of and adjacent to the chassis side panel, or opened from the chassis so that the cover top panel is sufficiently removed from the chassis bottom panel;

a stop attached to the cover side panel, the stop including a lip portion;

a button pivotally connected to the cover side panel and located proximate to the lip portion, said button capable of being selectively depressed; and

a spring member attached to the chassis side panel and comprising an indention portion;

wherein when the cover is closed onto the chassis, the spring member is proximate to the button of the cover side panel and retains the lip portion of the stop within the indention portion of the spring member, thereby securing the cover to the chassis;

wherein depression of the button disengages the lip portion of the stop from the indention portion of the spring member, thereby allowing the cover to be opened from the chassis.

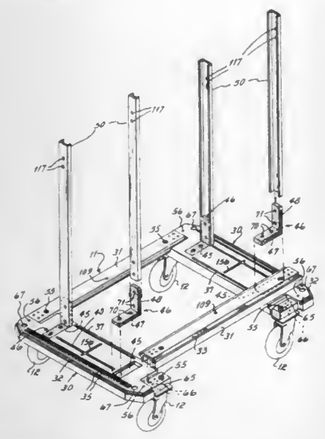
VOL 1209 ISS 4 AP 28 1998 UMI



5,743,607
**CART FOR MEDICATION**

Rainer B. Teufel; Timothy A. Friar; Paul P. Kolada; Jerome M. Romick; Marc D. Taylor, all of Columbus, Ohio, and Duane Beardsley, Berrien Springs, Mich., assignors to Artromick International, Inc., Columbus, Ohio

Continuation of Ser. No. 142,682, Oct. 26, 1993, abandoned, which is a division of Ser. No. 662,750, Mar. 1, 1991, Pat. No. 5,259,668. This application Jun. 7, 1995, Ser. No. 476,064
Int. Cl.[6] A47B *47/00*
U.S. Cl. 312—265.2 6 Claims



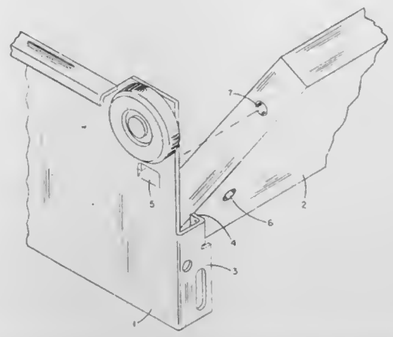
1. A modular cart comprising a base plate, a front side, a rear side and a pair of side walls connecting said front and rear sides, said cart formed in combination with an end cabinet including:
a cabinet back panel formed by one of said side walls of said cart which is spaced inwardly from one end of said base plate, said cabinet back panel having a lower edge,
side wing walls extending outwardly from opposite ends of said cabinet back panel,
interlocking structure on said cabinet back panel and said side wing walls joining said side wing walls to said cabinet back panel
a cabinet control panel frame interlockingly-attached to respective upper edges of said side wing walls,
posts secured to said base plate by mounting structure, said base plate having a plurality of connecting points for each post, said posts extending upwardly from said mounting structure and supporting said cabinet back panel, wherein the mounting structure mounts the cabinet back panel with said posts located at a first set of said connecting points and allows each of said posts to be alternatively mounted at a second set of said connecting points located at said one end of said base plate to mount an end panel to said base plate.

5,743,608
**DRAWER**

Hämmerle Johannes, Hochst, Austria, assignor to Grass AG, Austria

Filed Oct. 4, 1996, Ser. No. 720,939
Claims priority, application Germany, Nov. 9, 1995, 295 17 683.0
Int. Cl.[6] A47B *88/00*
U.S. Cl. 312—348.1 7 Claims

1. A drawer component comprising a drawer slide which forms a side wall of a drawer, the drawer slide having a back wall area and a front wall area, wherein the drawer slide has outwardly curving holding devices in the back wall area of the drawer slide adapted to engage in a back wall and adapted to secure the back wall against shifting in vertical and horizontal directions, the holding devices

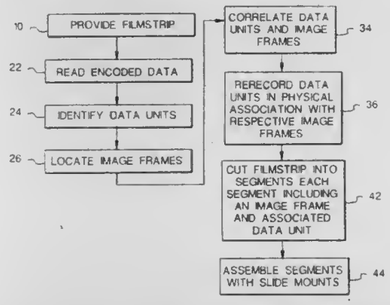


including a tab bent out of the back wall area of the drawer slide substantially perpendicular to the drawer slide, with a first shoulder projection formed on the bent tab, the first shoulder projection extending substantially perpendicular to the bent tab toward the front wall area of the drawer slide and being adapted to engage in a corresponding bore hole of the back wall, and a second shoulder projection bent out of the back wall area of the drawer slide and extending substantially perpendicular to the drawer slide and likewise adapted to engage in a corresponding bore hole in the back wall.

5,743,609
**METHOD AND APPARATUS FOR PREPARING PHOTOGRAPHIC FILM UNITS HAVING IMAGE FRAME ASSOCIATED ENCODED INFORMATION**

Richard W. Bauer, Webster; Dale F. McIntyre; Daniel M. Pagano, both of Honeoye Falls; David L. Patton, Webster, and Edward Weissberger, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 31, 1996, Ser. No. 775,677
Int. Cl.[6] G03B *21/14*
U.S. Cl. 353—25 12 Claims



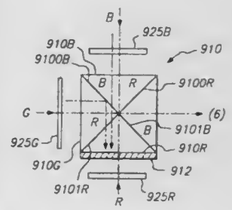

10. A method for preparing photographic film units having image frame associated encoded data comprising the steps of:
developing a filmstrip having a plurality of image frames and encoded data relating to individual said image frames;
reading said encoded data;
storing said encoded data;
locating said image frames;
identifying data units in said encoded data;
correlating individual said data units and individual said image frames;
rerecording said data units on said filmstrip in physical association with respective said image frames; and
cutting said filmstrip into segments, each said segment including an individual said image frame and an associated said data unit.



5,743,610
**PROJECTION-TYPE DISPLAY APPARATUS**

Akitaka Yajima; Motoyuki Fujimori; Mutsuya Furuhata; Tomiyoshi Ushiyama; Terunaga Koide; Toshiaki Hashizume; Kiyoshi Miyashita; Hiroshi Harima, and Keijiro Naito, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Aug. 27, 1996, Ser. No. 697,707
Claims priority, application Japan, Dec. 27, 1994, 6-326492; Dec. 27, 1994, 6-326493; Dec. 27, 1994, 6-326494; Dec. 27, 1994, 6-326497; Dec. 27, 1994, 6-326498
Int. Cl.[6] G03B *21/14*
U.S. Cl. 353—31 20 Claims

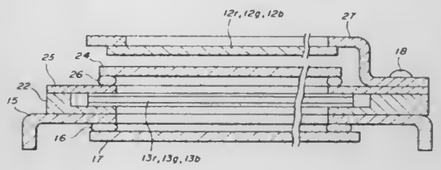



1. A projection-type display apparatus, comprising:
a color separator for separating a light beam emitted from a light source into colored light beams of three primary colors;
three liquid crystal light valves for modulating said separated and colored light beams;
a color synthesizer for combining said colored and modulated light beams, comprising:
a square column dichroic prism composed of four triangle prisms whose cross sections are right isosceles triangles such that said three light valves are located adjacent to three exterior peripheral surfaces of said dichroic prism to receive said colored and modulated light beams from said light valves, and
at least one filter for absorbing light within a specified wavelength range, located between at least one of said liquid crystal light valves and said dichroic prism.

5,743,611
**PROJECTOR**

Makoto Yamaguchi, Kanagawa; Noriaki Negishi, Tokyo, and Hisaharu Nakao, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 4, 1996, Ser. No. 725,467
Claims priority, application Japan, Oct. 13, 1995, 7-265952
Int. Cl.[6] G03B *21/14*
U.S. Cl. 353—31 9 Claims

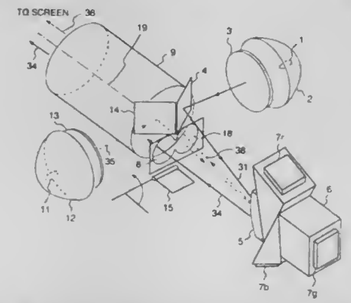



1. A projector for use with a screen comprising:
an image display panel for displaying an image based on a video signal fed thereto;
a light source for applying light to said image display panel;
a projecting lens for projecting the image from said image display panel to the screen; and
a supporting frame for supporting said image display panel and being sealed by a front glass and a rear glass, wherein said light from said light source is input through said front glass and output from said rear glass and wherein said front glass has a metal thin film on a surface thereof having neutral density filter characteristics.

5,743,612
**LIQUID CRYSTAL PROJECTOR**

Yutaka Matsuda, Fujisawa; Nobuhiro Konuma, and Kenji Sato, both of Yokohama, all of Japan, assignors to Hitachi, Ltd, Tokyo, Japan

Filed Nov. 4, 1996, Ser. No. 743,644
Claims priority, application Japan, Nov. 10, 1995, 7-292459; Nov. 10, 1995, 7-292460
Int. Cl.[6] G03B *21/14*
U.S. Cl. 353—97 14 Claims

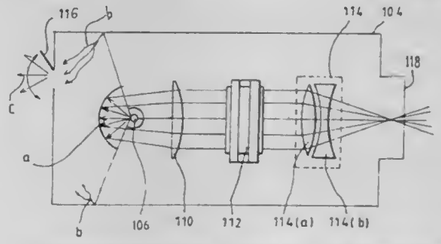



2. A liquid crystal projector comprising: a light source; a reflective type liquid crystal panel; a projection lens; a mirror arranged in an optical path between the light source and the reflective type liquid crystal panel; and an aperture diaphragm arranged in an optical path between the reflective type liquid crystal panel and the projection lens,
in which an illumination light from the light source is allowed to enter the reflective type liquid crystal panel via the mirror on the light source side and is modulated to an image light by the reflective type liquid crystal panel and is reflected, and the image light from the reflective type liquid crystal panel is allowed to enter the projection lens through the aperture diaphragm on the projection lens side and is enlargedly projected onto a screen by the projection lens, wherein
at least two light sources are provided.

5,743,613
**VIDEO PROJECTOR WITH INTERIOR ILLUMINATING MECHANISM**

Eui Seon Jeong, Kyungki-do, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Dec. 11, 1996, Ser. No. 764,628
Claims priority, application Rep. of Korea, Dec. 15, 1995, 50646/1995
Int. Cl.[6] G03B *21/14*
U.S. Cl. 353—119 19 Claims




1. A video projector including a light source for generating light to display image on a screen, the video projector comprising:

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reflection means for reflecting the light from the light source to generate a reflected light and for scattering the light from the light source to generate a dispersed light;

a liquid crystal display (LCD) panel for generating an image light by passing the reflected light therethrough;

a first window for outputting the image light to the screen; and

a second window being selectively opened and closed to output the dispersed light from the reflection means as an illumination source.

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**5,743,614**

**HOUSING ASSEMBLY FOR A MATRIX DISPLAY**

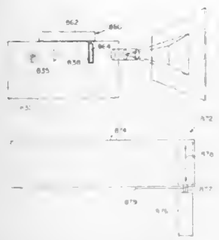
**Jack Salerno, Waban; Matthew Zayracky, Plympton; Stephen Offsey, Brookline; David Chastain, Acton; Michel Arney, Needham; Benjamin Beck, Boston; Gregory Hunter, Westwood; Kevin O'Connor, South Easton, and Alan Richard, Wrentham, all of Mass., assignors to Kopin Corporation, Taunton, Mass.**

**Continuation-in-part of Ser. No. 332,883, Nov. 1, 1994, which is a continuation of Ser. No. 106,071, Aug. 13, 1993, Pat. No. 5,376,979, which is a continuation-in-part of Ser. No. 16,138, Feb. 10, 1993, Pat. No. 5,396,304, which is a continuation-in-part of Ser. No. 944,207, Sep. 11, 1992, Pat. No. 5,444,557, which is a continuation-in-part of Ser. No. 823,858, Jan. 22, 1992, abandoned, and Ser. No. 872,297, Apr. 22, 1992, Pat. No. 5,317,436, which is a continuation-in-part of Ser. No. 839,241, Feb. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 636,602, Dec. 31, 1990, Pat. No. 5,206,749.**

**This application Jun. 7, 1995, Ser. No. 480,966**

**Int. Cl.[6] G03B *21/00***

**U.S. Cl. 353—122** **44 Claims**



1. A housing for mounting a light valve display to a projector body having a light source, and a projection lens, the housing comprising:

a housing having a light valve display panel movable between a first position and a second position, the first position being within the housing and the second position being outside the housing;

a securing mechanism for securing the housing to the projector body; and

a translation mechanism for actuating movement of the display panel between the first position and the second position along an optical path between the light source and projection lens.

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**5,743,615**

**FILM SLIDES HAVING ENCODED DATA AND METHODS FOR PREPARING FILM SLIDES**

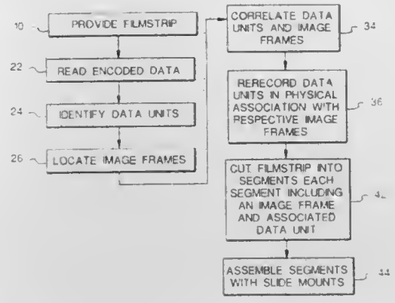
**Dale F. McIntyre; Daniel M. Pagano, both of Honeoye Falls; David L. Patton, Webster, and Edward Weissberger, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 31, 1996, Ser. No. 775,326**

**Int. Cl.[6] G03B *21/14***

**U.S. Cl. 353—122** **18 Claims**

12. A method for preparing film slides from a photographic filmstrip having a plurality of image flames and encoded data relating to said image flames, said method comprising the steps of:




reading said encoded data;

identifying data units in said encoded data;

correlating said data units, said image flames, and mounts;

cutting said filmstrip into segments corresponding to individual said image flames;

mounting individual said segments into slide mounts; and

recording said data units for respective said image flames on respective said slide mounts.

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**5,743,616**

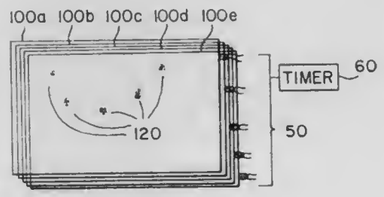
**LED ILLUMINATED IMAGE DISPLAY**

**Ronald Giuliano, 103-25 68th Ave., Forest Hills, N.Y. 11375, and Alexander Asianov, 504 E. 81st St., Suite 1F, New York, N.Y. 10028**

**Filed Dec. 26, 1995, Ser. No. 578,453**

**Int. Cl.[6] F21V *13/04***

**U.S. Cl. 362—31** **13 Claims**




1. An illuminated image display comprising at least one thin, integral solid panel of light transmitting material having a front image display surface, a rear surface opposite thereto and edge surfaces between said front and rear surfaces, wherein at least one light emitting diode (LED) is embedded in an edge of said panel, such that light from the at least one light emitting diode (LED) directly impinges on and is directly diffused through the light transmitting material and wherein a portion of the front image display surface of the panel, has its refractory parameters locally disrupted, in a controlled manner, wherein the refractory parameters are locally disrupted by etching of the display surface and wherein different parts of a desired non-random image are made to be perceptibly illuminated by varying light intensity by variation in at least one of etching depth and spacing between etchings, said etchings being configured to be in the shape of the non-random image, to change the refraction of at least one portion of the front panel surface whereby intensity of directly impinging light emitting diode (LED) light transmitted therethrough is made to vary, whereby the non-random image of a pre-determined specific configurational appearance is perceptible.



**5,743,617**

**VEHICULAR LAMP**

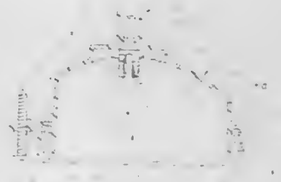
**Osamu Sato; Hiroshige Shinkai, and Kihachirou Uchida, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan**

**Filed Jan. 19, 1996, Ser. No. 587,713**

**Claims priority, application Japan, Jan. 20, 1995, 7-4006895**

**Int. Cl.[6] H01R *33/00***

**U.S. Cl. 362—61** **26 Claims**



13. A contact terminal for a vehicular lamp in which a wedge base bulb is held by and electrically connects to the contact terminal, the contact terminal comprising:

a box-like terminal member;

a male contact piece projecting toward a back wall surface side of a lamp body; and

a lamp body securing section disposed between said box-like terminal member and said male contact piece, said lamp body securing section having a portion projecting in a direction transverse to the direction of said male contact piece's projection towards a back wall surface side of the lamp body.

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**5,743,618**

**OPTICAL AXIS ADJUSTMENT STRUCTURE FOR VEHICULAR LAMPS AND METHOD FOR ASSEMBLING SAME**

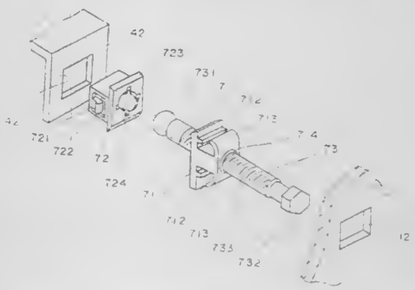
**Yuji Fujino, and Osamu Sato, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan**

**Filed Jun. 18, 1996, Ser. No. 665,397**

**Claims priority, application Japan, Jun. 28, 1995, 7-183248**

**Int. Cl.[6] B60Q *1/00*; *1/06*; F16B *13/04***

**U.S. Cl. 362—61** **21 Claims**



1. A structure for adjusting an optical axis of a lamp, comprising:

a stationary member which is stationary within the lamp;

a movable member which is movable within the lamp;

a single piece optical axis adjustment screw comprising:

a first end portion engaging with said stationary member;

a second end portion operable by rotating; and

an intermediate threaded portion.

a nut member rotatably engaging said intermediate threaded portion of said optical axis adjustment screw, wherein said first and second end portions of said optical axis adjustment screw have an outer radial dimension which is larger than that of said intermediate threaded portion of said optical axis adjustment screw, and wherein said nut member is integrally formed with said optical axis adjustment screw.

**5,743,619**

**FASTENING ARRANGEMENT FOR A VEHICLE LAMP**

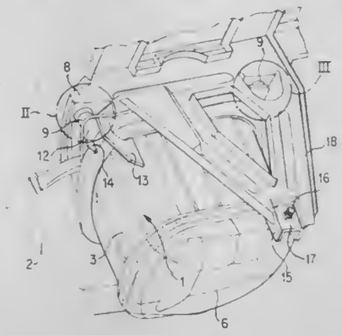
**Harald Gerstner; Reiner Jocher, both of Aidlingen; Horst Dahm, Neuhengstett, and Olaf Ebbesmeyer, Sindelfingen, all of Germany, assignors to Mercedes-Benz AG, Germany**

**Filed Nov. 28, 1995, Ser. No. 563,242**

**Claims priority, application Germany, Nov. 28, 1994, 44 42 294.6**

**Int. Cl.[6] B60Q *1/02***

**U.S. Cl. 362—82** **10 Claims**



1. A fastening arrangement for fitting a vehicle lamp in a receptive trim element, comprising at least two spaced-apart holder devices protruding from the lamp in a peripheral region of a diffusing screen, associated holders of the trim element to which the at least two holder devices are fixed when the lamp is in a finally installed position, one of the at least two holder devices being configured such that, upon insertion, the lamp is operatively joined with the associated holder of the trim element to constitute a plug connection, and a screw fastener for securing the plug connection comprising holding means protruding from the lamp and arranged to be screwed to rest upon a counter-surface of an associated holding structure at a sufficient distance rearwardly of the at least two holder devices so as to be accessible by a screwing tool from below the fastening arrangement, wherein that the lamp is configured to be, upon being inserted into the trim element, conveyed by sliding into an installation position by a longitudinal displacement essentially parallel to the diffusing screen, each of the at least two holder devices extending in a direction of the sliding and being assembleable together with one of the associated holders, and the holding means, at the installed position of the lamp, are accessibly disposed behind the lamp.

**5,743,620**

**BODY WORN LIGHTED DRINKING RECEPTACLE**

**Michael Rojas, and Marilyn Arnodo, both of 601 W. 17th, #2, Houston, Tex. 77008**

**Filed Mar. 24, 1997, Ser. No. 822,745**

**Int. Cl.[6] F21V *33/00***

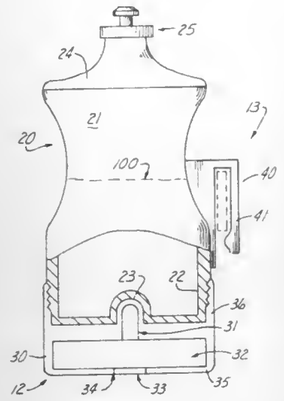
**U.S. Cl. 362—101** **5 Claims**

1. An illuminated drinking receptacle for use with a belt which encircles a user's torso wherein the drinking receptacle comprises:

a contoured receptacle member including an upper portion provided with a closure element, an intermediate portion, and a

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bottom portion wherein both the upper portion and the closure element are opaque and the intermediate and bottom portions of the receptacle member are fabricated from a translucent material;

an illumination unit operatively associated with the bottom portion of the receptacle member; and

a belt clip unit disposed on the intermediate portion of the receptacle member for releasably connecting the receptacle member to the belt.

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**5,743,621**

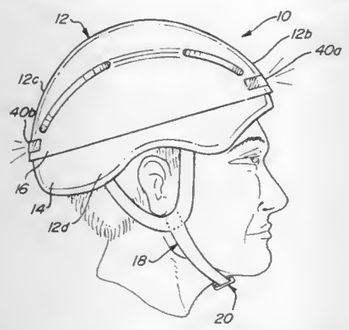
**ILLUMINATED SAFETY HELMET**

**Robert L. Mantha, 1657 Lesperance Road, Sandwich South, Ontario, N8N 142, Canada, and Robert Colaizzi, 106 Wilkinson Drive, Leamington, Ontario, Canada, N8H 3V5**

**Filed Aug. 8, 1996, Ser. No. 695,165**

**Int. Cl.[6] F21V** *33/00*

**U.S. Cl. 362—105** **14 Claims**



1. An illuminated safety helmet assembly comprising:

a protective helmet;

a chin strap having releasably engageable buckle portions that when connected operate to secure said helmet releasably to the head of a user and when disconnected enable said helmet to be removed;

a light source supported by said helmet;

a power source; and

a control circuit coupling said power source electrically to said light source, said circuit including a switch movable between a closed circuit position in response to the connection of said buckle portions to energize said light source and an open circuit position in response to the disconnection of said buckle portions to de-energize said light source.

**5,743,622**

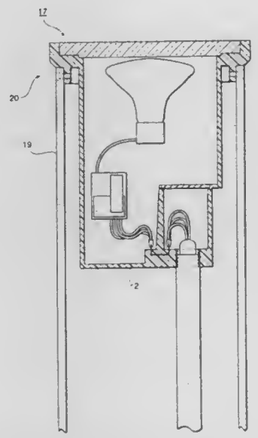
**LANDSCAPE LIGHT WITH ANTI-WICKING ELEMENTS AND ELONGATED BASE**

**Ian R. Ibbitson, Seal Beach, and Frank G. Watson, Long Beach, both of Calif., assignors to Architectural Landscape Lighting, Santa Ana, Calif.**

**Filed Aug. 14, 1996, Ser. No. 698,232**

**Int. Cl.[6] E01F** *9/00*; **F21S** *1/02*

**U.S. Cl. 362—153.1** **21 Claims**



1. An in-ground light fixture comprising:

a single unitary body having a first chamber and a second chamber, the first chamber and the second chamber being separated by a common wall; and

plural conductive elements, each of which is molded within the common wall separating the first chamber and the second chamber and each of which forms a conductive pathway between the first chamber and the second chamber,

wherein the first chamber contains at least electrical components and a light source, and has an opening for receiving a lens, and the second chamber has an opening adapted to receive a power conduit supplying power from an external power source,

wherein the plural conductive elements are molded within the common wall of the single unitary body of the in-ground light fixture by molding the common wall around the plural conductive elements when said common wall is forked, the plural conductive elements permitting power to be supplied from the second chamber to the electrical components and the light source in the first chamber.

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**5,743,623**

**SELF-LOCKING FLASHLIGHT HOLDER**

**Daniel G. Kerr, 2922 East 25th Avenue, Vancouver, British Columbia, Canada, V5R 1J2**

**Filed Sep. 12, 1996, Ser. No. 713,217**

**Int. Cl.[6] F21L** *7/00*

**U.S. Cl. 362—190** **16 Claims**

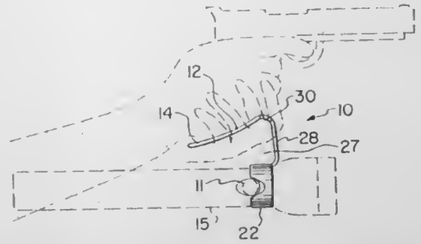
1. A flashlight holder for use in combination with a flashlight and a firearm, comprising:

(a) a collar operative to slidably attach to a flashlight housing proximate a flashlight head;

(b) a spacer arm dimensioned to fit between a pair of fingers, said spacer arm coupled to said collar and extending outwardly therefrom; and

(c) a cantilevered arm having a bowed body with a distal end, said cantilevered arm coupled to said spacer arm at a junction remote from said collar and forming an oblique angle with said spacer arm;





wherein said spacer arm has a length sufficient to permit a user to hold said cantilevered arm in a palm of a hand while said collar is attached to the flashlight housing proximate the flashlight head such that the user can control both the flashlight and the firearm.

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**5,743,624**

**TORCH WITH A BELLOWED INTERMEDIATE FLEXIBLE TUBE MEMBER**

**Hanh Chiang, No. 162, Chung-Chen S. Rd., Hsia-Jing Hsiang, Tainan Hsien, Taiwan**

**Filed Mar. 25, 1997, Ser. No. 823,838**

**Int. Cl.[6] F21L** *7/00*

**U.S. Cl. 362—198** **1 Claim**



1. A torch comprising:

a head member with a bulb unit and having a threaded end section;

a tail member with a cell unit and having a threaded end section;

a bellowed intermediate flexible tube member including a tube body, two connectors respectively attached to two ends of the tube body and respectively having internally threaded end sections engaging said threaded end sections of the head and tail members, front and rear conductive contact sets respectively provided in the connectors in such a manner that the front conductive set is in electrical contact with the bulb unit while the rear conductive set is in electrical contact with terminals of the cell unit, wherein each of the front and rear conductive sets includes an insulated tubular seat fixed within a corresponding one of the connectors and provided with a reduced-diameter outer end portion, an annular conductive ring sleeved respectively around each of the outer end portions, an opening formed respectively in each of the outer end portions of the seat, a conductive mushroom-like contact element press-fitted respectively within each of the outer end portions of the seat and having a small-diameter portion which extends respectively into each of the outer end portions of each of the respective seats and a large-diameter outer end portion which is exposed partially to an exterior of each of the respective seats, a central wire extending through the tube body and each of the openings of the respective seats and having an end attached to each of the respective small-diameter portions of the contact element so as to establish electrical connection therebetween, and a peripheral wire extending through the tube body and each of the respective seats for electrical contact with an inner peripheral surface of each of the respective rings;

each of said rings being flexible and having an externally toothed portion which extends radially and outwardly from an outer surface thereof and which engages an inner surface of a corresponding one of said connectors so as to prevent disengagement therefrom and consequently securing relative position of the ring on said seat;

said tail member including a cell-holding conductive barrel tube for accommodating said cell unit therein and a conductive cap which is detachably attached to the conductive barrel tube and which biases the cell unit to contact one of said contact elements while said conductive barrel tube contacts one of said rings, and said bulb unit including a first end and a second end which contacts another of said contact elements and another of said rings, respectively.

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**5,743,625**

**CURVED HOUSING ASSEMBLY FOR ILLUMINATED GLASS TUBING AND METHOD**

**Walter Keisler Tanner, Chesnee, S.C., assignor to Fallon Luminous Products, Inc., Spartanburg, S.C.**

**Continuation-in-part of Ser. No. 599,644, Feb. 12, 1996, which is a continuation-in-part of Ser. No. 389,314, Feb. 16, 1995, Pat. No. 5,541,823. This application Jan. 30, 1997, Ser. No. 790,199**

**Int. Cl.[6] F21S** *5/00*; *3/00*

**U.S. Cl. 362—216** **23 Claims**



1. A curved housing assembly for protective support of curved illuminated glass tubing comprising:

a curved longitudinally base section;

a curved and inverted u-shaped central section having an elongated support section for supporting glass tubing and downwardly directed wall portions forming an elongated channel having an open side adjacent said base section;

a curved and inverted u-shaped light-transmitting cover section having downwardly directed wall portions forming an elongated channel having an open side for receiving said central section therein, with the radii of curvature of said base, central, and cover sections being equal; and

fasteners for joining together said base, central, and cover sections.

23. A method of providing a substantially continuous neon light, comprising the steps of:

providing a plurality of straight light housing assemblies, each said housing assembly having all of its electrical components contained therein except for jumper cables for connecting said straight housing assemblies to other housing assemblies or a source of electricity;

providing a plurality of curved light housing assemblies, each said housing assembly having all of its electrical components contained therein except for jumper cables for connecting said straight housing assemblies to other housing assemblies or a source of electricity;

selecting a combination of straight and curved housing assemblies needed to produce a desired neon light configuration;

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interconnecting said jumper cables of said selected housing assemblies; and

attaching one of said selected and interconnected housing assemblies to a source of electricity.

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**5,743,626**

**LIGHTING SYSTEM**

**Richard Walker, Urbana, Ohio, assignor to Grimes Aerospace Company, Urbana, Ohio**

**Continuation of Ser. No. 388,239, Feb. 14, 1995, Pat. No. 5,636,919. This application Jan. 28, 1997, Ser. No. 790,002**

**Int. Cl.[6] F21S *3/00***

**U.S. Cl. 362—217** **1 Claim**




1. A compact, self-locking lampholder for a fluorescent lamp having two lamp pins, comprising:

a housing;

an opening in the housing for receiving the lamp pins;

a pair of retaining springs mounted in the housing and configured to retain the lamp pins within the housing;

a pair of biasing springs adjacent one another and positioned relative to the retaining springs; and

a plunger, mounted in the housing, the plunger when depressed moves the retaining springs apart and compresses the biasing springs so that the lamp pins may be placed in the opening of the housing, and when the plunger is released, the lamp pins are locked in place, the biasing springs biasing the lamp pins against the retaining springs.

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**5,743,627**

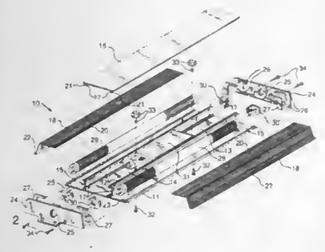
**LIGHTING FIXTURE**

**Joseph M. Casteel, 255 Lylton Rd., Moon Township, Pa. 15108**

**Filed Feb. 25, 1997, Ser. No. 805,925**

**Int. Cl.[6] F21V *23/00*; F21S *3/00***

**U.S. Cl. 362—222** **17 Claims**



1. A lighting fixture comprising: a substantially rigid housing base having an elongated back plate with a spaced pair of longitudinally extending legs depending from an inside surface of said back plate and providing a ballast channel therebetween and a pair of lamp channels on opposite sides of said ballast channel, and an elongated cover removably secured to said legs with longitudinal snap connections for covering said ballast channel and thereby providing a strong two-piece housing assembly.

**5,743,628**

**FIELD-OF-OPERATION ILLUMINATING DEVICE ACCOMMODATING INCANDESCENT AND DISCHARGE LAMPS**

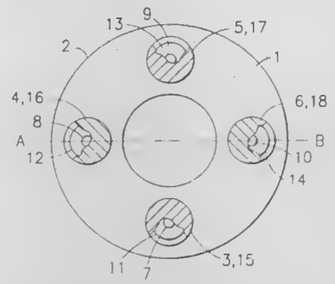
**Stefan Greif, Fulda; Jörg Eduard Hartge, Geinhausen, and Till Schmeling, Wipperfuerth, all of Germany, assignors to Heraeus Med GmbH, Hanau, Germany**

**Filed Feb. 12, 1996, Ser. No. 600,485**

**Claims priority, application Germany, Feb. 21, 1995, 195 05 925.5**

**Int. Cl.[6] F21V *23/00***

**U.S. Cl. 362—228** **17 Claims**




1. A field-of-operation illuminating device comprising:

(a) a housing having a bottom with a plurality of light-emitting areas,

(b) at least one incandescent lamp disposed in said housing, said at least one incandescent lamp having a light-emitting area associated therewith and optics for collimating and orienting light, and

(c) at least one discharge lamp disposed in said housing, said at least one discharge lamp having a light-emitting area associated therewith and optics for collimating and orienting light,

both of said at least one incandescent lamp and said at least one discharge lamp simultaneously illuminate a prescribed field of operation through said light-emitting areas in said bottom of said housing to provide a total intensity of illumination, wherein said at least one incandescent lamp provides 40 to 60% of the total intensity of illumination and said at least one discharge lamp provides 60 to 40% of the total intensity of illumination.

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**5,743,629**

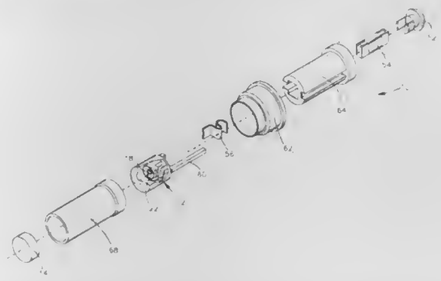
**ILLUMINATION SYSTEM**

**Robert P. Helstern, and Yusuke P. Okabayashi, both of Costa Mesa, Calif., assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Aug. 15, 1996, Ser. No. 698,307**

**Int. Cl.[6] F21V *9/00***

**U.S. Cl. 362—293** **41 Claims**



1. A method of providing illumination, said method comprising the steps of energizing a light source to produce nonwhite light of a first color at an energy level which can be perceived by the human eye, and obtaining white light at an energy level which can be perceived by a human eye by reflecting the nonwhite light of a first color from a reflector.



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**5,743,630**

**METHOD FOR MOLDING LAMP BODY AUTOMOTIVE LAMPS AND LAMP BODY THEREOF FORMED OF SYNTHETIC RESIN AND A MOLD THEREFOR**

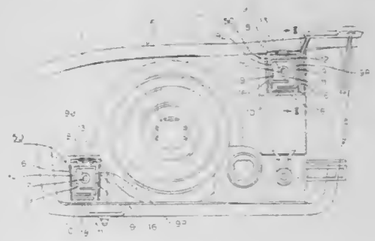
**Hirokazu Yanagihara, and Masakazu Yamashita, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan**

**Filed Jan. 25, 1996, Ser. No. 591,742**

**Claims priority, application Japan, Jan. 31, 1995, 7-032904**

**Int. Cl.[6] F21V *29/00***

**U.S. Cl. 362—294** **10 Claims**



6. An air communication system comprising:

an air communication hole formed in a rear wall of a lamp body;

a cylinder member extending rearwardly from and integrally with an opening periphery of said air communication hole;

a surrounding wall projecting from a rear wall of said lamp body for surrounding said cylinder member with a certain distance therefrom;

a first water blocking wall projecting leftward from a lower distal end of a right side wall of said surrounding wall;

a second water blocking wall projecting rightward from the left side wall of said surrounding wall at a position slightly upper than the lower distal end of the left side wall;

a pent roof wall extending in the horizontal direction at a position slightly upper than said surrounding wall;

a cover member formed integrally with said pent roof wall continuously therefrom through a thin hinge section, said cover member being provided at a tip end thereof with an engaging protrusion, said thin hinge section being formed on a surface of a junction of said pent roof wall and said cover member opposite said surrounding wall by forming a recess which is V-shaped in cross section;

a couple of outside walls formed on the rear wall of said lamp body to extend in the vertical direction and spaced apart laterally From said surrounding wall;

a step part facing rearward formed at a rear end of said respective outside walls on surfaces thereof facing each other, said step parts positioning on substantially the same plane as the rear end of said surrounding wall; and

a stopper wall extending in the horizontal direction at a position slightly lower than said first water blocking wall, said stopper wall being formed with an engaging slit at a rear portion thereof.

**5,743,631**

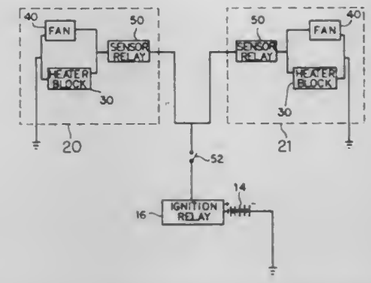
**LIGHT BAR HEATER**

**James R. Bigham, 209 Murray St., Boise, Id. 83714**

**Continuation-in-part of Ser. No. 438,978, May 11, 1995, abandoned. This application May 24, 1996, Ser. No. 653,256**

**Int. Cl.[6] F21V *15/00*; *29/00***

**U.S. Cl. 362—294** **1 Claim**




1. A heating and water removal system for vehicle warning light bars, comprising:

a pair of symmetrical first and second heater and fan units located within the vehicle warning light bar, with each heater and fan unit comprising a self-limiting heater comprised of one or more resistive heater elements, an electric fan for circulating heated air, and a control relay thermostatically actuated and/or actuated by relative humidity of 90% inside said vehicle warning light bar, and deactuated by relative humidity of 50% inside said vehicle light bar, operably connected to said heater and fan;

a vehicle battery as a source of power electrically connected to the heater and fan units, including a relay and a protective fuse interdisposed between the heater and fan units and the source of power, wherein the relay is actuated by the vehicle ignition switch; and

a manually operated switch for activating said heater and fan units.

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**5,743,632**

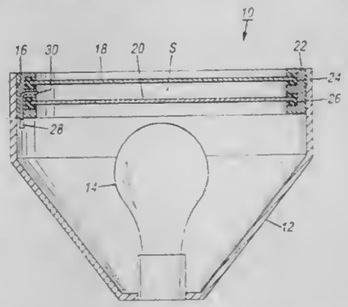
**THERMALLY CONTROLLED LIGHT FIXTURE**

**Michael J. Carl, New Braunfels, Tex., assignor to The Genlyte Group Incorporated, Union, N.J.**

**Filed Nov. 12, 1996, Ser. No. 748,239**

**Int. Cl.[6] F21V *29/00***

**U.S. Cl. 362—294** **3 Claims**




1. A thermally controlled light fixture, comprising:

a housing for holding a high intensity, heat-producing lamp and having an opening through which light emanates from the lamp, said housing being adapted for mounting adjacent the ground in a publically accessible area so as to illuminate one of an object and a surface substantially above the ground;

at least two lenses;

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mounting means for supporting said lenses in spaced layered relation, said mounting means including a resilient seal assembly forming a sealed thermal barrier between the lenses that at least partially encloses the opening of said housing such that one of said lenses is an outer lens positioned furthest from the heat-producing lamp and another of said lenses is an inner lens, whereby a temperature of the outer lens is maintained below a temperature that would cause discomfort if touched; and

a valve positioned within said mounting means for evacuating air within the sealed thermal barrier.

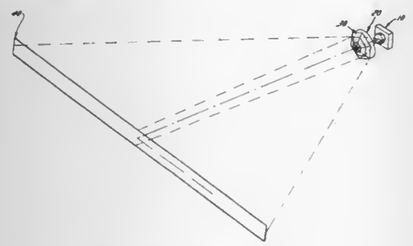
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**5,743,633**

**BAR CODE ILLUMINATOR**

**Chiu W. Chau, Buena Park, and Jeremy M. Lerner, Culver City, both of Calif., assignors to Physical Optics Corporation, Torrance, Calif.**

**Filed Dec. 27, 1995, Ser. No. 579,312**
**Int. Cl.[6] F21V** *5/04*
**U.S. Cl. 362—331** **21 Claims**



1. A bar code illuminator comprising:

I) a first light source; and

II) a first light transformer optically connected to said first light source, said first light transformer including:

A) a first light shaping diffuser comprising random, disordered, and non-planar speckle that defines non-discontinuous and smoothly varying changing in the refractive index of the medium of the diffuser, so as to scatter incident collimated light, said speckle being sized, shaped, and oriented so as to shape the angular spectrum of light scattered therefrom; and

B) a first lens optically connected to said first light shaping diffuser.

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**5,743,634**

**PERFORATED REFLECTOR FOR AN ORNAMENTAL LUMINAIRE**

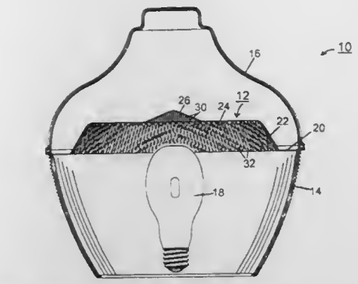
**Ronald L. Sitzema, Ellsworth; Joel E. Robinson, Charlevoix, and Robert D. Towne, Jr., Boyne City, all of Mich., assignors to Lexalite International Corporation, Charlevoix, Mich.**

**Filed Jul. 31, 1996, Ser. No. 688,833**
**Int. Cl.[6] F21V** *7/00;3/00*
**U.S. Cl. 362—341** **12 Claims**

2. A reflector for an ornamental luminaire comprising:

a member formed of a metal material, said metal member having a predetermined thickness and being perforated with spaced apart apertures of a selected diameter and a selected density;

said metal member having a predefined reflector shape, said spaced apart apertures and said predefined reflector shade arranged for providing control of both an upper illumination distribution and a lower illumination distribution; and



wherein said sloped, vertically extending, sidewall is fluted and includes elongated apertures.

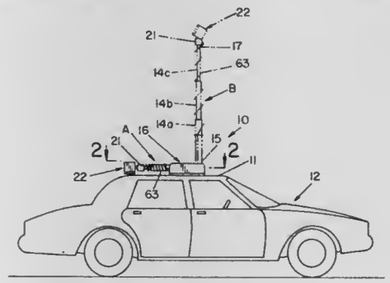
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**5,743,635**

**PNEUMATICALLY TELESCOPING MAST**

**John A. Hulse, Akron, and John C. Stearns, Medina, both of Ohio, assignors to The Will-Burt Company, Orrville, Ohio**

**Filed Jan. 16, 1996, Ser. No. 585,944**
**Int. Cl.[6] F21V** *21/22*
**U.S. Cl. 362—385** **28 Claims**



1. In a pneumatically telescoping mast supported for pivotal movement in opposite directions about a horizontal mast axis, said mast including adjacent telescoping sections slidable relative to one another between retracted and extended positions, means including pneumatic control means for displacing said mast sections between said retracted and extended positions, and means for pivoting said mast in opposite directions about said pivot axis between horizontal and vertical positions, the improvement comprising: said mast including lighting means for illumination mounted to one of said adjacent telescoping sections and DC power supply means for providing electrical power to said mast system, for providing power to said lighting means and said means for pivoting and including means adjacent said lighting means for converting DC power to AC power whereby AC power is provided to said lighting means.

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**5,743,636**

**MIXING MAT FOR CONCRETE**

**Walter L. Payne, 47156 Kentwell Pl., Sterling, Va. 20165**

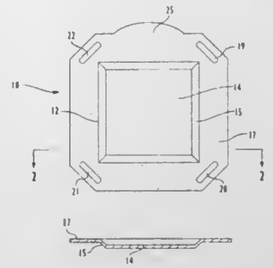
**Continuation-in-part of Ser. No. 498,700, Jul. 3, 1995, abandoned. This application Dec. 20, 1996, Ser. No. 771,152**
**Int. Cl.[6] B28C** *5/00;5/44*
**U.S. Cl. 366—1** **14 Claims**

1. A device for mixing a blend of dry ingredients with a liquid and for setting the ratio of the dry ingredients to the liquid, comprising:

a sheet of flexible material arranged to form a reservoir and a planar skirt, said reservoir positioned at a central area of said sheet and shaped as an open-topped basin having a flat bottom, said basin arranged and sized to hold a predetermined volume of liquid, said skirt surrounding said basin, disposed generally parallel with said basin bottom, spaced from the plane of said basin bottom by basin sides extending between the basin bottom and the skirt, and extending from the top of said basin sides to the perimeter of said sheet; and

a plurality of handles disposed around the perimeter of said skirt.





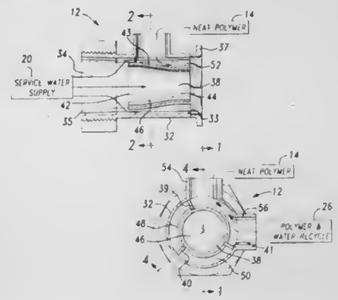
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**5,743,637**

**VENTURI MIXING VALVE FOR USE IN MIXING LIQUIDS**

**Ray Ogier, Milton, Canada, assignor to Chem Financial, Inc., Ontario, Canada**

**Filed Nov. 9, 1995, Ser. No. 555,783**
**Int. Cl.[6] B01F** *5/00*
**U.S. Cl. 366—163.2** **7 Claims**



4. A mixing valve for use in mixing liquids, said valve comprising:

a housing having an axial passageway extending between a primary inlet and an outlet;

a reducer member mounted to said housing within said passageway, said reducer member having a central throughbore, said reducer member tapering radially inwardly from an inflow end to an outflow end to form a venturi;

at least two baffles extending between said reducer member and said housing to form a mixing chamber; and

a pair of secondary inlets formed in said housing for delivering fluids into said mixing chamber, said pair of secondary inlets being separated 90° circumferentially on said housing.

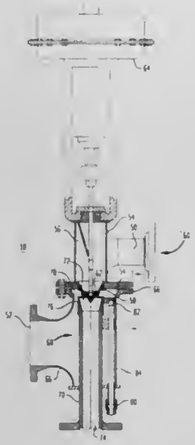
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**5,743,638**

**DUAL CONTROL MIXING JET COOKER**

**Richard D. Cummins, Orchard Park, and Jack A. Perry, Lewiston, both of N.Y., assignors to Q-Jet, DSI**

**Filed Jul. 30, 1996, Ser. No. 688,495**
**Int. Cl.[6] B01F** *15/02*
**U.S. Cl. 366—163.2** **15 Claims**



1. A fluid mixing apparatus for mixing a first fluid with a second fluid, said apparatus comprising:

a first housing having an entry end, first fluid supply inlet and a nozzle outlet at a nozzle end of said first housing;

first actuator means for controlling the exit pressure of said first fluid exiting from said nozzle outlet;

a second mixing housing coupled to said nozzle end of said first housing, said second mixing housing having a second fluid supply inlet;

a mixing tube for mixing the first and second fluids, said mixing tube having an entry end and an exit end, and contained within said second mixing housing;

a collar member circumferentially mounted around said mixing tube positionable along said mixing tube so as to form a circumferential gap between said nozzle and said collar member; and

second actuator means for axially moving said collar member toward and away from said nozzle so as to control the spacing of the gap between said nozzle and said collar member thereby regulating the pressure of the second fluid introduced into said mixing tube.

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**5,743,639**

**INGREDIENT FEEDER WITH CLOSELY SPACED ENROBING CHAMBER AND BLENDER ASSEMBLY**

**Gale Norman Puerner, Fort Atkinson, Wis.; Keith Douglas White, Loves Park, Ill., and John E. Kress, Waterloo, Wis., assignors to APV Crepaco, Inc., Rosemont, Ill.**

**Filed Nov. 2, 1995, Ser. No. 551,997**
**Int. Cl.[6] B01F** *7/00;* **G01F** *11/20*
**U.S. Cl. 366—182.1** **11 Claims**

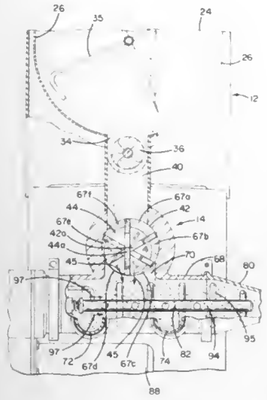
1. An ingredient feeder for metering an ingredient into a flowable food product comprising:

an enrobing section including an enrobing chamber having an inlet and outlet and a rotor assembly disposed within the enrobing chamber that supplies a selected ingredient amount in a first direction at the outlet; and

a blending section in communication and close spaced relation with the enrobing chamber outlet, the blending section including an elongate tubular housing oriented in a second direction and an agitator disposed within the housing in close spaced

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relation with the enrobing chamber outlet, the blending section being adapted to receive pressurized flowable food product which flows in the second direction such that the ingredient supplied through the enrobing chamber outlet is dispersed in both the first direction and the second direction when intermixed with the flowable food product to provide at least dispersion of the ingredient in the flowable food product in the first and second directions.

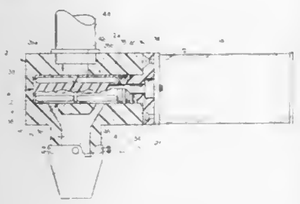
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**5,743,640**

## ICE CREAM TWISTING APPARATUS

**Jimmy L. Crossley, 3218 Nebraska Ave., Council Bluffs, Iowa 51501**

**Filed Feb. 6, 1996, Ser. No. 597,220**
**Int. Cl.[6] B01F** *15/02;7/00*
**U.S. Cl. 366—194** **5 Claims**





1. A twisting apparatus, comprising:

an elongated housing having an exterior surface, a top and bottom, opposing longitudinal sides, and first and second ends;

a mixing chamber within said housing;

an inlet port extending through the housing top and communicating with the mixing chamber for inputting product into said mixing chamber;

at least one wall dividing the mixing chamber into a plurality of separate mixing chambers, each of which communicates with the inlet port to receive product therefrom;

a passageway extending from a first of said plurality of separate mixing chambers to the exterior surface of the housing for selectively injecting flowable product into the first separate mixing chamber;

means in each of said separate mixing chambers for mixing product within each of said separate mixing chambers;

an outlet port formed in the bottom of the housing for dispensing mixed product from the mixing chambers; and

outlet tubes extending from each separate mixing chamber to said outlet port for dispensing mixed product from each of said separate mixing chambers to the outlet port.

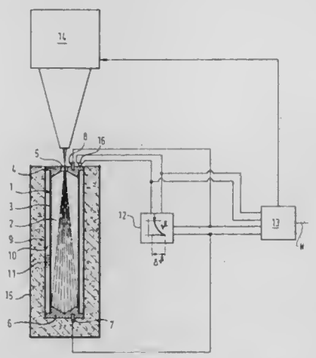
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**5,743,641**

## APPARATUS FOR POWER MEASUREMENT OF LASER IRRADIATION

**Franz Geiger, Via Lavorascio I-21027, Ispra, Italy**

**PCT No. PCT/EP94/03268, § 371 Date Aug. 23, 1996, § 102(e) Date Aug. 23, 1996, PCT Pub. No. WO95/09350, PCT Pub. Date Apr. 6, 1995**
**PCT Filed Sep. 30, 1994, Ser. No. 633,812**
**Claims priority, application Luxembourg, Sep. 30, 1993, 88 413**
**Int. Cl.[6] G01K** *17/20*
**U.S. Cl. 374—32** **15 Claims**



1. Apparatus for power measurement of laser irradiation comprising:

a first elongate body forming a hollow space, having first and second longitudinal ends, and comprising a metallic wall, wherein the wall comprises a material of small thickness and good thermal conductivity, wherein said first elongate body has an opening on the first longitudinal end for receiving laser irradiation, wherein said first elongate body has a black surface in an area covered by laser irradiation in the hollow space, and wherein said first elongate body has a first heat detector on the first longitudinal end and a second heat detector on the second longitudinal end, wherein said first and second heat detectors are adapted to be coupled to a means for processing electrical output signals of the heat detectors,

a second elongate body surrounding the first elongate body on longitudinal sides and on the second longitudinal end and, together with said first elongate body, forming an intermediate space wherein a vaporable heat transfer medium can be inserted.



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**5,743,642**

## METHOD FOR COMPENSATING EARTH SURFACE TEMPERATURES FOR THE SKYWARD EFFECT THEREON

**Lloyd C. Fons, 14410 Cindywood Dr., Houston, Tex. 77079**

**Filed Jun. 24, 1996, Ser. No. 668,814**
**Int. Cl.[6] G01N** *25/00;* **E21B** *47/06;* **G01K** *13/00*
**U.S. Cl. 374—45** **16 Claims**

1. A method for selecting locations, among a plurality of locations, in a geographical area, which are likely to have oil or gas deposits beneath them, which method comprises:

a). selecting the geographical area beneath which oil or gas deposits might be found and selecting the plurality of locations within the geographical area;

b). measuring an earth surface temperature, $T_L$ at each location of the plurality of locations within the geographical area, and simultaneously measuring a skyward temperature, $T_S$, in a vertical direction above each location;

c). determining an average, $T_{SA}$, of the skyward temperatures, $T_S$, measured at the plurality of locations;

d). determining a normalized temperature, $T_{NS}$, for each measured skyward temperature, $T_S$, according to the equation: $T_{NS}=T_{SA}-T_S$;

e). determining, for each location of the plurality of locations, a compensated earth surface temperature, $T_{CL}$ according to the formula:

$$T_{CL}=T_L-(C)(T_{NS});$$

where (C) is a constant proportional to the effect of a variation in the measured skyward temperature, $T_S$, at the respective location upon the measured earth surface temperature, $T_L$;

f). determining an average value, $T_{CLA}$, for the compensated earth surface temperatures, $T_{CL}$, of the plurality of locations; and

g). selecting locations, among the plurality of locations, having compensated earth surface temperatures, $T_{CL}$ less than the average value, $T_{CLA}$ as locations likely to have oil or gas deposits beneath them.

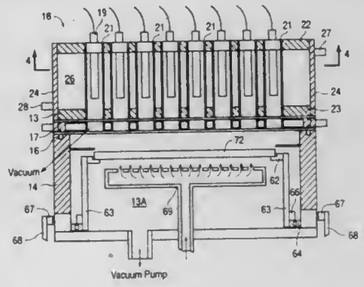
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**5,743,643**

## RAPID THERMAL HEATING APPARATUS AND METHOD

**Christian M. Gronet, and James F. Gibbons, both of Palo Alto, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.**

**Continuation of Ser. No. 509,392, Jul. 31, 1995, which is a division of Ser. No. 131,830, Oct. 5, 1993, Pat. No. 5,487,127, which is a division of Ser. No. 882,656, May 13, 1992, Pat. No. 5,317,492, which is a division of Ser. No. 781,632, Oct. 24, 1991, Pat. No. 5,155,336, which is a continuation of Ser. No. 467,808, Jan. 19, 1990, abandoned. This application Oct. 16, 1996, Ser. No. 732,020**
**Int. Cl.[6] G01J** *5/06*
**U.S. Cl. 374—121** **4 Claims**




1. A method of measuring the temperature across a substrate during processing in a vacuum chamber having a quartz window, said substrate heated during processing by radiation from a radiant energy source that passes through the quartz window, comprising:

positioning a substrate in the vacuum chamber so that one side of the substrate faces the quartz window and another side of the substrate faces away from the quartz window;

positioning a radiation detector so that it images the side of the substrate that faces away from the quartz window;

using the quartz window to absorb the radiation from the radiant energy source such that it is not sensed by the radiation detector;

sensing infrared radiation emitted by the substrate with the radiation detector; and

determining any differences in the temperature of different regions of the substrate from the sensed radiation.

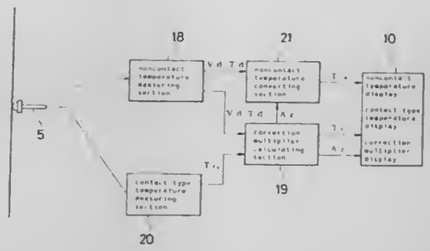
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**5,743,644**

## TEMPERATURE MEASURING APPARATUS

**Seishiro Kobayashi; Akiyoshi Nabei; Shuichi Takashina, and Takashi Fujishiro, all of Tokyo, Japan, assignors to Anritsu Meter Co., Ltd., Tokyo, Japan**

**Filed Aug. 29, 1995, Ser. No. 520,649**
**Claims priority, application Japan, May 31, 1995, 7-134388**
**Int. Cl.[6] G01J** *5/10;* **G01K** *7/04*
**U.S. Cl. 374—126** **2 Claims**




1. A temperature measuring apparatus, comprising

a noncontact-type thermometer for receiving heat radiation from a temperature measurement object and measuring the temperature of the temperature measurement object;

a contact-type thermometer for contacting the temperature measurement object and measuring the temperature of the temperature measurement object;

said noncontact-type thermometer comprising a portable body case with a holder housed therein, said contact-type thermometer comprising a sensor section removably supported by said holder;

arithmetic means set in said portable body case for automatically calculating a correction multiplier based on the temperature measured of the temperature measurement object by said noncontact-type thermometer and the temperature measured of the temperature measurement object by said contact-type thermometer, and automatically correcting the temperature measured by the noncontact-type thermometer by the calculated correction multiplier; and

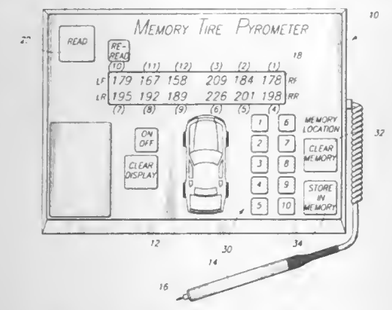
display means set in said portable body case for displaying the calculated correction multiplier and a corrected value of the temperature measured of the temperature measurement object by said noncontact-type thermometer as automatically corrected by the correction multiplier,

wherein the display means displays that an accurate correction value has not been determined when the heat radiation between the temperature measurement object and the noncontact-type thermometer is smaller than a predetermined value.

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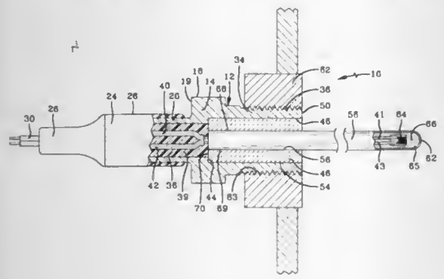
5,743,645
**TIRE PYROMETER**
Harry M. Jaynes, Redmond, Wash., assignor to Longacre Automotive Racing Products, Redmond, Wash.
Filed Jun. 12, 1996, Ser. No. 661,969
Int. Cl.[6] G01K *13/00;3/06;1/02*
U.S. Cl. 374—137 14 Claims




1. A computerized pyrometer for measuring tire temperatures of a vehicle having four tires comprising:
a temperature probe used to measure an inside, center, and outside temperature of each of the four tires, and
a control box including electronic circuitry that receives the temperature readings from the temperature probe and displays a numerical value representative of the temperature readings,
the control box having a display panel that displays twelve temperature readings at the same time, the temperature readings corresponding to the inside temperature, center temperature, and outside temperature for each of the four tires.

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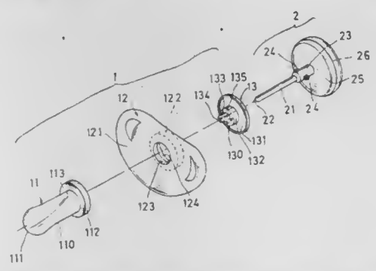
5,743,646
**TEMPERATURE SENSOR WITH IMPROVED THERMAL BARRIER AND GAS SEAL BETWEEN THE PROBE AND HOUSING**
David Peter O'Connell, Canfield, Ohio, and Randall Christian Sumner, New Wilmington, Pa., assignors to General Motors Corporation, Detroit, Mich.
Filed Jul. 1, 1996, Ser. No. 675,312
Int. Cl.[6] G01K *1/08;13/02*
U.S. Cl. 374—148 10 Claims



1. A temperature sensor comprising:
a hollow tube with a first end and a second end, wherein the second end is closed sealing a sensing cavity within the hollow tube from an environment outside of the hollow tube and wherein the first end has an exterior cylindrical surface;
a temperature responsive sensing element within the hollow tube proximate to the second end;
a glass cylinder having an inner cylindrical surface in sealing engagement with the exterior cylindrical surface of the first end of the hollow tube; and
a sensor housing having a first housing cavity bounded by an inner cylindrical wall, wherein an outer cylindrical surface of the glass cylinder is sealingly engaged with the inner cylindrical wall, wherein the sealing engagements of the inner cylindrical surface to the hollow tube and the outer cylindrical surface to the inner cylindrical wall maintain the hollow tube in place, wherein gas cannot flow between the glass cylinder and the hollow tube, wherein gas cannot flow between the glass cylinder and the sensor housing and wherein the glass cylinder thermally isolates the hollow tube from the sensor housing.

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5,743,647
**PACIFYING AND TEMPERATURE MEASURING MEANS**
Chean-Shui Chen, c/o Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei, Taiwan
Filed Mar. 14, 1996, Ser. No. 615,413
Int. Cl.[6] G01K *13/00*
U.S. Cl. 374—151 1 Claim

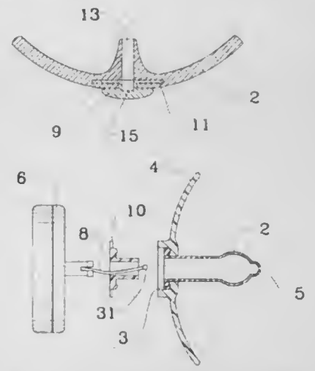


1. A pacifying and temperature measuring means comprising:
a pacifier having a soother member, and a skirt member secured with a coupling member integrally secured with the soother member; and an electronic clinical thermometer detachably securable with said pacifier through said coupling member;
said soother member including: a hollow stem portion, a nipple portion formed on a front end portion of the hollow stem portion to be inserted into a baby's mouth for soothing purpose, a flange portion formed on a rear end portion of the hollow stem portion, and a cylindrical hole formed in the flange portion and in the hollow stem portion; and said skirt member including: a guarding plate, a neck portion formed on a central portion of the guarding plate, a central through hole formed in the neck portion for engaging a coupling member for coupling said thermometer, and an annular recess annularly recessed in a rear end portion of the neck portion of the skirt member;
said coupling member including: a rear cover covering a rear end surface of the flange portion of the soother member and the neck portion of the skirt member, a sleeve portion protruding forwardly from the rear cover and engageable with the cylindrical hole of the soother member, a shaft hole formed through the sleeve portion; and
said electronic clinical thermometer including: a probe portion protruding forwardly from a disk portion having a temperature indicating circuit mounted in the disk portion and a digital display formed on a rear surface of the disk portion for visual reading of a temperature data as measured by the thermometer, a temperature sensor formed on a front tip end of the probe portion insertable into the hollow stem portion of the pacifier to contact an inside surface of the nipple portion for sensing temperature in a baby's mouth, a shaft portion protruding forwardly from the disk portion to dispose about the probe portion;
the improvement which comprises:
said coupling member including: a pair of projection holes diametrically formed in a central portion of the sleeve portion each said projection hole radially recessed from a perimeter of the shaft hole, an annular retaining portion annularly formed on a front end portion of the sleeve portion, and a pair of ridge portions diametrically formed on and protruding forwardly from the annular retaining portion with each said ridge portion contiguous to each said projection hole; and said thermometer including a pair of projections diametrically formed on the shaft portion of the thermometer to be engageable with the pair of projection holes formed in the coupling member of the pacifier.



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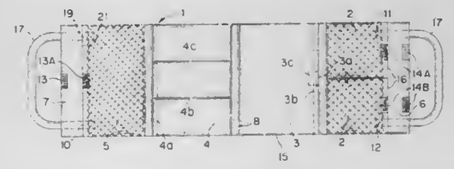
5,743,648
**COMBINATION PACIFIER AND THERMOMETER**
Kurt R Zeindler, Miami, Fla., assignor to Medec Establishment Ltd., Nassau, Bahamas
Filed Nov. 12, 1996, Ser. No. 747,338
Int. Cl.[6] G01K *13/00;7/22;* A61B *5/00;* A61J *17/00*
U.S. Cl. 374—151 13 Claims



1. A pacifier and thermometer assembly comprising:
a base having a flange forming an opening,
a flexible nipple for being received in the mouth of a user, said nipple having a flange engaging said flange of said base for securing said nipple to said base,
washer means for engaging said flange of said nipple for securing said flange of said nipple to said flange of said base, and
thermometer means for measuring the temperature of a user, wherein said thermometer means comprises a temperature sensing element for engaging said nipple and a guide end means, said guide means extending through said opening and having means for removably engaging said washer means to removably attach said thermometer means to said base.

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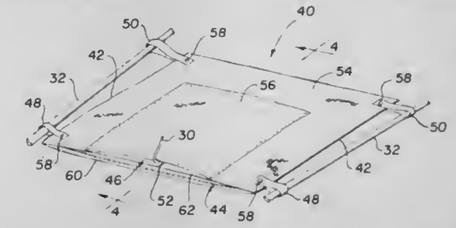
5,743,649
**DIAPER BAG**
Anita M. Gonzalez, 5934 Whispering Lake, San Antonio, Tex. 78222
Filed Feb. 12, 1997, Ser. No. 797,054
Int. Cl.[6] B65D *33/06;30/22*
U.S. Cl. 383—6 2 Claims



1. An article holder and carrier comprising:
fabric having top, bottom and side edges and an inside and outside surface,
said inside surface having four compartments,
a first two of said four compartments having openings which open toward a first side edge of said fabric, and
a second two compartments having openings which open toward a side edge opposite from said first side edge,
one of said first two compartments being made from a mesh material and having a flap means for closing said compartment,
one of said second two compartments being made from a mesh material and having a flap means for closing said compartment,
another of said first two compartments being made from a solid material and being divided into multiple pockets,
fastener means attached adjacent said side edges for holding said fabric in a folded condition, and
strap means attached adjacent said side edges for carrying said article holder.

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5,743,650
**COLLECTION BAG SUSPENSION**
Sandra G. Shannon, 702 Bishop, Clifton, Tex. 76634, and Janie L. Hulme, Rte. 1, Box 73A, Clifton, Tex. 76634
Filed Nov. 19, 1996, Ser. No. 752,245
Int. Cl.[6] B65D *30/22*
U.S. Cl. 383—16 15 Claims



1. Apparatus for supporting a collection bag and its associated inlet tubing in a substantially horizontal position comprising a body which defines:
a) a main pocket sized to hold a collection bag with its largest dimension disposed substantially horizontal;
b) a secondary pocket adapted to hold inlet tubing associated with said collection bag and to maintain said tubing above the body of a collection bag positioned in said main pocket;
c) a divider defined by the main pocket and the secondary pocket which includes a slit to allow the inlet tubing to pass between the secondary pocket and the main pocket; and
d) means for attaching the body which defines said main pocket to a support medium and maintaining said main pocket in a position so that the largest dimension of a drainage bag confined therein is disposed substantially horizontal.

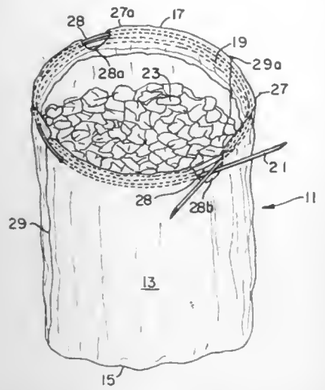
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5,743,651
**METHOD AND APPARATUS FOR FILLING TRASH BAGS**
Floyd Steinmetz, R.R. 4, Box 4199, Moscow, Pa. 18444
Filed Aug. 5, 1996, Ser. No. 708,127
Int. Cl.[6] B65D *33/02*
U.S. Cl. 383—33 5 Claims

1. A trash bag assembly for doing yard work for opening and holding open the open end (17) of the trash bag (11) while it is being filled with fallen leaves, lawn clippings, and other trash, comprising
a trash bag (11) for doing yard work having a body portion (13), a closed end bottom (15), and an open end top portion (17) with a top perimeter portion (19),
and means (21) for opening the trash bag by expanding the top perimeter portion (19) to a circular position and for holding the top perimeter (19) in circular position so that the bag (11)

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is fully open to receive fallen leaves, lawn clippings, and other trash without requiring someone to hold the bag open said means for opening the trash bag and holding it open being insertable after manufacture of the trash bag, being a flexible resilient rod removable from the trash bag, and being reusable on other trash bags indefinitely, said rod having two ends which are free and unattached and not attached to each other so that either end of the rod can be inserted into the trash bag and the rod can be removed from the trash bag by pulling on either end, said rod being round in cross section, said rod being made of a synthetic resin plastic, and a closure on the bag for closing the bag after it has been filled and the rod removed.

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**5,743,652**

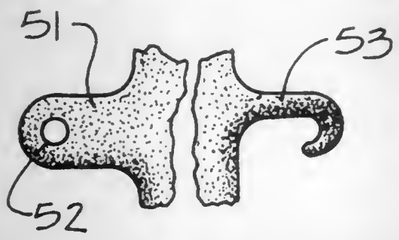
**RESEALABLE BAG**

**Daniel A. Dopps, 11415 Merridale, Wichita, Kans. 67212**

**Filed Aug. 5, 1996, Ser. No. 693,887**

**Int. Cl.[6] B65D *33/16***

**U.S. Cl. 383—89** **1 Claim**




1. An improved closure system and method for resealing a bag, having a set of snaps attached thereto, comprising the steps of:

(a) pressing the top edges of a bag together along their length;

(b) making a first fold across the bag, so that the top edges are folded over from the front to the back, with the first fold located in between the top edges and a line that intersects the snaps, which remain on the front side of the bag after the first fold, and having the fold press firmly against the back side of the bag;

(c) rolling the top of the bag in the same direction as the top portion has been folded, being from the front side of the bag to the back side of said bag, so that the bottom side rotates upward and backwards around the snaps and the intersecting line, with the movement of the bag continuing in a direction opposite to that which the fold was made, until the body of the bag and bottom side have rotated 360 degrees;

(d) Attaching the snaps to each other, to provide a squeezing force against the fold which further restricts the ability of air to move in or out of bag.

**5,743,653**

**LINEAR MOTION ROLLING GUIDE UNIT APPARATUS**

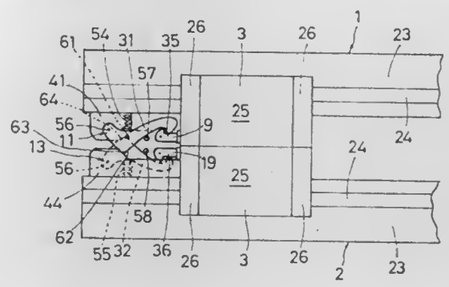
**Masataka Katoh, Seki, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan**

**Filed Oct. 22, 1996, Ser. No. 734,922**

**Claims priority, application Japan, Dec. 25, 1995, 7-349984**

**Int. Cl.[6] F16C *29/06***

**U.S. Cl. 384—43** **18 Claims**




1. A linear motion rolling guide unit apparatus comprising a pair of track rails provided with first raceway grooves extending in both of longitudinal side surfaces thereof; a pair of sliders provided between said two track rails, having raceway grooves opposed to those in said track rails, saddled on said track rails and moved slidingly and relatively to each other and also independently of and relatively to each other; connecting members provided on stroke end portions of said two track rails; and members to be connected provided on said two sliders and adapted to be engaged detachably with said connecting members.

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**5,743,654**

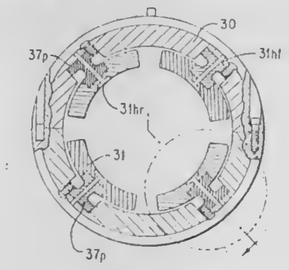
**HYDROSTATIC AND ACTIVE CONTROL MOVABLE PAD BEARING**

**Russell D. Ide, Exeter, and Fouad Y. Zeidan, Warwick, both of R.I., assignors to KMC, Inc., West Greenwich, R.I.**

**Continuation-in-part of Ser. No. 878,601, May 5, 1992, Pat. No. 5,489,155, which is a continuation-in-part of Ser. No. 685,148, Apr. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 309,081, Feb. 8, 1989, Pat. No. 5,137,373, which is a continuation-in-part of Ser. No. 283,529, Oct. 25, 1988, Pat. No. 5,112,143, which is a continuation-in-part of Ser. No. 55,340, May 29, 1987, abandoned. This application Aug. 17, 1993, Ser. No. 107,367**

**Int. Cl.[6] F16C *17/10***

**U.S. Cl. 384—100** **18 Claims**




1. In an assembly that includes a shaft and a supply of liquid, a fluid film bearing for pressurizing the liquid so as to support the shaft for rotation on a pressurized liquid film, the bearing comprising: a plurality of substantially circumferential bearing pads spaced about the shaft, each of the bearing pads having a shaft support surface; a bearing housing extending radially outside the bearing pads and encircling the bearing pads; at least one support member extending between one of the pads and the bearing housing so as to support the pad for movement, the support member comprising a radially outermost portion secured to the bearing housing, a radially innermost portion secured to the bearing pad and a central portion extending between the inner portion and the outer portion, whereby, under load, the support member bends so that the pad moves relative to the shaft, and a hydrostatic feed passage formed in the bearing and providing communication between a supply of pressurized fluid and the bearing pad shaft support surface.



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**5,743,655**

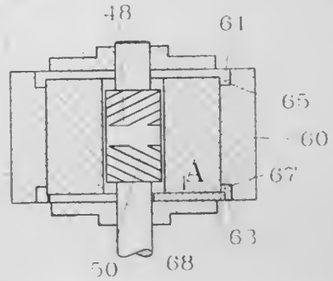
**SELF-ACTING FLUID DYNAMIC BEARING SUPPORT AND METHOD OF ASSEMBLING THEREOF**

**Viktor Slavin; Anna Skobeleva, both of Moscow, Russian Federation, and Alexander Shkolnik, San Carlos, Calif., assignors to Patent Translation and Consulting Co., Inc., Foster City, Calif.**

**Filed Mar. 12, 1997, Ser. No. 815,797**

**Int. Cl.[6] F16C *32/06;43/02***

**U.S. Cl. 384—107** **29 Claims**




1. A self-acting fluid dynamic bearing support having a radial gap and an axial play, comprising:

an inner cylindrical member having an outer working portion of a predetermined diameter and protruding ends on both sides of said outer working portion;

an outer cylindrical member having a width, a first working end surface on one side, a second end working surface strictly parallel to said first working end surface on the other side of said outer cylindrical member, and an opening with a diameter exceeding said predetermined diameter by an amount equal to a doubled magnitude of said radial gap of said bearing support;

a first thrust member attached to one of said protruding ends and having a working surface on a side facing said first working end surface;

a second thrust member attached to another one of said protruding ends at a distance exceeding said width of said bearing support, said second thrust member having a working surface on a side facing said second working end surface;

said outer cylindrical member being made of a first material, said inner cylindrical member being made of a second material, said first material having a coefficient of linear thermal expansion lower than a coefficient of linear thermal expansion of said inner cylindrical member, at least said working surface of said first thrust member and said working surface of said second thrust member having nonthrough profiled grooves which extend from outer peripheries of said first thrust member and said second thrust member but do not reach said shaft, said coefficients of linear thermal expansion and said radial gap satisfying the following relationship:

$$T_1 = T_o + \frac{\Delta h}{(\alpha_2 - \alpha_1)D} ,$$

where $T_1$ is the heating temperature, $T_0$ is room temperature, $\Delta h$ is a doubled value of said radial gap, D is said diameter of said opening, and $\alpha_1$ is a coefficient of linear thermal expansion of said first material, and $\alpha_2$ is a coefficient of linear thermal expansion of said second material.

12. A method for assembling a self-acting fluid dynamic bearing support having a radial gap and an axial play, comprising the steps of:

providing a shaft having a central working portion of a predetermined diameter and a first protruding end on one side and a second protruding end on the other side;

providing a cylindrical bearing member with a first working end surface, a second working end surface, and an opening of a diameter that exceeds said predetermined diameter by a magnitude of a doubled value of said radial gap, said bearing member being made of a material with a first coefficient of linear thermal expansion and said shaft being made of a material with a second coefficient of linear thermal expansion, said second coefficient of linear thermal expansion being greater than said first coefficient of linear thermal expansion;

fitting said bearing member on said working portion;

heating said shaft together with said bearing member to a temperature $T_1$ at which said shaft and said bearing member are temporarily rigidly connected into an integral unit due to a press fit caused by a greater thermal expansion of said shaft;

providing a first thrust member having an opening and a first thrust surface with nonthrough profiled grooves on said first thrust surface, said grooves extending from the periphery of said first thrust member but not reaching said opening of said thrust member;

fitting said first thrust member to said first protruding end so that said first thrust surface faces said bearing member and pressing said thrust surface of said first thrust member to said first thrust end surface of said bearing member while said bearing member and said shaft are still in a rigidly connected state so that said working end surface of said bearing member is used as a reference for positioning said first thrust member strictly perpendicular to said shaft;

fixing said first thrust member to said first protruding end, while said bearing member and said shaft are still in said rigidly connected state;

cooling said integral unit to a room temperature;

providing a second thrust member having an opening and a thrust surface with nonthrough profiled grooved on its working thrust surface, said grooves extending from the periphery of said first thrust member but not reaching said opening of said thrust member;

fitting said second thrust member to said second protruding end, placing a technological shim having a width of said axial play between said working thrust surface of said bearing member and said thrust surface of said second thrust member and pressing said second thrust member to said second working end surface of said bearing member via said technological shim;

fixing said second thrust member to said second protruding end while said second thrust member is still in said pressed state, thus forming a self-acting fluid dynamic bearing support unit;

heating said self-acting fluid dynamic bearing support unit for removing said shim.

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**5,743,656**

**HYDRODYNAMIC BEARING APPARATUS AND METHOD FOR MANUFACTURING SAME**

**Masato Gomyo; Tamotsu Nose, and Masamichi Hayakawa, all of Nagano, Japan, assignors to Sankyo Seiki Mfg. Co. Ltd., Nagano-ken, Japan**

**Filed Aug. 26, 1996, Ser. No. 702,012**

**Claims priority, application Japan, Aug. 26, 1995, 7-240683; Sep. 4, 1995, 7-250209; Feb. 9, 1996, 8-048089**

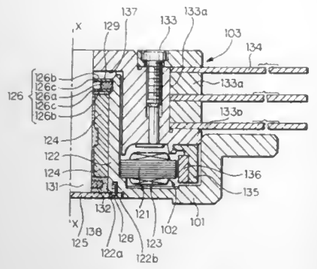
**Int. Cl.[6] F16C *33/74***

**U.S. Cl. 384—124** **8 Claims**

1. A hydrodynamic bearing apparatus comprising:

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at least two hydrodynamic bearing units which rotatably support a rotation member against a fixed member by hydrodynamic pressure of a lubricant filled in a bearing space;

a thrust plate being adhesively bonded on one of said rotation member and fixed member to support said rotation member in an axial direction, said thrust plate and rotation member or fixed member forming a junction;

mechanical bonding means bonding said thrust plate onto one of said rotation member and fixed member; and

a sealing agent for preventing said lubricant from leaking from said junction between said thrust plate and said rotation member or fixed member being provided to fill a space that communicates with said junction.

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**5,743,657**

**TILTING PAD JOURNAL BEARING**

**Peter D O'Reilly, Osterley, England, and Peter G Stopp, Guilsfield, Wales, assignors to The Glacier Metal Company Limited, England**

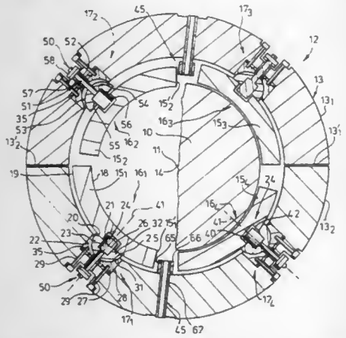
**PCT No. PCT/GB95/01734, § 371 Date Feb. 12, 1997, § 102(e) Date Feb. 12, 1997, PCT Pub. No. WO96/05442, PCT Pub. Date Feb. 22, 1996**

**PCT Filed Jul. 24, 1995, Ser. No. 793,012**

**Claims priority, application United Kingdom, Aug. 6, 1994, 9415964**

**Int. Cl.[6] F16C** *17/03*

**U.S. Cl. 384—312** **12 Claims**



1. A journal bearing arrangement for use with a shaft having a rotation axis which the shaft is rotatable, the arrangement comprising

(1) an annular housing having a longitudinal axis arranged operatively to surround a said shaft with which used,

(2) a ring of arcuate bearing pads lining the housing at positions spaced from each other in a circumferential direction about said longitudinal axis of the housing, each pad having a radially outer face including a mounting surface and being capable of tilting independently of the others about at least a primary tilt axis extending substantially parallel to the shaft rotation axis, and

(3) associated individually with each pad position, pad mounting means comprising

(i) a recess, fixed with respect to the housing, having at least in a cross-sectional plane perpendicular to the primary tilt axis, a surface forming part of a circle centred on the primary tilt axis,

(ii) a platform body having a curved supported surface, supported within the recess for rotation relative to the recess about said primary tilt axis, and a supporting surface co-operable with the mounting surface of the bearing pad at that position,

(iii) spigot and socket locating means extending between the platform body and pad in the direction of a locating axis to inhibit displacement of the pad with respect to the platform body in a circumferential direction about the shaft rotation axis but to permit displacement of the bearing pad with respect to the platform body along the locating axis,

(iv) pad stop means, operable to limit displacement of the pad along the locating axis to less than the spigot length of the locating means, and

(v) restraint means extending from the platform body by way of the recess and housing to permit rotational motion of the platform body about said tilt axis by sliding relative to the recess surface but prevent radial dissociation of the body from the recess.

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**5,743,658**

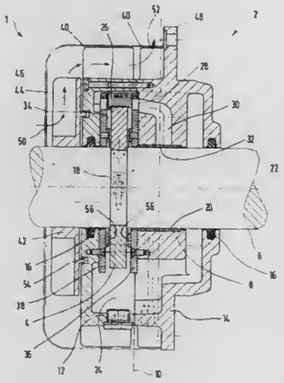
**LUBRICATED JOURNAL BEARING**

**Angela Vollmer, Dortmund; Joachmim Meyer; Hans Marschhausen, both of Hanover, and Christian Schliephack, Coppenbrugge, all of Germany, assignors to Renk Aktiengesellschaft, Augsburg, Germany**

**Filed Dec. 15, 1995, Ser. No. 573,288**

**Int. Cl.[6] F16C** *33/10;37/00*

**U.S. Cl. 384—406** **16 Claims**



1. A journal bearing (**1**) comprising a bearing housing (**2**), at least one fixed lubrication ring (**4**) secured coaxially on a shaft (**6**), and at least one bearing shell (**8**) disposed within the bearing housing (**2**) in which the shaft (**6**) is rotatably supported, the bearing housing (**2**) including a radial jointing plane (**10**), a sump (**24**) and a lubrication ring chamber (**34**), the fixed lubrication ring extending into the sump (**24**), the fixed lubrication ring drawing oil from the sump (**24**), the fixed lubrication ring (**4**) being in contact with an oil wiper (**26**), the wiper wiping oil from the fixed lubrication ring (**4**) into an oil channel, the oil channel connecting the oil wiper (**26**) with a bearing surface (**20**) of the bearing shell (**8**), whereby oil wiped by the oil wiper (**26**) lubricates the bearing surface (**20**) of the bearing shell (**8**), the lubrication ring chamber (**34**) being defined by chamber walls (**36, 38**) whereby oil spattered from the fixed lubrication ring (**4**) and/or wiped by the oil wiper (**26**) remains within the lubrication ring chamber (**34**) or flows into the oil channel (**30**), the bearing shell (**8**) comprising a thin-walled bearing shell having a ratio of bearing shell outer diameter to the diameter of the shaft (**6**) in the range between 1.02 and 1.08.



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**5,743,659**

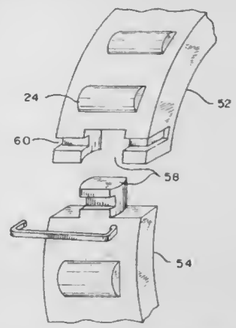
**SPLIT BEARING, CAGE FOR SPLIT OR NON-SPLIT BEARING AND METHOD OF CUTTING A MEMBER OF A SPLIT BEARING**

**Robert N. Stewart, Hampton, Va., assignor to Craft Bearing Company, Inc., Hampton, Va.**

**Division of Ser. No. 273,840, Jul. 12, 1994, Pat. No. 5,630,669. This application Jan. 30, 1997, Ser. No. 792,164**

**Int. Cl.[6] F16C** *33/46*

**U.S. Cl. 384—573** **2 Claims**



1. A cage for the roller members of a bearing, comprising:

two annular parts that in assembly define a plurality of cavities each one adapted to receive a roller member of the bearings, wherein

each of said two annular parts including at least two pieces joined together by a tongue and groove connection, and

each cavity is defined by said two annular parts with the longitudinally spaced edge surfaces of each cavity being defined by a different one of said two annular parts.

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**5,743,660**

**CAGE FOR ROLLER BEARING ASSEMBLY**

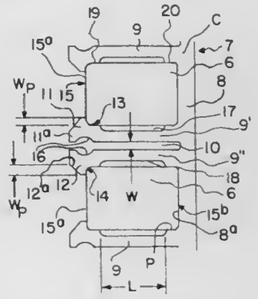
**Reinhart Hillmann, Gerolzhofen, Germany, assignor to SKF GmbH, Germany**

**Filed Feb. 10, 1997, Ser. No. 797,396**

**Claims priority, application Germany, Feb. 9, 1996, 196 04 681.5**

**Int. Cl.[6] F16C** *33/49*

**U.S. Cl. 384—577** **7 Claims**



1. A cage for roller bearings having a plurality of rolling elements (**6**), said cage comprising an annular side ring (**8**), a plurality of webs (**9**) extending from said side ring (**8**) which are circumferentially spaced to define pockets (P) for the rolling elements, said webs having lateral surfaces facing said rolling elements and having free terminal ends, the free terminal ends of the webs remote from the side ring (**8**) having projecting portions (**11, 12**) which partially enclose the rolling elements (**6**), each of said webs (**9**) having an elongated radial through slot (**10**) dividing each of said webs into web portions (**9', 9"**) which are displacable relative to one another in the peripheral direction to permit insertion of the cage between the rolling elements (**6**).

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**5,743,661**

**IMAGING DEVICE**

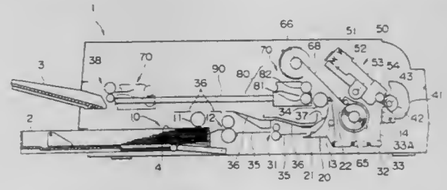
**Toshiharu Tamura, Saitama-ken, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 937,280, Aug. 31, 1992, Pat. No. 5,547,183. This application Jan. 19, 1996, Ser. No. 588,873**

**Claims priority, application Japan, Aug. 30, 1991, 3-244744; Oct. 28, 1991, 3-308420; Oct. 28, 1991, 3-308421; Oct. 28, 1991, 3-308422; Oct. 28, 1991, 3-308423; Nov. 20, 1991, 3-331239; Nov. 20, 1991, 3-331242; Dec. 11, 1991, 3-351006; Dec. 11, 1991, 3-351007; Dec. 13, 1991, 3-352004; Dec. 18, 1991, 3-353808; Dec. 18, 1991, 3-353809; Dec. 18, 1991, 3-353810; Dec. 18, 1991, 3-353811**

**Int. Cl.[6] B41J** *11/20*

**U.S. Cl. 400—55** **20 Claims**



1. An imaging device for forming an image on a recording paper held by a movable recording paper holding means by moving the recording paper between a platen roller and a recording head disposed in close proximity to the platen roller by the movement of the recording paper holding means;

wherein said recording head is supported by a head support member swung by a cam member mounted to a rotation shaft; said head member capable of being located at an image forming position in close proximity to said platen roller; and at a paper feed position slightly spaced apart from said platen roller by said head support member swung by the rotation of said cam member;

wherein, when said recording paper is held by said recording paper holding means and fed, said recording head is located at said paper feed position and said recording paper is fed between said platen roller and said recording head, said movable recording paper holding means comprising:

a coupling structure for coupling a timing belt with a moving member moved by the timing belt, wherein:

said moving member has teeth formed thereon and said timing belt has teeth adapted to mesh with said teeth of said moving member, and

said moving member is inseparably fixed to said timing belt when said teeth of said timing belt are meshed with said teeth of said moving member by a locking member having a holding portion for prohibiting said moving member from separating from said timing belt, so that said teeth of said timing belt are meshed with said teeth of said moving member, and having an engagement portion for engaging said moving member so that said moving member is prohibited from being separated from said timing belt by said holding member.

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**5,743,662**

## FRANKING MACHINES AND MEANS FOR DATA ENTRY THERETO

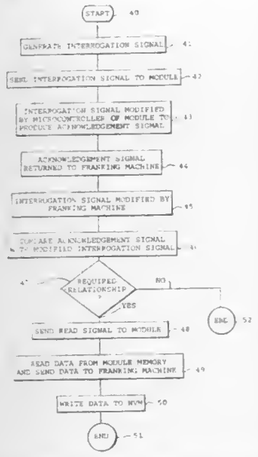
**Cyrus Abumehdi, 36 Ashworth Place, Harlow, Essex CM17 9PU, and Daniel John Lee, 65 Hammonds Lane, Warley, Brentwood, Essex CM13 3AH, both of United Kingdom**

**Filed Jan. 25, 1996, Ser. No. 590,357**

**Claims priority, application United Kingdom, Jan. 27, 1995, 9501602**

**Int. Cl.[6] B41J** *5/30*

**U.S. Cl. 400—62** **4 Claims**




1. A franking machine including electronic circuits operable to effect postage metering functions and operable to effect a data input routine;

a data input module including a memory and security means and releasably connected to said electronic circuits;

in the data input routine said electronic circuits sending an interrogation signal to said security means of said data input module; said security means being operative in response to receipt of said interrogation signal to generate a first signal comprising a predetermined modification of said interrogation signal and to send said first signal to said electronic circuits;

said electronic circuits generating a second signal comprising a predetermined modification of said interrogation signal and to effect comparison of said first signal received from said security means and said second signal; and only in response to said comparison of said first signal and said second signal indicating a predetermined relationship between said first signal and said second signal to read data from said memory of said data input module.

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**5,743,663**

## RECORD MEDIUM FEEDING IN A COLOR THERMAL PRINTER

**Ryo Imai, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

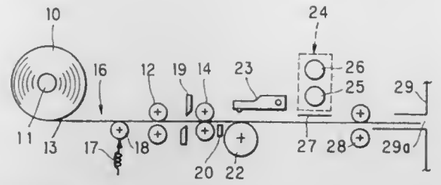
**Filed Jul. 25, 1996, Ser. No. 690,317**

**Claims priority, application Japan, Jul. 28, 1995, 7-193734; Jul. 5, 1996, 8-176251**

**Int. Cl.[6] B41J** *2/315*

**U.S. Cl. 400—120.04** **28 Claims**

1. A color thermal printer for recording a color image on continuous recording paper, wherein the continuous recording paper is continuous color thermosensitive recording paper having a first thermosensitive coloring layer for developing a first color, a second thermosensitive coloring layer for developing a second color and a third thermosensitive coloring layer for developing a third color, the first to third thermosensitive coloring layers being




sequentially overlaid on a support in order from a top of the continuous recording paper, the first thermosensitive coloring layer having a highest heat sensitivity, the first and second thermosensitive coloring layers being fixable by ultraviolet rays of a first wavelength range and a second wavelength range respectively, the color thermal printer comprising:

a paper feed unit in which a roll of the continuous recording paper is set;

a transport roller pair for nipping the continuous recording paper pulled out of the roll, and alternately performing pull-out and pull-back of the continuous recording paper;

a thermal head disposed at a downstream side of said transport roller pair for recording an image of the first color in a recording area of the continuous recording paper during a first pull-back operation, recording an image of the second color during a second pull-back operation, and recording an image of the third color during a third pull-back operation;

a cutter disposed at the downstream side of said paper feed unit for cutting the continuous recording paper into a print sheet;

a fixing unit disposed at the downstream side of said paper feed unit for selectively radiating a first ultraviolet ray specific to the first thermosensitive coloring layer and a second ultraviolet ray specific to the second thermosensitive coloring layer; and

a shutter disposed between said fixing unit and said continuous color thermosensitive recording paper, said shutter moving between a light shielding position for covering an ultraviolet exposure area to shield light and an open position retracted from said ultraviolet exposure area.

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**5,743,664**

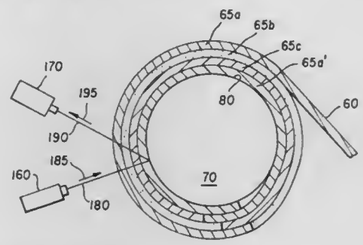
## THERMAL COLOR PRINTER ADAPTED TO DETECT END OF DYE DONOR WEB BY USE OF LIGHT BEAMS AND LIGHT REFLECTIVE SPINDLE

**Jeffrey A. Small, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 10, 1997, Ser. No. 795,265**

**Int. Cl.[6] B41J** *35/36*

**U.S. Cl. 400—249** **12 Claims**




1. A printer comprising:

(a) a spindle having a light-reflective surface thereon;

(b) a dye donor web wound about said spindle, said dye donor web having a predetermined number of non-opaque color patches therein, each color patch being adapted to absorb at least one different one of a plurality of colors;

(c) a light source disposed near said dye donor web for emitting an incident light beam containing said plurality of colors, and being incident upon said donor web in a direction toward the light-reflecting surface so as to be selectively absorbed by the color patches, whereby any unabsorbed portion of the incident light beam reaches the light-reflecting surface and is reflected thereby so as to define a reflected light beam; and

(d) a detector associated with said dye donor web and adapted to detect a characteristic of the reflected light beam, the characteristic being indicative of when the dye donor web has less than a minimum number of the color patches.



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**5,743,665**

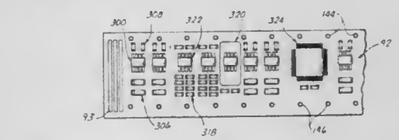
## PRINTER INTEGRATED DRIVER AND HAMMERBANK

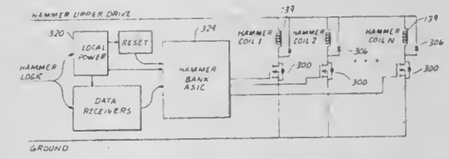
**Robert P. Ryan, Mission Viejo, and Gordon Barrus, Paseo Christina, both of Calif., assignors to Printronix, Inc., Irvine, Calif.**

**Continuation of Ser. No. 404,723, Mar. 15, 1995, abandoned. This application Feb. 27, 1997, Ser. No. 807,575**

**Int. Cl.[6] B41J** *2/235*

**U.S. Cl. 400—323** **21 Claims**




1. A printer having a reciprocally moving hammerbank with a plurality of hammers thereon comprising:

magnetic means on said hammerbank for retention of said hammers on the hammerbank from firing;

coil means on said hammerbank for overcoming the magnetism of said magnetic means; and,

circuit means connected to said coil means for providing power to said coil means comprising transistor means mounted on the hammerbank for providing at least a portion of the power to said coil means, and at least one logic control circuit mounted on the hammerbank connected to said transistor means.

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**5,743,666**

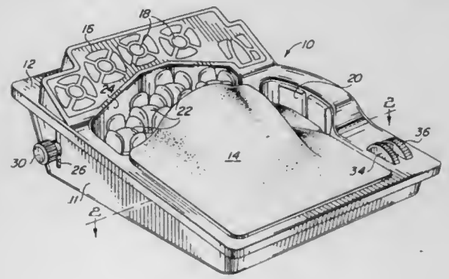
## ADJUSTABLE KEYBOARD

**Anthony VanZeeland, Mesa; Dale Retter, Scottsdale, and Stefen Dikov, Glendale, all of Ariz., assignors to Dataliand Systems, Inc., Phoenix, Ariz.**

**Filed Feb. 25, 1997, Ser. No. 805,292**

**Int. Cl.[6] B41J** *5/08*

**U.S. Cl. 400—485** **13 Claims**




1. An adjustable data input control mechanism including in combination:

a housing having a base portion and a top portion overlying and attached to said base portion, said top portion having an aperture in it;

a raised, substantially convex central portion on said top portion of said housing adapted to underlie and support the palm of a hand of an operator in a natural, relaxed, concave position; so that the fingertips of each finger extend substantially vertically downwardly from said central portion through the aperture in said top portion;

a data input key support member located in said housing beneath the aperture in said top portion and having a plurality of groups of data input keys arranged in three-dimensional patterns thereon at each of the fingertip positions of the hand of such operator, with each group of keys operated by different fingertips; and

an actuator coupled between said housing and said key support member for adjusting the position of said key support member, and said groups of keys arranged thereon, in at least two substantially perpendicular directions relative to said aperture in said top portion.

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**5,743,667**

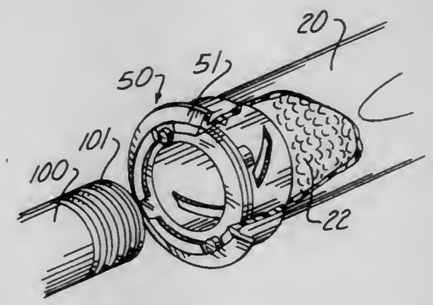
## FLUID APPLICATOR APPARATUS

**Michael E. Osborne, 8440 NE. 138th St., Kirkland, Wash. 98034, and John R. Anderson, 21520 E. Lost Lake Rd., Snohomish, Wash. 98290**

**Filed Aug. 24, 1994, Ser. No. 295,140**

**Int. Cl.[6] B05C** *17/00*

**U.S. Cl. 401—9** **14 Claims**




1. An improved applicator for dispensing liquid onto the ends of generally cylindrical workpieces; wherein, the apparatus comprises:

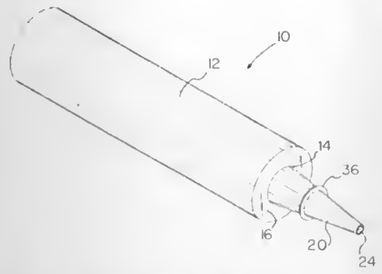
a receptacle unit including an open ended receptacle member forming a reservoir for a supply of liquid;

a metering ring unit including two metering cup members deployed on the open end of the receptacle member; wherein, the metering cup members are relatively rotatable relative to one another, and each one of the metering cup members are provided with at least one angled aperture which is selectively registrable with at least one cooperating angled aperture on the other metering c member to permit passage of the liquid from the receptacle member through the angled aperture in the metering cup members to vary the volume and point of introduction of the liquid passing thru the metering cup members.

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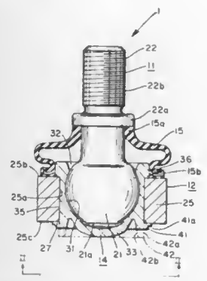
**5,743,668**
**ADJUSTABLE TIP CAULKING TUBE**
**Leonard Zimmerman, 280 Union Hill Rd., Manalapan, N.J. 07726**
**Filed Aug. 8, 1996, Ser. No. 695,106**
**Int. Cl.[6] B05C** *17/01;* **B05B** *1/30;* **B65D** *47/22*
**U.S. Cl. 401—265** **1 Claim**




1. An adjustable tip caulking tube for filling areas of differing widths with caulk comprising, in combination:
a tube having a generally elongated and cylindrical configuration, the tube adapted to contain a caulking material, the tube having an opening in a front end thereof, the tube being dimensioned for securement to a caulking gun;
a tapered nozzle having an open inner end and an open outer end, the open inner end having a diameter greater than a diameter of the open outer end, the open inner end coupling with the opening in the front end of the tube for receiving caulking material therein, the tapered nozzle having an interior surface and an exterior surface, the interior surface having a plurality of concentric springs disposed thereon for biasing the open outer end in a fully open orientation, the exterior surface having an angularly disposed elongated ridge thereon;
a dial having an annular configuration, the dial having a recess formed on an interior surface thereof, the dial coupling with the tapered nozzle with the recess slidably coupling with the ridge whereby movement of the dial away from the open outer end will reduce the diameter thereof.

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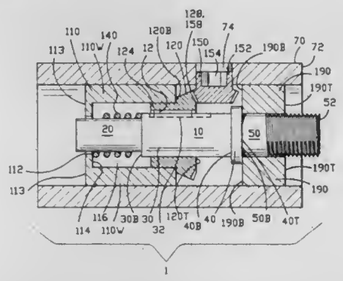
**5,743,669**
**BALL JOINT**
**Kouichi Fujita, Hamamatsu; Masahiro Yamada, Iwata-gun; Keiichiro Suzuki, Hamana-gun; Masao Takayama, Hamamatsu, and Masazumi Suzuki, Iwata-gun, all of Japan, assignors to Kabushiki Kaisha Somic Ishikawa, Tokyo, Japan**
**Continuation of Ser. No. 646,680, May 10, 1996, abandoned. This application Sep. 15, 1997, Ser. No. 937,267**
**Claims priority, application Japan, May 12, 1995, 7-115001**
**Int. Cl.[6] F16C** *11/06*
**U.S. Cl. 403—131** **11 Claims**




1. A ball joint, comprising:
a housing;
said housing having a generally cylindrical portion;
a first aperture at a first end of said cylindrical portion;
a second aperture at a second end of said cylindrical portion;
a ball seat having a generally cylindrical outer surface fitted in said cylindrical portion;
said ball seat having a first annular stopper portion at said first end;
said ball seat having a cylindrical crimpable portion at said second end;
a spherical face portion on an interior of said ball seat;
said first stopper portion catching said first aperture;
a ball stud fitted into said cylindrical portion;
said ball stud having an essentially spherical ball head and a stud portion projecting from said ball head;
said spherical face portion rotatably supporting said ball head;
said cylindrical crimpable portion having an inner side face;
said inner face being inclined outwardly with respect to an axial direction of said cylindrical crimpable portion;
a second annular stopper portion at said second end;
said cylindrical crimpable portion extending a substantial distance beyond said second annular stopper portion, thereby permitting a crimping operation to be performed thereon;
said housing including a chamfered portion around at least one of said first and second apertures; and
said chamfered portion being formed at a junction of an inner surface and an end face of said cylindrical portion.

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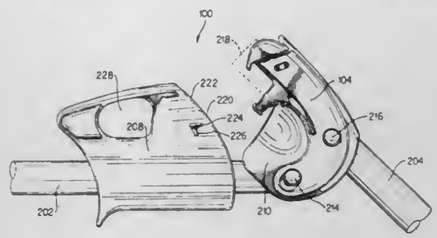
**5,743,670**
**STRUCTURAL FASTENER**
**Thompson G. Ader, 974 Kings Way, W., Hummelstown, Pa. 17036**
**Filed Oct. 2, 1995, Ser. No. 538,084**
**Int. Cl.[6] F16B** *7/18*
**U.S. Cl. 403—296** **18 Claims**




1. A mechanical fastener for longitudinal coupling to a threaded socket, said fastener comprising:
a rear support means for supporting a coupling means and a driving means, and for providing a spring stop;
said driving means for rotating said coupling means;
said coupling means for rotating a threaded stud into said socket;
a spring means to provide a compressive force on said coupling means so as to cause said threaded stud to extend; and
a front support means for supporting said coupling means;
wherein said rear support means, said driving means, said coupling means, said spring means, and said front support means are all mounted in a support housing.



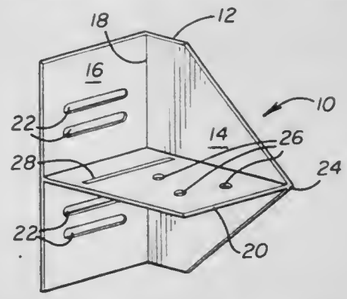
**5,743,671**
**LATCH FOR COLLAPSIBLE STROLLER**
**Bruce Leslie Williams, Narvon, Pa., assignor to Graco Children's Products Inc., Elverson, Pa.**
**Filed Oct. 24, 1996, Ser. No. 740,078**
**Int. Cl.[6] B62B** *7/06*
**U.S. Cl. 403—316** **20 Claims**




1. A latch for a collapsible stroller adapted to pivotally interconnect a first arm to a second arm, comprising:
a primary latch structure including a first member pivotally connected to the first arm, and fixed by a connector to the second arm, and a second member slidably connected to the first arm, said second member having an engaged position securing said first member and a disengaged position releasing said first member; and
a secondary latch structure disposed on the primary latch structure and adapted to prevent the second member from sliding on the first arm, such that said secondary latch structure releasably locks said first latch.

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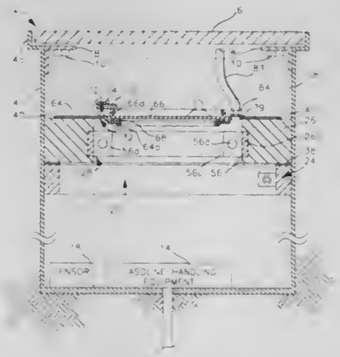
**5,743,672**
**HEADBOARD ATTACHING BRACKET**
**David Cline, Kentfield, Calif., assignor to Rid-Gid Products, Inc., Calif.**
**Filed Nov. 5, 1996, Ser. No. 743,856**
**Int. Cl.[6] A47C** *19/02;* **F16B** *12/46;12/54*
**U.S. Cl. 403—403** **16 Claims**




16. A headboard support bracket for use with a box springs and headboard, the bracket comprising:
an elongated member consisting of a first and second side, said first and second sides integrally formed on with the other at a right angle so that a longitudinal axis is defined at the junction of the two sides;
a plate defining a plane and defining at least one attachment hole therethrough for affixing said plate to a box springs;
said plate rigidly affixed to said first and second sides of said member so that the plane of said plate is perpendicular to the longitudinal axis of said member and forming a junction therewith;
said second side of said member defining at least four holes, two of said at least four holes formed on one side of said junction of said plate and said second side and two of said at least four holes formed on the other side of said junction of said plate and said second side, such that a headboard may be adjustably affixed to said headboard support bracket using any two of said at least four holes.

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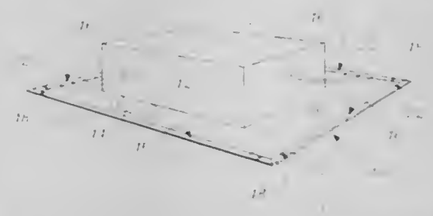
**5,743,673**
**WATERTIGHT SEALING SYSTEM WITH RELIEF VALVE FOR MANHOLE HAVING A SPILL BUCKET**
**Sergio M. Bravo, 2872 Tigertail Dr., Los Alamitos, Calif. 90720**
**Continuation-in-part of Ser. No. 527,370, Sep. 12, 1995, Pat. No. 5,597,263, which is a continuation-in-part of Ser. No. 286,136, Aug. 4, 1994, Pat. No. 5,474,396. This application Jun. 26, 1996, Ser. No. 670,958**
**Int. Cl.[6] E02D** *29/14*
**U.S. Cl. 404—25** **3 Claims**



1. An assembly for sealing a lower portion of a manhole against entering liquid comprising:
a skirt having inner walls extending down from the manhole;
a plate having an outer edge for sealing against the walls of the skirt the plate defining an opening;
a removable lid for effecting a seal at the opening of the plate within the manhole and forming an enclosed space between the removable lid and the lower portion of the manhole; and
a relief valve on the plate having an inlet communicating with the enclosed space and an outlet communicating with an open space above the removable lid, the relief valve for preventing the enclosed space from overpressuring in the event that volatile gas collects within the enclosed space.

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**5,743,674**
**ABSORBENT BERM DEVICE**
**Patrick E. Healy, Gallitzin, Pa., assignor to New Pig Corporation, Tipton, Pa.**
**Filed Sep. 10, 1996, Ser. No. 711,585**
**Int. Cl.[6] B01D** *63/06*
**U.S. Cl. 405—52** **8 Claims**



1. A device for forming a temporary or permanent berm to contain and absorb a spill or leak comprising:

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a plurality of elongated members having a housing, said housing having a hollow center provided longitudinally therein, said hollow center of at least one of said plurality of elongated members being filled with an absorbent material, each of said at least one of said plurality of elongated members having at least one opening provided in said housing along a side of said housing nearer said spill or leak, each of said plurality of elongated members having an exposed bottom surface and a pair of ends;

a plurality of joint members adapted to connect a pair of said elongated members, each of said plurality of joint members having a pair of ends generally conforming to each of said pair of ends of each of said plurality of elongated members and an exposed bottom surface;

wherein said plurality of elongated members and said plurality of joint members are connected to form a berm which surrounds said spill or leak, a bottom exposed surface of each said plurality of elongated members and each said plurality of joint members being secured to the floor surrounding said spill or leak.

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**5,743,675**

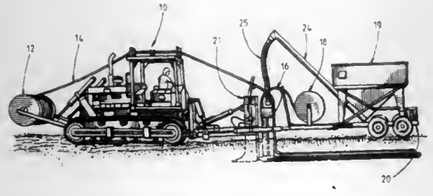
**UNDERGROUND CABLE ANODE INSTALLMENT SYSTEM**

**Herbert L. Fluharty; Scot P. Fluharty; John W. Fluharty, II, all of Mt. Pleasant, Mich., and Daniel P. Werner, Missouri City, Tex., assignors to Mears/CPG, Inc., Rosebush, Mich.**

**Continuation of Ser. No. 285,415, Aug. 3, 1994. This application Aug. 21, 1996, Ser. No. 701,090**

**Int. Cl.[6] F16L** *1/00;* **H02G** *9/00*

**U.S. Cl. 405—180** **17 Claims**



1. An apparatus for underground installation of a linear anode, comprising:

a plow for providing a substantially horizontal tunnel to receive the linear anode; and

a chute for delivering a granular cathodic material to the tunnel around the linear anode, said chute having a non-metallic inner surface and being dimensioned to receive the linear anode and granular cathodic material simultaneously, said linear anode being encased in a column of said cathodic material, said column being cylindrical and having an outer covering for holding the cathodic material in place around said inner anode.

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**5,743,676**

**METHOD AND DEVICE FOR KEEPING OUTFALL DRAINAGE IN SERVICE DURING SEWERAGE CONSTRUCTION**

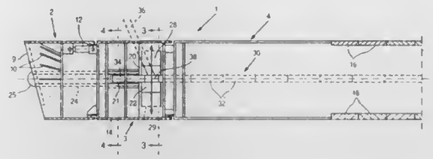
**John Hans-Juergen, Hamburg; Guenter Gesehke, Seevetal, and Gerhard Rade, Jork, all of Germany, assignors to Meyer & John GmbH & Co Tief- und Rohrleitungsbau, Germany**

**Filed Mar. 21, 1996, Ser. No. 619,320**

**Claims priority, application Germany, Mar. 29, 1995, 195 13 047.2**

**Int. Cl.[6] F16L** *1/028*

**U.S. Cl. 405—184** **16 Claims**



1. Method for keeping outfall drainage in service while constructing sewerage, wherein a main drain is laid in the position of an old drain or in a new line by pipe or shield tunnelling under closed or semi-open construction using a working pipe or shield (**1**) at the tunnelling end, wherein at essentially the same time as the working pipe or shield (**1**) is tunnelling, laying at least one outfall drain (**30, 30'**) below ground through at least one working orifice (**21, 22, 21', 22'**) in the working pipe or shield (**1**), so that the outfall drain (**30, 30'**) lies alongside the main drain.

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**5,743,677**

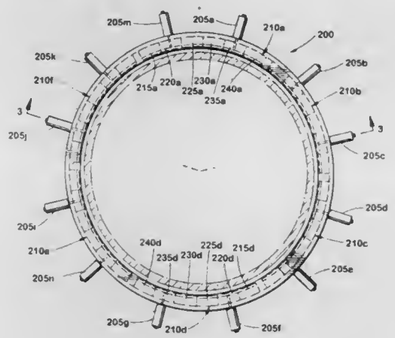
**SUBSEA MULTI-SEGMENTED PILE GRIPPER**

**Darron J. Phillips, Arlington; William J. Eldridge, Grand Prairie, and Larry V. Spalding, Fort Worth, all of Tex., assignors to Oil States Industries, Inc., Arlington, Tex.**

**Filed Mar. 29, 1996, Ser. No. 624,170**

**Int. Cl.[6] E02B** *17/02*

**U.S. Cl. 405—227** **22 Claims**



1. A pile gripper for gripping a pile, said pile gripper comprising:

(a) a hollow containment cylinder having an interior surface around an interior region for receiving said pile;

(b) a plurality of segment groups disposed adjacent to the interior surface of said hollow containment cylinder and arranged circumferentially about the interior surface of said hollow containment cylinder, each of said plurality of segment groups having a plurality of gripper segments, and each of said gripper segments having a plurality of teeth on a surface distal from said interior surface of said hollow containment cylinder for gripping said pile;

(c) a retraction mechanism coupling said plurality of segment groups to said hollow containment cylinder; and

(d) an engagement device disposed between said hollow containment cylinder and said plurality of segment groups;

wherein the plurality of gripper segments in each of the segment groups are resiliently interconnected for retraction together as a respective group by said retraction mechanism.



**5,743,678**

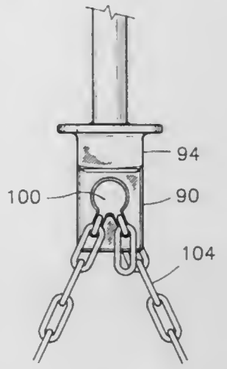
**ANCHOR EYE-BOLT FOR MINE ROOF**

**Gerald J. Pitre, Bathurst, Canada, assignor to Bathurst Machine Shop Ltd., Bathurst, Canada**

**Filed May 20, 1996, Ser. No. 650,371**

**Int. Cl.[6] E02D** *21/00;* **F16B** *31/00*

**U.S. Cl. 405—259.1** **6 Claims**




1. An anchor eye-bolt for use in supporting mechanical equipment under a mine roof, said anchor eye-bolt comprising:

an elongated stein having a threaded portion on a first end thereof for engagement into an anchoring shell, and a bolt head integrally forming a second end thereof, said bolt head having standard dimensions relative to a diameter of said elongated stem, said bolt head also having a pressure bearing surface on a first side thereof adjoining said stem, and

an eyed projection extending axially relative to said stem from a second side of said bolt head opposite said first side, said eyed projection having a circular opening therein with two radial slots extending from said circular opening and away from said bolt head;

such that said anchor eye-bolt is usable for compressing a roof strata of said mine roof and said circular opening with said two radial slots are usable for anchoring both ends of a chain for supporting said mechanical equipment.

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**5,743,679**

**HYDRAULIC SHIELD SUPPORT FRAME**

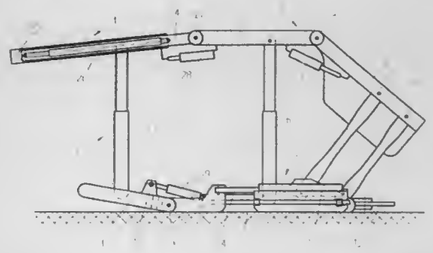
**Georg Gottschlich, Wuppertal, Germany, assignor to DBT Deutsche Bergbau-Technik GmbH, Wuppertal, Germany**

**Filed Aug. 2, 1996, Ser. No. 691,312**

**Claims priority, application Germany, Aug. 2, 1995, 195 28 378.3**

**Int. Cl.[6] E21D** *15/44;23/00*

**U.S. Cl. 405—296** **9 Claims**



1. A hydraulic shield support frame for long wall mining with a roof canopy supported by height-adjustable props and an attached cantilevered sliding canopy, which can be extended in the direction of the face, adjusted in height, and is supported by at least one front prop, whereby a transversely mounted gob shield is linked to the goaf end of the main canopy and is adjusted in height via a four link lemniscate mechanism on main shoes of the base, on which a hydraulically adjustable advancing cylinder is mounted thereby, in which the front assembly prop is positioned on an adjustable baseplate on the goaf side of a conveyor positioned at the face, which adjustable baseplate is connected to the advancing cylinder via a horizontal joint axle and is movable with respect to the main shoes, whereby the adjustable baseplate can be lifted at its tip during advancing of the front assembly prop using tensionable swivelling cylinders positioned at a distance above the joint axle.

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**5,743,680**

**METAL REMOVING TOOL, IN PARTICULAR LANCING INSERT**

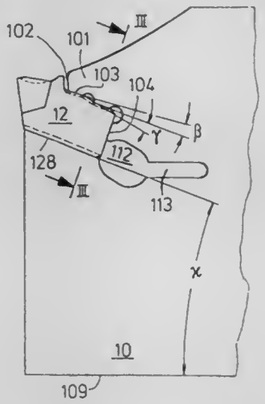
**Rainer Von Haas, Geesthacht, and Willi Jester, Herten, both of Germany, assignors to Widia GmbH, Essen, Germany**

**Continuation of Ser. No. 411,725, Mar. 31, 1995, abandoned. This application Nov. 20, 1996, Ser. No. 753,169**

**Claims priority, application Germany, Oct. 28, 1992, 42 36 370.5**

**Int. Cl.[6] B23P** *15/44*

**U.S. Cl. 407—19** **10 Claims**




1. A metal removing tool comprising:

a tool body provided with a slot-shaped recess, said recess being formed with a wide mouth open at an edge of said body and defined between opposite sides of V-shaped cross section, and a narrow bottom extending inwardly from said mouth,

said sides forming upper and lower flanks extending inwardly from said mouth and opposite one another, said lower flank being a bearing surface, said upper flank being formed with an outer face extending inwardly from said mouth and having a leading end, and an inner face lying inwardly and spaced apart from said outer face at a first obtuse angle to said first face and having a trailing end, said outer and inner faces of said body being bridged by a downwardly convex face; and

a cutting insert detachably mounted in said recess and having opposite sides of a V-shaped cross section complementary to said cross section of said sides of said recess, said insert having a cutting edge projecting outwardly beyond said mouth, a lower surface extending parallel to and engaging said bearing surface of said body in an inserted position of said insert, and an upper surface which includes a first insert surface extending inwardly from said cutting edge extending at a first angle with respect to said outer face of said flank in the inserted position, said first insert surface being formed with a stop adjacent the cutting edge of said insert, said stop extending upwardly from said mouth in said inserted position

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of said insert and pressing against a frontal surface of the body, a second insert surface extending inwardly of said first surface and at a second obtuse angle thereto and forming a ridge therewith, said first insert surface forming a discrete first contact point between said leading end of said outer face of said body and said insert in said inserted position located between said ridge and said mouth so that said body is pressed against said insert at said first contact point, and a third insert surface extending inwardly from said second surface and at a third obtuse angle thereto and having at least one discrete second contact point with said trailing end of said inner face of said upper flank inclined at a positive angle with respect to said third insert surface in said inserted position, so that said insert is held under preliminary stress upon inserting.

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**5,743,681**

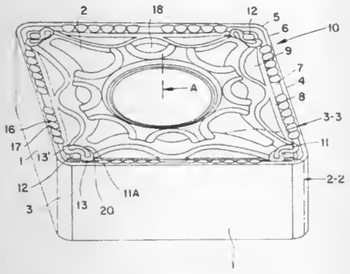
## CUTTING INSERT WITH CHIP CONTROL PROTRUSION ON A CHIP SURFACE

**Jörgen Wiman, Sandviken; Sture Murén, Gävle; Jan-Olof Olsson, Kungsgården, and Robert Isaksson, Järbo, all of Sweden, assignors to Sandvik AB, Sandviken, Sweden**

**Continuation of Ser. No. 539,374, Oct. 5, 1995, abandoned. This application Apr. 14, 1997, Ser. No. 837,092**

**Int. Cl.[6] B23B** *27/22*

**U.S. Cl. 407—114** **2 Claims**




1. A cutting insert for chipbreaking metal machining, comprising upper and lower substantially parallel surfaces, at least one of said upper and lower surfaces constituting a chip surface; a center axis of the insert intersecting said upper and lower surfaces; at least three side surfaces intersecting said upper and lower surfaces; adjacent ones of said side surfaces intersecting one another at a rounded corner; said side surfaces intersecting said chip surface to define main cutting edges therewith, and said corners intersecting said chip surface to define corner cutting edges therewith; protrusions disposed on said chip surface adjacent respective ones of said corners; each said protrusion being of curved configuration with a concave side facing a respective corner and a convex side facing away from said respective corner; said chip surface including a reinforcing land disposed immediately inwardly of said main cutting edges and said corner cutting edges; each protrusion extending no higher than a point of intersection of a respective cutting corner edge and a bisector of that corner; said chip surface including a planar surface disposed between a respective corner cutting edge and a respective protrusion, both said respective cutting edge and said respective protrusion extending higher than a highest point of said planar surface; there being a sloping surface sloping downwardly from the reinforcing land in a direction away from the cutting edge and transforming into a radiused surface which transforms into the planar surface, the planar surface extending to the protrusion and lying in a plane oriented substantially perpendicular to the center axis of the insert, the protrusion extending higher than all portions of the planar surface by at least 0.02 mm.

**5,743,682**

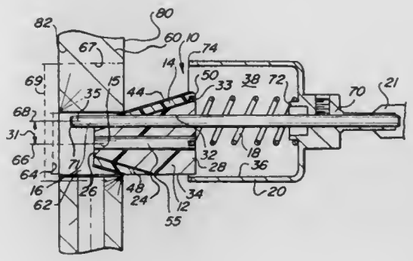
## HOLE SAW GUIDE

**Ramon William Chaney, Sr., 1282 Creamery Rd., Union City, Mich. 49094**

**Filed Nov. 15, 1996, Ser. No. 749,533**

**Int. Cl.[6] B23B** *41/00*

**U.S. Cl. 408—79** **9 Claims**




1. A hole saw guide assembly for use in combination with a hole saw for enlarging an existing hole in a work piece, said hole saw guide assembly comprising:

a generally conically shaped core member having a conically shaped first side wall section and a first longitudinally extending central aperture therethrough from a top end to a bottom end and being sized to slidably receive a pilot of the hole saw;

said core member having a second longitudinal aperture radially spaced from said central aperture and also extending from the bottom end and extending through the conically shaped side wall section;

a second wall section diametrically opposite said second longitudinal aperture and being generally arcuate in shape to be in proximity to an inner diameter surface of the hole saw;

a first spring for seating against said bottom end and interposable between said member and the hole saw to provide bias of said member outward from the hole saw to engage the existing hole in the work piece as said hole saw is pressed against said work piece with its pilot extending through a select one of said first and second longitudinal apertures.

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**5,743,683**

## REMOVAL TOOL FOR FLUSH RIVETS

**John M. Skaggs, Rockwall, Tex., assignor to E-Systems, Inc., Dallas, Tex.**

**Filed Jul. 1, 1996, Ser. No. 674,141**

**Int. Cl.[6] B23B** *49/00*

**U.S. Cl. 408—97** **22 Claims**

1. A fastener removal tool comprising:

a body having a central bore with an internally threaded section at an upper end of the central bore, said central bore including a lower end;

a base for attachment to the lower end of the body, said base having an opening to allow passage of a drill bit;

a drive shaft having:

an upper portion for coupling to a source of rotational power;

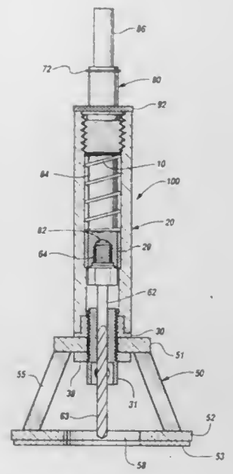
a lower portion to be received in the central bore of said body; and

an internally threaded drill receiving socket at an end of the lower portion of the drive shaft;

a drive shaft bushing having a central passage to receive the drive shaft, said drive shaft bushing including an externally threaded section for threading into the internally threaded section at the upper end of the central bore of the body; and

a drill stop bushing positioned at the lower end of the central bore of the body, said drill stop bushing having a central opening for passage of the drill bit.






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**5,743,684**

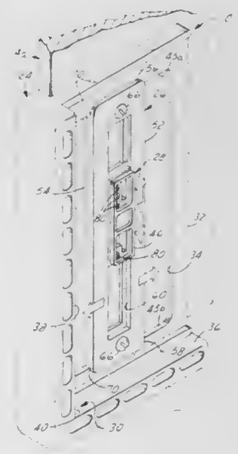
## ADJUSTABLE DRILL HOLE JIG FOR CARPENTRY APPLICATIONS

**Lewis L. Rex, Fraser, Mich., assignor to Rex Systems, Inc., Fraser, Mich.**

**Filed Oct. 25, 1996, Ser. No. 736,981**

**Int. Cl.[6] B23B** *49/00*

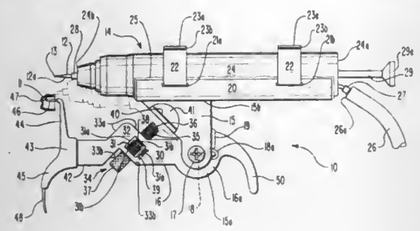
**U.S. Cl. 408—115 R** **19 Claims**



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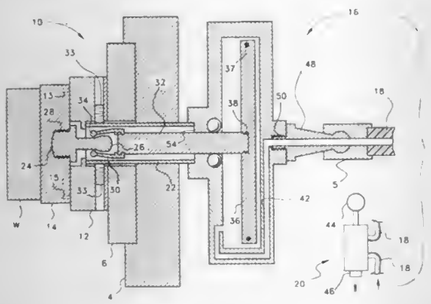


5,743,686
**PATTERN SIZING TOOL**
Riley B. Montgomery, 784 N. 2525 West, West Point, Utah 84015
Filed Nov. 18, 1996, Ser. No. 747,251
Int. Cl.[6] B23C *1/20*
U.S. Cl. 409—181 9 Claims



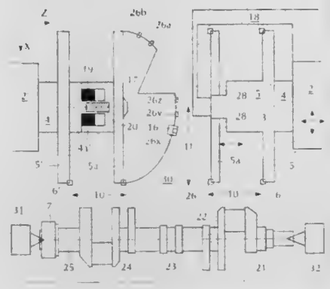
1. A pattern sizing tool comprising, a first arm and a second arm, each having first and second ends; pivot means for coupling said first and second arms so as to allow said second ends that are in opposition to one another to be moved apart and together; means for biasing said first and second arms apart; a rotary grinder means and means for maintaining it onto said first arm such that a milling end of said rotary grinder means is positioned apart from said second end of said second arm; a footing means extending from said second end of said second arm, which said footing means includes at least a pair of holder means each fitted to a positioning means that is for maintaining a coping thereon to be selectively positioned to where said coping is opposite to and spaced apart from said rotary grinder means milling end; and stop means arranged between said first and second arms for limiting movement together of said rotary grinder means milling end and an end of one said holder means.

5,743,687
**FOURTH AXIS FIXTURE QUICK CHANGE**
John Ribic, 7523 Allerton Ct., Hudson, Ohio 44236, and Valentin Ribic, 24061 Pleasant Tr., Richmond Hts., Ohio 44143
Filed Jan. 30, 1995, Ser. No. 380,496
Int. Cl.[6] B23Q *3/06*
U.S. Cl. 409—225 17 Claims



1. A pneumatic clamp assembly for securing a fixture to a turn table of a machine tool, said pneumatic clamp assembly comprising:
a first plate for holding a work piece, said first plate including means defining a hole and a stud centrally fastened thereto, said stud having an enlarged head;
a second plate adjacent said first plate and attachable to the turn table, said second plate having a central opening alignable with said stud, a dowel alignable with the hole of said first plate, and a projecting member disposed within said central opening;
an elongated drawbar alignable with said stud, said drawbar including a plurality of jaws pivotally disposed thereon and closable over said enlarged head of said stud, whereby said drawbar releasably engages said stud;
a pneumatic servomechanism attached to said drawbar and operably connected thereby to said first plate, whereby said first plate is releasably connectable to said servomechanism, and said first plate is clamped to said second plate when said servomechanism generates a pulling force; and
a spacing member separating and abutting said servomechanism and said projecting member of said second plate.

5,743,688
**MACHINE FOR TURN BROACHING CRANKSHAFTS WITH ROTATIONALLY SYMMETRICAL SURFACES**
Herbert Kiefer, Steisslingen; Herbert Klemisch, Uhingen; Kurt Rohr, Goppingen-Bezgenriet; Rolf Santorius, Uhingen-Nassachmühle; Manfred Schuler, Goppingen-Faumdau, and Wolf-Dietrich Voss, Boll, all of Germany, assignors to Boehringer Werkzeugmaschinen GmbH, Goppingen, Germany
Filed Feb. 27, 1995, Ser. No. 395,389
Claims priority, application Germany, Feb. 27, 1995, 44 06 272.9
Int. Cl.[6] B23D *43/06*
U.S. Cl. 409—268 12 Claims

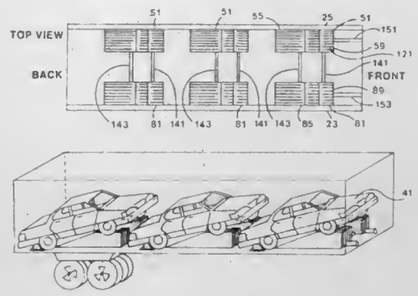


1. A machine for rotary broaching, turning/turn broaching or turning, comprising a bed, at least two tool rests mounted to the bed, said tool rests having a Z-axis and being traversable horizontally relative to the bed along the Z-axis and perpendicularly to the Z-axis in an X-direction, the tool rests having at least one tool mounting in the Z-direction and pivotable or rotatable about the Z-axis, the tool mounting comprising a tool-mounting shank having a free end and carrying, in the Z-direction, at least two axially spaced turn-broaching tool units having a plurality of peripheral cutters, said tool rests being movable independently of each other at least in the X-direction perpendicular to the Z-axis.

5,743,689
**AUTOMOBILE LOADING WEDGE AND METHOD**
Gary D. Schlaeger, 3321 Springfield Rd., Springtown, Tex. 76082-6136
Filed Feb. 20, 1996, Ser. No. 603,650
Int. Cl.[6] B60P *7/08*
U.S. Cl. 410—30 8 Claims

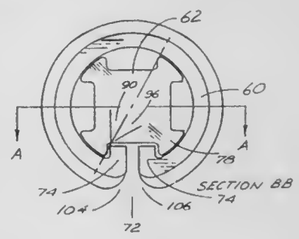
1. Apparatus for holding two wheels of a motor vehicle in place, comprising:
a pair of wedge shaped ramp members,
each wedge shaped ramp member comprising:
a bottom surface,
first and second opposite facing sides,
front and rear ends with said member having a given length between said front and rear ends.





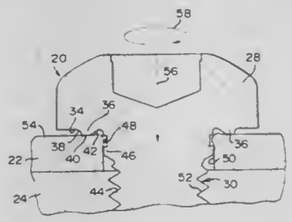

a top surface with at least a portion of said top surface forming an acute angle relative to said bottom surface such that the distance between said portion of said top surface and said bottom surface increases along said length of said member from said rear end for a given distance,
a slot formed in said top surface between said two sides near said front end for receiving a portion of a tire,
at least two side apertures extending into said member from one of said sides of said member near said bottom surface,
said two members being adapted to be located in a vehicle in a supporting position wherein said at least two side apertures of said two members are located to face each other when said bottom surfaces of said two members rest on a support surface and said front ends of said two members face in the same direction,
two elongated spacers each of which has opposite ends,
said two elongated spacers being adapted to have their opposite ends located in said side apertures of said two members when said two members are located in said supporting position to space said two members apart,
wherein two wheels of a vehicle may be partially located in said slots of said two members.

5,743,690
**SELF-LOCKING TUBULAR FASTENER AND FASTENER SYSTEM**
Ian A. Royle, 10323 Huntington Place Dr., Houston, Tex. 77099
Continuation-in-part of Ser. No. 367,738, Jan. 3, 1995, Pat. No. 5,549,431. This application Aug. 27, 1996, Ser. No. 702,241
Int. Cl.[6] F16B *37/12;39/284;25/00*
U.S. Cl. 411—178 7 Claims



1. A tubular fastener for fastening two or more work pieces together in combination with an internal rotary driver configured to impart torque to said fastener comprising:
a) a hollow body of cylindrical construction having an external surface with threads formed thereon and including a slot extending longitudinally along the entire length of the said hollow body between a first edge and a second edge comprising:
i) an elongated through bore adapted to receive said internal driver;
ii) an engaging means for engaging said internal driver comprising a detent or multiplicity of detents;
b) a driver means for threading said tubular fastener into apertures of a first and second work piece comprising:
i) a torque applying means at one end, and;
ii) an interengaging means at the other end comprising a detent engaging system and means of manipulating the first and second edges to facilitate assembly and disassembly.

5,743,691
**CLINCH-TYPE FASTENER MEMBER**
Steven P. Donovan, Roscoe, Ill., assignor to Textron Inc., Providence, R.I.
Filed Feb. 3, 1997, Ser. No. 792,776
Int. Cl.[6] F16B *37/04;* B23P *11/00*
U.S. Cl. 411—180 17 Claims



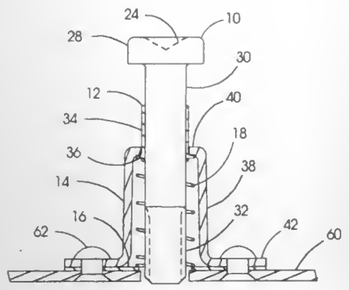
1. A joint comprising:
first and second workpieces, each said workpiece being formed from a material and having an aperture defined by an inner wall therethrough;
a fastener member seated within at least said aperture through said first workpiece, said fastener member having a first portion and a second portion which defines a shank portion, said first portion having a protuberance thereon which protrudes outwardly from an underside of said first portion, said shank portion having structure defining a retaining groove thereon proximate to said first portion, said protuberance on said first portion engaging a top surface of said first workpiece and deforming the material of which said first workpiece is formed to cause the material to flow into said retaining groove during rotational engagement of said fastener member in said aperture through said first workpiece, said fastener member being deterred from axial movement relative to said first workpiece after said material of which said first workpiece is formed has flowed into said retaining groove, said fastener member being capable of rotational movement relative to said first workpiece after said material of which said first workpiece is formed has flowed into said retaining groove; and
means associated with said fastener member for attaching said fastener member to said second workpiece.

5,743,692
**CAPTIVE BOLT ASSEMBLY**
Hans U. Schwarz, 216 Avenue A, Snohomish, Wash. 98290
Filed Feb. 18, 1997, Ser. No. 800,815
Int. Cl.[6] F16B *21/18;31/00*
U.S. Cl. 411—353 20 Claims

1 A captive bolt assembly for attaching an upper panel to a lower panel in conjunction with an internally threaded device such as a plate nut comprising:
a bolt comprising a threaded shank portion, a smooth shank portion, and a head containing a means to facilitate rotation of said bolt;

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a retainer, welded to said smooth shank portion of said bolt, with a flange extending outward from said bolt;

a generally cylindrical hollow receptacle through which said bolt and said retainer slide comprising an upper flange which extends inward and acts to captivate said bolt between said bolt head and said retainer flange, and a lower flange on the opposite end of said receptacle which extends outward and is used for attachment of said captive bolt assembly; said receptacle upper flange having sufficient height and said retainer flange located such that said bolt can be fully unmated from said plate nut without said upper receptacle flange and said retainer flange coming into contact.

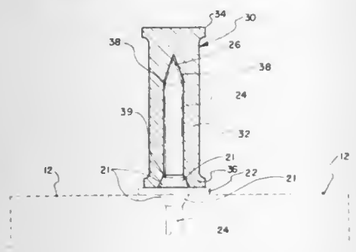
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**5,743,693**

**DOUBLE-ENDED NAIL DRIVING SYSTEM**

**Edmond P. Sobotker, Jr., 6208 Marquerite Dr., Newark, Calif. 94560**

**Filed Jan. 23, 1997, Ser. No. 788,707**
**Int. Cl.[6] F16B** *15/00*
**U.S. Cl. 411—460** **9 Claims**



1. A double ended nail driving system comprising:

a double-ended nail having an elongated shaft, said shaft having a first pointed end and a second pointed end, said nail further having a center flange secured concentrically to said elongated shaft;

a driving means for removably engaging said double-ended nail for driving an end of said doubled ended nail into a board straight and without dulling an opposite end of said double-ended nail;

said driving means having an elongated cylinder having a first end and a second end;

said driving means further having an elongated cavity projecting into said second end coaxially within said elongated cylinder, wherein said elongated cavity is formed to distally surround said shaft of said double-ended nail and wherein said second end removably engages said center flange for driving said double-ended nail into said board without dulling said first pointed end or said second pointed end of said shaft; and

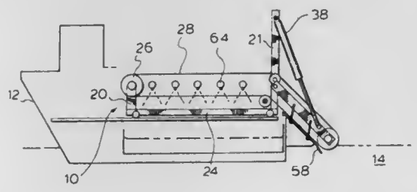
said driving means further including a lower flange secured to said second end for engaging said center flange.

**5,743,694**

**OIL RECOVERY APPARATUS**

**David W. Hines, Port Colborne, Canada, assignor to Environment Recovery Equipment Inc., Port Colborne, Canada**

**Continuation of Ser. No. 605,963, Feb. 23, 1996, abandoned, which is a continuation of Ser. No. 374,824, Jan. 19, 1995, abandoned, which is a continuation-in-part of Ser. No. 57,777, May 6, 1993, Pat. No. 5,399,054, which is a continuation-in-part of Ser. No. 738,686, Jul. 31, 1991, abandoned. This application Jan. 14, 1997, Ser. No. 783,104**
**Int. Cl.[6] E02B** *15/10*
**U.S. Cl. 414—137.7** **1 Claim**



1. The oil recovery apparatus comprising:

a conveyor mountable on a vessel to define generally parallel upper and lower flights,

said conveyor being composed of an open mesh,

said conveyor supported to extend downwardly from the edge of the vessel,

means for controlling the angle of said downward extent so that the outer end of said lower flight is submerged in the water about the vessel,

means for driving said conveyor in the direction which moves said lower and upper flights in an inboard and an outboard direction, respectively, and thereby defining a travel direction,

a flat bottomed trough having a bottom shaped to contact the lower surface of the lower flight,

means for supporting said trough so that said lower surface slides on said bottom,

said bottom defining an upper edge,

a container on said vessel located to receive oil flow over said upper edge.

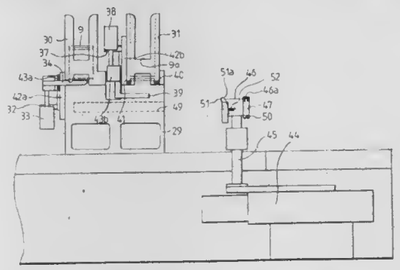
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**5,743,695**

**AUTOMATIC CHIP-LOADING APPARATUS**

**Do Hyun Ryu, Kyungsangbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Japan**

**Filed Jun. 23, 1995, Ser. No. 493,457**
**Claims priority, application Rep. of Korea, Jun. 24, 1994, 14610/1994**
**Int. Cl.[6] B07C** *5/344*
**U.S. Cl. 414—222** **21 Claims**



1. An automatic chip-leading apparatus comprising:

a wafer loading means for supporting a wafer having a plurality of chips;



a tray loading/unloading means for disposing a selected tray from a plurality of empty trays and for receiving and storing said selected tray with chips mounted thereon;

the tray loading/unloading means including loading and unloading portions joined together and collectively positioned to one side of the wafer loading means;

a tray carrying means for transporting said selected tray between said tray loading/unloading means and a position adjacent to said wafer loading means;

means for transferring selected chips from said wafer as supported on said wafer loading means onto said selected tray when positioned on said tray carrying means.

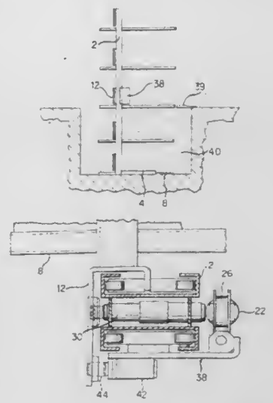
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**5,743,696**

**MOTOR VEHICLE PARKING INSTALLATION**

**Eride Rossato, Via Galilei, 20, 30035 Mirano, Italy**

**Division of Ser. No. 620,744, Mar. 18, 1996, Pat. No. 5,622,466, which is a continuation of Ser. No. 365,739, Dec. 29, 1994, abandoned. This application Mar. 4, 1997, Ser. No. 810,033**
**Claims priority, application Italy, Jul. 10, 1992, PD92A0127**
**Int. Cl.[6] E04H** *6/12*
**U.S. Cl. 414—228** **6 Claims**



1. A multiple vehicle parking installation comprising:

a central unit for controlling operation of said installation;

a pair of vertical columns;

a plurality of horizontal platforms, each suitable for accommodating individual vehicles, each of said plurality of horizontal platforms being provided with means for vertically sliding along said pair of vertical columns;

carriage means controlled by said central unit, said carriage means being vertically slidable along each of said pair of columns and selectively moving one of said plurality of horizontal platforms;

first mechanical locking means, comprising first elements mounted on said carriage means and second elements mounted on each of said plurality of horizontal platforms and cooperating with said first elements of said first mechanical locking means to releasably lock, when engaged, a corresponding one of said plurality of horizontal platforms to said carriage means;

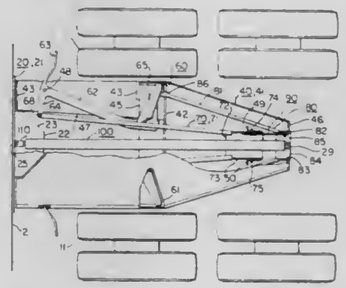
second mechanical locking means, comprising primary elements mounted on said pair of vertical columns at pre-determined distances and secondary elements mounted on each of said plurality of horizontal platforms and cooperating with said primary elements to releasably lock, when engaged, a corresponding one of said plurality of horizontal platforms to said pair of vertical columns and to allow, when disengaged, sliding of said one of said plurality of horizontal platforms along said pair of vertical columns.

**5,743,697**

**AUTOMATIC WHEEL CHOCK**

**James C. Alexander, London, Canada, assignor to United Dominion Ind., Inc., Charlotte, N.C.**

**Continuation of Ser. No. 350,132, Nov. 29, 1994, abandoned. This application Jul. 11, 1996, Ser. No. 679,719**
**Int. Cl.[6] B65G** *67/02*
**U.S. Cl. 414—401** **17 Claims**



1. A system for restraining a vehicle positioned at a loading dock, said vehicle having pairs of tires mounted on separated axles, said system comprising:

a member mounted proximate to said loading dock and movable into position between said separated axles;

said member having a pair of engaging elements movable therewith;

one said engaging elements comprising a contact sensor carried by said member and contacting a first portion of a tire located on a rearmost axle that is closest to said loading dock, to position said member at said tire and the other of said engaging elements comprising a chock carried by said member and movable from a stored position where it does not interfere with movement and engaging a second portion of the same tire contacted by said sensor to restrain said vehicle from movement outward from said loading dock; and

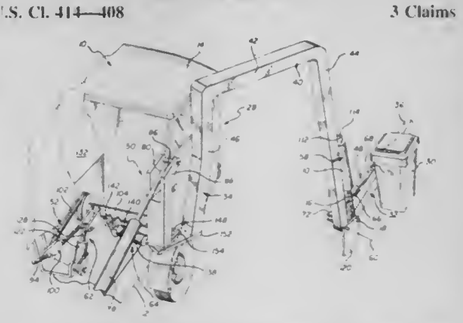
a mechanism operably coupled to said sensor and said chock to extend and retract said chock after tire contact by said sensor.

**5,743,698**

**FRONT-SIDE LIFTING AND LOADING APPARATUS**

**Fred T. Smith, and Fred P. Smith, both of Alpine, Utah, assignors to Galion Solid Waste Equipment, Inc., Galion, Ohio**

**Continuation of Ser. No. 482,031, Jun. 7, 1995, Pat. No. 5,601,392, which is a continuation of Ser. No. 118,564, Sep. 9, 1993, Pat. No. 5,470,187. This application Feb. 10, 1997, Ser. No. 797,877**
**Int. Cl.[6] B65F** *3/02*
**U.S. Cl. 414—408** **3 Claims**



1. A device for handling a material collection container, the device operably engaged to a vehicle having a frame, a forwardly-

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mounted cab, and a storage container mounted on the frame rearwardly of the cab, the storage container having an inlet opening, comprising:

a mechanism for engaging the collection container;

a lift assembly including a lift arm mounted at a first end portion to the vehicle and rearward of the cab, and connected at a second end portion to the engaging mechanism;

a first powered actuator for moving the lift arm upwardly and rearwardly relative to the storage container and over the cab between a load position, at which the engaging mechanism is located near ground level, and an off-load position, at which the engaging mechanism is adjacent the inlet opening; and

a second powered actuator for pivoting the lift arm about a vertical axis to move the engaging mechanism to a position laterally displaced from the storage container.

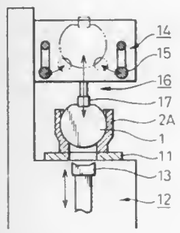
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**5,743,699**

**APPARATUS AND METHOD FOR TRANSFERRING WAFERS**

**Katsuhiro Ishihara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Sep. 11, 1996, Ser. No. 711,002**
**Claims priority, application Japan, Dec. 19, 1995, 7-330514**
**Int. Cl.[6] B65G *49/07***
**U.S. Cl. 414—417** **11 Claims**




1. A wafer transferring apparatus for transferring a plurality of wafer-like materials from a first carrier to a second carrier, while the materials are maintained in their predetermined upright arrangement parallel to each other at a predetermined pitch, said apparatus comprising:

first and second carriers each having means for accommodating a plurality of wafer-like materials in a predetermined upright arrangement;

a transporting section having a supporting means provided with a plurality of guide grooves arranged at a pitch the same as the predetermined pitch for moving up and down said plurality of materials between a lowered position and a raised position, said guide grooves of said supporting means being engaged with first peripheral portions of the respective materials when said materials are moved upward or downward by said transporting section;

a holding section for temporarily holding said plurality of materials when said plurality of materials are in their raised position; and

an inclination restriction means provided with means for restricting second peripheral portions of the respective materials to prevent said materials from being inclined when said materials are moved upward or downward by said transporting section, said inclination restriction means being simultaneously movable upward and downward with the supporting means;

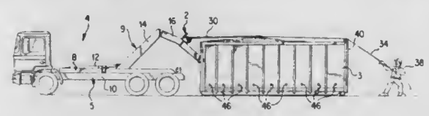
wherein each of said first and second carriers has a central bottom opening through which said supporting means can be moved up and down, and wherein said first and second peripheral portions are lower and upper peripheral portions, respectively, of the respective materials.

**5,743,700**

**CONTAINER COVERING SYSTEM**

**Robert A. Wood, Jr., and Michael F. Ciferri, both of Palm City, Fla., assignors to John Donovan Enterprises-FL., Inc., Stuart, Fla.**

**Filed Aug. 8, 1996, Ser. No. 694,324**
**Int. Cl.[6] B60P *1/00***
**U.S. Cl. 414—498** **20 Claims**




1. A covering system for covering an open top of a container removable from a vehicle, said covering system comprising an arm having an element for grasping a container to load the container onto a vehicle, and a covering device mounted to said arm, said covering device including a tarp which is movable between an extended position for covering a container unsupported by the vehicle and a retracted position.

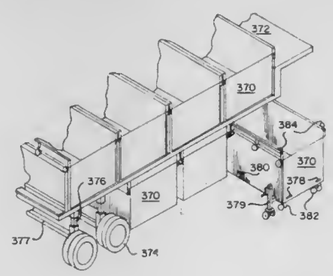
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**5,743,701**

**ROLL ON ROLL OFF DEVICE WITH A PORTABLE SUPPORT**

**Richard Green, P.O. Box 249, Titus, Ala. 36080**

**Division of Ser. No. 200,958, Feb. 24, 1994, Pat. No. 5,593,272, which is a continuation-in-part of Ser. No. 1,960, Jan. 8, 1993, Pat. No. 5,490,753. This application Dec. 6, 1996, Ser. No. 761,442**
**Int. Cl.[6] B60P *3/42*; B65G *67/02***
**U.S. Cl. 414—498** **5 Claims**




1. A transport vehicle adapted to move in a longitudinal direction, independent supports borne by the ground, and a plurality of modular containers supported on said transport vehicle at predetermined elevations above the ground and movable from said transport vehicle, in a lateral direction, to said independent supports at said predetermined elevations above the ground;

said transport vehicle adapted to receive said modular containers from and unload said modular containers to said independent supports as a result of the modular containers being moved relative to the transport vehicle in a direction normal to the longitudinal direction of said transport vehicle; and

each of said independent supports includes a plurality of jacks that are releasably attachable to said modular containers.

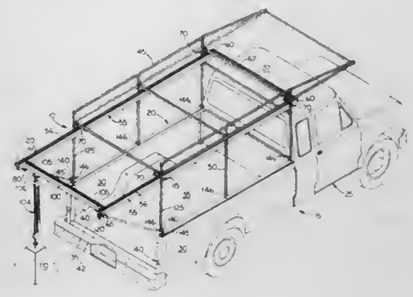


**5,743,702**

**METHOD AND APPARATUS FOR A VEHICLE MOUNTED HOISTING SYSTEM**

**Michael J. Gunderson, 111 Herlou Dr., Selah, Wash. 98942**

**Filed May 3, 1996, Ser. No. 642,452**
**Int. Cl.[6] B60P *1/54***
**U.S. Cl. 414—542** **14 Claims**



1. A hoist system for a vehicle, which includes:

a support frame mounted to the vehicle,

the support frame having a first rearward member and a second rearward member,

the first rearward member having a first lower pin,

the second rearward member having a second lower pin;

a slidably extendable first rail mounted to the support frame,

the first rail having a first front stop pin and a first rear stop pin;

a first support bar, attachable to between the first lower pin and the first rear pin;

a slidably extendable second rail mounted to the support frame,

the second rail having a second front stop pin and a second rear stop pin;

a second support bar, attachable to between the second lower pin and the second rear pin;

the second rail mounted in parallel relation to the first rail;

a hoist mechanism; and

a two ended mobile crossbeam for slidably supporting the hoist mechanism,

the two ended mobile crossbeam having a first end slidably mounted to the first rail, and

the two ended mobile crossbeam having a second end slidably mounted to the second rail,

the first support bar supports the first rail and prevents sliding movement of the first rail; and

the second support bar supports the first rail and prevents sliding movement of the second rail.

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**5,743,703**

**WEB CARRYING APPARATUS**

**Kiyoji Nakajima, Higashikurume, Japan, assignor to Himecs Corp., Tokyo, Japan**

**Filed Jun. 20, 1995, Ser. No. 492,820**
**Int. Cl.[6] B66F *9/075*; B65G *67/02***
**U.S. Cl. 414—590** **12 Claims**

1. A web carrying apparatus for use in carrying a rolled web having an outer peripheral surface and axially opposing end surfaces, said web carrying apparatus comprising:

a carrying device;

a bearing mounted on said carrying device;

a web receiver rotatably mounted to said bearing for rotation about a vertical axis between a web receiving position and a web lifting position;

a link mechanism pivotally coupling said bearing to said carrying device for pivotal movement of said bearing between a horizontal position, in which said bearing and said web receiver are positioned horizontally to support the web in an axially horizontal orientation, and a vertical position in which said bearing and said web receiver are positioned vertically to support the web in an axially vertical orientation;

a first fluid cylinder having first and second ends, said first end of said first fluid cylinder being rotatably connected to said bearing, and said second end of said first fluid cylinder being connected to said carrying device; and

a second fluid cylinder having first and second ends, said first end of said second fluid cylinder being rotatably connected to an intermediate section of said link mechanism, and said second end of said second fluid cylinder being rotatably connected to said carrying device.



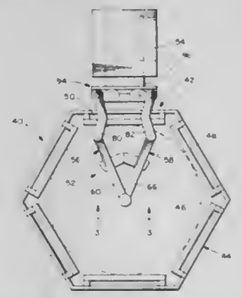
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**5,743,704**

**WIDE WRIST ARTICULATED ARM TRANSFER DEVICE**

**Robert T. Caveney, Windham, and Christopher A. Hofmeister, Hampstead, both of N.H., assignors to Brooks Automation, Inc., Chelmsford, Mass.**

**Continuation of Ser. No. 573,500, Dec. 15, 1995, abandoned. This application Apr. 9, 1997, Ser. No. 833,768**
**Int. Cl.[6] B25J *18/04***
**U.S. Cl. 414—744.5** **9 Claims**



1. Apparatus for transferring an object comprising:

a support;

first and second articulated arms mounted on said support;

said first articulated arm having a first elongated drive member disposed for rotation about a drive axis and a first elongated driven member extending between proximal and distal ends, being no greater in length than said first drive member, and being pivotally mounted to said first drive member at said proximal end said first driven member having a cylindrical bore adjacent said distal end;

said second articulated arm having a second elongated drive member disposed for rotation about said drive axis and a second elongated driven member extending between proximal and distal ends, being no greater in length than said second drive member, and biting pivotally mounted to said second

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drive member at said proximal end, said second driven member having a cylindrical bore adjacent said distal end;

holding means pivotally coupled to said first and second driven members for travel along an extend-retract path as it moves between an initial position and a final position, said holding means including:

a wrist member including:

a wrist plate extending transverse of said extend retract path and having upper and lower surfaces;

first, second, and third cylindrical pivot drums projecting from said lower surface, said first and second pivot drums being distant from one another, said first and third pivot drums being adjacent one another, the distal born of said first driven member being pivotally engaged with said first pivot drum and the distal bore of said second driven member being pivotally engaged with said second pivot drum;

an idler bushing rotatably mounted on said third pivot drum, means operatively connecting said idler bushing with said distal end of said second driven member such that of rotation said second driven member relative to said second pivot drum in one direction causes rotation of said idler bushing in an opposite direction;

a wrist link extending between and pivotally engaged at first and second opposed ends with said idler bushing and with said distal end of said first driven member, respectively, so as to impart an equal and opposite rotational movement to said first drive member with respect to said second drive member; and

a platform for receiving the object thereon fixed to and extending away from said wrist member;

drive means for rotating said first and second drive members about said drive axis from an initial position whereat said first and second drive members subtend a first acute angle with said holding means at said initial position distant from said drive means through an intermediate position whereat said first and second drive members subtend an angle of 180° to said final position whereat said first and second drive members subtend a second acute angle oppositely disposed from said first acute angle with said holding means at a final position overlying said drive axis;

whereby as said holding means moves between said initial and final positions, the orientation of said platform remains substantially unchanged.

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**5,743,705**

**INDUSTRIAL ROBOT**

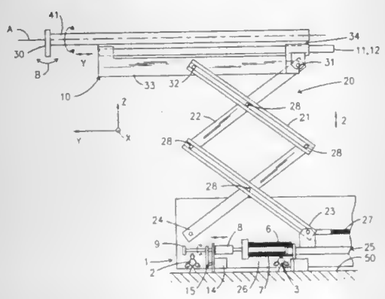
**Roman Eissfeller, Breslauer Strasse 13, D-78194 Immendingen, Germany**

**Filed Sep. 13, 1995, Ser. No. 527,624**

**Claims priority, application Germany, Sep. 13, 1994, 9414820 U**

**Int. Cl.[6] B25J** *9/02*

**U.S. Cl. 414—749** **1 Claim**



1. An industrial robot comprising:

a moveable arm for manipulation of work pieces;

an arm moving mechanism connected to said arm and comprising at least a first, a second, and a third linear movement device (**1**, **10**, **20**) for moving said arm independently in the X-, Y- and Z- directions, said X-, Y- and Z- directions oriented orthogonally to each other;

a drive device connected to each linear movement device (**1**, **10**, **20**);

a control device connected to the drive devices for controlling the drive devices; and

a sensing device connected to each linear movement device for determining the movement of each linear movement device (**1**, **10**, **20**);

wherein said third linear movement device (**20**) is a scissors lift device comprising a scissors with two scissors movement arms for adjusting the height of the arm (**30**) in the Z-direction, wherein a spring assembly (**26**) is attached at the lower end (**23**, **24**) of each of the scissors movement arms (**21**, **22**) for adjustment of the work piece, wherein each of the linear movement devices (**1**, **10**, **20**) is connected to its respective drive device via a coupling device, and wherein at least one of the movement devices (**1**, **10**, **20**) are coupled and uncoupled from their corresponding drive device by operation of at least one switch device, and

wherein a further spring assembly (**27**) is coupled to lower ends of said scissors movement arms for setting an end position base level for the scissor lift device (**20**).

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**5,743,706**

**METHOD OF AND APPARATUS FOR AUTOMATIC HANDLING OF TEST PIECES**

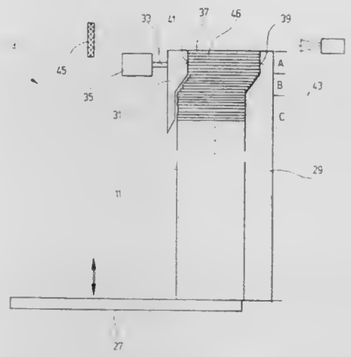
**Christian Happ, Mondfeld, and Rudolf Geier, Külsheim-Hundheim, both of Germany, assignors to atg test systems GmbH, Wertheim, Germany**

**Filed Apr. 15, 1996, Ser. No. 632,777**

**Claims priority, application Germany, Apr. 15, 1995, 195 14 163.6**

**Int. Cl.[6] B65G** *59/04*

**U.S. Cl. 414—797** **3 Claims**



1. An apparatus for automatic handling of plate-shaped test pieces, comprising:

a vertically displaceable lift table on which a stack of plate-shaped test pieces is supported;

a displaceable slide for horizontally displacing an uppermost test piece relative to an adjacent test piece located immediately below and into a predetermined test piece lift-off position;

stop means defining the predetermined test piece lift-off position and against which stop means the uppermost test piece is displaced;

a first transporter for lifting the uppermost test piece off and transporting it into a test position; and

a second transporter for transporting the tested piece from the test position to a storing position,



wherein the stop means has a height-dependent profile; and

wherein the stop means has a stop surface which defines the height dependent-profile and which has at least one surface region extending at an angle to a vertical.

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**5,743,707**

**CONTACT SEAL FOR TURBOMACHINES RUNNING AT HIGH SPEED AND/OR HAVING HIGH TEMPERATURES IN THE SEALING REGION**

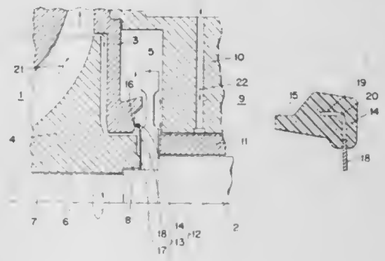
**Josef Bättig, Egliswil, and Mehmet Güven Kutay, Baden, both of Switzerland, assignors to Asea Brown Boveri AG, Baden, Switzerland**

**Filed Nov. 1, 1996, Ser. No. 742,810**

**Claims priority, application Germany, Nov. 24, 1995, 195 43 764.0**

**Int. Cl.[6] F01D** *11/00*

**U.S. Cl. 415—113** **10 Claims**



1. A contact seal for a turboengine including a sealing region and running at high speed and/or having high temperatures in said sealing region, which contact seal is fastened nonpositively or positively between two adjacent working spaces of said turboengine which have different pressure conditions, so as to seal off said working spaces from one another, for this purpose bears on a sealing face of one of the working spaces and lifts off from the sealing face at a rotational speed above a predetermined operating point, wherein

a) the contact seal is of at least two-part design and comprises a thin carrier ring and a sealing ring,

b) the sealing ring comprising a wear resistant and sufficiently oil and heat resistant material,

c) the carrier ring comprising an elastic material which is completely reversible under high loads, and has an inner fastening part and an outer carrying part,

d) the carrying part is positively connected to the sealing ring,

e) when the contact seal is in the mounted state, at least the carrying part is designed to be inclined in the direction of the sealing face.

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**5,743,708**

**TURBINE STATOR VANE SEGMENTS HAVING COMBINED AIR AND STEAM COOLING CIRCUITS**

**Francisco J. Cunha, Schenectady; David A. DeAngelis, Voorheesville; Theresa A. Brown, Clifton Park; Sanjay Chopra, Albany; Victor H. S. Correia, New Lebanon, and Daniel R. Predmore, Clifton Park, all of N.Y., assignors to General Electric Co., Schenectady, N.Y.**

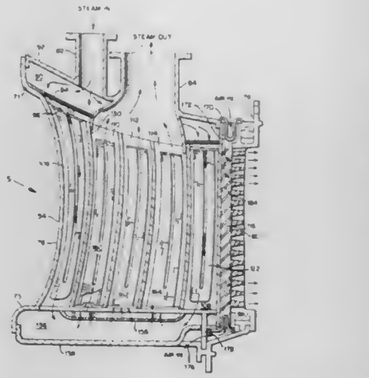
**Division of Ser. No. 414,697, Mar. 31, 1995, Pat. No. 5,634,766, which is a continuation-in-part of Ser. No. 294,671, Aug. 23, 1994, abandoned. This application Jul. 2, 1996, Ser. No. 674,476**

**Int. Cl.[6] F01D** *9/04;9/06*

**U.S. Cl. 415—115** **13 Claims**

5. A turbine vane segment, comprising:

inner and outer walls spaced from one another;



a vane extending between said inner and outer walls and having leading and trailing edges, said vane including a plurality of discrete cavities between the leading and trailing edges and extending lengthwise of said vane between said inner and outer walls, a closed-circuit cooling system through said vane including at least two of said cavities;

an insert sleeve within each of said at least two cavities and spaced inwardly of inner wall surfaces of said vane defining a volume therebetween, an inlet to each of said insert sleeves for flowing a cooling medium into said insert sleeves, each said insert sleeve having openings therethrough for flowing the cooling medium through said openings into said volumes for impingement against the inner wall surfaces of said vane, a first of said two cavities having an outlet in communication with the inlet to a second of said two cavities, said outlet and the inlet to said second of said two cavities lying adjacent said inner wall, an outlet for said second cavity passing through said outer wall, whereby the cooling medium flows through said first cavity in one direction through said second cavity in a generally opposite direction, and through said outer wall; and

a third cavity of said plurality of cavities comprising a trailing edge cavity having a plurality of openings through a wall of said vane for flowing cooling air from said trailing edge cavity through said third cavity openings into a region external of said vane.

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**5,743,709**

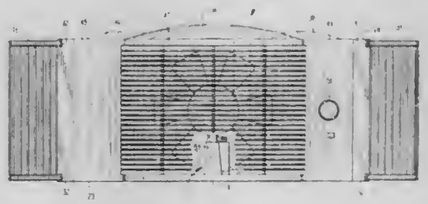
**OSCILLATING WINDOW FAN**

**Rodney B. Jane, Westboro, Mass.; Jui-Shang Wang, Taipei, Taiwan; Robert L. Marvin, Jr., Farmington, Conn., and John Longan, Natick, Mass., assignors to Honeywell Consumer Products, Inc., Southborough, Mass.**

**Filed Jun. 1, 1995, Ser. No. 458,145**

**Int. Cl.[6] F04D** *29/70;* **F24F** *7/013*

**U.S. Cl. 415—125** **23 Claims**



1. A portable electric window fan comprising:

a housing having side walls, a bottom wall for mounting on a sill of a window, a top wall for engaging a sash of the window, a

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front wall defining an air outlet, a rear wall defining an air inlet; said housing defining a closed chamber communicating with said inlet and said outlet;

a fan mount supported by said housing;

a fan blade rotatably mounted on said fan mount and disposed within said closed chamber, said fan blade being arranged to direct air flow into said air inlet and out of said air outlet;

an electric drive motor rotatably coupled to said fan blade; and

an electrically powered drive mechanism coupled to said fan mount and arranged to produce substantial oscillating movement of said fan blade, and wherein said closed chamber is shaped and arranged to provide clearance that accommodates said substantial oscillating movement of said fan blade.

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**5,743,710**

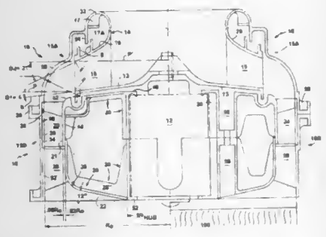
**STREAMLINED ANNULAR VOLUTE FOR CENTRIFUGAL BLOWER**

**Martin G. Yapp, Needham, Mass., assignor to Bosch Automotive Motor Systems Corporatinn, Waltham, Mass.**

**Filed Feb. 29, 1996, Ser. No. 609,062**

**Int. Cl.[6] F04D *29/44***

**U.S. Cl. 415—208.2** **18 Claims**



**10**. A centrifugal blower assembly for mounting adjacent a heat exchanger, the blower comprising:

a) an impeller mounted to rotate on an axis, the impeller comprising multiple blades which draw air in through a central inlet and force air outward; and

b) an annular envelope positioned around the impeller to receive airflow from the impeller and direct airflow out of a discharge the envelope comprising,

i) an axially forward inlet section positioned to receive airflow from the impeller,

ii) a flow-directing envelope section, bounded by an inner envelope surface and an outer envelope surface, the flow directing envelope section being positioned behind the inlet section and extending rearwardly to an annular outlet, the flow-directing section comprising two stages of airfoil vanes positioned in the annular envelope to turn and diffuse airflow in the envelope;

the blower being further characterized in that the inner envelope surface includes a convex rearward terminal section curving gradually from a generally axial segment to a rear wall that is transverse to the axis, whereby the heat exchanger is positioned adjacent the rear wall, the assembly further comprising an impeller wheel comprising,

i) multiple blades which draw air in through a central inlet and force air outward,

ii) an annular top plate positioned to cap an annular segment of the forward edges of the impeller blades, and

iii) a hub plate positioned to cap the rear edges of the impeller blades; and

the top plate forms a top plate angle with a plane perpendicular to the blower axis between 12° and 30° and the hub plate forms a hub plate angle with a plane perpendicular to the blower axis between 0° and 30°.

**5,743,711**

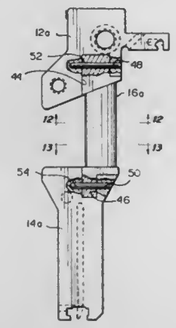
**MECHANICALLY ASSEMBLED TURBINE DIAPHRAGM**

**Maurice D. Fournier, Clifton Park; David C. Gonyea, Scotia; George Reluzco, Schenectady; Kenneth J. Robertson, Schenectady, and John P. McGrane, Schenectady, all of N.Y., assignors to General Electric Co., Schenectady, N.Y.**

**Division of Ser. No. 588,030, Jan. 17, 1996, which is a division of Ser. No. 298,019, Aug. 30, 1994, abandoned. This application Jan. 16, 1997, Ser. No. 784,897**

**Int. Cl.[6] F04D *29/44***

**U.S. Cl. 415—209.2** **13 Claims**




**1**. A mechanically assembled turbine diaphragm comprising:

outer and inner rings;

a plurality of partitions, each having an airfoil shape for disposition in a flow path of the turbine diaphragm;

a connecting element carried by the partitions at each of the opposite outer and inner ends thereof for connecting the partitions to the outer and inner rings, respectively, to form with the outer and inner rings the turbine diaphragm; and

means for mechanically connecting said outer and inner elements to said outer and inner rings, respectively, to form at least a portion of the turbine diaphragm, said connecting elements at the inner ends of said partitions being mechanically connected to said inner ring independently of one another, said mechanical connecting means including pins for pinning the connecting elements of said inner ends of said partitions to the inner ring.

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**5,743,712**

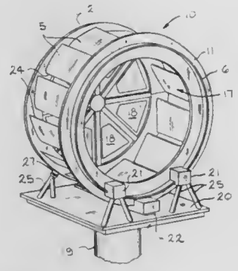
**TURBINE SUPPORT AND ENERGY TRANFORMATION**

**Elmo Edison Aylor, Yerington, Nev., assignor to Prime Energy Corporation, Gardnerville, Nev.**

**Continuation of Ser. No. 417,813, Apr. 6, 1995, Pat. No. 5,591,004. This application Dec. 19, 1996, Ser. No. 772,028**

**Int. Cl.[6] F03D *7/04***

**U.S. Cl. 416—42** **6 Claims**




**1**. An air driven turbine comprising

a rotor having a generally horizontal axis of rotation,



said rotor having a front portion providing a circular front face for said rotor and a back portion parallel to and spaced from said front portion providing a circular back face for said rotor,

a plurality of blades distributed in spaced side-by-side relation extending between said front and back portions about said axis of rotation,

said distributed blades defining an interior of said rotor,

said front face having an entry opening for air flow into said rotor interior and for release from between said blades,

said blades across their width being shaped and angularly pitched to the flow of air therebetween to effect rotation of said rotor,

a system of support for said rotor including a pair of circular rotor-support rings concentric with said axis of rotation,

each of said rings being located on one of said faces near the outer circumferential edge of the respective face with which it is associated;

an underlying rotatable support roll mounted in rotational supporting association with the support ring of one of said faces for support of one side of said rotor,

an additional rotatable support roll mounted in underlying rotational supporting association with the support ring of the face of said rotor opposite said one face for rotational support of the side of said rotor opposite said one side, whereby said rotor is rotationally supported at both its front and back sides for rotation about said generally horizontal axis subject to the forces of the air blown into said rotor,

a power take-off shaft driven by one of said support rolls functioning as a power take-off roll,

a backup roll overlying said power take-off roll and contacting the inner surface of the ring with which said power take-off roll is associated, and

a spring biasing assembly including,

a spring under compression for drawing said backup roll toward said power take-off roll in compression contact with opposite surfaces of the ring with which they are associated.

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**5,743,713**

**BLADE, TURBINE DISC AND HYBRID TYPE GAS TURBINE BLADE**

**Mitsuru Hattori, Ama-gun, and Keiichiro Watanabe, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan**

**Filed Sep. 13, 1996, Ser. No. 713,445**

**Claims priority, application Japan, Sep. 21, 1995, 7-242666**

**Int. Cl.[6] B63H *1/20***

**U.S. Cl. 416—215** **4 Claims**



**1**. A ceramic blade for use in a hybrid type gas turbine blade, the ceramic blade comprising

a longitudinally extending dovetail portion, a platform portion formed on the dovetail portion and blade portions formed on the platform portion, wherein the blade portions are arranged substantially perpendicular to a longitudinal axis of the dovetail portion,

the number of blade portions formed on one platform being two or more, the upper surface of the platform portion being shaped into an arc-like form, wherein said arc-like form extends in the longitudinal direction of the dovetail portion, the dovetail portion being linearly formed in a tangential direction to a turbine rotation direction.

**4**. A hybrid type gas turbine blade comprising:

a ceramic blade comprising a longitudinally extending dovetail portion, a platform formed on the dovetail portion and blade portions formed on the platform portion, wherein the blade portions are arranged substantially perpendicular to a longitudinal axis of the dovetail portion, the number of the blade portions formed on one platform portion being two or more, the upper surface of the platform portion being shaped into an arc-like form, wherein said arc-like form extends in the longitudinal direction of the dovetail portion, the dovetail portion being linearly formed in a tangential direction to a turbine rotation direction, and

a metallic turbine disc having grooves on its outer periphery, said grooves having an upper portion and a lower portion for fixing the dovetail portion, said grooves being noncontinuously oriented in said outer periphery, the turbine disc comprising a combination of two divided portions into which the turbine disc is divided so that the divided surfaces of the turbine disc may be formed at substantially right angles to the axial direction of the turbine disc, and a shim being inserted between the two divided portions, an upper end of said shim terminating at said lower portion of the grooves, and

the ceramic blade being attached to the metallic turbine disc.

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**5,743,714**

**METHOD AND APPARATUS FOR MINIMUM WORK CONTROL OPTIMIZATION OF MULTICOMPRESSOR STATIONS**

**Dmitry Drob, P.O. Box 12848, Houston, Tex. 77217, assignor to Dmitry Drob, Fort Collins, Colo.**

**Filed Apr. 3, 1996, Ser. No. 626,806**

**Int. Cl.[6] F04B *49/00***

**U.S. Cl. 417—2** **15 Claims**



**1**. A control system for optimizing the overall work performed by a compressor station having multiple compressors with associated governors and prime movers where the governors and prime movers vary the performance of each compressor, said system comprising:

a. surge means for maintaining each of the compressor in a non-surge condition;

b. pressure means for maintaining the station output at a desired pressure or suction;

c. a work means for controlling performance of each compressor in the station to minimize an overall work function for the station; and

d. control means which computes, on a periodic basis, a DEV value for each of the compressors, where each of DEV value represents a deviation from a compressor surge control line for the compressor, an INCR value for each of the compressors, where each INCR value represents an increment of the system work function based on a step upset of a mass flow balance between the compressors, and a dW value or ΔW

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value which represents a station differential work value derived from the INCR values from at least two periods or scans.

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**5,743,715**

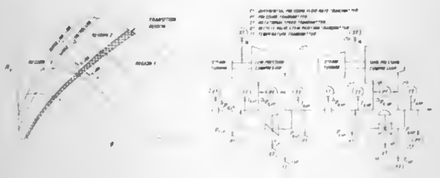
**METHOD AND APPARATUS FOR LOAD BALANCING AMONG MULTIPLE COMPRESSORS**

**Serge Staroselsky, West Des Moines; Brett W. Batson, Dallas Center; Saul Mirsky, and Vadim Shapiro, both of West Des Moines, all of Iowa, assignors to Compressor Controls Corporation, Des Moines, Iowa**

**Filed Oct. 20, 1995, Ser. No. 546,114**

**Int. Cl.[6] F04B** *41/06;49/00*

**U.S. Cl. 417—6** **60 Claims**





1. A method for controlling a compression system comprising at least two compressors, at least one driver, and a plurality of devices for varying the performance of said compressors, the method comprising the steps of:

(a) defining a surge parameter, S, representing a distance between an operating point and a surge line for each compressor;

(b) specifying a value, $S_s$, of said surge parameter for each compressor;

(c) manipulating the performance of said compressors to maintain a predetermined relationship between all compressors and/or drivers when the operating points of all compressors are farther from surge than said specified value, $S_s$, wherein said predetermined relationship is not a function of S; and

(d) manipulating the performance of said compressors in such a fashion that all compressors reach their surge lines simultaneously.

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**5,743,716**

**REVERSIBLE PUMP CONTROLLER**

**Norris Edward Smith, Lufkin, Tex., assignor to Air-Go Windmill, Inc., Lufkin, Tex.**

**Filed May 23, 1996, Ser. No. 652,364**

**Int. Cl.[6] F04B** *49/00*

**U.S. Cl. 417—46** **12 Claims**

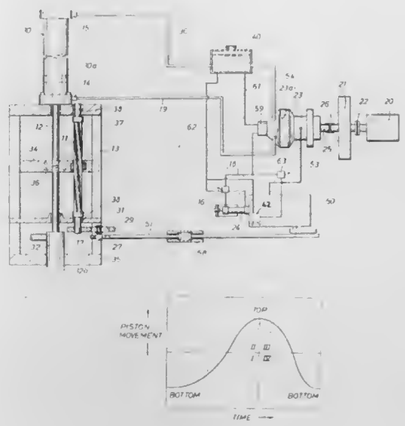
1. A mechanical controller for down-hole hydraulic pumping units, comprising:

means for sensing a position of a pumping unit piston, said piston being coupled by sucker rods to a subsurface pump;

means mechanically linked to said sensing means for transmitting the said position of said pumping unit piston to a reversible and variable flow hydraulic pump;

means for controlling transition from downstroke to upstroke and upstroke to downstroke of said pumping unit piston so as to produce minimum acceleration differences of a mass supported by said pumping unit piston at the transition phases in the upstroke and downstroke portion of a pumping cycle and for variably increasing flow from zero to full preset flow through said hydraulic pump in a first portion of each of the upstroke and downstroke phases of said pumping cycle; and

means for overriding said controlling and increasing means to




decrease flow through said hydraulic pump from full flow to zero at a rate independent of the rate of increase from zero to full flow.

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**5,743,717**

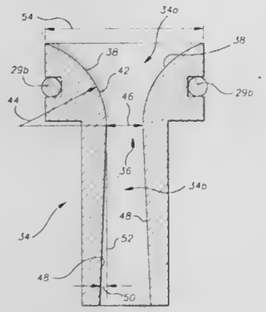
**NOZZLE-VENTURI GAS LIFT FLOW CONTROL DEVICE**

**Zelimir Schmidt, Tulsa, Okla., assignor to Fluid Flow Engineering Company, Tulsa, Okla.**

**Continuation of Ser. No. 725,219, Sep. 27, 1996, abandoned, which is a continuation of Ser. No. 466,691, Jun. 6, 1995, abandoned, which is a continuation of Ser. No. 301,661, Sep. 7, 1994, abandoned, which is a continuation-in-part of Ser. No. 269,888, Jul. 1, 1994, abandoned. This application Aug. 27, 1997, Ser. No. 917,879**

**Int. Cl.[6] F04F** *1/18;1/20*

**U.S. Cl. 417—109** **18 Claims**




1. A device for controlling a flow of gas from an external source into well tubing to enhance lift of fluid in the tubing comprising:

a gas lift valve insertable in the tubing, said valve having a housing with an upper portion having at least one inlet port for admitting the gas from the external source into the valve, a lower portion having at least one outlet port for discharging the gas from the valve into the tubing and a mid-portion extending therebetween on a longitudinal axis;

an orifice mounted within said housing mid-portion, said orifice having a throat transverse to and symmetrical about said longitudinal axis, a nozzle extending upwardly from said throat and diverging symmetrically outwardly from said axis and a Venturi extending downwardly from said throat and diverging symmetrically outwardly from said axis, said orifice defining a path of flow of gas from said upper portion to said lower portion of said housing;

said nozzle including a nozzle first end, a nozzle second end, and a nozzle flow path between said nozzle first end and said nozzle second end, said nozzle flow path converging from said nozzle first end to said nozzle second end, such that the gas experiences a decrease in pressure;

said Venturi including a first end and a second end, and a Venturi flow path therebetween, said Venturi flow path diverging from said Venturi first end to said Venturi second end, such that the gas experiences a rise in pressure, said Venturi first end being disposed adjacent said nozzle second end, such that critical flow is achieved in said throat, said Venturi flow path being aligned with said nozzle flow path to provide a continuous flow path;

whereby said gas flows into said at least one inlet port of said housing through said continuous flow path, and out through said at least one outlet port into said tubing, and

a check valve means responsive to said flow of gas.



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**5,743,718**

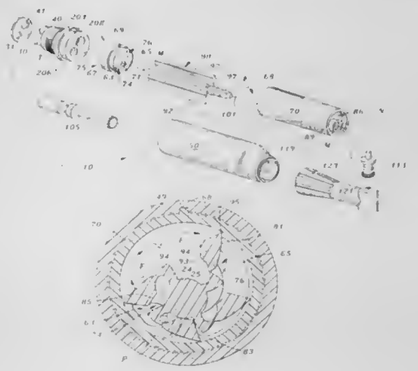
**COMPRESSED AIR DRIVEN DISPOSABLE HAND TOOL HAVING A ROTOR WITH RADIALLY MOVING VANES**

**Jose L. Mendoza, Rancho Cordova, and Philip Theodore Lingman, Cotati, both of Calif., assignors to Denticator International, Inc., Sacramento, Calif.**

**Filed Jun. 7, 1995, Ser. No. 479,929**

**Int. Cl.[6] F01C** *1/00;* **F01D** *5/02;* **A61C** *1/12*

**U.S. Cl. 418—267** **6 Claims**



1. A method for utilizing fluid to cause a shaft to rotate, including the steps of:

forming a rotor to include a trunk and a plurality of vanes,

connecting each vane through a hinge to the trunk, the hinge allowing each said vane to pivot with respect to the trunk between a first collapsed position and a second extended position,

orienting the rotor within a hollow cavity,

providing an inlet fluid port passing into the cavity from a rear plug,

providing an outlet fluid port passing into the cavity parallel to an axis of rotor rotation from the rear plug,

coupling the rotor to a means to extract rotational energy from the rotor,

coupling the inlet fluid port to a source of fluid,

directing fluid from the source of fluid through the inlet fluid ports and into contact with the vanes of the rotor, causing the rotor to rotate,

biasing the vanes toward the second position such that the vanes extend away from the trunk unless forces are applied against the vanes, causing the vanes to pivot toward the first position adjacent the trunk,

providing a recess in the trunk for each vane, the recess sized to receive the vanes therein when said vanes are pivoted into said first position, and

regulating a speed of said rotor by:

shaping said cavity with a circular cross-section and

sizing said cavity with a diameter less than a diameter scribed by tips of the vanes most distant from the trunk when the vanes are in the second position, such that the vanes can contact the cavity at all times where frictional forces increase with increasing velocity and increasing pressure.

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**5,743,719**

**OIL-FREE SCROLL VACUUM PUMP HAVING A GAS BALLAST PART**

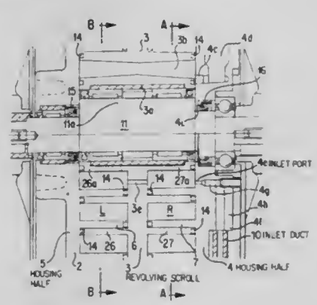
**Shuji Haga, and Masaru Tsuchiya, both of Yokohama, Japan, assignors to Anest Iwata Corporation, Tokyo, Japan**

**Filed Jul. 17, 1996, Ser. No. 682,256**

**Claims priority, application Japan, Jul. 21, 1995, 7-207601**

**Int. Cl.[6] F04C** *18/04;25/02*

**U.S. Cl. 418—15** **2 Claims**




1. An oil-free scroll vacuum pump comprising revolving and stationary scrolls with wraps which engage one another to define between them at least one sealed space which is compressed as the revolving scroll revolves, said pump having a peripheral withdrawal opening through which a fluid is drawn into said sealed space, a central discharge opening through which fluid from the sealed space is discharged from the pump when the sealed space is brought into communication therewith, and a gas ballast inlet port communicating with a source of ballast gas and formed through a stationary scroll sliding surface such that the port can open into said sealed space; the port having a diameter smaller than the wrap width of the revolving scroll such that the port is opened and closed when the revolving scroll wrap slides across the stationary scroll sliding surface as the revolving scroll revolves; and said port being positioned such that it is closed by the revolving scroll wrap when the sealed space is brought into communication with the discharge opening; whereby ballast gas introduced through the port is compressed together with fluid from the withdrawal opening in the sealed space and the resultant fluid is discharged from the pump through the discharge opening.

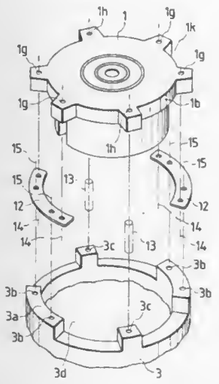
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5,743,720
**SCROLL COMPRESSOR WITH AXIAL BIASING**

**Fumiaki Sano; Masayuki Kakuda; Hiroshi Ogawa; Kiyoharu Ikeda; Yoshihide Ogawa; Eiji Watanabe; Toshiyuki Nakamura; Shuji Motegi, all of Kanagawa, and Norihide Kobayashi, Wakayama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 21, 1995, Ser. No. 505,384**
**Claims priority, application Japan, Jul. 22, 1994, 6-171125; Mar. 20, 1995, 7-060291; Mar. 27, 1995, 7-068119; Jul. 4, 1995, 7-168414**
**Int. Cl.[6] F01C *1/04***
**U.S. Cl. 418—55.5** **12 Claims**

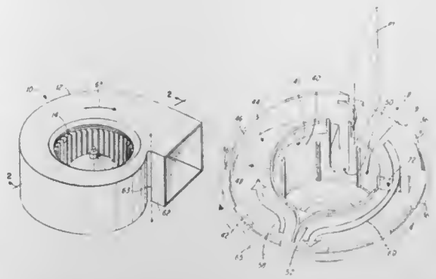


1. A scroll compressor comprising in a sealed vessel:
a fixed scroll having a fixed scroll base plate, one side of said fixed scroll being formed with a plate-like spiral tooth;
an orbiting scroll having an orbiting scroll base plate and a boss portion, one side of said orbiting scroll being formed with a plate-like spiral tooth of substantially the same form as the plate-like spiral tooth of the fixed scroll, wherein a drive member for receiving a driving force is positioned on an opposite side of the orbiting scroll base plate and is drivingly connected to said boss portion, the orbiting scroll executing orbiting motion with respect to the fixed scroll; and
a frame fixedly supported to the sealed vessel for axially supporting the orbiting scroll and radially supporting a drive shaft, the frame being coupled to the fixed scroll through a plate spring which permits the fixed scroll to make minute axial displacements, said plate spring being inserted between an upper end face of the frame and a lower end face of the fixed scroll, wherein:
the plate spring and the fixed scroll or the plate spring and the frame are fastened to each other by means of a reamer bolt or a reamer pin, or the plate spring and the fixed scroll or the plate spring and the frame are fastened to each other by means of a reamer pin and a bolt.

5,743,721
**BLOWER ASSEMBLY HAVING INTEGRAL AIR FLOW COOLING DUCT**

**Mark A. Graham, Kettering; Michael J. Neely, Dayton, and John R. Savage, Kettering, all of Ohio, assignors to ITT Automotive Electrical Systems, Inc., Auburn Hills, Mich.**

**Filed Apr. 30, 1996, Ser. No. 640,357**
**Int. Cl.[6] F01D *1/12*; F04B *17/00*; H02K *9/00***
**U.S. Cl. 415—58.4** **3 Claims**

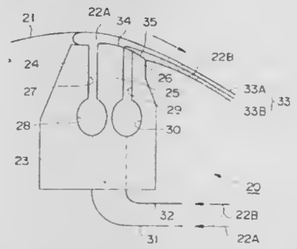


1. A blower assembly, comprising:
a motor cover having (1) a body portion defining a motor cavity, (2) an air flow guide surface connected to an end of said body portion, said guide surface extending radially outwardly from said body portion, and (3) a cooling duct integrally formed with said body portion and having an inlet and an outlet, said inlet being located at the end of said body portion and said outlet being defined in a sidewall of said motor cavity;
a motor positionable in the motor cavity, said motor having a motor shaft having a central axis; and
a fan housing connected to said motor cover, wherein (1) said fan housing defines a scroll cut-off line, and (2) a plane passes through the scroll cut-off line and the central axis, and (3) the cooling duct is positioned adjacent to the plane.

5,743,722
**COATING APPARATUS**

**Eiten Chin; Toshiharu Numata; Masayuki Sugawa, and Takeshi Nakajima, all of Ichigai-machi, Japan, assignors to Kao Corporation, Tokyo, Japan**

**Continuation of Ser. No. 365,102, Dec. 28, 1994, abandoned. This application May 29, 1996, Ser. No. 654,790**
**Claims priority, application Japan, Dec. 28, 1993, 5-348968; Mar. 25, 1994, 6-077856**
**Int. Cl.[6] B05D *3/12***
**U.S. Cl. 427—356** **2 Claims**



2. A coating method, comprising a step of:
using a coating apparatus comprising,
an upstream lip,
at least two downstream lips which include a first downstream lip and a second downstream lip that are located downstream of the upstream lip with respect to a running direction of a base material, said second downstream lip of said at least two downstream lips located downstream of said first downstream lip of said at least two downstream lips with respect to the running direction of said base material; and
slots formed between said upstream lip and said first downstream lip and between said first downstream lip and said second downstream lip, such that coating liquids are extruded from said slots, said coating liquids being applied to said base material which runs past said upstream lip and said downstream lips, wherein
said respective downstream lips form coating work surfaces where said respective coating liquid contacts said base material,
a coating work surface of said second downstream lip is set in a position so as to be spaced apart from said base material by an amount thereafter referred to as a shortest distance d which is measured as a distance between from a tangential line which extends from a downstream end of a coating work surface of said first downstream lip and said coating work surface of said second downstream lip wherein said shortest distance is set so as to be

$$0 \; t<t/d<0.8$$

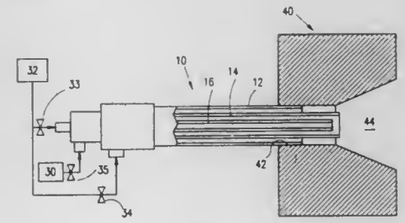
where, t represents a thickness of an undried coating film formed by an extrusion of said respective coating liquid which just exits from said slot that is positioned between said first downstream lip and said second downstream lip



5,743,723
**OXY-FUEL BURNER HAVING COAXIAL FUEL AND OXIDANT OUTLETS**

**Jean-Yves Iatrides, Saint Maur des Fossés, France; Harley Borders, Lombard, and William Von Drasek, Oak Forest, both of Ill., assignors to American Air Liquide, Inc., Houston, Tex.**

**Filed Sep. 15, 1995, Ser. No. 529,136**
**Int. Cl.[6] F23M *3/04***
**U.S. Cl. 431—8** **25 Claims**



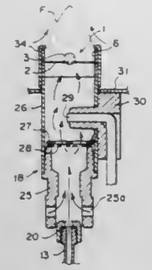
1. An oxy-fuel burner comprising an outer oxidant-conducting passage forming an outer oxidant outlet, an inner oxidant-conducting passage forming an inner oxidant outlet, oxidant source means for providing a source of oxidant comprising at least 80% oxygen, said oxidant source means being in fluid communication with said inner and outer oxidant-conducting passages, a fuel-conducting passage forming a fuel outlet, said outer oxidant outlet, said inner oxidant outlet, and said fuel outlet being coaxially arranged, with said fuel outlet disposed radially between said outer and inner oxidant outlets, and first valve means for varying a flow rate of oxidant through the inner oxidant-conducting passage to control a characteristic of the flame.

5,743,724
**FLAME REACTION MEMBER FOR GAS COMBUSTION APPLIANCES AND A PROCESS FOR PRODUCING THE SAME**

**Hideo Mifune; Masato Seki; Jun Kashiwagi, and Satosi Komiyama, all of Shizuoka-ken, Japan, assignors to Tokai Corporation, Shizuoka-ken, Japan**

**Filed Nov. 15, 1995, Ser. No. 555,997**
**Claims priority, application Japan, Nov. 16, 1994, 6-281900; Nov. 22, 1994, 6-288244; Dec. 5, 1994, 6-300984**
**Int. Cl.[6] F23Q *2/34***
**U.S. Cl. 431—126** **24 Claims**

1. A gas combustion appliance comprising a fuel storage tank, a combustion cylinder, a nozzle for jetting fuel from the fuel storage tank into the combustion cylinder, an igniter for igniting fuel gas jetted into the combustion cylinder, and a flame reaction member comprising a flame reaction material disposed with the combustion cylinder so as to be heated by a gas flame within the combustion cylinder so as to produce a flame reaction which colors the gas flame by the flame reaction,

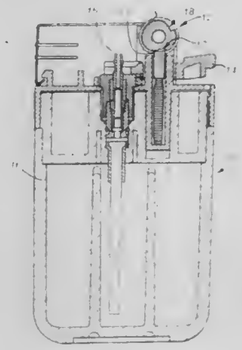


wherein the flame reaction material comprises a glass compound, which is formed by mixing a flame reaction agent and a fused material with each other and fusing them together, said flame reaction agent comprising a metal compound capable of producing the flame reaction, said fused material being capable of being mixed and fused together with said flame reaction agent and vitrified.

5,743,725
**SAFETY LIGHTER**

**Leung Chan, Shatin, Hong Kong, assignor to Cli-Claque Company Limited, Fo Tan, Hong Kong**

**Filed Dec. 2, 1996, Ser. No. 759,022**
**Int. Cl.[6] F23D *11/36***
**U.S. Cl. 431—153** **7 Claims**



1. A lighter having a flint, a spark wheel rotatable in a first direction to functionally engage the flint, thereby producing a spark, a reservoir storing an ignitable fluid, and a valve for releasing a quantity of fluid to be ignited by the spark in conjunction with the rotations in the first directions of said spark wheel, characterized by said spark wheel including a safety mechanism coacting with said flint to limit rotations of the spark wheel in said first direction to less than one revolution.

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5,743,726

## APPARATUS FOR THE VAPORIZATION OF FUELS AND SUPPLY OF AIR FOR COMBUSTION

Winfried Werding, 2, rue du carroz, La Rippe, Switzerland

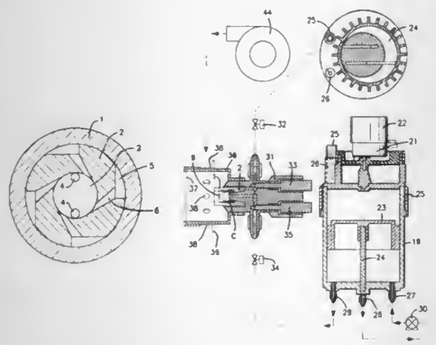
PCT No. PCT/IB94/00015, § 371 Date Aug. 21, 1995, § 102(e) Date Aug. 21, 1995, PCT Pub. No. WO94/19648, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 17, 1994, Ser. No. 507,254

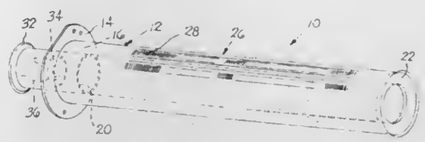
Claims priority, application Switzerland, Feb. 19, 1993, 514/93

Int. Cl.[6] F23L *17/00*

U.S. Cl. 431—157 14 Claims



1. Apparatus for the vaporization of fuels and supply of air for combustion comprising a nozzle unit (C) supplied via a fuel pump (**30**) and fuel supply line (**29**) with fuel and, separately, via an air generator (**21**) and air supply line with air, said nozzle unit (C) having a longitudinal axis and a chamber mounted perpendicularly to said axis into which the fuel and air are conveyed via supply channels for mixing, said supply channels (**6**, **14**) for the fuel opening tangentially into the chamber so that the fuel is set in whirling motion occurring substantially in a direction perpendicular to the longitudinal axis, the mixture being discharged from the nozzle unit via a nozzle channel (**9**, **16**), said apparatus being characterized by the fact that the separate supply channels (**4**, **18**) for the air in the nozzle unit (C) are formed by bores running parallel to the longitudinal axis so that the air is pressed into the fuel whirling in a first chamber part (**3**, **15**) of the chamber, in a direction substantially perpendicular to the plane of rotation of this fuel; that the chamber comprises a second chamber part (**7**, **17**) where the air and mixture can expand and which is located axially next to the first chamber part (**3**, **15**); and that directly upstream in front of the nozzle channel (**9**, **16**) the chamber has a compression part (**8**, **15**) where the mixture is compressed prior to being ejected through the nozzle channel (**9**, **16**) and which has a smaller diameter than the second chamber part (**7**, **17**), the mixture after being ejected from the nozzle channel (**9**, **16**) undergoing expansion as if exploding and hence shattering the fuel into minute droplets.



a sector of said periphery spaced downstream from said inlet, a second elongated hollow body member defining a burner body, said burner body having a periphery defining a curvilinear cross sectional configuration substantially conforming in shape to that of said distributor but larger than said distributor such that said distributor may be received therein, means for securely positioning said distributor within said burner body in spaced apart relationship with said inlet extending out said burner body, said burner body having a deck comprising a multiplicity of burner ports extending therethrough disposed in an array over a sector of the periphery of said burner body, the sector of the periphery of said distributor containing said outlet means being disposed substantially oppositely to that of the sector of the periphery of said burner containing said burner ports.

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5,743,728

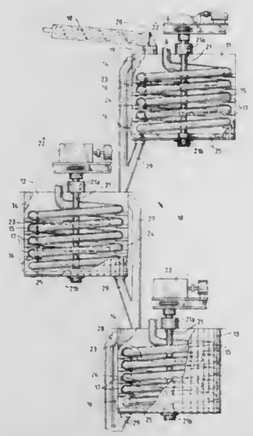
## METHOD AND SYSTEM FOR MULTI-STAGE CALCINING OF GYPSUM TO PRODUCE AN ANHYDRITE PRODUCT

Michael L. Cloud, Canton, and Kirk S. Moore, Okeene, both of Okla., assignors to USG Corporation, Chicago, Ill.

Filed Aug. 15, 1995, Ser. No. 515,265

Int. Cl.[6] F27B *14/00*

U.S. Cl. 432—151 12 Claims



1. A system for calcining gypsum and producing an anhydrite product, said system comprising:

at least two refractoryless kettles having a kettle shell defining an interior chamber for retaining ground gypsum, said kettles including a first kettle and at least one subsequent kettle;

heating means disposed in said kettles for circulating a heated media throughout said interior chamber of said kettles, said heated media being kept separate from gypsum contained in said kettles;

feeding means for feeding ground gypsum into said first kettle;

communication means for transferring heated ground gypsum from said first kettle to said at least one subsequent kettle; and

fluidization means provided in said at least one subsequent kettle for fluidizing ground gypsum contained therein.

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5,743,727

## PREMIXED GAS BURNER

Ian M. Rodgers, Ooltewah, Tenn., assignor to Burner Systems International, Inc., Chattanooga, Tenn.

Filed Jan. 21, 1997, Ser. No. 786,032

Int. Cl.[6] F23D *14/12*

U.S. Cl. 431—328 20 Claims

1. A premixed gas burner comprising an elongated substantially hollow first body member defining a gas/air distributor having a periphery defining a curvilinear cross sectional configuration, said distributor having an inlet for receiving a combustible mixture of gas and air and outlet means comprising means forming a plurality of apertures through which said mixture is directed to flow upstream toward said inlet, said outlet means being disposed about



5,743,729

## COOLING DEVICE WITH PANELS FOR ELECTRIC ARC FURNACES

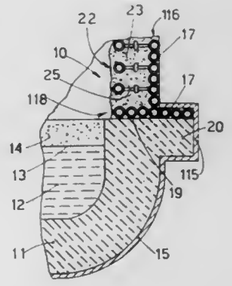
Milorad Pavlicevic, Udine; Gianni Gensini, Buia; Alfredo Poloni, Fogliano Di Redipuglia, and Romano Sellan, Trieste, all of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Feb. 13, 1997, Ser. No. 798,729

Claims priority, application Italy, Feb. 14, 1996, UD96A0019

Int. Cl.[6] F27D *1/12*

U.S. Cl. 432—238 21 Claims



1. Cooling device with panels for electric arc furnaces, which is used in an electric melting furnace in cooperation with the vertical sidewall placed above the lower shell of the furnace, the furnace comprising in its lower part one lower shell to contain the bath of melting metal and an upper shell defined by a plurality of panels comprising a plurality of cooling tubes, the lower shell having at its outer part a metallic containing element, the inner refractory having an upper edge located substantially at the level of the upper edge of the layer of slag contained above the bath of melting metal, the device being characterised in that at least part of the outer panel consists of a horizontal row of cooling tubes arranged immediately above a substantial part of the upper refractory edge of the lower shell.

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5,743,730

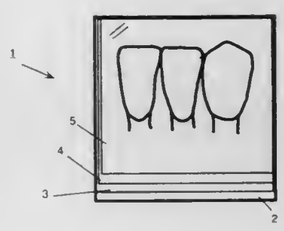
## DENTAL PORCELAIN SHADING GUIDE AND METHOD OF USE THEREFORE

Kenneth E. Clester, and Karen L. Clester, both of 3803 McCain Loop, Anchorage, Ak. 99503

Filed May 7, 1996, Ser. No. 647,448

Int. Cl.[6] A61C *19/10*

U.S. Cl. 433—26 2 Claims



1. A method of marking indicating colors of a tooth having a depth, and the depth of placement of the colors, said method using a kit including a device having a base sheet having a top and having at least one outline of a tooth printed thereon, a plurality of overlay sheets, each overlay sheet having a top and a bottom, the top of each overlay sheet being fixedly attached to the top of said base sheet, such that the bottom of each of said plurality of overlay sheets can be lifted, and a means for marking said base sheet and said transparent overlay sheets with color indications, comprising the steps of:

a) determining a deepest color and pattern on a tooth;

b) marking the deepest color and pattern on the overlay sheet closest to said opaque sheet;

c) determining a color and pattern at the next higher level on the tooth; and

d) marking the color and pattern on the next higher transparent overlay sheet.

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5,743,731

## INSTRUMENT HOLDER WITH INTEGRATED CAMERA CAPABILITY AND INTERCHANGEABLE INSTRUMENT TIPS

Craig J. Lares; Ravi Pathmanabhan, and Jason E. Orgain, all of Chico, Calif., assignors to Lares Research, Chico, Calif.

Continuation-in-part of Ser. No. 487,364, Jun. 7, 1995, Pat. No. 5,634,790. This application Aug. 30, 1996, Ser. No. 707,050

Int. Cl.[6] A61C *1/00*; A61B *1/00*

U.S. Cl. 433—29 17 Claims



1. A dental/medical instrument, comprising:

(a) a body member, said body member including a first end and a second end;

(b) a connector member, said connector member having a first end and a second end;

(c) coupling means for detachably coupling said second end of said body member to said first end of said connector member;

(d) means for reversibly attaching an instrument tip to said first end of said body member;

(e) illumination transferring means for transferring illumination from a light source to a work area adjacent said instrument tip; wherein said illumination transferring means extends though said body member and said connector member, said illumination transferring means including opposing annular ends adjacent said coupling means, said opposing annular ends having a coaxial opening therethrough;

(f) image transferring means for transferring an image of said work area; and wherein said imaging means transfers images though an optical path extending through said coaxial opening in said illumination transferring means; and

(g) imaging means for detecting said image for visual display or recording thereof.

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5,743,732

## WOVSANIKER DYNAMIC JAW MODEL

Jeffrey A. Watson, 5023 Pine Valley Dr., Fayetteville, N.Y. 13066

Filed Sep. 27, 1996, Ser. No. 722,897

Int. Cl.[6] A61C *19/04*

U.S. Cl. 433—55 33 Claims

1. An apparatus for modelling the physiological dynamics of a jaw, comprising:

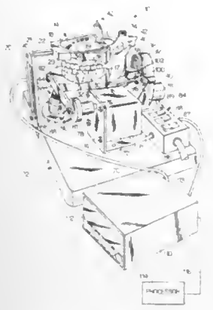
a jaw model having a mandible and a maxilla;

loading means, coupled to said jaw model, for imposing an occlusal force on the mandible of said jaw model;

movement means, coupled to the mandible of said jaw model, for moving the mandible latreally relative to the maxilla; and

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sensor means for sensing occlusal forces on said jaw model during the lateral movement of mandible.

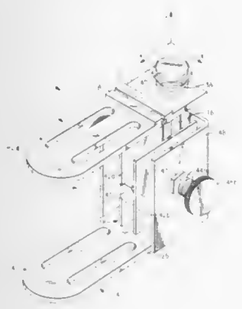
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**5,743,733**

## MECHANICAL DENTAL ARTICULATOR HAVING ADJUSTABLE CLAMING FEATURE AND METHOD OF USE

**Larry Crosland, 142 Roberts Ave., New York, N.Y. 13207-1348**

**Filed Feb. 14, 1996, Ser. No. 601,526**
**Int. Cl.[6] A61C *11/00***
**U.S. Cl. 433—57** **14 Claims**



**1**. A dental articulator, comprising:

a first frame, configured to accept for fixation thereto a first dental model;

a second frame, configured to accept for fixation thereto a second dental model;

a positioning member having one end attached to said first frame and another end, said positioning member being configured and dimensioned to position said first frame in opposing relationship with said second frame, the other end of said positioning member facilitating manual adjustment of said first frame relative to said second frame; and

clamping means for receiving the other end of said positioning member and allowing adjustment of said other end along a least two axes, said clamping means being adapted to secure said other end in an adjusted position.

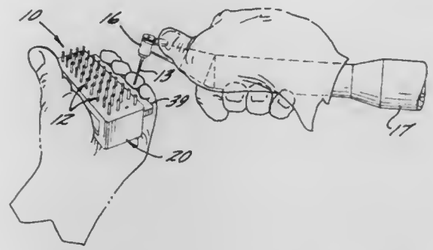
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**5,743,734**

## PORTABLE HOLDER FOR SAFELY SUPPORTING AND HANDLING SHARP DENTAL INSTRUMENTS

**Derek E. Heath; Jerry A. Mooneyhan, both of Johnson City, and Van T. Himel, Germantown, all of Tenn., assignors to Tulsa Dental Products, L.L.C., Tulsa, Okla.**

**Filed Jun. 3, 1996, Ser. No. 655,690**
**Int. Cl.[6] A61G *15/00***
**U.S. Cl. 433—77** **14 Claims**




**1**. A portable holder for supporting dental instruments of the type comprising an elongate shank and an enlarged head at one end of the shank, and comprising

a body member including a base plate having a plurality of openings therein which are each sized to permit the shank of an instrument to pass therethrough while engaging the head so as to permit a plurality of the instruments to be supportingly received in the openings of the base plate,

a pressure plate having a plurality of openings therein which are sized to permit the shank of an instrument to pass therethrough and which are arranged in a pattern matching that of the openings in the base plate,

means slideably mounting the pressure plate to the body member so that the pressure plate is parallel to and below the base plate and so as to be slidable between a loading position wherein the openings of the base plate and the pressure plate are respectively aligned, and an instrument retaining position wherein the openings are respectively offset, and .

means biasing the pressure plate toward one of the loading position and the retaining position and such that the pressure plate is normally retained in said one of the positions and may be moved to the other of said positions by manually pressing the pressure plate in a direction against the force of said biasing means.

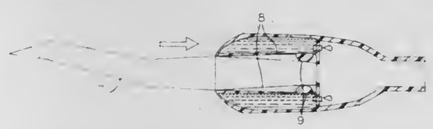
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**5,743,735**

## DEVICE FOR INTRODUCING LIQUIDS INTO DENTAL SUCTION SYSTEMS

**Manfred Vollstedt, Treiberpfad 20, DE 13469 Berlin, Germany**

**Continuation of Ser. No. 255,026, Jun. 7, 1994. This application Apr. 3, 1996, Ser. No. 626,952**
**Claims priority, application Germany, Jun. 17, 1993, 43 20 095.8**
**Int. Cl.[6] A61C *17/06***
**U.S. Cl. 433—91** **7 Claims**




**1**. A dental device for interconnecting a replaceable, elongated hollow dental instrument for being inserted into the mouth of a patient and a suction hose communicating with a vacuum source, said dental device comprising:



(a) a fluid-dispensing, hollow body member including radially spaced apart inner and outer walls defining therebetween a cleansing agent holding reservoir, and opposing first and second open ends for receiving respective connecting ends of the dental instrument and suction hose;

(b) a cleansing agent contained in said holding reservoir for being selectively dispensed from said reservoir through the second end of said body member and into the suction hose to cleanse and disinfect the suction hose; and

(c) dispensing means located on the inner wall of said body member and operatively engaging the connecting end of the dental instrument for dispensing a predetermined amount of cleansing fluid from said holding reservoir into the suction hose upon insertion of the dental instrument into the first end of said body member, whereby the suction hose is automatically cleansed and disinfected upon each replacement of the dental instrument after use.

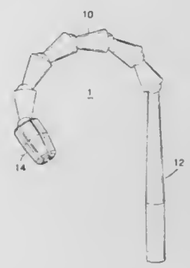
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**5,743,736**

## SALIVA EJECTOR COMPRISING A NUMBER OF STIFF SECTION MEMBERS

**Matts Folko, Koping, and Christer Albertsson, Eskilstuna, both of Sweden, assignors to Zirc Company, Buffalo, Minn.**

**PCT No. PCT/SE94/01039, § 371 Date Aug. 8, 1996, § 102(e) Date Aug. 8, 1996, PCT Pub. No. WO95/13031, PCT Pub. Date May 18, 1995**
**PCT Filed Nov. 3, 1994, Ser. No. 640,769**
**Claims priority, application Sweden, Nov. 8, 1993, 9303675**
**Int. Cl.[6] A61C *17/06***
**U.S. Cl. 433—96** **10 Claims**




**10**. A saliva ejector, comprising a plurality of stiff hollow section members joined end-to-end at a plurality of respective joints to form a length of tubing extending from one tubing end to an opposite tubing end, each respective joint of said plurality of respective joints pivotally coupling together adjacent stiff hollow section members of said plurality of stiff hollow section members, each joint of said plurality of joints being hollow and forming a continuous conduit channel from said one tubing end to said opposite tubing end.

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**5,743,737**

## DENTAL INSTRUMENT

**Kirk G. Hawn, P.O. Box 337, Lovettsville, Va. 22080, and James T. Lindsay, Lovettsville, Va., assignors to Kirk G. Hawn, Lovettsville, Va.**

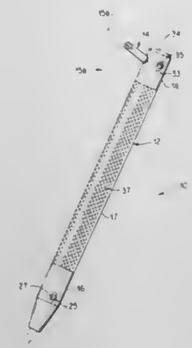
**Filed Feb. 9, 1996, Ser. No. 596,867**
**Int. Cl.[6] A61C *3/00***
**U.S. Cl. 433—141** **29 Claims**

**1**. A dental instrument comprising:

an elongate, generally linear, rigid body having a, longitudinal axis and first and second ends, said body also having a first lateral bore extending in said body at an acute angle to said longitudinal axis and proximate said first end, a second lateral bore extending in said body at an acute angle to said longitudinal axis and proximate said second end, and an axial bore extending inwardly from one of said ends generally along said longitudinal axis;

a bit having a mounting end secured within one of said bores and a working end opposite said mounting end, said bit projecting laterally from said body when said mounting end is sectored in one of said lateral bores; and

a securing element for engaging said mounting end to hold said bit in one of said bores.



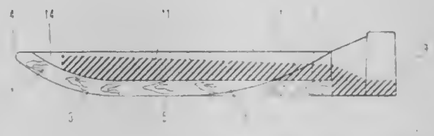
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**5,743,738**

## INTERDENTAL WEDGE

**Gianni Baffelli, Tesserete; Beat A. Von Weissenfluh, Gentilino, and Beat Kilcher, Bosco Luganese, all of Switzerland, assignors to Hawe Neos Dental, Binggio, Switzerland**

**Filed Jun. 25, 1996, Ser. No. 669,958**
**Claims priority, application Switzerland, Jun. 28, 1995, 01892/95**
**Int. Cl.[6] A61C *7/00***
**U.S. Cl. 433—149** **24 Claims**



**1**. Interdental wedge suitable for use on the insertion of approximal fillings of light during synthetic materials into tooth cavities, comprising:

a compressible sole portion having a top portion; and

a light-guiding insert of synthetic material arranged on the top portion of the sole portion, the sole portion being made of a material that is compressible from an uncompressed state under the influence of a compressive force which raises more than proportionally with respect to the compression in order to achieve a high separation force.

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**5,743,739**

**Patent Not Issued For This Number**

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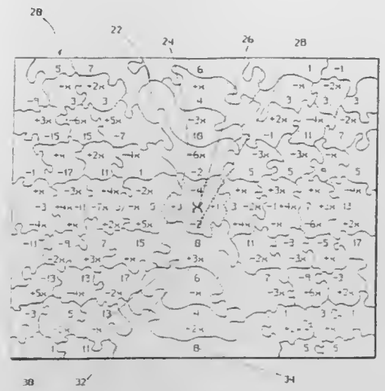
**5,743,740**
**EDUCATIONAL WORD AND LETTER GAME AND METHOD OF PLAYING**
**Richard Visser, and Janice Visser, both of 16001 Cotillion Apt. 707, Houston, Tex. 77060**
**Filed Dec. 20, 1995, Ser. No. 575,607**
**Int. Cl.[6] G09B *19/22***
**U.S. Cl. 434—128** **14 Claims**




5. A method of teaching, comprising:
(a) providing a game, said game comprising:
a set of game cards selected from a plurality of sets of game cards, said plurality of sets of game cards comprising varying skill levels, at least one of said game cards of said set each having a character imprinted thereon and at least one of said game cards of said set each having a picture imprinted thereon, where the character is selected from the group consisting of a letter, a number, a word phrase, and a symbol;
a set of game boards selected from a plurality of sets of game boards, said plurality of sets of game boards comprising said varying skill levels, each of said game boards of said set of game boards further comprising a multitude of rows and columns which form spaces, at least one of said spaces each having a randomly selected character imprinted thereon and at least one of said spaces each having a randomly selected picture imprinted thereon, wherein each character is selected from the group consisting of a letter, a word phrase, a number, and a symbol, and each character and each picture on each game board of said set of game boards corresponds to a character and a picture imprinted on said set of game cards, respectively;
a plurality of markers for placing on said spaces in response to said set of game cards; and
a free space located in one of the spaces formed by the multitude of rows and columns;
(b) an instructor selecting at least one game card from said set of game cards;
(c) the instructor reciting information that corresponds to each selected game card
(d) a game participant locating a character or a picture imprinted on a space on a game board of said set of same boards that corresponds to said recited information; and
(e) a game participant placing a marker on said space on said game board that has said character or said picture that corresponds to said recited information.

**5,743,741**
**MATH JIGSAW PUZZLE**
**Patricia Fife, 1331 Traynor Rd., Concord, Calif. 94520**
**Filed Jan. 31, 1997, Ser. No. 792,473**
**Int. Cl.[6] G09B *19/02***
**U.S. Cl. 434—205** **9 Claims**

1. An educational jigsaw puzzle comprising:

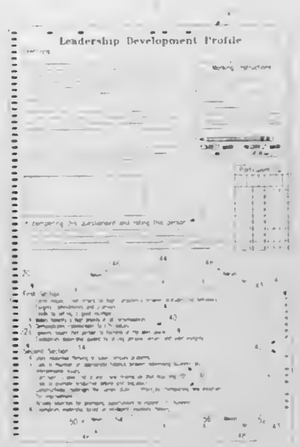



a plurality of components including at least one designated beginning component and a plurality of other components, each of said plurality of components having an irregular side edge for uniquely interfitting with at least one other of said plurality of components, a front face, and a back face;
each said at least one designated beginning component having first indicia means for identifying each such component as a member of a first group;
each of a plurality of said other components having second indicia means for identifying each such component as a member of a second group, said first indicia means and said second indicia means being contrasting so that a member of said first group is distinguishable from a member of said second group;
said front face of each member of said first group having a beginning mathematical expression and a plurality of surrounding mathematical expressions extending therefrom in a plurality of directions, said beginning mathematical expression being of a different size than said surrounding mathematical expressions, and each of said surrounding mathematical expressions being adjacent a respective portion of the edge of said each member of said first group;
said front face of each member of said second group having at least an equivalent mathematical expression adjacent a respective portion of the edge of said each member of said second group, said equivalent mathematical expression being the value of a mathematical combination of all mathematical expressions along a one of said directions from said beginning mathematical expression up to that component of said second group having said equivalent value when the respective portion of the edge of a component having the last mathematical expression of said mathematical combination is positioned in uniquely interfitting relationship with the respective portion of the edge of the component having the equivalent mathematical expression.

**5,743,742**
**SYSTEM FOR MEASURING LEADERSHIP EFFECTIVENESS**
**Palmer Morrel-Samuels, Sylvan, Mich., assignor to Electronic Data Systems Corporation, Plano, Tex.**
**Filed Apr. 1, 1996, Ser. No. 625,967**
**Int. Cl.[6] G09B *19/00;19/18;3/00*; B42D *15/00***
**U.S. Cl. 434—236** **14 Claims**

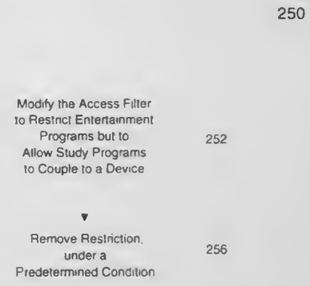
1. An assessment tool for gathering meaningful information concerning an object, comprising:
a plurality of statements directed toward observable characteristics of said object;
a frequency estimation scale corresponding to each statement, the frequency estimation scale comprising a non-response option; and





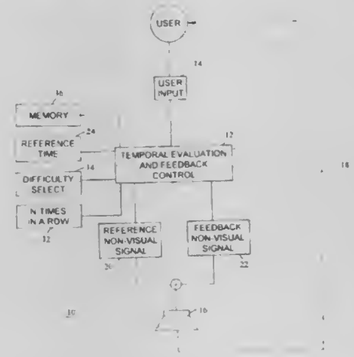

at least one statement being reverse keyed from the remaining statements.

**5,743,743**
**LEARNING METHOD AND SYSTEM THAT RESTRICTS ENTERTAINMENT**
**Chi Fai Ho, 4816 Cabello Ct., Union City, Calif. 94587, and Peter P. Tong, 1807 Limetree La., Mountain View, Calif. 94040**
**Filed Sep. 3, 1996, Ser. No. 707,189**
**Int. Cl.[6] G02B *19/00*; G09B *7/00***
**U.S. Cl. 434—236** **27 Claims**




1. A computer-aided-educational method for educating a student through a computer, which includes a device separated from a plurality of programs by an access filter, with the plurality of programs including a study program and an entertainment program, which requires the device to fulfill its entertainment purpose, the method comprising the steps of:
modifying the access filter to restrict coupling between the device and the entertainment program, but simultaneously allow coupling between the device and the study program; and
removing the restriction in the access filter to allow coupling between the device and the entertainment program under a predetermined condition.

**5,743,744**
**METHOD AND APPARATUS FOR MEASURING AND ENHANCING NEURO-MOTOR COORDINATION**
**James F. Cassily, Wyoming, and James B. Lagerkvist, Royal Oak, both of Mich., assignors to Synaptec, LLC, Wyoming, Mich.**
**Continuation of Ser. No. 139,568, Oct. 20, 1993, Pat. No. 5,529,498. This application May 31, 1996, Ser. No. 656,061**
**Int. Cl.[6] G09B *19/00***
**U.S. Cl. 434—258** **20 Claims**




1. A neuro-motor coordination measuring and enhancing apparatus, comprising:
a user operable trigger device which receives a user manipulation of said trigger device;
an aural output which provides an aural signal to a user; and
a control including an aural generator which is responsive to user manipulation of said trigger device for causing said aural output to generate aural signals, said control generating a reference signal having occurrences separated by a predetermined time interval and determining a temporal relationship between user manipulations of said trigger device and occurrences of said reference signal, said control causing said aural output to provide aural signals including said reference signal and a guidance aural signal that is a function of said temporal relationship, wherein said guidance aural signal is provided substantially concurrently with a user manipulation of said trigger device in order to draw the user into time alignment with the occurrences of the reference signal for extended periods thereby improving the user's neurological functionality.

12. A method of measuring and enhancing the neuro-motor coordination of a user, said method including the steps of:
presenting to the user repetitive occurrences of a non-visual reference signal, said occurrences separated by a predetermined time interval;
receiving from the user with a trigger device a conscious physical response to the user's prediction of the lapse of said predetermined time interval since the last occurrence of said reference signal;
determining the temporal relationship between the conscious physical response of the user and the predetermined time interval since the last occurrence of the reference signal; and
generating a non-visual guidance signal that is a function of said temporal relationship and presenting said guidance signal to the user substantially concurrently with the user's response in order to draw the user into time alignment with the occurrence of the reference signal and to induce repetitive physical interactivity with the reference signal to thereby enhance the neuro-motor coordination of the user.

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**5,743,745**

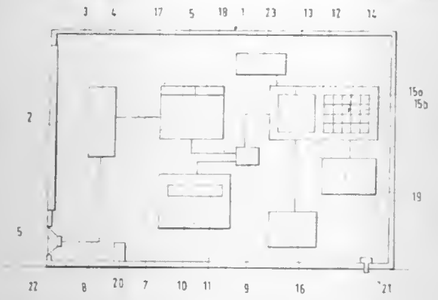
**DEVICE FOR PLAYING BACK SHORT FILMS AND/OR ADVERTISING SPOTS AND/OR QUIZ QUESTIONS**

**Wilhelm Reintjes, Alpener Strasse 52, 47665 Sonsbeck, Germany**

**Continuation of Ser. No. 297,942, Aug. 31, 1994, abandoned. This application Dec. 9, 1996, Ser. No. 762,796**

**Int. Cl.[6] A63F** *9/18*; **G09B** *9/00*

**U.S. Cl. 434—307** **8 Claims**



1. Method for presenting visual images selected from the group consisting of short films, advertising spots and quiz questions, in particular at sales outlets, leisure facilities and locations belonging to the entertainment and catering sector, such as discotheques, including the steps of:

a) presenting at least one of short films and advertising spots, during or in between which at least one quiz question or at least one answer is to be inserted, on at least one projection screen,

b) projecting short films or advertising spots with the quiz question or quiz questions to be inserted on the screen during or in between the films, advertising spots or the answers by a projecting device,

c) playing a sound recording which accompanies the short films, the advertising spots or the quiz question or quiz questions through an acoustic device,

d) storing the short films or the advertising spots by means of a storage device (video recorder), and inserting at least one quiz question and the correct answer optically or acoustically during or in between the short films or advertising spots,

e) entering answers to the quiz question with an additional device which enables comparison of the entered answer with the stored, correct answer,

f) determining winners of the quiz game by means of a storage device with a programmable memory, and the memory can be expanded to incorporate individual consumer goods to be offered or services, or displays of the addresses of the suppliers of these goods or services, said storage device being controlled by the input device, after entry of the correct answer into the latter,

g) dividing a display into fields for presentation of the individual consumer goods or services or the suppliers' addresses,

h) printing out the winning certificates or the selected supplier or a receipt for further information to be obtained from the supplier,

i) digitalizing recorded speech for recall from the memory,

j) alternately displaying from two different display projectors invitations to play on the screen when no player is using the device,

k) after pressing a play key, a prompt for the player appears on the screen, after which the player is required to select the answer which he considers to be correct from a large number of possible answers,

l) after choosing the correct answer, the player is requested to choose between two envelopes which are displayed on the screen, whereby only one of these envelopes contains a shopping voucher,

m) after choosing the envelope containing the shopping voucher, the player is requested to provide personal details, such as his postal code and date of birth, and

n) printing a winning certificate for the player after this information has been provided.

**5,743,746**

**REWARD ENRICHED LEARNING SYSTEM AND METHOD**

**Chi Fai Ho, 4816 Cabello Ct., Union City, Calif. 94587, and Peter P. Tong, 1807 Limetree La., Mountain View, Calif. 94040**

**Filed Apr. 17, 1996, Ser. No. 633,582**

**Int. Cl.[6] G09B** *7/00*

**U.S. Cl. 434—332** **23 Claims**



1. A computer-aided-educational apparatus for rewarding a student for attaining a milestone in a subject, which is divided into line-items with at least one line-item being more difficult than another line-item, the apparatus comprising:

a milestone setter for setting a plurality of milestones, with each milestone being related to a line-item;

a performance analyzer coupled to the milestone setter for accessing the milestones and determining whether the student has reached a milestone;

a reward determinator coupled to the performance analyzer to determine a reward for the student if the performance analyzer indicates that the student has reached a milestone; and

a reward generator coupled to the reward determinator for generating the reward for the student.

**5,743,747**

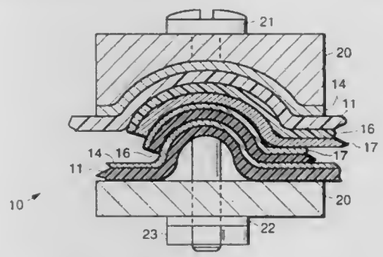
**DIMPLED CONNECTOR**

**Mohi Sobhani, Encino, Calif., assignor to Hughes Electronics, Los Angeles, Calif.**

**Filed Jan. 13, 1997, Ser. No. 783,840**

**Int. Cl.[6] H01R** *9/09*

**U.S. Cl. 439—67** **5 Claims**



1. A connector comprising:

a first structural substrate comprising one or more mechanically raised structural dimples formed therein that protrude above a top surface thereof, and a first metallization pattern formed on the top surface of the first structural substrate which overlays each of the structural dimples;

a first flexible interconnect circuit that is matable with the first structural substrate that comprises a first dielectric substrate having conductive traces formed on a top side thereof that terminate at first contact areas, and wherein the first contact areas are configured to conform to an exterior surface of the dimples formed on the first structural substrate;

a second structural substrate comprising one or more mechanically raised structural dimples formed therein that protrude above a top surface thereof, and a second metallization pattern formed on the top surface of the second structural substrate which overlays each of the structural dimples;

a second flexible interconnect circuit that is matable with the second structural substrate that comprises a second dielectric substrate having second conductive traces formed on a bottom side thereof that terminate at second contact areas, and wherein the contact areas are configured to conform to an interior surface of the dimples formed on the second structural substrate;

and wherein the first and second flexible interconnect circuits are respectively supported by the first and second structural substrates and the first and second metallization patterns formed thereon and have their respective first and second contact areas disposed in contact with each other; and

securing means for compressing the first and second structural substrates together to hold the contact areas together.



**5,743,748**

**EMULATOR PROBE**

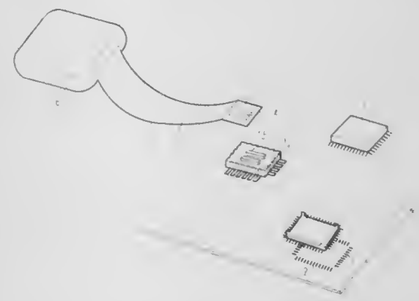
**Youichi Takahata, and Toshihiko Sugahara, both of Hyogo, Japan, assignors to Mitsubishi Electric Semiconductor Software Co., Ltd., Itami, and Mitsubishi Denki Kabushiki Kaisha, Tokyu, both of Japan**

**Filed Aug. 25, 1995, Ser. No. 519,811**

**Claims priority, application Japan, Apr. 4, 1995, 7-078951**

**Int. Cl.[6] H01R** *23/72*;*9/09*

**U.S. Cl. 439—71** **10 Claims**



1. An in-circuit emulator coupling device for coupling an in-circuit emulator, which assists program development, with a main circuit board on which an integrated circuit for executing said program is mounted, comprising:

a coupling circuit board having external dimensions corresponding to external dimensions of said integrated circuits;

lead terminals for coupling said in-circuit emulator coupling device with said main circuit board at a location where said integrated circuit for executing said program is to be mounted;

relay connectors provided on said coupling circuit board for coupling with a pod portion of an in-circuit emulator; and

conductor patterns for electrically connecting said relay connectors to said lead terminals.

**5,743,749**

**ELECTRONIC COMPONENT CONNECTOR**

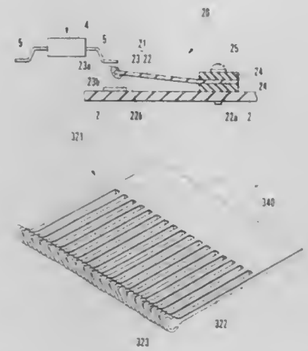
**Takashi Kurakane, Tokyo, Japan, assignor to Tesec Corporation, Japan**

**Filed Nov. 15, 1996, Ser. No. 749,987**

**Claims priority, application Japan, Nov. 17, 1995, 7-300161**

**Int. Cl.[6] H01R** *9/09*

**U.S. Cl. 439—72** **17 Claims**



1. An electronic component connector for very high frequency use comprising:

a plurality of conductive terminals formed on an insulating substrate;

a plurality of belt like support members provided on said insulating substrate to correspond to said conductive terminals, said support members made of an elastic insulating material and respectively having free end portions arranged in a row to correspond to a plurality of lead terminals extending from an electrical component and proximal end portions cantilevered by said insulating substrate; and

a plurality of conductive contacts insulated from each other and provided to said free end portions of said support members to normally oppose said conductive terminals through a predetermined gap, said conductive contacts forming a structure distinct from said support member and respectively having first contact portions arranged to come into contact with said lead terminals of the electrical component and second contact portions arranged to come into contact with said terminals at positions, in a longitudinal direction of said support members, different from positions where said first contact portions come into contact with said terminals,

wherein said lead terminals of the electrical component are positioned to correspond to said conductive contacts, thereafter the electrical component is pressed against an elastic force of said support members in a direction to come close to said insulating substrate, thereby electrically connecting said conductive terminals and said lead terminals of the electrical component through said conductive contacts.

**5,743,750**

**ELECTRICAL CONNECTOR FOR STRAIGHT-THROUGH CONNECTION AND BREAKOUT TESTING OF DATA COMMUNICATION LINES**

**Robert W. Sullivan, Simi Valley, and Lee A. Watkins, Thousand Oaks, both of Calif., assignors to Test-Um, Inc., Camarillo, Calif.**

**Filed Aug. 19, 1996, Ser. No. 699,662**

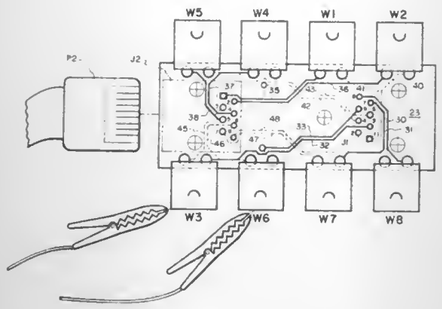
**Int. Cl.[6] H04M** *1/24*

**U.S. Cl. 439—76.1** **16 Claims**

1. A circuit board assembly for use in an electrical connector to provide straight-through interconnection of data lines between two jacks each of which has eight output pins, said circuit board assembly comprising:

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a circuit board (**20**) having two ends (**21**, **22**), a top surface (**23**) and a bottom surface (**24**);

two rows of pin openings adjacent each end of said board and extending transversely thereon, one row having four pin openings for receiving the output pins (**1**, **3**, **5**, **7**) of a corresponding jack, and the other row having four pin openings for receiving the output pins (**2**, **4**, **6**, **8**) of the corresponding jack;

four pairs of eyelets (**27**) forming a row on each longitudinal edge of said circuit board;

four sets of conductors on said circuit board, having four conductors in each set, a first set (**30–33**) being on the top surface (**23**) of said circuit board (**20**) and connecting half of said pin openings on one end (**21**) of said board to half of said eyelets on one longitudinal edge of said board, a second set (**35–38**) being on the top surface (**23**) of said circuit board (**20**) and connecting half of said pin openings on the other end (**22**) of said board to half of said eyelets on the other longitudinal edge of said board, a third set (**40–43**) being on the bottom surface (**24**) of said circuit board (**20**) and connecting the other half of said pin openings on said one end (**21**) of said board to the other half of said eyelets on the other longitudinal edge of said board, and a fourth set (**45–48**) being on the bottom surface (**24**) of said circuit board and connecting the other half of said pin openings on the other end (**22**) of said board to the other half of said eyelets on said one longitudinal edge of said board;

a separate row of four metal test pads extending along each respective side of said circuit board to form breakout terminals, each of said test pads being connected between an associated pair of eyelets and serving to thereby interconnect corresponding pin openings at the two ends of said circuit board; and

the first two test pads in one row representing pin opening pair (**1** and **2**), the second two test pads in said one row representing pin opening pair (**4** and **5**), the first two test pads in the other row representing pin opening pair (**7** and **8**), and the second two test pads in said other row representing pin opening pair (**3** and **6**); and

the arrangement of said conductors further being such that:

(1) said conductors for each pin opening pair are in close parallel relation; and

(2) at each over-crossing where a conductor on one surface of said circuit board crosses over the location of a conductor on the opposite surface of said circuit board, said over-crossing is made at approximately a right angle, said arrangement of said conductors thereby maximizing common mode rejection and minimizing cross-talk between the circuit pairs within said connector.

**5,743,751**

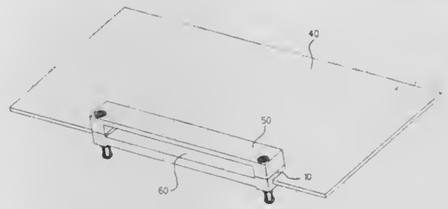
## STRADDLE ADAPTER FOR MOUNTING EDGE CONNECTORS TO A PRINTED CIRCUIT BOARD

**Philip E. Davis, P.O. Box 580, Delray Beach, Fla. 33444; John C. Beck, 1502 N.E. 12 St., Fort Lauderdale, Fla. 33304; John M. Pierini, 2301 N.W. 93 La., Sunrise, Fla. 33322, and Andrea L. Garza, 7630 Ladson Ter., Lakeworth, Fla. 33467**

**Filed May 14, 1996, Ser. No. 645,763**

**Int. Cl.[6] H01R** *9/09*

**U.S. Cl. 439—79** **8 Claims**




**1**. An adapter for coupling a first edge connector and a second edge connector independent of the first edge connector to opposite sides of a circuit board, said adapter comprising:

first and second plates and a side end that joins an edge of said first and second plates so that the first and second plates are spaced apart and substantially parallel to each other, wherein said first and second plates have inner surfaces facing each other and outer surfaces facing away from each other, and the inner surfaces of said first and second plates are adapted to receive an edge of the circuit board therebetween;

first means for mounting the first edge connector to the outer surface of said first plate; and

second means for mounting the second edge connector to the outer surface of said second plate.

**5,743,752**

## WATERPROOF ELECTRICAL CONNECTION APPARATUS

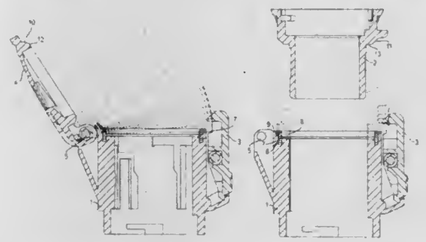
**Eric Masseheuf, Rouen, France, assignor to Societe d'Exploitation des Procedes Marechal (SEPM), Saint Maurice, France**

**Filed Nov. 30, 1995, Ser. No. 565,152**

**Claims priority, application France, Dec. 2, 1994, 94 14515**

**Int. Cl.[6] H01R** *13/44*

**U.S. Cl. 439—142** **22 Claims**



**1**. A waterproof electrical connection apparatus, comprising:

a socket comprising a casing having an annular throat, said annular throat comprising a flat internal shoulder;

an annular seal disposed within said annular throat, said annular seal projecting from said annular throat in an axial direction;

a protective cover connected to said socket by a hinge to pivotally move from a first position to a second position, said cover including a contact surface;



a plug including a periphery and a contact surface formed around said periphery, said plug being insertable into said socket to be coupled in said casing; and

when said protective cover is in said second position and secured to said casing, said contact surface of said protective cover is arranged to contact said annular seal and said flat internal shoulder is contacted by a corresponding part of said protective cover, and when said plug is coupled to said casing, said contact surface of said plug is arranged to contact said annular seal.

**5,743,753**

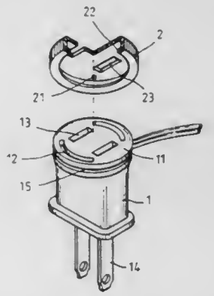
## WATERTIGHT ELECTRICAL PLUG

**Chun Chang Yen, No. 8, Ln. 247, Niu Pu Rd., Hsinchu, Taiwan**

**Filed Nov. 26, 1996, Ser. No. 753,492**

**Int. Cl.[6] H01K** *13/44*

**U.S. Cl. 439—143** **1 Claim**




**1**. An improved watertight electrical plug comprising a plug body and a cover wherein said plug body is configured to have a slightly raised spherical end face and a cylindrical wall substantially encircling said end face, said watertight electrical plug being provided with two symmetrical curved grooves on the end face and an annular engaging grooves on the cylindrical wall around said end face, said end face having formed therein a pair of elongate electrical connection slots adapted to receive prongs of a mating plug, said cover includes an inwardly extending flange at a lower end thereof in engagement with said engaging groove in order to snap said cover on the end face of the plug body, two downwardly projecting locating bulges on the underside of said cover at positions corresponding to said two symmetrical curved grooves, and two elongate slots on the top surface of said cover corresponding to the slots on the end face of said plug body, whereby said cover is angularly displaceable relative to said plug body between an open position and a sealed position, said elongate slots of said cover being substantially aligned with said elongate slots of said plug body end face when said cover is in said open position.

**5,743,754**

## ELECTRICAL MULTI-PIN SNAP CONNECTOR

**Cristi L. Cristich, 270 S. Old Bridge Rd., Anaheim Hills, Calif. 92808**

**Filed Jul. 10, 1995, Ser. No. 500,147**

**Int. Cl.[6] H01R** *13/627*

**U.S. Cl. 439—349** **22 Claims**

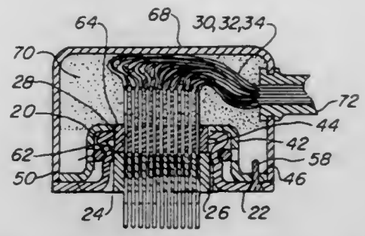
**1**. An electrical multi-pin snap connector comprising:

a snap fastener stud having a multi-conductor current carrying first electrical mating connector disposed therewithin.

a gripping ring snap fastener socket, compliant with the snap fastener stud, having a multi-conductor current carrying second electrical mating connector disposed within the snap fastener socket, the second electrical mating connector insertably conforming with the first electrical mating connector such that when the stud and snap fastener socket are urgingly snapped together, the electrical mating connectors interconnect creating a flowpath for electricity and the stud and snap fastener socket provide a spring retention means for the mating connectors in a removable manner.

said first electrical mating connector and second electrical mating connector are reverse gender with an electrical socket having a plurality of extended hollow fixed diameter tubular female contacts and a plug having a plurality of spring member male contacts recessed within the plug for mating insertion into the electrical socket, and

an electromagnetic interference shield of a metallic composition completely enclosing the snap fastener socket and a portion of the snap fastener stud.




**5,743,755**

## CONNECTOR SYSTEM

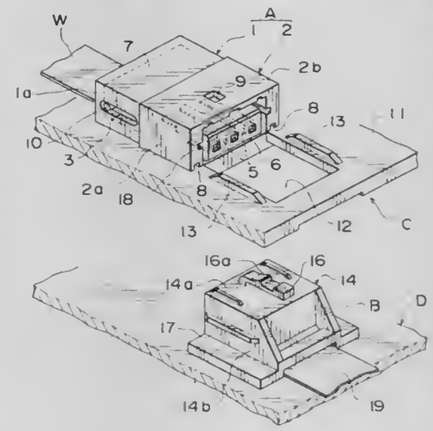
**Yoshihito Aoki, Susono, Japan, assignor to Yazaki Corporation, Tokyo, Japan**

**Filed Dec. 19, 1996, Ser. No. 769,527**

**Claims priority, application Japan, Dec. 22, 1995, 7-334776**

**Int. Cl.[6] H01R** *13/627;9/09;13/62*

**U.S. Cl. 439—354** **5 Claims**




1. A connector system comprising:

a first connector including a first connector housing and a second connector housing movable to and from said first connector housing; and

a second connector to be coupled to said first connector, said second connector including a third connector housing to be coupled with the second connector housing, wherein said first connector housing includes a connection terminal, said second connector housing includes a movable contact piece arranged within a terminal chamber and slidably coupled with said connection terminal, and said third connector housing

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includes an electrical contact piece to be electrically connected to said movable contact piece.

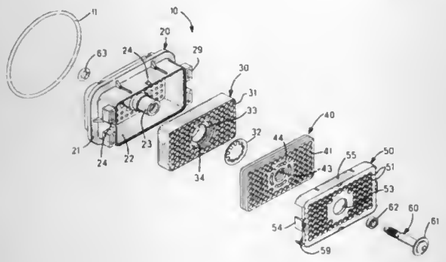
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5,743,756

## SEALED ELECTRICAL CONNECTOR WITH JACK SCREW

**Richard Eric Hasz, Ramseur; Gary Ray Marpoe, Jr., Kernersville, and Thomas Edward Musser, Greensboro, all of N.C., assignors to The Whitaker Corporation, Wilmington, Del.**

**Filed Mar. 29, 1996, Ser. No. 625,466**
**Int. Cl.[6] H01R** *13/627*
**U.S. Cl. 439—364** **20 Claims**



1. An electrical connector subassembly comprising:
(a) a housing with a housing cavity for receiving a contact retention insert therein, and a tower section;
(b) a contact retention insert disposed in said housing cavity, said retention insert comprises at least one electrical contact receiving cavity therein, and said retention insert comprises an aperture, said tower extends through said aperture; and
(c) a retaining part is mounted in said housing cavity for contact with said contact retention insert, and a section of said retaining part engages a portion of said tower for retaining said insert in said housing cavity.

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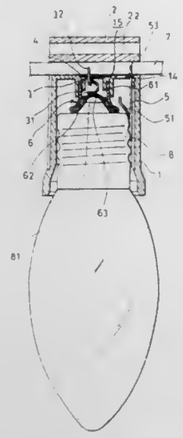
5,743,757

## LAMP SOCKET WITH WATER SEALING MEANS

**Ming-Hsiung Chen, 7F, No. 16, Alley 3, Lane 227, Nung-An St., Taipei City, Taiwan**

**Continuation-in-part of Ser. No. 546,820, Oct. 23, 1995. This application Apr. 26, 1996, Ser. No. 638,495**
**Int. Cl.[6] H01R** *4/24*
**U.S. Cl. 439—419** **5 Claims**

1. A lamp socket comprising:
a socket body having
a top transversely grooved top wall having a center vertical through hole, a side vertical through hole, and a central top recess formed in said socket body, the top wall further having an inside annular groove formed within the socket body and around the center vertical through hole;
a first contact plate mounted within the center vertical through hole, said first contact plate having a pointed tip;
a second contact plate mounted within the side vertical through hole;
an electric wire fastened to the transversely grooved top wall of the socket body;
a socket cap fastened to the socket body to hold down the electric wire and to force the electric wire into contact with the first contact plate and the second contact plate;
a water sealing cushion mounted within the central top recess of the socket body and disposed about the electric wire, the water sealing cushion having a vertical through hole formed therein, the vertical through hole receiving the pointed tip of the first contact plate, the pointed tip making electrical contact



with the electric wire, the water sealing cushion preventing the exposure of the electrical contact to fluids;
a flexible inner socket fastened to the inside annular groove of the socket body, the inner socket having a metal strip retained therein and further having an outward flange disposed opposite the inside annular groove of the socket body;
the outward flange of the inner socket being pressed against a base of a lamp bulb when the lamp bulb is inserted into the socket body, thereby effecting a water-tight seal of a tip contact of the lamp bulb, the tip contact contacting and pressing the metal strip of the inner socket against the first contact plate as the bulb is inserted into the socket body, thereby creating an electrical contact between the tip contact of the bulb and the first contact when the bulb is inserted into the socket body.

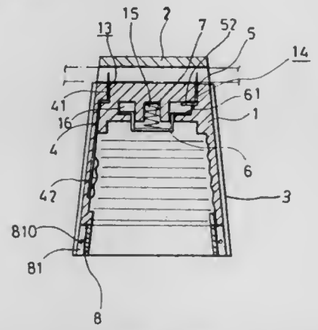
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5,743,758

## LAMP SOCKET WITH A WATER AND ELECTRICITY SEALING STRUCTURE

**You-Jen Cheng, and Tzu-Ling Cheng, both of P.O. Box 82-144, Taipei City, Taiwan**

**Filed Jun. 19, 1996, Ser. No. 667,232**
**Int. Cl.[6] H01R** *4/24*
**U.S. Cl. 439—419** **3 Claims**



1. A lamp socket comprising a lamp socket having a grooved top wall and a bottom lamp hole, a socket cap fastened to said lamp socket to hold down an electric wire in the grooved top wall of said lamp socket, a positive metal contact plate and a negative metal contact plate mounted in respective slots in said lamp socket and having respective pointed top tips forced into contact with respective conductors in said electric wire, said socket body comprised of



two symmetrical halves having respective elongated flanges at two opposite sides respectively coupled together by two dovetail-grooved coupling boxes, wherein:
a movable metal contact plate is transversely suspended inside said socket body and adapted for connecting the tip contact of the lamp bulb to said positive metal contact plate;
a spring is mounted inside said socket body to impart a downward pressure to said movable metal contact plate so as to prevent direct contact of said movable metal contact plate with said positive metal contact plate;
a rubber packing ring is mounted within said socket body around said bottom lamp hole to prohibit water from passing to the inside of said socket body after the installation of the lamp bulb.

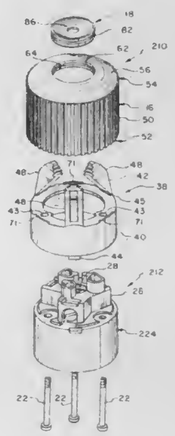
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5,743,759

## ELECTRICAL CONNECTOR WITH SUBSTANTIALLY FLUSH MOUNTED CORD SEAL

**Albert A. Pudims, Stratford, and Thomas J. Vigorito, Fairfield, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.**

**Filed Sep. 26, 1996, Ser. No. 721,632**
**Int. Cl.[6] H01R** *13/58*
**U.S. Cl. 439—462** **15 Claims**



1. An electrical connector for attachment to an end of an electrical cord comprising:
a connector body having a plurality of electrical contacts mounted thereto, said contacts being adapted to be coupled to the end of the electrical cord;
a cover having a tubular sidewall with a first end and a second end, said first end of said cover being coupled to said connector body and said second end having an inwardly extending end wall with an exterior surface defining a centrally located opening for receiving the electrical cord therethrough; and
a removable resilient cord seal fixedly coupled within said opening of said cover, said cord seal having an outer peripheral surface engaging an inner peripheral surface of said opening in said end wall to form a seal therebetween and a centrally located aperture for receiving the end of the electrical cord therethrough to form a seal therebetween, said outer peripheral surface of said cord seal being located entirely within said opening of said cover, said cord seal having an outer end surface extending between said outer peripheral surface and said aperture, said outer end surface of said cord seal being substantially contiguous with respect to said exterior surface of said cover to form a substantially smooth interface with said exterior surface to increase difficulty of removal of said cord seal from said opening in said end wall of said cover,
said inner peripheral surface of said opening being configured to matingly engage said outer peripheral surface of said cord seal to secure said cord seal within said opening via a protrusion and recess connection formed on said peripheral surfaces.

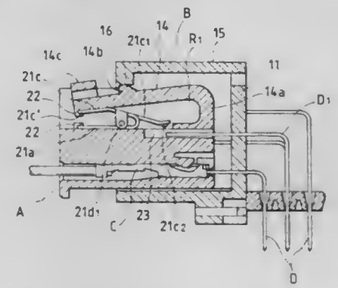
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5,743,760

## CONNECTOR ENGAGEMENT DETECTING DEVICE

**Shigemitsu Inaba; Etsuro Suzuki; Akira Maeda, and Tomoyuki Hotta, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan**

**Filed Sep. 23, 1996, Ser. No. 723,880**
**Claims priority, application Japan, Sep. 25, 1995, 7-245963; Oct. 20, 1995, 7-272771**
**Int. Cl.[6] H01R** *3/00*
**U.S. Cl. 439—489** **12 Claims**



1. A connector engagement detecting device comprising:
a first connector housing having a flexible locking arm;
a shorting contactor set in a displacement permitting space provided for said flexible locking arm in said first connector housing, said shorting contactor including an elastic contact plate having a front and rear end, which is displaced in association with displacement of said flexible locking arm;
a second connector housing having an engaging section provided for said flexible locking arm; and
a pair of engagement detecting metal terminals provided in said second connector housing in confrontation with the front end of said elastic contact plate of said shorting contactor, wherein when said first and second connector housings are incompletely engaged with each other, said shorting contactor is prevented from being in contact with said engagement detecting metal terminals by displacement of said front end of said elastic contact plate of said shorting contactor in an upward direction within the displacement permitting space, which is due to the displacement of said flexible locking arm in a downward direction.

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5,743,761

## ELECTRICAL CONNECTOR

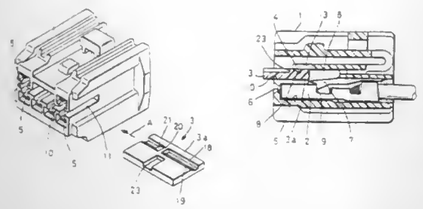
**Hajime Kawase, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan**

**Filed Apr. 23, 1996, Ser. No. 636,694**
**Claims priority, application Japan, Apr. 24, 1995, 7-124441; Apr. 24, 1995, 7-124442; Aug. 3, 1995, 7-219697**
**Int. Cl.[6] H01R** *13/40*
**U.S. Cl. 439—595** **24 Claims**

1. A connector, comprising:
a connector housing comprising at least one cavity into which a terminal member can be inserted in a terminal insertion direction; and

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a retainer being movable in the connector housing between a temporarily secured position and a fully secured position, the retainer when in the fully secured position being able to secure the terminal member to prevent removal; wherein

the connector housing includes a side surface having a retainer insertion hole, the retainer is insertable into the retainer insertion hole in a first direction to the temporarily secured position, whereby the retainer after being inserted into the retainer insertion hole and positioned at the temporarily secured position is moved in a second direction being different from the first direction in the connector housing from the temporarily secured position to the fully secured position, wherein the first direction is perpendicular to the terminal insertion direction while the second direction is opposite to the terminal insertion direction.

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**5,743,762**

**CONNECTOR**

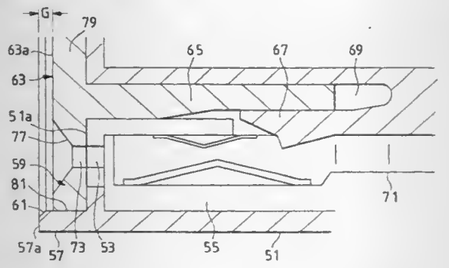
**Toshiharu Takahashi, Shizunka, Japan, assignor to Yazaki Corporation, Tokyo, Japan**

**Filed Jun. 6, 1996, Ser. No. 659,522**

**Claims priority, application Japan, Jun. 7, 1995, 7-140845**

**Int. Cl.[6] H01R** *13/40*

**U.S. Cl. 439—595** **3 Claims**



1. A connector comprising; a connector housing having a front end surface serving as a fitting abutment surface for abutment against a mating connector retaining a mating terminal; a recessed portion formed in said fitting abutment surface having a surface perpendicular to said fitting abutment surface and a first tapered surface;

a front holder for detecting a half-fitted condition of a terminal and for effecting the double retaining of said terminal, said front holder being attached to said recessed portion, said front holder being fitted in said recessed portion in such a manner that a front surface of said front holder is first in encountering said front holder to receive said mating terminal during abutment of said connector against said mating connector, said front surface containing both a second tapered surface and a non-tapered surface wherein said non-tapered surface is not flush with said fitting abutment surface wherein said front surface is disposed inwardly of said fitting abutment surface, said first tapered surface and at least a portion of said perpendicular surface;

said second tapered surface guiding said mating terminal when said connector and said mating connector are to be fitted together.

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**5,743,763**

**INDUSTRIAL-TYPE MOBILE ELECTRIC SOCKET AND PLUG OF EASIER ASSEMBLING**

**Mapelli Giovanni, Ranica, Italy, assignor to Scame Parre S.p.A., Parre, Italy**

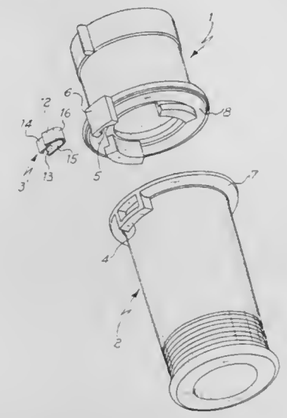
**PCT No. PCT/IT94/00101, § 371 Date Mar. 22, 1996, § 102(e) Date Mar. 22, 1996, PCT Pub. No. WO95/01664, PCT Pub. Date Jan. 12, 1995**

**PCT Filed Jun. 30, 1994, Ser. No. 569,142**

**Claims priority, application Italy, Jul. 1, 1993, MI930540 U**

**Int. Cl.[6] H01R** *13/40*

**U.S. Cl. 439—598** **10 Claims**



1. An electrical connector comprising:

a connector housing; a connector insert removably mounted on the housing by relative rotational movement therebetween; a projection formed on one of the housing and the insert; a seat formed on the other of the housing and insert; a resilient detent member located in the seat; the projection having an inwardly facing surface shaped to engage a complementary surface of the resilient detent member so as to prevent relative rotation between the connector housing and the insert when the detent and projection are interengaged; and an actuator portion which is externally accessible for disengaging the resilient detent member from the projection.

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**5,743,764**

**MULTIWAY CONNECTOR**

**Franz Czeschka, Rechberghausen; Jürgen Lapphöhn, Heiningen, and Wolgang Hornig, Eckental, all of Germany, assignors to Erni Elektroapparate GmbH, Adelberg, and Diehl GmbH & Co., Nuenberg, both of Germany**

**Filed Dec. 22, 1995, Ser. No. 577,274**

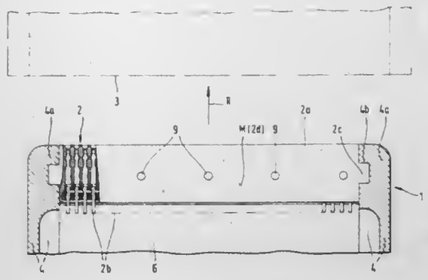
**Claims priority, application Germany, Dec. 24, 1994, 44 46 747.8**

**Int. Cl.[6] H01R** *13/648*

**U.S. Cl. 439—607** **8 Claims**

1. A multiway connector of a non-metal material for a tight connection to metal components having a housing, the connector comprising a row of metal passages, each passage having a sleeve on one side of the connector and a contact pin on another side of the connector, wherein the multiway connector is metallized with a metal coating at surfaces which come into contact with the metal components of the housing, and wherein the side of the connector





having the contact pins is covered with a sealing compound, wherein the surfaces with the metal coating have cams and the metal components of the housing have recesses, wherein the cams engage in the recesses for absorbing expansion forces.

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**5,743,765**

**SELECTIVELY METALLIZED CONNECTOR WITH AT LEAST ONE COAXIAL OR TWIN-AXIAL TERMINAL**

**Derek Andrews, Vinkel, and Bernardus Paagman, Schijndel, both of Netherlands, assignors to Berg Technology, Inc., Reno, Nev.**

**Filed Jul. 17, 1995, Ser. No. 503,124**

**Int. Cl.[6] H01R** *13/648*

**U.S. Cl. 439—608** **16 Claims**



1. A connector provided with at least two adjacent cavities to accommodate terminals, the connector having a length and a metallized plastic structure in order to at least partly shield at least one cavity from the other cavities characterized in that said connector is selectively metallized over its entire length and comprises at least partly the following housing structure between each shielded cavity and its adjacent cavities: a first insulating plastic wall, at least one metal layer, a second insulating plastic wall, said at least one metal layer being provided as a coating on one of said plastic walls.

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**5,743,766**

**SIM CAR CONNECTOR**

**Akira Kaneshige, Musashino, and Hiroyuki Fujii, Yokohama, both of Japan, assignors to Molex Incorporated, Lisle, Ill.**

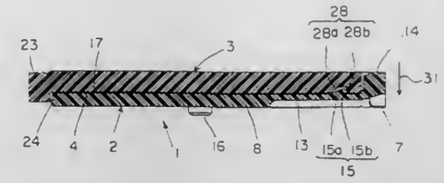
**Filed Mar. 28, 1996, Ser. No. 623,204**

**Claims priority, application Japan, May 18, 1995, 7-144098**

**Int. Cl.[6] G06K** *7/00*

**U.S. Cl. 439—630** **6 Claims**

1. A two-piece card-receiving connector for electrically connecting the circuitry of a card to the circuitry of a printed circuit board comprising:



a housing for mounting on the circuit board and having terminals mounted therein, the terminals adapted to make electrical contact with contacts on the card, and

a card holder having a card-receiving recess formed on a lower surface thereof for holding the card within the card holder,

wherein said card holder is adapted to be slidably mounted in said housing by way of side edges of the card holder which slide within channels formed along both sides of the housing, and

wherein said housing includes a manually releasable cantilever lock lever formed on an upper surface of one end thereof having a latch projection integrally formed therewith adapted to engage a corresponding recess in the card holder to prevent the card holder from sliding out of the housing and to removably lock the card holder within the housing to ensure a reliable connection between the card contacts and the terminals of the housing.

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**5,743,767**

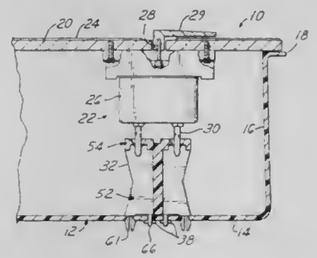
**INSTRUMENT CLUSTER GAUGE CONNECTOR**

**Bernard Thomas Londeck, Waterford; Donald Frederick Wildfong, Flint, both of Mich., and Nickey Doyle Keen, Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.**

**Filed Aug. 24, 1994, Ser. No. 295,123**

**Int. Cl.[6] H01R** *13/10*

**U.S. Cl. 439—682** **12 Claims**



1. In an instrument cluster having a printed circuit board and a gauge having terminals spaced from the circuit board, a connector joining the gauge to the circuit board comprising:

a molded body for spanning between the gauge and the circuit board, the body having a base at one end thereof seating on the circuit board and a crown at the other end thereof facing the gauge, wherein the crown has a generally square shape;

a plurality of apertures in the crown for receiving the gauge terminals;

the base comprising a plurality of webs forming a cross shaped section;

the crown overlies the base and includes regions, wherein each of said regions is in between the webs, the apertures in the crown being in the regions; and

electrical contacts positioned in said body with each of said contacts in each of said apertures for electrically contacting with one of said gauge terminals, said each of said electrical

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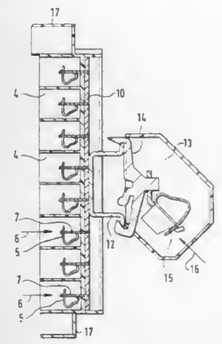
contacts having an elongated leg extending beyond the base for connection to the circuit board.

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**5,743,768**
**SHUNTING LATTICE FOR ELECTRICAL DISTRIBUTORS**

**Wolfgang Hohorst, Minden, and Lothar Roland Hennemann, Enger, both of Germany, assignors to WAGO Verwaltungsgesellschaft mbH, Minden, Germany**

**Filed Mar. 26, 1996, Ser. No. 622,682**
**Claims priority, application Germany, Mar. 29, 1995, 195 13 037.5**
**Int. Cl.[6] H01R** *11/09*
**U.S. Cl. 439—723** **2 Claims**



1. Shunting lattice having conductor supply terminals on an installation side and on a field side thereof for incoming and outgoing electrical conductors, and several pole chambers being arranged adjacent to one another at least in a partial region of the shunting lattice conduct the same potential, said shunting lattice comprising:

pole chambers (**4**) of the same potential on the installation side of the shunting lattice having an essentially two-dimensional surface structure (**10**) in the form of a metal plate, and an expanded metal grid, said surface structure being common to all pole chambers of the same potential and being electrically connected with conductor supply terminals (**5**, **7**) present on the field side per pole chamber; and

a mounting rail (**12**) attached mechanically and electrically on the back of said surface structure (**10**), said mounting rail being turned away from the field side of the shunting lattice in such a way that at least one conductor supply terminal (**13**) on the mounting rail can be in electrical connection with said mounting rail with a conducting connection (**14**) to be locked to the mounting rail,

wherein the conductor supply terminals on the field side of pole chambers (**4**) have current rails (**7**), whose foot parts are joined mechanically and electrically into surface structure (**10**) on the installation side of the pole chambers.

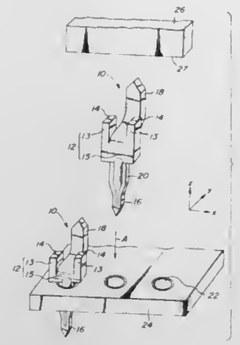
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**5,743,769**
**PRESS-IN CONTACT AND A METHOD FOR MANUFACTURING THE SAME**

**Yasuyuki Koguchi, Tokyo, Japan, assignor to DDK Ltd., Japan**

**Filed Jun. 10, 1996, Ser. No. 664,999**
**Claims priority, application Japan, Aug. 8, 1995, 7-222482**
**Int. Cl.[6] H01R** *13/42*
**U.S. Cl. 439—751** **3 Claims**

1. A press-in contact comprising, a connection portion to be connected to a mating connector, a press-fitting portion to be fixed in a cylindrical through-hole of a printed circuit board by a press-fitting operation, and a contact portion for introducing the



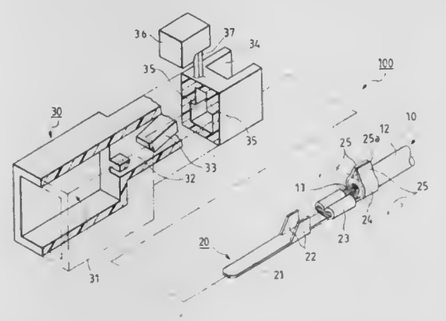
press-in contact into the through-hole of said printed circuit board, said press-in contact including a positioning portion with two plate-shaped pieces each having a surface to be urged by a jig for said press-fitting operation and a connection part for connecting said plate-shaped pieces to said connection portion, said connection portion being formed in a substantially J-shape, the center axes of said connection portion and said positioning portion being shifted from each other to prevent the connection portion from contacting the jig during said press-fitting operation.

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**5,743,770**
**CONNECTOR**

**Tsuyoshi Hamai, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan**

**Filed Aug. 15, 1996, Ser. No. 698,453**
**Claims priority, application Japan, Sep. 13, 1995, 7-235473**
**Int. Cl.[6] H01R** *13/514*
**U.S. Cl. 439—752.5** **6 Claims**



1. A connector, comprising:

a press-clamping terminal having a sheath clamping portion for clamping an insulative sheath of a wire, said sheath clamping portion having a retaining projection which upwardly projects;

a connector housing having a terminal receiving chamber for receiving said press-clamping terminal; and

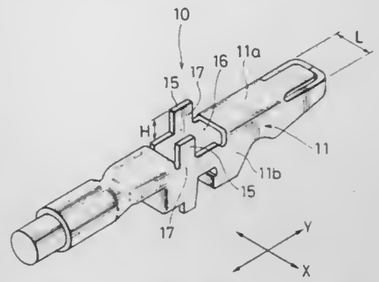
a pair of guide portions, for guiding said retaining projection, formed on an inner surface of said terminal receiving chamber, said guide portions extending inward from said housing and positioned so as to abut said retaining projection when said press-clamping terminal is inserted into said terminal receiving chamber, said guide portions limiting said retaining projection to move in a terminal-inserting direction.



**5,743,771**
**TERMINAL FOR ELECTRICAL CONNECTOR**

**Noboru Yamaguchi, and Masaya Yamamoto, both of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan**

**Filed Sep. 27, 1996, Ser. No. 720,068**
**Claims priority, application Japan, Sep. 29, 1995, 7-253426**
**Int. Cl.[6] H01R** *13/42*
**U.S. Cl. 439—752.5** **5 Claims**



1. A terminal for an electrical connector comprising:

a terminal body section provided by bending a metallic plate material in a generally semi-cylindrical shape;

an elastic contact piece formed so as to protrude from a front section of said terminal body section to the outside; and

two wrong-insertion prohibiting pieces formed so as to project from a bottom wall of said terminal body section in a direction opposite to said elastic contact piece, said two wrong-insertion prohibiting pieces being arranged on both edges of said bottom wall in a width direction of said terminal body section respectively, and shifted from each other in a longitudinal direction of said terminal body section;

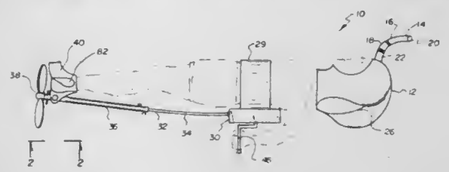
wherein said two wrong-insertion prohibiting pieces are provided by slitting said bottom wall of said terminal body section partially and raising the two resultant slitted portions of said bottom wall in a direction perpendicular to said bottom wall.

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**5,743,772**
**MANUALLY DRIVEN WATER PROPULSION DEVICE**

**Wagdy A. Assawah, and Nader W. Assawah, both of 17 Penn Valley Rd. Apt. D-4, Levittown, Pa. 19054**

**Filed May 12, 1997, Ser. No. 854,319**
**Int. Cl.[6] B63H** *16/20*
**U.S. Cl. 440—28** **9 Claims**



1. A new and improved manually driven water propulsion device comprising, in combination:

a helmet formed in an elongated semi-circular configuration with a closed top, an open bottom, a front portion and a rear portion, the front portion having an upper region including a light formed in an elongated cylindrical configuration with a hollow interior, the light including a light bulb and one battery at a base thereof, the front portion having a lower region including a large, generally oval shaped face aperture therethrough, the rear portion including a head float attached thereto, the head float having a generally hollow interior and including a plug;

a propulsion assembly comprising an attachment strap, a gearbox, a telescopic shaft with an upper portion and a lower portion, a propeller, securing booties, and bootie attachment member, the attachment strap being formed in an elongated rectangular shape and being configured as a loop, in an operative orientation the attachment strap being coupled around a user's waist, the gearbox being formed in a generally rectangular configuration with an upper surface, a lower surface, a top, a bottom and a generally hollow interior, the attachment strap being coupled to the upper surface of the gear box, a hand crank including a handle extending from the lower surface of the gearbox; and

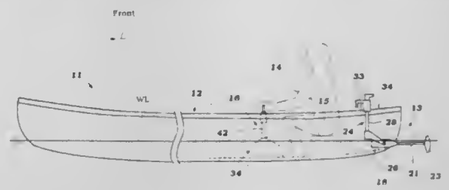
a bevel gear assembly being positioned within the gearbox, the bevel gear assembly including a large gear operatively coupled to the hand crank and a small gear operatively coupled to the upper portion of the telescopic shaft, the bevel gears being positioned perpendicular with respect to each other, the upper portion of the telescopic shaft being slidably coupled within the lower portion of the telescopic shaft, the lower portion including adjustment means comprising a set screw adapted to fixedly engage the upper position of the telescopic shaft with the lower portion thereof, the propeller being formed as a generally circular central section with three elongated blades projecting therefrom, the propeller being coupled to the lower portion of the telescopic shaft, the bootie attachment member having a first hollow cylindrical member rotatably coupled to the lower portion of the telescopic shaft and a pair of second cylindrical members integrally coupled perpendicularly to the first cylindrical member for releasably inserting within a pair of third hollow members coupled to a heel portion of each of the securing booties, each securing bootie having a foot float attached thereto, in an operative orientation a user positioning the helmet around his head, positioning the attachment strap around his waist, positioning the securing booties over his feet, coupling the booties to the bootie attachment member and the user then floating on his back and turning the handle, this action causing rotation of the bevel gears thereby rotating the telescopic shaft and propeller.

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**5,743,773**
**PROPULSION SYSTEM FOR WATERCRAFT**

**Chitose Saito, and Yasunari Okamoto, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Jan. 29, 1997, Ser. No. 790,703**
**Claims priority, application Japan, Jan. 29, 1996, 8-035378**
**Int. Cl.[6] B63H** *5/125*
**U.S. Cl. 440—53** **19 Claims**



1. An outboard motor comprising a propulsion system consisting of a prime mover and propeller shaft driven by said prime mover and contained within a common housing and driving a propulsion device supported by said common housing, and means for mounting said common housing from a watercraft hull with said common housing being mounted at least in substantial part submerged in a body of water and for providing about a generally vertically-extending axis for steering of the associated watercraft and for pivotal movement about a generally horizontally-extending axis for adjusting the trim of said propulsion device.

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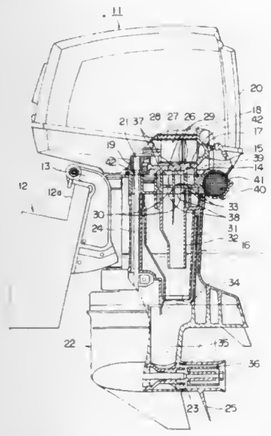


5,743,774

## EXHAUST STRUCTURE OF OUTBOARD MOTOR

Shigeo Adachi, Hamamatsu, and Masaaki Yoshimura, Shizuoka-ken, both of Japan, assignors to Suzuki Kabushiki Kaisha, Japan

Filed Aug. 1, 1996, Ser. No. 690,991
Claims priority, application Japan, Aug. 8, 1995, 7-202557
Int. Cl.[6] B63H *20/24*
U.S. Cl. 440—89 5 Claims



1. An exhaust structure of an outboard motor having an engine holder, an engine mounted to an upper portion of the engine holder, a drive shaft housing mounted to a lower portion of the engine holder and an exhaust structure connecting an exhaust inlet opening formed to an upper surface of the engine holder to an exhaust outlet opening formed to a lower surface of the engine holder, in an installed state, said exhaust structure comprising an exhaust port passage extending downward from the engine and communicated with the exhaust inlet opening, an exhaust tube extending downward into the drive shaft housing and an exhaust passage formed between said exhaust inlet and outlet openings, said exhaust passage extending horizontally in the engine holder and being provided with a catalyst means which is arranged horizontally on the way of the exhaust passage, wherein exhaust passage covers for covering the exhaust passage are detachably mounted to both side portions of the engine holder.

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5,743,775

## LAMINATE FOR RESTRAINING ORGANIC VAPORS, AEROSOLS, AND BIOLOGICAL AGENTS

Ulrich Baurmeister, Wuppertal, Germany, assignor to Akzo Nobel NV, Arnhem, Netherlands

Filed Aug. 29, 1995, Ser. No. 521,341
Claims priority, application Germany, May 22, 1995, 195 18 683.4
Int. Cl.[6] B32B *7/00*
U.S. Cl. 442—77 27 Claims

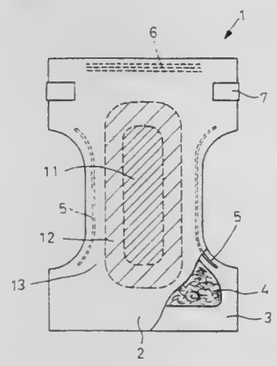
1. A laminate for restraining organic vapors, aerosols and biological agents which is permeable to water vapor comprising at least three layers, wherein at least one layer is a barrier layer comprising cellulose-based polymers over the entire surface thereof which is permeable to water vapor and which restrains organic vapors, aerosols, and biological agents and wherein at least two layers are separation layers which substantially prevent the penetration of water in liquid form, but which are water-vapor permeable, at least one of said separation layers being on each side of said barrier layer.

5,743,776

## TOPSHEET FOR USE IN BODY FLUIDS ABSORPTIVE GOODS

Takamitsu Igauc; Hisashi Takai, and Tsutomu Kido, all of Kawanoe, Japan, assignors to Uni-Charm Corporation, Ehime-ken, Japan

Continuation of Ser. No. 469,738, Jun. 6, 1995, abandoned, which is a continuation of Ser. No. 191,546, Feb. 4, 1994, abandoned. This application Aug. 5, 1996, Ser. No. 692,404
Claims priority, application Japan, Feb. 12, 1993, 5-024288
Int. Cl.[6] A61F *13/15;* D04H *1/54;1/56*
U.S. Cl. 442—414 17 Claims



1. A topsheet for use in a body fluids absorptive good including a crotch area, said topsheet consisting essentially of a nonwoven made of thermoplastic synthetic fibers appropriately fused together and defining a first zone of relatively high water-resistance and appreciable dimensional extent located at and extending over said crotch area and a second zone of relatively low water-resistance surrounding said first zone, the fabric including openings adapted to guide body fluids from a top surface of the topsheet to an absorbent core underlying a bottom surface of the topsheet.

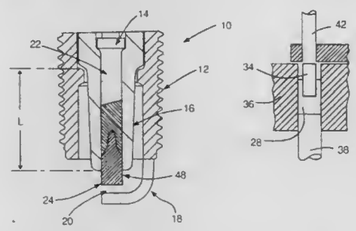
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5,743,777

## METHOD OF MANUFACTURING NICKEL CORE COPPER CENTER ELECTRODES

Andre Demeuter, West Kirby, England, assignor to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 654,008, May 29, 1996, abandoned, which is a continuation of Ser. No. 283,872, Aug. 1, 1994, abandoned. This application May 5, 1997, Ser. No. 851,492
Claims priority, application European Pat. Off., Aug. 2, 1993, 93306092
Int. Cl.[6] H01T *21/02;13/39*
U.S. Cl. 445—7 13 Claims



1. A method of producing an electrode for a spark plug, the method comprising the steps of:

providing a tubular cup having an opening and being formed of a first material having high thermal conductivity;



positioning a billet of a second material having higher corrosion resistance than the first material in the opening of the tubular cup, with the billet being positioned so that an end of the billet extends beyond all portions of the tubular cup; and

extruding the cup and billet to form an electrode.

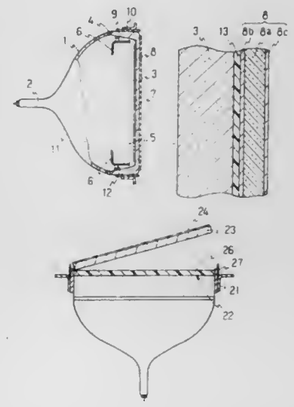
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5,743,778

## IMAGE DISPLAY APPARATUS WITH FLAT SCREEN

Nozomu Arimoto, Osaka; Takami Okamoto; Mutsuo Masuda, both of Kyoto; Hideaki Maki, Osaka; Atsushi Suzuki; Tsutomu Utsumi, both of Kyoto; Tetsu Ebihara, and Junichi Taira, both of Osaka, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Apr. 23, 1996, Ser. No. 636,708
Claims priority, application Japan, Apr. 24, 1995, 7-098309; Sep. 14, 1995, 7-237487; Dec. 27, 1995, 7-340137
Int. Cl.[6] H01J *9/24*
U.S. Cl. 445—8 11 Claims



1. A method of manufacturing an image display apparatus having a mutilayer screen comprising a flat panel, an adhesive resin layer and a front panel, the method comprising;

applying adhesive resin to a surface of the flat panel;

placing the front panel on the adhesive resin layer on the surface of the flat panel without a spacer between the flat panel and the front panel;

pressing the front panel toward the flat panel; and

hardening the adhesive resin layer.

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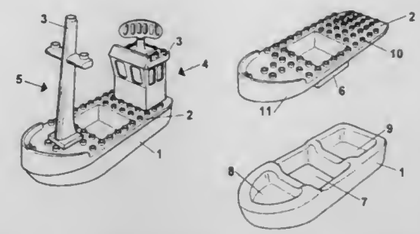
5,743,779

## TOY SHIP

Per Steen Nielsen, Hvidovre, Denmark, assignor to INTER-LEGO AG, Baar, Switzerland

Filed Sep. 17, 1996, Ser. No. 714,859
Int. Cl.[6] A63H *33/08;23/02*
U.S. Cl. 446—93 5 Claims

1. A toy ship comprising a hull part (1) which is blow moulded as a closed unit, and an upper part (2) having an outer peripheral edge, said upper part being injection moulded, said hull part (1) and upper part (2) being assembled at least one joint to form the toy ship, wherein at least one area of the upper part (2) is provided with a plurality of coupling means for coupling with other toy building elements (3), said at least one area being located between a part of the outer, peripheral edge of the upper part (2) and the at least one joint between the hull part (1) and the upper part (2), such



that the outer, peripheral edge of the upper part (2) is cantilevered at least in the area provided with coupling means.

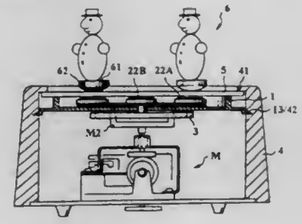
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5,743,780

## STRUCTURE FOR DRIVING TOYS BY MAGNETIC FORCES

Jack Liu, No. 3, Alley 202, Kao-Fon Rd., Hsin-Chu City, Taiwan

Filed Jan. 6, 1997, Ser. No. 779,222
Int. Cl.[6] A63H *33/26;* G09F *19/00*
U.S. Cl. 446—136 7 Claims



1. A structure for driving a toy by magnetic force comprising

a rotary disk having an upper surface and a lower surface,

a plurality of positioning bases on the upper surface of said rotary disk and spaced from each other, one of said positioning bases being positioned in the center of said upper surface of said rotary disk,

each of said positioning bases supporting a separate, inner magnet,

the polarity of the inner magnet on the positioning base located in the center of said rotary disk being opposite to the polarity of the magnets in the other positioning bases,

a center axle extending downwardly from the center of said lower surface of said rotary disk,

a fixing disk having a wall extending upwardly about its periphery, said fixing disk having an axle hole extending through the center thereof for receiving said center axle,

said fixing disk having a plurality of elastic pieces connected thereto and extending from an edge of said fixing disk,

a driven wheel disposed below said fixing disk and having a plurality of spaced apertures therethrough,

said driven wheel having an engaging base extending upwardly from the center of an upper surface of said driven wheel,

said engaging base extending through said axle hole in said fixing disk and drivingly engaging said center axle of said rotary disk,

a driven claw having a plurality of nose portions,

each of said nose portions engaging one aperture of said plurality of apertures in said driven wheel, and

a rotary axle on said driven claw,

a cylindrical substrate having a flange extending inwardly about the upper edge of said substrate and an annular groove on the inner surface of said substrate and spaced from said flange,

said elastic pieces of said fixing disk engaging said annular groove and supporting said fixing disk within said cylindrical substrate.

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a mirror supported by said wall of said fixing disk and disposed beneath said flange,

a plurality of outer magnets corresponding to said inner magnets on said rotary disk except for the inner magnet on the center of the rotary disk,

each of said plurality of outer magnets disposed within a cover having a curved outer surface for contacting an upper surface of said mirror above an inner magnet,

the polarity of said outer magnets being the opposite of the polarity of said inner magnets,

a toy positioned on each of said outer magnets, whereby movement of said inner magnets of said rotary disk results in corresponding movement of the toys on the outer magnets, and

means for imparting a rotary movement to said rotary axle of said driven claw to cause rotation of said driven wheel and said rotary disk.

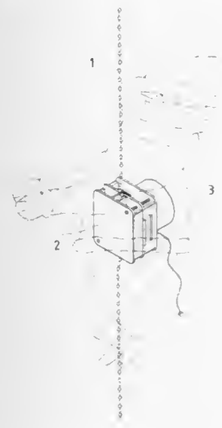
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**5,743,781**

**ORNAMENTAL TOY CAPABLE OF RUNNING UP AND DOWN**

**Sam Lee, Taipei, Taiwan, assignor to Studio Eluceo Ltd., Taipei, Taiwan**

**Filed Sep. 30, 1996, Ser. No. 723,362**
**Int. Cl.[6] A63H** *11/04*
**U.S. Cl. 446—315** **8 Claims**



**1**. An ornamental toy capable of running up and down, comprising:

a long string comprising a plurality of similarly shaped bead units serially connected together; and

a driving mechanism comprising at least an electric motor which rotates a first or driving wheel of a clamp wheel set, said first or driving wheel being provided along a circumferential surface with a plurality of serially arranged recesses for each fitly receiving and engaging with one said bead unit of said long string, said first or driving wheel together with a second or idle wheel of said clamp wheel set tightly clamping each one said bead unit of said long string passing between said first and said second wheels and thereby brings said whole driving mechanism to shift up along said bead units one by one; said second or idle wheel being co-axially connected to a disengaging mechanism, said disengaging mechanism being actuated to work by a reduction gear set and shifting said second or idle wheel outward by a certain distance when said reduction gear set has rotated for a certain period of time, so that said long string is no longer clamped between said first and said second wheel; and

an ornamental toy wrapping up said driving mechanism;

whereby when said disengaging mechanism is not actuated to work, said first and said second wheels of said clamp wheel set together tightly clamp between them said bead units of said long string passing through said clamp wheel set and bring said ornamental toy to shift upward along said long string; and when said disengaging mechanism is actuated to work, said clamp wheel set no longer tightly clamp said bead units, causing said ornamental toy to slide downward along said long string.

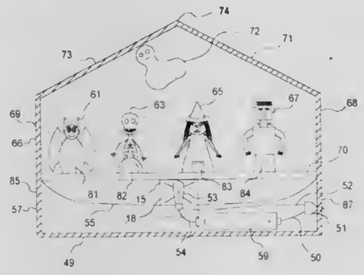
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**5,743,782**

**ILLUMINABLE TOYS HAVING REPLACABLE ILLUMINABLE EDIBLES**

**Kenneth P. Glynn, Raritan Township, Hunterdon County, and James R. Blair, II, Phillipsburg, both of N.J., assignors to Ideal Ideas, Inc., Flemington, N.J.**

**Continuation-in-part of Ser. No. 410,055, Mar. 24, 1995. This application Feb. 5, 1996, Ser. No. 596,987**
**Int. Cl.[6] A63H** *3/50*
**U.S. Cl. 446—485** **20 Claims**



**1**. An illuminable toy comprising:

(a) at least one light source;

(b) at least one battery, said battery being electrically connected to said at least one light source;

(c) a switch, said switch being electrically connected to said at least one light source and said at least one battery, said switch providing an on/off adjustment for energizing and de-energizing said at least one light source with said at least one battery;

(d) a base, said base containing said at least one light source and said at least one battery and said switch, said base having at least one light permeated portion for allowing passage of light emitted from said at least one light source, said switch being adjustable from exterior side of said base;

(e) a plurality of sets of holders, each set of holders having the same size and shape, each holder being attached to said base;

(f) a plurality of sets of replaceable, illuminable edibles, each set of replaceable illuminable edibles having a same sized and shaped protrusion and being illuminated by light emitted from said at least one light source, said protrusion being attached to a corresponding one of said holders;

(g) connecting means for connecting a cover to said base, and

(h) a cover for covering said plurality of replaceable, illuminable edibles and having a three dimensional configuration, wherein a scene is simulated when said cover is connected to said base and said illuminable edibles are placed in said holders.

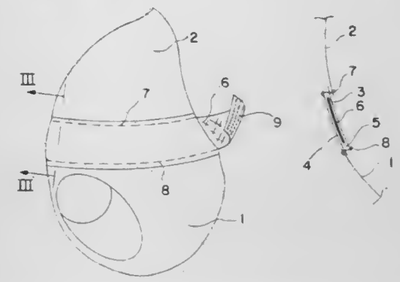


**5,743,783**

**PANTY GIRDLE**

**Georg Weber-Unger, Kufstein, Austria, assignor to Anita International Helbig GmbH & Co. KG, Brannenburg, Germany**

**Filed Oct. 16, 1996, Ser. No. 732,145**
**Claims priority, application Germany, Oct. 19, 1995, 195 40 242.1**
**Int. Cl.[6] A41C** *1/08*
**U.S. Cl. 450—155** **5 Claims**



**1**. A panty girdle for mothers-to-be, having a panty part, having a longitudinally elastic supporting strap which encircles the body and is intended for the lower abdomen, and having an abdominal part which serves to provide additional support for the upper abdomen and has longitudinal and transverse elasticity which is increased with respect to the elasticity of the supporting strap, wherein at least that section of the supporting strap (**6**) which comes to rest against the lower abdomen is arranged in a tunnel (**5**) which is formed from two fabric layers (**3**, **4**) made of elastic material, wherein a upper border of the tunnel (**5**) is connected to the abdominal part (**2**) via a first seam (**7**), and wherein a lower border of the tunnel (**5**) is connected to the panty part (**1**) via a second seam (**8**).

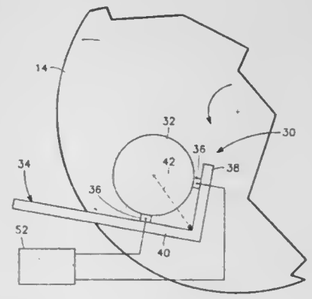
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**5,743,784**

**APPARATUS AND METHOD TO DETERMINE THE COEFFICIENT OF FRICTION OF A CHEMICAL MECHANICAL POLISHING PAD DURING A PAD CONDITIONING PROCESS AND TO USE IT TO CONTROL THE PROCESS**

**Manoocher Birang, Los Gatos, and John Prince, Los Altos, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.**

**Filed Dec. 19, 1995, Ser. No. 574,501**
**Int. Cl.[6] B24B** *7/22;53/02*
**U.S. Cl. 451—21** **31 Claims**



**1**. An apparatus for controlling a chemical mechanical polishing (CMP) pad conditioning device, comprising:

(a) a disk-shaped body having a bottom surface in contact with a top surface of a rotating CMP pad undergoing a CMP pad conditioning process;

(b) a bracket for restraining the disk-shaped body so as to prevent the disk-shaped body from moving along with the rotating CMP pad;

(c) force sensing means for sensing a restraining force which is exerted by the bracket on the disk-shaped body and which is substantially parallel to the top surface of the CMP pad, the force sensing means generating an output signal indicative of the restraining force; and

(d) means for causing the CMP pad conditioning device to terminate the CMP pad conditioning process whenever the output signal from the force sensing means indicates a prescribed threshold has been exceeded.

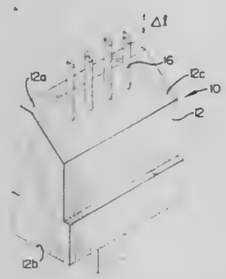
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**5,743,785**

**POLISHING METHOD AND APPARATUS FOR PREFERENTIALLY ETCHING A FERRULE ASSEMBLY AND FERRULE ASSEMBLY PRODUCED THEREBY**

**Jeffrey C. Lundberg, Lenoir; Donald Lee Knasel, and Toshiaki Satake, both of Hickory, all of N.C., assignors to US Conec Ltd., Hickory, N.C.**

**Filed Apr. 4, 1996, Ser. No. 628,218**
**Int. Cl.[6] B24B** *1/00*
**U.S. Cl. 451—28** **23 Claims**



**1**. A method of polishing a ferrule assembly comprising the steps of:

providing a ferrule assembly comprising a ferrule having a front face and an opposed rear face and defining at least one opening extending between the opposed front and rear faces, the ferrule assembly further comprising at least one optical fiber extending through a respective opening such that end portion of each optical fiber is exposed through the front face of the ferrule;

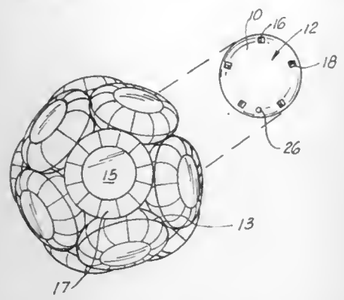
polishing the front face of the ferrule with a first slurry having a plurality of suspended particulates of a first predetermined size on average to initiate a preferential etch of the ferrule relative to each optical fiber; and

thereafter polishing the front face of the ferrule with a second slurry having a plurality of suspended particulates of a second predetermined size on average, wherein the second predetermined size is less than the first predetermined size such that said step of polishing the front face of the ferrule with the second slurry completes the preferential etch of the ferrule relative to each optical fiber such that the end portion of each optical fiber protrudes beyond the preferentially etched front face of the ferrule by a preselected length.

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**5,743,786**
**BALLOON FACE POLYHEDRA**
**Alan Lindsey, 213 Richland Dr. East, Mandeville, La. 70448**
**Filed May 30, 1996, Ser. No. 657,650**
**Int. Cl.[6] A63H** *33/06*
**U.S. Cl. 446—85** **33 Claims**

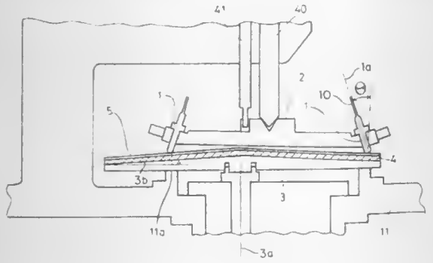



1. A system for forming a multi-unit structure approximating a least a portion of a polyhedron, said polyhedron comprising first and second, adjacent faces, said system further comprising:
a first unit having a three dimensional structure formed from a flexible envelope substantially impermeable to, and filled with, a supporting fill material, said envelope having an outer surface and a peripheral edge, said peripheral edge defining a first plane;
a second unit having a three dimensional structure formed from a flexible envelope substantially impermeable to, and filled with, a supporting fill material, said envelope having an outer surface and a peripheral edge, said peripheral edge defining a second plane;
said first and second planes being situated in generally tangential fashion with said first and second adjacent faces of said polyhedron, respectively, such that a portion of said outer surface of said first unit is positioned adjacent to said outer surface of said second unit, defining a connection area between said outer surfaces of said first and second units;
contact fastening means for selectively anchoring said first unit outer surface to said second unit outer surface at said connection area, said contact fastening means situated in the vicinity of said connection area.

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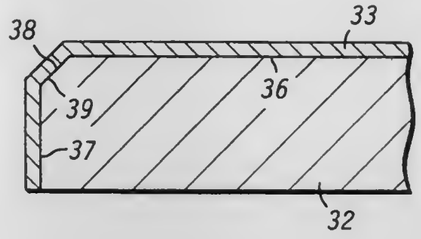
**5,743,787**
**METHOD FOR POLISHING OPTICAL FIBER END SURFACE**
**Keiichi Ishiyama; Kohji Minami; Hiroyuki Tokita; Toyokazu Iwakiri, and Nobuo Suzuki, all of Chiba, Japan, assignors to Seiko Instruments Inc., Japan**
**Filed Oct. 12, 1995, Ser. No. 541,208**
**Claims priority, application Japan, Oct. 13, 1994, 6-248103**
**Int. Cl.[6] B24B** *1/00*
**U.S. Cl. 451—41** **6 Claims**

1. A method of polishing an optical fiber end surface, comprising the steps of: preparing a ferrule having an axis about which an optical fiber is held; tilting the axis of the ferrule at a given angle Θ to a line normal to a flat surface of a rotary grinding wheel machine; moving an end surface of the ferrule to a position adjacent to the flat surface of the rotary grinding wheel machine; rotating the flat surface of the rotary grinding wheel machine; moving the end surface of the ferrule into contact with the rotating flat surface of the rotary grinding wheel machine to polish the end surface of the ferrule and an end surface of the optical fiber; moving the end surface of the ferrule out of contact with the flat surface of the rotary grinding wheel machine after the end surface of the ferrule and the end surface of the optical fiber have been polished into a flat plane; providing a polishing machine having a platen mounted for rotation about an axis, a resilient body disposed on a surface of the platen, and a polishing member disposed on the resilient body; tilting the axis of the ferrule at an angle θ to the axis of rotation of the platen, the angle θ being larger than the given angle Θ by a minute angle Δ; rotating the platen; moving the end surfaces of the ferrule and the optical fiber polished into a flat plane into contact with the polishing member; and moving the end surfaces of the ferrule and the optical fiber out of contact with the polishing member after the end surfaces have been polished into an oblique convex spherical surface so that an oblique angle defined between a plane normal to the axis of the ferrule and a tangent plane at the intersection of the axis of the ferrule and the convex spherical surface is equal to the given angle Θ.




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**5,743,788**
**PLATEN COATING STRUCTURE FOR CHEMICAL MECHANICAL POLISHING AND METHOD**
**James F. Vanell, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**
**Filed Dec. 2, 1996, Ser. No. 755,870**
**Int. Cl.[6] B24C** *7/22*
**U.S. Cl. 451—41** **29 Claims**



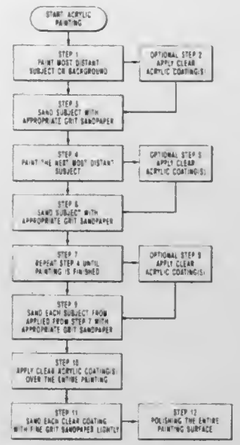

18. A method for removing material from a work piece comprising the steps of:
providing a work piece comprising a first material;
placing the work piece onto a polishing apparatus having a support member, wherein the support member includes a major surface for supporting the work piece during polishing, and wherein the support member includes a deposited refractory metal oxide layer formed over the major surface; and
removing at least a portion of the first material from the work piece.

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**5,743,789**
**PROCESS FOR FINISHING A PAINTING**
**Rosemarie M. Russell, 3986 Mt. Olympus Way, Salt Lake City, Utah 84124**
**Filed Feb. 26, 1996, Ser. No. 606,691**
**Int. Cl.[6] B24B** *1/00*
**U.S. Cl. 451—57** **6 Claims**

1. A process for finishing a painting consisting of the steps of, to a painted surface of an artist's depiction, during the creation

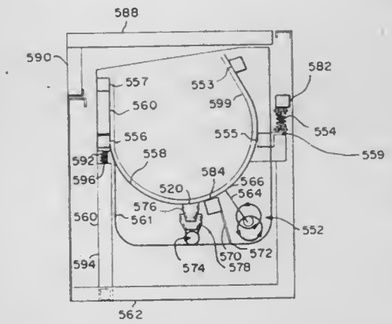





thereof, selecting at least one section of the painting for enhancement; sanding said section to smooth said section surface and reapplying paint to said at least one section; after the paint applied to the entire painting has dried, applying at least one coating of an acrylic material to the entire painting surface; after sanding the acrylic coated surface to smooth it; applying a wax or polishing compound the acrylic material has dried to said acrylic surface; and buffing said entire painted surface to a finish.

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**5,743,790**
**VIBRATING ABRASIVE CLEANING APPARATUS AND METHOD**
**Joe O. Trahan, Lafayette, La., assignor to Drilltech Technologies, Inc., Houston, Tex.**
**Continuation of Ser. No. 16,724, Feb. 11, 1993, Pat. No. 5,460,566. This application Jul. 25, 1995, Ser. No. 507,635**
**Int. Cl.[6] B24B** *31/00*
**U.S. Cl. 451—326** **5 Claims**




1. A method for clearring articles which comprises:
(a) placing articles, an abrasive media and cleaning fluid in a container angularly mounted on a frame by a plurality of opposing parallel compression and tension springs for oscillation of the container;
(b) engaging a primary power source for engaging a secondary hydraulic power source;
(c) pumping said cleaning fluid through a filter system;
(d) injecting said cleaning fluid into the container;
(e) oscillating said container; and
(f) recirculating said cleaning fluid through a series of filters back into the container through an injection means.

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**5,743,791**
**SANDING SYSTEM**
**Donald Robert Bosten; John Robert Kriaski, both of Jackson, and Randy Glen Cooper, Milan, all of Tenn., assignors to Porter Cable Corporation, Jackson, Tenn.**
**Continuation of Ser. No. 386,144, Feb. 9, 1995, abandoned. This application Feb. 4, 1997, Ser. No. 795,695**
**Int. Cl.[6] B24B** *23/00*
**U.S. Cl. 451—356** **13 Claims**




1. A sanding system, comprising:
(a) a sander body comprising a motor; and
(b) a system of interchangeable pads for holding sandpaper, the pads being arranged and configured to be selectively coupled to the motor for creating a sanding motion in order to alternatively and selectably sand into the corner of a carcass, sand louvers of a shutter blocked by other louvers on the shutter, and sand pre-configured profiles onto or sand such profiles previously configured on a workpiece, wherein the system of interchangeable pads comprises:
(i) a detail sanding pad having a substantially flat lower surface and a substantially pointed front portion bounded laterally by two substantially-linear corner-sanding edges having an included angle of less than 90 degrees;
(ii) a shutter pad having at least one extended substantially linear side edge which extends laterally a conspicuous distance beyond the maximum width of the sander; and
(iii) a system of profiled sanding pads, each profiled sanding pad having a distinct particular cross sectional profile corresponding to a profile to be formed onto or to be sanded on a workpiece, the cross sectional configuration of any profiled pad in the system extending substantially consistently along the length of the pad, each profiled pad in the system defining a sanding surface having a profile corresponding to the distinct particular cross section profile of the pad.

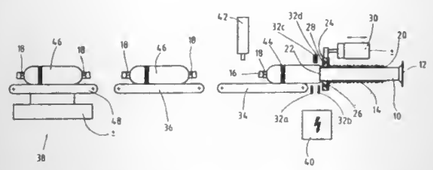
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**5,743,792**
**PROCESS OF PRODUCING SAUSAGES**
**Jürgen Hanten, Rockenberg, and Günter Vermehren, Usingen, both of Germany, assignors to Poly-Clip System GmbH & Co. KG, Frankfurt, Germany**
**Filed May 24, 1996, Ser. No. 653,530**
**Claims priority, application Germany, May 26, 1995, 195 19 394.6**
**Int. Cl.[6] A22C** *11/00*
**U.S. Cl. 452—37** **5 Claims**

1. A process of producing sausages, wherein a tubular sausage casing closed at one end and provided with a figurative print is filled with sausage meat by pressing the sausage meat through the open end of the sausage casing into the same, where the sausage casing is carried along against the resistance of a casing brake and, corresponding to markers on the sausage casing, filled partial

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lengths of the sausage casing are divided off by compressing and closing them and are subsequently cut off from the remaining sausage casing, characterized in that each filled partial length (sausage) is weighed after being cut off, and the weight difference between a predetermined desired weight and the actual weight of the partial length is determined, and that the braking force of the casing brake (**24**) is increased when the actual weight of the filled partial length is smaller than the desired weight thereof, but is decreased when the actual weight is larger than the desired weight, until the actual weight and the desired weight correspond with each other.

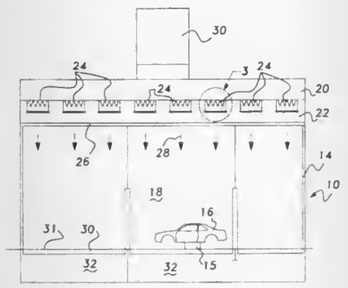
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**5,743,793**

## AIRFLOW DIFFUSER APPARATUS FOR USE WITH A PAINT BOOTH

**Steven James Parks, Northville, and Ernest Henry Tong, Canton, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.**

**Filed Jan. 23, 1997, Ser. No. 786,940**
**Int. Cl.[6] B05B** *15/12*
**U.S. Cl. 454—52** **8 Claims**



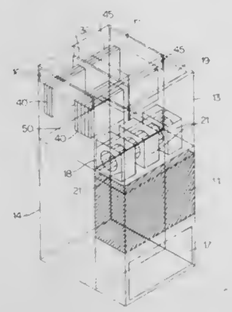
1. An airflow diffuser apparatus for use with a paint booth comprising:
   a plenum;
   an air supply, connected to and supplying air to said plenum;
   a filter unit attached to said plenum wherein the air exits said plenum through said filter unit; and
   a diffuser positioned adjacent said filter unit for diffusing airflow exiting the filter unit, said diffuser including a plate having dimensions similar to dimensions of said filter unit and suspended adjacent said filter unit by a plurality of supports extending from said plenum and attached to said plate, said plate cooperating with said filter unit in a one to one basis and positioned such that the airflow exiting said plenum through said filter unit strikes said plate and is redirected around said plate to provide a more uniform airflow.

**5,743,794**

## METHOD FOR FIELD UPGRADING OF AIR COOLING CAPACITY

**Gregory Martin Chrysler, and Richard Chao-Fan Chu, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 18, 1996, Ser. No. 769,082**
**Int. Cl.[6] H05K** *7/20*
**U.S. Cl. 454—184** **9 Claims**



1. A method for upgrading the cooling capacity of an electrical system, said method comprising the steps of:
   removing at least one internal air-moving device from a cabinet which possesses an internal air flow path which includes sequentially: an air inlet port, space between a first set of printed circuit cards disposed within said cabinet, said at least one air-moving device, space between a second set of printed circuit cards disposed within said cabinet and an exhaust port;
   providing an access port to said air flow path at a point along said air flow path downstream of said at least one air moving device and upstream of said second set of printed circuit cards;
   connecting to said access port an exterior enclosure having at least one air-moving device disposed therein, said enclosure having its own exterior air flow path terminating in an exterior exhaust port, said connection providing a new air flow communication path in which said inlet and exhaust ports both become operable as air inlet ports and in which said exterior exhaust port in said enclosure is capable of exhausting air driven by said air-moving device in said enclosure to said exterior exhaust port in said enclosure.

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**5,743,795**

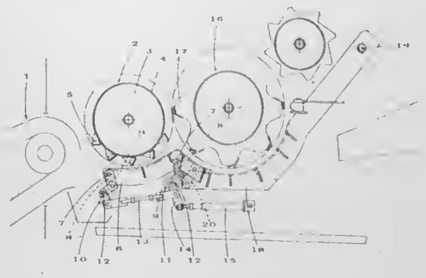
## SELF-PROPELLING HARVESTER THRESHER WITH ADJUSTABLE THRESHING BASKET

**Hermann Kersting, Oelde, Germany, assignor to CLAAS KGaA, Harsewinkel, Germany**

**Filed Jun. 3, 1996, Ser. No. 656,760**
**Claims priority, application Germany, Jun. 3, 1995, 195 20 463.8**
**Int. Cl.[6] A01F** *12/28*
**U.S. Cl. 460—62** **9 Claims**

1. A self-propelling harvester thresher, comprising threshing means including at least two threshing mechanisms located one after another in a traveling direction and operating in accordance with the principle of a tangential flow, each of said threshing mechanisms having a drum and a basket defining a gap therebetween, said gap between said drum and said basket of each of said threshing mechanisms being substantially constant along the entire length, said drums of said threshing mechanisms having different diameters; means for articulatingly connecting said baskets of said threshing mechanisms with one another; means for driving said drums of said threshing mechanisms in the same direction; said basket of said first threshing mechanism being adjustable along a substantially straight line, while said basket of said second thresh-





ing mechanism being supported rotatably about an axis located at an end which faces away from said basket of said first threshing mechanism; and a single actuating member connected with said threshing means and operative for simultaneously adjusting a gap between said basket and said drum of both said threshing mechanisms.

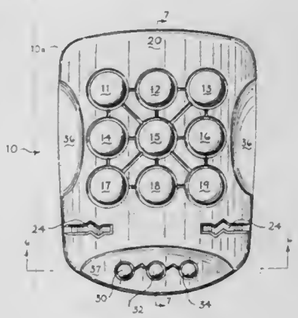
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**5,743,796**

## ELECTRONIC GAME

**Zeki Orak, San Francisco, and Dan Klitsner, Larkspur, both of Calif., assignors to Tiger Electronics, Inc., Vernon Hills, Ill.**

**Filed Jan. 16, 1996, Ser. No. 586,064**
**Int. Cl.[6] A63F** *9/24*
**U.S. Cl. 463—9** **12 Claims**



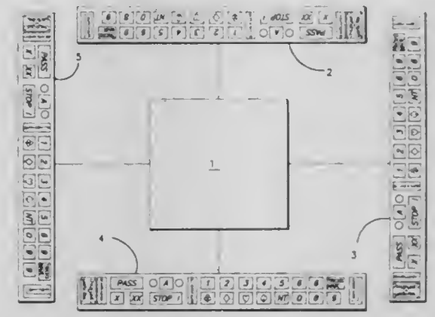
1. An electronic game comprising:
   a housing having an exterior;
   a plurality of spaces on said exterior of said housing;
   a plurality of indicators corresponding to said spaces, each of said indicators having an off state and a plurality of distinct player states;
   a plurality of input devices corresponding to said spaces for changing the state of the corresponding indicators; and
   an electronic controller disposed within said housing wherein said electronic controller is in electronic communication with each of said input devices and each of said indicators, and said controller is configured to change a state of an indicator from a particular player state to an off state when a number of indicators in said particular player state exceeds a predetermined number.

**5,743,797**

## DEVICE FOR CONTROLLING, PRESENTING AND REGISTERING THE BIDDING IN A GAME OF BRIDGE

**Per Jannersten, Banérgatan 15, S-752 37 Uppsala, Sweden**

**Filed May 24, 1996, Ser. No. 653,250**
**Int. Cl.[6] A63F** *1/00*
**U.S. Cl. 463—11** **5 Claims**



1. A device for registering and presenting bidding in a game of bridge, comprising:
   a computer unit which includes at least one bid-entering keyboard;
   means for comparing an entered bid with bids permitted by the rules of bridge;
   means for preventing presentation of impermissible bids;
   means for registering entered bids; and
   means for presenting or displaying the entered bid.

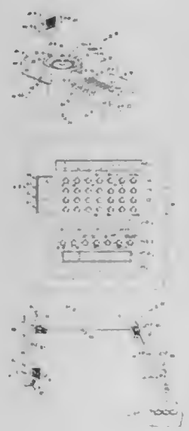
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**5,743,798**

## APPARATUS FOR PLAYING A ROULETTE GAME INCLUDING A PROGRESSIVE JACKPOT

**Terry Allen Adams, Coconut Creek; Yosef Har-Nov, Margat; Donald W. Jones, Parkland, all of Fla.; Peter R. De Raedt, Wijnegem, Belgium; Jeremy Francisco Stein, Wilton Manors, Fla.; Jonathan Charles West, San Diego, Calif., and Michael Wade Woodruff, Ft. Lauderdale, Fla., assignors to Progressive Games, Inc., Ft. Lauderdale, Fla.**

**Filed Sep. 30, 1996, Ser. No. 724,535**
**Int. Cl.[6] A63F** *5/02*
**U.S. Cl. 463—17** **8 Claims**



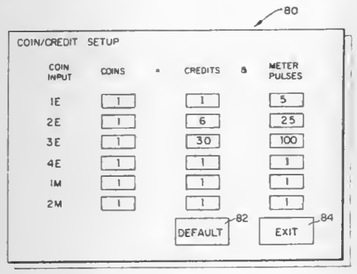
VOL 1209 ISS 4 AP 28 1998 UMI



2. A roulette game including a jackpot, comprising:
a roulette wheel;
a table including a plurality of player locations;
a betting layout on said table;
a plurality of coin acceptors at said player locations for placement of wagers by players to participate in said jackpot; and
a motorized conveyor operatively connected to said control system for collecting coins chips, or tokens placed into said coin acceptors.

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**5,743,799**
**METHOD FOR SETTING GAME CREDITS IN A GAMING MACHINE AND TALLYING A TOTAL CURRENCY AMOUNT FED INTO THE MACHINE**
**John W. Houriet, Jr., Yardley, Pa., and Kevin A. Hassan, Mountainside, N.J., assignors to Merit Industries, Inc., Bensalem, Pa.**
**Division of Ser. No. 516,809, Aug. 18, 1995, Pat. No. 5,575,717. This application Jun. 3, 1996, Ser. No. 658,289**
**Int. Cl.[6] A63F** *9/24*
**U.S. Cl. 463—25** **8 Claims**

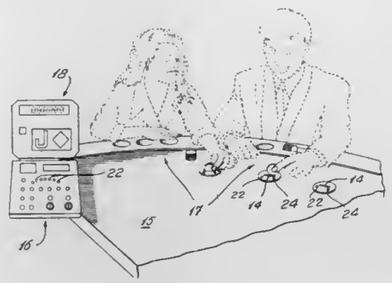



1. A method for tallying a total currency amount fed into a gaming machine which accepts a plurality of different types of coins, each coin type representing a different number of currency units, the method comprising the steps of:
(a) displaying a setup screen on a video display showing a representation of the plurality of different coin types and the total number of currency units associated with each coin type;
(b) selecting the total number of currency units to be associated with each coin type while displaying the setup screen, wherein the selection is made individually for each coin type, a coin type/currency unit ratio being established for each different type of coin; and
(c) tallying the total currency amount fed into the machine based upon the number of coins deposited in the gaming machine and the total number of currency units selected for each coin type.

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**5,743,800**
**AUXILIARY GAME WITH RANDOM PRIZE GENERATION**
**Marcel Huard, and Réal Bérubé , both of Québec, Canada, assignors to B.C.D. Mecanique Ltee., Quebec, Canada**
**Continuation-in-part of Ser. No. 323,672, Oct. 18, 1994, abandoned. This application Aug. 16, 1996, Ser. No. 698,972**
**Int. Cl.[6] A63F** *9/22*
**U.S. Cl. 463—26** **25 Claims**

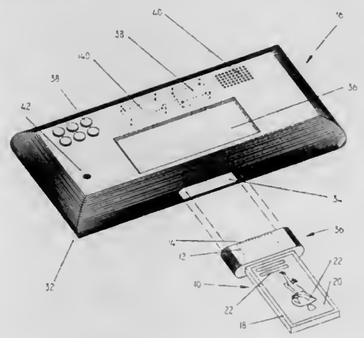
1. A method for playing a game consisting of an auxiliary prize game played along with a principal casino game played by a plurality of players located at a plurality of player positions around a casino table, each one of said players possessing a number of gaming symbols as a result of playing said principal casino game, said auxiliary prize game being played at the same time as playing the principal casino game, the method comprising the following steps:




said players paying to participate in said game;
choosing at random a winning set of gaming symbols;
playing said principal casino game to its normal conclusion;
displaying to said players said winning set of gaming symbols;
determining as being eligible to win a prize in said auxiliary game ones of said players possessing gaming symbols matching said winning set of gaming symbols; and
awarding said prize to said players determined to be eligible in the previous step.

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**5,743,801**
**COLLECTABLE VIDEO SPORTS CARD**
**Paul M. Welander, 1500 Tamarack Ave., Boulder, Colo. 80304**
**Filed Aug. 19, 1996, Ser. No. 697,023**
**Int. Cl.[6] A63F** *9/24*
**U.S. Cl. 463—44** **21 Claims**

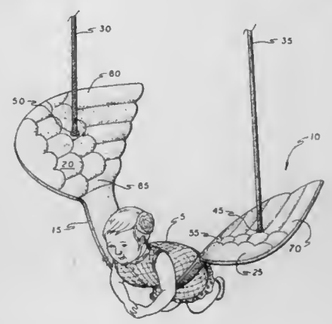



1. A collectable video commemorative device simulating and representing a sportscard, such as a baseball card, in its external appearance, featuring an entity, most commonly a famous athlete and herein referred to as an athlete, on its exterior in a manner and format resembling a sportscard, in addition, the device having the capacity to store a video highlight sequence featuring the same athlete, further, the device having the ability to interface or otherwise interact with a display means, for the purpose of allowing said display means, using its own associated means, to retrieve and display said video highlight sequence, said video commemorative comprising:
a machine-readable video storage means for storing, as data, said video highlight sequence, further, said video storage means may take the form of any number of machine-readable video storage devices having the capability to store video information, including the storage devices selected from the group comprising memory chips, circuit boards, video tape and compact disks;
said video highlight sequence comprised of various moving video images and sequences which feature and commemorate the athlete, said video highlight sequence stored, as data, in said video storage means, said video highlight sequence, further, to be displayed by said display means;
a decorated housing means forming the exterior of said video commemorative and for the purpose of protecting and housing said video storage means, said decorated housing means further having an interface means allowing it to be removably connected to said display means, this interface condition allowing said video highlight sequence to be displayed by said display means through the use of means within said display means, said decorated housing means, further, supporting an identification means;
said identification means comprising pictorial images, statistical information, and graphic embellishment featuring the athlete, said identification means also in a manner and format substantially resembling a sportscard whereby the exterior of said video commemorative is given an attractive, aesthetic, commemorative quality in the spirit of traditional, cardboard sportscards;
said video commemorative also having proportions substantially resembling the proportions of a sportscard, said video commemorative further being of a size such that one video commemorative substantially fits within a typical, open, adult, human hand, whereby said video commemorative is conducive to being displayed, facilitates the exchange of collectable video commemoratives between people, allows space-efficient archival storage of annually issued sets of more than 250 video commemoratives and, in general, is conducive to activities associated with the collection of traditional, cardboard sportscards,
whereby, said video commemorative in its appearance and format, in essence, functions as a sportscard, but with the additional feature of supplementing its commemorative value with video highlights.



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**5,743,802**
**WING SWING SEAT AND SWING DEVICE**
**Dennis Eugene Shives, 1272 Rice Rd., Ojai, Calif. 93023**
**Filed Dec. 16, 1996, Ser. No. 767,365**
**Int. Cl.[6] A63G** *9/10*
**U.S. Cl. 472—118** **20 Claims**




1. A winged swing seat device comprising:
a pair of wide flexible wings, each wing having a first end and a second end;
a narrow flexible seat bridging said first end of each wing; and
an attachment means for attaching a suspension means to each said wing, said attachment means located between said first end and said second end of each said wing and proximate a predetermined distance from said first end of each said flexible wing for oscillation of said pair of wide flexible wings while swinging to enhance a sensation of flight.

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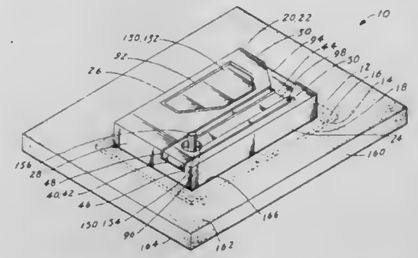
**5,743,803**
**CUE-STICK APPARATUS**
**Frank Jordan, 277 Redfish La., Boise, Id. 83706, and Mike Givens, 227 Silver City Dr., Boise, Id. 83713**
**Filed Dec. 13, 1995, Ser. No. 571,600**
**Int. Cl.[6] A63D** *15/08*
**U.S. Cl. 473—48** **4 Claims**




1. A cue for impacting a ball on a gaming table, the cue having a longitudinal cue axis and consisting of:
an elongated front portion having an outer surface for gripping by a user, the front portion having a cue tip for impacting the ball;
an elongated back portion having an outer surface for gripping by a user, the back portion having a bore running parallel to the longitudinal cue axis;
a rod extending from said front portion, parallel to the longitudinal cue axis, and slidably received in the bore;
wherein said back portion is movable, for aiming, forward toward the front portion to retract the cue and backward away from the front portion to extend the cue; and
a stop means for halting the forward motion of the back portion relative to the front portion by the back portion impacting the front portion to transfer energy from the back portion to the front portion for impacting the ball with the cue tip;
wherein said cue is without potential energy means; and
wherein said cue is without fastening means for securing the back portion to the front portion in positions other than a fully-retracted, closed position or a fully-extended, open position, or both fully-retracted and fully-extended positions.

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**5,743,804**
**HANDS-FREE GOLF BALL TEEING DEVICE**
**Gary E. Bacon, 10772 Pine St., Los Alamitos, Calif. 90720**
**Filed Mar. 11, 1997, Ser. No. 814,202**
**Int. Cl.[6] A63B** *57/00*
**U.S. Cl. 473—132** **17 Claims**




1. A hands-free golf ball teeing device comprising a base from where extends upward a structure, with said structure having:
a) an upper surface and a ramp channel, with said ramp channel having an open left end, a closed right end and front and rear side walls, where near the open left end is located a golf ball tee attached by an attachment means, and
b) a golf ball ramp having a front edge, a rear edge, a left edge, an open right edge, an upper surface, a lower surface, a golf ball retaining bore located inward from the left edge and over said golf ball the and a golf ball channel that commences at the open right edge and terminates at an interface with said golf ball retaining bore, a means for pivotally attaching said ramp to said ramp channel, a means for maintaining said ramp in a lowered position where said ramp is substantially flush with said structure, and a means for placing said ramp in a

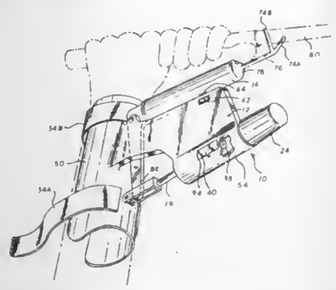
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raised position, wherein to use said device, said ramp is initially placed in the raised position, a golf ball is then maneuvered up the golf ramp onto said golf ball retaining bore, the ramp is then lowered, at which time the ball is in position to be struck by the golfer.

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**5,743,805**
**GOLF SWING TIMING TRAINER**
**Robert E. Richter, 106 Brookview Ter., Valdosta, Ga. 31605**
**Filed Nov. 18, 1996, Ser. No. 751,887**
**Int. Cl.[6] A63B *69/36***
**U.S. Cl. 473—213** **26 Claims**



1. A golf swing timing trainer device for attachment to a human forearm, said human forearm having an upper side, a lower side, a wrist end at which Ulna and Radius forearm bones terminate, and an elbow end, the ends of the Ulna and Radius forearm bones at the wrist end and the elbow end defining a forearm plane containing a forearm axis extending through elbow end and wrist end, the upper side of said forearm being above and defining the upper side of said forearm plane and the lower side of said forearm being below and defining the lower side of said forearm plane, comprising:

(a) a releasable forearm attachment means, said releasable forearm attachment means having a generally planar member and releasable attachment means for releasably attaching said generally planar member to a human forearm, said generally planar member having an extended concave planar configuration with a concave inward surface adapted for placement adjacent a human forearm, an outward surface opposite said inward surface, a first end adapted for placement proximate the wrist of a human forearm and a second end opposite said first end; and

(b) a generally rigid member, said generally rigid member having a contact end that is rigidly affixed to the outward surface of said generally planar member and an interface end distant from said generally planar member, said interface end being provided with golf club shaft interfacing means, said interface end and a forearm axis of a human forearm placed adjacent said inward surface defining a club shaft placement plane, which club shaft placement plane is at a selected angle below a forearm plane of a human forearm placed adjacent said inward surface.

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**5,743,806**
**GOLF SWING TRAINER**
**Daniel P. Brennan, 7411 Lantana Ter., Carlsbad, Calif. 92009**
**Filed Apr. 26, 1996, Ser. No. 638,362**
**Int. Cl.[6] A63B *69/36***
**U.S. Cl. 473—214** **12 Claims**

1. An improved swing training device for a golf player including a strip of semi-rigid spring material that will emit an audible sound when bent and means to secure the opposite ends of said strip to the player's arm above and below the elbow, the improvement comprising:

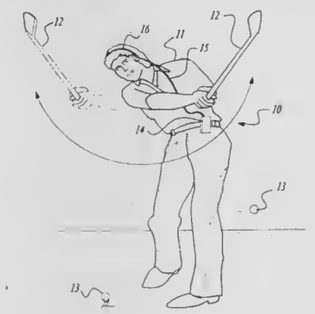


a sleeve configured to encircle the player's arm and fit securely over one elbow of the player throughout the swing.

retaining means within said sleeve to hold and position said strip parallel to the player's arm and centered over the outside of the player's elbow such that the protrusion of the olecranon is a fulcrum at the approximate center of said strip.

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**5,743,807**
**GOLF SWING SOUND TRAINING DEVICE**
**Christopher J. Bendo, Tecumseh, and Tibor M. Varga, Belle River, both of Canada, assignors to Tempo-Tuner Inc., Ontario, Canada**
**Filed Jan. 24, 1996, Ser. No. 590,733**
**Int. Cl.[6] A63B *69/36***
**U.S. Cl. 473—234** **17 Claims**



1. An apparatus for training an athlete to perform an athletic endeavor requiring a biomechanical motion in rhythm with a predetermined tempo, said biomechanical motion including a backward movement involving at least one bodily limb, a pause, and a forward movement of at least one bodily limb, said apparatus comprising:

a housing;

a controller operatively located within said housing and programmed to output a timing pattern in response to a set of preselected timing data; and

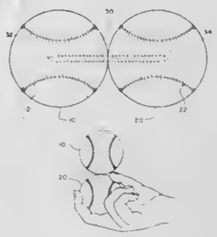
a transmitter operatively connected to said controller for transmitting signals to said athlete corresponding to said timing pattern,

said timing pattern including a first plurality of signals corresponding to a preliminary time interval, said timing pattern further including an initialization signal indicating to said athlete an athletic endeavor starting point, said timing pattern further including a second plurality of signals that form a preset timing pattern that initially rises in pitch, and subsequently falls in pitch, corresponding to said backward and forward movements, respectively, associated with said biomechanical motion to train said athlete to perform said athletic endeavor in response to, and at a tempo synchronous with, that of said second plurality of signals.



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**5,743,808**
**BASEBALL THROWING TRAINER**
**Joseph Barth, 6 Bicentennial Ct., Erial, N.J. 08081**
**Filed Mar. 25, 1996, Ser. No. 621,365**
**Int. Cl.[6] A63B *69/36***
**U.S. Cl. 473—280** **6 Claims**



1. A device for training a pitcher to impart appropriate rotation and hand motion to a ball having a cover surrounding a ball core, wherein said cover consists of two generally 8-shaped sections sewn together in a continuous seam holding said cover to the core, said device consisting of:

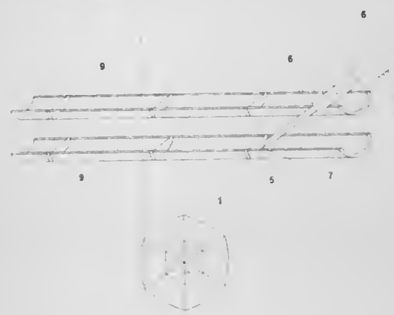
first and second identical balls;

a second ball of said type; and

connection for rigidly connecting said first and said second balls to each other, said first and said second balls being in contact with each other when so connected.

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**5,743,809**
**BAMBOO GOLF CLUB SHAFT**
**S. D. Lehman, 1717 Gascony Rd., Encinitas, Calif. 92024**
**Filed Nov. 6, 1996, Ser. No. 746,094**
**Int. Cl.[6] A63B *53/02;53/10;53/14***
**U.S. Cl. 473—300** **3 Claims**



3. A golf club comprising:

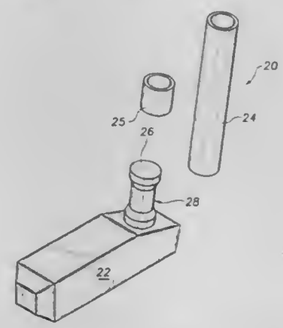
A) a shaft comprised of a plurality of strips of bamboo and defining a head end and a grip end, wherein said plurality of strips of bamboo is at least five strips of bamboo, wherein said bamboo is tonkin bamboo, approximately straight over a section of at least 50 inches, nodes are spaced at 8 inches or greater, and diameter is at least 1½ inches, wherein said strips are tapered and held together by glue, wherein said glue is URAC 185 glue, wherein said shaft contains a protective coat of varnish.

B) a golf club head attached at said head end, wherein said head end is trimmed to fit tightly in a hole in said golf club head and is held in place in said head with glue, and

C) said grip end of said shaft is filed round and a padded grip attached at said grip end, wherein said grip is attached to said shaft by using a double-side tape and solvent.

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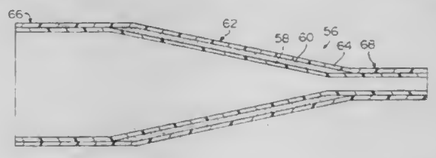
**5,743,810**
**GOLF CLUB FABRICATION METHOD AND ARTICLE**
**Richard A. Bennett, Smithtown; Robert L. Benoit, Oakdale; Bernard I. Rachowitz, and Glenn L. Spacht, both of Lloyd Neck, all of N.Y., assignors to TechMatics, Inc., Hauppauge, N.Y.**
**Filed Apr. 9, 1997, Ser. No. 831,586**
**Int. Cl.[6] A63B *53/04;53/02***
**U.S. Cl. 473—305** **18 Claims**



15. A golf club, comprising a golf club head having a post that comprises an eletrically non-conductive material projecting therefrom in a substantially vertical direction, said post having at least one groove disposed therein, a shaft that comprises an eletrically non-conductive material disposed over said non-conductive post about said at least one groove, and a ring that comprises an eletrically conductive material disposed about said electrically non-conductive post and said electrically non-conductive shaft adjacent said at least one groove, said electrically conductive ring being electromagnetically formed about said electrically non-conductive post and said electrically non-conductive shaft to form a substantially inseparable bond therebetween.

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**5,743,811**
**LIGHTWEIGHT SHAFT**
**Gregory M. Bird, Collierville, Tenn., assignor to Emhart Inc., Newark, Del.**
**Filed Mar. 7, 1996, Ser. No. 612,028**
**Int. Cl.[6] A63B *53/10;53/12***
**U.S. Cl. 473—319** **22 Claims**



1. A lightweight shaft of a generally tubular configuration and a prescribed length along an axis of the shaft, which comprises:

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a first layer of a material of a given density extending axially for a distance equal to the prescribed length,

a second layer of a foam material of a density lower than the given density and in engagement with at least a portion of the first layer,

the second layer extending axially for a distance less than the prescribed length;

a third layer of a material of a density greater than the density of the material in the second layer and in engagement with at least a portion of the second layer;

the third layer extending axially for a distance equal to the prescribed length and having at least a portion thereof in engagement with a portion of the first layer;

the shaft being formed axially with a butt end and a tip end at the axial extremities thereof and an intermediate section between the butt end and the tip end; and

the second layer being located in at least one of the butt end, the intermediate section and the tip end.

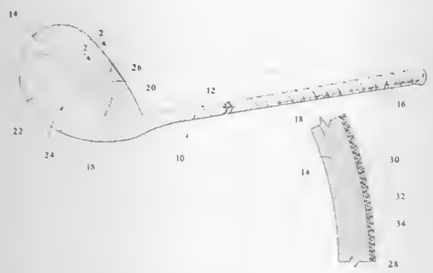
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**5,743,812**

**GOLF DRIVER AND METHOD OF MAKING SAME**

**Richard C. Card, Dallas, Tex., assignor to MasterGrip, Inc., Irving, Tex.**

**Filed Jun. 12, 1996, Ser. No. 662,068**
**Int. Cl.[6] A63B *53/04*; B05D *1/00***
**U.S. Cl. 473—327** **22 Claims**



1. A golf driver club comprising:

a driver club head including a club face having a cured, firmly adherent coating disposed on the club face, said coating comprising polytetrafluoroethylene, said coating being effective to provide reduced backspin to a golf ball hit with said driver club by at least about 10% fewer RPM as compared with a similar driver club not having said coating.

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**5,743,813**

**GOLF CLUB HEAD**

**Kuang-Wei Chen, Kaohsiung Hsien, and Yung-Hao Cheng, Kaohsiung, both of Taiwan, assignors to Chien Ting Precision Casting Co., Ltd., Ping Tung, Taiwan**

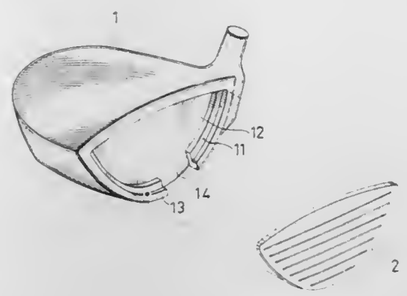
**Filed Feb. 19, 1997, Ser. No. 802,853**
**Int. Cl.[6] A63B *53/04***
**U.S. Cl. 473—329** **1 Claim**

1. A golf club head comprising:

a hollow head body having a stainless steel face with a recess formed therein, said recess being circumscribed by an annular peripheral edge having an inwardly directed annular ledge raised above a bottom surface of said recess, said annular peripheral edge having an opening formed therethrough in open communication with said recess;

a stainless steel face plate secured to said hollow head body and having a peripheral edge portion of a lower surface thereof disposed in contiguous relationship with said annular ledge, said face plate forming a closure for a cavity defined in said recess between said lower surface of said face plate and said bottom surface of said recess; and,

an elastic material substantially filling said cavity for forming a shock absorber to absorb shocks generated by said face plate striking a ball.



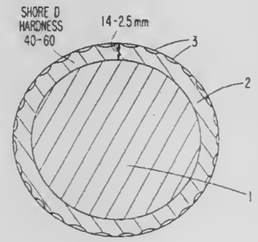
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**5,743,814**

**SOLID GOLF BALL**

**Seiichiro Endo, Shirakawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan**

**Filed Apr. 11, 1996, Ser. No. 630,213**
**Claims priority, application Japan, Apr. 11, 1995, 7-110149**
**Int. Cl.[6] A63B *37/06*; *37/12***
**U.S. Cl. 473—374** **3 Claims**




1. A golf ball comprising a core and a cover covering the core, said cover having a Shore D hardness of 40 to 60, wherein

a compression deformation A, formed by applying a load of from 10 kg to 130 kg to the golf ball, is within the range of 2.3 to 3.5 mm,

a compression deformation B, formed by applying a load of from 0.2 kg to 5 kg to the golf ball, is within the range of 0.26 to 0.40 mm, and

a ratio of compression deformation B to compression deformation A (B/A) is within the range of 0.10 to 0.15.

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**5,743,815**

**GOLF BALL AND INDENTIFICATION SYSTEM**

**Michael D. Helderman, 2621 N. Markwell, Bethany, Okla. 73008**

**Filed Jul. 18, 1996, Ser. No. 685,185**
**Int. Cl.[6] A63B *69/36*; *37/02***
**U.S. Cl. 473—353** **13 Claims**

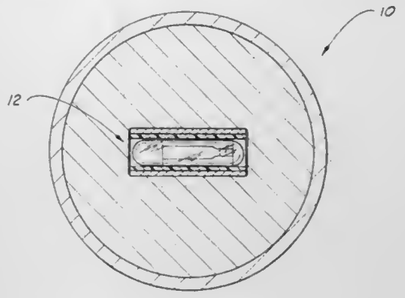
7. An electronically identifiable golf ball comprising:

a golf ball;

a transponder implanted within the golf ball;

a rigid housing surrounding said transponder;





an elastic material between the transponder and the rigid housing to further absorb shock when the golf ball is hit.

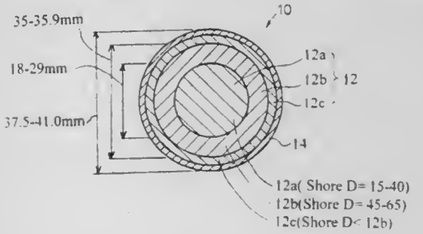
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**5,743,816**

**SOLID GOLF BALL**

**Shunji Ohsumi; Yasuhiro Fukui; Kenji Baba, all of Kagawa-ken, and Hiroyuki Naito, Takamatsu, all of Japan, assignors to Kasco Corporation, Kagawa-ken, Japan**

**Filed Mar. 27, 1997, Ser. No. 835,023**
**Claims priority, application Japan, Apr. 1, 1996, 8-079203**
**Int. Cl.[6] A63B *37/06*; *37/12***
**U.S. Cl. 473—376** **7 Claims**




1. A solid golf ball comprising a solid core having a three-layered structure composed of an inner layer, an intermediate layer formed outside said inner layer, and an outer layer formed outside said intermediate layer, and a cover for coating said solid core, wherein:

said inner layer is designed to have a Shore D hardness which is lower than that of said intermediate layer;

said intermediate layer is designed to have a Shore D hardness of 45 to 65; and

said outer layer is designed to have a Shore D hardness which is lower than that of said intermediate layer.

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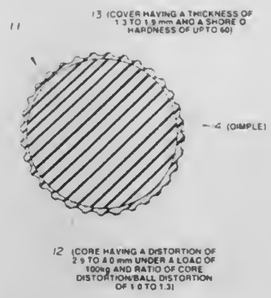
**5,743,817**

**GOLF BALL**

**Hisashi Yamagishi; Yoshinori Egashira, and Hideo Watanabe, all of Chichibu, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan**

**Filed Sep. 29, 1995, Ser. No. 536,049**
**Claims priority, application Japan, Oct. 14, 1994, 6-276109; Dec. 14, 1994, 6-333024**
**Int. Cl.[6] A63B *37/06*; *37/12***
**U.S. Cl. 473—377** **2 Claims**

1. A golf ball comprising a core and a cover wherein said core and said ball has a core hardness and a ball hardness respectively, wherein said core has a distortion of 2.9 to 4.0 mm under a load of 100 kg, the ratio of a core distortion under a load of 100 kg divided by a ball distortion under a load of 100 kg ranges from 1.0 to 1.3, and said cover consists of an ionomer resin as a resin component and has a thickness of 1.3 to 1.8 mm and a Shore D hardness of up to 60.



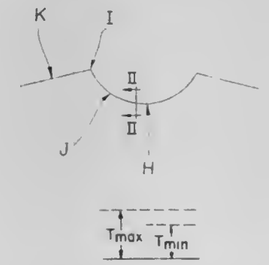

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**5,743,818**

**GOLF BALL**

**Kiyoto Maruoka; Kuniyasu Horiuchi, both of Kobe, and Yoshikazu Yabuki, Shirakawa, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan**

**Division of Ser. No. 553,830, Nov. 6, 1995, Pat. No. 5,552,190, which is a continuation-in-part of Ser. No. 163,720, Dec. 9, 1993, abandoned. This application Feb. 22, 1996, Ser. No. 606,035**
**Claims priority, application Japan, Dec. 9, 1992, 4-352542**
**Int. Cl.[6] A63B *37/12*; *37/14***
**U.S. Cl. 473—378** **4 Claims**




1. A golf ball comprising a surface covered with a coat of paint formed by electrostatic painting having a thickness of 5 to 60 μm, the ratio of maximum to minimum thickness of the coat being 1 to 2.

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**5,743,819**

**GOLF TEE SETTER**

**Won Ho Chun, 2007 Wren Way, Fullerton, Calif. 92833**

**Filed Oct. 31, 1996, Ser. No. 742,057**
**Int. Cl.[6] A63B *69/36***
**U.S. Cl. 473—386** **18 Claims**

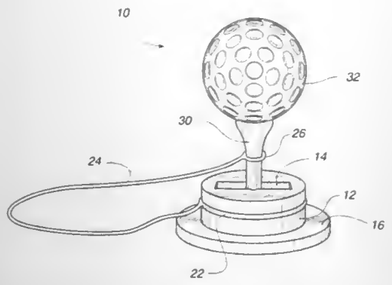
1. A golf tee setting device for use with a tee and a practice mat, the golf tee setting device comprising:

a first member configured for placing in the practice mat, wherein the first member has a solid interior;

a second member coupled to a bottom portion of the first member, the second member having a larger diameter than the first member, and

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a slit lengthwise formed in the first member and extending through the solid interior for holding the tee in a substantially vertical position.

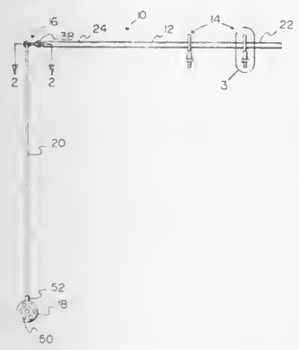
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**5,743,820**

**BATTING PRACTICE DEVICE WITH ADJUSTABLE MOUNTING MEANS**

**Eugene R. Espinosa, and Richard E. Espinosa, both of 442 Andrea Dr., Vacaville, Calif. 95687**

**Filed Feb. 7, 1997, Ser. No. 798,999**
**Int. Cl.[6] A63B** *69/00*
**U.S. Cl. 473—429** **7 Claims**




1. A new and improved batting practice device with adjustable mounting means comprising, in combination:

a support pole being fabricated of plastic and formed in an elongated cylindrical configuration, the support pole having an inboard end including mounting means and an outboard end including a swivel joint, the mounting means comprising two adjustable U-clamps each formed in a generally semi-circular configuration with two arm members formed as screws, each U-clamp including a securing member coupled to the arm members by nuts, the U-clamps being positioned around the outboard end of the support pole, in an operative orientation a user suspending the support pole from a ceiling with the U-clamps;

the swivel joint being fabricated of metal and comprising first and second generally circular swivel hooks, an eye screw and a central swivel member, the eye screw having a first end formed in a generally circular configuration and a second end formed as a screw, the second end being coupled to the outboard end of the support pole, each swivel hook being formed in a generally circular configuration with a projection member, the first swivel hook being positioned within the first end of the eye screw with its projection member coupled to the central swivel member, the projection member of the second swivel hook being coupled to the central swivel member;

a wiffle ball being fabricated of plastic and formed in a generally spherical configuration with a plurality of circular apertures therethrough, the wiffle ball having a top including coupling means; and

a rope formed in an elongated cylindrical configuration, the rope being coupled to the coupling means of the wiffle ball and secured to the second swivel hook of the swivel means, in an operative orientation a user hitting the wiffle ball thereby causing rotation of the swivel means and return of the ball.

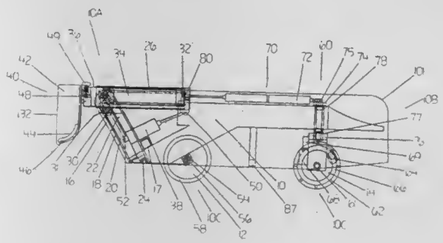
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**5,743,821**

**SCRUM MACHINE**

**Kevin Wirachowski, 900 Whittaker Road, Malahat, British Columbia, Canada, V0R 2L0**

**Filed May 28, 1996, Ser. No. 652,658**
**Claims priority, application Canada, May 25, 1995, 2150196**
**Int. Cl.[6] A63B** *67/00*
**U.S. Cl. 473—441** **29 Claims**




1. A scrum machine comprising:

a frame having a forward end including a structural member, a rearward end, an upper side, a lower side and a ground engaging support, a direction from the lower side to the upper side defining an upward direction, a direction from the rearward end to the forward end defining a forward direction and a direction perpendicular to both the forward direction and the upward direction being a horizontal direction;

at least a first extendable actuator arm telescopically mounted on the structural member at the forward end of the frame and extendable upwardly away from the structural member;

a first pivot oriented horizontally on the first extendable actuator arm, whereby the pivot is height adjustable by extension of the first extendable actuator arm;

a first forward thrusting ram pivotally mounted on the first pivot, the first forward thrusting ram being locatable in selected angular positions about the first pivot; and

a first pad mounted on the first forward thrusting ram for engagement by a user.

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**5,743,822**

**DOUBLE STRINGED TENNIS RACQUET**

**Barry A. Tarleton, Box C374 1525 Aviation Blvd., Redondo Beach, Calif. 90278**

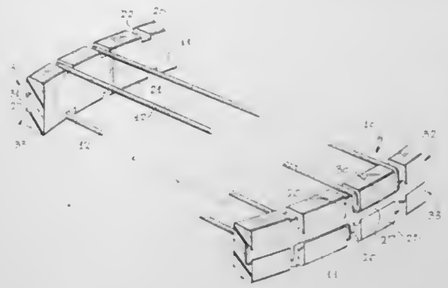
**Filed Mar. 17, 1997, Ser. No. 818,993**
**Int. Cl.[6] A63B** *51/06*
**U.S. Cl. 473—533** **5 Claims**

1. A double stringed racquet comprising:

a racquet frame having an oval frame head with a central opening defined by an encircling frame;

said frame having a plurality of spaced-apart lateral grooves across the opposite face surfaces of said frame and a continuous edge groove with a plurality of connecting slots communicating said lateral grooves with said continuous edge groove;





a plurality of lugs defined between adjacent spaced-apart connecting slots and terminating with said continuous edge groove;

a string element trained across said frame head opening in a crisscross pattern on both sides of said frame head to provide a double stringed frame head;

said string element further being trained about said plurality of lugs and terminating in securement loops at its opposite ends with said frame.

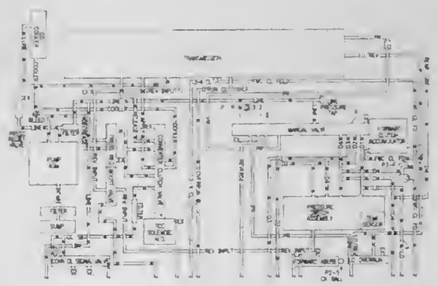
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**5,743,823**

**METHODS AND SYSTEMS FOR IMPROVING THE OPERATION OF TRANSMISSIONS FOR MOTOR VEHICLES**

**Gilbert W. Younger, 2621 Merced Ave., El Monte, Calif. 91733**

**Filed Feb. 2, 1996, Ser. No. 595,810**
**Int. Cl.[6] F16H** *3/62*
**U.S. Cl. 475—120** **20 Claims**



1. A method for modifying the hydraulic circuitry of an automotive transmission of the type including a manual valve coupled in fluid flow relationship to a "1–2" shift valve, a "2–3" shift valve, and a "3–4" shift valve; said manual valve being coupled to a gear selector; said method comprising the step of:

providing a fluid flow path through said "1–2" shift valve such that fluid flowing through said fluid flow path results in the application of fluid pressure to a side of said "1–2" shift valve for maintaining said "1–2" shift valve in a downshifted position without regard to vehicle speed when said gear selector is in a first gear position.

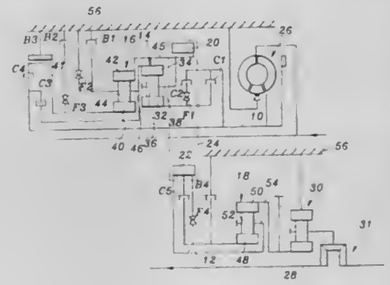
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**5,743,824**

**AUTOMATIC TRANSMISSION WITH IMPROVED POWER TRAIN**

**Lae-Kyoung Park, Yongin-Gun, Rep. of Korea, assignor to Hyundai Motor Company, Rep. of Korea**

**PCT No. PCT/KR94/00092, § 371 Date Apr. 11, 1997, § 102(e) Date Apr. 11, 1997, PCT Pub. No. WO96/02771, PCT Pub. Date Feb. 1, 1996**
**PCT Filed Jul. 15, 1994, Ser. No. 765,936**
**Int. Cl.[6] F16H** *3/64*
**U.S. Cl. 475—276** **12 Claims**




1. An automatic transmission for a motor vehicle having a gear train capable of providing five forward drive and one reverse drive ratios, said gear train comprising:

(a) an input shaft;

(b) a first planetary gear set concentrically mounted about said input shaft for rotary movement therewith, said first planetary gear set including a first sun gear selectively connectable to said input shaft, a first annulus gear, a plurality of first pinion gears circumferentially disposed between said sun gear and said annulus gear and a first planetary carrier rotatably supporting said first pinion gears;

(c) a second planetary gear set concentrically mounted about said input shaft in an axially spaced relationship with respect to said first planetary gear set, said second planetary gear set including a second sun gear selectively connectable to said input shaft, a second annulus gear rigidly coupled to said first planetary carrier for unitary rotation therewith, a plurality of second pinion gears circumferentially disposed between said second sun gear and said second annulus gear and a second planetary carrier rotatably supporting said second pinion gears, said second planetary carrier rigidly connected to said first annulus gear and selectively couplable to said input shaft, wherein said first and second planetary gear sets are interrelated one another to produce the first to the fourth forward drive ratios and the reverse drive ratio one at a time;

(d) an output shaft extending in a spaced, parallel relationship with respect to said input shaft; and

(e) a third planetary gear set concentrically mounted about said output shaft, said third planetary gear set including a third sun gear selectively connectable to both of said first planetary carrier and said second annulus gear, a third annulus gear coaxially disposed around the third sun gear, a plurality of third pinion gears circumferentially disposed between said third sun gear and said third annulus gear and a third planetary carrier rotatably supporting said third pinion gears, said third planetary carrier drivingly coupled to both of said first planetary carrier and said second annulus gear, wherein said third planetary gear set is operable to produce the fifth forward drive ratio.

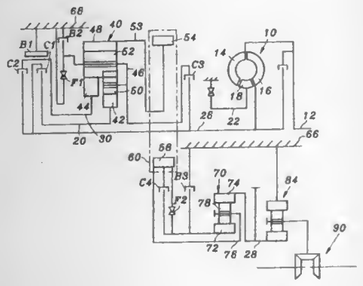
VOL 1209 ISS 4 AP 28 1998 UMI



## 5,743,825
## POWER TRAIN WITH A REDUCED NUMBER OF CLUTCHES

Dong-Hoon Park, Kyunggi-Do, Rep. of Korea, assignor to Hyundai Motor Company, Rep. of Korea

PCT No. PCT/KR94/00093, § 371 Date Apr. 23, 1997, § 102(e) Date Apr. 23, 1997, PCT Pub. No. WO96/02772, PCT Pub. Date Feb. 1, 1996
PCT Filed Jul. 19, 1994, Ser. No. 765,966
Int. Cl.[6] F16H *3/64*
U.S. Cl. 475—278 11 Claims



1. An automatic transmission for use in a motor vehicle having a transmission casing and a gear train contained in the casing for providing five forward and one reverse gear ratios, wherein said gear train comprising:

(a) an input shaft;

(b) a compound planetary gear set coaxially mounted about said input shaft for rotary movement therewith, said compound planetary gear set including a first sun gear selectively connectable to said input shaft by means of a first multi-disc clutch, a second sun gear selectively couplable to said input shaft by means of a second clutch means and selectively anchorable to said transmission casing by means of a first brake means, a first annulus gear rotatably mounted around said first and second sun gears, a plurality of first pinion gears meshing with said first sun gear, a plurality of second pinion gears disposed to mesh with each of said second sun gear, said first pinion gears and said first annulus gear, and a first planetary carrier for rotatably supporting said first and second pinion gears, said first planetary carrier selectively connectable to said input shaft by means of third clutch means and selectively anchorable to said transmission casing by means of a second brake means;

(c) an output shaft disposed in parallel with said input shaft;

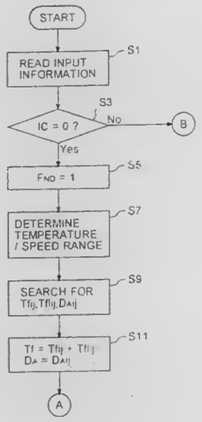
(d) a simple planetary gear set coaxially mounted about said output shaft for rotary movement therewith, said simple planetary gear set including a third sun gear drivingly connected to said first annulus gear by means of a fourth clutch means and selectively anchorable to said transmission casing by means of a third brake means, a second annulus gear rigidly connected to said output shaft, a plurality of third pinion gears circumferentially disposed between said third sun gear and said second annulus gear, and a second planetary carrier rotatably supporting said third pinion gears, said second carrier drivingly connected to said first annulus gear; and

(e) means for delivering rotary power from said compound planetary gear set to said simple planetary gear set.

## 5,743,826
## SPEED CHANGE CONTROL APPARATUS FOR AN AUTOMATIC TRANSMISSION

Katsutoshi Usuki, Kyoto; Kenjiro Fujita, Kusatsu, and Katsuhiro Hatta, Uji, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1996, Ser. No. 588,334
Claims priority, application Japan, Jan. 18, 1995, 7-005994
Int. Cl.[6] F16H *61/08*
U.S. Cl. 477—98 8 Claims




1. A speed change control apparatus for an automatic transmission interposed between an internal combustion engine and a driving wheel, comprising:

a frictional element which is engaged to establish a predetermined gearshift position when hydraulic fluid is supplied thereto,

a hydraulic pump for generating the pressure of the hydraulic fluid,

oil-temperature detecting means for detecting a temperature of hydraulic fluid in the automatic transmission,

speed detecting means for detecting a rotational speed of the internal combustion engine or the hydraulic pump,

control time period setting means for setting a control time period required to eliminate a piston dead stroke of the frictional element, based on the temperature of the hydraulic fluid detected by said oil-temperature detecting means and the rotational speed detected by said speed detecting means,

oil-pressure control means for adjusting the oil pressure supplied from the hydraulic pump to the frictional element to establish the predetermined gearshift position and for performing a piston dead stroke control to eliminate the piston dead stroke based on the control time period ($T_f$) when gear-changing is carried out to establish the predetermined gearshift position, and

learning correction means for effecting, based on a time period elapsed from a time point at which the piston dead stroke control is completed to a time point at which actual gear-changing is started, learning of a correction time period ($T_1$) for an associated one of a plurality of pre-determined learning areas based on the temperature of the hydraulic fluid and the rotational speed, the correction time period being used to correct the control time period ($T_f$);

wherein the oil-pressure control means performs the piston dead stroke control based on the control time period ($T_f$) corrected by said learning correction means.

## 5,743,827

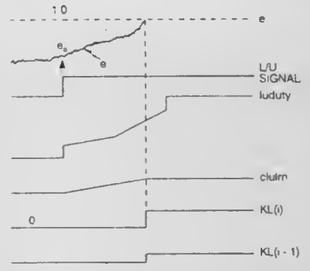
**Patent Not Issued For This Number**



## 5,743,828
## FLUID COUPLING LOCK-UP CONTROL SYSTEM

Minoru Kuriyama, Higashihiroshima, and Kazuo Sasaki, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 18, 1995, Ser. No. 530,459
Claims priority, application Japan, Sep. 19, 1994, 6-223029
Int. Cl.[6] F16H *61/14*; B60K *41/02*
U.S. Cl. 477—169 12 Claims

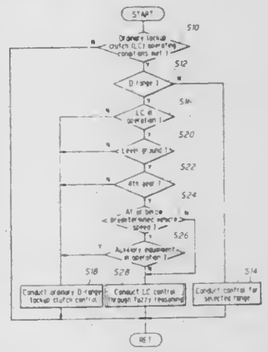



1. A lock-up control system for a fluid coupling interposed between an engine and automatic transmission, said fluid coupling including a lock-up clutch interposed between an engine torque input member and an engine torque output member of said fluid coupling and being locked up by said lock-up clutch so as to directly couple said engine and said automatic transmission together, said lock-up control system comprising locking pressure control means for setting a rate of locking pressure increase, at which a locking pressure necessary for said lock-up clutch to lock up said fluid coupling increases during locking of said fluid coupling, during a time period prior to synchronization of engine and turbine speeds wherein said locking pressure increase is small at an early stage of said locking-up of said fluid coupling during said time period and said locking pressure increase is large at a later stage of said locking-up of said fluid coupling during said time period.

## 5,743,829
## CONTROL SYSTEM FOR VEHICLE AUTOMATIC TRANSMISSION

Shoichi Tanizawa; Masahide Saito, and Satoru Sunada, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1996, Ser. No. 600,635
Claims priority, application Japan, Feb. 22, 1995, 7-058018
Int. Cl.[6] F16H *61/14;59/06*
U.S. Cl. 477—174 7 Claims




1. A system for controlling an automatic transmission of a vehicle, comprising:

hydraulic coupling means having an input connected to an internal combustion engine mounted on the vehicle and an output connected to a gear system in the transmission, said hydraulic coupling means passing engine power to the gear system;

gear ratio establishing means for establishing a gear ratio of the gear system in response to a gear shift command to transmit the engine power to a vehicle wheel through the established gear ratio;

a clutch for engaging/disengaging the input and the output of the hydraulic coupling means;

engaging force control means for controlling the engaging force of the clutch;

vehicle operating condition detecting means for detecting operating conditions of the vehicle; and

basic manipulated variable determining means for determining a basic manipulated variable to be applied to said clutch in response to a parameter of the detected vehicular operating conditions in accordance with a predetermined characteristic set with respect to at least a parameter indicative of engine load;

wherein said engine force control means includes:

fuzzy reasoning means for carrying out fuzzy reasoning based on the detected operating conditions of the vehicle to determine a correction value of the basic manipulated variable;

manipulated variable correcting means for correcting the basic manipulated variable based on the correction value; and

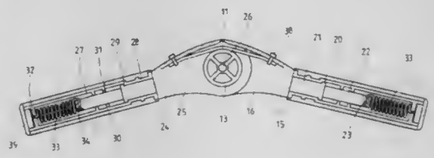
discriminating means for discriminating whether a control condition for engaging force control based on the corrected manipulated variable is met; and

wherein said engaging force control means controls the engaging force of the clutch in response to the corrected manipulated variable, when the control condition is discriminated to be met.

## 5,743,830
## TORSION EXERCISE DEVICE FOR ARM AND WRIST

Ko Ching Ho, P.O. Box 453, Taichung, Taiwan

Filed Jun. 27, 1997, Ser. No. 884,009
Int. Cl.[6] A63B *21/02*
U.S. Cl. 482—44 2 Claims



1. An exercise device for developing arm and wrist, said exercise device comprising:

an elastic element having two ends provided respectively with a fastening hole;

a bearing member of a circular construction and having a center hole;

a joint housing provided with a receiving seat, an axial hole, a locating hole, and an extension portion of a rodlike construction;

a joint seat provided with an axial hole, a locating hole, and an extension portion of a rodlike construction;

a shaft engaged with said axial hole of said joint housing, said axial hole of said joint seat and said center hole of said bearing member such that said joint housing, said joint seat and said bearing member are fastened coaxially and pivotally by said shaft, and that said two fastening holes of said elastic

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element are engaged with two locating bolts which are also engaged with said locationg holes of said joint housing and said joint seat; and

two handlebars of a hollow construction and provided respectively therein with a torsion-resisting element having two ends which are provided with a retaining hook, one of said two handlebars being fastened with said extension portion of said joint housing such that said retaining hook of one of said two ends of said torsion-resisting element is engaged with a through hole of said extension portion of said joint housing, and that said retaining hook of another one of said two ends of said torsion-resisting element is engaged with an insertion hole of said one of said two handlebars, another one of said two handlebars being fastened with said extension portion of said joint seat such that said retaining hook of another one of said two ends of said torsion-resisting element is engaged with a through hole of said extension portion of said joint seat, and that said retaining hook of another one of said two ends of said torsion-resisting element is engaged with an insertion hole of said another one of said two handlebars.

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**5,743,831**

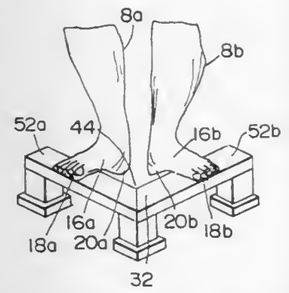
**APPARATUS AND METHOD FOR EXERCISING THE LEG**

**Alek Jakich, 2451 N. Sawyer Ave., Chicago, Ill. 60647**

**Filed Jul. 15, 1996, Ser. No. 680,022**

**Int. Cl.[6] A63B** *22/00;23/04*

**U.S. Cl. 482—52** **19 Claims**




1. A method of exercising the leg comprising the steps of: providing an apparatus comprising a flat platform with a first top surface and a second top surface, said platform being defined by a plurality of sides including a first side extending along said first top surface and a second side extending along said second top surface, said first side and said second side each having a common end, said first side and said second side converging at an angle with respect to each other at said common ends thereof, said first side and said second side each having free ends opposite to said common ends; a third side and a fourth side, said free end of said first side being adjacent to said third side and said free end of said second side being adjacent to said fourth side; a fifth side and a sixth side, said fifth side being adjacent to said third side and extending toward said second side, and said sixth side being adjacent to said fourth side and extending toward said first side; said first top surface being coplanar with said second top surface to define a plane; and legs for bracing said platform above a base surface;

placing a first forefoot of a user on said first top surface and placing a second forefoot of said user on said second top surface; and

extending the heels of each foot in a direction longitudinally away from the legs of the user through said plane while maintaining both forefeet on the first and second top surfaces; and withdrawing the heels of each foot in a direction longitudinally toward the legs of the user back through and away from said plane while maintaining both forefeet on the first and second top surfaces of said platform.

**5,743,832**

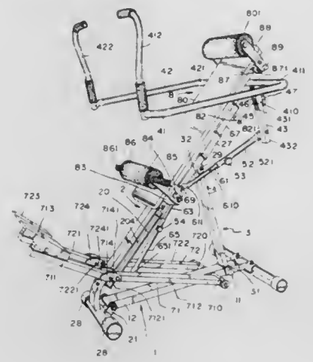
**FITNESS EQUIPMENT**

**Leonard Sands, 4555 Reseda Blvd., Tarzana, Calif. 91356, and Johnson Kuo, 5F., No. 6, Lane 12, Sec. 6, Hsin I Rd., Taipei, Taiwan**

**Filed Mar. 10, 1997, Ser. No. 812,926**

**Int. Cl.[6] A63B** *22/04;23/035*

**U.S. Cl. 482—52** **10 Claims**



1. A fitness equipment comprising:

a base having a rear end mounted with a pin, a front end and two pivots bilaterally disposed near the rear end;

an oblique support having a bottom end equipped with a pair of wheels for supporting on the ground, a pair of bottom lugs spaced between said wheels and bilaterally pivoted to the front end of said base, a bracket disposed at a back side, a transverse locating bar spaced above said bracket, two back lugs, two axles bilaterally disposed near a top end thereof and a socket member defining two parallel sliding holes;

a bracing having a bottom lug pivoted to the pin at the rear end of said base, and a top end pivoted to the back lugs of said oblique support;

two handlebars having a respective rear end respectively fixed to the axles of said oblique support by a respective screw, a respective front end terminating in a respective hand grip, a respective backward frame perpendicularly and backwardly extended from the respective rear end and defining a respective sliding slot;

two connecting frames respectively mounted on the backward frames of said left handlebar and right handlebar, having a respective front end terminating in a respective sliding slot respectively and adjustably fixed to the sliding slots of the backward frames of said handlebars by a respective screw and a respective washer and a respective wing nut, and a respective rear end;

two actuating rods each having a respective top end respectively pivoted to the rear ends of said connecting frames, and a respective tubular bottom end;

two upper links having a respective top end respectively inserted into the tubular bottom ends of said actuating rods and fixed in place by a respective adjustment screw, and a respective flat bottom end;

two sliding bars having a respective top end inserted through the sliding holes of the socket member of said oblique support and a respective bottom end with a respective side block respectively pivoted to the top ends of said upper links;

two intermediate links having a respective flat top end respectively pivoted to the bottom ends of said upper links and the bottom ends of said sliding bars, a respective barrel mounted on the respective pivot, and a respective bottom end;

a damping mechanism coupled between the bracket of said oblique support and the barrel of said intermediate links to impart a damping resistance;

two bottom links having a respective tubular top end respectively sleeved onto the bottom ends of said intermediate links and fixed in place by a respective adjustment screw and, a respective flat bottom end;

a bench mounted on said oblique support, said bench comprising a bench body having a bottom end pivoted to the transverse locating bar of said oblique support, a pair of back locating plates raised from a back side of said bench body and detachably connected to the top end of said oblique support by a pin, a pair of bottom lugs and a pair of top lugs respectively raised from said bench body at different elevations, said bottom lugs and said top lugs having a respective series of locating holes spaced at different angles, a pair of bottom arms respectively fastened to the locating holes of the bottom lugs of said bench by a respective pin, a pair of top arms respectively fastened to the locating holes of the top lugs of said bench by a respective pin, a cylindrical seat cushion connected between said bottom arms in front of said bench body, two handles respectively raised from two opposite ends of said cylindrical seat cushion, and a headrest connected between said top arms; and

two pedals each having a respective rear end respectively turned about the pivots of said base, and a respective front end respectively pivoted to the flat bottom ends of said bottom links;

whereby when a user sits on said cylindrical seat cushion with the back supported on said bench body and the hands holding on the hand grips of said handlebars and the legs pedaling said pedals, said bottom links and said intermediate links and said upper links are alternatively driven to move said actuating rods and said connecting frames, enabling the user to simulate the action of swimming and at the same time said sliding bars are alternatively moved up and down in the sliding holes of said socket member to guide the movement of said bottom links and said intermediate links and said upper links and said actuating rods.



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**5,743,833**

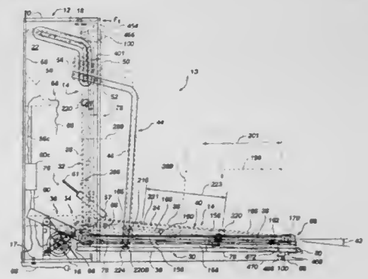
**CABINET TREADMILL WITH DOOR**

**Scott R. Watterson; William T. Dalebout, and Frank Troy Miller, all of Logan, Utah, assignors to ICON Health & Fitness, Inc., Logan, Utah**

**Filed Jan. 30, 1996, Ser. No. 593,800**

**Int. Cl.[6] A63B** *22/02*

**U.S. Cl. 482—54** **18 Claims**



1. A treadmill comprising:

a freestanding housing having

surface engaging means for engaging a support surface, and

enclosure structure extending upwardly from said surface engaging means, said enclosure structure having a left side, a right side and a top;

a tread base formed to be a unitary and non-foldable structure to rigidly extend between a front and a rear, said tread base having a left side, a right side and a deck secured to and between said left side and said right side, said deck having an underside and being secured to said left side and said right side, and said tread base having an endless belt with an upper stretch positioned above said deck to support a user thereon and a lower stretch positioned below said underside, said tread base being movably attached to said freestanding housing to be orientable between a first position in which said tread base extends away from said freestanding housing with said upper stretch of said endless belt positioned to support a user performing exercises thereon and a second position in which said tread base is positioned toward said freestanding housing; and

a panel secured to and between said left side and said right side exterior of said lower stretch, said panel being positioned to be a portion of the exterior of said enclosure structure with said tread base in said second position.

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**5,743,834**

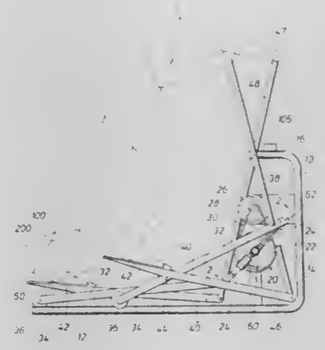
**STATIONARY EXERCISE APPARATUS WITH ADJUSTABLE CRANK**

**Robert E. Rodgers, Jr., 8011 Meadowcroft, Houston, Tex. 77063**

**Continuation-in-part of Ser. No. 602,952, Feb. 16, 1996, Pat. No. 5,683,333, which is a continuation of Ser. No. 377,846, Jan. 25, 1995, Pat. No. 5,573,480. This application Apr. 29, 1997, Ser. No. 841,123**

**Int. Cl.[6] A63B** *69/16;22/04*

**U.S. Cl. 482—57** **13 Claims**



7. In an exercise apparatus having first and second reciprocating members, one end of each reciprocating member adapted for substantially reciprocating motion and the other end adapted for arcuate motion about a common axis and having means operatively associated with each reciprocating member for supporting the bottom of the foot of the user so that during operation of the apparatus each foot of the user follows a predetermined closed path, the exercise apparatus further comprising means for adjusting the distance from the other end of each reciprocating member to the common axis while the apparatus is in use allowing the user to selectively adjust the geometry of the closed path to a preferred anatomical pattern of the particular user.

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**5,743,835**

**BICYCLE TREADMILL WITH SINGLE TURNTABLE**

**Edward E. Trotter, 4545 Gandy Blvd., Tampa, Fla. 33611**

**Filed May 8, 1997, Ser. No. 853,086**

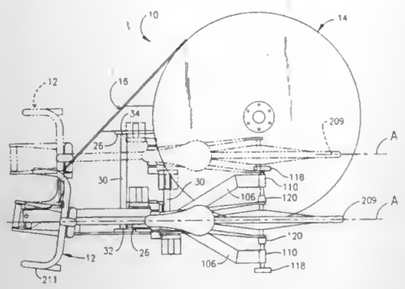
**Int. Cl.[6] A63B** *69/16*

**U.S. Cl. 482—57** **14 Claims**

1. An exercise apparatus for use in combination with at least a portion of a bicycle, that has a body, a front fork pivotally attached to the body, handlebars attached to the fork, a wheel attached to the body, and pedals operatively connected to the wheel, said apparatus comprising:

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a frame;

a turntable rotatably connected to said frame;

a base attached to said frame adjacent to said turntable for movement of said base along a first path between a first stop position and a second stop position;

a carriage attached to said base for movement along a second path,

a first support attached to said carriage, said first support being configured for attachment of at least a portion of a bicycle thereto so that when a bicycle is mounted on said first support a wheel of the bicycle is engagable with said turntable; and

means for moving said carriage along said second path between a first unstable position and a second unstable position, and said first support being positionable at a stable position lying therebetween, whereby when the bicycle is mounted on said support with a wheel of the bicycle contacting said turntable and with said first support lying proximal said first unstable position, said base moves along said first path toward said first stop position, and when said first support lies proximal said stable position said base remains generally motionless, and when said first support lies proximal said second unstable position said base moves along said first path toward said second stop position.

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**5,743,836**

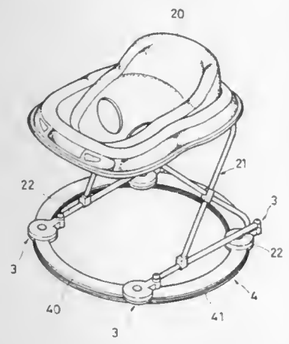
**STRUCTURE OF BABY WALKER**

**Yin-Ying Lo, No. 59-16, Chiu-She Lane, Chiu-She Li, Pei-Tun Dist., Taichung City, Taiwan**

**Filed Oct. 25, 1996, Ser. No. 736,686**

**Int. Cl.[6] A63B** *26/00*

**U.S. Cl. 482—66** **5 Claims**



1. A baby walker comprising a seat, an annular base frame, two pairs of wheel assemblies symmetrically mounted on said base frame, two links connected in parallel between said two pairs of wheel assemblies above said base frame, and two crossed supports connected between said links and said seat, wherein each of said wheel assemblies is comprised of a hemispherical upper shell, a circular bottom shell, a coupling member, and a dome-like cap, said upper shell comprising a center coupling barrel, and an arm perpendicularly extended from a periphery and terminating in a vertical axle housing, said coupling member and said dome-like cap being pivotably coupled to the axle housing of said arm by a screw bolt to hold one end of one of said links, each link having opposite ends pivotally coupled to the vertical axle housings of each pair of said wheel assemblies said coupling member having a bottom coupling section journalled in the vertical axle housing of said arm and a half-round notch at a top side thereof, said cap having a half-round notch matched with the half-round notch of said coupling member into a circular hole which receives one end of the corresponding link, said circular bottom shell comprising a center coupling barrel pivotably connected to the center coupling barrel of said upper shell by a screw bolt for permitting said upper shell to be turned relative to said bottom shell;

said annular base frame is comprised of an annular upper plate fixedly coupled to the bottom shells of said wheel assemblies, and an annular bottom plate coupled to the bottom shells of said wheel assemblies and imparting an annular track for permitting said wheel assemblies and said annular upper plate to be moved thereon through 360° angle, and rollers positioned between the bottom shell of each of said wheel assemblies and said annular bottom plate for permitting rolling movement therebetween.

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**5,743,837**

**BODY MOUNTED MUSCLE EXERCISE DEVICE AND METHOD**

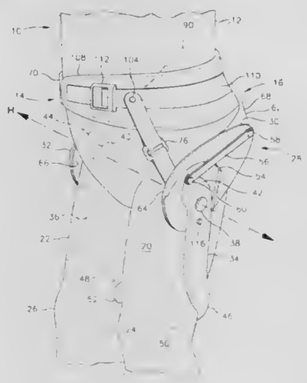
**Joseph A. Dias, Toronto, Canada; Tory Allman, Laguna Niguel, Calif.; John T. Loechner, Westport, Conn., and John R. Nottingham, Hunting Valley, Ohio, assignors to Laurcath Corporation, Solana Beach, Calif.**

**Filed Jul. 24, 1995, Ser. No. 506,424**

**Claims priority, application Canada, Nov. 1, 1994, 2134852**

**Int. Cl.[6] A63B** *21/02*

**U.S. Cl. 482—124** **13 Claims**



1. A body mounted muscle exercise apparatus for humans, said apparatus comprising:

a harness adapted to at least partially encircle the waist of the user;

adjustable means for removably securing said harness to the user;

hinge plate means secured to said harness at a position adjacent to each hip of the user;

an elongated, substantially rigid, sanitary arm pivotably coupled at one end to each said hinge plate means;



means connected between each said hinge plate means and said elongated arm for biasing said arm to oppose movement of a body extremity of the user only in one direction with respect to said apparatus, the biasing strength of said biasing means being variable; and

means at the opposite end of said elongated arm for engaging a body extremity to be exercised by exerting force against the urging of said biasing means, said engaging means functioning with respect to the user's extremity without impeding normal bending of that extremity at any of its joints, said hinge plate means, unitary arm and biasing means adjacent one hip of the user functioning independently of said hinge plate means, unitary arm said biasing means adjacent the other hip of the user;

whereby selective predetermined muscles of the user can be exercised by moving a body extremity against the resistive force of said biasing means.

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**5,743,838**

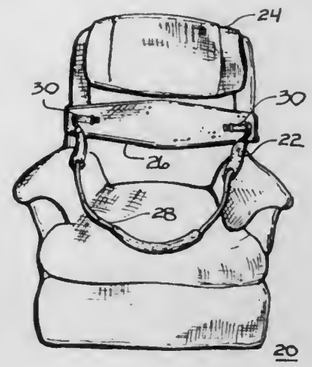
**EXERCISE SYSTEM**

**James E. Willis, 528 McNally Dr., Prescott, Ariz. 86301**

**Filed Nov. 13, 1996, Ser. No. 747,775**

**Int. Cl.[6] A63B** *21/02*

**U.S. Cl. 482—124** **25 Claims**



1. A method for making an exercise device, said method comprising steps of:

providing an elongated flexible body having a first extremity and a second extremity disposed to either side of a central portion;

providing an elongated elastic member, said elongated elastic member having a first end and a second end, said first and second ends (i) adapted to accommodate a human limb and (ii) adapted to removably couple to said central portion of said elongated flexible body;

disposing a plurality of ring structures along an axis extending between said first extremity and said second extremity of said elongated flexible body;

disposing a first clip at said first end of said elongated elastic member;

disposing a second clip at said second end of said elongated elastic member, wherein said first and second clips are adapted to couple said first and said second ends of said elongated elastic member to ones of said plurality of ring structures;

providing a first strap adapted to be coupled to said first end of said elongated elastic member, said first strap having a first bight at one extremity thereof, said first bight capturing a ring coupled to said first clip, wherein said first strap includes a second bight at another extremity thereof, said second bight capturing a ring adapted to couple to said first clip to form a continuous closed loop; and

providing a second strap adapted to be coupled to said second end of said elongated elastic member, said second strap having a first bight at one extremity thereof, said first bight capturing a ring coupled to said second clip, wherein said second strap includes a second bight at another extremity thereof, said second bight capturing a ring adapted to couple to said second clip to form a continuous closed loop.

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**5,743,839**

**APPARATUS FOR SUPPORTING A ROLL MANTLE**

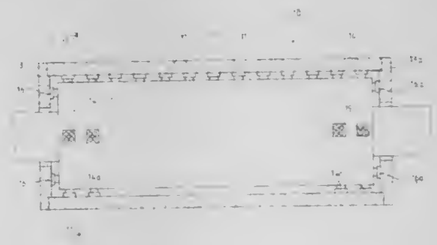
**Juhani Niskanen, Oulunsalo, Finland, assignor to Valmet Corporation, Helsinki, Finland**

**Filed Sep. 15, 1995, Ser. No. 528,766**

**Claims priority, application Finland, Sep. 15, 1994, 944272**

**Int. Cl.[6] B23P** *15/00*

**U.S. Cl. 492—20** **12 Claims**



1. An apparatus for rotatingly supporting a roll mantle on a stationary roll axle in a paper machine, wherein loading means are arranged on said roll axle for supporting and loading said roll mantle in a principal loading direction, said roll mantle being movable in relation to said roll axle at least in the principal loading direction, comprising

at least one pair of glide bearing elements arranged on said roll axle arrange to support said roll mantle in opposite radial directions substantially transverse to the principal loading direction, said at least one pair of glide bearing elements acting upon an inner face of said roll mantle under hydraulic pressure provided by a pressure medium,

said at least one pair of glide bearing elements comprising guiding means for guiding movement of said roll mantle along a desired path.

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**5,743,840**

**CENTRIFUGE WITH A HEATING JACKET FOR DRYING COLLECTED SOLIDS**

**Robert B. Carr, Brookline, Mass., assignor to Carr Separations, Inc., Franklin, Mass.**

**Filed Jun. 24, 1996, Ser. No. 669,600**

**Int. Cl.[6] B04B** *11/08;15/02;15/08*

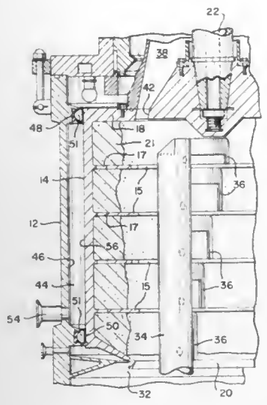
**U.S. Cl. 494—13** **9 Claims**

1. A centrifuge of the type including a housing and a rotatable bowl, said centrifuge being adapted to separate by way of centrifugal force and collect within said bowl a solids component of an introduced liquid feed, said centrifuge comprising:

means for heating said collected solids within said bowl, said heating means comprises inflatable ring seals located between said housing and said bowl, said ring seals being inflatable between a collapsed condition wherein said seals are spaced from said bowl and said bowl is free to rotate, and an inflated condition when said bowl is stationary wherein said seals are in sealing contact with said housing and said bowl, said ring

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seals in said inflated condition forming a sealed heating jacket between the housing and the bowl through which a heated fluid may flow.

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5,743,841

**FOAM COMPOSITION FOR TREATING ASBESTOS-CONTAINING MATERIALS AND METHOD OF USING SAME**

**Jacob Block, Rockville; Natalia Vera Krupkin, Timonium; Daniel Reid Kuespert, Columbia, all of Md.; Gary Masaru Nishioka, Pataskala, Ohio; John Wing-Keung Lau, North Potomac, Md., and Nigel Innes Palmer, Boca Raton, Fla., assignors to W. R. Grace & Co.-Conn., New York, N.Y.**

**Filed Sep. 27, 1996, Ser. No. 721,857**

**Int. Cl.[6] A62D** *3/00;* **B09B** *3/00;* **C01F** *11/12*

**U.S. Cl. 588—254** **10 Claims**

1. A method of treating a chrysotile-asbestos containing porous building material (ACM) installed on a substrate in a building, comprising:

(a) providing an admixture composition derived from admixing (i) water, (ii) at least about 30% by weight of an acid component comprising an inorganic acid, an inorganic acidic salt or mixtures thereof, (iii) from about 0.1 to about 4% by weight of a source of fluoride ions;

and (iv) a stable foam generating amount of a foaming agent system comprising at least one agent providing cationic and non-ionic functionality in a molar ratio of cationic to non-ionic functional group of from about 100:1 to 1:100;

(b) foaming the composition from step (a);

(c) applying the resulting foamed composition to the ACM chrysotile asbestos-containing building material;

(d) permitting the foamed composition to remain on and penetrate the building material and contact the chrysotile asbestos contained therein;

(e) allowing said composition to remain in contact with the chrysotile asbestos for a sufficient period of time to reduce the amount of chrysotile asbestos contained in said building material to less than 1% by weight of the resultant material; and

permitting said resultant material to remain on the substrate in the building.

5,743,842

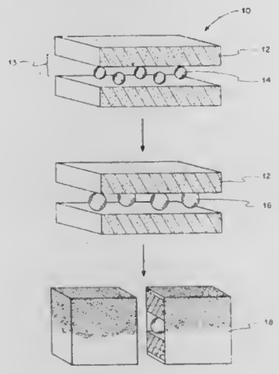
**METHOD FOR ENCAPSULATING AND ISOLATING HAZARDOUS CATIONS, MEDIUM FOR ENCAPSULATING AND ISOLATING HAZARDOUS CATIONS**

**Stephen R. Wasserman, Darien; Kenneth B. Anderson, Lisle; Kang Song, Woodridge; Steven E. Yuchs, and Christopher L. Marshall, both of Naperville, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Apr. 11, 1996, Ser. No. 635,437**

**Int. Cl.[6] A62D** *3/00;* **B09B** *3/00*

**U.S. Cl. 588—256** **14 Claims**



1. A method for encapsulating hazardous cations comprising

a.) supplying a pretreated substrate containing the cations; and

b.) contacting the substrate with a silane compound in a non-aqueous environment to form a coating on the substrate.

11. A method for preventing hazardous cations from leaching from solid petroleum refining materials comprising:

a.) supplying a catalyst that has been used in petroleum refining processes;

b.) pretreating said used fluid catalytic cracking catalyst; and

c) contacting said pretreated fluid catalytic cracking catalyst with a silane compound so as to form a coating on the catalyst.

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5,743,843

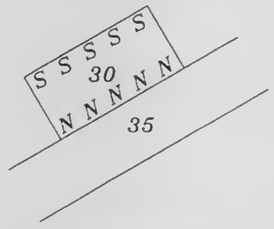
**METHOD FOR THERAPEUTIC BLOOD CONDITIONING**

**Michael F. Berman, 19 Berkshire Cir., Ansonia, Conn. 06401, and Randy Boncek, 46 Florence St., East Haven, Conn. 06513**

**Filed Jul. 21, 1995, Ser. No. 505,373**

**Int. Cl.[6] A61B** *17/52*

**U.S. Cl. 600—9** **2 Claims**




1. A method for improving the solubility, dispersability, and buffering capacity of polar blood components comprising exposing a patient's blood to a minimum magnetic force field of one (1.) Tesla generated with a lineal single pole oriented magnet with a minimum length of 7.5 cm, placing the lineal magnet in parallel relationship with and immediately adjacent to a patient's extremity having blood vessels through which the blood including the polar blood components is flowing, the polar blood components orienting as the blood passes through the blood vessels and the magnetic force field, thereby having improved solubility, dispersability, and buffering capacity.



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5,743,844

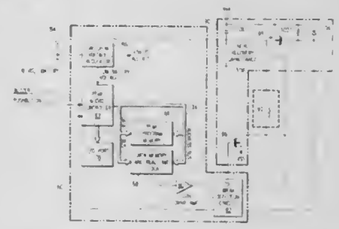
**HIGH EFFICIENCY PULSED ELECTROMAGNETIC FIELD (PEMF) STIMULATION THERAPY METHOD AND SYSTEM**

**John C. Tepper, Carrollton; Peter Kuo, Richardson; Thomas M. Emge, Sachse, all of Tex., and William L. Winstrom, Andover, N.J., assignors to AMEI Technologies, Inc., Wilmington, Del.**

**Filed Nov. 1, 1996, Ser. No. 742,512**

**Int. Cl.[6] A61N** *2/00;2/02*

**U.S. Cl. 600—14** **13 Claims**



1. A PEMF transducer for a bone growth stimulator device, consisting essentially of:

a single-winding transducer coil for receiving a supply voltage from a voltage supply and in response thereto generating a PEMF stimulation therapy signal; and

a drive circuit for recovering flyback energy from the single-winding transducer coil and dumping a voltage equal to a predetermined voltage differing from said supply voltage for sequencing the current through the transducer coil in a positive direction and negative direction.

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5,743,845

**BIVENTRICULAR PULSATILE CARDIAC SUPPORT SYSTEM HAVING A MECHANICALLY BALANCED STROKE VOLUME**

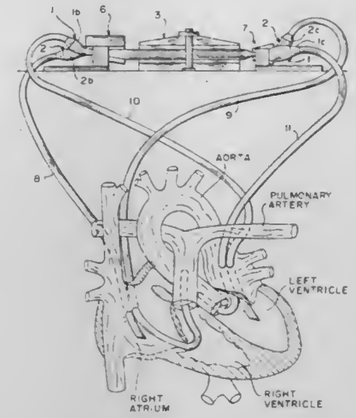
**Thomas M. Runge, P.O. Box 50045, Austin, Tex. 78763**

**Filed Jan. 12, 1995, Ser. No. 371,964**

**Int. Cl.[6] A61M** *1/10*

**U.S. Cl. 600—16** **2 Claims**

1. A biventricular pulsatile cardiac support system having a mechanically balanced stroke volume comprising, a pulsatile flow cardiopulmonary bypass pump having a compression chamber intermediate the inlet and outlet of said pump, said compression chamber including a movable compression plate and a fixed plate, a pair of side-by-side, externally valved, compressible conduits extending through said compression chamber and under said compression plate, each conduit having an inlet and an outlet, a passive exterior valve positioned at the pump inlet and outlet, said pair of side-by-side conduits extending through said valves, the portions of said compressible conduits extending between the inlet and outlet valves forming sacks, the valve at the pump inlet being positioned downstream from the inlets of said conduits, the valve at the pump outlet being positioned upstream from the outlets of said conduits, a first tube having one end connected to the inlet of one of said conduits and an opposite end adapted to be connected to the right atrium of a patient's heart, a second tube having one end connected to the outlet of said one conduit and an opposite end adapted to be connected to the pulmonary artery of said patient, a third tube having one end connected to the inlet of the other of said conduits and an opposite end adapted to be connected to the left ventricle of the patient's heart, and a fourth tube having one end connected to the outlet of said other condoit and an opposite end adapted to be connected to the patient's aorta, whereby when the inlet valve is open and the outlet valve is closed blood flowing through the inlets of the side-by-side conduits fills the sack portions of the conduits underneath the pump compression plate, to thereby push the compression plate upwardly until at least one of the sacks is filled, whereupon the compression plate descends to compress the sacks, thereby pumping the blood out of the conduits simultaneously while the inlet valve moves to the closed position and the outlet valve moves to the open position, whereby the pumping rate is automatically varied as a function of the filling pressure, to thereby substantially balance the volume of blood passing from the right atrium to the pulmonary artery with the volume of blood passing from the left ventricle to the aorta.




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5,743,846

**STEREOSCOPIC ENDOSCOPE OBJECTIVE LENS SYSTEM HAVING A PLURALITY OF FRONT LENS GROUPS AND ONE COMMON REAR LENS GROUP**

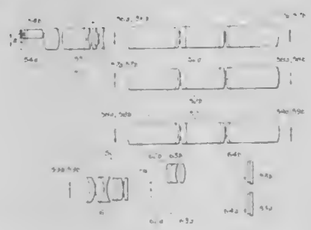
**Susumu Takahashi, Iruma; Shinichi Nakamura, Hino, and Tsutomu Takebayashi, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Mar. 16, 1995, Ser. No. 404,890**

**Claims priority, application Japan, Mar. 17, 1994, 6-047189; May 17, 1994, 6-103084; Oct. 27, 1994, 6-264004**

**Int. Cl.[6] A61B** *1/06*

**U.S. Cl. 600—166** **13 Claims**



1. A stereoendoscope, comprising:

an elongate inserted section having a distal end;

an illuminating light projecting means for projecting an illuminating light from the distal end of said inserted section;

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an objective optical system arranged on the distal end of said inserted section for forming the light from the object illuminated by said illuminating light as a plurality of images having a parallax between them through a plurality of incident pupils; and

one image transmitting optical system comprising one relay lens optical system contained at least partially within said inserted section for transmitting said plurality of images having a parallax between them by said objective optical system,

wherein said objective optical system is formed of two negative lens units arranged in parallel with each other and one positive lens group, said two negative lens units being arranged to be substantially symmetrically concentric about an optical axis of said one positive lens group and said image transmitting optical system, said two negative lens units being arranged nearer the object side of said distal end of said inserted section than said one positive lens group.

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**5,743,847**

## STEREOSCOPIC ENDOSCOPE HAVING IMAGE TRANSMITTING OPTICAL-SYSTEM AND PUPIL DIVIDING UNIT THAT ARE AXIALLY MOVABLE WITH RESPECT TO EACH OTHER

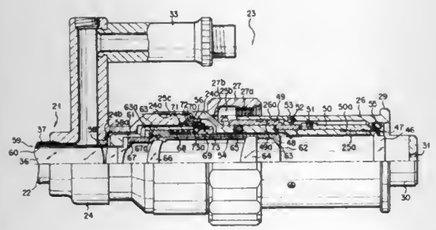
**Motokazu Nakamura, and Tetsumaru Kubota, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Dec. 22, 1995, Ser. No. 577,239**

**Claims priority, application Japan, Jan. 13, 1995, 7-004312**

**Int. Cl.[6] A61B *1/06***

**U.S. Cl. 600—166** **8 Claims**



1. A pupil division type stereoscopic endoscope comprising:

an image transmitting optical system having an image-forming lens for forming an image of an object and a relay lens for transmitting the image formed by said image-forming lens, said image transmitting optical system having an optical axis;

a pupil dividing unit for dividing the image transmitted by said image transmitting optical system into a plurality of object images having a parallax therebetween;

an observation unit for receiving the plurality of object images obtained through division by said pupil dividing unit, and for displaying the plurality of object images so as to enable stereoscopic observation;

an optical lens system main body which integrally incorporates said image transmitting optical system and said pupil dividing unit so that said image transmitting optical system and said pupil dividing unit are coupled to and not detachable from each other;

a connecting unit for detachably coupling said optical lens system main body and said observation unit to each other; and

a position adjusting device for adjusting optical positions of said image transmitting optical system and said pupil dividing unit relative to each other in a direction of the optical axis of said image transmitting optical system.

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**5,743,848**

## PORTABLE ENDOSCOPE SYSTEM

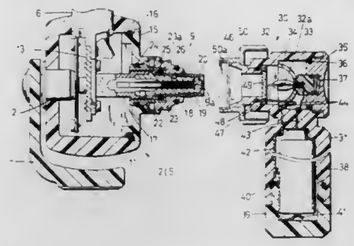
**Takashi Koeda; Hiroshi Sano; Hirohisa Ueda; Kunitoshi Ikeda; Kunikiyo Kaneko, and Rensuke Adachi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 21, 1996, Ser. No. 701,045**

**Claims priority, application Japan, Aug. 31, 1995, 7-222876; Sep. 6, 1995, 7-228810**

**Int. Cl.[6] A61B *1/06***

**U.S. Cl. 600—178** **10 Claims**



1. A portable endoscope system comprising an endoscope control part that controls bending of an insert part;

an illuminating light guide extending through said insert part for transmitting light for illuminating an object, said illuminating light guide having an entrance end portion disposed in said endoscope control part;

an illuminating light supply unit attached to said endoscope control part and being detachable with respect to said endoscope control part;

a light source lamps contained in said illuminating light supply unit, for supplying illuminating light to said illuminating light guide

a filament serving as a light emission source in said light source lamp, said filament being supported such that a longitudinal direction of said filament is substantially perpendicular to an entrance end surface of said illuminating light guide; and

a spheroidal reflecting mirror, contained in said illuminating light supply unit, said spheroidal reflecting mirror converging light emitted from said filament to said entrance end surface of said illuminating light guide.

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**5,743,849**

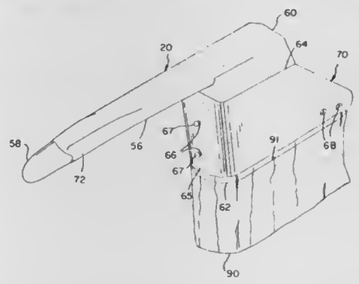
## DISPOSABLE PROTECTIVE SLEEVE FOR A LARYNGOSCOPE AND METHOD OF USING THE SAME

**Mark J. Rice, Johnson City, Tenn.; William T. Kearney, III, Lexington, Ky.; William T. Williams, Jonesborough, Tenn.; Ganesh V. Phatak, Lexington, Ky., and Timothy P. Maupin, Fairfield, Ohio, assignors to Blue Ridge Products, LP, Gray, Tenn.**

**Filed Aug. 9, 1996, Ser. No. 694,776**

**Int. Cl.[6] A61B *1/32***

**U.S. Cl. 600—186** **14 Claims**





7. A disposable protective sleeve for covering a laryngoscope, comprising:

a fluid-impervious preformed sheath defining a hollow cavity to enclose therein portions of a laryngoscope blade of the type having a blade tip and a blade back end connected by a continuous blade length, the sheath having an open end and a closed end, the open end having an aperture through which the blade tip may be inserted into the cavity, the sheath constructed to completely envelop the blade tip and the length of the blade and formed of a flexible plastic material molded to a preformed shape which conforms to the shape and contours of the blade tip and blade length after placement of the sheath on the blade while maintaining sufficient rigidity to retain the lateral shape of the blade prior to installation of the sheath on the blade; and

a fluid-impervious flexible shield having a top edge, the top edge at least partially integrally attached to the sheath proximate to the open end of the sheath, the shield defining an opening through which a laryngoscope blade can be inserted into the open end of the sheath, the shield extending downwardly from the sheath to at least partially cover a handle of a laryngoscope when the laryngoscope blade is fully inserted into the sheath, wherein the sheath and shield are integrally attached to each other to maintain a semi-rigid relation between the sheath and shield so that when the sleeve is mounted on a laryngoscope, the sleeve will restrain the blade of the laryngoscope from rotating down to contact the handle of the laryngoscope.

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**5,743,850**

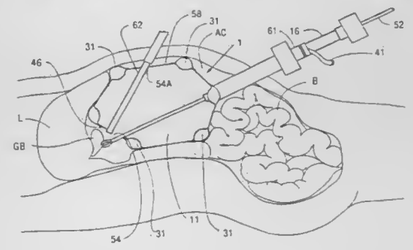
## ENDOSCOPIC INFLATABLE RETRACTION DEVICE WITH ADDITIONAL INFLATABLE CHAMBER

**Frederic H. Moll; Charles Gresl, Jr., both of San Francisco; Albert K. Chin, Palo Alto, and Philip K. Hopper, Laverne, all of Calif., assignors to Origin Medsystems, Inc., Menlo Park, Calif.**

**Continuation of Ser. No. 106,307, Aug. 13, 1993, abandoned, which is a division of Ser. No. 794,590, Nov. 19, 1991, Pat. No. 5,309,896, which is a continuation-in-part of Ser. No. 706,781, May 29, 1991, abandoned. This application Aug. 24, 1994, Ser. No. 295,144**

**Int. Cl.[6] A61B *17/02***

**U.S. Cl. 600—204** **8 Claims**



1. An apparatus for retracting an organ inside the body to gain access to an adjacent tissue, the apparatus comprising:

a main chamber having a thin, flexible main envelope,

inflating means for selectively inflating the main chamber to an expanded condition while in place within the body, inflation of the main chamber retracting the organ to a retracted condition, and

inflatable maintaining means, operatively associated with the main chamber, for maintaining the main chamber in the expanded condition, and the organ in the retracted condition, notwithstanding release of the inflation of the main chamber following the inflation of the main chamber to the expanded condition, the release of the inflation of the main chamber rendering the main chamber incapable of maintaining the organ in the retracted condition, the maintaining means having an open structure for providing access therethrough to the tissue, wherein the maintaining means comprises:

one, and only one, additional chamber, and

means for inflating the additional chamber to an expanded state to maintain the organ in the retracted condition.

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**5,743,851**

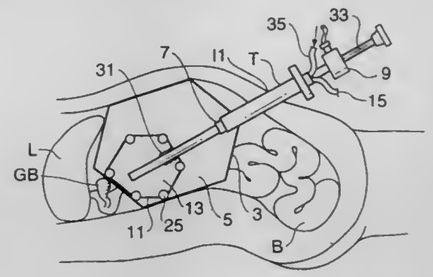
## RETRACTION APPARATUS AND METHODS FOR ENDOSCOPIC SURGERY

**Frederic H. Moll, San Francisco, and Albert K. Chin, Palo Alto, both of Calif., assignors to Origin Medsystems, Inc., Menlo Park, Calif.**

**Continuation of Ser. No. 212,122, Mar. 14, 1994, Pat. No. 5,522,790, which is a division of Ser. No. 877,995, May 4, 1992, Pat. No. 5,361,752, which is a continuation-in-part of Ser. No. 794,590, Nov. 19, 1991, Pat. No. 5,309,896, which is a continuation-in-part of Ser. No. 706,781, May 29, 1991, abandoned. This application Jun. 4, 1996, Ser. No. 660,333**

**Int. Cl.[6] A61B *17/02***

**U.S. Cl. 600—204** **9 Claims**



6. An apparatus for retracting an organ inside the body to gain access to an adjacent tissue, the apparatus comprising:

a hollow tube having a distal end;

an inflatable chamber attached to and extending beyond the distal end of the hollow tube, wherein the inflatable chamber has a window located opposite the distal end of the hollow tube;

means for inflating the inflatable chamber;

an endoscope inserted into the hollow tube so that a distal end of the endoscope protrudes beyond the distal end of the hollow tube and is located within the inflatable chamber adjacent the window; and

detachable covering means covering the portion of the endoscope and deflated inflatable chamber that protrudes beyond the distal end of the hollow tube.

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**5,743,852**

## SPECULUMS

**William T. M. Johnson, 69 Twin Pine Way, Glen Mills, Pa. 19342-1606**

**Filed Apr. 15, 1996, Ser. No. 632,242**

**Int. Cl.[6] A61B *1/02***

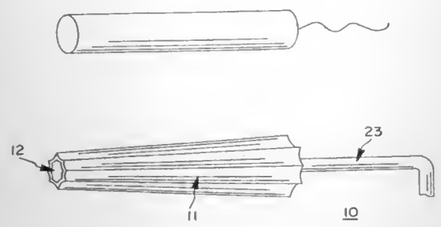
**U.S. Cl. 600—207** **6 Claims**

6. An improved medical speculum system, comprising:

an inflatable speculum, comprising a tube-shaped body section, said body section having an inner wall element and an outer wall element sealed together along the edges of the wall elements, thereby forming a fluid-tight envelope, said wall element being bonded together at a plurality of contact areas within said envelope wherein said contact areas form a grid pattern;

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means for inflating the body section by introducing a fluid into the body section envelope;

a rigid medical device for retaining the inflated speculum in its inflated state, said rigid medical device being inserted and positioned within the inflated speculum after inflation;

a removable plastic sleeve that covers the speculum body section exterior; and

a removable insertion rod that fits within the speculum body section interior in the speculum's deflated state such that one end of said insertion rod extends through the body section and is affixed to removable sleeve, and the other end of the insertion rod extends outside of the body section, said insertion rod being used to insert and position the deflated speculum prior to inflation;

wherein said insertion rod is removed from within the body section interior after partial inflation of the speculum thereby also withdrawing the removable sleeve through the speculum body section.

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**5,743,853**

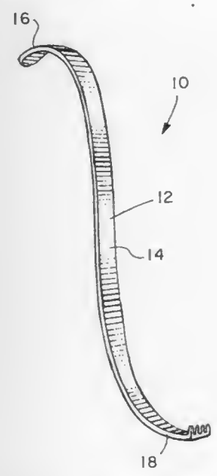
**SERRATED S-RETRACTOR**

**Robert A. Lauderdale, #2 Crown Pl., Richardson, Tex. 75080**

**Filed Sep. 9, 1996, Ser. No. 708,842**

**Int. Cl.[6] A61B *11/02***

**U.S. Cl. 600—210** **1 Claim**




1. Apparatus for use in surgery, comprising:

an instrument body being formed of a strip of metal about 10 inches long, about ⅜ inch wide, and about 1/16 inch thick;

the instrument body having a middle portion and first and second ends;

the instrument body being S-shaped along its length, with the middle portion being straight, and the first end being circularly bent from the middle portion about 100 degrees, the second end being circularly bent about 90 degrees in the opposite direction from the first end;

the first end being rounded in the wide direction; and

the second end being specially adapted for tissue dissection, by being serrated in the wide direction, with four teeth about 1/16 inch wide, about ⅛ inch long and about 1/16 inch apart, the teeth extending perpendicularly from the second end in a direction parallel to and spaced apart from the middle portion, and the teeth extending in a direction generally towards the middle portion.

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**5,743,854**

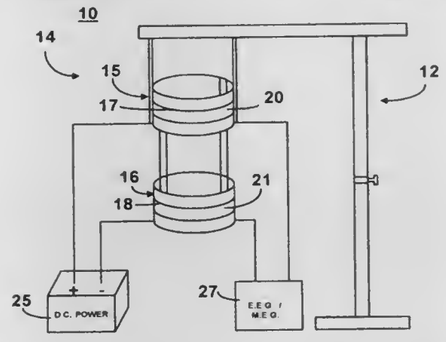
**METHOD AND APPARATUS FOR INDUCING AND LOCALIZING EPILEPTIFORM ACTIVITY**

**Jon Paul Dobson; Heinz-Gregor Wieser, both of Zurich, Switzerland, and Michael David Fuller, Santa Barbara, Calif., assignors to The Regents of the University of California, Oakland, Calif.**

**Filed Mar. 29, 1994, Ser. No. 219,183**

**Int. Cl.[6] A61B *5/0484;5/05***

**U.S. Cl. 600—409** **18 Claims**




1. An apparatus for evoking epileptiform activity in a patient with drug resistant epilepsy, as part of a presurgical evaluation procedure, the apparatus comprising in combination:

a DC magnetic field generator adapted to surround at least part of the patient's head, to generate a DC magnetic field of a strength sufficient to evoke epileptiform activity in the head of said patient;

a DC power source coupled to said DC magnetic field generator;

a support structure to maintain said DC magnetic field generator in a selected location relative to said patient's head; and

sensors adapted to be coupled to said patient's head to monitor said epileptiform activity in the patient's head and to assist in the location selection of said DC magnetic field generator to evoke said epileptiform activity in said patient's head.

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**5,743,855**

**BROADBAND PHASED ARRAY TRANSDUCER DESIGN WITH FREQUENCY CONTROLLED TWO DIMENSION CAPABILITY AND METHODS FOR MANUFACTURE THEREOF**

**Amin M. Hanafy, Los Altos Hills; Samuel H. Maslak, Woodside, and Jay S. Plugge, Mountain View, all of Calif., assignors to Acuson Corporation, Mountain View, Calif.**

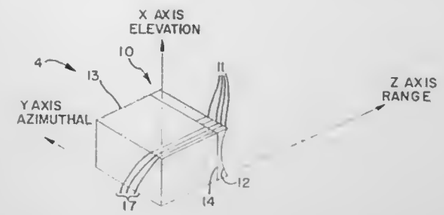
**Continuation of Ser. No. 398,348, Mar. 3, 1995, Pat. No. 5,582,177. This application Jun. 12, 1996, Ser. No. 662,330**

**Int. Cl.[6] A61B *8/00***

**U.S. Cl. 600—459** **29 Claims**

1. An ultrasonic transducer array for testing a body, comprising:






a plurality of transducer elements aligned along an array axis; and

a backing support that supports the plurality of transducer elements;

wherein each of the plurality of transducer elements in the array includes

a piezoelectric layer having a front surface overlaid by a front electrode and a rear surface overlaid by a rear electrode, the front surface being concave along an axis perpendicular to the array axis and the piezoelectric layer having a non-uniform thickness wherein the thickness is smallest near the center of the layer and largest at each end of the layer wherein the thickness of the piezoelectric layer continuously increases from the smallest to the largest thickness, and

a first acoustic matching layer having a front surface that is concave along an axis perpendicular to the array axis, a rear surface, and a uniform thickness, the rear surface of the acoustic matching layer being mounted to the concave front surface of the piezoelectric layer;

wherein each of the plurality of transducer elements in the array has its piezoelectric layer and at least a portion of its first acoustic matching layer spaced from the adjacent transducer elements in the array; and

wherein the concave shapes of the front surfaces of the piezoelectric and acoustic matching layers of each transducer element are selected to mechanically focus the transducer elements in a plane perpendicular to the array axis.

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**5,743,856**

**APPARATUS FOR MEASURING PULSE-WAVE PROPAGATION VELOCITY**

**Tohru Oka, Ichinomiya; Hiroshi Sakai, Komaki; Hidekatsu Inukai, Nagoya; Toshihiko Ogura, Inuyama; Tomoko Ikawa, Mino, and Takashi Nomura, Komaki, all of Japan, assignors to Colin Corporation, Komaki, Japan**

**Filed Sep. 24, 1996, Ser. No. 718,715**

**Claims priority, application Japan, Nov. 6, 1995, 7-287339; Nov. 27, 1995, 7-307353; Nov. 27, 1995, 7-307354; Jan. 25, 1996, 8-010619**

**Int. Cl.[6] A61B *5/02***

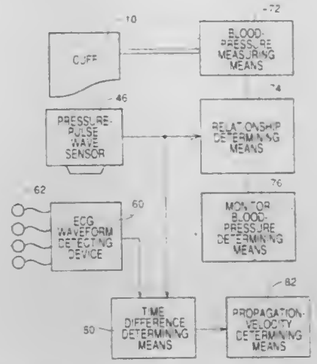
**U.S. Cl. 600—493** **14 Claims**

1. An apparatus for measuring a propagation velocity of a pulse wave which is propagated through an artery of a living subject, the apparatus comprising:

an electrocardiographic-waveform detecting device which detects an electrocardiographic waveform from the subject, the detected electrocardiographic waveform comprising a plurality of first heartbeat-synchronous pulses;

a pulse-wave sensor which is adapted to be worn on the subject and which detects the pulse wave from the subject, the detected pulse wave comprising a plurality of second heartbeat-synchronous pulses;

time-difference determining means for determining a time difference between a first periodic point relating to one of the first heartbeat-synchronous pulses of the detected electrocardiographic waveform and a second periodic point relating to a corresponding one of the second heartbeat-synchronous pulses of the detected pulse wave; and




propagation-velocity determining means for determining the propagation velocity, $V_M$, of the pulse wave based on the determined time difference, $TD_{RP}$, according to a following expression:

$$V_M = L/(TD_{RP} - T_{PEP})$$

where

L is a length of the artery of the subject from a left ventricle of the subject via an aorta of the subject to a position where the pulse-wave sensor is worn on the subject, and

$T_{PEP}$ is a pre-ejection period between a Q wave of said one first heartbeat-synchronous pulse of the electrocardiographic waveform and a minimum point of said corresponding one of the second heartbeat-synchronous pulses of the pulse wave.

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**5,743,857**

**BLOOD PRESSURE MONITOR APPARATUS**

**Masayuki Shinoda, Tajimi; Hidekatsu Inukai, Nagoya, and Hiroshi Sakai, Komaki, all of Japan, assignors to Colin Corporation, Komaki, Japan**

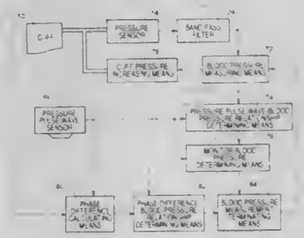
**PCT No. PCT/JP96/00039, § 371 Date Sep. 10, 1996, § 102(e) Date Sep. 10, 1996, PCT Pub. No. WO96/22050, PCT Pub. Date Jul. 25, 1996**

**PCT Filed Jan. 12, 1996, Ser. No. 704,576**

**Claims priority, application Japan, Jan. 17, 1995, 7-4806; Dec. 20, 1995, 7-332076**

**Int. Cl.[6] A61B *5/00***

**U.S. Cl. 600—496** **19 Claims**



1. A blood pressure monitor apparatus including a blood pressure measuring device for measuring a blood pressure value of a living subject based on variation of a pulse-synchronous wave obtained through a cuff adapted to be worn on the living subject by changing a pressure of the cuff, a pressure pulse wave sensor adapted to be pressed on an artery of the living subject for detecting a pressure pulse wave produced from the artery of the living subject, a pressure pulse wave-blood pressure relationship determining means for determining, at a predetermined period, a

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pressure pulse wave-blood pressure relationship between magnitude of pressure pulse wave and blood pressure, based on the pressure pulse wave detected by said pulse wave sensor and the blood pressure value measured by said blood pressure measuring device, by starting said blood pressure measuring device at said predetermined period, and a monitor blood pressure determining means for successively determining a monitor blood pressure value based on an actual pressure pulse wave detected by said pressure pulse wave sensor, according to said pressure pulse wave-blood pressure relationship, the blood pressure monitor apparatus being characterized by comprising:

a pair of heartbeat-synchronous wave sensors for detecting, on different portions of said living subject, respective heartbeat-synchronous waves produced in synchronism with a heartbeat of the living subject;

a phase difference calculating means for calculating a phase difference between one of the heartbeat-synchronous waves detected by one of said pair of heartbeat-synchronous wave sensors and the other of the heartbeat-synchronous waves detected by the other of said pair of heartbeat-synchronous wave sensors;

a phase difference-blood pressure relationship determining means for determining a phase difference-blood pressure relationship between phase difference and blood pressure, based on the phase difference calculated by said phase difference calculating means and the blood pressure value measured by said blood pressure measuring device; and

a blood pressure measurement terminating means for terminating a blood pressure measurement of said blood pressure measuring device, when a difference between a phase difference obtained according to said phase difference-blood pressure relationship based on a monitor blood pressure value determined by said monitor blood pressure determining means, and a phase difference obtained by said phase difference calculating means, when the blood pressure measurement of said blood pressure measuring device starts, is smaller than a predetermined reference value.

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**5,743,858**

**Patent Not Issued For This Number**

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**5,743,859**

**INTEGRATED ELECTRICAL SIGNAL SWITCHING AND AMPLIFYING SYSTEM**

**Harold Max Wodlinger, Thornhill, and Richard Michael Fine, Mississauga, both of Canada, assignors to Quinton Electrophysiology Corporation, Richmond Hill, Canada**

**Continuation of Ser. No. 219,692, Mar. 29, 1994, Pat. No. 5,566,096, which is a continuation-in-part of Ser. No. 975,768, Nov. 13, 1992, abandoned. This application May 13, 1996, Ser. No. 648,529**

**Int. Cl.[6] A61B** *5/04*

**U.S. Cl. 600—522** **30 Claims**

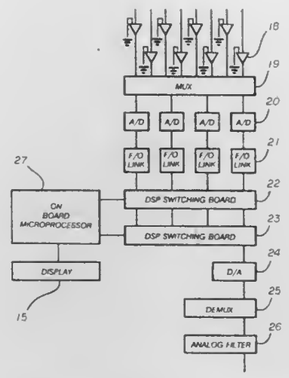
**15**. An integrated intracardiac signal switching and amplifying system for receiving intracardiac signals from the body of a patient, amplifying the received intracardiac signals, switching the amplified intracardiac signals, and outputting the switched intracardiac signals, said system comprising:

an intracardiac signal receiver for receiving the intracardiac signals from a patient,

an intracardiac signal amplifier for amplifying the received intracardiac signals,

an analog to digital converter for converting the amplified intracardiac signals into digital intracardiac signals,

a digital signal processor for performing a signal switching operation on the digital intracardiac signals, and




an intracardiac signal output for outputting the switched intracardiac signals.

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**5,743,860**

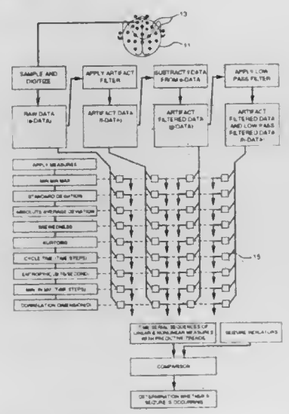
**APPARATUS AND METHOD FOR EPILEPTIC SEIZURE DETECTION USING NON-LINEAR TECHNIQUES**

**Lee M. Hively; Ned E. Clapp; C. Stuart Daw, and William F. Lawkins, all of Knoxville, Tenn., assignors to Lockheed Martin Energy Systems, Inc., Oak Ridge, Tenn.**

**Filed Mar. 20, 1996, Ser. No. 619,024**

**Int. Cl.[6] A61B** *5/0476;5/048*

**U.S. Cl. 600—544** **14 Claims**




**1**. A method for automatically detecting an epileptic seizure in a patient comprising the steps of:

(a) providing at least one channel of a patient's raw brain wave data, called e-data, selected from the group consisting of electroencephalogram data and magnetoencephalogram data;

(b) separating the e-data into artifact data, called f-data, and artifact-free data, called g-data, while preventing phase distortions in the data;

(c) processing g-data through a low-pass filter to produce a low-pass-filtered version of g-data, called h-data;

(d) applying at least one nonlinear measure selected from the group consisting of time steps per cycle, kolmogorov entropy, first minimum in the mutual information function, and correlation dimension to at least one type of data selected from the group consisting of e-data, f-data, g-data, and h-data to provide at least one time serial sequence of nonlinear measures, from which at least one indicative trend selected from the group consisting of abrupt increases and abrupt decreases can be determined;

(e) comparing at least one indicative trend with at least one known seizure indicator; and

(f) determining from said comparison whether an epileptic seizure is occurring in the patient.



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**5,743,861**

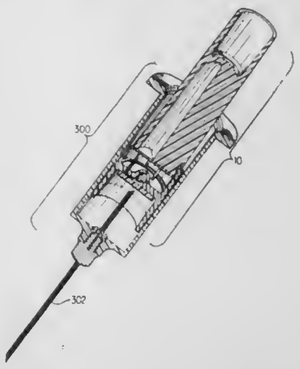
**BLOOD COLLECTION DEVICE**

**Richard L. Columbus, Rochester; Harvey J. Palmer, Lima, both of N.Y.; John Brian Barclay, Winthrop Harbor, Ill.; Ted J. Hanagan, Libertyville, Ill.; Michael G. Lowery, Wildwood, Ill.; Edward J. Gutierrez, Gurnee, Ill.; Douglas Durnux Hansmann, Libertyville, Ill., and Daniel Patrick Schmidt, Oak Creek, Wis., assignors to Abbott Laboratories, Abbott Park, Ill.**

**Filed Jan. 23, 1996, Ser. No. 589,916**

**Int. Cl.[6] A61B** *5/00*

**U.S. Cl. 600—577** **13 Claims**




**1**. A blood collection device, comprising:

(a) an adapter including a piercing probe, a manifold in fluid communication with the piercing probe, a plenum in fluid communication with the manifold, the plenum sealed with an adapter septum; and

(b) a body having one or more evacuated chambers, each of said chambers having an aperture aligned with the piercing probe, each of said apertures sealed with a septum;

the adapter selectively movable relative to the body to pass the piercing probe through the septum and fluidly connect the plenum with the one or more evacuated chambers.

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**5,743,862**

**ULTRASONIC MEDICAL TREATMENT APPARATUS**

**Mamoru Izumi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Sep. 15, 1995, Ser. No. 529,072**

**Claims priority, application Japan, Sep. 19, 1994, 6-222771; Mar. 14, 1995, 7-053804**

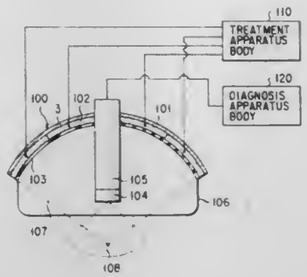
**Int. Cl.[6] A61B** *17/22*

**U.S. Cl. 601—2** **18 Claims**

**1**. An ultrasonic medical treatment apparatus comprising,

a piezoelectric oscillation plate including a plurality of piezoelectric oscillator elements, said elements each having a higher resonance frequency in a lateral direction thereof than in a thickness direction thereof; and

a drive unit for supplying a drive voltage to each of said piezoelectric oscillator elements,




wherein said piezoelectric oscillation plate has a ultrasonic radiation surface, and further includes a acoustic matching layer, a resin is filled in gaps among said elements and an adhesive for adhering the acoustic matching layer to the ultrasonic radiation surface is directly bonded to only a portion of said resin in a central region of said piezoelectric oscillation plate.

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**5,743,863**

**HIGH-INTENSITY ULTRASOUND THERAPY METHOD AND APPARATUS WITH CONTROLLED CAVITATION EFFECT AND REDUCED SIDE LOBES**

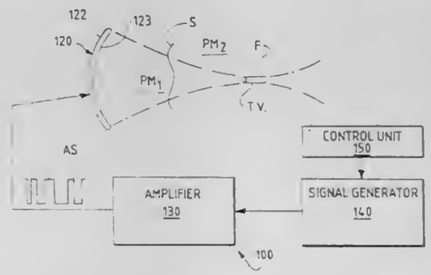
**Jean-Yves Chapelon, Villeurbanne, France, assignor to Technomed Medical Systems and Institut National, Vaux en Velin**

**Continuation of Ser. No. 396,160, Feb. 28, 1995, Pat. No. 5,573,497, which is a continuation-in-part of Ser. No. 307,719, Nov. 30, 1994, abandoned. This application Oct. 2, 1996, Ser. No. 720,555**

**Claims priority, application France, Jan. 22, 1993, 9300662; Jan. 3, 1994, 9402322; WIPO, Jan. 21, 1994, PCT/FR94/00070**

**Int. Cl.[6] A61B** *17/00*

**U.S. Cl. 601—2** **22 Claims**




**1**. A method for generating high power therapeutic ultrasound waves in a propagation medium, said ultrasound waves produced by an ultrasonic transducer having at least one ultrasound transducer element, the method comprising the steps of activating said at least one ultrasound transducer element with an electronic signal supplied by a signal generator, the signal generator supplying a wideband electronic signal to said at least one ultrasound transducer element, said wideband signal having a multiple frequency spectrum, the wideband signal configured to reduce or prevent cavitation phenomena resulting from the propagation of the ultrasound waves emitted by said at least one ultrasound transducer element within the propagation medium,

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**5,743,864**

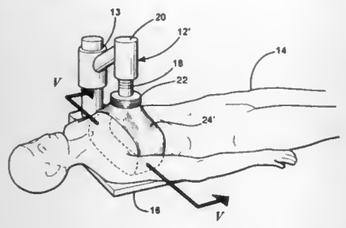
**METHOD AND APPARATUS FOR PERFORMING CARDIO-PULMONARY RESUSCITATION WITH ACTIVE RESHAPING OF CHEST**

**R. Mitchell Baldwin, II, Grand Rapids, Mich., assignor to Michigan Instruments, Inc., Grand Rapids, Mich.**

**Filed Jun. 29, 1995, Ser. No. 496,732**

**Int. Cl.[6] A61H** *31/00*

**U.S. Cl. 601—41** **14 Claims**



**14**. A method of performing cardio-pulmonary resuscitation, including:

providing a reciprocating piston which is actively driven by an actuating device;

restraining the circumference of a patient's thoracic cavity with a substantially non-extensible collar attached to said piston;

applying a concentrated compression force between a patient's sternum and spine by intermittently driving said piston toward the patient's sternum in order to apply direct cardiac compression, wherein said compression force is translated by said collar to laterally restrain the patient's chest in order to increase the patient's intrathoracic cavity pressure; and

after said applying, actively reshaping the patient's thoracic cavity by imermittently driving said piston away from the patient's sternum and thereby decreasing intrathoracic cavity pressure of the patient;

wherein said non-extensible collar includes an annular outer substantially non-extensible membrane and an annular interior extensible membrane positioned against the patient's chest defining an interior cavity in said collar between said membranes and a non-compressible fluid in said cavity, and wherein said applying a concentrated compression force includes compressing said cavity in order to compress the patient's thoracic cavity.

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**5,743,865**

**KNEE BRACE FOR APPLYING CORRECTIVE LOAD**

**Jeffrey Townsend, Bakersfield, Calif., assignor to Townsend Industries, Inc., Bakersfield, Calif.**

**Filed Feb. 12, 1997, Ser. No. 799,488**

**Int. Cl.[6] A61F** *5/00*

**U.S. Cl. 602—26** **20 Claims**

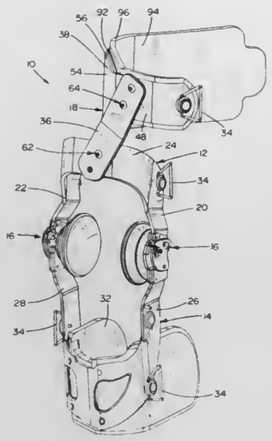
**11**. A knee brace for treating osteoarthritis comprising:

an upper support portion including an upper frontal cross member connecting a lateral femoral strut with a medial femoral strut;

a lower support portion including a lower frontal cross member connecting a lateral tibial strut with a medial tibial strut;

a joint mechanism connecting said upper support portion and said lower support portion for permitting bending movement of a wearer's leg;

load application means connected to said upper support portion for applying a corrective load to one side of the wearer's leg by said upper support portion, means for applying a complementary force to said one side of said wearer's leg at said lower support portion and means for imparting a force to a wearer's knee joint by said joint mechanism at an opposite side of the leg from the side to which said corrective load and complementary force is applied;



wherein said load application means comprises a load arm pivotally connected to said upper frontal cross member, a load arm securing means for adjustably securing said load arm against pivotal movement relative to said upper support portion, a leg support mounted on said load arm for contacting a wearer's leg and applying the corrective load to the side of the wearer's leg, said load arm being securable against pivotal movement relative to said leg support by said leg support securing means in each position within a range of relative angular positions for maintaining an applied corrective load.

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**5,743,866**

**TUBULAR BANDAGE FOR PARTS OF THE HUMAN BODY**

**Hans B. Bauerfeind, and Holger Reinhardt, both of Kempen, Germany, assignors to Bauerfeind GmbH & Co., Kempen, Germany**

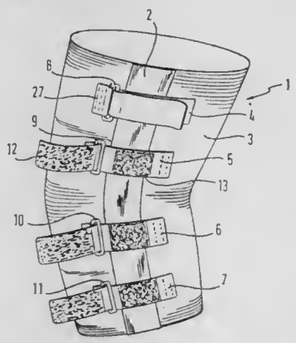
**PCT No. PCT/EP95/02064, § 371 Date Mar. 14, 1997, § 102(e) Date Mar. 14, 1997, PCT Pub. No. WO95/32693, PCT Pub. Date Dec. 7, 1995**

**PCT Filed May 31, 1995, Ser. No. 750,200**

**Claims priority, application Germany, Jun. 1, 1994, 44 19 260.6**

**Int. Cl.[6] A61F** *5/00*

**U.S. Cl. 602—63** **9 Claims**



**1**. A tubular bandage for parts of the human body, said bandage comprising: an elastic part, a significantly less elastic part, and straps which are significantly less elastic longitudinal extensibility, or are nonelastic in the longitudinal direction, wherein said elastic part of the bandage comprises at least one insert incorporated with said significantly less elastic part to form a tubular configuration, wherein said straps are fixable to said significantly less elastic part and extend across said elastic part such that when said straps are fixed the elasticity of said at least one insert is significantly reduced.



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**5,743,867**

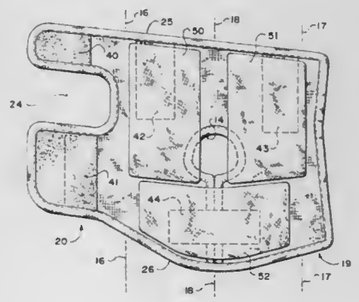
**THERAPEUTIC WRAPPING FOR A JOINT OF A PATIENT**

**Shawn Hickling, 5302 Verner Dr., La Palma, Calif. 90623**

**Filed Oct. 28, 1996, Ser. No. 738,894**

**Int. Cl.[6] A61F** *7/00*

**U.S. Cl. 602—65** **11 Claims**



**1**. Apparatus for therapeutic wrapping of a limb of a patient, the limb having a joint with a projecting bone portion at the joint and parts of the limb above and below the joint at an angle to each other less than 180°, the apparatus comprising:

a fabric wrapping member cut and sewn to form an integral body defining central strip portion and two wing portions;

the central strip portion being shaped and arranged to cover the limb at the joint such that a first part of the central strip portion lies along the limb above the joint and a second part of the central strip portion lies along the limb below the joint;

the central strip portion having an opening in the central strip portion between the first and second parts for surrounding the projecting bone;

the first and second parts being arranged mutually at an angle less than 180° to accommodate the angle of the joint;

the wing portions each projecting outwardly from opposite sides of the central strip portion such that the wing portions can be wrapped around the limb to meet on the side of a limb opposite to the central strip portion, the wing portions including cooperating fastening means for applying tension to the wrapping member around the limb;

at least three separate bags each containing a gel material of high thermal capacity, each bag being generally flat so as to define a front side and a rear side bounded by edges of the bag;

each bag having on the rear side thereof a strip formed from one part of a hook and loop fastener material for cooperation with a respective one of three cooperating strips of hook and loop fastener material;

the central strip portion having on the first part two of the cooperating strips, each arranged on a respective side of the center line of the central strip, to receive two of the separate bags;

the central strip portion having on the second part one of the cooperating strips arranged so as to bridge the center line to receive one of the separate bags.

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**5,743,868**

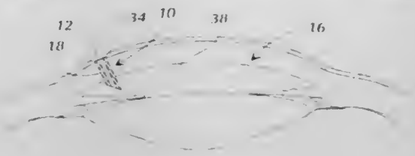
**CORNEAL PRESSURE-REGULATING IMPLANT DEVICE**

**Reay H. Brown, and Keith P. Thompson, both of 4375 E. Brookhaven Ave., Atlanta, Ga. 30319**

**Filed Feb. 14, 1994, Ser. No. 195,614**

**Int. Cl.[6] A61M** *5/00*; **A61F** *2/14*

**U.S. Cl. 604—8** **11 Claims**



**1**. A unitary, pressure-regulating corneal implant device for use in controlling intraocular pressure of the cornea in an eye having a cornea, an ocular surface, a corneal stroma, and an anterior chamber; said corneal implant device comprising a conduit means having a bore with a porous core material disposed in said bore for allowing egress of aqueous humor from said anterior chamber of the eye to said ocular surface of the eye, said conduit means having a proximal end and a distal end, said proximal end being free of a surrounding flange and said distal end being sharpened so as to facilitate insertion of said device in the cornea, said conduit means being elongated for extending from a position substantially flush with the ocular surface of the eye through said corneal stroma, and into the anterior chamber.

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**5,743,869**

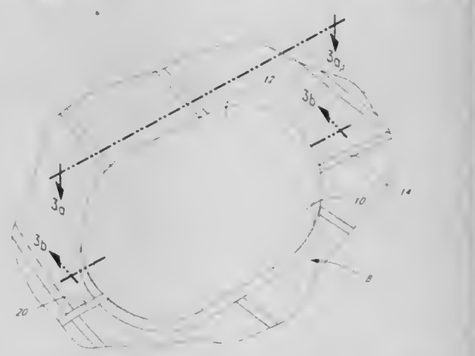
**MEDICAL DEVICE AND METHOD FOR TREATING ASCITES**

**Abdul Mateen Ahmed, 928 E. Juanita Ave., La Verne, Calif. 91750**

**Continuation-in-part of Ser. No. 269,839, Jul. 1, 1994, Pat. No. 5,616,118, which is a continuation of Ser. No. 786,734, Oct. 1, 1991, Pat. No. 5,411,473, which is a division of Ser. No. 478,655, Feb. 12, 1990, Pat. No. 5,071,408, which is a continuation-in-part of Ser. No. 255,070, Oct. 7, 1988, abandoned. This application Jan. 26, 1996, Ser. No. 592,639**

**Int. Cl.[6] A61M** *5/00*

**U.S. Cl. 604—9** **29 Claims**



**1**. A medical device for treating a patient suffering from ascites, including

a valve having a membrane which forms a slit-like opening, said membrane having an aperture therein,

said valve being formed, at least in part, by a pair of plates, which maintain the membrane in tension,

a flexible shell which encloses the valve, said shell having a reservoir and first and second ends, with said first and second ends having openings therein.

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an inlet tube in communication with the valve through the aperture, said inlet tube having an end portion received by the opening at the first end of the shell, and a free end adapted to be inserted into the abdomen of a patient, and

an outlet tube having one end in communication with the reservoir of the shell, said outlet tube having one end portion received by the opening at the second end of the shell and a free end adapted to be insert into the jugular vein of the patient.

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**5,743,870**

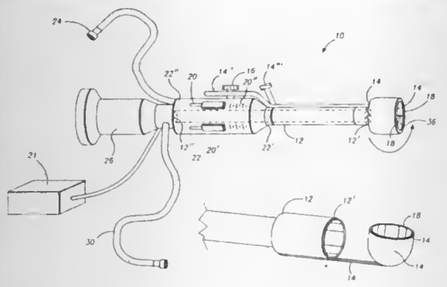
## ABLATION APPARATUS AND SYSTEM FOR REMOVAL OF SOFT PALATE TISSUE

**Stuart D. Edwards, Los Altos, Calif., assignor to Somnus Medical Technologies, Inc., Sunnyvale, Calif.**

**Continuation-in-part of Ser. No. 516,781, Aug. 18, 1995, Pat. No. 5,674,191, which is a continuation-in-part of Ser. No. 239,658, May 9, 1994, Pat. No. 5,456,662. This application May 6, 1996, Ser. No. 643,524**

**Int. Cl.[6] A61B** *17/39*

**U.S. Cl. 604—22** **25 Claims**



1. An ablation apparatus, comprising:

a handpiece including a distal portion and a proximal portion;

an ablation energy delivery device configured to extend from a distal portion of the handpiece into an interior of a selected oral cavity anatomical structure and further configured to be coupled to an energy source, the ablation energy delivery device including a and

a vacuum assisted retainer device coupled to the handpiece distal portion, wherein the vacuum assisted retainer device is configured to be coupled with a vacuum source, and apply a vacuum force to the exterior surface of the oral cavity anatomical structure.

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**5,743,871**

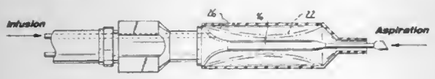
## PHACOEMULSIFICATION HANDPIECE, SLEEVE, AND TIP

**Igor Strukel, and William Banko, both of New York, N.Y., assignors to Surgical Design Corporation, Long Island City, N.Y.**

**Division of Ser. No. 458,409, Jun. 2, 1995. This application Jun. 7, 1996, Ser. No. 660,284**

**Int. Cl.[6] A61M** *1/00*

**U.S. Cl. 604—35** **4 Claims**




1. A surgical instrument for removing a cataract through an incision in an eye, comprising:

irrigation means;

aspiration means;

a handpiece shell;

an infusion sleeve connected to said handpiece shell and connected to said irrigation means, said sleeve having a distal end and a proximal end;

a needle disposed within said sleeve and connected to said aspiration means; and

an elastic membrane disposed radially within at least one of said handpiece shell and at least a portion of said sleeve and radially outside of said needle to define an annular variable volume reservoir chamber disposed between said membrane and said needle to account for a surge of flow in said aspiration means.

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**5,743,872**

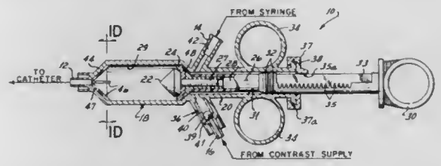
## LIMITED BACKFLOW REFLUX VALVE AND METHOD

**Larry Kelly, Fairfield, Ohio, assignor to Liebel-Flarsheim Company, Cincinnati, Ohio**

**Division of Ser. No. 535,771, Sep. 28, 1995, Pat. No. 5,665,074. This application Apr. 29, 1997, Ser. No. 841,287**

**Int. Cl.[6] A61M** *31/00*

**U.S. Cl. 604—49** **5 Claims**




1. A method of injecting fluid into a patient, comprising the steps of:

providing a limited backflow reflux valve comprising

a housing,

an inlet port in said housing,

an outlet port in said housing,

a bi-directional port in said housing,

a first check valve permitting fluid flow only into said limited backflow reflux valve housing through said inlet port, and

a second check valve permitting fluid flow from said limited backflow reflux valve housing through said outlet port, and permitting only a predetermined limited volume of fluid to backflow through said outlet port and into said limited backflow reflux valve housing, and preventing any further backflow through said outlet port into said limited backflow reflux valve housing beyond said limited volume,

inserting a catheter into a patient and coupling said catheter to said outlet port,

coupling a bulk container of said fluid to said inlet port,

coupling a syringe to said bi-directional port,

driving a piston in said syringe forwardly to force said fluid from said syringe and into said catheter through said limited backflow reflux valve housing, and

driving said piston in reverse in said syringe to initially extravasate said predetermined limited volume of fluid from said catheter into said limited backflow reflux valve housing, and thereafter draw fluid from said bulk container into said syringe,

said driving steps being performed alternately without disconnection or reconnection of said syringe, catheter or bulk container from said limited backflow reflux valve.



**5,743,873**

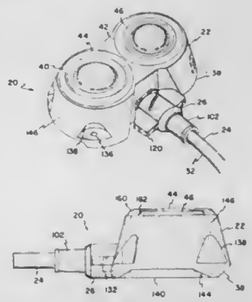
## METHODS FOR USING CATHETER CONNECTORS AND PORTALS, AND METHODS OF ASSEMBLY

**Qingsheng Cai, St. Paul; William L. Beling, New Brighton; Jerald Glantz, Lake Elmo, and Theodore A. Johnson, St. Paul, all of Minn., assignors to SIMS Deltec, Inc., St. Paul, Minn.**

**Division of Ser. No. 184,655, Jan. 21, 1994, Pat. No. 5,562,618. This application Sep. 16, 1996, Ser. No. 716,560**

**Int. Cl.[6] A61M** *11/00*

**U.S. Cl. 604—93** **11 Claims**



1. A method of using a connector comprising the steps of:

providing a base arrangement with a first tube extending therefrom;

positioning an end of a catheter on the first tube;

compressing the end of the catherter against a surface of the base arrangement, the surface positioned to constrain the end of the catheter from outward radial expansion; and

forming the end of the catheter into a thickened wedge shape by compression against the surface, the thickened wedge shape having a wall portion with a thickness greater than the thickness of a catheter wall in the uncompressed state.

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**5,743,874**

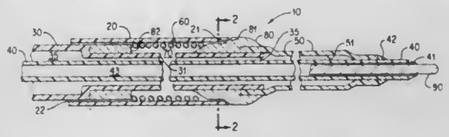
## INTEGRATED CATHETER FOR BALLOON ANGIOPLASTY AND STENT DELIVERY

**Robert E. Fischell, 14600 Viburnum Dr., Dayton, Md. 21036; David R. Fischell, 71 Riverlawn Dr., Fair Haven, N.J. 07704, and Tim A. Fischell, 1018 Chancery La., Nashville, Tenn. 37215**

**Filed Aug. 29, 1994, Ser. No. 298,214**

**Int. Cl.[6] A61M** *29/00*

**U.S. Cl. 604—96** **15 Claims**



1. An integrated catheter for performing a dilatation procedure within a vessel of a human body and for placement of a stent within that region of the vessel that underwent dilatation, the catheter comprising:

a balloon angioplasty center in the form of an elongated tubular member having a proximal end and a distal end and having a non-extensible inflatable balloon and longitudinal length of decreased diameter forming a stent containment cavity both located near the tubular member's distal end;

a self-expanding stent initially located within the stent containment cavity, the stent being operational to automatically expand radially outward at the normal temperature of the human body, the stent containment cavity having a proximal end and a distal end and the balloon having a proximal end and a distal end, the distal end and proximal end of the stent containment cavity each being defined by a surface that extends generally radially outward from the surface of the elongated tubular member;

a slideable outer sheath coaxially placed over the elongated tubular member and adapted to retain the self-expanding stent in its unexpanded state when the outer sheath is advanced to a forward, distal position thus forming a cover over the stent containment cavity, the outer sheath extending distally at least to the radially outward extending surface that defines the stent containment cavity's distal end, and the outer sheath having a proximal pullback means lying outside the human body for pulling the sheath back in a proximal direction to a proximal position so as to uncover the stent containment cavity thus allowing the stent to expand radially outward against the vessel wall, whereby when the sheath is displaced for deployment of said stent a distal end of said slideable outer sheath is positioned proximal said stent; and,

a radiopaque marker band having a proximal surface is located at a stent containment cavity distal end, said proximal surface defining the distal end of said stent containment cavity.

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**5,743,875**

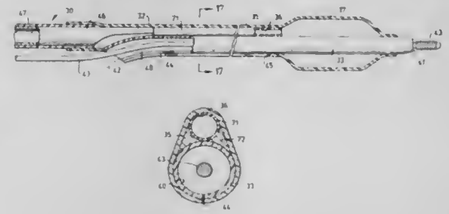
## CATHETER SHAFT WITH AN OBLONG TRANSVERSE CROSS-SECTION

**Motasim M. Sirhan, Sunnyvale; Jovito L. Fernando, Sr., Modesto; Troy L. Thornton, San Francisco, all of Calif.; Patrick K. Campbell, Georgetown, Mass.; Eric Williams, Fairfield, and Lawrence D. Wasicek, Sunnyvale, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.**

**Continuation of Ser. No. 368,794, Jan. 4, 1995, abandoned, which is a continuation-in-part of Ser. No. 250,708, May 27, 1994, abandoned, which is a continuation-in-part of Ser. No. 21,062, Apr. 15, 1993, abandoned, and Ser. No. 192,065, Feb. 4, 1994, Pat. No. 5,496,275, which is a continuation of Ser. No. 95,814, Jul. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 700,617, May 15, 1991, abandoned, and a continuation-in-part of Ser. No. 870,820, Apr. 20, 1992, abandoned. This application Nov. 4, 1996, Ser. No. 742,689**

**Int. Cl.[6] A61M** *29/00*

**U.S. Cl. 604—96** **27 Claims**



1. An elongated dilatation catheter for performing an angioplasty procedure, comprising:

a) an elongated catheter shaft having proximal and distal ends, a guidewire receiving inner lumen extending therein to a distal guidewire port in the distal end of the catheter shaft and an inflation lumen extending therein to an inflation port spaced proximally of the distal end of the catheter shaft;

b) an inflatable dilatation member mounted proximal to the distal end of the catheter shaft for performing an angioplasty procedure which has an interior in fluid communication with the inflation lumen through the inflation port;

c) a flexible distal catheter shaft section which is proximal to the inflatable dilation member, which has a length of at least about 4 cm and which has an oblong transverse shape with a first transverse dimension in a first direction substantially greater than a second transverse dimension in second direction perpendicular to the first direction; and

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d) tubular support member extending within at least a portion of the inflation lumen extending within the distal catheter shaft section.

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**5,743,876**

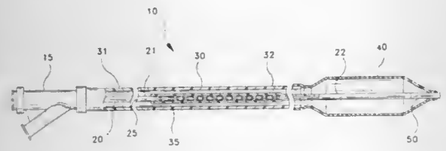
**CATHETER HAVING SHAFT OF VARYING STIFFNESS**

**William J. Swanson, St. Paul, Minn., assignor to Schneider (USA) Inc, Plymouth, Minn.**

**Division of Ser. No. 594,355, Jan. 30, 1996, Pat. No. 5,605,543, which is a continuation of Ser. No. 374,388, Jan. 17, 1995, abandoned, which is a continuation of Ser. No. 209,342, Mar. 10, 1994, abandoned. This application Nov. 7, 1996, Ser. No. 745,073**

**Int. Cl.[6] A61M *29/00***

**U.S. Cl. 604—96** **9 Claims**




1. A catheter comprising:

(a) an inner tube comprising

(i) a proximal section having a cylindrical distal portion, the cylindrical distal portion formed of an uninterrupted wall having a circular and uniform cross-section throughout its length as viewed perpendicular to its longitudinal axis, the cylindrical distal portion having a first flexibility;

(ii) a cylindrical polymeric distal section having a length and a proximal portion, the distal section formed of an uninterrupted wall having a circular and uniform cross-section throughout its entire length as viewed perpendicular to its longitudinal axis, the proximal portion having a second flexibility; and

(iii) a transition section intermediate the proximal section and the distal section, the transition section having one or more openings therein, with the transition section being configured to provide a flexibility which is greater than the first flexibility of the distal portion of the proximal section and which flexibility is less than the second flexibility of the proximal portion of the distal section; and

(b) an outer tube positioned around the inner tube.

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**5,743,877**

**Patent Not Issued For This Number**

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**5,743,878**

**INFUSION PUMP, TREATMENT FLUID BAG THEREFOR, AND METHOD FOR THE USE THEREOF**

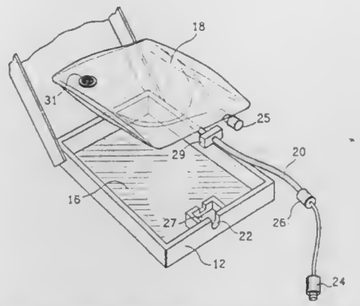
**Stephen O. Ross, Vista, and Mark D. McWilliams, San Diego, both of Calif., assignors to Medication Delivery Devices, Inc., San Diego, Calif.**

**Division of Ser. No. 503,524, Jul. 18, 1995, Pat. No. 5,584,811, which is a continuation of Ser. No. 238,265, May 3, 1994, Pat. No. 5,433,704, which is a division of Ser. No. 970,299, Nov. 2, 1992, Pat. No. 5,308,335, which is a continuation of Ser. No. 720,658, Jun. 19, 1991, Pat. No. 5,207,645. This application Dec. 11, 1995, Ser. No. 570,723**

**Int. Cl.[6] A61M *5/20***

**U.S. Cl. 604—131** **6 Claims**

1. An infusion system including an infusion pump and a removable treatment fluid bag that can be positioned within a containment receptacle of the infusion pump, the infusion pump having an inflatable bladder, an electronic control circuit, and a pressure sensor, the treatment fluid bag including:




(1) a port for introducing fluid into the treatment fluid bag;

(2) an extension set, attached to the treatment fluid bag, for delivering treatment fluid to a patient; and

(3) an activator device for activating the electronic control circuit which controls the expulsion of treatment fluid from the fluid bag, wherein the electronic control circuit controls the expulsion of treatment fluid from the fluid bag by controllably inflating the inflatable bladder against the fluid bag when the bag is positioned within the containment receptacle, and wherein the electronic control circuit is in operative communication with the pressure sensor which is, in turn, in operative communication with the bladder.

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**5,743,879**

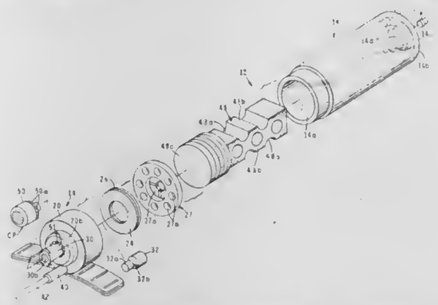
**MEDICAMENT DISPENSER**

**Marshall S. Kriesel, Saint Paul, Minn., assignor to Science Incorporated, Bloomington, Minn.**

**Continuation-in-part of Ser. No. 349,496, Dec. 2, 1994. This application Jun. 6, 1995, Ser. No. 473,650**

**Int. Cl.[6] A61M *37/00***

**U.S. Cl. 604—132** **17 Claims**



1. A dispensing apparatus for dispensing fluids comprising.

(a) a container;

(b) a fluid reservoir disposed within said container, said reservoir having an outlet for permitting fluid flow from said fluid reservoir;

(c) a plunger sealably movable within said reservoir from a first position to a second position;

(d) stored energy means for acting upon said plunger to cause the fluid to controllably flow through said outlet means, said stored energy means comprising a compressively deformable, elastomeric member carried within said reservoir, said compressively deformable elastomeric member being expandable to cause fluid flow from said reservoir; and

(e) fill means operatively associated with said container for filling said reservoir with the fluid to be dispensed and to cause said stored energy means to compressively deform.



**5,743,880**

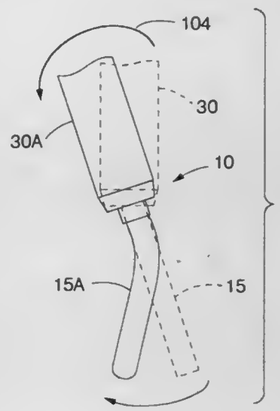
**SIDE LOAD TOLERANT INSTRUMENTS FOR USE IN LAPAROSCOPIC SURGERY**

**Edwin J. Hlavka, Palo Alto, Calif., assignor to Origin Medsystems, Inc., Menlo Park, Calif.**

**Continuation of Ser. No. 994,124, Dec. 21, 1992, abandoned. This application May 31, 1995, Ser. No. 455,293**

**Int. Cl.[6] A61M *27/00***

**U.S. Cl. 604—164** **18 Claims**




1. A side-load tolerant trocar instrument for use in laparoscopic procedures in a body cavity, the instrument comprising:

an outer part, the outer part being elongate and bending lengthways when a lateral bending force is applied thereto, the outer part, when bent lengthways by the lateral bending force, including a laterally-displaced portion, wherein the outer part is straight in the absence of the lateral bending force; and

an inner part, the inner part being an elongate trocar, having a first length, and including a housed portion, the housed portion being part of the first length of the inner part, the housed portion being housed in, and being capable of moving freely axially relative to, the outer part, the housed portion of the inner part having a second length, and being shaped over at least part of the second length to accommodate the laterally-displaced portion of the outer part, wherein the housed portion of the inner part is straight in the absence of the lateral bending force.

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**5,743,881**

**LAPAROSCOPIC SURGICAL INSTRUMENT AND METHOD OF USING SAME**

**Lawrence A. Demco, Calgary, Canada, assignor to Aptec Medical Corporation, Calgary, Canada**

**Filed Nov. 3, 1995, Ser. No. 552,863**

**Int. Cl.[6] A61M *5/00***

**U.S. Cl. 604—164** **16 Claims**

1. A surgical instrument comprising:

a needle suitable for the administration of fluids having a sharpened tip and a bore therethrough;

a member having an end formed as a sharpened tip for insertion through tissue and having a lumen therein for accepting the needle, the lumen being disposed to allow extension of the sharpened tip of the needle from the end formed for insertion through tissue, the needle being slidable within the lumen and the lumen being formed to permit the member to ride along the needle;



a sleeve disposed about the member; and,

a wire sized to pass through the bore of the needle.

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**5,743,882**

**NEEDLE BLUNTING ASSEMBLY FOR USE WITH INTRAVASCULAR INTRODUCERS**

**Ronald B. Luther, Newport Beach, Calif., assignor to Luther Medical Products, Inc., Tustin, Calif.**

**Filed Mar. 8, 1996, Ser. No. 611,323**

**Int. Cl.[6] A61M *5/178***

**U.S. Cl. 604—168** **11 Claims**



1. An intravascular introducer assembly, said assembly comprising:

a tubular introducer sheath having a proximal end, a distal end and a hollow lumen extending longitudinally therethrough;

a needle having a sharpened distal tip and a hollow bore extending longitudinally therethrough, said needle being initially disposed coaxially within the lumen of said introducer sheath such that the sharpened distal tip of the needle protrudes out of and beyond the distal end of said introducer sheath;

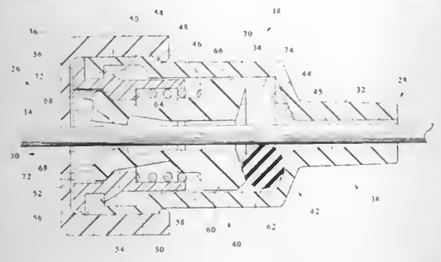
an elongate blunting member having a hollow lumen extending longitudinally therethrough, a closed proximal end, and a blunt distal tip, said elongate blunting member being disposed coaxially within the bore of said needle;

said blunting member being axially moveable from a non-blunting position wherein the blunt distal tip of said blunting member is positioned within the bore of said needle a spaced distance proximal to the sharpened distal tip of said needle, to a distally advanced blunting position wherein the blunt distal tip of said blunting member protrudes out of and beyond the sharpened distal tip of said needle to deter the sharpened distal tip of said needle from causing penetration trauma.

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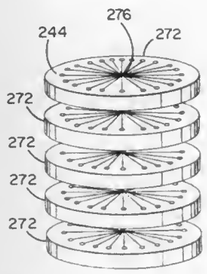
**5,743,883**
**THORACENTESIS CATHETER INSTRUMENTS HAVING SELF-SEALING VALVES**
**Peter L. Visconti, 1453 W. Rosemont Ave., Chicago, Ill. 60660**
**Filed Jun. 7, 1995, Ser. No. 476,690**
**Int. Cl.[6] A61M *5/178***
**U.S. Cl. 604—169** **31 Claims**



1. A valve for use in a thoracentesis device, the valve comprising:
a housing having a first end and defining an opening through the first end;
a plunger movable within the housing from a first plunger position to a second plunger position, the plunger having a plunger portion movable from a first portion position engaged with a catch inside the housing such that the plunger is maintained in the first plunger position to a second portion position which permits the plunger to move to the second plunger position;
a biasing member adjacent the plunger, wherein the biasing member biases the plunger toward the first end; and,
a seal in sealing engagement with the opening when the plunger is in the second plunger position.

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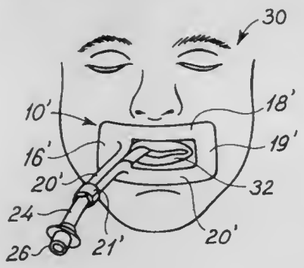
**5,743,884**
**SEALING STRUCTURE FOR MEDICAL INSTRUMENT**
**Harrith M. Hasson, 2043 N. Sedgewick, Chicago, Ill. 60614, and Nick Lakatos, 1625 Elm St., Des Plaines, Ill. 60018**
**Continuation-in-part of Ser. No. 992,495, Dec. 17, 1992, abandoned. This application Jun. 22, 1995, Ser. No. 493,492**
**Int. Cl.[6] A61M *5/178***
**U.S. Cl. 604—169** **27 Claims**



1. A sealing structure for an elongate medical instrument, said sealing structure comprising:
a first sealing member having a first body with oppositely facing first and second surfaces and a peripheral edge;
a second sealing member having a second body with oppositely facing third and fourth surfaces and a peripheral edge; and
a housing having a peripheral wall to surroundingly engage the peripheral edges of the first and second bodies with the first and second sealing members in operative relationship,
said first body having at least a first portion that is compressible and deformable,
said second body having at least a second portion that is compressible and deformable,
there being an opening in the first portion of the first body that has a central axis extends through the first body from the first surface to the second surface,
there being an opening in the second portion of the second body that has a central axis extends through the second body from the third surface to the fourth surface,
the openings in the first and second bodies being expandable to allow the first and second bodies to grippingly engage an elongate medical instrument extended through the openings in the first and second bodies with the first and second sealing members in operative relationship the second surface on the first body facially abutting to the third surface on the second body with the first and second sealing members in operative relationship with the first and second sealing members substantially undeformed along the central axis of the openings in the first and second bodies.

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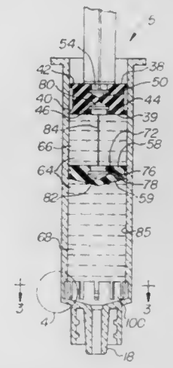
**5,743,885**
**BANDAGE FOR FIXATING AN ORAL, ENDO-TRACHEAL ANAESTHESIA TUBE RELATIVE TO THE MOUTH OF A PERSON AND AN ASSEMBLY FOR FIXATING AN ORAL, ENDO-TRACHEAL ANAESTHESIA TUBE RELATIVE TO THE MOUTH OF A PERSON**
**John Hoerby, Hellerup, Denmark, assignor to Nikomed ApSl, Denmark, Sweden**
**PCT No. PCT/DK95/00012, § 371 Date Sep. 17, 1996, § 102(e) Date Sep. 17, 1996, PCT Pub. No. WO95/18645, PCT Pub. Date Jul. 13, 1995**
**PCT Filed Jan. 6, 1995, Ser. No. 669,429**
**Claims priority, application Denmark, Jan. 6, 1994, 0004/94**
**Int. Cl.[6] A61M *5/32***
**U.S. Cl. 604—180** **57 Claims**



1. A bandage for fixating an oral, endo-tracheal anaesthesia tube relative to a mouth of a person, comprising:
a support sheet of a flexible, substantially non-ductile material defining opposite side surfaces and defining contiguous first and second parts,
said first part being provided with a coating, at one side surface thereof, of a first adhesive exhibiting an ability of adhering to a skin of said person, and being configured so as to allow said first part to be adhered to a cheek of said person adjacent said mouth of said person leaving said mouth unobstructed, and
said second part being provided with a coating, at one side surface thereof, of a second adhesive exhibiting an ability of adhering to said endo-tracheal anaesthesia tube, and being configured so as to allow said second part to be adhered to a segment of said tube extending outwardly from said mouth of said person, wherein
said bandage constitutes a unitary structure, and said first part at least partly encircles said second part.

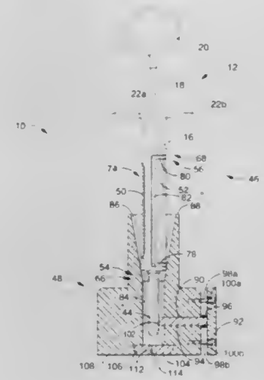


**5,743,886**
**SEQUENTIAL MEDICAL FLUID ASPIRATION AND INJECTION SYSTEM AND METHOD**
**Lawrence A. Lynn, 862 Curleys Ct., Columbus, Ohio 43235, and Mark E. Larkin, Columbus, Ohio, assignors to Lawrence A. Lynn, Columbus, Ohio**
**Continuation of Ser. No. 413,966, Mar. 30, 1995, Pat. No. 5,549,569, which is a division of Ser. No. 196,455, Feb. 15, 1994, abandoned. This application Aug. 20, 1996, Ser. No. 697,085**
**Int. Cl.[6] A61M *5/00***
**U.S. Cl. 604—191** **20 Claims**



1. A syringe for the sequential withdrawal of a first liquid and a second liquid into said syringe and for the subsequent sequential injection of said second liquid and then said first liquid into a patient, the syringe comprising:
a. a barrel having a distal end and an opening in said distal end;
b. a proximal piston moveable along said barrel to define a variable volume chamber intermediate said proximal piston and said distal end;
c. a chamber divider piston for separating said variable volume into primary and secondary reservoirs, said chamber divider piston being moveable along said barrel within said variable volume chamber, said chamber divider piston being positioned adjacent said distal end prior to withdrawal of said first liquid into said syringe;
d. a flow channel along said syringe, said flow channel being capable of providing flow connection between the primary reservoir and the secondary reservoir, said flow channel being in fluid communication with said opening and said secondary reservoir;
e. an element linking said proximal piston and said chamber divider piston so that when said proximal piston is moved away from said chamber divider piston, and said first reservoir is at least partially filled with said first liquid, said chamber divider piston is urged by said element away from said distal end to enlarge said secondary reservoir and to withdraw said second liquid into said secondary reservoir;
wherein said syringe includes a valve, said valve being capable of at least one disabling and enabling flow between said primary reservoir and said secondary reservoir through said flow channel;
wherein said flow channel extends through said divider piston;
wherein said valve comprises a plug carried by said chamber divider piston adjacent said flow channel, said plug being moveable from a first position wherein said flow channel is open to a second position that is a sealing position wherein said flow channel is closed and sealed by said plug.

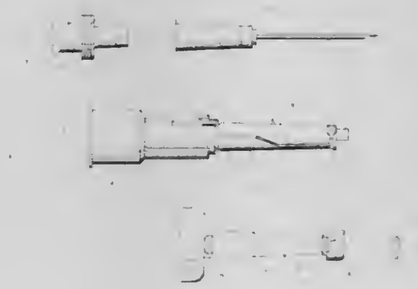
**5,743,887**
**SYRINGE SAFETY SLEEVE ADAPTER APPARATUS**
**Steven J. Brattesani, 2561 Chestnut St., San Francisco, Calif. 94123**
**Filed Jul. 16, 1996, Ser. No. 683,058**
**Int. Cl.[6] A61M *5/00***
**U.S. Cl. 604—192** **17 Claims**



1. A syringe safety sleeve adapter apparatus, comprising:
(a) an inner barrel;
(b) an outer sleeve, said outer sleeve slidable disposed on said inner barrel;
(c) means for reversibly locking said sleeve in an extended position on said barrel;
(d) wherein said outer sleeve slidably moves on said inner barrel between a retracted position and said extended position;
(e) a side-facing opening in said inner barrel and a side-facing opening in said outer sleeve; and
(f) means for coupling said barrel to a syringe device.

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**5,743,888**
**SAFETY NEEDLE**
**Robert D. Wilkes, Galveston, Tex.; Paul S. Turin, Berkeley, Calif.; Robert G. Ullrich, Alameda, Calif., and Brian S. Murray, Oceanside, Calif., assignors to Kaleva Design, San Leandro, Calif.**
**Filed Jul. 26, 1996, Ser. No. 687,842**
**Int. Cl.[6] A61M *5/32***
**U.S. Cl. 604—198** **78 Claims**



1. An improved safety needle, comprising:
a) a needle base, for fixing therein a rigid needle containing a hollow hub at one end, a hollow needle connected thereto and a sharp needle tip at the other end, said base defined by a proximal end and a distal end spaced-apart therefrom;

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b) said distal end of said needle base having formed therethrough a first bore concentric to said needle and carrying said sharp needle tip; and,

c) a cap covering said first bore and rotatably positioned thereover, having formed therethrough a second bore;

d) wherein said cap is rotatable between a first, safe position placing said first and second bores out of alignment and preventing passage of the needle and the sharp needle tip therethrough, and a second, armed position placing said first and second bores in alignment to allow passage of said needle therethrough to expose said sharp needle tip.

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**5,743,889**

**INCREMENTING DOSAGE MECHANISM FOR SYRINGE**

**Bernard Sams, 22 Avondale Avenue, London, Great Britain, N12 8EJ**

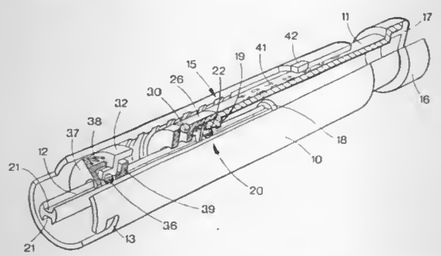
**PCT No. PCT/GB93/02593, § 371 Date Jun. 7, 1995, § 102(e) Date Jun. 7, 1995, PCT Pub. No. WO94/15120, PCT Pub. Date Jul. 7, 1994**

**PCT Filed Dec. 17, 1993, Ser. No. 464,839**

**Claims priority, application United Kingdom, Dec. 18, 1992, 9226423**

**Int. Cl.[6] A61M** *5/00*

**U.S. Cl. 604—211** **23 Claims**



1. An incrementing mechanism comprising an outer tubular body having a central axis, an elongate element mounted in the outer tubular body for incremental axial movement on operation of the mechanism in one direction relative to the outer tubular body, a driving member slidably mounted in the outer tubular body for axial sliding movement in the one direction and in another direction opposite to the one direction and arranged for relative turning movement with respect to the element, an end stop connected to the outer tubular body to limit the axial sliding movement of the driving member in the one direction, control means associated with the driving member to selectively control movement of the driving member in the other direction dependent upon the required amount of incremental axial movement of said element in said one direction, automatic one-way clutch means including first and second opposed surfaces on the driving member and on the element, respectively, there being a gap between the surfaces which reduces in said other direction, the clutch means further comprising a clutch member movable in the gap between an unlocked position wherein the clutch member is disengaged from at least one of the surfaces to permit relative axial sliding movement between the driving member and the element when the driving member is moved in said other direction, and a locked position wherein the clutch member contacts both surfaces to connect the driving member to the element for simultaneous movement of the driving member and the element when the driving member is moved in said one direction, and resisting means acting on said element for resisting movement thereof in said other direction, the clutch member being disengaged from the at least one surface upon relative rotation of the driving member and element.

**5,743,890**

**PISTONS FOR INJECTION CARTRIDGES**

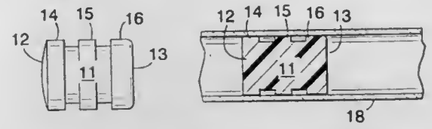
**Birger Hjertman, Hässelby, and Olle Ljungquist, Täby, both of Sweden, assignors to Pharmacia & Upjohn Aktiebolag, Stockholm, Sweden**

**Continuation of Ser. No. 505,254, Oct. 12, 1995, abandoned. This application Jul. 22, 1997, Ser. No. 898,239**

**Claims priority, application Sweden, Feb. 17, 1993, 9300525**

**Int. Cl.[6] A61M** *5/315*

**U.S. Cl. 604—218** **17 Claims**



1. In a liquid displacement arrangement comprising a barrel having at least a section which has an essentially cylindrical shape and at least one piston of resilient material wherein said at least one piston has:

a) a substantially cylindrical mantle surface or circumferential ridges, and

b) at least one end surface substantially transversal to the cylindrical mantle surface or circumferential ridges, and the barrel surrounding the piston having a barrel interior surface in contact with the mantle surface or circumferential ridges,

the improvement comprising that the piston end surface is deformation corrected.

i) in that said end surface has a convex shape under unstressed conditions for the piston resilient material, and

ii) in that the degree of end surface convexity under unstressed conditions is adapted to give an essentially planar end surface shape under conditions of mantle surface constriction or circumferential ridges constriction, and that the barrel internal diameter and the piston external diameter are adapted to provide said conditions of constriction.

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**5,743,891**

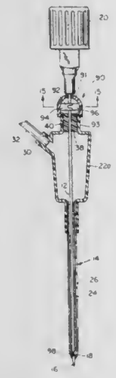
**SUBCUTANEOUS SAFETY CATHETER ASSEMBLY**

**M. Joshua Tolkoff, Brookline, and Fernando Alvarez de Toledo, Concord, both of Mass., assignors to ACT Medical, Inc., Newton, Mass.**

**Filed Oct. 25, 1996, Ser. No. 738,003**

**Int. Cl.[6] A61M** *25/00*

**U.S. Cl. 604—282** **9 Claims**



1. A subcutaneous safety catheter assembly comprising:

a flexible catheter having an inner wall including a hollow stiffening member which is stiff in the longitudinal direction and flexible laterally;



a needle having a sharp point at one end and a grip at the other end adapted to being disposed in said hollow stiffening member with the sharp point extending beyond the distal end of said member; and

needle guard means at the proximal end of said catheter for securely engaging said needle and shielding the sharp point of said needle automatically upon and after its withdrawal from said catheter.

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**5,743,892**

**DUAL FOAM CONNECTION SYSTEM FOR PERITONEAL DIALYSIS AND DUAL FOAM DISINFECTANT SYSTEM**

**Eric P. Loh, Park Ridge, Ill.; Randy Murphey, Kenosha, Wis.; Robin Peters, McHenry, Ill.; Scott D. Edwards, Libertyville, Ill.; Rafael A. Castellanos, Roselle, Ill., and Ying-Cheng Lo, Green Oaks, Ill., assignors to Baxter International Inc., Deerfield, Ill.**

**Filed Mar. 27, 1996, Ser. No. 622,969**

**Int. Cl.[6] A61M** *25/00*

**U.S. Cl. 604—283** **19 Claims**



1. A connector system for enabling fluid flow, the system comprising:

a first housing having a first fluid pathway;

a second housing having a second fluid pathway; and

a ring having an opening, disposed within the second fluid pathway, the ring including a first section having absorbent properties and a second section having wiping properties, the first section containing a disinfectant.

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**5,743,893**

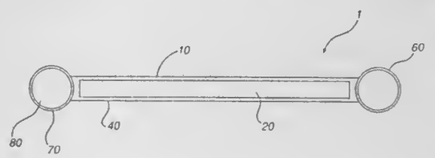
**DEVICE FOR COLLECTION OF VAGINAL DISCHARGE**

**Irvin M. Kalb, 113 Seagull La., Sarasota, Fla. 34236**

**Filed Oct. 2, 1996, Ser. No. 708,000**

**Int. Cl.[6] A61M** *1/00*

**U.S. Cl. 604—317** **8 Claims**



1. A device for the collection of vaginal discharge, the device comprising:

a. a first layer, the first layer adapted to allow passage of fluid therethrough while substantially preventing the passage of tissue and blood cells therethrough,

b. a rim attached to the perimeter of the first layer, the rim being sufficiently resilient to provide an outward resilient force suitable to maintain the device in position within a user's vaginal canal during use,

c. a second layer attached at the perimeter of the second layer to the rim, the second layer adapted to substantially prevent the passage of fluid therethrough, and

d. a fluid retention layer positioned between the first layer and the second layer, the fluid retention layer being suitable for retaining fluid passed through the first layer.

**5,743,894**

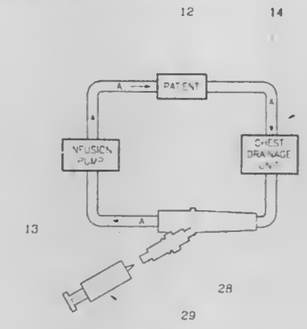
**SPIKE PORT WITH INTEGRATED TWO WAY VALVE ACCESS**

**David Rork Swisher, Maryland Heights, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.**

**Filed Jun. 7, 1995, Ser. No. 481,237**

**Int. Cl.[6] A61M** *1/00*

**U.S. Cl. 604—320** **6 Claims**




1. In combination, a two-way valve and drainage unit for liquid priming, sampling, flushing and injecting fluid into a fluid collection system, comprising:

a valve connector having a distal opening, proximal opening, access opening, and an interior chamber, a first tube being attached to said distal opening and a second tube being attached to said proximal opening;

the two-way valve having a distal end and proximal end, said distal end forming a receptacle for receiving a liquid sampling, flushing and injecting device, said proximal end being disposed within said connector and in fluid flow communication with said interior chamber;

a pump attached to said second tube, said second tube being interposed between said pump and said connector;

a drainage unit having a fluid collection chamber, said drainage unit being attached to said first tube, said first tube being interposed between said drainage unit and said connector,

whereby said first tube carries fluid from said drainage unit to said connector and said second tube carries fluid from said connector to said pump.

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**5,743,895**

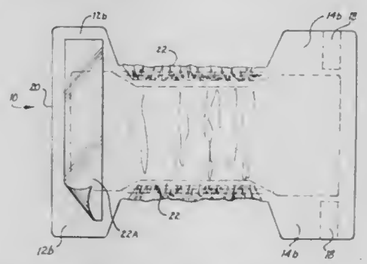
**DISPOSABLE DIAPER AND METHOD THEREFOR**

**Edward Reiss, and Brenda J. Schenk, both of Westport, Conn., assignors to RMED International, Inc., Westport, Conn.**

**Filed Jan. 26, 1996, Ser. No. 592,108**

**Int. Cl.[6] A61F** *13/15;13/20*

**U.S. Cl. 604—377** **13 Claims**



1. A disposable diaper comprising, in combination:

a multi-layered diaper assembly comprising:

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a first top surface exterior layer assembly comprising a non-woven material having a planar, soft, cloth-like surface layer and an underlying thin, liquid impermeable plastic sheet, said non-woven material surface layer being in bonded contact with said thin plastic sheet on a top surface portion thereof;

a second layer consisting solely of a blended mixture of wood pulp and cotton pulp having a substantially higher liquid urine absorption than wood pulp and located below a bottom surface of said underlying thin plastic sheet;

a third layer comprising a thin, planar layer of tissue paper having a top surface portion in contact with a bottom surface portion of said second layer; and

a fourth bottom surface interior layer in contact with a bottom surface portion of said third layer and comprising a non-woven liquid permeable material having a planar, soft, cloth-like body contact surface portion.

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**5,743,896**

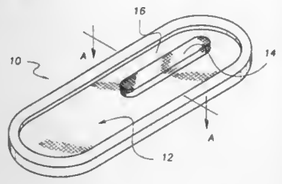
**SANITARY NAPKIN HAVING A PROTRUSION INSERTABLE INTO THE POSTERIOR RUGAE OF THE BUTTOCKS**

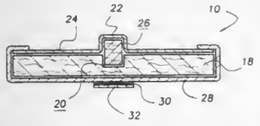
**Beverly Marie Parker, 4414 Townsend, Detroit, Mich. 48214**

**Filed Dec. 7, 1995, Ser. No. 568,651**

**Int. Cl.[6] A61F** *13/15;13/20*

**U.S. Cl. 604—385.1** **2 Claims**




1. A sanitary napkin having a protrusion insertable into the posterior rugae between the buttocks of a wearer, said sanitary napkin comprising:

an absorbent padding member including a protruding pad portion that extends from a substantially planar side thereof, said protruding pad portion extending from said planar side along a length of said absorbent padding member equal to at least one-half the length of said absorbent pad member, said absorbent padding member including a first padding section having a first section perimeter and a first section length, said first padding section including a first substantially planar surface and a second substantially planar surface, said second surface having a channel of a first channel depth of two-fifths of an inch, a first channel width of one-half, and a first channel length measuring at least one-half said first section length of said first padding section and a linear length of two and three-quarters inches, that is formed along a longitudinal axis of said first padding section extending from a rear portion of said first padding section beginning one-half inch from a rear end of said first padding section past at least a center point of said first padding section, and a second padding section having a second section length that is less than said first channel length, a second section width that is less than said first channel width, and a thickness at least twice as great as said first channel depth in a manner such that an extending portion of said second padding section extends away from said second surface of said first padding section and forms said protruding portion;

a screen barrier including a protruding screen portion having a screen channel formed therein, said screen barrier having a screen perimeter corresponding to said perimeter of said first padding section and a screen channel formed within said screen barrier at a location allowing extending portion of said second padding section to be entirely disposed within said screen channel when said screen barrier is placed over said second surface of said first padding section; and

a liquid impermeable member secured around a perimeter of said screen barrier in a manner such that said absorbent padding member is secured within a chamber formed between said screen barrier and said liquid impermeable member when said protruding pad portion is disposed within said screen channel, an exterior surface of said liquid impermeable barrier that covers said first padding surface having a layer of adhesive disposed thereon covered with a removable cover member.

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**5,743,897**

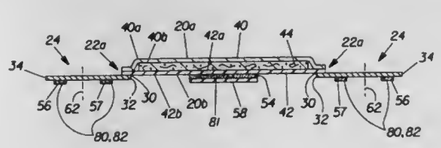
**ABSORBENT ARTICLE HAVING A SELF RELEASABLE ADHESIVE SECUREMENT MEANS**

**Kaoru Niihara, Ashiya, Japan; Charles John Berg, Jr., Cincinnati, and Bruce William Lavash, West Chester, both of Ohio, assignors to The Procter and Gamble Company, Cincinnati, Ohio**

**Continuation of Ser. No. 991,912, Dec. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 769,891, Oct. 1, 1991, Ser. No. 832,246, Feb. 7, 1992, Ser. No. 906,593, Jun. 30, 1992, abandoned, Ser. No. 906,629, Jun. 30, 1992, Pat. No. 5,281,209, and Ser. No. 42,840, Apr. 5, 1993, Pat. No. 5,354,400, which is a continuation of Ser. No. 769,607, Oct. 1, 1991, abandoned. This application Dec. 15, 1994, Ser. No. 358,043**

**Int. Cl.[6] A61F** *13/15*

**U.S. Cl. 604—389** **17 Claims**




1. An absorbent article having a garment side, a body-facing side, and at least one flap, said absorbent article comprising:

a main body portion comprising an absorbent assembly and a longitudinal centerline which divides said main body portion into a first longitudinal half and a second longitudinal half;

a first flap joined to the first longitudinal half of said main body portion at a line of juncture, said first flap comprising flap material, said first flap having a proximal edge substantially adjacent the line of juncture, a distal edge disposed away from the line of juncture, and an adhesive patch joined to said flap material, said adhesive patch comprising a first half and a second half removably secured to said first half, said first half comprising an adhesive and said second half comprising an adhesive which is releasably separable from the adhesive of said first half wherein after separation, the adhesive of the first and second halves remains substantially capable of attachment and said underlying flap material to which said first half and said second half are joined and is substantially undeformed by separating said first half and said second half of said adhesive patch from each other wherein when said first flap is folded, said distal edge of said first flap is spaced farther laterally outward from the longitudinal centerline of said absorbent article than any other portion of said absorbent article so that said distal edge forms a graspable tab for use in unfolding said flap.



**5,743,898**

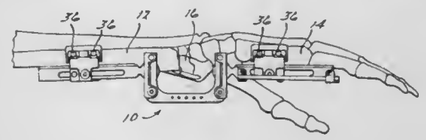
**METHOD AND APPARATUS FOR EXTERNAL FIXATION OF SMALL BONES**

**Kirk Jay Bailey, Andover; Sean P. Curry, Hoboken, and John Scott Mahaffey, Hackettstown, all of N.J., assignors to Electro-Biology, Inc., Parsippany, N.J.**

**Continuation-in-part of Ser. No. 439,696, May 12, 1995, Pat. No. 5,620,442. This application May 9, 1996, Ser. No. 647,096**

**Int. Cl.[6] A61B** *17/60*

**U.S. Cl. 606—54** **16 Claims**




1. A method for securing a first bone portion in a fixed relationship to a second portion by a first bone screw connected to the first bone portion and a second bone screw connected to the second bone portion, the method comprising the steps of:

forming a first clamping member having a spherical portion;

forming a second clamping member having a spherical portion;

interconnecting said spherical portion of said first clamping member and said spherical portion of said second clamping member through a cantilevered motion;

connecting the first bone screw to said first clamping member;

connecting the second bone screw to said second clamping member;

defining a radiographic window extending directly between said spherical portion of said first clamping portion and said spherical portion of said second clamping portion to permit radiographic examination of the fixed relationship of the first and second bone portions; and

longitudinally advancing the first bone screw relative to said spherical portion of said first clamping member.

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**5,743,899**

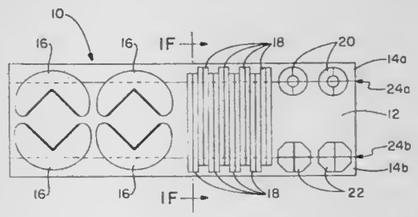
**METHOD AND APPARATUS FOR MARKING SKIN WITH INK**

**Eva S. Zinreich, Owings Mills, Md., assignor to IZI Medical Products, Owing Mills, Md.**

**Filed Mar. 4, 1997, Ser. No. 764,325**

**Int. Cl.[6] A61B** *17/00*

**U.S. Cl. 606—1** **18 Claims**




1. A device for marking skin surfaces comprising:

a substrate having a first and second surface;

an adhesive layer disposed on said second surface;

a first ink layer disposed on said adhesive layer, said first ink layer defining a pattern which is transferable onto said skin surface when placed in contact with said skin surface; and

a backing liner removably covering said adhesive layer and said first ink layer;

whereby said pattern may be subsequently and selectively removed from said skin surface.

**5,743,900**

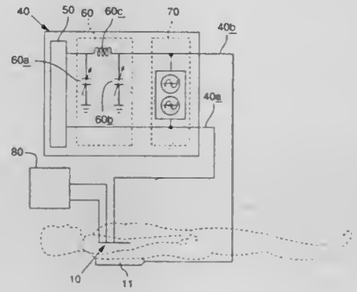
**HOT TIP CATHETER AND METHOD FOR USING THE SAME**

**Shinji Hara, Tokyo, Japan, assignor to Sun Star Technology, Inc., Paradise Valley, Ariz.**

**Filed Jun. 6, 1995, Ser. No. 467,036**

**Int. Cl.[6] A61B** *17/36*

**U.S. Cl. 606—7** **18 Claims**




1. A catheter for the capacitative-heating treatment of a stenosis in a bodily fluid passageway comprising:

a controller including a generator for generating radio frequency energy along a pair of output lines, the generator having an output impedance at the output lines the energy at one of the output lines having a phase relative to the other output line, the controller monitoring the phase of the radio frequency energy along the output lines and adjusting the output impedance thereof;

a catheter body operatively connected to the controller having a lumen defining an opening, and wherein the catheter body is insertable into the bodily passageway;

a mandril disposed within the lumen having a terminal end which extends through the opening, and another end operatively connected to one of the output lines for receiving the radio opening, and another end operatively connected to one of the output lines for receiving the radio frequency energy and delivering such energy to the terminal end;

an internal electrode joined to the mandril's terminal end for receiving radio frequency energy; and

an external electrode outside of the catheter connected to the other output line for permitting the capacitative heating of a stenosis.

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**5,743,901**

**HIGH FLUENCE DIODE LASER DEVICE AND METHOD FOR THE FABRICATION AND USE THEREOF**

**Robert E. Grove, Pleasanton, and James Z. Holtz, Livermore, both of Calif., assignors to Star Medical Technologies, Inc., Pleasanton, Calif.**

**Filed May 15, 1996, Ser. No. 648,212**

**Int. Cl.[6] A61N** *5/06*

**U.S. Cl. 606—9** **19 Claims**

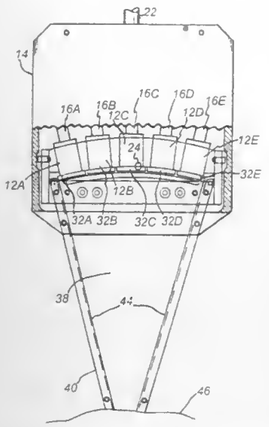
1. A high fluence diode laser device comprising:

at least one diode laser array, each array having a plurality of diode laser bars, which bars are separated by spacers formed of a material having both high thermal conductivity and high thermal capacity, said bars being spaced by the spacers by an amount adequate to avoid significant thermal interaction between bars;

an optical array mounted to receive light energy from the diode bars and to reduce the divergence of light energy outputted therefrom; and

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a non-imaging condenser mounted to receive light energy passing through the optical array and to channel such energy to a smaller area for increased fluence.

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**5,743,902**

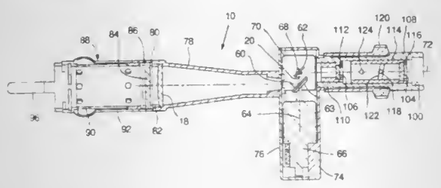
**HAND-HELD LASER SCANNER**

**David Trost, San Francisco, Calif., assignor to Coherent, Inc., Palo Alto, Calif.**

**Filed Jan. 23, 1995. Ser. No. 377,131**

**Int. Cl.[6] A61B** *17/36*

**U.S. Cl. 606—18** **18 Claims**




1 A surgical handpiece for connection to a laser that generates a laser beam, wherein the handpiece scans the laser beam onto a target tissue, the handpiece comprising:

a housing having an input end and an output end;

a scanning mirror means mounted in the housing for reflecting a laser beam entering the housing input end; and

a lens mounted in the housing onto which the scanning mirror means reflects the laser beam and through which the laser beam is refracted through the housing output end and onto the target tissue, wherein the lens has a focal length and the scanning mirror means is located at a distance from the lens that is substantially equal to the focal length so that any variation in the size of a pattern projected onto the target tissue is minimal as the spacing between the housing and the target tissue is varied.

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**5,743,903**

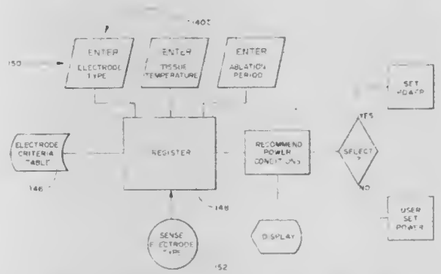
**CARDIAC ABLATION SYSTEMS AND METHODS USING TISSUE TEMPERATURE MONITORING AND CONTROL**

**Roger A. Stern, Cupertino, and Jerome Jackson, Sunnyvale, both of Calif., assignors to EP Technologies, Inc., San Jose, Calif.**

**Continuation of Ser. No. 564,928, Nov. 30, 1995, abandoned, which is a continuation of Ser. No. 285,890, Aug. 4, 1994, abandoned, which is a continuation of Ser. No. 975,372, Nov. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 790,578, Nov. 8, 1991, abandoned. This application Aug. 12, 1996, Ser. No. 689,772**

**Int. Cl.[6] A61B** *17/39*

**U.S. Cl. 606—31** **22 Claims**




1. A system for supplying energy to ablate tissue within a heart, the system comprising

a catheter including a body carrying an electrode element for contacting tissue while emitting energy to ablate the tissue, the electrode element having an alpha or numeric identification relating to a predetermined operating characteristic,

a temperature sensing element carried by the electrode element for contact with tissue,

an apparatus operatively coupled to the catheter to conduct ablating energy to the electrode element, the apparatus including

an input to receive the alpha or numeric identification of the electrode element,

a first processing element coupled to the input that generates a first control signal based upon the alpha or numeric identification of the electrode element received by the input,

a second processing element coupled to the temperature sensing element that registers the temperature of the tissue contacting the temperature sensing element including means for deriving deviation between the temperature and a selected temperature and for generating a second signal based upon the deviation, and

a control element coupled to the first and second processing elements that increases or decreases the ablating energy conducted to the electrode element in response to both the first and second control signals.

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**5,743,904**

**PRECISION PLACEMENT OF ABLATION APPARATUS**

**Stuart D. Edwards, Portola Valley, Calif., assignor to Somnus Medical Technologies, Inc., Sunnyvale, Calif.**

**Continuation-in-part of Ser. No. 651,800, May 22, 1996, and Ser. No. 651,378, May 22, 1996, and Ser. No. 643,203, May 6, 1996, Pat. No. 5,718,702, and Ser. No. 643,524, May 6, 1996, and Ser. No. 651,796, May 22, 1996, and Ser. No. 651,798, May 22, 1996. This application Jun. 7, 1996, Ser. No. 660,539**

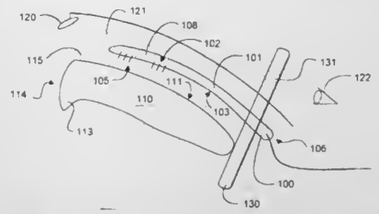
**Int. Cl.[6] A61B** *17/36*

**U.S. Cl. 606—32** **6 Claims**

1. A system for positioning a distal end of an ablation catheter at a desired position within an oral cavity of a patient comprising:

a baseplate shaped to be immobilized relative to teeth of the patient, the baseplate including a slot through which the catheter can be introduced into the oral cavity;






an ablation catheter inserted passed through the slot adapted to be passed into the oral cavity; and

a position indicator for indicating the position of the catheter distal end within the oral cavity based on a relative position of the catheter distal end to the baseplate.

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**5,743,905**

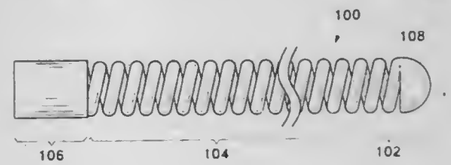
**PARTIALLY INSULATED OCCLUSION DEVICE**

**Joseph Eder, Los Altos; Guido Guglielmi, Santa Monica, and Cheng Ji, Los Angeles, all of Calif., assignors to Target Therapeutics, Inc., Fremont, Calif.**

**Continuation of Ser. No. 591,821, Jan. 25, 1996, abandoned, which is a continuation of Ser. No. 499,428, Jul. 7, 1995, abandoned. This application Feb. 27, 1996, Ser. No. 607,592**

**Int. Cl.[6] A61B** *17/38*

**U.S. Cl. 606—32** **10 Claims**




6. An occluding device comprising an elongated tubular braided body member having a proximal end and a distal end and a body length between said proximal and distal ends, a detachable joint attached to said body member proximal end capable of conducting an electrical current through said joint to said body member, wherein said body member is comprised of at least a proximal conductive region comprising a conductive material and a distal insulated region having a length between about 5 and 25% of the body length.

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**5,743,906**

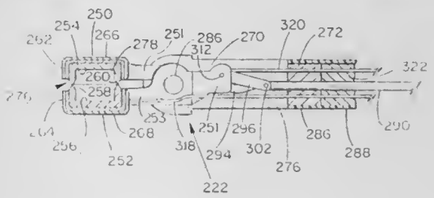
**ENDOSCOPIC BIPOLAR BIOPSY FORCEPS**

**David J. Parins, Corcoran, and Richard Keith Poppe, Minneapolis, both of Minn., assignors to Everest Medical Corporation, Minneapolis, Minn.**

**Division of Ser. No. 375,953, Jan. 20, 1995, Pat. No. 5,603,711. This application Sep. 12, 1996, Ser. No. 713,168**

**Int. Cl.[6] A61B** *17/39;10/00*

**U.S. Cl. 606—51** **20 Claims**




1. A bipolar biopsy device comprising:

(a) a bipolar biopsy jaw arrangement having a first and second jaw member, said first jaw member is pivotable in relation to the second jaw member, a first tissue specimen collecting receptacle on a distal end of said first jaw member and a second tissue specimen collecting receptacle on a distal end of said second jaw member and a cutting edge on said first tissue specimen collecting receptacle;

(b) first conductive coating on said first tissue specimen collecting receptacle and a second conductive coating on said second tissue specimen collecting receptacle;

(c) a spacing means for electrically isolating said conductive coatings from said first and second tissue specimen collecting receptacles; and

(d) means to supply a voltage across said conductive coatings.

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**5,743,907**

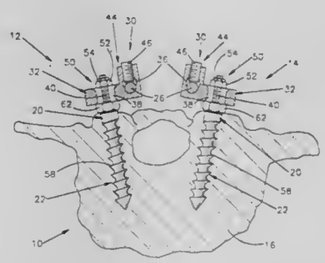
**SPINAL COLUMN RETAINING METHOD AND APPARATUS**

**Marc A. Asher, Leawood, Kans.; Walter E. Stripggen, Golden, Colo.; Charles F. Heinig, Ware Neck, Va., and William L. Carson, Columbia, Mo., assignors to AcroMed Corporation, Cleveland, Ohio**

**Continuation of Ser. No. 839,243, Feb. 20, 1992, Pat. No. 5,312,404, which is a continuation-in-part of Ser. No. 557,587, Jul. 24, 1990, Pat. No. 5,129,900. This application Feb. 9, 1994, Ser. No. 193,945**

**Int. Cl.[6] A61B** *17/70*

**U.S. Cl. 606—61** **22 Claims**




1. An apparatus for use internally in a human body in retaining spinal elements in a desired spatial relationship in a spinal column, said apparatus comprising:

an elongate member having a longitudinal axis and a first end portion extending along the longitudinal axis for receipt in an opening in a spinal element in a spinal column;

a longitudinal rod which is positionable along the spinal column laterally from a line containing the longitudinal axis of said elongate member;

a connector member for connecting said elongate member and said longitudinal rod, said connector member having a portion with an opening therethrough, said opening having a length greater than its width and the length of said opening extending transverse to said longitudinal rod when said connector member connects said elongate member and said longitudinal rod;

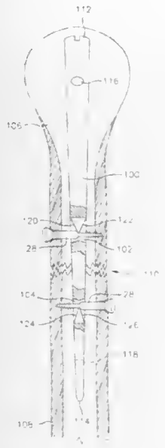
first fastener means for securing said rod to said connector member;

second fastener means for securing said elongate member to said connector member, said second fastener means comprising a nut and a second threaded end portion fixedly connected to said elongate member and extending along said longitudinal axis and on which said nut is threaded, said second threaded end portion extending through said opening through said connector member and being of a dimension less than the length of said opening enabling adjustment of said rod toward or away from said elongate member.

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**5,743,908**
**BI-DIRECTIONAL BI-POSITIONAL UNIVERSAL DYNAMIC COMPRESSION DEVICE**
**Andrew C. Kim, 30213 Del Rey Rd., Temecula, Calif. 92591**
**Continuation-in-part of Ser. No. 674,784, Jul. 3, 1996, which is a continuation-in-part of Ser. No. 618,366, Mar. 19, 1996, Pat. No. 5,658,288. This application Apr. 9, 1997, Ser. No. 835,612**
**Int. Cl.[6] A61B *17/72***
**U.S. Cl. 606—64** **18 Claims**

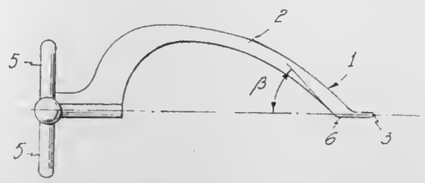


1. A compression interlocking system for stabilizing long bone fractures, comprising:
elongated intramedullary rod means having a proximal end, a distal end and a longitudinal axis, said rod means adapted for extending within a bore generally parallel to a longitudinal axis of a long bone from a proximal end of the bone to beyond a fracture of the bone;
first means for fixing said proximal end to a first portion of a bone having a fracture;
second means for fixing said distal end to a second portion of the bone having the fracture; and
compression means associated with one of said first and second means for fixing and comprising cam means accessible from at least one side of said rod and a lag screw having shoulder means for engaging said cam means for moving one of said first and second portion of the bone toward the other of said first and second portion of the bone for applying compression to the fracture.

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**5,743,909**
**RADIOLOGICAL METHOD FOR PREOPERATIVE DETERMINATION OF ISOMETRIC ATTACHMENT POINTS OF AN ACL GRAFT, SURGICAL AIMING INSTRUMENT AND METHOD OF USE**
**Michel Collette, Avenue des 14 Bonniers 28, B-1325 Dion-Valmont, Belgium**
**Filed Jun. 24, 1996, Ser. No. 668,832**
**Int. Cl.[6] A61B *17/17***
**U.S. Cl. 606—88** **5 Claims**

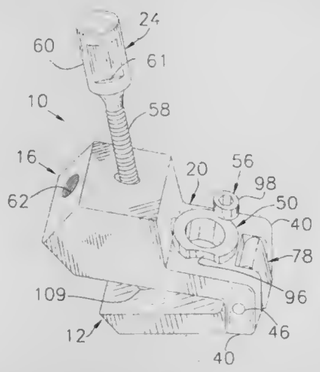
1. A surgical instrument for aligning and guiding a piercing tool creating a tunnel through a tibia associated with a knee joint, the tunnel having an axis aligned with two predefined points of the knee joint, the knee joint having an associated intra-articulary space, the instrument comprising:
a first member for insertion into the intra-articulary space of the knee joint, the first member including a tip disposed at its



distal end for locating the instrument relative to a first one of said predefined points, the first predefined point being disposed in a region located between the condyles of a femur associated with the knee joint;
means for positioning the instrument relative to a second one of said predefined points;
a second member disposed in line with said first member along the axis of the tunnel to be pierced, the second member being adapted to receive and guide the piercing tool; and,
an arm connecting the first and the second members;
with the axis of the tunnel to be pierced and wherein said tip is pointed towards said distal with the axis of the tunnel to be pierced and wherein said tip is pointed towards said distal end of said instrument.

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**5,743,910**
**ORTHOPEDIC PROSTHESIS REMOVAL INSTRUMENT**
**F. Barry Bays, Clearwater; Randall D. Ross, and Stephen M. Vajda, both of Largo, all of Fla., assignors to Xomed Surgical Products, Inc., Jacksonville, Fla.**
**Filed Nov. 14, 1996, Ser. No. 751,015**
**Int. Cl.[6] A61B *17/56*; A61F *5/04***
**U.S. Cl. 606—99** **17 Claims**



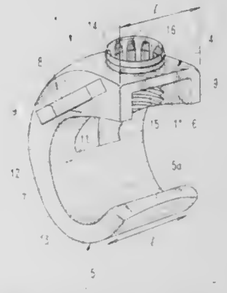
1. An instrument for extracting an orthopedic prosthesis having an elongated shank implanted in bone and defining a first longitudinal axis and a tapered stem projecting from the shank and defining a second longitudinal axis oriented at an oblique angle relative to the first axis, said instrument comprising
a lower jaw defining a first opening for receiving the tapered stem;
an upper jaw pivotally connected to said lower jaw and defining a second opening in opposed relation to said first opening; and
pivot means for forcing said upper and lower jaws to pivot apart so that, when the tapered stem is received in said first and second openings, at least one of said first and second openings is caused to tilt relative to the second longitudinal axis such that diagonally opposed inside surfaces of said tilted opening contact the tapered stem of the prosthesis at longitudinally spaced locations to secure said instrument to the tapered stem so that an extraction tool can be attached to the instrument



and used to exert an extraction force substantially parallel to the first longitudinal axis of the prosthesis.

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**5,743,911**
**FIXING DEVICE FOR A RIGID TRANSVERSE CONNECTION DEVICE BETWEEN RODS OF A SPINAL OSTEOSYNTHESIS SYSTEM**
**Yves P. Cotrel, Paris, France, assignor to Sofamor S.N.C., Rang-du-Fliers, France**
**Continuation of Ser. No. 210,890, Mar. 18, 1994, Pat. No. 5,601,552. This application Aug. 1, 1996, Ser. No. 690,811**
**Int. Cl.[6] A61B *17/70***
**U.S. Cl. 606—61** **22 Claims**



1. A fixing hook for interconnecting a rod of a spinal osteosynthesis system with a rigid transverse bar, said hook comprising:
a body;
a passage in said body for receiving the bar, said passage having a height at least equal to a thickness of the bar and extending throughout a length of said body, said passage freely opening at a first end and at a second end and terminating in an aperture at said first end, said aperture having a height exceeding the thickness of the bar; and
a curved strip portion extending from said body for receiving the rod therein, said aperture being provided in a connection region between said body and said strip portion;
wherein said passage defines a pair of edge portions in said body so shaped as to define a pair of ramps inclined toward said curved strip portion and configured for sliding engagement by the rod to facilitate putting the rod in position within said curved strip portion.

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**5,743,912**
**UPPER FEMORAL EPIPHYSIS OSTEOSYNTHESIS IMPLANT**
**Michel Lahille, Vauhallan; Philippe Cottin, Saint Remy Les Chevreuse; Christian Maresca, Marseilles, all of France, and Toshio Yamaguchi, Kobe, Japan, assignors to Biomat, Saclay, France**
**Filed Aug. 14, 1996, Ser. No. 696,519**
**Claims priority, application France, Aug. 23, 1995, 95 10076**
**Int. Cl.[6] A61B *17/76***
**U.S. Cl. 606—65** **12 Claims**

1. An implant for osteosynthesis of a fracture between first bone fragment and a second bone fragment, comprising:
(a) an elongate implant body having a proximal end and a distal end, said implant body containing a longitudinal conduit extending from an opening in said proximal end toward said distal end, said body also containing a plurality of longitudinally spaced through openings extending radially outwardly from said conduit, said body proximal end being adapted for insertion within alined bores formed in the first and second bone fragments on opposite sides of the fracture; and
(b) first self-tapping means arranged at one end of said body for connecting said body one end with the associated bone fragment.

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**5,743,913**
**READILY EXPANSIBLE BONE FIXATION PLATE**
**Tadeusz Z. Wellisz, 536 S. Rimpau Blvd., Los Angeles, Calif. 90020**
**Filed Apr. 2, 1997, Ser. No. 831,907**
**Int. Cl.[6] A61B *17/80***
**U.S. Cl. 606—69** **11 Claims**



1. A surgical connector comprising:
a) grid plate having multiple openings therethrough,
b) said plate having multiple nodes distributed over the plate area,
c) the plate defining multiple curved ribs interconnecting said nodes,
d) there being at least three curved ribs connected to each node,
e) said openings defined between said ribs, said openings having elongate dumb bell configuration, with narrow intermediate zones and enlarged end zones,
f) the plate forming elongated tabs located at different sides of the plate, each tab connected to multiple of said ribs, each tab having length exceeding the length of each said elongate dumb bell configuration, each tab having width throughout its length exceeding the widths of the ribs to which it is connected.

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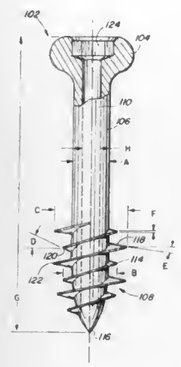


5,743,914

## BONE SCREW

Jeffry B. Skiba, 4614 E. Thistle Landing Dr., Phoenix, Ariz. 85044

Filed Jun. 6, 1996, Ser. No. 659,782
Int. Cl.[6] A61B *17/86*
U.S. Cl. 606—73 17 Claims



16. A bone screw, comprising:

a head for receiving a screw driving device; and

a shaft having a length and extending from said head, said shaft including at least two series of interleaved helical threads, each of said series of helical threads having a pitch and having a substantially different diameter than each other of said series of helical threads;

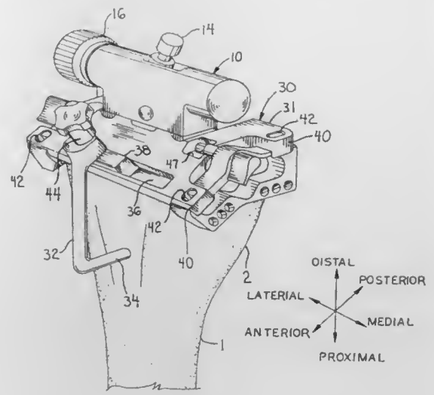
wherein at least one of said series of helical threads changes pitch along the length of said shaft.

5,743,916

## DRILL GUIDE WITH REMOVABLE FERRULES

Alex M. Greenberg; Douglas M. Spranger, and Paul J. Mulhauser, all of New York, N.Y., assignors to Human Factors Industrial Design, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 300,707, Sep. 2, 1994, which is a continuation-in-part of Ser. No. 919,783, Jul. 24, 1992, Pat. No. 5,409,493, which is a continuation-in-part of Ser. No. 719,178, Jun. 21, 1991, Pat. No. 5,133,720, which is a continuation-in-part of Ser. No. 552,703, Jul. 13, 1990, Pat. No. 5,026,376. This application Jan. 31, 1995, Ser. No. 382,235
Int. Cl.[6] A61B *17/58*
U.S. Cl. 606—102 20 Claims




milling device to mill discrete anterior, anterior chamfer, distal and posterior chamfer surfaces on the bone to accommodate an implant.

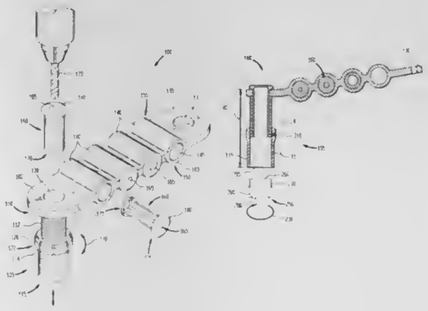
5,743,915

## FEMORAL MILLING INSTRUMENTATION FOR USE IN TOTAL KNEE ARTHOROPLASTY WITH OPTIONAL CUTTING GUIDE ATTACHMENT

Kim C. Bertin, Bountiful, Utah; Dennis W. Burke, Milton, Mass.; Gregory C. Stalcup, Columbia City, and Rodney Bays, Pierceton, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind., from Gregory Stalcup and Rodney Bays

Continuation of Ser. No. 516,370, Aug. 17, 1995, abandoned, which is a continuation of Ser. No. 169,459, Dec. 17, 1993, Pat. No. 5,474,559, which is a continuation-in-part of Ser. No. 87,933, Jul. 6, 1993, abandoned. This application Mar. 25, 1997, Ser. No. 823,740
Int. Cl.[6] A61B *17/58*
U.S. Cl. 606—88 3 Claims

1. A generally C-shaped milling guide for connection to an exposed end of a bone for guiding a milling device along the bone to mill away portions of the bone for accommodation of an orthopaedic implant, said guide including a plurality of interconnected walls positioned adjacent the exposed end of the bone, each of said walls including a elongated slot therein for accommodating a milling device, wherein the walls of said guide cooperate with a



1. A drill guide comprising:

a handle, and

a sleeve having a first end attached to one end of said handle, said sleeve comprising:

a first bore,

a first ferrule dimensioned for demountable insertion into one end of said sleeve and having a second bore dimensioned to receive therethrough an instrument having a particular width, and

a second ferrule which is demountably attached to an end of said first ferrule, said second ferrule extending from an end opposite said one end of said first bore,



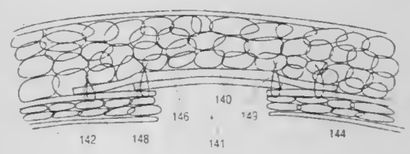
wherein said exposed end of said second ferrule has markings on an outer surface thereof indicating a penetration depth of said instrument inserted through said second bores of the attached pair of ferrules.

5,743,917

## PROSTHESIS FOR THE REPAIR OF SOFT TISSUE DEFECTS

Allen Saxon, 57 Overbrook Rd., Barrington, Ill. 60010

Continuation-in-part of Ser. No. 24,233, Mar. 1, 1993, which is a continuation of Ser. No. 2,394, Jan. 13, 1993, abandoned. This application Aug. 25, 1994, Ser. No. 295,028
Int. Cl.[6] A61F *2/08*
U.S. Cl. 623—11 12 Claims




1. A process for treating a soft tissue defect of a patient comprising the step of surgically implanting adjacent the soft tissue defect a prosthesis comprising:

a first portion comprising a first material which substantially does not incorporate into the host tissue, wherein said fist portion is sized to extend beyond said defect, and

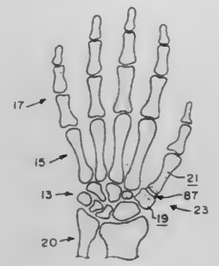
a second portion comprising a second material selected from the group of materials consisting of a material which substantially incorporates into the host tissue, a material which increases the structural integrity of the prosthesis, and a material which does both.

5,743,918

## INSTRUMENTATION FOR AND METHOD FOR IMPLANTING A SPHERICAL PROSTHESIS

James H. Calandruccio, and Mark T. Jobe, both of Memphis, Tenn., assignors to Wright Medical Technology, Inc., Arlington, Tenn.

Filed May 13, 1996, Ser. No. 645,178
Int. Cl.[6] A61B *17/56*
U.S. Cl. 623—21 5 Claims




1. A method of implanting a spherical prosthesis in a joint between a first bone having a proximal surface and a second bone having a distal surface; the method comprising the steps of:

(a) exposing the joint between the first bone and the second bone;

(b) measuring the distance between the proximal surface of the first bone and the distal surface of the second bone;

(c) forming a semispherical cavity in the proximal surface of the first bone to a depth substantially equal to the distance between the proximal surface of the first bone and the distal surface of the second bone;

(d) forming a semispherical cavity in the distal surface of the second bone to a depth substantially equal to the distance between the proximal surface of the first bone and the distal surface of the second bone;

(d) providing the spherical prosthesis having a diameter substantially three times the distance between the proximal surface of the first bone and the distal surface of the second bone; and then

(e) inserting the spherical prosthesis into the semispherical cavities formed in the proximal surface of the first bone and in the distal surface of the second bone.

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5,743,919

## ISATIN DERIVATIVES FOR COLORING KERATIN-CONTAINING FIBERS

Hinrich Moeller, Monheim, and Horst Hoeffkes, Duesseldorf, both of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP95/00848, § 371 Date Sep. 17, 1996, § 102(e) Date Sep. 17, 1996, PCT Pub. No. WO95/24886, PCT Pub. Date Sep. 21, 1995

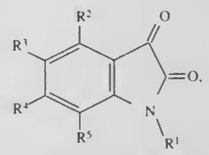
PCT Filed Mar. 8, 1995, Ser. No. 716,207

Claims priority, application Germany, Mar. 17, 1994, 44 09 143.5

Int. Cl.[6] A61K *7/13*

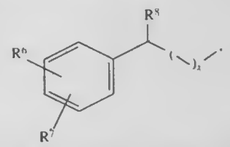
U.S. Cl. 8—409 26 Claims

1. The process of coloring keratin-containing fibers comprising contacting said fibers with an isatin derivative corresponding to formula (I):



(I)

in which $R^1$ is a hydroxy group, an optionally $C_{1-4}$-alkyl- or phenyl-substituted amino group, a $C_{3-8}$ alkenyl, dihydroxy-($C_{3-6}$)-alkyl, trihydroxy-($C_{4-6}$)-alkyl, tetrahydroxy-($C_{5-6}$)-alkyl, pentahydroxy-$C_6$-alkyl, $C_{2-4}$-aminoalkyl, $C_{1-4}$-sulfoalkyl group, an optionally $C_{1-4}$-alkyl-substituted 2-furylmethyl, 2-thienylmethyl, 2-pyridylmethyl, 3-pyridylmethyl, 4-pyridylmethyl group or an aralkyl group corresponding to formula (II):



(II)

in which $R^6$ and $R^7$ independently of one another represent hydrogen, halogen atoms, hydroxy groups, amino groups optionally substituted by $C_{1-4}$ alkyl or phenyl, $C_{1-4}$ alkyl groups, $C_{1-4}$ alkoxy groups, carboxy groups or sulfo groups and $R^8$ is hydrogen, a $C_{1-4}$ alkyl group or a $C_{2-4}$ hydroxyalkyl group and x=0, 1 or 2,

and $R^2$, $R^3$, $R^4$ and $R^5$ independently of one another represent hydrogen, hydroxy groups, halogen atoms, nitro groups, sulfo groups, carboxyl groups, $C_{1-4}$ alkyl groups, $C_{1-4}$ alkoxy groups or $NR^9R^{10}$ groups, wherein $R^9$ and $R^{10}$ independently of one another represent hydrogen, $C_{1-4}$ alkyl groups or $C_{2-4}$ hydroxyalkyl groups, and two adjacent groups $R^3$, $R^4$ and $R^5$ may represent an alkylenedioxy group containing 1 to 4 carbon atoms, and water-soluble salts thereof.

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5,743,920

## NO-MESS OPHTHALMIC LENS TINTING PROCESS

George Kohan, 16139 Chief Dr., Hudson, Fla. 34667

Filed Aug. 23, 1996, Ser. No. 702,135

Int. Cl.[6] D06P *5/00*

U.S. Cl. 8—506 11 Claims

9. A process for tinting an ophthalmic lens, the process comprising:

(a) obtaining a plurality of gelatin capsules, wherein each of the capsules is in at least two sections;

(b) introducing a quantity of dry powder dye into each of said capsules, (c) closing said capsules to seal said dry powder dye within said capsules;

(d) adding at least one of said capsules to an aqueous solvent to dissolve said gelatin capsules and form an aqueous dye bath; and

(e) submerging an ophthalmic lens to be tinted in said dye bath for a time sufficient to dye said opthalmic lens.

5,743,921

## METHOD OF MAKING A CELL USING A LITHIUM-DEACTIVATED CARBON ANODE

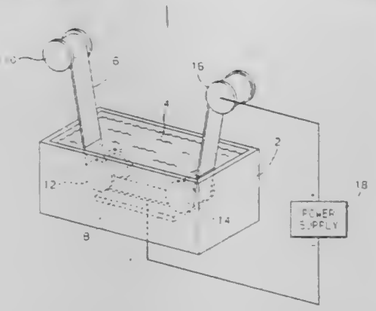
Gholam-Abbas Nazri, Bloomfield Hills, and Blake James Howie, Almont, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 497,761, Jul. 3, 1995, abandoned.

This application Nov. 29, 1996, Ser. No. 785,976

Int. Cl.[6] H01M *10/38*

U.S. Cl. 29—623.5 15 Claims




1. In the method of assembling a secondary, lithium-ion cell in the substantially discharged state including the principle step of positioning an anode and a lithiated cathode opposite each other with a non-aqueous, lithium-ion-conducting, immobilized electrolyte therebetween, wherein said anode comprises lithium-intercalatable carbon and said lithiated cathode comprises a lithium-retentive material substantially saturated with a quantity of electrochemically reversible lithium species, the improvement comprising:

before said positioning, (a) initially cathodizing said carbon opposite a counterelectrode in a non-aqueous, lithium-ion-conducting solution so as to substantially saturate said carbon with said solution and electrolytically deposit enough lithium from said solution into said carbon to deactivate any active sites in said carbon yet leave said carbon with sufficient residual lithium capacity to reversibly intercalate said quantity of reversible lithium species, and (b) subsequently cathodizing said carbon in a non-aqueous, lithium-ion-conducting solution following said deactivation to intercalate a sufficient amount of lithium into said carbon to substantially compensate for any first cycle inefficiencies inherent in said lithium-retentive cathode material; and

effecting said positioning while said carbon is still saturated with said electrolyte;

whereby assembly of a near-stoichiometrically balanced battery is made possible.

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5,743,922

## ENHANCED LUBRICITY DIESEL FUEL EMULSIONS FOR REDUCTION OF NITROGEN OXIDES

Jeremy D. Peter-Hoblyn, Bodwin, Great Britain; James M. Valentine, Fairfield, Conn., and Leonard Dubin, Skokie, Ill., assignors to Nalco Fuel Tech, Naperville, Ill.

Continuation-in-part of Ser. No. 918,679, Jul. 22, 1992, abandoned. This applicatinn Mar. 21, 1994, Ser. No. 215,504

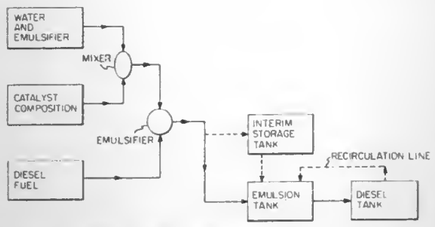
Int. Cl.[6] C10L *1/18*

U.S. Cl. 44—301 20 Claims

1. An improved lubricity water and diesel fuel emulsion for use

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as fuel for a diesel engine, comprising a lubricity additive which comprises dimer acids, trimer acids or mixtures thereof.

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**5,743,923**

**OIL ADDITIVES AND COMPOSITIONS**

**Brian William Davies, Blewbury; Kenneth Lewtas, Wantage, and Alessandro Lombardi, Abingdon, all of United Kingdom, assignors to Exxon Chemical Patents Inc., Linden, N.J.**

**PCT No. PCT/EP93/02908, § 371 Date Apr. 25, 1995, § 102(e) Date Apr. 25, 1995, PCT Pub. No. WO94/10267, PCT Pub. Date May 11, 1994**

**Continuation of Ser. No. 424,374, Apr. 25, 1995, abandoned. This PCT application Oct. 21, 1993, Ser. No. 668,202**

**Claims priority, application United Kingdom, Oct. 26, 1992, 9222458**

**Int. Cl.[6] C10L** *1/18;1/22*

**U.S. Cl. 44—393** **3 Claims**

1. A fuel oil composition comprising a mixture of 10–50% by weight of a biofuel selected from the group consisting of vegetable oil and re-esterified vegetable oil with a petroleum based middle distillate fraction containing 0.0005% to 1% by weight of an additive being a mixture of a first ethylene vinyl acetate copolymer having 36 wt. % ethylene and an Mn of about 2400 with a second ethylene vinyl acetate copolymer having 14 wt. % vinyl acetate and a Mn of about 3500, the weight ratio of the first ethylene vinyl acetate to the second being 6:1.

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**5,743,924**

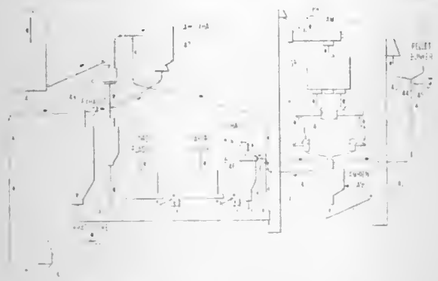
**PELLETIZED FUEL COMPOSITION AND METHOD OF MANUFACTURE**

**Robert L. Dospoy, Westover; Clifford E. Raleigh, Home; Clark D. Harrison, Murrysville, and David J. Akers, Indiana, all of Pa., assignors to CQ, Inc., Homer City, Pa.**

**Continuation-in-part of Ser. No. 397,909, Mar. 3, 1995, abandoned. This application Dec. 20, 1996, Ser. No. 770,345**

**Int. Cl.[6] C10L** *5/00;5/14*

**U.S. Cl. 44—553** **13 Claims**



1. A pelletized fuel composition comprising coal fines in an amount of from about 60% to about 80% by weight, paper making sludge in the amount of from about 10% to about 30% by weight, and a low density shredded polyethylene plastic film having a major dimension of no more than about ¼ inch in an amount of from about 0.5% to about 15% by weight.

7. A method of manufacturing a fuel composition comprising the steps of (a) mixing coal fines in an amount of about 60% to about 80% by weight, paper making sludge in an amount of about 10% to about 30% by weight, and a low density polyethylene (LDPE) plastic having a major dimension of no more than about ¼ inch in an amount of about 0.5% to about 15% by weight; and (b) then pelletizing the mixture produced in step (a) at a pressure of from about 1,000 psig to about 4,000 psig.

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**5,743,925**

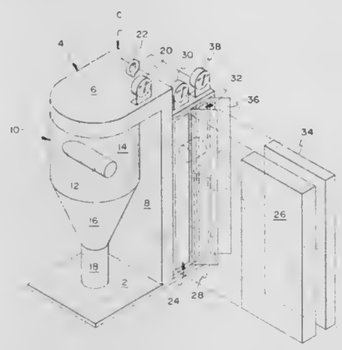
**COMPACT CYCLONE FILTER TRAIN FOR RADIOLOGICAL AND HAZARDOUS ENVIRONMENTS**

**Thomas R. Bench, Pittsburgh, Pa., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.**

**Filed Apr. 10, 1996, Ser. No. 635,421**

**Int. Cl.[6] B01D** *45/12*

**U.S. Cl. 55—274** **19 Claims**



1. A compact, single unit, readily moveable, cyclone filter train, adapted for decontaminating radiological material in confined areas, and capable of being remotely controlled, comprising:

a) a base,

b) a cyclone filter supported vertically on said base having a bottom, a top and cylindrical and conical side walls,

c) an air/gas inlet in one of said side walls,

d) means in said bottom for securing a removable heavier particle waste receiving container,

e) a waste receiving container sealably secured to said cyclone filter bottom, and adapted to be remotely replaceable,

f) a gas plenum having horizontal and vertical components mounted on said top,

g) said horizontal component extending laterally a short distance from said top,

h) said vertical component extending vertically downwardly adjacent said cylindrical wall of said cyclone filter and connected to said base,

i) said gas plenum supporting said cyclone filter vertically above said base,

j) at least one filter housing mounted vertically on said vertical component of said gas plenum, sealably connected to the rear of said vertical plenum component and including means for removing and sealably receiving removable cartridge filter means,

k) a first removable cartridge filter means in said at least one filter housing,

l) gas outlet means for receiving gas from said at least one filter housing, and

m) means associated with said filter train for measuring said filter means effectiveness.



**5,743,926**

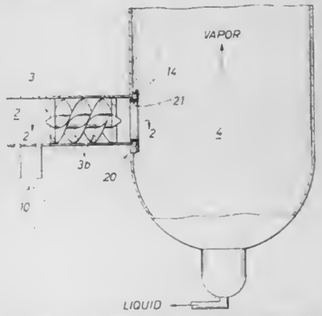
**APPARATUS FOR SEPARATION OF LIQUID AND VAPOR IN DISTILLATION/FLASHING PROCESS**

**Robert Patrick Bannon, deceased, late of Fulshear, by Elizabeth Jane Bannon, executrix; Louis Edward Stein, Houston; William David Kief, Spring, all of Tex.; Krishna Rangraj Kaushik, Benicia, Calif., and Pui-Yuen Jeffrey Chan, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.**

**Filed Aug. 1, 1996, Ser. No. 691,155**

**Int. Cl.[6] B01D** *45/12*

**U.S. Cl. 55—396** **13 Claims**




1. A liquid/vapor separator for separating entrained liquid from vapor comprising:

a transfer tube having an input end for receiving a feed, said feed comprising a liquid entrained in a vapor, and an output end fluidly connected to the input of a vessel for delivering said feed to said vessel;

helical vane means located within said transfer tube for imparting centrifugal force to said feed whereby said heavier fluid components of said feed are forced to the inner wall of said transfer tube thereby separating the liquid and vapor components of said feed and wherein said helical vane means includes drainage slots in the bottommost portions thereof for preventing entrapment of liquid within said transfer tube;

means for collecting said separated liquid components of said feed;

means for directing said collected liquid components of said feed to said vessel; and

separate means for directing said vapor component to a different portion of said vessel.

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**5,743,927**

**AIR FILTER ELEMENT; ASSEMBLY; AND, METHOD**

**Richard J. Osendorf, West St. Paul, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.**

**Continuation of Ser. No. 690,549, Jul. 31, 1996. This application Oct. 25, 1996, Ser. No. 738,281**

**Int. Cl.[6] B01D** *46/10;29/07*

**U.S. Cl. 55—497** **28 Claims**

1. A filter assembly comprising:

(a) first and second opposite, separate frame members; said first and second frame members comprising permanent constructions within the filter assembly;

(i) said first frame member including a first receiving slot arrangement thereon;

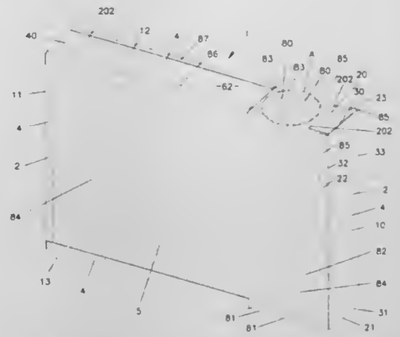
(ii) said second frame member including a second receiving slot arrangement thereon;

(b) a filter element removably and replaceably secured to said first and second frame members; said filter element comprising:

(i) a filter media member;

(ii) first and second opposite end panels; said filter member being secured in extension between said first and second end panels;

(A) said first and second end panels comprising paperboard material;



(B) said first end panel including a slidable portion constructed and arranged to slide within said first receiving slot arrangement;

(C) said second end panel including a slidable portion constructed and arranged to slide within said second receiving slot arrangement; and

(iii) said filter element being releasably secured to said first and second frame members by a slidable engagement between: said first end panel slidable portion and said first receiving slot arrangement; and said second end panel slidable portion and said second receiving slot arrangement;

(A) said slidable engagement being constructed and arranged to permit selected removal and replacement of said filter element from said first and second frame members by sliding each of said first and second end panels relative to said first and second frame members.

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**5,743,928**

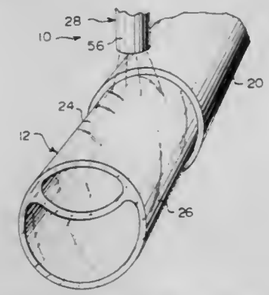
**METHOD AND APPARATUS FOR EXTRUDING GLASS TUBING**

**Larry Pfleiderer, 35 Tamarack Rd., Rocky Point, N.Y. 11778**

**Filed Dec. 16, 1996, Ser. No. 767,184**

**Int. Cl.[6] C03B** *17/00*

**U.S. Cl. 65—83** **18 Claims**



1. An apparatus for extruding glass tubing which comprises:

a) a furnace;

b) means within said furnace for holding molten glass;

c) a duplex mandrel on one end of said furnace connected into said holding means;

d) means for forcing the molten glass in said holding means out through said duplex mandrel, so as to form the glass tubing having an upper support segment and a lower structural segment; and

e) means for quick cooling said upper support segment of said glass tubing upon exiting said duplex mandrel, so that said lower structural segment will maintain its desired shape while slow cooling.

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5,743,929

## PROCESS FOR THE PRODUCTION OF HIGH PURITY CARBON DIOXIDE

Akhilesh Kapoor, South Orange, and Carl Schatz, East Windsor, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Aug. 23, 1995, Ser. No. 518,380
Int. Cl.[6] C03B 5/237
U.S. Cl. 65—134.6 21 Claims

1. A process for producing molten glass comprising the steps:
(a) heating a mixture of glass batch and cullet in a furnace by combusting a hydrocarbon fuel with an oxidant selected from oxygen-enriched air and high purity oxygen in said furnace, thereby producing molten glass and a hot waste gas comprised of carbon dioxide, water vapor and sulfur dioxide;
(b) quenching said hot waste gas with an aqueous carbonate quench solution having a pH in the range of about 6.5 to about 8, thereby cooling said waste gas and converting at least part of said sulfur dioxide to particulate sulfur salt;
(c) passing said cooled waste gas through a filtration zone, thereby filtering particulate sulfur salt therefrom; and
(d) recycling said particulate sulfur salt to said furnace.

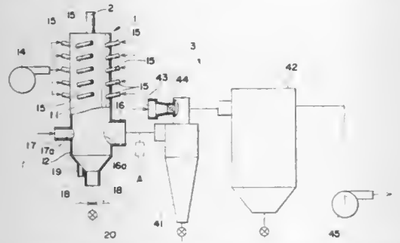
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5,743,930

## APPARATUS FOR PRODUCING INORGANIC SPHERICAL PARTICLES

Shinichi Miyake, and Takeru Yajima, both of Yamanashi, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan

Filed Jan. 27, 1997, Ser. No. 788,335
Claims priority, application Japan, Sep. 18, 1996, 8-246148
Int. Cl.[6] B29B 9/00
U.S. Cl. 65—142 4 Claims



1. An apparatus for manufacturing inorganic spherical particles containing a vertical sphering furnace and a sphering burner disposed at the top of said furnace to face vertically downward,
said furnace further comprising:
a particle outflow pipe through which spherical particles formed in said furnace are drawn out therefrom, and an air inflow pipe for introducing air for carrying said spherical particles toward an opening of said particle outflow pipe;
wherein said particle outflow pipe and said air inflow pipe are aligned to oppose each other horizontally at a lower position of said furnace; and the opening diameter of said particle outflow pipe is adapted to be greater than that of that of said air inflow pipe.

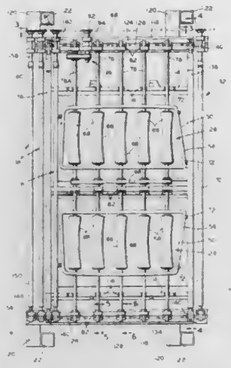
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5,743,931

## GLASS SHEET CONVEYING AND BENDING APPARATUS

Jeffrey Ronald Flaugher, Carleton, Mich.; William J. Skilliter, Genoa, and Vince Dew, Toledo, both of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Aug. 14, 1995, Ser. No. 514,741
Int. Cl.[6] C03B 23/00;29/00;23/02;25/00
U.S. Cl. 65—287 17 Claims



1. Apparatus for press bending heat-softened glass sheets comprising:
a frame;
a bending mold mounted on said frame for bending sheets of glass, said bending mold including opposed lower and upper horizontally disposed press members having complemental shaping surfaces, the lower press member having a continuous peripheral shaping rail conforming to a marginal outline of the sheet of glass;
drive means mounted on said frame for selectively raising and lowering the lower press member to position the shaping rail in a lowered position for receiving a first sheet of glass, in a raised position for shaping the first sheet of glass between the lower and upper press members, and in the lowered position for transferring the first sheet of glass after it is bent and then receiving a second sheet of glass;
a conveyor mounted on said frame for moving the sheets of glass along a predetermined path from a heating end of said frame through a bending area between the lower and upper press members to a cooling end of said frame, said conveyor including, in the bending area, a plurality of rotatably mounted, parallel, straight shafts extending transversely across the path below the shaping rail of the lower press member; and
a plurality of conveyor rolls, each conveyor roll being longitudinally secured on one of the straight shafts such that the conveyor rolls are disposed within the marginal outline of said shaping rail, said conveyor rolls having opposing end portions extending radially from the shafts and positioned in close proximity to opposing sides of the shaping rail, said conveyor rolls having uniform diameter with progressively diminishing cross section from the end portions to provide a generally concave supporting surface complementary to the curvature of the glass sheet after bending thereof to receive the glass sheet after it is bent and to retain the curvature in the bent glass sheet as it is transferred along the path to the cooling end of said frame, the shaping rail positioned below supporting surface of said conveyor rolls when the shaping rail is in the lowered position to facilitate movement of the glass sheet along the path, and positioned above said conveyor rolls when the shaping rail is in the raised position to shape the sheets of glass between the lower and upper press members.

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5,743,932

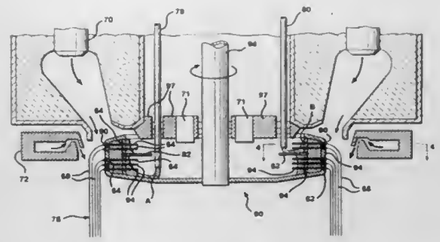
## METHOD OF MAKING AN INSULATION PRODUCT FROM HOLLOW FIBERS

Ronald A. Houpt, Newark; Larry J. Huey, Granville, and David C. K. Lin, Worthington, all of Ohio, assignors to Owens-Corning Fiberglas Technology Inc., Summit, Ill.

Continuation-in-part of Ser. No. 309,706, Sep. 21, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 483,789
Int. Cl.[6] C03B 37/075;37/04
U.S. Cl. 65—438 8 Claims

1. A method of making an insulation product comprising the steps of:
providing at least one thermoplastic insulation material;
melting the insulation material;





forming portions of the molten insulation material into a plurality of hollow fibers suitable for use in an insulation product by centrifuging the molten insulation material through a plurality of orifices and directing a gas through a plurality of gas conduits and into the molten insulation material, wherein each gas conduit directs gas into one of the portions of the molten insulation material being centrifuged through one of the orifices so as to form a hollow fiber having a hollow bore formed therethrough; and
combining the hollow fibers together to form the insulation product.

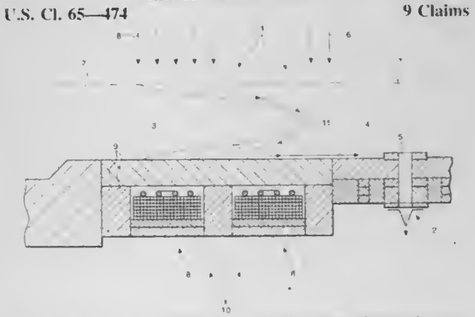
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5,743,933

## APPARATUS AND METHOD FOR DEFIBRATING OPTICALLY DENSE GLASS MELTS

Joachim Mellem, Hockenheim, Germany, assignur to ISOVER Saint-Gobain, Courbevoie, France

PCT No. PCT/EP94/02786, § 371 Date Oct. 24, 1995, § 102(e) Date Oct. 24, 1995, PCT Pub. No. WO95/07242, PCT Pub. Date Mar. 16, 1995
PCT Filed Aug. 23, 1994, Ser. No. 433,448
Claims priority, application Germany, Sep. 10, 1993, 43 30 797.3
Int. Cl.[6] C03B 5/16;7/07
U.S. Cl. 65—474 9 Claims



1. An apparatus for defibrating optically dense glass melts comprising,
a glass melt feeding mechanism for feeding an optically dense glass melt having warmer, faster-flowing, upper layers and colder, slow-flowing, lower layers;
said glass melt feeding mechanism comprising a feed channel having a bottom side, a distributing channel positioned and arranged adjacent to said feed channel, and outlet ports positioned and arranged within said distributing channel;
defibrating aggregates positioned and arranged to receive said glass melt from said outlet ports;
at least one warming device positioned and arranged to extend over an area of said bottom side of said feed channel, said area of said bottom side of said feed channel being adjacent to said distributing channel; and
wherein said at least one warming device is constructed and arranged for warming said bottom side of said feed channel so as to substantially stop said colder, slow-flowing, lower layers of said optically dense glass melt in an area of said bottom side of said feed channel which is adjacent to said at least one warming device and for creating a cascading rolling flow in said glass melt which leads said warmer, faster-flowing, upper layers of said optically dense glass melt toward said bottom side of said feed channel to achieve vertical homogenization of glass melt temperature prior to said optically dense glass melt being received by said defibrating aggregates so as to prevent discontinuation of flow of said glass melt in said defibrating aggregates.
8. A method for defibrating an optically dense glass melt, comprising the steps of:
melting optically dense glass to form an optically dense glass melt having warmer, faster-flowing, upper layers and colder, slow-flowing, lower layers;
feeding the optically dense glass melt along a feed channel having a bottom side directed toward a distributing channel having outlet ports therein which lead the glass melt to defibrating aggregates;
warming the bottom side of the feed channel with at least one warming device to substantially stop said colder, slow-flowing, lower layers of said optically dense glass melt in an area of said bottom side of said feed channel which is adjacent said at least one warming device and to create a cascading rolling flow in said glass melt which leads said warmer, faster-flowing, upper layers of said optically dense glass melt toward said bottom side of said feed channel to achieve vertical homogenization of glass melt temperature; and
feeding said glass melt which has achieved said vertical homogenization of glass melt temperature to said distributing channel and out said outlet ports to said defibrating aggregates for defibrating said optically dense glass melt.

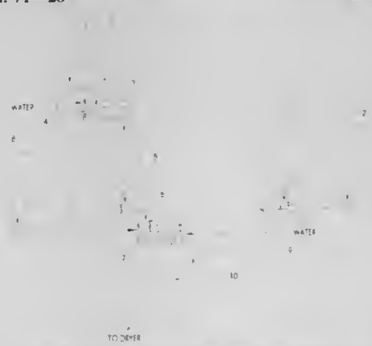
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5,743,934

## SOIL CONDITIONING AGGLOMERATES CONTAINING CEMENT KILN DUST

Greg Wommack, Silex, Mo.; Carl Holley, Riverview, Mich., and Eugene Greskovich, State College, Pa., assignors to Magic Green Corporation, Silex, Mo.

Continuation-in-part of Ser. No. 398,657, Mar. 3, 1995, abandoned. This application Jul. 5, 1996, Ser. No. 672,226
Int. Cl.[6] C05C 9/00; C05B 13/00; C05D 1/00; A01N 25/00
U.S. Cl. 71—28 32 Claims



1. A process for forming an agglomerate containing cement kiln dust for use as a soil conditioning agent to neutralize soil acidity and provide a source of nutrient values, the process comprising:
preparing a preagglomerate containing a water-soluble binder and a particulate calcium source comprising cement kiln dust, the combined concentration of CaO and other calcium-containing compounds having the potential to be hydrated in the preagglomerate being no greater than about 10% by weight;
pelletizing the preagglomerate to form the agglomerate, the proportion of the particulate calcium source in the preagglomerate being sufficient such that the agglomerate contains at least about 15% by weight of the particulate calcium source; and
drying the agglomerate, the drying being controlled such that dried agglomerates having a size ranging from −7 to +8 Tyler

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Standard Sieve Series exhibit an average green crush strength of at least about 2 pounds.

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**5,743,935**

## CONDITIONING COMPOSITION

**David Alan Hall, Queensland, Australia, assignor to Plantagenet Holdings Pty Ltd., Australia**

**Continuation-in-part of Ser. No. 388,464, Feb. 14, 1995, Pat. No. 5,605,557. This application Mar. 13, 1996, Ser. No. 615,695**

**Int. Cl.[6] C05D** *1/00*

**U.S. Cl. 71—62** **38 Claims**

1. A conditioning composition comprising from 60 to 80% by weight of a diamagnetic mineral source, from 20 to 40% by weight of a paramagnetic basalt, from 2 to 5% by weight of a bonding agent, and from 1 to 20% by weight of a mixed colloidal mineral source.

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**5,743,936**

## METHOD OF RECOVERING VALUABLES FROM PRINTED WIRING BOARD HAVING ELECTRONIC COMPONENTS MOUNTED THEREON

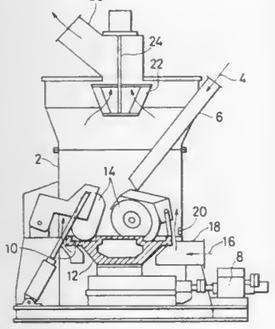
**Sadahiko Yokoyama, and Masatoshi Iji, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed May 17, 1996, Ser. No. 649,486**

**Claims priority, application Japan, May 19, 1995, 7-121495**

**Int. Cl.[6] C22B** *3/00*

**U.S. Cl. 75—403** **18 Claims**




1. A method of recovering valuables from a printed wiring board on which electronic components are mounted, comprising the steps of:

(a) removing electronic components from a printed wiring board on which said electronic components are mounted;

(b) polishing a surface of said printed wiring board from which said electronic components have been removed in said step (a);

(c) milling said printed wiring board a surface of which has been polished in said step (b) into milled portions, wherein said milled portions comprise portions mainly including copper and portions mainly including materials other than copper; and

(d) separating said milled portions of said printed wiring board into said portions mainly including copper and said portions mainly including materials other than copper.

**5,743,937**

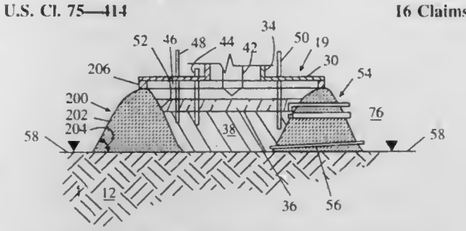
## EARTH MELTER WITH RUBBLE WALLS AND METHOD OF USE

**Chris C. Chapman, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.**

**Filed Sep. 26, 1996, Ser. No. 723,942**

**Int. Cl.[6] C22B** *9/20;9/21*

**U.S. Cl. 75—414** **16 Claims**




1. An apparatus for melting feed materials for subsequent use or safe disposal in a relatively harmless condition, comprising:

(a) retaining walls defining a melt zone for melting the feed materials, said retaining walls resting on a ground level and extending above the ground level, said retaining walls constructed of rubble;

(b) a cover extending over the retaining walls and defining an air-filled space between a quantity of melted feed materials and the cover;

(c) a feed material inlet extending through the cover to permit feed materials to be introduced onto the melt zone;

(d) a heating element for heating the feed material such that a molten pool of feed materials is produced in the melt zone; and

(e) at least one outlet to withdraw a portion of the molten pool of feed materials from the melt zone.

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**5,743,938**

## METHOD OF DECARBURIZING REFINING MOLTEN STEEL CONTAINING CR

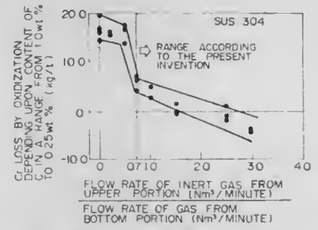
**Hiroshi Nishikawa; Masaru Washio, and Naoki Kikuchi, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan**

**Continuation of Ser. No. 459,271, Jun. 2, 1995. This application Dec. 12, 1996, Ser. No. 764,438**

**Claims priority, application Japan, Jun. 6, 1994, 6-123679; Oct. 5, 1994, 6-241303; Oct. 5, 1994, 6-241304; Mar. 31, 1995, 7-076435**

**Int. Cl.[6] C21C** *5/35*

**U.S. Cl. 75—532** **6 Claims**




1. A method of refining by decarburizing a bath of molten steel contained within a refining chamber, said molten steel including a slag layer and having an initial temperature within an allowable temperature range, and containing a concentration level Cr, said slag layer containing a concentration of $Cr_2O_3$ said refining proceeding in such a manner that one of an oxygen gas, an inert gas and a mixture of said inert gas and oxygen gas is blown to a bottom of said steel bath, said method comprising the steps of:

adding a carbon source to the refining chamber in an early stage of the decarburizing refining process;

blowing oxygen gas to the surface of the bath of molten steel and to a bottom of the steel bath in order to decarburize the molten steel;

blowing only the inert gas to the surface of the steel bath; and



blowing one of the oxygen gas, the inert gas and a mixture of the oxygen gas and the inert gas to a bottom of the steel bath during one of a portion of and all of a decarburization period in which the concentration of C in the molten steel containing Cr is in a range of 1 wt % to 0.05 wt % so that the slag and the molten steel are stirred within said chamber to cause said $Cr_2O_3$ in the slag and the C in the molten steel to positively take part in a reduction reaction represented by an expression wherein:

$$Cr_2O_3+3C \rightarrow 2Cr+3CO$$

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**5,743,939**

## WASTE GAS PROCESSING APPARATUS AND METHOD FOR SEMICONDUCTOR FABRICATING EQUIPMENT

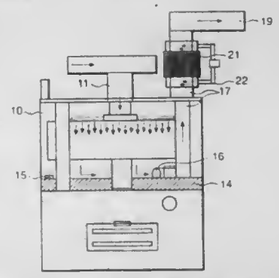
**Sang-min Lee; Hong-rok Choi; Young-soek No, and Yung-ho Kim, all of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Sep. 24, 1996, Ser. No. 718,670**

**Claims priority, application Rep. of Korea, Oct. 11, 1995, 95-34994**

**Int. Cl.[6] B01D** *50/00;47/00*

**U.S. Cl. 95—214** **10 Claims**




1. A method for treating a waste gas stream evolved from equipment for fabricating semiconductor devices, comprising:

introducing the waste gas stream into a chamber;

in the chamber spraying water into the waste gas of said waste gas stream for thereby producing a wetted waste gas stream and waste water;

draining waste water from said chamber;

venting the wetted waste gas stream upwardly from the chamber via a tube having a length;

intermediate the length of said tube, demisting said wetted waste gas stream using a demister interposed in said tube; and

introducing a gas from externally of said tube into said tube, adjacent said demister, thereby adding said gas to said wetted waste gas stream.

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**5,743,940**

## PROCESS FOR PRODUCING GAS ADSORBENT

**Takanobu Sugo; Jiro Okamoto, both of Gunma-ken; Kunio Fujiwara, Kanagawa-ken; Hideaki Sekiguchi, Chiba-ken, and Toshiaki Fujii, Kanagawa-ken, all of Japan, assignors to Japan Atomic Energy Research Institute, and Ebara Corporation, both of Tokyo, Japan**

**Continuation-in-part of Ser. No. 996,838, Dec. 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 711,601, Jun. 7, 1991, abandoned, which is a continuation of Ser. No. 328,647, Mar. 27, 1989, abandoned. This application Jun. 23, 1994, Ser. No. 264,762**

**Claims priority, application Japan, Apr. 7, 1988, 63-85854**

**Int. Cl.[6] B01D** *46/00;* **C08F** *2/46;* **D06M** *14/26;14/20*

**U.S. Cl. 95—285** **40 Claims**

37. A method for removing fine particles and polar gaseous substances from a gaseous atmosphere, comprising:

passing the gaseous atmosphere through an adsorbent fabric made by the steps of

exposing to an ionizing radiation a woven or nonwoven fabric made from a material comprising a polyolefin; and then

graft polymerizing onto the exposed polyolefin, one or more polymerizable monomers selected from the group consisting polymerizable monomers having ion exchange groups and polymerizable monomers that can be converted to ion exchange groups; and

when said polymerizable monomers include ones that can be converted to ion exchange groups, converting said polymerizable monomers to ion exchange groups,

wherein said graft polymerizing step and, if necessary, said converting step take place under conditions such that the resultant product is capable of removing fine particles and polar gaseous substances from a gaseous atmosphere by passing the gaseous atmosphere through the adsorbent fabric.

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**5,743,941**

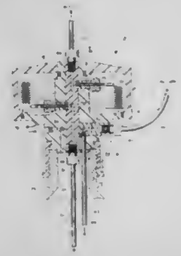
## BOTTLE TOP SOLVENT DEGASSER

**Yuri Gerner, Mendota Heights, and Carl W. Sims, St. Paul, both of Minn., assignors to Systec, Inc., Minneapolis, Minn.**

**Continuation-in-part of Ser. No. 468,016, Jun. 6, 1995, abandoned. This application Jul. 30, 1996, Ser. No. 688,439**

**Int. Cl.[6] B01D** *53/22*

**U.S. Cl. 96—10** **9 Claims**



1. Vacuum degassing and solvent delivery apparatus for handling HPLC solvents and adapted for removable retention on a solvent reservoir and having coupling means for coupling of the degassing apparatus between said solvent reservoir and an apparatus having a pump and arranged to perform an HPLC operation, said vacuum degassing apparatus comprising:

(a) a solvent reservoir having a retention means on the top thereof for removably receiving a solvent degassing and solvent delivery assembly thereon, said degassing and delivery assembly including a closed body with a coiled degassing tube disposed in a vacuum chamber formed within said closed body, and with a vacuum port being formed in said body and being in communication with said vacuum chamber;

(b) a first solvent receiving port formed within said body for delivery of solvent from said reservoir to said coiled degassing tube;

(c) a solvent delivery port for delivery of degassed solvent from said coiled degassing tube to a fluid line, said fluid line being in communication with an HPLC pump for transferring degassed solvent from said reservoir to said HPLC pump.

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**5,743,942**

## DESICCANT CONTAINER

**Richard M. Shelley, and Matthew Lee Rix, both of Belen, N. Mex., assignors to United Catalysts Inc., Belen, N. Mex.**

**Filed Sep. 19, 1996, Ser. No. 715,067**

**Int. Cl.[6] B01D** *53/02*

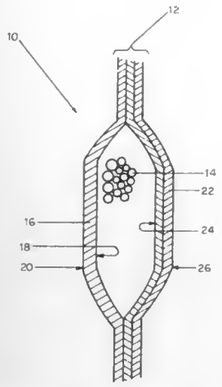
**U.S. Cl. 96—118** **12 Claims**

1. A desiccant container comprising

a desiccant material surrounded by a laminated, water vapor permeable desiccant packaging material, wherein said packaging material comprises an uncoated microporous film hav-

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ing an inner and outer surface heat sealed to an uncoated laminate film having an inner and outer surface, wherein the uncoated microporous film comprises a different composition from the uncoated laminate film, wherein edges of the inner surface of the uncoated microporous film are sealed to edges of the inner surface of the uncoated laminate film, and wherein the inner surface of the uncoated microporous film and the inner surface of the uncoated laminate film are comprised of compatible polymeric materials.

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**5,743,943**

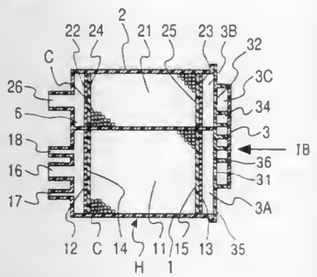
**EVAPORATED FUEL ADSORBING CANISTER PREVENTING DIFFUSION OF FUEL THERETHROUGH**

**Kazuto Maeda, Nisshin; Nobuhiko Koyama, Nagoya, and Naoya Kato, Ama-gun, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, and Nippon Soken Inc., Nishio, both of Japan**

**Filed Jul. 5, 1996, Ser. No. 677,370**

**Int. Cl.[6] B01D** *53/04*

**U.S. Cl. 96—126** **32 Claims**




1. A canister comprising:

a casing defining a main chamber having a first adsorbent layer disposed therein and a subchamber having a second adsorbent layer disposed therein, said first and second adsorbent layers being for adsorbing evaporated fuel;

an evaporated fuel lead-in port and a purge port, each connected to said main chamber;

an atmospheric air lead-in port connected to said sub-chamber; and

a cover member disposed on said casing over holes in said casing so that said cover member and said casing cooperatively define a nonlinear communication passage connecting said main chamber to said subchamber through said holes, said cover member including a plurality of partition walls, disposed on and connected to an outermost wall of said cover member, defining a portion of the nonlinear communication passage.

**5,743,944**

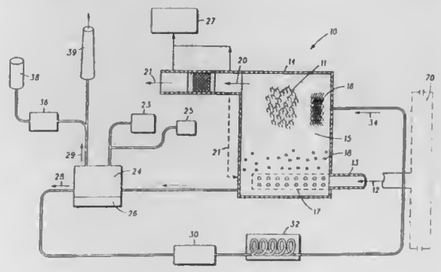
**FLUID CLATHRATE SYSTEM FOR CONTINUOUS REMOVAL OF HEAVY NOBLE GASES FROM MIXTURES OF LIGHTER GASES**

**Kenneth C. Gross, Bolingbrook; Francis Markun, Joliet, both of Ill., and Mary T. Zawadzki, South Bend, Ind., assignors to University of Chicago, Chicago, Ill.**

**Continuation-in-part of Ser. No. 192,141, Feb. 4, 1994, abandoned. This application Oct. 11, 1995, Ser. No. 540,715**

**Int. Cl.[6] B01D** *47/02*

**U.S. Cl. 96—181** **20 Claims**




1. A system for separation of a heavy noble gas entrained in a gas stream obtained from surrounding ambient air in an enclosed volume of air breathable by a person, comprising:

means for containing a fluid and having an input port, said means for containing coupled to a volume of air breathable by a person and said means also constructed for receiving a stream of the volume of air and said containing means enabling the stream of the volume of air to be input into said containing means to contact the fluid in said means for containing and be output therefrom;

said fluid in said containing means consisting essentially of an oil and the oil disposed within said containing means with said oil for contacting the stream of the volume of air and also for absorbing a heavy noble gas entrained in the stream of the volume of air; and

means coupled to said containing means for receiving said oil therefrom after said oil has absorbed the heavy noble gas and said means for receiving further for desorbing the heavy noble gas from said oil.

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**5,743,945**

**INK FOR INK JET RECORDING AND INK JET RECORDING PROCESS**

**Yoshiro Yamashita, and Ken Hashimoto, both of Minamiashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Filed Dec. 11, 1996, Ser. No. 763,886**

**Claims priority, application Japan, Dec. 14, 1995, 7-325369**

**Int. Cl.[6] C09D** *11/02*

**U.S. Cl. 106—31.58** **19 Claims**

1. An ink for ink jet recording process, comprising water, a coloring material and a water-soluble organic solvent, wherein said ink further comprises a compound having a plurality of hydroxyl groups and at least one group selected from the group consisting of alkyl, haloalkyl, alkenyl, alkinyl, cycloalkyl and aromatic groups each having from 5 to 18 carbon atoms.



**5,743,946**

**WATER-COLOR INK COMPOSITION AND PROCESS FOR FORMING AN INORGANIC COATING FILM**

**Yumiko Aoki, Yokohama, and Makoto Sato, Koriyama, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan**

**Filed Dec. 17, 1996, Ser. No. 767,642**

**Claims priority, application Japan, Dec. 18, 1995, 7-347504**

**Int. Cl.[6] C09D** *11/00*

**U.S. Cl. 106—31.95** **9 Claims**

1. A water-color ink composition comprising a fusible inorganic component, an aqueous medium and an organic binder soluble and/or dispersible in the aqueous medium.

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**5,743,947**

**FILM COATINGS AND FILM COATING COMPOSITIONS BASED ON CELLULOSIC POLYMERS AND LACTTOSE**

**Martin Philip Jordan, Orpington, England, assignor to Berwind Pharmaceutical Services, Inc., West Point, Pa.**

**Continuation of Ser. No. 400,134, Mar. 6, 1995, Pat. No. 5,630,871, which is a continuation of Ser. No. 3,604, Jan. 13, 1993. This application May 19, 1997, Ser. No. 858,787**

**Claims priority, application European Pat. Off., Jan. 17, 1991, 92300406**

**Int. Cl.[6] C09D** *101/00;101/28*

**U.S. Cl. 106—162.7** **5 Claims**

1. A method of coating substrates comprising:

mixing a cellulosic polymer and lactose into water to form an aqueous coating suspension;

spraying the coating suspension onto the substrates to form a film coating on the substrates and;

drying the film coating on said substrate;

the cellulosic polymer being from 11% to 56% by dry weight of the composition;

the lactose being from 11% to 56% by dry weight of the composition.

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**5,743,948**

**METHOD FOR CONTINUOUS PRODUCTION OF VARNISH**

**Greg A. Laszewski, Wauwatosa, and Sunil M. Rao, Hubertus, both of Wis., assignors to Chemical Research Technology, Sussex, Wis.**

**Continuation-in-part of Ser. No. 603,203, Feb. 20, 1996, and Ser. No. 278,403, Jul. 21, 1994, abandoned. This application May 10, 1996, Ser. No. 644,868**

**Int. Cl.[6] C09D** *191/00*

**U.S. Cl. 106—244** **21 Claims**

1. A method for the production of varnish, said method comprising the steps of:

(a) continuously introducing resin, oil and a gelling agent into a mixing zone of an extruder;

(b) heating the resin, oil, and gelling agent to a first elevated temperature in the mixing zone of the extruder;

(c) mixing the resin, oil, and gelling agent under turbulent mixing conditions in the mixing zone of the extruder for a first period sufficient to produce varnish;

(d) continuously withdrawing the varnish from the mixing zone of the extruder;

(e) continuously introducing the varnish into a holding zone;

(f) maintaining the varnish at an elevated temperature in the holding zone for a second period, the second period being longer than the first period; and

(g) continuously withdrawing the varnish from the holding zone.

**5,743,949**

**STABLE AQUEOUS WAX DISPERSIONS**

**Hans Jürgen Kainz, Neusäss, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany**

**Filed Dec. 9, 1996, Ser. No. 761,842**

**Claims priority, application Germany, Dec. 11, 1995, 195 46 073.1**

**Int. Cl.[6] C09D** *191/06*

**U.S. Cl. 106—271** **13 Claims**

1. A stable aqueous wax dispersion comprising

A) 5 to 65% by weight of micronized wax, the wax comprising an amide or montan or polyethylene wax or a mixture thereof,

B) 0.01 to 7 by weight of polymeric carbohydrate derivatives as a dispersing agent, the polymeric carbohydrate derivatives comprising a cellulose ether or starch ether or bean flour derivative or a mixture thereof, and

C) 94.99 to 28% water, and wherein the wax has an average particle size of 1 to 50 μm.

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**5,743,950**

**PROCESS FOR PREPARING AN ASPHALT COMPOSITION**

**Henricus Engelbertus Johannes Hendriks, and Dirk Adriaan Stoker, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

**Filed Nov. 25, 1996, Ser. No. 755,996**

**Claims priority, application European Pat. Off., Jan. 12, 1995, 95308681**

**Int. Cl.[6] C08L** *95/00*

**U.S. Cl. 106—281.1** **7 Claims**

1. A process for preparing a dense-graded asphalt composition having a void content of no more than 10 percent which comprises adding a hard binder component having a penetration of less than 50 to a mixture of a non-emulsified soft binder component having a viscosity of less than 300 mpa.s at 100° C. and a dense-graded aggregate, the adding step being conducted at a temperature of less than 50° C. if the hard binder component is added as a powder or less than 80° C. if the hard binder component is added as an emulsion or suspension, whereby the hard binder component comprises from 10 to 90 percent by weight of the total binder.

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**5,743,951**

**PRIMER COMPOSITION**

**Toshiyuki Ozai; Masatoshi Miyake; Shinichi Sato; Keisuke Imai, and Masaharu Sato, all of Gunma-ken, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan**

**Filed Jul. 31, 1996, Ser. No. 688,897**

**Claims priority, application Japan, Aug. 1, 1995, 7-215233; Dec. 15, 1995, 7-347628**

**Int. Cl.[6] C09D** *183/06*

**U.S. Cl. 106—287.11** **12 Claims**

1. A primer composition which comprises:

(A) an organosilicon compound of the general formula (1)

$$(H_2N-(R-N)_b-R^1-Si-(OR^2)_{3-a} \quad (1)$$

wherein R represents an alkylene group having from 1 to 6 carbon atoms, $R^1$ represents a divalent hydrocarbon group having not less than 4 carbon atoms, $R^2$'s may be the same or different and independently represent an unsubstituted or substituted monovalent hydrocarbon group, a is 0 or 1, and b is 0, 1, 2 or 3;

(B) a catalyst for condensation for the organosilicon compound; and

(C) an organopolysiloxane resin of the following average compositional formula

$$R^3_nSiO_{4-n/2}$$

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wherein each $R^3$ independently represents an unsubstituted or substituted monovalent hydrocarbon group, and c is a positive value of from 0.4 to 1.8.

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5,743,952

## AQUEOUS SUSPENSIONS OF INORGANIC MATERIALS

David Robert Skuse, Truro Cornwall; Warren Paul Eagles, Loughborough, and Keith Robert Rogan, St. Austell, all of United Kingdom, assignors to ECC International Ltd., England

PCT No. PCT/GB95/00563, § 371 Date Nov. 21, 1996, § 102(e) Date Nov. 21, 1996, PCT Pub. No. WO95/25146, PCT Pub. Date Sep. 21, 1995

PCT Filed Mar. 16, 1995, Ser. No. 704,553

Claims priority, application United Kingdom, Mar. 17, 1994, 9405275

Int. Cl.[6] C04B *14/20*

U.S. Cl. 106—416 13 Claims

1. A process for improving the rheological properties of an aqueous suspension of a particulate inorganic material which comprises the steps of:

(a) forming an aqueous suspension comprising particulate inorganic material having particles with at least 45 percent by weight of which have an equivalent spherical diameter of smaller than 2 μm and an effective amount of an anionic polyelectrolyte dispersing agent to cause the particulate inorganic material to be in a dispersed state in the aqueous suspension:

(b) diluting the suspension formed in step (a) with water while the particles of the particulate inorganic material are in said dispersed state of step (a) to give a suspension having a solids concentration of not less than 20% by weight of the particulate inorganic material; and

(c) reconcentrating the diluted suspension formed in step (b) to give a suspension having a solids concentration of at least 50% by weight of the particulate inorganic material.

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5,743,953

## HEAT CURABLE ALUMINO-SILICATE BINDER SYSTEMS AND THEIR USE

Helena Twardowska; John J. Cooper, both of Columbus, and Yuliy Yunovich, Hilliard, all of Ohio, assignors to Ashland Inc., Columbus, Ohio

Filed Dec. 11, 1996, Ser. No. 762,670

Int. Cl.[6] C04B *12/04*

U.S. Cl. 106—600 13 Claims

1. A heat curable foundry binder system comprising as separate components:

(A) a soluble source of silica,

(B) a caustic solution of an alkai silicate, and

(C) aluminum silicate, and

(D) an alcohol selected from the group consisting of sorbitol, xylitol, meso erythritol, and mixtures thereof, which is incorporated into component (A), (B), or (C), such that the binder mix contains 1–15 weight percent silica, 60–80 weight percent alkali silicate solution having a solids concentration of 35–40 weight percent, 15–30 weight percent aluminum silicate, and 2–15 weight percent alcohol, where said weight percents are based upon the total weight of the binder.

5,743,954

## METHOD FOR CONTINUOUS REFRACTORYLESS CALCINING OF GYPSUM

George E. Rowland, Naperville, Ill.; Michael L. Cloud, Canton, and Daniel J. Milligan, Watonga, both of Okla., assignors to United States Gypsum Company, Chicago, Ill.

Filed Feb. 2, 1995, Ser. No. 382,612

Int. Cl.[6] C04B *11/00*

U.S. Cl. 106—783 12 Claims

1. A method of calcining gypsum comprising the steps of:

feeding ground gypsum into a calcining kettle which includes at least one interiorly-disposed heating means for circulating a heated media throughout an interior chamber of said kettle without allowing said heated media to contact contents in said kettle, said calcining kettle further including a plurality of distinct calcining zones, each calcining zone having its own interiorly-disposed heating means, and where said heated media provides the heat required to calcine said kettle's contents, said gypsum being fed into the kettle until said heating means is covered;

then, circulating said heated media through said heating means to heat said gypsum material in said kettle to a calcining temperature in the range of about 290° F. to about 310° F., so that said gypsum material becomes calcined;

then, introducing more gypsum material into said kettle to cause the calcined gypsum in said kettle to overflow into a recovery means for receiving said calcined gypsum from said kettle.

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5,743,955

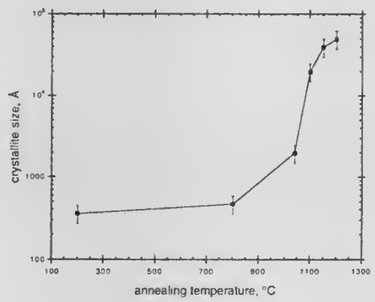
## METHOD FOR SYNTHESIZING FINE-GRAINED PHOSPHOR POWDERS OF THE TYPE $(RE_{1-x}LN_x)(P_{1-y}V_y)O_4$

Mark L. F. Phillips, 83 Lagarto Rd., Tijeras, N. Mex. 87059

Filed Oct. 23, 1995, Ser. No. 546,655

Int. Cl.[6] C30B *25/02*

U.S. Cl. 117—2 17 Claims




1. A method comprising preparing well-crystallized photo- and cathodoluminescent oxide phosphor powders of a desired size using hydrothermal synthesis and annealing to produce nearly monosized $(RE_{1-x}Ln_x)(P_{1-y}V_y)O_4$(Ln=Ce→Lu; $0<x<1$; $0\leq y\leq 1$) phosphor grains comprising the steps of:

(a) preparing a mixture of aqueous solutions of compounds of a rare earth (RE), a lanthanide (Ln), and vanadium and/or phosphorus, wherein the RE and Ln are different elements,

(b) treating the mixture with an alkali until precipitation is complete,

(c) heating the precipitate in an aqueous medium to a maximum of about 600° C.

(d) recovering the precipitate from the solution,

(e) annealing the dried precipitate by heating it to the range of about 900° C. to about 1300° C. to achieve the desired crystallite size, and

(f) deaggregating the dried precipitate.



5,743,956

## METHOD OF PRODUCING SINGLE CRYSTAL THIN FILM

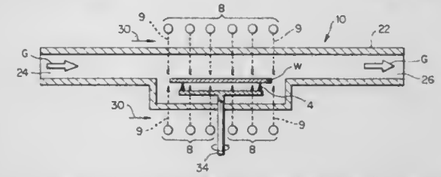
Hitoshi Hahuka, Machashi, and Masanori Mayuzumi, Annaka, both of Japan, assignors to Shin-Etsu Handotai, Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1996, Ser. No. 665,290

Claims priority, application Japan, Jun. 20, 1995, 7-153105

Int. Cl.[6] C30B *25/10*

U.S. Cl. 117—89 20 Claims



1. A method of producing a single crystal thin film in a reaction vessel of a cold wall type with a holder which has no capability of heating, said method comprising the steps of: placing a semiconductor single crystal substrate(s) on the holder; feeding a reaction gas to flow in one direction in the vessel; adjusting a temperature profile of the substrate(s) to be uniform along the flow direction of the reaction gas and growing the single crystal film on the substrate(s).

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5,743,957

## METHOD FOR FORMING A SINGLE CRYSTAL DIAMOND FILM

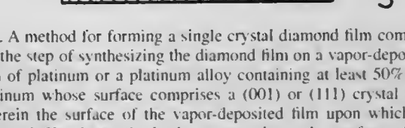
Koji Kobashi, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 16, 1996, Ser. No. 680,612

Claims priority, application Japan, Aug. 4, 1995, 7-219624

Int. Cl.[6] C30B *29/04*; C23C *16/26*

U.S. Cl. 117—929 12 Claims




1. A method for forming a single crystal diamond film comprising the step of synthesizing the diamond film on a vapor-deposited film of platinum or a platinum alloy containing at least 50% (at.) platinum whose surface comprises a (001) or (111) crystal face, wherein the surface of the vapor-deposited film upon which the diamond film is synthesized corresponds to the surface of the vapor-deposited film which has been joined to a substrate upon which the vapor-deposited film was formed.

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5,743,958

## VEHICLE POWDER COATING SYSTEM

Jeffrey R. Shutic, Wakeman, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Continuation-in-part of Ser. No. 66,873, May 25, 1993, abandoned. This application Oct. 11, 1994, Ser. No. 320,921

Int. Cl.[6] B65G *53/40*

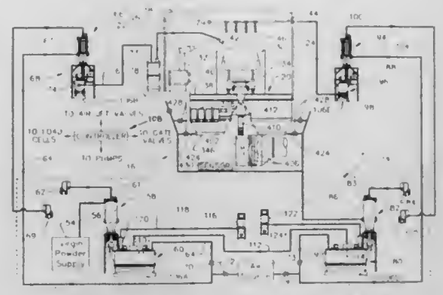
U.S. Cl. 118—308 24 Claims

1. Apparatus for supplying powder coating material, comprising:

a source of virgin powder coating material, a primary hopper and a feed hopper;

a first transfer device, connected between said source and said primary hopper, which transmits powder coating material under the application of negative pressure from said source to said primary hopper;

a second transfer device, connected between said primary hopper and said feed hopper, which transmits powder coating material under the application of negative pressure from said primary hopper to said feed hopper, said feed hopper being adapted to connect to coating dispensers which apply powder coating material onto objects passing through a powder spray booth;



each of said first and second transfer devices including:

(i) a powder receiver unit having a powder collection chamber;

(ii) a clean air chamber separated from said powder collection chamber;

(iii) at least one cartridge filter located within said powder collection chamber and in communication with said clean air chamber; and

(iv) a device for dislodging powder coating material collected on said cartridge filter.

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5,743,959

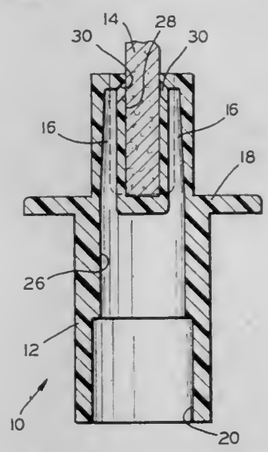
## REUSABLE APPLICATOR TIP

Charles E. Ash, Perrysburg, Ohio; Kevin R. Fisher, Warren, Mich.; Wallace F. Krueger; Michael L. Simon, both of Toledo, Ohio, and John G. Rock, Harrison Twp., Mich., assignors to Libbey-Owens Ford Co., Toledo, Ohio

Filed Nov. 26, 1996, Ser. No. 757,729

Int. Cl.[6] B05C *11/02*

U.S. Cl. 118—264 16 Claims




1. A reusable applicator tip for applying a liquid material to at least one peripheral marginal surface of a sheet of material, comprising:

(A) a pad block having opposing ends, one end having a cylindrical coupling extension, the opposing end forming a transfer pad base, said coupling extension in fluid communication with a liquid dispensing means;

(B) an internal chamber created by an annular opening extending from said cylindrical coupling extension to said transfer pad base;

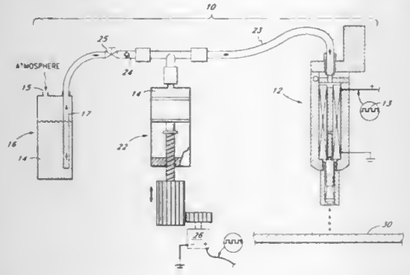
VOL 1209 ISS 4 AP 28 1998 UMI



(C) a recess extending into said transfer pad base;
(D) a transfer pad removably fitted into the recess of said transfer pad base and extending outwardly beyond said transfer pad base;
(E) at least one channel extending from said internal chamber into said transfer pad base, said channel in fluid communication with the fluid dispensing means through said internal chamber; and
(F) an opening in said transfer pad base to said channel, said opening located at an upper extremity of said recess to permit flow of the liquid material from said channel onto an outer surface of said transfer pad wherein said liquid material is deposited as a band onto a peripheral marginal surface of a sheet of material upon movement of said applicator tip and wiping contact of said transfer pad with said sheet of material.

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**5,743,960**
**PRECISION METERED SOLENOID VALVE DISPENSER**
**Thomas C. Tisone, Orange, Calif., assignor to Bio-Dot, Inc., Irvine, Calif.**
**Filed Jul. 26, 1996, Ser. No. 687,712**
**Int. Cl.[6] B05B** *13/02;5/025*
**U.S. Cl. 118—683** **34 Claims**

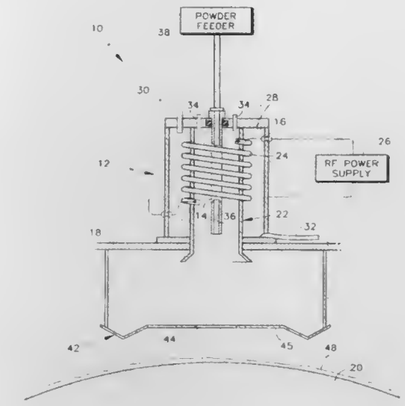



1. An apparatus for forming a diagnostic test strip comprising:
a carriage for movably supporting a receptive membrane,
a non-contact solenoid valve dispenser mounted in juxtaposition with said carriage and having a valve adapted to be opened and closed at a predetermined frequency and duty cycle to form droplets of reagent which are deposited onto said receptive membrane, said droplets having a size in the range from about 0.42 nonoliters to about 2.1 microliters; and
a positive displacement pump in fluid communication with a source of said reagent and said solenoid valve dispenser for metering predetermined quantities of said reagent to said solenoid valve dispenser so that the quantity and/or flow rate of said reagent dispensed by said solenoid valve dispenser can be precisely metered substantially without being affected by the particular operating parameters of said solenoid valve dispenser or the particular flow characteristics of said airborne reagent being dispensed.

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**5,743,961**
**THERMAL SPRAY COATING APPARATUS**
**Robert J. Wright, Tequesta; William J. Dalzell, Jr., Jupiter; George Himich, Jr., West Palm Beach, and Raymond M. O'Donoghue, Coral Springs, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.**
**Filed May 9, 1996, Ser. No. 647,125**
**Int. Cl.[6] C23C** *16/06*
**U.S. Cl. 118—620** **3 Claims**

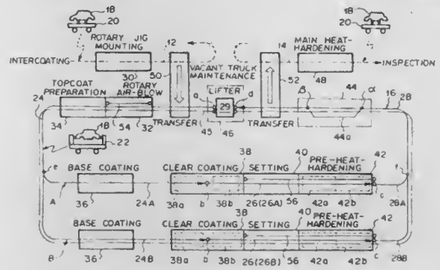
1. A thermal spray apparatus for depositing a coating onto a substrate, comprising:
a plasma generator, wherein said generator selectively changes gas from a gaseous state to a plasma; and




means for entraining powder particles in said plasma, wherein a portion of said powder particles change into a molten state while entrained within said plasma; and
a plasma filter, disposed adjacent the substrate, for filtering said powder particles entrained within said plasma;
wherein plasma and entrained powder particles exiting said plasma generator travel between said plasma generator and said plasma filter, and said plasma filter is sized to permit only a high intensity region of said plasma and entrained molten powder particles through to the substrate.

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**5,743,962**
**PRODUCT CONVEYING SYSTEM FOR COATING AND TREATING SURFACES**
**Toshifumi Ogasawara, and Shinji Katayama, both of Hiroshima-ken, Japan, assignors to Mazda Motor Corporation, Japan**
**Division of Ser. No. 627,252, Apr. 3, 1996, Pat. No. 5,651,820, which is a continuation of Ser. No. 312,801, Sep. 27, 1994, abandoned. This application Mar. 25, 1997, Ser. No. 823,483**
**Claims priority, application Japan, Sep. 30, 1993, 5-268455; Jul. 7, 1994, 6-156131**
**Int. Cl.[6] B05B** *13/00*
**U.S. Cl. 118—643** **27 Claims**




1. In a coating apparatus comprising
a coating station including a plurality of coating zones for applying a solvent-containing thermosetting coating composition to a work, said plurality of coating zones including a final coating zone for applying the coating composition to a thickness larger than a limit thickness over which the coating composition on a surface of the work extending in a vertical direction will normally run or sag, a heat-hardening station including a heat-hardening zone for hardening the coating composition applied to the work by heating, a rotating means



for rotating the work about a substantially horizontal axis after the coating in the coating zone to prevent the coating composition on the vertical surface of the work from running or sagging, and a conveyor means for passing the work through the coating zone and the heat-hardening zone in this order, the conveyor means including a pair of conveyors which form a conveyor line for conveying the work and are separated from each other upstream of a position where the coating composition is applied to the work to a thickness larger than said limit thickness, and said heat-hardening zone including a pre-heat-hardening zone for half hardening the coating composition to such an extent that the coating composition cannot run or sag and a main heat-hardening zone for fully hardening the coating composition after the coating composition is half hardened, wherein the improvement comprises that
a pooling station including a pooling zone in which a predetermined number of works are temporarily pooled is provided between the pre-heat-hardening zone and the main heat-hardening zone, said pooling zone having a storage capacity equal to at least the sum of the number of works in the final coating zone and present in the pre-heat-hardening zone, wherein at least the final coating zone, the pre-heat-hardening and the pooling zone are formed on at least one conveyor, the coating zones other than the final coating zone and the main heat-hardening zone being formed on conveyor sections which operate independently from said at least one conveyor.

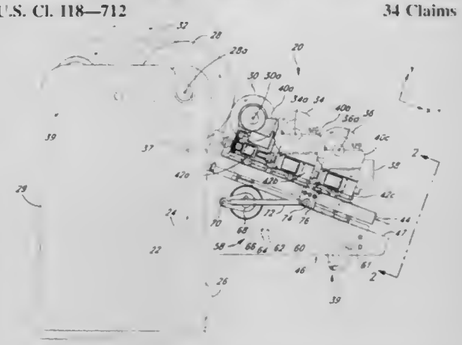
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**5,743,963**
**APPARATUS AND METHOD FOR COATING OF OBJECTS USING A POROUS RESILIENT MATRIX**
**Victor A. Williamitis, Dayton, Ohio; Jeanne E. Lambert, Conyers, Ga.; Min Shiu Lee, and Robert A. Taller, both of Sandy, Utah, assignors to Becton Dickinson and Company, Franklin Lakes, N.J.**
**Division of Ser. No. 509,393, Jul. 31, 1995. This application Jul. 29, 1996, Ser. No. 681,750**
**Int. Cl.[6] B05C** *1/00*
**U.S. Cl. 118—680** **6 Claims**



1. An apparatus for applying a coating to an object, comprising:
a first roller mounted on a first axis for rotation thereabout, the first roller being compressible and defining a non-compressed thickness of $t_1$;
a first porous lubricating roller having an axis parallel to the first axis for rotation thereabout, the first porous lubricating roller being compressed against said first roller wherein a thickness $t_2$ of said first roller from the first axis to the first porous lubricating roller is less than $t_1$;
a second roller mounted on a second axis parallel to the first axis for rotation about the second axis the second roller being disposed adjacent said first roller; and
means, in communication with said first roller and said second roller, for moving said object to a location between the first roller and the second roller for the application of a fluid on the object wherein a distance $t_3$ of the first roller from the first axis to the object is less than $t_1$, and greater than $t_2$ when said object is disposed between said first roller and said second roller.

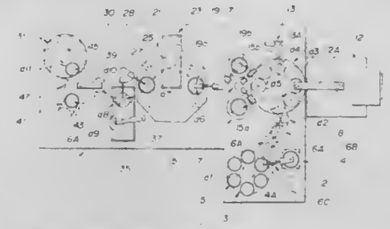
**5,743,964**
**ROLL COATING SYSTEM**
**Eugene A. Pankake, Newburgh, Ind., assignor to FATA Hunter, Inc., Riverside, Calif.**
**Filed Jan. 24, 1995, Ser. No. 378,305**
**Int. Cl.[6] B05C** *1/00*
**U.S. Cl. 118—712** **34 Claims**



1. An apparatus for applying a layer of liquid coating of controlled thickness onto the surface of a travelling web, comprising:
a frame;
a source of liquid coating material;
a first roll sled movable with respect to said frame along a line;
a first roll defining a first axis supported by said first roll sled and journaled so as to be rotatable about said first axis;
a second roll sled movable along said line;
a second roll defining a second axis supported by said second roll sled and journaled so as to be rotatable about said second axis; and
a third roll sled movable along said line and a third roll defining a third axis, wherein none of said roll sleds supports another of said roll sleds.

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**5,743,965**
**DISK COATING SYSTEM**
**Hironobu Nishimura, Tokorozawa; Yoshihiko Naito, Nerima; Naozumi Mizutani, Toride; Masahiko Kotoyori, Setagaya, and Katumi Yamaguchi, Bunkyo, all of Japan, assignors to Origin Electric Company, Limited, Tokyo, Japan**
**Filed May 2, 1996, Ser. No. 641,791**
**Claims priority, application Japan, Aug. 30, 1995, 7-245477**
**Int. Cl.[6] B05C** *5/00*
**U.S. Cl. 118—712** **17 Claims**



1. A disk coating system comprising:
a first process section which comprises a turntable for carrying a plurality of disks sequentially from a predetermined coating material supply position to a predetermined disk removal position by intermittently rotating, and a coating material supplying apparatus for supplying a coating material to each disk held at the coating material supply position by said turntable;
a second process section for spinning each disk to remove an excess amount of the coating material;
a third process section for receiving each disk from said second process section and for curing a coating layer on each disk;

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a first disk transfer mechanism for transferring each disk from said removal position on said turntable of said first process section to said second process section; and

a second disk transfer mechanism for transferring each disk from said second process section to said third process section;

wherein said second process section comprises first and second spinners spaced substantially equidistantly from said removal position of said first process section so as to form an imaginary isosceles triangle; and

wherein said first disk transfer mechanism comprises first and second transfer arms for transferring disks from said removal position alternately to said first and second spinners.

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**5,743,966**

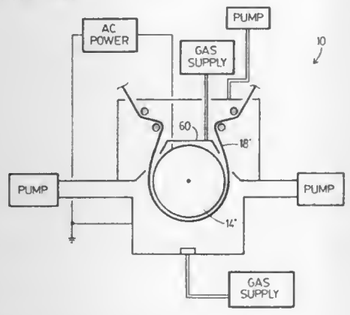
**UNWINDING OF PLASTIC FILM IN THE PRESENCE OF A PLASMA**

**Christopher P. Woolley, Martinez; Harvey Rogers, Playa del Rey, and John Mourelatos, Clayton, all of Calif., assignors to The BOC Group, Inc., New Providence, N.J.**

**Filed May 31, 1996, Ser. No. 656,395**

**Int. Cl.[6] C23C *16/00***

**U.S. Cl. 118—718** **12 Claims**




1. An apparatus comprising:

an evacuable chamber;

a rotatable drum adapted to roll a web, wherein when the web is rolled over the drum, the web divides the evacuable chamber into a deposition zone and a winding zone; the deposition zone facing the side of the web onto which a layer is to be deposited, the winding zone facing the other side of the web; and

means for forming a plasma in the winding zone, the plasma adapted to allow for the dissipation of static electricity from the web so that the sticking of the web to the drum is reduced.

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**5,743,967**

**LOW PRESSURE CVD APPARATUS**

**Isamu Kobori, Chiba, and Michio Arai, Tokyo, both of Japan, assignors to Semiconductor Energy Laboratory Co., Kanagawa-ken, and TDK Corporation, Tokyo, both of Japan**

**Filed Jul. 11, 1996, Ser. No. 678,592**

**Claims priority, application Japan, Jul. 13, 1995, 7-200361**

**Int. Cl.[6] C23C *16/00***

**U.S. Cl. 118—724** **13 Claims**

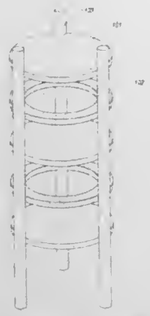
1. A low-pressure CVD apparatus comprising:

a reaction vessel configured to hold a plurality of substrates that are stacked relative to one another in a substantially vertical direction at a first spacing between two adjacent substrates;

substrate supporting trays disposed in said reaction vessel to hold the substrates;

means for forming films over the substrates; and

at least one annular corrective frame located between two adjacent substrates, said annular corrective frame being spatially separated from the substrates and having a central opening opposing a central portion of said two adjacent substrates and



a peripheral rim opposing peripheral portions of the substrates, wherein said annular corrective frame operates to allow said films to be uniformly formed on the substrates.

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**5,743,968**

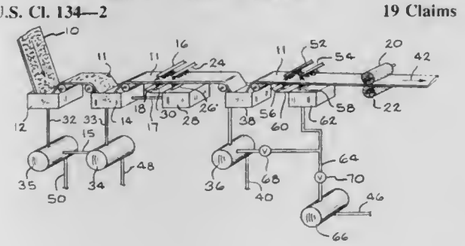
**HYDROGEN PEROXIDE PICKLING OF STAINLESS STEEL**

**Jerald W. Leeker, Trenton, and Ronald D. Rodahaugh, Lebanon, both of Ohio, assignors to Armco Inc., Middletown, Ohio**

**Filed Mar. 20, 1997, Ser. No. 821,154**

**Int. Cl.[6] C23G *1/02*; B08B *1/02***

**U.S. Cl. 134—2** **19 Claims**




1. A process for removing scale from a ferrous alloy containing chromium, comprising:

providing a ferrous alloy strip containing chromium covered by scale,

pretreating the strip to crack the scale,

immersing the pretreated strip into at least one pickling tank containing an inorganic acid from the group consisting of hydrochloric and sulfuric acid to remove the cracked scale thereby forming a pickled strip, and

applying an aqueous solution free of dissolved iron containing hydrogen peroxide to the pickled strip wherein any residual scale on the pickled strip becomes activated by the hydrogen peroxide and removed by the inorganic acid thereby forming a clean strip.

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**5,743,969**

**METHOD FOR TREATING THE OUTER SURFACE OF PIPE**

**Oliver Wayne Lawler, 307 Banana Bend Loop, Highlands, Tex. 77562**

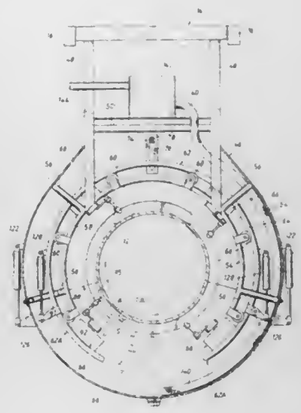
**Division of Ser. No. 106,928, Aug. 16, 1993, Pat. No. 5,615,696, which is a continuation-in-part of Ser. No. 919,534, Jul. 24, 1992, abandoned. This application Apr. 30, 1996, Ser. No. 641,178**

**Int. Cl.[6] B08B *3/02***

**U.S. Cl. 134—10** **15 Claims**

1. A method for treating a pipeline having an outer surface with a carriage mounted for longitudinal movement along the pipeline





**5,743,971**

**LIQUID RUST PROOF FILM-FORMING COMPOSITION AND RUST PROOF FILM-FORMING METHOD**

**Manabu Inoue; Tadahiro Ohnuma; Tomitaka Yamamoto, and Go Sato, all of Tokyo, Japan, assignors to Dipsol Chemicals Co., Ltd., Tokyo, Japan**

**Filed Jul. 18, 1996, Ser. No. 683,472**

**Claims priority, application Japan, Aug. 21, 1995, 7-211585**

**Int. Cl.[6] C23C *27/78***

**U.S. Cl. 148—247** **9 Claims**

1. A liquid rust proof film-forming composition consisting essentially of (A) 0.001 to 3.0 mole/l of an oxidative substance, (B) 0.001 to 2.0 mole/l of a silicate and/or silicon dioxide, (C) 0.0001 to 0.5 mole/l of at least one member selected from the group consisting of metal cations of Ti, Zr, Ce, Sr, V, W and Mo, and oxymetal anions thereof, and a chelating agent selected from the group consisting of aliphatic amines, aminoalcohols, aminocarboxylic acids, hydroxycarboxylic acids, monocarboxylic acid and polyvalent carboxylic acids, said composition being free of chromium ions.

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having a plurality of nozzles spaced at spaced intervals about the pipeline and mounted for oscillation concentric to the outer surface of the pipeline, the method including the following steps:

a) moving the carriage in a series of separate longitudinal steps of a specified distance along the pipeline while stopping periodically the carriage for a predetermined time period to initiate pipeline cleaning; and

b) oscillating said nozzles in a predetermined arcuate stroke around the pipeline for each longitudinal step along the pipeline while operating the nozzles discharging cleaning liquid against the pipeline in the form of high pressure jets wherein the outer surface of the pipeline is treated along the external surface in a plurality of continuous cylindrical bands on the outer surface of the pipeline.

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**5,743,970**

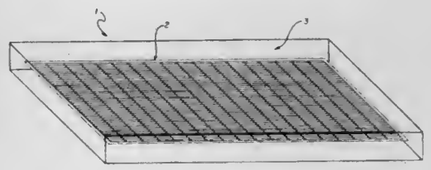
**PHOTOVOLTAIC MODULE HAVING AN INJECTION MOLDED ENCAPSULANT**

**Wolodymyr Czubatyj, Warren, and Joachim Doehler, Union Lake, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.**

**Filed Dec. 13, 1995, Ser. No. 571,338**

**Int. Cl.[6] H01L *31/048***

**U.S. Cl. 136—251** **12 Claims**




1. A photovoltaic module comprising:

a photovoltaic panel having front and back sides and edges forming a perimeter and at least one photovoltaic cell capable of converting radiation incident the front side of the panel to electrical energy; and

a non-reacted injection molded polymeric material encapsulating said panel and forming an environmental seal therearound,

wherein said non-reacted injection molded polymeric material encapsulating said panel is injection molded in-situ around said panel.

**5,743,972**

**HEAVY-WALL STRUCTURAL STEEL AND METHOD**

**Tatsumi Kimura; Kiyoshi Uchida; Fumimaru Kawahata; Keniti Amano, and Takanori Okui, all of Okayama, Japan, assignors to Kawasaki Steel Corporation, Japan**

**Filed Aug. 27, 1996, Ser. No. 697,645**

**Claims priority, application Japan, Aug. 29, 1995, 7-220063**

**Int. Cl.[6] C22C *38/12***

**U.S. Cl. 148—330** **9 Claims**

1. In a heavy-wall structural steel, said heavy-wall steel having a flange portion with a flange thickness of about 40 mm or more and possessing excellent strength, toughness, weldability and seismic resistance, which said heavy-wall steel comprises, in terms of weight percentage about 0.05–0.18% of C, about 1.00–1.80% of Mn, about 0.005–0.050% of Al, about 0.020% or less of P, about 0.004–0.015% of S, at least one element selected from the group consisting of about 0.05–0.60 % of Cu, about 0.05–0.60% of Ni, about 0.05–0.50% of Cr, and about 0.02–0.20% of Mo, the combination which comprises about 0.04–0.15% of V, about 00.007–0.0150% of N and about 0.60% or less of Si, the weight ratio of V to N being about 5 or more,

the balance of said steel comprising Fe and incidental impurities; wherein said steel has a Ceq value defined by the following equation 1 which is within the range of about 0.36–0.45 wt %:

Ceq(wt %)=C+Si/24+Mn/6+Ni/40+Cr/5+Mo/4+V/14(1), where the symbols C, Si, Mn, Ni, Cr, Mo and V represent the weight percentages of the identified elements, said steel having a microstructure selected from the group consisting of ferrite-pearlite and ferrite-pearlite-bainite, and having a ferrite grain size number defined according to JIS G0552 which is about 5 or more, and wherein the areal ratio of ferrite is about 50–90%, and wherein said steel has a flange portion having, at a center of thickness in each of the rolling direction, the direction perpendicular to the rolling direction, and the plate-thickness direction, a Charpy absorbed energy value at 0° C. of about 27 J or more, a yield ratio of about 80% or less, and a tensile strength of about 490–690 MPa.

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**5,743,973**

**TIRE WITH ELECTRICALLY ORIENTED COMPOSITE**

**Ram Murthy Krishnan, Munroe Falls, and Gary Thomas Belski, Massillon, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Mar. 10, 1997, Ser. No. 814,957**

**Int. Cl.[6] B60C *1/00; 19/00; 23/00***

**U.S. Cl. 152—152.1** **21 Claims**

1. A rubber tire containing an electrically oriented non-reinforcing composite within a rubber composition component of

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the tire, wherein said composite is composed of (i) at least two electrically conductive metal elements in close proximity to each other and (ii) an electrically conductive rubber composition which contacts and electrically connects said metal elements together; wherein the said electrically conductive rubber composition has a thickness in a range of about 0.1 to about 1 millimeter and an electrical volume resistivity within a range of about 3 to about 200 ohm-cm.

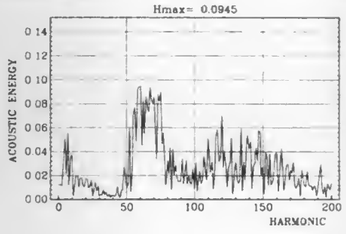
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**5,743,974**

## PNEUMATIC TIRE HAVING PITCH SEQUENCING

**Piotr Janusz Wesolowski, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Sep. 5, 1995, Ser. No. 523,709**
**Int. Cl.[6] B60C** *113/00*
**U.S. Cl. 152—209 R** **11 Claims**




1. A tire provided with a tread having a plurality of load-supporting elements placed about the circumference of said tire, said tread having a pitch sequence comprising:

(a) 52, 55, 57, 59, 62, 64 or 65 total pitches;

(b) only four different pitch lengths and the lowest indivisible integers used for the pitch ratios for the four pitch lengths are 11-13-15 and 17;

(c) a ratio of the longest pitch length to the shortest pitch length not to exceed 1.55;

(d) a ratio of the longer pitch length to the shorter pitch length of any two pitch which precede or follow each other not to exceed 1.37;

(e) there being no instance in the pitch sequence where the shortest pitch length directly precedes or directly follows the longest pitch length; and

(f) there being a constant increment in pitch length in the four different pitch lengths as one progresses from the shortest pitch length to the longest pitch length;

wherein said 52 total pitches consist of 15 13 17 15 15 11 13 17 13 13 15 15 15 13 13 11 11 13 15 13 13 17 15 11 13 11 13 17 13 11 11 11 13 15 17 17 15 15 11 13 11 11 11 13 15 17 15 11 11 13 11 15;

wherein said 55 total pitches consist of 13 13 15 15 13 11 11 11 11 13 13 15 17 15 11 15 11 13 13 13 15 11 13 17 15 15 13 13 17 13 11 11 13 13 17 15 11 13 11 13 11 13 15 15 17 13 17 13 11 13 11 11 11 13 17;

wherein said 57 total pitches consist of 13 11 13 15 17 15 13 17 13 13 11 11 11 11 11 13 15 17 15 13 15 11 11 11 11 11 13 15 13 17 15 11 15 11 15 11 13 13 13 15 15 13 13 17 15 17 15 13 11 13 11 11 13 15 15 13 11;

wherein said 59 total pitches consist of 15 15 17 15 13 13 11 15 11 15 13 13 11 11 11 15 17 15 11 11 13 15 13 11 11 11 11 11 15 15 13 17 13 13 11 11 11 13 17 15 13 11 11 15 17 15 13 11 13 13 17 17 15 15 11 13 11 11 13;

wherein said 62 total pitches consist of 15 15 15 11 13 15 17 17 15 13 11 11 11 13 13 15 17 15 15 15 13 15 11 11 13 15 17 15 13 11 11 13 13 15 13 11 11 13 15 17 13 11 13 15 15 17 13 13 11 11 11 11 13 15 15 17 17 15 11 13 13 11;

wherein said 64 total pitches consist of 15 17 13 17 15 13 11 11 11 13 13 15 15 17 15 15 13 11 11 15 15 13 17 13 15 13 13 11 11 15 11 11 13 15 17 13 13 11 13 13 15 17 13 11 11 11 13 13 17 17 15 15 13 15 11 13 13 11 11 13 15 15 15 11; and

wherein said 65 total pitches consist of 15 15 15 17 13 13 15 11 11 15 13 13 17 15 15 13 13 11 11 15 13 11 11 15 17 13 11 13 13 13 15 17 13 11 15 11 11 11 13 15 15 17 13 11 15 13 17 17 15 13 11 11 11 13.

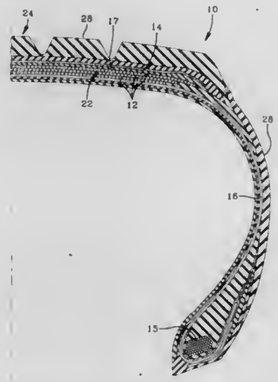
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**5,743,975**

## RADIAL MEDIUM TRUCK TIRE WITH ORGANIC POLYMER REINFORCED TOP BELT OR BREAKER

**Italo M. Sinopoli, Canton; John Gomer Morgan, North Canton, both of Ohio; Anthony Hardy, Bettendorf, and Murat Yasar Susutoglu, Bissen, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Mar. 24, 1995, Ser. No. 427,524**
**Int. Cl.[6] B60C** *9/00;9/08;9/18;9/20*
**U.S. Cl. 152—527** **4 Claims**




1. A pneumatic radial medium truck tire comprising at least a pair of parallel annular beads, at least one carcass ply wrapped around said beads only four belts or breakers consisting of three belts reinforced with steel filaments or cords at an angle of 12 to 35 degrees with respect to the equatorial plane (EP) of the tire and a top belt reinforced with nylon monofilaments disposed over said at least one carcass ply at an angle of 0 to 35 degrees with respect to the equatorial plane of the tire in a crown area of said tire, a tread disposed over said four belts and sidewalls disposed between said tread and beads, wherein said nylon monofilaments are obround in cross section and coated with a resorcinol formaldehyde latex (RFL) adhesive are 6,000 denier (6,700 dTex) and have a tenacity of at least 3.5 g/denier (31 cN/Tex), an initial modulus of at least 30 g/denier (265 cN/tex), and an elongation at break of at least 17% and a shrinkage of at most 6%, and wherein said nylon monofilaments have an angle with respect to the equatorial plane (EP) of the tire which is substantially the same as the angle of the steel filaments of cords of the adjacent belt radially inward of said top belt.

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**5,743,976**

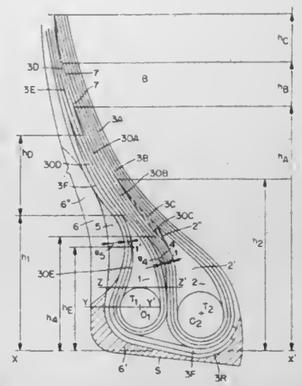
## RADIAL TIRE FOR AIRPLANES WITH BEADS HAVING TWO BEAD RINGS

**Jorge Fernando Peña, Greenville, S.C.; Robert Postic, and Pierre Roux, both of Clermont-Ferrand, France, assignors to Compagnie Generale des Etablissements Michelin-Michelin & Cie, Clermont-Ferrand Cedex, France**

**Filed Nov. 20, 1996, Ser. No. 754,079**
**Claims priority, application France, Dec. 8, 1995, 95 15689**
**Int. Cl.[6] B60C** *15/00;15/05;15/06*
**U.S. Cl. 152—543** **7 Claims**

1. An airplane tire having a tread, a belt reinforcement, and a radial carcass reinforcement, said carcass reinforcement having at






least two turned-up plies of textile threads or cords anchored in each bead, each bead having an axially inner and outer bead ring, and at least one ply of textile threads or cords extending along the axially outer faces of the turn-ups of the axially outer turn-up plies, the tire characterized by the fact that at least one turned-up ply is wound around each bead ring, extending axially from the inside to the outside to form an axially outer turn-up, the turn-up of the ply, which is axially furthest inward and is turned up around the axially inner bead ring, being, over a given radial portion, separated from the carcass ply axially furthest to the interior and turned up around the axially outer bead ring, by a first profiled member (4) of rubber mix in crescent shape, the radially upper end of which is located at a distance $h_4$ from the base XX' of the bead which is between 0.15 and 0.30 times the carcass reinforcement height H of the tire, and the radially lower end contained between the two straight lines YY' and ZZ' which are parallel to the base XX' of the bead and pass through the center of the outer bead ring and the point of said outer bead ring furthest from the axis of rotation, respectively, the maximum thickness $e_4$ of said first profiled member being at least equal to 0.5 times the total thickness t of the turn-ups of carcass plies turned up around the axially inner bead ring.

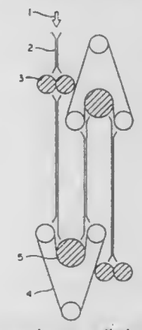
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**5,743,977**

## RADIATION IMAGE STORAGE PANEL AND ITS PREPARATION

**Hideki Suzuki; Masamitu Nonomura, and Yuichi Hosoi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Division of Ser. No. 504,668, Jul. 20, 1995, Pat. No. 5,641,968.**
**This application Apr. 23, 1996, Ser. No. 636,319**
**Claims priority, application Japan, Jul. 20, 1994, 6-190887**
**Int. Cl.[6] G21K** *4/00;* **B32B** *31/20*
**U.S. Cl. 156—67** **5 Claims**




1. A process for preparing a radiation image storage panel having on a permanent support a phosphor layer comprising a stimulable phosphor and a binder, said binder comprising a thermoplastic elastomer having a softening or melting point of 30° to 150° C. and a modulus of elasticity of not more than 0.3 kgf/mm$^2$ which comprises the steps of:

coating on a temporary support a phosphor layer-forming coating dispersion which contains a stimulable phosphor and a binder comprising a thermoplastic elastomer having a softening or melting point of 30° to 150° C. and a modulus of elasticity of not more than 0.3 kgf/mm$^2$ in a solvent to prepare a phosphor sheet;

separating the phosphor sheet from the temporary support; and

fixing the phosphor sheet onto the permanent support under a pressure of not lower than 50 kgw/cm$^2$ and at a temperature higher than the softening or melting point of the thermoplastic elastomer by 10° to 50° C.

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**5,743,978**

## HINGED SUPPORT OR THE LIKE FOR THE ARTICULATED CONNECTION OF CHASSIS PARTS IN MOTOR VEHICLES

**Silke Otto, Marl, and Alfons Nordloh, Visbek, both of Germany, assignors to Lemförder Metallwaren AG, Stemwede-Dielingen, Germany**

**Filed Nov. 13, 1995, Ser. No. 557,972**
**Claims priority, application Germany, Nov. 19, 1994, 44 41 220.7**
**Int. Cl.[6] B32B** *31/16*
**U.S. Cl. 156—73.1** **18 Claims**




1. A process for manufacturing a hinged support including a first end portion defining a first bearing eye, a second end portion defining a second bearing eye and a shaft part connecting said end portions, the process comprising the steps of:

manufacturing an injection molded first end piece and an injection molded second end piece separately from each other;

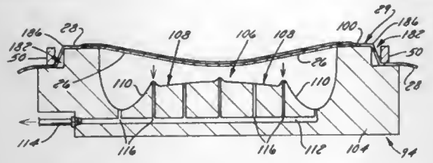
manufacturing an injection molded shaft part to provide an injection molded shaft part defining a longitudinally extending hollow space; and

joining said first end piece and said shaft part and joining said second end piece and said shaft part by one of bonding, ultrasonic welding and orbital welding.

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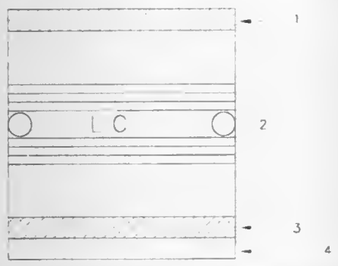
5,743,979
METHOD OF FORMING FABRIC
James R. Lorbiecki, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.
Filed Nov. 13, 1995, Ser. No. 556,303
Int. Cl.[6] B32B *31/04;31/16;31/20*
U.S. Cl. 156—79 27 Claims



1. A method of forming fabric comprising performing the following steps in the order presented:
a) providing a film constructed of a stretchable material, a frame for securing the film, a fabric, an adhesive, and a mold having a cavity with a contoured surface;
b) securing the film to the frame;
c) placing the fabric on the film with the adhesive between the fabric and film and without securing the fabric to the frame;
d) tacking the fabric to the film;
e) forming the fabric by drawing the fabric and film into the cavity of the mold; and thereafter
f) fixing the shape of the fabric so that it substantially conforms to the contoured surface of the mold cavity.

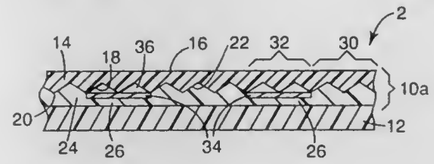
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5,743,980
METHOD OF FABRICATING AN OPTICAL RETARDATION FILM
Ting-Chiang Hsieh, Hsinchu Hsien; Dong-Yuan Goang, Taoyuan Hsien, and Ren-Long Chu, Hsinchu Hsien, all of Taiwan, assignors to Industrial Technology Research Institute, Hsin-Chu, Taiwan
Filed May 2, 1996, Ser. No. 642,107
Int. Cl.[6] B29D *11/00*
U.S. Cl. 156—99 12 Claims




1. A method of fabricating an optical retardation film comprising the steps of:
preparing a clean glass substrate;
preparing an alkyl solvent;
forming a solution by dissolving a polymer in said alkyl solvent, said polymer comprising at least one member selected from the group consisting of polyvinyl alcohol, polystyrene, polycarbonate and poly methylmethacrylate;
establishing a coating of said solution over said glass substrate by spin-coating method;
forming a single axis crystal coating by heating said coated glass substrate and drying said coating of said solution, said single axis crystal coating having identical refractive indexes along two orthogonal axes on a plane parallel to said glass substrate; and
separating said single axis crystal coating from said glass substrate, said single axis crystal coating forming said retardation film.

5,743,981
OPTICAL SECURITY ARTICLES AND METHODS FOR MAKING SAME
Shih-Lai Lu, Taipei, Taiwan, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 333,276, Nov. 2, 1994, Pat. No. 5,591,527.
This application Sep. 25, 1996, Ser. No. 719,814
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—182 12 Claims



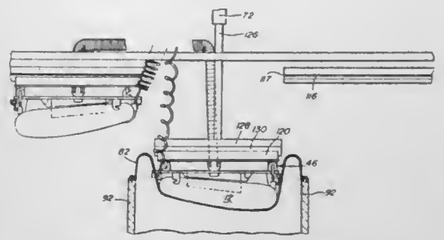

1. A method of making an optical security article comprising the steps of:
a) preparing a coatable composition comprising a curable organic resin;
b) providing a production tool comprising a first plurality of geometric concavities and corresponding peaks;
c) coating the coatable composition onto the production tool, thus substantially filling the first plurality of concavities;
d) contacting a first plastic film with the coatable composition on the production tool, at least one of the production tool and the first plastic film being flexible;
e) exposing the composition to conditions sufficient to cure the resin of the composition to yield a first intermediate comprising the first plastic film and a cured composition, the cured composition having a first refractive index;
f) removing the first intermediate from the production tool, the first intermediate having a structured first surface and a substantially smooth second surface, the structured first surface comprising a second plurality of geometric concavities and corresponding peaks which are the reverse image of the first plurality of geometric concavities and corresponding peaks;
g) providing a second plastic film having first and second surfaces;
h) applying a separation material on a selected area of the first surface of the second plastic film to form a second intermediate; and
i) adhering the second intermediate to the first intermediate with an adhesive layer, the adhesive layer having a second refractive index which is substantially similar to the first refractive index of the cured composition, such that the separation material is disposed between a first portion of the second plurality of geometric concavities and a first portion of the adhesive layer to form a reflective area, and wherein a second portion of the adhesive layer adhesively contacts and fills a second portion of the second plurality of concavities to form a transparent area.

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5,743,982
METHOD FOR BONDING A COVER TO A FLEXIBLE PAD
Donald F. Marfilius, Farmington Hills; William F. Klems, Troy, both of Mich., and Iftikhar Kamil, Springboro, Ohio, assignors to Magna Lomason Corporation, Farmington Hills, Mich.
Filed Jul. 1, 1996, Ser. No. 674,176
Int. Cl.[6] B29C *65/02;65/18*
U.S. Cl. 156—212 8 Claims

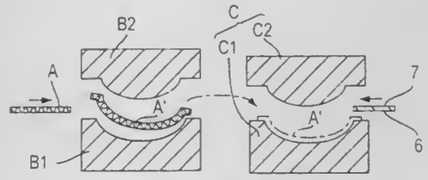
1. A process for adhesively bonding a flexible cover sheet having a front surface and a back surface to a flexible pad having a contoured appearance surface, said process comprising the steps of:
positioning said back surface of said cover sheet adjacent said appearance surface with a heat-activatable adhesive disposed





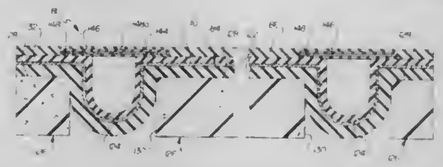

therebetween such that said cover sheet, said adhesive, and said flexible pad form an assembly,
mounting said assembly to a support frame,
providing a bed apparatus having a chamber devoid of particulate matter defined by interior surfaces of the bed apparatus and constructed and arranged to be filled with hot air, a permeable membrane constructed and arranged to allow a quantity of hot air to permeate therethrough and secured at one end of said chamber, and a hot air inlet, said bed apparatus being constructed and arranged such that hot air continuously flows through said hot air inlet and fills said chamber thereby distending said permeable membrane to define a hot air cushion,
pressing said assembly into said hot air cushion such that said hot air cushion substantially conforms to the contoured appearance surface and applies heat and pressure to the front surface of said cover sheet thereby activating said adhesive and bonding the back surface of said cover sheet to the appearance surface of said flexible pad,
allowing said adhesive to cure, and
removing said assembly from said support frame.

5,743,983
FORMING METHOD FOR INTERIOR TRIM MATERIAL MADE OF CORRUGATED CARDBOARD
Mitsutoshi Ogata; Kunio Cho, and Yutaka Sato, all of Tokyo, Japan, assignors to Tri-Wall K.K., Tokyo, Japan
Continuation of Ser. No. 119,230, Sep. 28, 1993, abandoned.
This application Oct. 21, 1996, Ser. No. 734,311
Claims priority, application Japan, Jul. 10, 1992, 4-183688
Int. Cl.[6] B32B *31/20*
U.S. Cl. 156—214 22 Claims



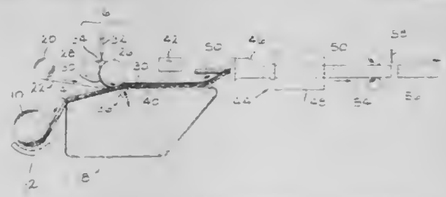

5. A method for forming an interior trim material having a base of corrugated cardboard, comprising:
selecting an overall substantially planar, corrugated cardboard base;
placing the overall substantially planar corrugated cardboard base into a hot press for forming the substantially planar corrugated cardboard base into a predetermined shape;
applying heat and pressure to the overall substantially planar corrugated cardboard base, using the hot press, to melt a hot melt adhesive on a surface of the overall substantially planar corrugated cardboard base without scorching the corrugated cardboard of the overall substantially planar corrugated cardboard base;
removing the corrugated cardboard base having the predetermined shape and immediately transferring the corrugated cardboard base having the predetermined shape to a forming die of a cold press which has no heating device;
applying a skin layer to a surface of the corrugated cardboard base having the predetermined shape; and
pressing the skin layer and the corrugated cardboard base having the predetermined shape together until the hot melt adhesive on the surface of the corrugated cardboard base having the predetermined shape bonds with the skin layer.

5,743,984
METHODS OF CONSTRUCTING A PORTABLE LIQUID CONTAINMENT
David B. Gregory, Kawkawlin, and Dan A. Oliver, West Branch, both of Mich., assignors to ReNew Roof Technologies, Inc., Bay City, Mich.
Continuation-in-part of Ser. No. 421,197, Apr. 13, 1995, Pat. No. 5,567,259, which is a continuation-in-part of Ser. No. 247,137, May 20, 1994, Pat. No. 5,464,492. This application Mar. 21, 1996, Ser. No. 619,315
Int. Cl.[6] B05D *5/00*; B32B *31/00*
U.S. Cl. 156—242 4 Claims



1. A method of making a portable liquid containment having an upstanding endless curb enclosing a recessed containment surface comprising the steps of:
a) providing a form having an endless curb enclosing an area of surface which is recessed relative to the curb;
b) applying a continuous layer of a curable liquid elastomeric polymeric material over the shape of the form an curing the layer to produce a continuous liquid-impervious top membrane having a membrane recessed surface portion surrounded by a membrane curb portion which is channel shaped and has an open bottom side;
c) removing the top membrane from the form and inverting it;
d) applying a shielding strip to the open side of the channel-shaped curb portion of the membrane; and
e) while the top membrane is inverted, applying to the top membrane and shielding strip a continuous layer of a liquid elastomeric polymeric material and curing it to unite it with said top membrane and form a liquid-impervious containment lower membrane covering the said curb portion, and the recessed surface portion of the top membrane.

5,743,985
METHOD OF MAKING AN ASPHALT AND FIBER LAMINATED INSULATION PRODUCT
Frederick R. Ernest, St. Louisville, Ohio; Jeffrey J. Van Sloun, Aiken, S.C., and Charles R. Weir, Westerville, Ohio, assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.
Filed Oct. 31, 1996, Ser. No. 742,191
Int. Cl.[6] B32B *31/20*
U.S. Cl. 156—243 18 Claims



1. A method of forming an insulation product comprising:
heating a thermoplastic material to a softened condition;
applying a layer of reinforcement material to a blanket of fibrous insulation material,

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applying the thermoplastic material to the layer of reinforcement material and the blanket of insulation material to form a laminated insulation material comprising a layer of the thermoplastic material bonded to the layer of reinforcement material and the blanket of insulation material, wherein the viscosity of the thermoplastic material is established so that some of the thermoplastic material passes through the layer of reinforcement material and penetrates only minimally into the blanket of insulation material;

heating the laminated insulation material to soften the layer of thermoplastic material to form a heated laminated insulation material which is more flexible;

molding the heated laminated insulation material to form the laminated insulation material into a desired shape; and

cooling the molded laminated insulation material to form an insulation product.

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**5,743,986**

**METHOD OF PRODUCING COMPOSITE MATERIALS, STRATIFORM COMPOSITES, AND CONTAINERS MADE THEREFROM**

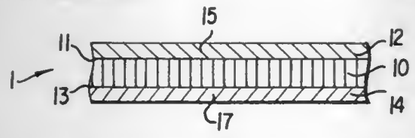
**Gian Carlo Colombo, San Giorgio Su Legnano, Italy, assignor to ICMA San Giorgio S.p.A., San Giorgio Su Legnano, Italy**

**Filed Dec. 21, 1995, Ser. No. 576,693**

**Claims priority, application Italy, Feb. 14, 1995, MI95A0262**

**Int. Cl.[6] B29D** *31/50*

**U.S. Cl. 156—244.11** **12 Claims**




1. A method of manufacturing a stackable container suitable for use as a box or crate for shipping fruits or vegetables, said container having an abrasion-exposed outer surface and an inner surface for contact with said fruits or vegetables; said method comprising:

producing a composite stratiform material by co-extrusion of at least three layers, each comprising polypropylene and at least one filler, said co-extrusion being effected by means of at least one extruder having a pair of co-rotating screws by co-extruding:

(I) a carrier layer formed of a mixture containing polypropylene and a particulate organic filler;

(II) a first outer layer consisting essentially of a mixture containing polypropylene and an inorganic filler; and

(III) a second outer layer consisting essentially of a mixture containing polypropylene and an inorganic filler; said co-extrusion providing for interfusion of said carrier layer with each of said first and second outer layers at mutually opposite interfaces between said carrier layer and said outer layers; and

(IV) molding said composite stratiform material at an elevated temperature and an elevated pressure so as to form said container.

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**5,743,987**

**STABILIZER BAR BUSHING WIHT ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE LINING AND METHOD OF MANUFACTURE**

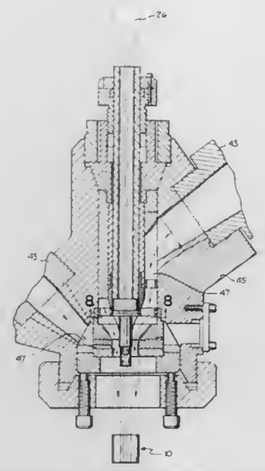
**Solomon H. Tang, Carmel, and James A. Roth, Wabash, both of Ind., assignors to BTR Antivibration Systems, Inc., Wabash, Ind.**

**Division of Ser. No. 327,529, Oct. 21, 1994, Pat. No. 5,565,251. This application Aug. 7, 1996, Ser. No. 684,975**

**Int. Cl.[6] B29C** *47/00*

**U.S. Cl. 156—244.11** **10 Claims**

1. A process of manufacturing a stabilizer bar bushing including an elastomeric bushing member having an outer surface and an




inner diameter defining a bore and having a slot extending the longitudinal length of the elastomeric member from the outer surface to the inner diameter, the slot and the inner diameter having a layer of solid, abrasion resistant low coefficient of friction film of ultra high molecular weight polyethylene adhered thereto to facilitate ease of insertion and removal of a stabilizer bar within the bore and reduce frictional engagement of the stabilizer bar bushing with the stabilizer bar, the process comprising the steps of:

a) providing a die assembly including a die having a cavity of a shape of an outer profile of the stabilizer bar bushing, and a film guide having the outer profile of the shape of the bore and the slot of the stabilizer bar bushing;

b) positioning the film guide within the die;

c) guiding an abrasion resistant low coefficient of friction ultra high molecular weight polyethylene film through the film guide and then through the die; and

d) extruding and funneling an elastomeric material toward the center of the die assembly and around the film guide to form a stabilizer bar bushing including a bore and slot having a layer of a low coefficient of friction ultra high molecule weight polyethylene film adhered thereto;

e) wherein the thin film of the low coefficient of friction material passes through the film guide into the die and into intimate contact with the extruded elastomeric material within the die such that an adhesive bond is formed between the elastomeric material and the thin film.

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**5,743,988**

**METHOD FOR PRODUCING CONTAINERS WITH A FILM MADE OF THERMOPLASTIC SYNTHETIC MATERIAL**

**Marco Accorsi, Reggiolo, Italy, assignor to Trimat S.r.l., Reggiolo, Italy**

**Filed Dec. 13, 1995, Ser. No. 571,565**

**Claims priority, application Italy, Dec. 23, 1994, MO94A0173**

**Int. Cl.[6] B29C** *49/00*; **B32B** *31/14*

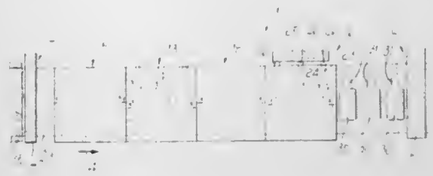
**U.S. Cl. 156—267** **8 Claims**

1. A method for producing containers with a film made of thermoplastic synthetic material, the method comprising:

a thermal bonding step for thermally bonding two strips of film made of thermoplastic synthetic material by providing thermal bond regions, said strips facing one another so that the thermal bonding step forms, therebetween, pouches that are open at a longitudinal edge end of said strips of film, said pouches being delimited by said thermal bond regions;

a cooling step for cooling portions of said thermal bond regions surrounding each of the pouches;





a thermoforming step, during which a segment of said two strips of film, in which said pouches are formed, is inserted in a forming mold, said mold being provided with molding cavities that are located at said pouches, a pressurized fluid being further injected into said pouches through their open end to thermoform said pouches by plastic inflation inside said molding cavities to form said containers,

wherein in said thermal bonding step, thermal bonding of the two strips of film that form said pouches is correlated to overall dimensions of said molding cavities so as to arrange in said molding step, when said strips of film are inserted in the forming mold, respective portions of said thermal bond regions, which delimit said pouches, inside a corresponding molding cavity at a preset distance from peripheral walls of said molding cavity, said respective portions of said thermal bond regions arranged inside said molding cavity corresponding to said portions of the thermal bond regions which have been cooled in said cooling step; and

a blanking step for separating the thermoformed containers from said strips wherein the containers have a lateral and bottom contour and are blanked flush with said lateral and bottom contours.

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**5,743,989**

**METHOD OF WELDING PLASTICS SHEETS TOGETHER AND A JOINT USED THEREIN**

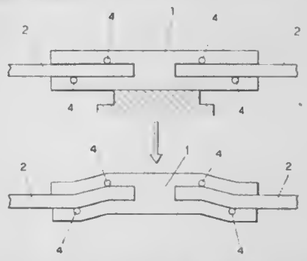
**Masaru Kumagai, and Toshikazu Nishimura, both of Osaka, Japan, assignors to Toua Kokyu Tugitevaruhu Seizo Co., Ltd., Osaka, Japan**

**Filed Dec. 13, 1995, Ser. No. 571,655**

**Claims priority, application Japan, Nov. 8, 1995, 7-316146**

**Int. Cl.[6] B32B** *31/26*; **H05B** *3/10*;*3/44*

**U.S. Cl. 156—273.9** **3 Claims**




1. A method of welding plastics sheets together comprising the steps of:

preparing at first plastics sheets having edges to be bonded one to another as well as a plastics joint having at least two weldable regions, the plastics joint also having a conductive linear member embedded in and extending along each weldable region from end to end, the conductive linear member for the front surface of the sheet edge and the conductive linear member for the rear surface being disposed in a staggered relationship, such that a bending stress is imparted to regions when the same are fusion bonded, whereby a curved deformation is produced in said regions to improve the welding strength;

subsequently placing the edges of the plastics sheets onto the weldable regions of the joint; and

finally supplying an electric current to the conductive linear members so as to heat same and thereby fusion bond each plastics sheet edge to the corresponding weldable region of the joint.

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**5,743,990**

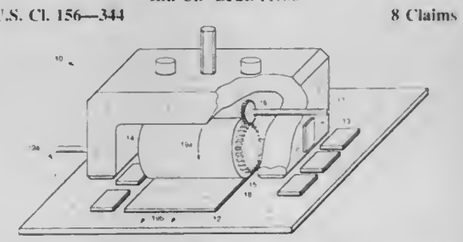
**THIN LAMINATE REMOVAL PROCESS TOOLING AND METHOD**

**Craig Iwami, Dana Point; Cunegundis T. Cura, Stanton; Vincente Soto, Riverside, and Seth Greiner, Costa Mesa, all of Calif., assignors to Hughes Electronics, Los Angeles, Calif.**

**Filed Nov. 25, 1996, Ser. No. 755,988**

**Int. Cl.[6] B32B** *35/00*

**U.S. Cl. 156—344** **8 Claims**




1. A method of removing a thin interconnect substrate from a surface of a base structure, said method comprising the steps of:

disposing a cylindrical thermode adjacent to a surface of the thin interconnect substrate wherein the thin interconnect substrate comprises a polyimide interconnect substrate;

attaching a non-slip drive mechanism to the cylindrical thermode;

disposing a layer of adhesive between the cylindrical thermode and the surface of the thin interconnect substrate that secures the cylindrical thermode to the surface of the thin interconnect substrate;

heating the thermode and layer of adhesive to secure the thermode to the thin interconnect susbstrate; and

rotating the non-slip drive mechanism and cylindrical thermode to translate the thermode along the surface of the base structure and interconnect substrate, to apply a peel force to the interconnect substrate to peel the interconnect substrate from the base structure.

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**5,743,991**

**VACUUM-ASSISTED DEVICE FOR MOUNTING AN OPTICAL MOISTURE SENSOR ON GLASS**

**Rein S. Teder, Bloomington, Minn.; Dennis L. Bomer, Walbridge, Ohio, and Michael A. Niver, Onalaska, Wis., assignors to Libbey-Owens-Ford Co., Toledo, Ohio**

**Division of Ser. No. 372,566, Jan. 13, 1995, Pat. No. 5,556,493. This application Jun. 12, 1996, Ser. No. 662,088**

**Int. Cl.[6] B32B** *31/00*

**U.S. Cl. 156—351** **14 Claims**

1. A sensor mounting device for mounting a sensor on a surface of a windshield, said device comprising:

a) a vacuum chamber defining a cavity for temporarily receiving a sensor, said vacuum chamber including an aperture to facilitate the insertion and removal of the sensor from the cavity of said vacuum chamber;

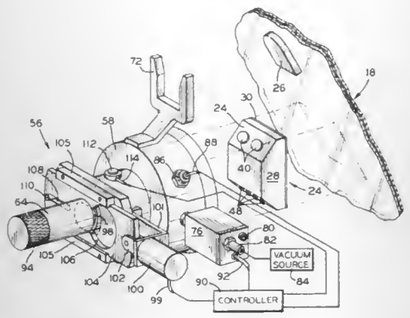
b) movable positioning means disposed in the cavity of said vacuum chamber for securing the sensor in the cavity such that an adhesive surface of the sensor is adjacent the aperture;

c) sealing means formed about the aperture in said vacuum chamber for sealably engaging a windshield when the aperture is positioned adjacent the windshield;

d) vacuum means connected to said vacuum chamber for selectively creating a vacuum in the cavity of said vacuum chamber when the vacuum chamber is sealably engaging the windshield; and

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e) means for selectively driving the positioning means while a vacuum is maintained in the cavity of the vacuum chamber such that the adhesive surface of the sensor is secured to the windshield in a vacuum.

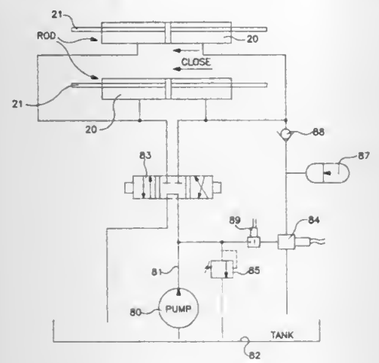
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**5,743,992**

**BUTT FUSION APPARATUS WITH CONSTANT PRESSURE ACCUMULATOR**

**James Callen Weimer, Charleston; Jack Lee Workman, Alum Creek, and Gary Wayne Gunno, Charleston, all of W. Va., assignors to Hughes Supply, Inc., Orlando, Fla.**

**Continuation-in-part of Ser. No. 593,161, Feb. 1, 1996, which is a continuation-in-part of Ser. No. 551,119, Oct. 31, 1995.**
**This application Apr. 26, 1996, Ser. No. 639,125**
**Int. Cl.[6] B29C** *65/20;* **B65H** *69/06*
**U.S. Cl. 156—358** **3 Claims**




1. In an apparatus for attaching abutting ends of first and second coaxial thermoplastic pipe sections together, and including a support frame, a fixed pipe clamping jaw having upper and lower jaw halves carried by the support frame for positioning the first pipe section in a fixed position, a movable pipe clamping jaw having upper and lower jaw halves carried by the support frame for translating movement of the second pipe section relative to the fixed clamping jaw and into aligned abutment with the first pipe section, heating means for heating adjacent pipe ends to a butt fusion temperature and a hydraulic circuit including a hydraulic pressure pump for supplying pressure to hydraulic movement means to translate the movable pipe clamping jaw towards the fixed pipe clamping jaw in a closing direction to join the first and second heated pipe sections together under pressure;

the improvement comprising supplemental hydraulic pressure means for supplying hydraulic pressure to said hydraulic movement means, said supplemental hydraulic pressure means comprising:

(a) a directional control valve for directing fluid from said pressure pump to said hydraulic movement means for moving said hydraulic movement means in an opening and closing direction;

(b) a pressure accumulator for accumulating hydraulic fluid under pressure;

(c) a check valve positioned between said pressure accumulator and said hydraulic movement means for permitting pressure communication from said pressure accumulator to said hydraulic movement means;

(d) a solenoid valve positioned between said pressure accumulator and said pressure pump for interrupting communication between said pressure accumulator and said pressure pump during non-operation of said pressure pump, such that upon non-operation of said pressure pump said accumulator maintains pressure on said hydraulic movement means only in the closing direction through said check valve, the pressure supplied by said accumulator being substantially equal to the pressure exerted on said hydraulic movement means during normal operation of said pressure pump; and

(e) a pressure controller for maintaining proper pressure in the hydraulic circuit.

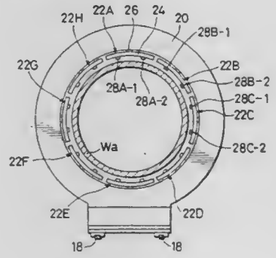
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**5,743,993**

**TREAD RING TRANSFERRING APPARATUS FOR USE IN A GREEN TIRE BUILDING SYSTEM**

**Kazuya Suzuki, Shirakawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan**

**Filed Mar. 13, 1997, Ser. No. 815,940**
**Claims priority, application Japan, Mar. 14, 1996, 8-057249**
**Int. Cl.[6] B29D** *30/26*
**U.S. Cl. 156—406.2** **7 Claims**




1. A tread ring transferring apparatus for use in a green tire building system adapted for holding and transferring a tire component which is formed in a cylindrical shape, comprising:

a holder frame in the form of a ring; and

a plurality of holding segments provided along a circumferential direction of the holder frame and radially movable inward and outward to hold and release the tire component respectively, each holding segment including:

at least one contact member which is adapted for pressing contact with the tire component when the holding segments are moved radially inward, and

a contact member of one of the plurality of segments is different in height in a radial direction from another contact member of another segment.

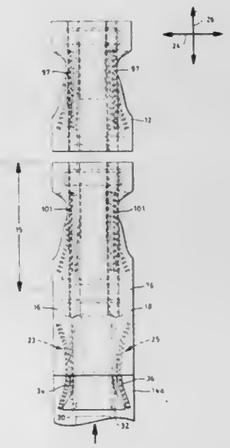


**5,743,994**

**APPARATUS FOR MAKING AN ABSORBENT ARTICLE WITH ASYMMETRIC LEG ELASTICS**

**Thomas Harold Roessler, Menasha; Paul Theodore Van Gompel, Hortonville; Daniel Robert Schlinz, Greenville; Mark Gordon Heath, Butte des Morts, all of Wis., and Geoffrey Walter Frost, Ogden, Utah, assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.**

**Filed Nov. 6, 1995, Ser. No. 554,110**
**Int. Cl.[6] A61F** *13/15*
**U.S. Cl. 156—495** **17 Claims**



1. An apparatus for making an elasticized article, comprising:

(a) delivering means for supplying a substrate web having a longitudinal direction and a lateral cross-direction;

(b) first connecting means for applying and attaching an inboard elastic member to said substrate web;

(c) second connecting means for applying and attaching an outboard elastic member to said substrate web, said outboard elastic member located laterally outboard of said inboard elastic member;

(d) dividing means configured to separate away a portion of said substrate web and a portion of said outboard elastic member to thereby provide a set of elastics which are arranged in a staggered overlapping relation

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**5,743,995**

**APPARATUS FOR THERMALLY ATTACHING AN ELEMENT TO A MOUNTING SURFACE**

**Shawn W. Ritchie; Michael Leroy Koelsch, both of Rochester, and Charles Edward Young, Williamson, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 440,802, May 15, 1995, Pat. No. 5,622,591. This application Nov. 6, 1996, Ser. No. 744,783**
**Int. Cl.[6] B32B** *31/00*
**U.S. Cl. 156—499** **13 Claims**

1. Apparatus for thermally attaching along a mounting surface of an article, comprising:

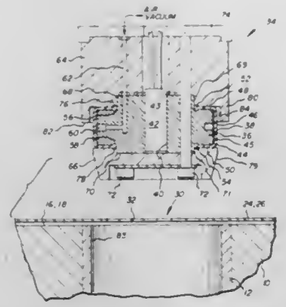
a thermally conductive support body having an edge surface;

a heater element operatively associated with the support body for heating the body at least at the edge surface;

a pneumatically expandable elastomeric element mounted to the support body along the edge surface; and

means for directing pressurized gas to the elastomeric element to expand the elastomeric element away from the edge surface,

whereby upon actuation of the heater element, the elastomeric element is heated to a temperature suitable for attaching; and upon introduction of pressurized gas, the heated elastomeric element expands to permit contact with the mounting surface.



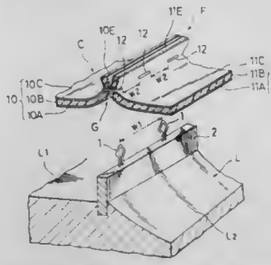
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**5,743,996**

**STRUCTURE OF BONDING DIE FOR FORMING A SEAT**

**Ikuo Sakamoto, and Tatsuo Majima, both of Akishima, Japan, assignors to TACHI-S Co., Ltd., Tokyo, Japan**

**Filed Aug. 27, 1996, Ser. No. 703,474**
**Int. Cl.[6] B32B** *31/00*
**U.S. Cl. 156—581** **16 Claims**



1. A structure of bonding die for pressing and bonding a trim cover assembly to a foam cushion member to form a seat, in which the trim cover assembly includes a connected portion where one cover section thereof is sewn with another cover section thereof, said structure comprising:

a die member upon which said trim cover assembly is to be placed for pressure bonding with said foam cushion member, said die member including a retaining area where said connected portion of said trim cover assembly is to be retained; and

a retaining means of a loop-like shape for retaining said trim cover assembly at a predetermined position for the pressure bonding with said foam cushion member, said retaining means being formed by bending a rigid wire material into the loop-like shape and provided on said die member at a point corresponding to said retaining area,

wherein said retaining means allows insertion thereof into and along said connected portion of said trim cover assembly when the trim cover assembly is placed on said die member.

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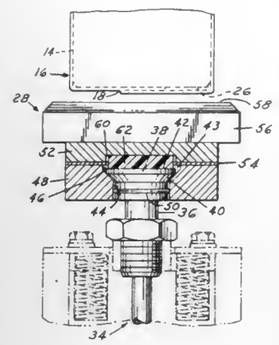
**5,743,997**

**SHEET MATERIAL SEALING ARRANGEMENT**

**James E. Podsiadlo, and Mark R. Kucera, both of Walled Lake, Mich., assignors to Elopak Systems AG, Glattbrugg, Switzerland**

**Filed Mar. 29, 1996, Ser. No. 624,099**
**Int. Cl.[6] B30B** *5/02;* **B65B** *7/18*
**U.S. Cl. 156—583.3** **8 Claims**

1 A sealing arrangement for sealing overlapped sheet portions backed by a support member, the arrangement comprising



pressure-applying means, a drive member, an elastomeric pad between the drive member and the pressure-applying means, and drive means for urging, via said drive member and said elastomeric pad, said pressure-applying means into sealing engagement with the overlapped sheet portions, wherein said pressure-applying means comprises an interconnected assembly of pressure pad, intermediate back-up plate, and collar, wherein an opening is formed through the collar to receive an end portion of the drive member, a recess is formed in the back-up plate, and said elastomeric pad is confined between a base wall of said recess and said end portion.

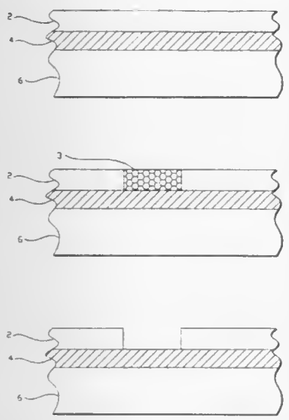
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**5,743,998**

**PROCESS FOR TRANSFERRING MICROMINIATURE PATTERNS USING SPIN-ON GLASS RESIST MEDIA**

**Sun Woo Park, Palo Alto, Calif., assignor to Park Scientific Instruments, Sunnyvale, Calif.**

**Filed Apr. 19, 1995, Ser. No. 424,960**
**Int. Cl.[6] G03F *7/00***
**U.S. Cl. 156—628.1** **54 Claims**



1. A process for altering a susceptibility of a portion of a Spin-On Glass layer to etching comprising:

taking a substrate including a layer of positive resist Spin-On Glass; and

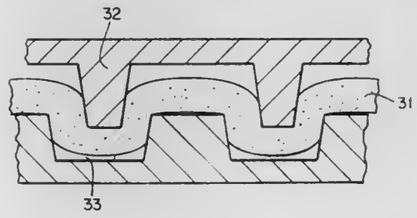
exposing a portion of the positive resist Spin-On Glass layer to an electric field or electron beam to increase the susceptibility of the exposed portion of the positive resist Spin-On Glass layer to etching.

**5,743,999**

**METHOD FOR MAKING SOFT TISSUE**

**Richard Joseph Kamps, Wrightstown; Janica Sue Behnke, Appleton; Fung-Jou Chen, Appleton; Bernhardt Edward Kressner, Appleton, and Janice Gail Nielsen, Appleton, all of Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.**

**Continuation of Ser. No. 46,789, Apr. 12, 1993, abandoned. This application Jun. 15, 1994, Ser. No. 259,824**
**Int. Cl.[6] D21F *3/04***
**U.S. Cl. 162—113** **17 Claims**



1. A method of softening a wet-pressed, creped tissue sheet comprising passing the wet-pressed, creped tissue sheet through one or more noncompactive, fixed-gap straining nips, each nip formed between two engraved rolls having partially-engaged intermeshing straining elements which noncompactively strain the tissue sheet in all directions, wherein the Average Percent Void Area of the tissue sheet is increased about 1.5 percentage points or greater per 100 grams of geometric mean tensile strength loss without an increase in the external bulk of the tissue sheet.

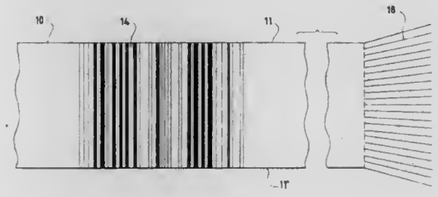
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**5,744,000**

**METHOD FOR MAKING ENCODED FILAMENTS AND USE OF ENCODED FILAMENTS TO PRODUCE SECURITY PAPER**

**Graham Athey, and James Zorab, both of Unit A13 Treforest Industrial Estate, Pontypridd Mid-Glamorgan, Great Britain**

**PCT No. PCT/GB94/02123, § 371 Date May 23, 1996, § 102(e) Date May 23, 1996, PCT Pub. No. WO95/09947, PCT Pub. Date Apr. 13, 1995**
**PCT Filed Sep. 29, 1994, Ser. No. 619,620**
**Claims priority, application United Kingdom, Oct. 2, 1993, 9320365**
**Int. Cl.[6] D21H *13/10***
**U.S. Cl. 162—140** **18 Claims**



1. A method of manufacturing an encoded filament or fiber comprising the steps of: applying a bar code directly onto a length of film the bar code being readable by scanning the length of the film longitudinally, and then dividing such that each filament or fiber produced is encoded with the same bar code, independent of the filament or fiber width.



**5,744,001**

**AQUEOUS PIGMENT SLURRIES FOR PRODUCTION OF FILLER-CONTAINING PAPER**

**Friedrich Linhart, Heidelberg; Dietmar Moench, Weinheim; Guenter Scherr, Ludwigshafen; Wolfgang Reuther, Heidelberg, and Primuz Lorencak, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**PCT No. PCT/EP94/00480, § 371 Date Aug. 23, 1995, § 102(e) Date Aug. 23, 1995, PCT Pub. No. WO94/20681, PCT Pub. Date Sep. 15, 1994**
**PCT Filed Feb. 19, 1994, Ser. No. 507,231**
**Claims priority, application Germany, Mar. 3, 1993, 43 06 608.9**
**Int. Cl.[6] D21H *17/69***
**U.S. Cl. 162—164.3** **4 Claims**

1. An aqueous pigment slurry which contains up to 80% by weight of a finely divided pigment selected from the group consisting of filler pigments and coating pigments, and mixtures thereof, in dispersed form and from 0.1 to 5% by weight of at least one dispersant, wherein the dispersants used are reaction products which are obtained by reacting

(a) polyalkylenepolyamines, polyamidoamines, polyamidoamines grafted with ethyleneimine or mixtures thereof with

(b) monoethylenically unsaturated carboxylic acids, salts, esters, amides or nitrites of monoethylenically unsaturated carboxylic acids, and, if required,

(c) bifunctional or polyfunctional crosslinking agents which have a halohydrin, glycidyl, aziridine or isocyanate unit or a halogen atom as a functional group,

and wherein (a) and (b) are present in a ratio such that from 20 to 99% of the primary and secondary amino groups of (a) remain unchanged in the reaction product of (a) and (b) and when (c) is present, the ratio (a):(c) is from 1:001 to 1:10,

to give water-soluble condensates which, in 20% strength by weight aqueous solution at 20° C., have a viscosity of at least 100 mPa.s.

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**5,744,002**

**PAPER STRENGTHENED WITH SOLUBILIZED COLLAGEN AND METHOD**

**Kenneth E. Hughes, Gahanna; David C. Masterson, Grove City; David J. Fink, Shaker Heights; Barbara A. Metz, Baltimore; Gordon E. Pickett, Reynoldsburg; Paul M. Gemmer, Columbus, and Richard S. Brody, Worthington, all of Ohio, assignors to Ranpak Corp., Concord, Ohio**

**Division of Ser. No. 250,806, May 27, 1994, abandoned, which is a continuation-in-part of Ser. No. 78,932, Jun. 16, 1993, Pat. No. 5,316,942. This application Jun. 7, 1995, Ser. No. 475,594**
**Int. Cl.[6] D21H *17/00;17/22;* C07K *1/00;* C12P *21/06***
**U.S. Cl. 162—174** **6 Claims**

1. A method for making a collagen strengthened cellulosic product comprising:

(A) mixing a cellulosic material selected from the group consisting of virgin paper pulp, broke, reclaimed newsprint, reclaimed carton container, or a mixture thereof with a solution comprising water, or water and NaOH, and mechanically pulping until a pulp slurry is formed having a consistency of about 3 wt % to about 6 wt % based on dry pulp solids;

(B) diluting said pulp slurry to a consistency of about 1 wt % to about 3 wt % based on dry pulp solids and adjusting pH to about 3.5 to about 7.0:

(C) providing an aqueous ground slurry of insoluble collagen:

(D) adjusting the water or solid content of said wet ground slurry whereby said insoluble collagen is at a concentration that promotes substantially maximum concentration and maximum molecular weight of said soluble collagen in a final product;

(E) adjusting the pH of said slurry from step (D) to obtain activity for a proteolytic enzyme added in step (F);

(F) adding said proteolytic enzyme to said pH adjusted slurry and reacting at a temperature, T, and for a time, t, effective for forming a solution including soluble collagen from said insoluble collagen;

(G) controlling said reaction to obtain a high degree of soluble collagen and a molecular weight of said soluble collagen where the collagen is capable of binding with cellulosic pulp, by simultaneously measuring the concentration of soluble collagen and the molecular weight of said soluble collagen, whereby said reaction is complete when said molecular weight and said concentration are substantially maximized;

(H) withdrawing at least some of the solution of step (H) containing soluble collagen as product;

(I) adding said soluble collagen of step (H) comprising between about 0.1 dry wt % to abont 2 dry wt % soluble collagen (based on dry weight of cellulosic material) to said diluted pulp slurry of step (B), and mixing at a shear rate and a time effective for interaction of said diluted pulp slurry solids and soluble collagen, whereby at least a portion of said soluble collagen is bound to said pulp to form a collagen-pulp slurry;

(J) diluting said collagen-pulp slurry to between about 0.1 dry wt % and about 1 dry wt % consistency;

(K) forming said collagen-pulp slurry into a cellulosic product of desired shape; and

(L) drying said product.

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**5,744,003**

**PROCESS FOR CONTROLLING THE DEPOSITION OF PITCH WITH A BLEND OF DERIVATIZED CATIONIC GUAR AND STYRENE MALEIC ANHYDRIDE COPOLYMER**

**Linda M. Hlivka, Flemington, and George K. Wai, Mountain Lakes, both of N.J., assignors to Ashland Inc., Columbus, Ohio**

**Filed Jul. 30, 1996, Ser. No. 692,829**
**Int. Cl.[6] D21F *1/32;* D21C *3/20***
**U.S. Cl. 162—199** **9 Claims**

1. A process for controlling the deposition of pitch in a hardwood or softwood pulp or papermaking process, where said process may include the use of pulp or papermaking equipment, shower process water, and processing areas such as a brown stock washer, screen room, decker, and a post bleaching operation wherein said process comprises

applying an effective pitch retarding amount of a liquid composition comprising a blend of a derivatized cationic guar and a styrene maleic anhydride copolymer having an average molecular weight of from 500 to 10,000 to a feedpoint in the pulp or papermaking process.

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**5,744,004**

**SYSTEM FOR FEEDING A SUSPENSION TO A PRESSURIZED VESSEL**

**Rolf Ekholm, and Ulf Jansson, both of Karlstad, Sweden, assignors to Kvaerner Pulping AB, Sweden**

**Filed Aug. 20, 1996, Ser. No. 705,709**
**Claims priority, application Sweden, Apr. 17, 1996, 9601461**
**Int. Cl.[6] D21C *7/06***
**U.S. Cl. 162—246** **26 Claims**

1. A feeding system for feeding a suspension to a pressurized vessel disposed in a cellulose pulp mill, comprising:

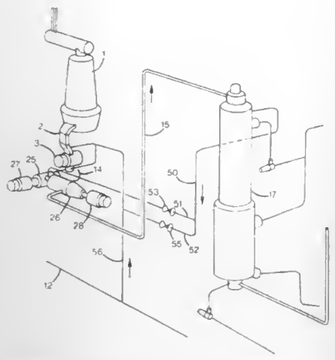
a pressurized vessel;

a low-pressure portion having a flowable suspension disposed therein;

a first pump disposed between the pressurized vessel and the low-pressure portion for driving the suspension from the low-pressure portion to the pressurized vessel, the first pump having a pump housing and defining an axial inlet for receiving the suspension and a tangential outlet for discharging the suspension;

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a pump chamber defined by the pump housing;

a plurality of parallel discs disposed in the pump chamber, the parallel discs being held together to form a stack so that the parallel discs are rotatable about a common axis of rotation; and

spaces defined between the parallel discs, the spaces having a size that is sufficient to permit the suspension to flow therethrough.

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**5,744,005**

**SELF-SUPPORTING STRAINING DEVICE FOR A CONTINUOUS DIGESTER**

**Jan G. Carlsson, and Sören Söderquist, both of Karlstad, Sweden, assignors to Kvaerner Pulping Technologies Aktiebolag, Sweden**

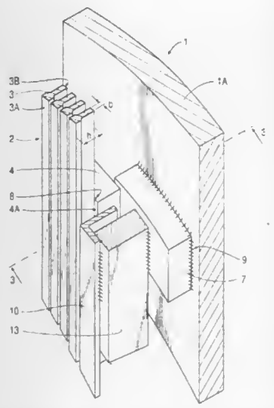
**PCT No. PCT/SE94/00020, § 371 Date Aug. 14, 1995, § 102(e) Date Aug. 14, 1995, PCT Pub. No. WO94/19533, PCT Pub. Date Sep. 1, 1994**

**PCT Filed Jan. 14, 1994, Ser. No. 501,070**

**Claims priority, application Sweden, Feb. 16, 1993, 93300504**

**Int. Cl.[6] D21C *7/14***

**U.S. Cl. 162—251** **8 Claims**



1. A digester having a digester shell and comprising a strainer device; the strainer device comprising a number of strainer elements comprising:

a plurality of strainer bars made of metal, said strainer bars being arranged in parallel in a lengthwise direction; and

at least two rod elements arranged transversely in relation to the lengthwise direction of said strainer bars, said strainer bars being fixedly attached to said rod elements;

wherein said rod elements are made of metal having a strength value RP 0.2 at 100° C. which exceeds 200 MPA, a length of said rod elements in a transversal direction in relation to the lengthwise extension of said strainer bars is less than 800 mm, each of said rod elements has a cross-sectional area that exceeds 700 $m^{m2}$, and an end section of each rod element is adapted for interaction with a supporting element arranged between the digester shell and each strainer element so that the strainer device becomes self-supporting.

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**5,744,006**

**APPARATUS FOR DEWATERING MIXTURES OF FIBROUS AND LIQUID MATERIALS**

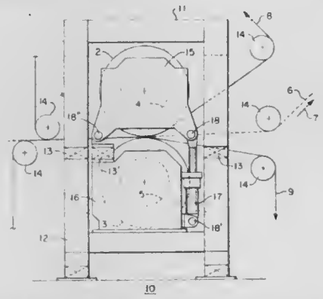
**Wilhelm Mausser, Berliner Ring 61 A-8047, Graz, Australia; Karlheinz Beil, deceased, late of Graz, Australia, and Ilse Beil, Strasserhofwel 13 A-8045, Graz, Australia, Legal Representative of said Karlheinz Beil**

**Filed May 27, 1994, Ser. No. 250,021**

**Claims priority, application Australia, May 28, 1993, A 1045/93**

**Int. Cl.[6] D21F *3/06***

**U.S. Cl. 162—358.1** **37 Claims**



1. Apparatus for dewatering mixtures of fibrous and liquid materials wherein at least one pair of mutually opposite pressure rollers forms a pressure gap through which a continuous web formed of the mixture of fibrous and liquid materials is passed jointly within at least one endless belt and wherein the pressure rollers are supported in mountings disposed in a press frame, at least one pressure roller mounting being removable in such frame, there being provided at least one distance adjustment means for adjusting at least one pressure roller and thereby the magnitude of the pressure gap or the pressure intensity, characterized in that the distance adjustment means is at least one hydraulic cylinder installed solely between and directly to the mountings of the pressure rollers.

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**5,744,007**

**VACUUM APPARATUS HAVING TEXTURED WEB-FACING SURFACE FOR CONTROLLING THE RATE OF APPLICATION OF VACUUM PRESSURE IN A THROUGH AIR DRYING PAPERMAKING PROCESS**

**Paul Dennis Trokhan, Hamilton, and Donald Eugene Ensign, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Sep. 3, 1996, Ser. No. 706,915**

**Int. Cl.[6] D21F *1/52***

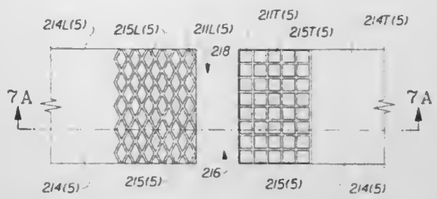
**U.S. Cl. 162—374** **15 Claims**

1. A vacuum apparatus in a papermaking machine having a machine direction and a cross-machine direction perpendicular to said machine direction, said apparatus comprising:

a head having a web-facing surface supporting a papermaking belt traveling in said machine direction;

a body joined to said head and being in fluid communication with a vacuum source;





at least one vacuum slot disposed in said head and defining an aperture on said web-facing surface, said at least one vacuum slot extending from said web-facing surface to said body;

said web-facing surface having a textured area in the region juxtaposed with said aperture, said textured area comprising a plurality of sealing areas which are discrete relative to each other in both said machine direction and said cross-machine direction, said sealing areas being separated from one another by a continuous reticulated network of passageways extending in at least two mutually intersecting directions and being in fluid communication with said at least one vacuum slot, to provide a leakage between said web-facing surface and the papermaking belt.

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**5,744,008**

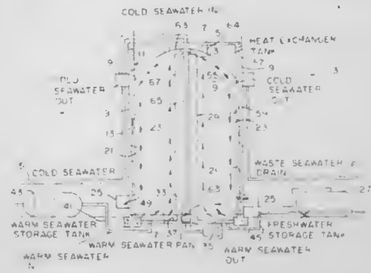
**HURRICANE TOWER WATER DESALINATION DEVICE**

**John P. Craven, Honolulu, Hi., assignor to Oceanit Laboratories, Inc., Honolulu, Hi.**

**Filed Jan. 2, 1996, Ser. No. 581,941**

**Int. Cl.[6] B01D *3/00*; C02F *1/18***

**U.S. Cl. 202—83** **22 Claims**



1. A desalination apparatus comprising a tower having a top, a bottom, and side walls extending between the top and the bottom, a warm salt water pan positioned in the bottom of the tower, the pan having an opening for receiving a bottom end of a rotor, a warm salt water source, first tubing connected to the warm salt water source and to the warm salt water pan for delivering warm salt water to the pan, second tubing connected to the warm salt water pan for draining warm salt water from the pan, the rotor extending upward between the side walls of the tower from a lower portion of the tower for stirring air and water vapor in the tower and forming a vortex, a heat exchanger positioned inside the tower near the top of the tower for condensing vapors swirling upward in the vortex into fresh water condensate at the top of the tower and promoting the vortex, the rotor having a top end connected to the heat exchanger and a bottom end connected to a rotary power source, a cold water source, piping having a first end connected to the cold water source and a second end connected to an upper portion of the tower and to the heat exchanger for delivering cold water to the heat exchanger, at least one cold water receiving tank connected to the tower near the upper portion of the tower for draining cold water from the heat exchanger, a condensate catchment device connected to and extending around inner surfaces of the side walls of the tower, and at least one fresh water collecting tank connected to the condensate catchment device for collecting fresh water from the condensate catchment device.

22. A desalination plant apparatus comprising a mobile support structure and at least one desalination station, the at least one desalination station further comprising a tower having a top, a bottom, and side walls extending between the top and the bottom, a heat exchanger positioned inside the tower near the top of the tower, a cold water source, piping having a first end connected to the cold water source and a second end connected to an upper portion of the tower and the heat exchanger for delivering cold water to the heat exchanger, at least one cold water receiving tank connected to the tower near the upper portion of the tower for draining cold water from the heat exchanger, a condensate catchment grille connected to and extending around inner surfaces of the side walls of the tower, at least one fresh water collecting tank connected to the condensate catchment grille for collecting fresh water, a rotor extending upward between the side walls of the tower from a lower portion of the tower, the rotor having a top end connected to the heat exchanger and a bottom end connected to a rotary power source, a warm salt water pan positioned in the bottom of the tower, the pan having an opening for receiving the bottom end of the rotor, a warm salt water source, first tubing connected to the warm salt water source and to the warm salt water pan for delivering warm salt water to the pan, and second tubing connected to the warm salt water pan for draining warm salt water from the pan.

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**5,744,009**

**METHOD AND APPARATUS FOR RECOVERING CONDENSABLES IN VAPOR FROM A UREA VACUUM EVAPORATOR**

**Vishnu Deo Singh, Sugarland; Richard Bruce Strait, Kingwood, and Thomas Anthony Czuppon, Houston, all of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.**

**Filed Jul. 7, 1995, Ser. No. 499,510**

**Int. Cl.[6] B01D *1/28;3/10***

**U.S. Cl. 203—42** **20 Claims**



1. A method for recovering condensables in hot vapor from a urea vacuum evaporator, comprising the steps of:

(a) directly introducing the hot vapor from the urea vacuum evaporator below an absorption zone of an absorber unit;

(b) withdrawing a vapor stream overhead from the absorption zone to maintain subatmospheric pressure in the absorber unit;

(c) introducing an aqueous stream to the absorber unit above the absorption zone;

(d) contacting the vapor introduced in step (a) in the absorption zone with the aqueous stream introduced in step (c) to condense water, absorb ammonia and $CO_2$ and wash urea from the vapor introduced in step (a) into the aqueous stream introduced in step (c);

(e) collecting the aqueous stream from step (d);

(f) cooling and recirculating aqueous solution collected in step (e) to the introduction step (c); and

(g) maintaining a vacuum seal between the absorber unit and a tank for receiving the aqueous solution collected in step (e), wherein the vacuum seal comprises a water-filled leg extend

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ing from below liquid level in the tank to an upper elevation below the absorption zone.

9. A urea concentrating unit, comprising:

first and second stage urea vacuum evaporators in series;

an absorption column including an absorption zone;

means for introducing vapor streams from the vacuum evaporators directly to the absorption column below the absorption zone;

an overhead means from the absorption column for withdrawing vapor from above the absorption zone to maintain a subatmospheric pressure in the absorption column;

a tank for receiving aqueous liquid from the absorption column comprising ammonia, carbamate and urea;

a pump and means for recirculating aqueous liquid from the tank to the absorption column above the absorption zone wherein the recirculated liquid contacts, cools, and condenses the vapor from the evaporators to form the aqueous liquid comprising ammonia, carbamate and urea;

a heat exchanger on the recirculation means for cooling the recirculated aqueous liquid.

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**5,744,010**

**PROCESS FOR THE PREPARATION OF THE NON-TOXIC SALTS OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZIN-4-ONE 2,2-DIOXIDE AND ARRANGEMENT FOR CARRYING OUT THIS PROCESS**

**Günter Roscher, Kelkheim; Heinz Litterer, Bad Schwalbach; Axel Engelmann, Königstein; Wolf-Dietmar Kaufmann, Kronberg; Bernd Laugwitz, Bad Soden, and Hans-Dietmar Schnabel, Eppstein, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany**

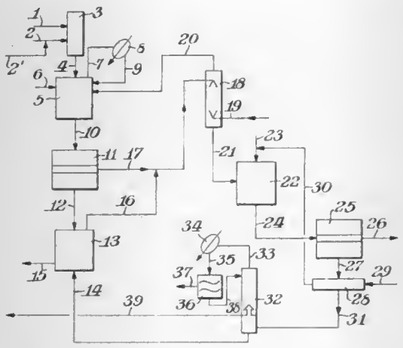
**PCT No. PCT/EP93/00606, § 371 Date Jun. 19, 1995, § 102(e) Date Jun. 19, 1995, PCT Pub. No. WO93/19055, PCT Pub. Date Sep. 30, 1993**

**PCT Filed Mar. 16, 1993, Ser. No. 302,807**

**Claims priority, application Germany, Mar. 17, 1992, 42 08 513.6**

**Int. Cl.[6] B01D** *11/00*; **C07D** *291/00*

**U.S. Cl. 203—43** **20 Claims**



1. A process for preparation of acesulfam, in acid or salt form, by cyclization of an acetoacetamidosulfonate salt, comprising the following steps:

(a) cyclization of the acetoacetamidosulfonate salt with $SO_3$ in a reaction zone containing a halogenated, aliphatic hydrocarbon solvent, to obtain a $SO_3$ adduct in said solvent,

(b) downstream from said reaction zone, treating said $SO_3$ adduct, in said solvent, with an aqueous medium, to obtain 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one2,2-dioxide and neutralizing the resulting solution of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one2,2-dioxide in said solvent,

(c) downstream from said reaction zone, distilling the resulting solvent from step (b) to recover purified solvent sufficiently pure for use in the preparation of an acetoacetamidosulfonate salt or 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one2,2-dioxide and

solvent-containing residue of the distillation,

(d) introducing said solvent-containing residue, without further purification, into a step of said process, downstream from said reaction zone.

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**5,744,011**

**SPUTTERING APPARATUS AND SPUTTERING METHOD**

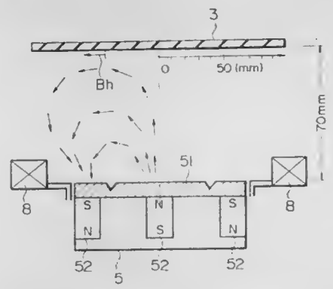
**Michiko Okubo, Kawasaki; Naoyuki Inoue; Katsutaro Ichihara, both of Yokohama, and Nobuaki Yasuda, Zushi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 208,521, Mar. 11, 1994, abandoned. This application Apr. 19, 1996, Ser. No. 634,134**

**Claims priority, application Japan, Mar. 18, 1993, 5-058568; Sep. 21, 1993, 5-235039**

**Int. Cl.[6] C23C** *14/34*

**U.S. Cl. 204—192.12** **12 Claims**



1. A method for sputtering, comprising the steps of:

disposing inside a film forming vessel a target and a material on which a film formed of a substance of said target is to be formed, the vessel having a gas supply system and a discharge system communicating with each other;

forming in the interior of said film forming vessel a gas atmosphere;

supplying an electric field and a main magnetic field in the neighborhood of said target thereby inducing generation of magnetron plasma in the neighborhood of said target in the interior of said film forming vessel; and

supplying from a location closer to the target than to the material a sufficiently weak auxiliary magnetic field so that substantial distribution of said main magnetic field is not varied in the neighborhood of said target in the interior of said film forming vessel thereby decreasing a spatially dispersed amount of said magnetron plasma diffused from the neighborhood of said target to the neighborhood of a surface of said material by varying distribution of said main magnetic field in the neighborhood of said material surface.

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**5,744,012**

**METHOD FOR FABRICATING SEMICONDUCTOR DEVICE**

**Hee Kook Park, Kyoungkido, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea**

**Filed Nov. 12, 1996, Ser. No. 748,178**

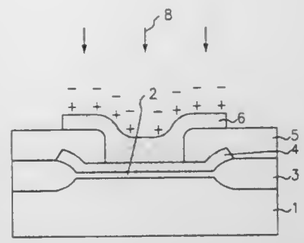
**Claims priority, application Rep. of Korea, Dec. 16, 1995, 1995 50905**

**U.S. Cl. 204—192.34** **4 Claims**

1. A method for fabricating a gate electrode in a semiconductor device, said method comprising the steps of:

forming a gate insulating layer on a semiconductor substrate;





forming a conducting layer for a gate electrode on said gate insulating layer;

patterning said conducting layer using a plasma etching process; and

injecting anions onto said patterned conducting layer so that said anions neutralize cations remaining on said patterned conducting layer,

whereby said anions prevent said gate insulating layer from deteriorating.

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**5,744,013**

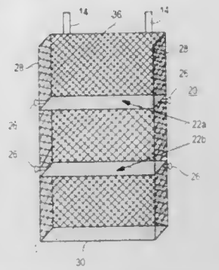
**ANODE BASKET FOR CONTROLLING PLATING THICKNESS DISTRIBUTION**

**Robert R Botts; Swati V. Joshi, and Louis W. Nicholls, all of Durham, N.C., assignors to Mitsubishi Semiconductor America, Inc., Durham, N.C.**

**Filed Dec. 12, 1996, Ser. No. 764,807**

**Int. Cl.[6] C25D** *17/02*

**U.S. Cl. 204—242** **8 Claims**



1. An apparatus for electroplating a work piece with an electroplate metal, the apparatus comprising:

a cathode rack configured to support the work piece; and

an anode basket in which anode particles are contained, the anode basket including a plurality of baffles positioned in the basket at selected locations, the plurality of baffles providing separate compartments in the basket for the anode particles, wherein

each baffle is secured to the anode basket via hinges, allowing the baffle to pivot about the hinge.

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**5,744,014**

**STORAGE STABLE ELECTROLYTIC GAS GENERATOR FOR FLUID DISPENSING APPLICATIONS**

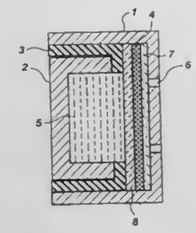
**John H. Gordon; Ashok V. Joshi, and John McEvoy, all of Salt Lake City, Utah, assignors to Ceramatec, Inc., Salt Lake City, Utah**

**Continuation-in-part of Ser. No. 300,947, Sep. 6, 1994, Pat. No. 5,538,605. This application Jul. 23, 1996, Ser. No. 685,303**

**Int. Cl.[6] C25B** *9/00; 11/02; 11/12*

**U.S. Cl. 204—266** **18 Claims**

1. A storage stable gas-generating electrolytic electrochemical cell comprising



a sealed cathode compartment containing a cathode mixture including an aqueous electrolyte and a reducible metal hydroxide or metal oxide;

a cathode member associated with said cathode compartment;

an anode compartment having at least one gas outlet port and an anode member;

a hydrophobic barrier film between said anode member and gas outlet port(s)

a power supply having its negative pole communicating with said cathode member and its positive pole communicating with said anode member; and

a moisture barrier during storage between the anode member and the environment, wherein said anode member consists of a mixture of carbon and/or graphite sintered together with a hydrophobic polymeric material to form an electronically conductive film which is electrochemically active and somewhat hydrophobic and where this film is laminated to a nonsintered hydrophobic polymeric film.

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**5,744,015**

**SOLID MULTI-COMPONENT MEMBRANES, ELECTROCHEMICAL REACTOR COMPONENTS, ELECTROCHEMICAL REACTORS AND USE OF MEMBRANES, REACTOR COMPONENTS, AND REACTOR FOR OXIDATION REACTIONS**

**Terry J. Mazanec, 7168 Selworthy La., Solon, Ohio 44139; Thomas L. Cable, 13973 Meadowlark, Newbury, Ohio 44065; John G. Frye, Jr., 6821 Glenallen, and Wayne R. Kliewer, 7269 Selworthy La., both of Solon, Ohio 44139**

**Division of Ser. No. 394,925, Feb. 24, 1995, Pat. No. 5,591,315, which is a continuation of Ser. No. 228,793, Apr. 15, 1994, abandoned, which is a division of Ser. No. 618,792, Nov. 27, 1990, Pat. No. 5,306,411, which is a continuation-in-part of Ser. No. 457,327, Dec. 27, 1989, abandoned, Ser. No. 457,340, Dec. 27, 1989, abandoned, Ser. No. 457,384, Dec. 27, 1989, abandoned, and Ser. No. 510,296, Apr. 16, 1990, abandoned, said Ser. No. 457,340 is a continuation-in-part of Ser. No. 25,511, Mar. 13, 1987, Pat. No. 4,933,054, said Ser. No. 510,296 is a continuation-in-part of Ser. No. 357,317, May 25, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 486,767**

**Int. Cl.[6] G25B** *13/00*

**U.S. Cl. 204—295** **7 Claims**

1. A solid multi-component membrane comprising an intimate, gas-impervious, mixture of a first mixed metal oxide material of a perovskite structure with a second mixed metal oxide material of a perovskite structure, wherein the first mixed metal oxide material has an electron conductivity greater than that of the second mixed metal oxide material and the second mixed metal oxide material has an oxygen ion conductivity greater than that of the first mixed metal oxide material.

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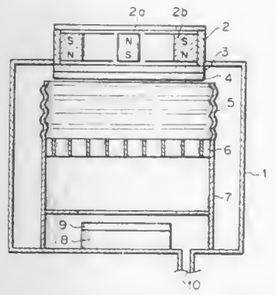


**5,744,016**

## SPUTTERING APPARATUS

Yoshiaki Yamada, and Toshiki Shinmura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 543,863, Oct. 19, 1995, abandoned. This application Jan. 16, 1997, Ser. No. 782,301
Claims priority, application Japan, Oct. 20, 1994, 6-279693
Int. Cl.[6] C23C *14/34*
U.S. Cl. 204—298.11 17 Claims



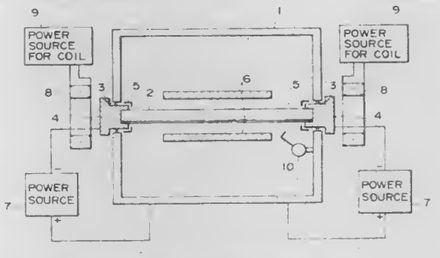

1. A sputtering apparatus for use with a substrate comprising:
a vacuum container;
a target retainer member disposed at one side of said vacuum container;
a target comprising titanium (Ti), attached to said target retainer member inside said vacuum container, for producing sputtered particles;
a substrate holder disposed at a second side of said vacuum container;
a filter disposed inside said vacuum container between said target and said substrate holder, wherein sputtered particles advancing in a direction substantially parallel to the normal direction of said substrate which is secured to said substrate holder are allowed to pass said filter;
a first shield plate disposed at a substrate holder side of said filter and covering an outer peripheral portion of said filter;
a second shield plate disposed at a target side of said filter and covering the outer peripheral portion of said filter;
means for increasing an effective surface area of said second shield plate;
a first space surrounded by said vacuum container, said first shield plate and said filter;
a second space communicating with said first space via said filter, wherein said target is positioned in said second space; and
a gas inlet open to said first space for introducing a reactive gas comprising nitrogen (N) into said first space,
wherein a first titanium nitride (TiN) film is deposited on said substrate by a reactive sputtering process of said target which forms said sputtered particles which pass said filter and combine with said nitrogen in said first space, and
said means for increasing an effective surface area being further for suppressing nitriding of said target by allowing said nitrogen to combine with said titanium and form a second titanium nitride film on said second shield plate,
wherein an effective area of said first shield plate is differentiated from said effective surface area of said second shield plate by being devoid of said means for increasing an effective surface area, wherein adsorption of said nitrogen by said first shield plate is suppressed to allow the sputtered particles to be combined with said nitrogen in said first space.

**5,744,017**

## VACUUM ARC DEPOSITION APPARATUS

Hiroshi Tamagaki; Hiroshi Kawaguchi; Hirofumi Fujii; Katsuhiko Shimojima; Takeshi Suzuki, and Koji Hanaguri, all of Takasago, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Dec. 16, 1994, Ser. No. 357,752
Claims priority, application Japan, Dec. 17, 1993, 5-318603; Dec. 20, 1993, 5-320379; Dec. 21, 1993, 5-322763
Int. Cl.[6] C23C *14/22*
U.S. Cl. 204—298.41 12 Claims



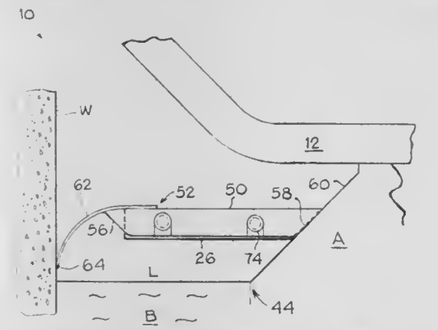

1. A vacuum arc deposition apparatus comprising:
a cylindrical evaporation source having a cylindrical axis;
a substrate positioned around said evaporation source so as to at least partially axially overlap the evaporation source;
a cathode of an arc power source connected to at least one end of said evaporation source so at to supply power to said evaporation source to form an arc for consuming the evaporation source and forming a film on said substrate; and
a magnetic field forming exciting coil having a coil axis which is coaxial with the cylindrical axis of the evaporation source, said exciting coil being positioned offset with respect to an end of said evaporation source such that said exciting coil does not substantially overlap said evaporation source.

**5,744,018**

## PREVENTING ESCAPE OF VAPOR OR GAS FROM ELECTROLYTIC SYSTEMS

Manuel G. Santoyo, 8051 E. Kenyon Dr., Tucson, Ariz. 85710; James A. Murray, 3535 Cassena Dr., Walnut Creek, Calif. 94598; Graeme Alexander, 4371 N. Camino Ferreo, Tucson, Ariz. 85715; Ron Tix, 1178 W. Fourteen St., Hastings, Minn. 55033, and Dale F. Halter, 2353 Country Dr., Fremont, Calif. 94536

Filed Sep. 10, 1996, Ser. No. 711,561
Int. Cl.[6] C25B *9/00;15/00;* C25D *21/04*
U.S. Cl. 205—94 22 Claims




19. A method of inhibiting the escape of vapor or gas from an electrolytic system which includes a vessel having a wall, an electrolytic bath in said vessel, and a plurality of electrodes extending into said bath, said method comprising the steps of:



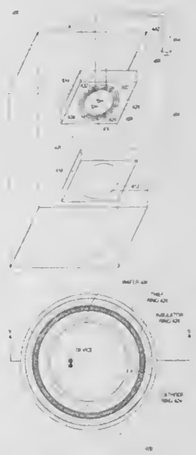
holding at least one sealing member on a support so that said one sealing member is in contact with a first one of said electrodes;
holding a second sealing member on a support so that said second sealing member is in contact with a second one of said electrodes;
establishing contact between said wall and a third sealing member; and
sandwiching at least a portion of said third sealing member between said supports.

**5,744,019**

## METHOD FOR ELECTROPLATING METAL FILMS INCLUDING USE A CATHODE RING INSULATOR RING AND THIEF RING

Jane Ang, San Mateo, Calif., assignor to AIWA Research and Development, Inc., Fremont, Calif.

Continuation of Ser. No. 564,508, Nov. 29, 1995, Pat. No. 5,620,581. This application Jan. 31, 1997, Ser. No. 789,914
Int. Cl.[6] C25D *5/00;7/12;* C25B *15/00;* B05B *5/025*
U.S. Cl. 205—96 17 Claims



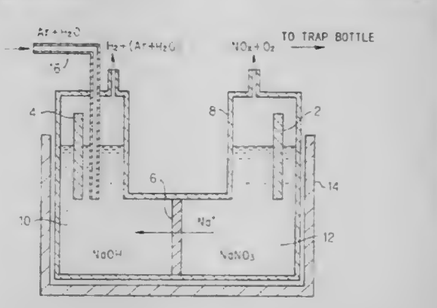
1. A method of electroplating a thin metal film onto a substrate wafer comprising the steps of:
electroplating on a clean substrate wafer in an electroplating solution;
maintaining an alloy composition uniformity of at least one electroplated layer substantially uniform using a cathode assembly for mounting the substrate wafer, the cathode assembly including:
an inner cathode ring electrically connected to the wafer;
a thief ring external to the cathode ring; and
an insulating ring connected between and electrically insulating the cathode and thief rings; and
powering the cathode ring and the thief ring using separate first and second power sources having respective first and second negative terminals respectively coupled to the cathode ring and the thief ring the first and second power sources having a positive terminal coupled to an anode.

**5,744,020**

## PROCESS FOR TREATMENT OF RADIOACTIVE WASTE

Takao Akiyama; Yoichi Miyamoto, both of Mito; Shunji Inoue; Yoshihiko Kurashima, both of Nagoya, and Yoichi Karita, Handa, all of Japan, assignors to Douryokuro Kakunenryo Kaihatsu Jigyoudan, Tokyo, and NGK Insulators, Ltd., Nagoya, both of Japan

Filed Oct. 30, 1996, Ser. No. 739,955
Claims priority, application Japan, Nov. 1, 1995, 7-285177
Int. Cl.[6] C25B *1/16*
U.S. Cl. 205—408 22 Claims




1. A process for treating a radioactive waste, which comprises drying a radioactive waste containing a radioactive substance(s) and a sodium compound(s), to convert it into a dried material, heating the dried material to convert it into a molten salt, and subjecting the molten salt to electrolysis using the salt as an anolyte and β-alumina as a sodium ion-permeable membrane.

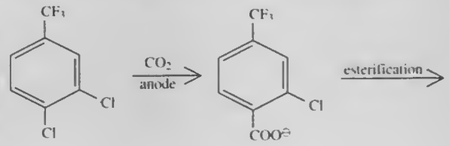
**5,744,021**

## 2-ALKYLMERCAPTO-4-(TRIFLUOROMETHYL)BENZOIC ESTERS AND A PROCESS FOR THEIR PREPARATION

Peter Brungs, Frankfurt; Thomas Karcher, Altötting; Klaus Köhlein, Kelkheim; Hans Millauer, Eschborn, and Manfred Wildt, Brombachtal, all of Germany, assignors to Hoechst AG, Frankfurt, Germany

Filed Dec. 20, 1996, Ser. No. 770,325
Claims priority, application Germany, Dec. 22, 1995, 195 48 428.2
Int. Cl.[6] C25B *3/00;* C07C *321/00;69/76*
U.S. Cl. 205—441 20 Claims

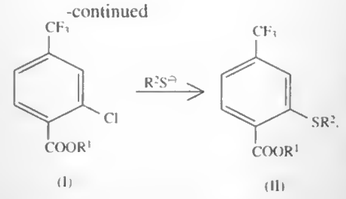
1. A process for preparing 2-alkylmercapto-4-(trifluoromethyl)benzoic esters of the formula (II), where $R^1$ and $R^2$ are, independently of each other, $C_1$–$C_6$ alkyl, which comprises reacting 3,4-dichlorobenzotrifluoride electrochemically at an anode with $CO_2$ to give 2-chloro-4-(trifluoromethyl)benzoate, converting the 2-chloro-4-(trifluoromethyl)benzoate into a corresponding benzoic ester of the formula (I), and then reacting the corresponding benzoic ester of the formula (I) with an alkylmercaptide $R^2S^-$:



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(I) (II)

13. A process as claimed in claim 1, wherein the alkylmercaptide is an alkali metal mercaptide, an alkaline earth metal mercaptide or an ammonium mercaptide.

15. A process as claimed in claim 1, wherein $R^2$ is methyl.

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**5,744,022**

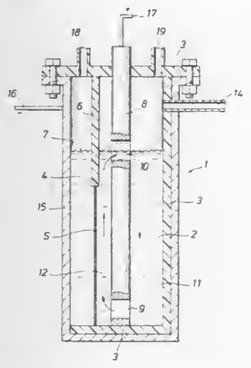
**METHOD AND APPARATUS FOR PRODUCING SULFUR HEXAFLUORIDE**

**Jorge Miller, 3300 Sage Rd., Apt. 9204, Houston, Tex. 77056**

**Filed Feb. 19, 1997, Ser. No. 802,862**

**Int. Cl.[6] C25B *1/00***

**U.S. Cl. 205—554** **25 Claims**



1. A method of preparing sulphur hexafluoride in an electrolytic cell with insoluble electrodes, comprising:

suspending finely ground elemental sulphur in a liquid electrolyte maintained in an electrolytic cell and comprising substantially anhydrous hydrogen fluoride and a conductivity-enhancing solute selected from the group consisting of potassium fluoride, sodium fluoride and mixtures thereof,

dividng said electrolytic cell into a cathodic half-cell and an anodic half-cell by disposing a non-conductive diaphragm between a pair of insoluble electrodes comprising a cathode and an anode, said diaphragm comprising a solid fluid-impermeable upper portion separating said half-cells above said electrolyte and extending below said electrolyte to prevent mixing of gases formed at said electrodes and a woven, mesh lower portion which is permeable to said electrolyte and to current passing between said half-cells;

applying to said electrodes a cell voltage sufficient to produce sulphur hexafluoride;

circulating said electrolyte and elemental sulphur around said anode in said anodic half-cell by locating a pair of passageways through said anode said passageways spaced along said anode with a first passageway disposed through said anode at a location near the bottom of said cell and a second passageway disposed through said anode at a location near the surface of said electrolyte; and

generating sufficient gas bubbles on said anode to maintain said elemental sulphur suspended in said electrolyte and to cause natural circulation around said anode and through said passageways.

**5,744,023**

**METHOD FOR SEPARATION AND RECOVERY OF ORGANOGERMANIUM COMPOUND**

**Norihiro Kakimoto, Tokyo; Keiji Umeda, Ibaraki, and Takashi Ichimura, Chiba, all of Japan, assignors to Asai Germanium Research Institute Co., Ltd., and Asahi Glass Company, both of Tokyo, Japan**

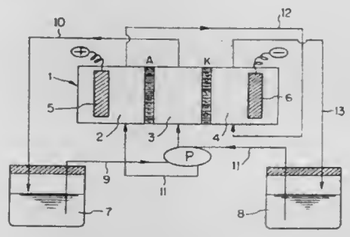
**PCT No. PCT/JP95/01286, § 371 Date Feb. 27, 1996, § 102(e) Date Feb. 27, 1996, PCT Pub. No. WO96/00731, PCT Pub. Date Jan. 11, 1996**

**PCT Filed Jun. 28, 1995, Ser. No. 602,842**

**Claims priority, application Japan, Jun. 28, 1994, 6-170136**

**Int. Cl.[6] C13D *1/00;3/18***

**U.S. Cl. 205—697** **7 Claims**



1. A method for separating and recovering an organogermanium compound from a mixed solution containing a saccharide or saccharides and said organogermanium compound, which method comprises passing an electric current through a mixed solution containing a saccharide or saccharides and an organogermanium compound, in one or more compartments each defined by one pair of an ion exchange membrane and a cation exchange membrane facing each other, whose anode side is defined by an anion exchange membrane and whose cathode side is defined by a cation exchange membrane, to separate and recover said organogermanium compound from said mixed solution.

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**5,744,024**

**METHOD OF TREATING SOUR GAS AND LIQUID HYDROCARBON**

**Daniel S. Sullivan, III; Allan R. Thomas, both of Houston; Juan M. Garcia, III, Sugar Land, and Paul Yon-Hin, Houston, all of Tex., assignors to Nalco/Exxon Energy Chemicals, L.P., Sugar Land, Tex.**

**Filed Oct. 12, 1995, Ser. No. 542,462**

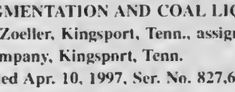
**Int. Cl.[6] C10G *29/20***

**U.S. Cl. 208—236** **9 Claims**

1. A method of reducing $H_2S$ in a hydrocarbon fluid which comprises contacting the fluid with an effective amount of a scavenging composition, comprising an aqueous solution of

(a) a 1,3,5-trimethyl-hexahydro-1,3,5 triazine $H_2S$ scavenger; and

(b) a quaternary ammonium compound having the following formula:



where $R_1$ and $R_2$ are independently alkyl groups or hydroxyalkyl groups having from 1 to 4 carbon atoms

$R_3$ is a benzyl group, and

$R_4$ is an alkyl or aryl group having from 7 to 20 carbon atoms, and

$X^-$ is an anion selected from the group consisting of chloride and methyl sulfate;



wherein the amount of the quaternary ammonium compound is sufficient to accelerate the $H_2S$ scavenging action of the 1,3,5-trimethyl-hexahydro- 1,3,5 triazine in comparison with the scavenging action of said triazine without the quaternary ammonium compound.

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**5,744,025**

**PROCESS FOR HYDROTREATING METAL-CONTAMINATED HYDROCARBONACEOUS FEEDSTOCK**

**Andries Qirin Maria Boon, The Hague; Constantinus Johannes Jacobus Den Ouden, Amsterdam, both of Netherlands, and Opinder Kishen Bhan, Katy, Tex., assignors to Shell Oil Company, Houston, Tex.**

**Filed Feb. 28, 1997, Ser. No. 808,597**

**Int. Cl.[6] C10G *45/06***

**U.S. Cl. 208—253** **13 Claims**

1. A process for hydrotreating a metal-contaminated hydrocarbonaceous feedstock of which at least about 60% wt. boils at a temperature ≧370° C., which comprises contacting the feedstock at elevated temperature and elevated pressure in the presence of hydrogen with one or more catalyst beds each of a first catalyst, a second catalyst and a third catalyst where first, second and third designate the order of the catalyst contact with said feed, wherein

(i) the first catalyst comprises a Group VI and/or a Group VIII hydrogenation metal component on an inorganic oxide support having at least about 40% of its pore volume in pores with diameters in the range from about 17 nm to about 25 nm and a surface area in the range from about 100 $m^2/g$ to about 160 $m^2/g$;

(ii) the second catalyst comprises a Group VI and/or a Group VIII hydrogenation metal component on an inorganic oxide support having at least about 40% of its pore volume in pores with diameters in the range from about 3 nm to about 17 nm and a surface area in the range from 160 $m^2/g$ to 350 $m^2/g$; and

(iii) the third catalyst comprises a Group VI and a Group VIII hydrogenation metal component on an inorganic oxide support having at least about 40% of its pore volume in pores with diameters in the range from about 17 nm to about 25 nm and a surface area in the range from about 100 $m^2/g$ to about 160 $m^2/g$;

wherein the third catalyst is at least 1.5 times more active for demetallization than the first catalyst at contaminant metal deposition levels of less than 5% wt.

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**5,744,026**

**CATALYST SYSTEM AND PROCESS FOR BENZYL ETHER FRAGMENTATION AND COAL LIQUEFACTION**

**Joseph Robert Zoeller, Kingsport, Tenn., assignor to Eastman Chemical Company, Kingsport, Tenn.**

**Filed Apr. 10, 1997, Ser. No. 827,668**

**Int. Cl.[6] C10G *1/00***

**U.S. Cl. 208—430** **19 Claims**

1. A process for benzyl ether fragmentation or coal liquefaction which comprises contacting a benzyl ether compound or coal, with a catalyst system comprising a Group 6 metal, a halide salt and an organic halide under conditions of temperature and pressure sufficient to cause the fragmentation or liquefaction.

**5,744,027**

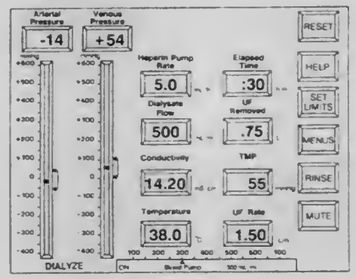
**APPARATUS FOR KIDNEY DIALYSIS**

**Mark E. Connell, Sandy; Robert A. Bedient, Portland, both of Oreg.; Raymond Elsen, Antwerp, Belgium; Michael E. Hogard, Oregon City, Oreg.; Harley D. Johnson; Thomas D. Kelly, both of Portland, Oreg.; Jean McEvoy Long, Portland, Oreg.; Bruce A. Peterson, Milwaukie, Oreg.; William G. Preston, Jr., Portland, Oreg., and Dalibor J. Smejtek, Beaverton, Oreg., assignors to Althin Medical, Inc., Miami Lakes, Fla.**

**Division of Ser. No. 122,047, Sep. 14, 1993, Pat. No. 5,486,286, which is a division of Ser. No. 688,174, Apr. 19, 1991, Pat. No. 5,247,434. This application Jun. 7, 1995, Ser. No. 479,688**

**Int. Cl.[6] B01D *61/32***

**U.S. Cl. 210—96.2** **16 Claims**




1. A kidney dialysis machine comprising:

(a) means for circulating dialysate at a dialysate conductivity through a dialysate circuit including a dialysate compartment for a dialyzer;

(b) means for circulating blood from a dialysis patient through an extracorporeal blood circuit including a blood compartment of the dialyzer; and

(c) control means operable to receive chemical-composition data reflecting a particular selection of dialysate to be circulated and to calculate from the data an expected conductivity reading of the dialysate and to automatically set conductivity alarm limits around the expected conductivity reading.

2. A kidney dialysis machine as recited in claim 1 wherein said control means comprises means for receiving data regarding expected conductivity values of dialysates made from various concentrates, and means for processing the data so as to compare actual dialysate conductivity values against the corresponding expected conductivity value.

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**5,744,028**

**WATER TREATING APPARATUS**

**Nobutaka Goto, Tokyo, Japan, and Peter S. Cartwright, Minneapolis, Minn., assignors to Konica Corporation, Japan**

**Filed Nov. 21, 1996, Ser. No. 752,998**

**Int. Cl.[6] C02F *1/461;1/32***

**U.S. Cl. 210—181** **3 Claims**

1. A water dispenser comprising:

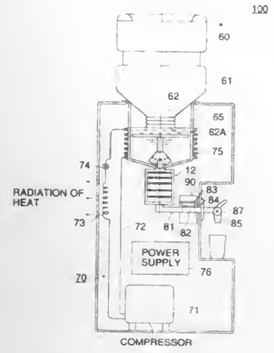
a water tank for storing water supplied from a water bottle, said water bottle being arranged to maintain an outlet of said water bottle at a fixed position in said water dispenser;

an electrolytic cell including an anode, a cathode, and a three-dimensional carbon electrode between the anode and the cathode, the electrolytic cell being below the water tank to produce a flow of water from an outlet of said water tank into and through said electrolytic cell;

a water outlet valve downstream of the electrolytic cell; and

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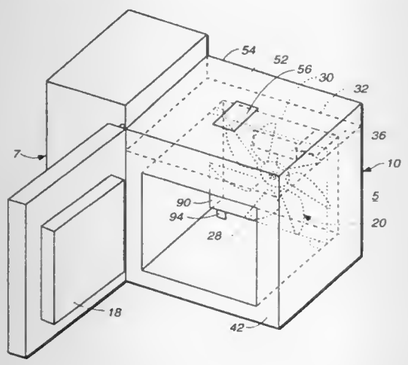





a power supply for applying an electric current between the anode and the cathode so as to polarize the electrode, thereby sterilizing the water.

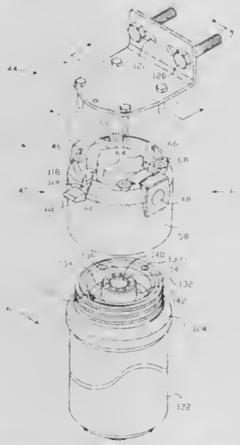
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**5,744,029**
**GAS CHROMATOGRAPHY OVEN**
**Kenneth I. Li, Piedmont, and Roger C. Tong, Berkeley, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.**
**Filed Feb. 3, 1997, Ser. No. 792,016**
**Int. Cl.[6] B01D** *15/08*
**U.S. Cl. 210—198.2** **28 Claims**




17. A chromatograph oven comprising:
a housing having an interior surface and an exterior surface having a front wall, a rear wall, a bottom side wall, a top side wall, and right and left side walls normal to said front and rear walls,
a fan mounted within said interior surface of said housing adjacent to said rear wall and having a longitudinal axis substantially parallel to said right and left side walls,
intake means comprising an ambient air intake vent in said rear wall, and
exhaust means comprising an exhaust vent in a rear corner of one of said top, right and left side walls and oriented to tangentially face the oncoming rotational flow of air created by said fan for exhausting the air.

**5,744,030**
**FILTER ASSEMBLY WITH AUTOMATIC SHUT-OFF AND QUICK-CONNECT FILTER CARTRIDGE**
**Roger P. Reid; Lance J. Christiansen, both of Caldwell, and Warren D. Stockton, Eagle, all of Id., assignors to Omnipure Filter Company, Caldwell, Id.**
**Continuation of Ser. No. 450,229, May 25, 1995, Pat. No. 5,591,332. This application May 24, 1996, Ser. No. 656,038**
**Int. Cl.[6] B01D** *35/153;27/10*
**U.S. Cl. 210—235** **19 Claims**



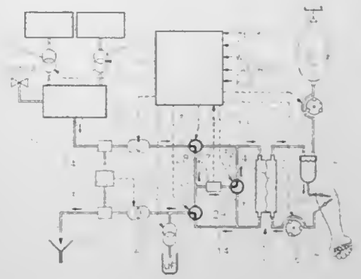

1. A filter assembly comprising a valve head assembly and a removable filter cartridge having an upper end connected to the valve head assembly, the valve head assembly comprising:
a. a valve head comprising a cavity opening downward, a first port, and a second port, wherein the cavity receives the upper end of the cartridge, and the cavity is in fluid communication with the first port and the second port,
b. a stem within the cavity, the stem having an indentation;
c. a closure member within the cavity having a first opening extending vertically through the closure member and receiving said stem, wherein the closure member is movable upward on the stem to a first position, and movable downward on the stem to a second position, and wherein, when the closure member is in the first position, the first port and the cartridge are in fluid communication via the indentation; and
d. a sleeve received in and secured in the cavity, wherein the sleeve retains the closure member within the cavity, the sleeve comprising a second opening for fluid communication between the second port and the cartridge.

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**5,744,031**
**ARTIFICIAL KIDNEY PROVIDED WITH MEANS FOR DETERMINING CHARACTERISTICS OF BLOOD**
**Bernard Bene, Irigny, France, assignor to Hospal Industrie, France**
**Filed Sep. 9, 1992, Ser. No. 942,460**
**Claims priority, application France, Sep. 10, 1991, 91 11352**
**Int. Cl.[6] B01D** *61/28;61/32*
**U.S. Cl. 210—321.71** **15 Claims**

1. An artificial kidney comprising:
an exchanger having two compartments separated by a semipermeable membrane, a first compartment being connected to a circuit for extracorporeal circulation of blood having a circulating pump disposed therein, a second compartment being connected to a dialysis liquid circuit;
measurement means for measuring data corresponding to at least one physicochemical characteristic of a fresh dialysis liquid and at least one physicochemical characteristic of a used liquid;

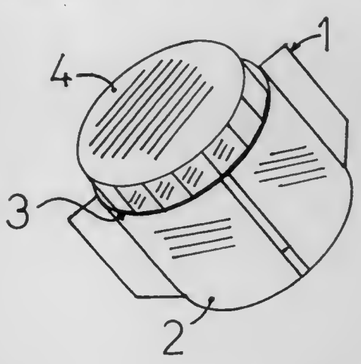




computation means responsive to data received from the measurement means for calculating an actual clearance of the artificial kidney for a type of impurity; and
control means for controlling a flow rate through the extracorporeal blood circuit as a function of a comparison between the calculated clearance and a predetermined clearance.

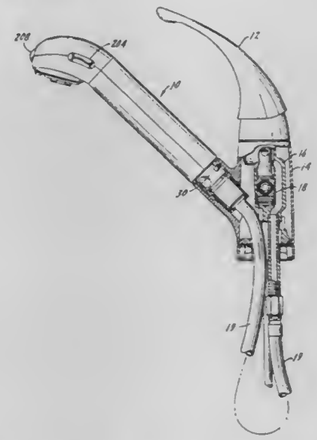
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**5,744,032**
**EASILY REMOVABLE OIL FILTER ATTACHMENT**
**John Joseph Kemper, 5512 Sara Dr., Torrance, Calif. 90503**
**Filed Apr. 16, 1996, Ser. No. 633,198**
**Int. Cl.[6] B01D** *35/00*
**U.S. Cl. 210—238** **9 Claims**




1. An oil filter hi combination with an oil filter attachment comprising:
an annular attachment body coaxially surrounding a longitudinal axis and including first and second open ends, said body defining a length between said first and second open ends, wherein said body includes a peripheral exterior surface extending from said first open end to said second open end, said body having a first peripheral interior surface portion adjacent said first open end and a second peripheral interior surface portion adjacent said second open end, wherein said first peripheral interior surface portion is cylindrically shaped and is adapted to engage a cylindrical peripheral outer surface of said oil filter, and wherein said second peripheral interior surface portion has a polygonal shape adapted to engage a polygonal peripheral outer surface said oil filter, and a plurality of ribs fixedly attached to the peripheral exterior surface of said annular attachment body, wherein said ribs extend from said first open end to said second open end in a direction substantially parallel to said longitudinal axis, and wherein said ribs have a length that is substantially equal to the length of said body whereby the oil filter attachment and oil filter can be used in engine compartments having limited space.

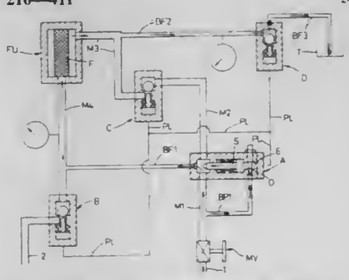
**5,744,033**
**WATER FILTER FOR USE WITH A FAUCET**
**John E. Bertrand, Fairview Park, Ohio; Thomas H. Burchard, Winchester, Mass.; Gregory Hunter, Westwood, Mass.; Kevin M. Johnson, Natick, Mass., and Jeffery Karg, Hopkinton, Mass., assignors to Moen Incorporated, North Olmsted, Ohio**
**Filed Dec. 6, 1996, Ser. No. 761,352**
**Int. Cl.[6] B01D** *27/08*
**U.S. Cl. 210—282** **12 Claims**




1. A water filter for use with a faucet including a cover, a filter element within said cover, said cover having a single unfiltered water input connection and a plurality of output connections, one for filtered water and one for unfiltered water, a conduit within said cover connecting said unfiltered water input connection and said unfiltered water output connection, a flow path within said cover from said input connection through said filter element and connecting to said filtered water output connection, and a peripheral chamber between the exterior of said filter element and the interior of said cover, with said chamber being within said flow path and being connected to said unfiltered water input connection.

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**5,744,034**
**HYDRAULIC CIRCUIT**
**William Stephen Clapham, and John Joseph Warren, both of Sheffield, England, assignors to Hydra Tools International PLC, Sheffield, England**
**Filed May 17, 1996, Ser. No. 649,198**
**Claims priority, application United Kingdom, Jun. 9, 1995, 9511738**
**Int. Cl.[6] B01D** *29/62;29/94;35/157*
**U.S. Cl. 210—411** **3 Claims**




1. A hydraulic circuit comprising a fluid pressure inlet line; a fluid pressure delivery line; and a filter unit interposed between said inlet line and said delivery line, with said circuit incorporating

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an automatic back flushing facility comprising valve arrangement means for temporarily preventing flow of fluid through said filter unit in a delivery direction, and for causing reverse fluid flow through the filter unit in a back flushing direction, wherein said back flushing is initiated by said valve arrangement means sensing an initial flow of fluid, at a predetermined pressure, and, after a predetermined period of time, causing fluid flow in the normal, delivery direction, said back-flushing facility comprising:

(i) a back flush timing valve (A) located upstream of said filter unit (FU);

(ii) a first, pilot-operable, non-return valve (C) located downstream of said timing valve (A);

(iii) a line (M2) between said flush timing valve (A) and said first non-return valve (C);

(iv) a line (M3) between said first non-return valve (C) and said filter unit (FU);

(v) a second, pilot-operable, non-return valve (B) located downstream of said filter unit (FU);

(vi) a back-flushing line from said timing valve (A) to said filter unit (FU);

(vii) a line from said filter unit (FU) to atmosphere/tank;

(viii) a third, pilot-operable, non-return valve (D) located in said line from said filter unit (FU) to atmosphere/tank;

(ix) a by-pass line upstream of said timing valve (A) to convey fluid at mains pressure to a throttling device to create pilot pressure and gradual displacement of said timing valve (A) from an open position to a closed position;

(x) a pilot gallery associated with said throttling device; and

(xi) pilot lines from said gallery to said first, second and third non-return valves (C), (B) and (D) to change their condition upon pilot pressure being present.

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**5,744,035**

**MODULE CONTAINING ZEOLITE-BASED MEMBRANE AND PREPARATION THEREOF**

**Eduard Rudolf Geus; Wridzer Jan Willem Bakker, both of Delft; Jacob Adriaan Moulijn, The Hague; Herman van Bekkum, Vlaardingen, and Jacobus Cornelis Jansen, Delft, all of Netherlands, assignors to Exxon Chemical Patents Inc., Wilmington, Del.**

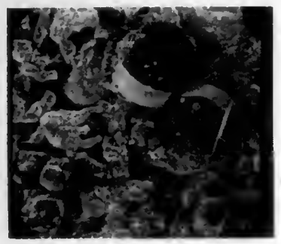
**PCT No. PCT/NL93/00142, § 371 Date Jan. 31, 1995, § 102(e) Date Jan. 31, 1995, PCT Pub. No. WO94/01209, PCT Pub. Date Jan. 20, 1994**

**PCT Filed Jul. 6, 1993, Ser. No. 362,515**

**Claims priority, application Netherlands, Jul. 6, 1992, 9201204**

**Int. Cl.[6] B01D** *29/00*

**U.S. Cl. 210—490** **24 Claims**



Calcinated (1400°C) ZSM-5 (MFI) crystal on porous RVS support (magnification 100x)

1. A module having included therein a membrane, which module consists essentially of a membrane housing, comprising a porous part and walls, and a membrane supported on said porous part, said module being obtainable by the application of a synthesis solution for a zeolite film to said porous part in the membrane housing, followed by crystallization of the zeolite layer resulting in a gastight zeolite layer, and by calcination of the said gastight zeolite layer, while passing over an oxygen-containing gas at a temperature of at least 350° C., whereby the continuous zeolite layer is formed in one step, and in which process through the formation of the zeolite layer any openings between the porous part and the walls of the module are closed.

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**5,744,036**

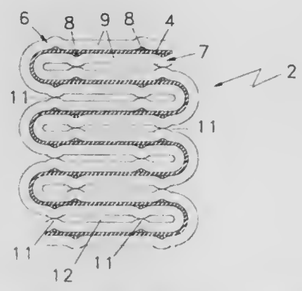
**PLEATED FILTER ARRANGEMENT**

**Kyung-Ju Choi, Jefferson County, Ky., assignor to AAF International, Louisville, Ky.**

**Filed Feb. 3, 1997, Ser. No. 794,594**

**Int. Cl.[6] B01D** *27/06*

**U.S. Cl. 210—493.5** **14 Claims**




1. A pleated filter media arrangement for removing particulate matter from a fluid stream comprising:

at least one sheet of porous filter media having opposed faces and being pleated into a plurality of longitudinally extending spaced pleats of porous filter media;

at least one sheet of longitudinally extending, pleated thermobondable plastic screening in nesting relation with and engaging between adjacent pleats along one of the opposed faces of said pleats of porous filter media to separate said pleats with preselected opposed abutting portions of immediately opposed pleat faces of adjacent pleats said pleated plastic screening being heat bonded together.

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**5,744,037**

**METHOD OF TREATING FOUL WATER**

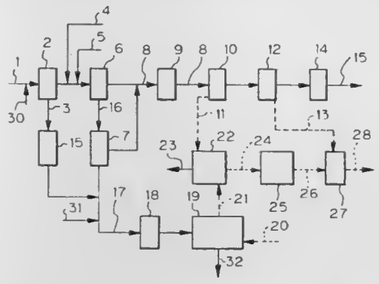
**Hiroyuki Fujimura, Tokyo; Takayuki Suzuki, Kanagawa-ken; Norio Yamada, and Yoshiyuki Ichiki, both of Tokyo, all of Japan, assignors to Ebara Corporation, Tokyo, Japan**

**Filed Nov. 27, 1996, Ser. No. 758,249**

**Claims priority, application Japan, Nov. 28, 1995, 7-331189; Dec. 25, 1995, 7-350053**

**Int. Cl.[6] B01D** *37/00*; **C02F** *11/06*

**U.S. Cl. 210—620** **14 Claims**




8. A method of treating foul water comprising at least one of night soil, septic sludge and sewage, which comprises:

removing solids from the foul water to provide a solid portion and separated water;



introducing said separated water into an anaerobic digestion treatment apparatus, or biological denitrification treatment apparatus, or activated sludge treatment apparatus, whereby treatment is conducted to produce digested sludge or excess sludge;

introducing the digested sludge or excess sludge into a sand filtration tank having a sand layer and an underlying gravel layer;

combining sludge trapped with sand of said sand layer, said solid portion, and waste materials comprising scrap tires and domestic organic wastes to form a mixture, fluidizing the mixture to form a fluidized layer, and burning the mixture in a fluidized-bed heat treatment apparatus;

after burning the sludge in the fluidized-bed heat treatment apparatus, feeding sand from the fluidized layer into a separator to separate said sand, and recycling the resultant separated sand to said sand filtration tank.

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**5,744,038**

**SOLVENT EXTRACTION METHODS FOR DELIPIDATING PLASMA**

**Bill Elliot Cham, Sheldon, Australia, assignor to Aruba International PTY Ltd., Rocklea, Australia**

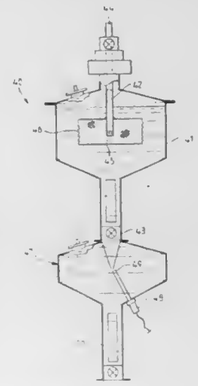
**PCT No. PCT/AU94/00415, § 371 Date Jan. 30, 1996, § 102(e) Date Jan. 30, 1996, PCT Pub. No. WO95/03840, PCT Pub. Date Feb. 9, 1995**

**PCT Filed Jul. 22, 1994, Ser. No. 592,379**

**Claims priority, application Australia, Jul. 30, 1993, PM0287**

**Int. Cl.[6] B01D** *11/00*; **A61M** *1/36*

**U.S. Cl. 210—634** **12 Claims**



1. A method for delipidating plasma comprising subjecting the plasma to a solvent extraction step and a de-emulsification step,

the solvent extraction step being carried out in a first container containing extracting solvent, the first container having a spinning container associated therewith, the solvent extraction step including the steps of passing the plasma into the spinning container, dispersing the plasma into fine droplets by spinning the spinning container, and passing the fine droplets through the extracting solvent to produce delipidated plasma,

the de-emulsification step being carried out in a second container, the second container having an inlet and a homogenizer and containing a de-emulsifying medium, the de-emulsification step including the steps of passing the delipidated plasma into the second container through the inlet and homogenizing the delipidated plasma and the de-emulsifying medium.

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**5,744,039**

**COMPOSITE SEMIPERMEABLE MEMBRANE AND PRODUCTION METHOD THEREOF**

**Hiroki Itoh; Masahiko Hirose, and Katsumi Ishii, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan**

**Continuation of Ser. No. 339,179, Nov. 10, 1994, abandoned. This application Jan. 29, 1997, Ser. No. 790,613**

**Claims priority, application Japan, Nov. 12, 1993, 5-283287; Oct. 27, 1994, 6-263483**

**Int. Cl.[6] B01D** *69/12*; *71/54*; *71/56*

**U.S. Cl. 210—644** **17 Claims**

1. A liquid separation composite semipermeable membrane comprising a porous base material having formed thereon a semipermeable thin film formed by crosslinking interfacial polymerization of a 2,6-diaminotoluene monomer with a polyfunctional crosslinking agent having at least two functional groups capable of reacting with amino groups of the monomer, wherein the interfacial polymerization takes place in the presence of an amine salt.

5. A production method of a composite liquid separation semipermeable membrane, which comprises coating or impregnating a porous base material with a solution containing (1) 2,6-diaminotoluene monomer or a mixture of 2,6-diaminotoluene monomer and other amino compound monomer and (2) an amino salt and thereafter, contacting the coated or impregnated layer with a polyfunctional crosslinking agent having at least two functional groups capable of reacting with the amino group(s) of the monomer(s) to cause an interfacial crosslinking polymerization, thereby to form a semipermeable thin film on the porous base material.

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**5,744,040**

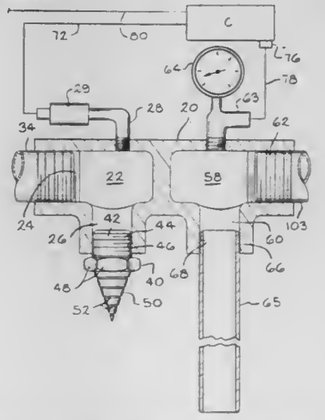
**APPARATUS AND METHOD FOR REMOVING DISSOLVED HYDROGEN SULFIDE FROM WATER**

**Charles E. Slates, Sylvania; Edrice L. Bakies, Toledo; Larry D. Kohlenberg, Maumee, and Mark C. Slates, Bowling Green, all of Ohio, assignors to Sulfur-Tech Water Systems, Inc., Toledo, Ohio**

**Filed May 24, 1996, Ser. No. 653,405**

**Int. Cl.[6] C02F** *1/58*; *1/74*

**U.S. Cl. 210—664** **25 Claims**




1. A method for removing dissolved hydrogen sulfide from water, including the steps of:

(a) aerating water containing dissolved hydrogen sulfide with air at a predetermined pressure in an inlet channel defined by a manifold positioned within an open end of an atomizing tank, said inlet channel having a first inlet port and a second inlet port, said first inlet port being connected to a source of water containing dissolved hydrogen sulfide, said inlet channel being disposed downstream of said first inlet port, said inlet channel further being connected to a source of air under pressure, said inlet channel defining means for mixing said water containing dissolved hydrogen sulfide and said air under pressure to aerate said water; and

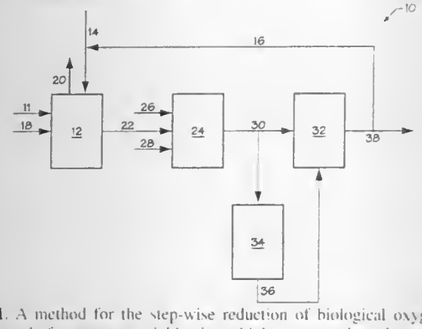
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(b) atomizing said water with a one-piece atomizing nozzle disposed in said atomizing tank and connected to said second inlet port of said manifold to cause said dissolved hydrogen sulfide to react with oxygen in said air to form sulfate in said atomizing tank.

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**5,744,041**
**BIOLOGICAL TREATMENT PROCESS**
**John E. Grove, 18999 C.R. 306, Buena Vista, Colo. 81211**
**Filed Sep. 19, 1996, Ser. No. 715,923**
**Int. Cl.[6] C02F** *3/30;3/32*
**U.S. Cl. 210—602** **27 Claims**




1. A method for the step-wise reduction of biological oxygen demand of a waste material having a high concentration of organic waste, the method comprising the steps of:

providing waste material having a biological oxygen demand and allowing the waste material to separate into a liquid fraction comprising water and suspended organic waste, and allowing at least a portion of the organic waste to be anaerobically digested by microorganisms naturally occurring in the organic waste;

removing at least a portion of the liquid fraction having a reduced biological oxygen demand in relation to the biological oxygen demand of the waste material, and mixing the liquid fraction with aerobic microorganisms and an aerating gas and allowing at least a portion of the organic waste in the aerobic mixture to be aerobically digested by the aerobic microorganisms to form a liquor comprising water and suspended solids, the liquor having a reduced biological oxygen demand relative to the biological oxygen demand of the liquid fraction;

allowing at least a portion of the suspended solids in the liquor to settle, forming a clarified liquor having a reduced biological oxygen demand relative to the biological oxygen demand of the liquor;

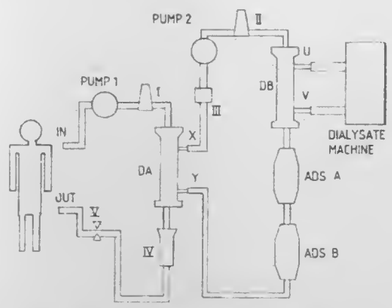
subjecting the clarified liquor to microzone treatment to remove at least a portion of the aerobic microorganisms from the clarified liquor to form a permeate having a reduced biological oxygen demand relative to the clarified liquid; and

discharging or reusing at least a portion of the permeate.

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**5,744,042**
**METHOD FOR THE SEPARATION OF PROTEIN-BOUND SUBSTANCES FROM A PROTEIN-CONTAINING LIQUID BY DIALYSIS**
**Jan Stange, W. Seelenbiderstr. 38; Steffen Mitzner, Wendenstr. 2, both of 18055 Rostock, and Wolfgang Ramlow, Goethestr. 20, D-18209 Bad Doberan, all of Germany**
**Continuation of Ser. No. 123,002, Sep. 17, 1993, abandoned. This application Dec. 12, 1995, Ser. No. 570,816**
**Int. Cl.[6] B01D** *61/24*
**U.S. Cl. 210—645** **11 Claims**

1. A process of separating substances bound to a first protein in a first liquid by means of a semipermeable membrane separating the first liquid from a second liquid, the process comprising the steps of:




a) impregnating the membrane by passing a solution along both sides of the membrane, the solution containing the first protein, which first protein has an acceptor function for the substances to be separated and an affinity for the membrane, for a period of time sufficient to permit penetration and adsorption of the first protein on both sides of the membrane; and

b) passing the first liquid and the second liquid on each side of said semipermeable membrane, the second liquid containing the first protein in free form, wherein the membrane contains (i) a first structure facing the first liquid and having tunnels with a length of 0.01 to 0.1 micrometer and a diameter that permits passage of the substances to be separated but excludes passage of the first protein and (ii) a port- and adsorption structure facing the second liquid that permits the second liquid and the first protein therein to pass into and out of the port- and adsorption structure, whereby the substances bound to the first protein in the first liquid are separated from the first protein and passed through the membrane to the first protein in the second liquid

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**5,744,043**
**PROCESSES FOR REDUCING CONTAMINATION OF CELLULOSIC LIQUORS**
**Paul Kenneth Cutts, West Yorkshire, and Anthony John Burke, North Yorkshire, both of United Kingdom, assignors to Allied Colloids Limited, West Yorkshire, United Kingdom**
**Filed Jul. 22, 1996, Ser. No. 684,054**
**Claims priority, application United Kingdom, Nov. 21, 1994, 9423452**
**Int. Cl.[6] C02F** *1/56*
**U.S. Cl. 210—705** **16 Claims**

1. A process for reducing contamination in a cellulosic liquor due to stickies material derived from pulping or deinking of cellulosic material, the process comprising mixing with the liquor an effective stickies-removing amount of an emulsion in water of particles of collector polymer which ionize in the liquor and which is formed of a water insoluble monomer blend comprising

a) at least 20% by weight hydrophobic monomer having a solubility in water of below 5 g/100 cc and which is selected from the group consisting of alkylmethacrylates, styrenes, vinyl esters, acrylonitriles, vinyl ethers, and ethylenically unsaturated monomers having a polyethoxy chain terminated with a hydrophobic group,

b) at least 10% by weight of a hydrophilic ionizable monomer that is soluble in the monomer blend when substantially non-ionized but is soluble in water when ionized and is selected from the group consisting of ethylenically unsaturated carboxylic acids and amines

c) 0 to 50% by weight of a non-ionizable hydrophilic monomer that is soluble in the monomer blend and which has a solubility in water of above 5 g/100 cc, and

d) 0.05 to 10% oil soluble polyethylenically unsaturated cross-linking agent and in which the proportions of a, b, c and d are such that an aqueous composition, formed by blending 3% (dry weight polymer) of the emulsion in water with acid or alkali to ionize monomer (b) is a fluid composition which contains the polymer in swollen particulate form.



**5,744,044**

**Patent Not Issued For This Number**

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**5,744,045**
**METHOD OF TREATING FLUIDS**
**Po S. Yuen, 99 Edgemont Rd., Scarsdale, N.Y. 10583**
**Filed Oct. 1, 1996, Ser. No. 725,674**
**Int. Cl.[6] C02F** *1/70*
**U.S. Cl. 210—719** **6 Claims**

1. A method for treating municipal, commercial or environmental waste water to remove substantially all undesirable constituents including halogens, heavy metals and bacteria, said method comprising the steps of:

a) preparing an alloy of Si, Cu, and Zn having multiple redox potentials in a mix of three about equal amounts of particle sizes of 20–50 mesh (coarse), 51–150 mesh (intermediate), and 151–250 mesh (fine);

b) preparing a bed of said alloy mix for the fluid to be treated;

c) causing said fluid to flow in a single pass only through said bed;

d) whereby said multiple redox potential system in a single pass substantially removes all halogens, heavy metals and bacteria.

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**5,744,046**
**PROCESS FOR THE TREATMENT OF AN AQUEOUS MEDIUM POLLUTED WITH HYDROCARBONS AND A DE-EMULSIFYING AND DISPERSING COMPOSITION BASED ON POLYGLYCEROL ESTERS**
**Christine Dalmazzone, Versailles, and Gérard Hillion, Herblay, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France**
**Filed Jan. 21, 1997, Ser. No. 786,644**
**Claims priority, application France, Jan. 22, 1996, 96 00671**
**Int. Cl.[6] B01D** *17/05*
**U.S. Cl. 210—749** **15 Claims**

1. A process for the treatment of an oil spill comprising an aqueous medium polluted with crude oil and a water-in-oil emulsion of hydrocarbon compounds, characterized in that said emulsion is brought into contact with a solution of a mixture of polyglycerol esters in a proportion of at least 5000 ppm by weight in order to break the water-in-oil emulsion and disperse the resultant formed hydrocarbon phase into the aqueous medium.

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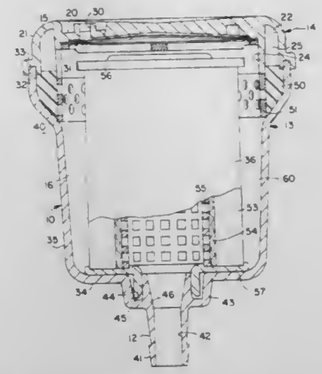
**5,744,047**
**LEUCOCYTE DEPLETING FILTER DEVICE AND METHOD OF USE**
**Thomas C. Gsell; Vlado I. Matkovich, both of Glen Cove, and Thomas Bormann, Seaford, all of N.Y., assignors to Pall Corporation, East Hills, N.Y.**
**Continuation of Ser. No. 221,983, Mar. 9, 1994, Pat. No. 5,362,406, which is a continuation of Ser. No. 827,488, Jan. 30, 1992, abandoned, which is a continuation of Ser. No. 558,468, Jul. 27, 1990, abandoned. This application Aug. 24, 1994, Ser. No. 294,051**
**Int. Cl.[6] B01D** *19/00;37/00;39/00;* **A61M** *1/38*
**U.S. Cl. 210—767** **35 Claims**

1. A method for removing leucocytes and other deleterious matter from leucocyte-containing blood comprising:

directing the blood through a leukocyte depletion filter assembly comprising a housing, a porous degassing element, a vent, and a hollow, cylindrical filter element;

passing the blood through the porous degassing element disposed within the housing;

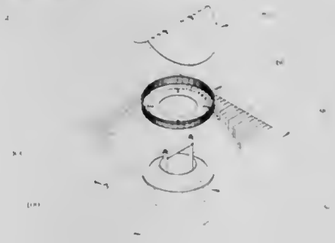
venting gas from the housing through the vent in communication with the degassing element, wherein the vent includes a liquophobic membrane which allows the gas but not the blood to flow through the vent; and




passing the blood through the hollow, cylindrical filter element positioned within the housing, the filter element comprising a depth filter including a fibrous mass of synthetic polymeric fibers capable of decreasing the leucocyte content of the blood at a flow rate capacity of about one to about six liters per minute at a differential pressure of less than 15 psi, said fibrous mass having a CWST of at least 53 dynes/cm.

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**5,744,048**
**CLOG RESISTANT STORM DRAIN FILTER**
**Christopher C. Stetler, South Lake Tahoe, Calif., assignor to Storm Water Systems, Inc., Reno, Nev.**
**Filed Jan. 18, 1997, Ser. No. 785,760**
**Int. Cl.[6] C02F** *1/28;* **E03F** *1/00*
**U.S. Cl. 210—803** **13 Claims**



1. A removable storm drain filter to be used in combination with an absorbent media, and a catch basin having grated inlet and standpipe outlet, for purposes of removing pollutants carried in surface drainage, comprising:

(a) a filtration vessel for containing absorbent media, said filtration vessel having solid side walls, a perforated bottom, and a perforated lid;

(b) means for accessing said filtration vessel to permit inspecting and changing absorbent media;

(c) bracing means for supporting said filtration vessel upon a standpipe;

(d) sealing means for making a watertight seal between said bracing means and the standpipe;

(e) weir means for creating sufficient pressure head upon said perforated lid to force the passage of storm water through said

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filtration vessel, and for bypassing high flows without disruption of the absorbent media;

(f) a removable cover plate for dissipating kinetic energy of incoming storm water between the catch basin grated inlet and said filtration vessel, and for directing influent sediment away from said perforated lid;

(g) means for supporting and securing said cover plate above and upon said filtration vessel;

(h) floatables screen for preventing the accumulation of floating litter upon said perforated lid;

(i) means for supporting and securing said floatables screen upon said filtration vessel;

(j) means to facilitate installing, removing, and carrying the fully assembled apparatus by a human being;

whereby sedimentation, straining of floating litter, and dissipation of kinetic energy occur prior to contact with absorbent media so as to prevent clogging and scouring of media, and flow control is provided to prevent scouring of media even during high flows.

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**5,744,049**

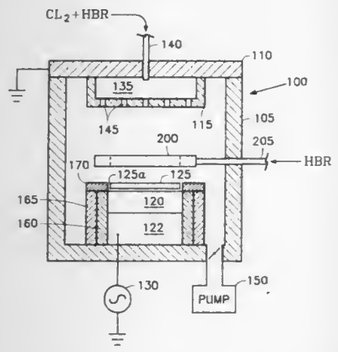
## PLASMA REACTOR WITH ENHANCED PLASMA UNIFORMITY BY GAS ADDITION, AND METHOD OF USING SAME

**Graham W. Hills, Los Gatos, and Yuh-Jia Su, Cupertino, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.**

**Filed Jul. 18, 1994, Ser. No. 276,750**

**Int. Cl.[6] H01L** *21/02*

**U.S. Cl. 216—67** **25 Claims**




**21**. A method of etching a semiconductor wafer having an edge periphery with a RF plasma etch reactor, wherein the semiconductor wafer has a surface comprising a material characterized by silicon and the RF plasma etch reactor has a vacuum chamber, a pedestal for holding said wafer inside said vacuum chamber, and an RF poser source, said method comprising the steps of:

introducing an etchant gas characterized by a mixture of chlorine gas and hydrogen bromide for providing in a plasma, etchant species capable of etching the material characterized by silicon on the surface of said semiconductor wafer;

coupling RF poser into the interior of said vacuum chamber to maintain a plasma therein characterized by said etchant species; and

introducing a diluent gas characterized by hydrogen bromide which tends to dilute said etchant species, said diluent gas being directed near said edge periphery of said semiconductor wafer so as to reduce density of said etchant species near said edge periphery relative to the density of said etchant species near a center portion of said semiconductor wafer.

**5,744,050**

## NOZZLE

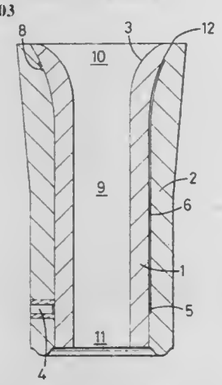
**Richard Dudley Shaw, Dunedin, High Elms Road, Downe, United Kingdom, BR6 7JN**

**Filed Oct. 24, 1996, Ser. No. 736,084**

**Claims priority, application United Kingdom, Oct. 31, 1995, 9522217**

**Int. Cl.[6] B22D** *41/58*

**U.S. Cl. 222—603** **10 Claims**




1. A nozzle for teeming molten metal from a tundish or other receptacle, which nozzle comprises an inlet, an outlet, an inner tubular member and an outer tubular member said outer tubular member and said inner tubular member being joined to one another forming a joint therebetween, a passageway through the nozzle between the inlet and outlet and a port for admitting gas into the nozzle between the inner and outer members; said inner and outer tubular members being constructed from refractory materials, said inlet and outlet being disposed respectively at inlet and outlet ends of the nozzle, said inner and outer tubular members extending to the inlet end of the nozzle and the joint between the inner and outer tubular members being gas-permeable.

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**5,744,051**

## VIBRATION DAMPING COMPOSITION

**Richard F. Cummins, Lawrence, Kans., assignor to Rosinanté, Inc., Eudora, Kans.**

**Filed Dec. 27, 1996, Ser. No. 773,404**

**Int. Cl.[6] E04B** *1/74*

**U.S. Cl. 252—62** **12 Claims**

1. A modified polymer concrete composition having a strength for forming an article to be used in damping vibrations comprising:

6–40% by weight of a synthetic resin;

40–90% by weight of an aggregate;

1–10% by weight of a structural fiber which increases the strength of the composition; and

2–30% by weight of a filler material comprising lead shot or ground visco-elastomeric particles, said filler being used to reduce the amount of resin.

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**5,744,052**

## AZEOTROPE-LIKE COMPOSITIONS CONTAINING DIFLUOROMETHANE, PENTAFLUOROETHANE, AND CARBON DIOXIDE

**Donald Bernard Bivens, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Continuation of Ser. No. 274,886, Jul. 14, 1994, abandoned. This application Apr. 17, 1996, Ser. No. 634,526**

**Int. Cl.[6] C09K** *5/04*

**U.S. Cl. 252—67** **3 Claims**

1. An azeotrope-like composition consisting essentially of 49–55 weight percent difluoromethane, 40–49.5 weight percent pentafluoroethane and about 0.5–3 weight percent carbon dioxide, said composition having a liquid and a vapor phase, wherein when 50 weight percent of an initial composition is evaporated the vapor pressure of the composition changes by less than about 10 percent and further wherein said composition is nonflammable in the vapor phase.



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**5,744,053**

## LUBRICATING OIL ADDITIVE, LUBRICATION OIL AND WORKING FLUID FOR REFRIGERATORS

**Takashi Kaimai, Toda, Japan, assignor to Japan Energy Corporation, Tokyo, Japan**

**Continuation of Ser. No. 580,982, Jan. 3, 1996, abandoned. This application Jun. 6, 1997, Ser. No. 870,788**

**Claims priority, application Japan, Apr. 7, 1995, 7-107070; Oct. 4, 1995, 7-257629**

**Int. Cl.[6] C09K** *5/04;* **C10M** *129/08*

**U.S. Cl. 252—68** **26 Claims**

1. A lubricating oil additive comprising a phosphate and a partially etherified polyhydric alcohol, said partially etherified polyhydric alcohol comprising a polyhydric alcohol moiety having at least two hydroxyl groups and at least one alkenyl group having one to three double bonds and 12 to 24 carbon atoms, said alkenyl group being attached to said polyhydric alcohol moiety through an ether linkage provided at a hydroxyl group position of said polyhydric alcohol moiety other than the positions of the at least two hydroxyl groups, said phosphate comprising a trialkyl phosphate, a triaryl phosphate or a mixture thereof, with the privoso that at least one of the following conditions are satisfied, the polyhydric alcohol moiety has from three to six carbon atoms, the ether linkage is at a carbon atom which is adjacent to a carbon atom having one of at least two hydroxyl groups attached thereto or at least two carbon atoms of three successively adjoining carbon atoms in said polyhydric alcohol moiety have a hydroxyl group attached thereto.

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**5,744,054**

## HEAT REGENERATING AGENT

**Masayoshi Takei, Kunitachi, Japan, assignor to Takei Seisakusho Co., Ltd., Tokyo, Japan**

**Filed Jan. 7, 1997, Ser. No. 779,718**

**Claims priority, application Japan, Jan. 20, 1996, 8-26078; Oct. 18, 1996, 8-297318**

**Int. Cl.[6] C09K** *5/00*

**U.S. Cl. 252—70** **8 Claims**

1. A heat regenerating agent comprising a mixture of 90–98% by weight butanediol and 2–10% by weight polyethylene glycol.

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**5,744,055**

## STABLE MONOPERSULFATE TRIPLE SALT AND ITS METHOD OF PREPARATION

**William A. Hills, Lawrenceville; James L. Manganaro, Princeton; Basil A. Guiliano, Lawrenceville, and Dean S. Thorp, Plainsboro, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.**

**Filed Oct. 27, 1995, Ser. No. 549,111**

**Int. Cl.[6] C01B** *15/043;15/08*

**U.S. Cl. 252—186.27** **23 Claims**

1. A stabilized peroxygen persalt, comprising:

a bicaroate particle having a coherent sodium borosilicate coating.

**5,744,056**

## OXYGEN-SCAVENGING COMPOSITIONS AND ARTICLES

**Lakshmi N. Venkateshwaran, Naperville; Dinesh J. Chokshi, Bolingbrook; Weilong L. Chiang, Naperville, and Boh Chang Tsai, Inverness, all of Ill., assignors to Amoco Corporation, Chicago, Ill.**

**Continuation-in-part of Ser. No. 249,758, May 25, 1994, abandoned, which is a division of Ser. No. 92,722, Jul. 16, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,302**

**Int. Cl.[6] C01B** *3/00*

**U.S. Cl. 252—188.28** **19 Claims**

1. An oxygen-scavenging composition comprising an oxidizable metal component, an electrolyte component and sodium acid pyrophosphate.

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**5,744,057**

## POLYMERIZABLE, CHIRAL COMPOUNDS, AND USE THEREOF

**Frank Meyer, Ludwigshafen; Karl Siemensmeyer; Karl-Heinz Etzbach, both of Frankenthal, and Peter Schuhmacher, Mannheim, all of Germany, assignors to BASF Aktiengesellshaft, Ludwigshafen, Germany**

**Filed Jun. 5, 1996, Ser. No. 658,560**

**Claims priority, application Germany, Jun. 9, 1995, 195 20 704.1**

**Int. Cl.[6] C09K** *19/52;19/32;* **G02F** *1/13;* **C07D** *493/00*

**U.S. Cl. 252—299.01** **17 Claims**

1. A polymerizable, chiral compound of the formula

$$(Z-Y^1\text{-}A\text{-}O-CO-O\text{-}M\text{-}Y^2)_nX \qquad I$$

where

A is a spacer,

M is a mesogenic group,

$Y^1$ and $Y^2$ are chemical bonds or —O—, —S—, —CO—O—, —O—CO—, —O—CO—O—, —CO—N(R)— or —N(R)—CO—,

X is an n-valent chiral radical,

R is hydrogen or $C_1$-$C_4$-alkyl,

n is from 2 to 6,

Z

a1) at least one of these radicals is a reactive group which can participate in a polyaddition reaction,

$a_2$) at least two of these radicals are substituents carrying a reactive group which can participate in a polycondensation reaction,

b) is hydrogen or an unreactive radical so long as condition ($a_1$) or ($a_2$) is satisfied,

where Z, $Y^1$, A, M and $Y^2$ since they occur n times in I, can be identical or different.

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**5,744,058**

## DIENES AND LIQUID-CRYSTALLINE MEDIA

**Volker Reiffenrath, Rossdorf, and Bernhard Rieger, Münster, both of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany**

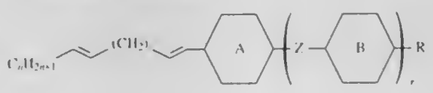
**Filed Jun. 2, 1995, Ser. No. 458,704**

**Claims priority, application Germany, Jun. 3, 1994, 44 19 585.0**

**Int. Cl.[6] C09K** *19/34;19/32;19/30;19/12*

**U.S. Cl. 252—299.61** **7 Claims**

1. Dienes of the formula I.




in which

VOL 1209 ISS 4 AP 28 1998 UMI



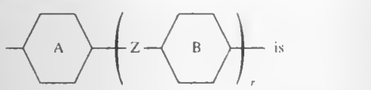
n is 0, 1, 2, 3, 4 or 5,
r is 1, 2 or 3,
s is 1 or 2,

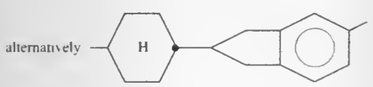


is trans-1,4-cyclohexylene or trans-1,3-dioxane- 2,5-diyl,



is trans-1,4-cyclohexylene, trans-1,3-dioxane-2,5-diyl, unfluorinated or mono- or polyfluorinated 1,4-phenylene, in which one or two CH groups may also be replaced by N, or the central part is





Z is a single bond, a bridging member selected from the group consisting of $-CH_2CH_2-$, $-CH=CH-$, $-C\equiv C-$, $-CO-O-$, $-CH_2O-$, $-OCH_2-$ and $-O-CO-$, or any desired combination of two such bridging members, where two O atoms are not linked directly to one another, and

R is —CN, —NCS, halogen or an alkyl, alkenyl, alkoxy or alkenyloxy group, in each case having up to 12 carbon atoms and in each case unsubstituted or monosubstituted or polysubstituted by fluorine, chlorine or both.

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**5,744,059**

**LIQUID CRYSTAL COMPOSITION, LIQUID CRYSTAL DEVICE AND LIQUID CRYSTAL APPARATUS**

**Masataka Yamashita, Chigasaki; Kazuharu Katagiri, Tama; Masahiro Terada, Hadano; Shosei Mori, Hiratsuka; Syuji Yamada, and Koji Noguchi, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 26, 1996, Ser. No. 592,180**

**Claims priority, application Japan, Jan. 31, 1995, 7-032955**

**Int. Cl.**[6] **C09K** *19/34;19/32;19/30;* **G02F** *1/13*

**U.S. Cl. 252—299.61** **15 Claims**

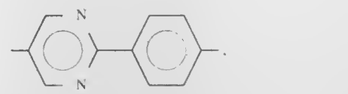
1. A liquid crystal composition, comprising:

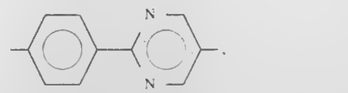
a mesomorphic compound represented by the following formula (A):

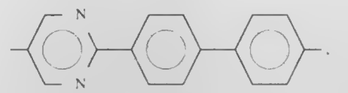


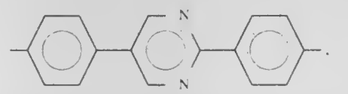
(A)

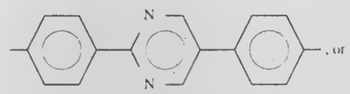
wherein $R_1$ denotes a linear or branched alkyl group having 1–18 carbon atoms; $X_1$ denotes a single bond, —O—, —CO—O— or —O—CO—; $X_2$ denotes a single bond, —$OCH_2$—, —CO—O— or —O—CO—; n is an integer of 3–16; and $A_1$ denotes

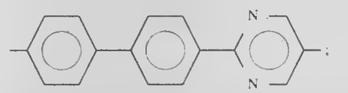










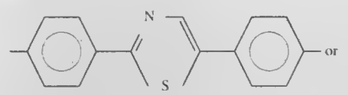


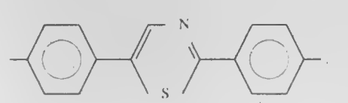
and a mesomorphic compound represented by the following formula (B):



(B)

wherein $R_2$ denotes a linear or branched alkyl group having 1–18 carbon atoms; $X_3$ and $X_4$ independently denote a single bond, —O—, —CO—O— or —O—CO—; m is an integer of 3–16; and $A_2$ denotes





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**5,744,060**

**LIQUID-CRYSTALLINE MEDIUM**

**Kazuaki Tarumi, Seeheim-Jugenheim; Brigitte Schuler, Grossostheim; Ekkehard Bartmann, Erzhausen, and Detlef Pauluth, Ober-Ramstadt, all of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany**

**Filed Aug. 2, 1996, Ser. No. 691,234**

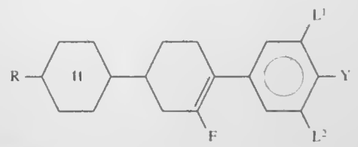
**Claims priority, application Germany, Aug. 4, 1995, 195 28 665.0**

**Int. Cl.**[6] **C09K** *19/30;19/12*

**U.S. Cl. 252—299.63** **16 Claims**

1. A liquid-crystalline medium based on a mixture of polar compounds having positive dielectric anisotropy, comprising one or more compounds of the formula I,





I

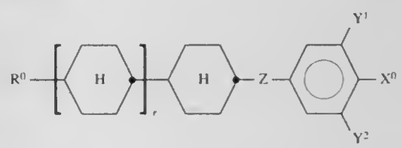
in which

R is H, an alkyl or alkenyl radical having 1 to 15 carbon atoms, which is unsubstituted, monosubstituted by CN or $CF_3$ or monosubstituted to perhalo-substituted by halogen, it also being possible for one or more $CH_2$ groups in these radicals to be replaced, in each case independently of one another, by —O—, —S—, —O—, —CO—, —CO—O—, —O—CO— or —O—CO—O— in such a way that O atoms are not linked directly to one another,

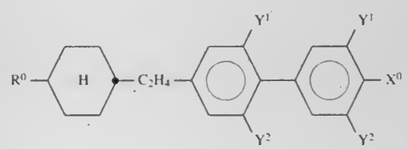
Y is F, Cl or halogenated alkyl, alkenyl or alkoxy having 1 to 6 carbon atoms, and

$L^1$ and $L^2$ are each, independently of one another, H or F;

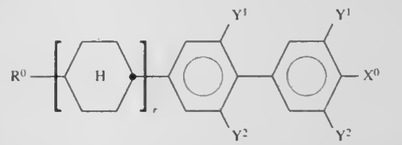
additionally comprising one or more compounds selected from the group consisting of those of the formulae II, III, IV, V, VI and VII:



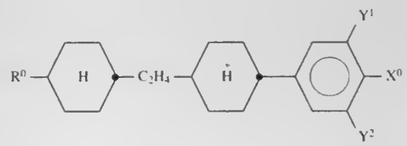
II



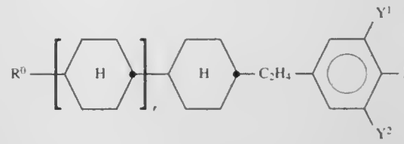
III



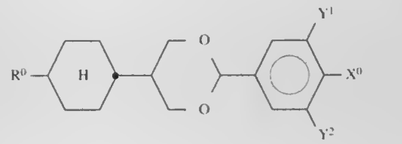
IV



V



VI



VII

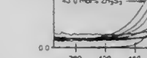
in which the individual radicals having the following meanings:

$R^0$: n-alkyl, oxaalkyl, fluoroalkyl or alkenyl in each case having 1 to 7 carbon atoms,

$X^0$: F, Cl or halogenated alkyl, alkenyl or alkoxy having 1 to 6 carbon atoms,

$Y^1$ and $Y^2$: in each case independently of one another H or F,

Z: single bond or



and

r: 0 or 1.

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**5,744,061**

**COLOR DISPLAY SCREEN COMPRISING A CONTRAST-ENHANCING PIGMENT**

**Michael Bredol, Münster; Jacqueline Merikhi, and Dieter Wädow, both of Aachen, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 9, 1996, Ser. No. 762,649**

**Claims priority, application Germany, Dec. 9, 1995, 195 46 013.8**

**Int. Cl.**[6] **H01J** *1/63;* **C08K** *3/30;* **C09K** *11/56*

**U.S. Cl. 252—301.65** **7 Claims**




1. A color display screen comprising a coating which contains at least a green and/or a red phosphor and at least a pigment having the composition $Zn_{3-3x}In_{2+2x}Ga_{2-2y}S_3$, wherein

$0.2<x<0.97$ and $0.1<y\leq 1.0$.

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**5,744,062**

**BALANCED EMULSIFIER BLENDS FOR OIL-IN-WATER EMULSIONS**

**Gerd H. Dahms, Velbert, Germany, and James W. Cook, Crystal Lake, Ill., assignors to R.I.T.A. Corporation, Woodstock, Ill.**

**Filed Aug. 29, 1996, Ser. No. 705,122**

**Int. Cl.**[6] **B01F** *17/34;* **B01J** *13/00*

**U.S. Cl. 252—312** **19 Claims**

13. A method of preparing an oil-in-water emulsion having a preselected viscosity comprising the steps of:

(a) selecting a coemulsifier, said coemulsifier capable of forming a gel network in an aqueous phase;

(b) selecting an acyl lactylate as a primary emulsifier, said acyl lactylate having a lactylate index value of about 50 to about 80, and capable of providing the preselected viscosity by substantially satisfying a relation

$$\log \eta = 12.6 - (0.16 \times LI),$$

wherein $\eta$ is the preselected viscosity in Pa.s and LI is the lactylate index value of the acyl lactylate;

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(c) calculating an amount of the acyl lactylate capable of providing the determined viscosity, said amount determined by substantially satisfying a formula:

$$C_L = 123 - (30.54 \text{ HLB}) - (1.35 \text{ LI}) + (0.34 \text{ HLB} \times \text{LI})$$

wherein $C_L$ is the weight percent of the acyl lactylate in the emulsifier blend, HLB is the HLB value of the coemulsifier, and LI is the lactylate index value of the acyl lactylate;

(d) admixing the coemulsifier and the acyl lactylate to form a balanced emulsifier blend; and

(e) admixing the balanced emulsifier blend, an oil phase, and an aqueous carrier to form the oil-in-water emulsion of preselected viscosity.

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**5,744,063**

**HIGHER PURITY IMIDAZOLINE BASED AMPHOACETATE SURFACTANTS AND PROCESSES FOR THE PREPARATION THEREOF**

**Bharat Desai, Belle Mead, N.J.; Peter Lees, Bradford, England; Jean-Marc Ricca, Lyons, France, and David J. Tracy, Plainsboro, N.J., assignors to Rhone-Poulenc Inc., Cranbury, N.J.**

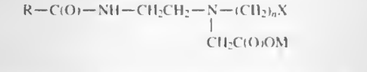
**Continuation of Ser. No. 135,094, Oct. 12, 1993, abandoned. This application Feb. 18, 1997, Ser. No. 801,313**

**Int. Cl.[6] B01F** *17/00;17/22;17/32*

**U.S. Cl. 252—356** **15 Claims**

1. A fatty acid derived, substituted imidazoline-derived amphoacetate surfactant composition consisting essentially of

i) a compound of the formula:



wherein R represents an aliphatic radical containing from about 5 to about 19 inclusive carbon atoms, n is an integer of from 2 to 4 inclusive, X is —OH or —$NH_2$, and M is an alkali or alkaline earth metal;

ii) alkali metal halide salt;

iii) less than about 3.5 weight percent unalkylated amide;

iv) less than about 4.5 weight percent glycolic acid; and

v) water;

the above weight percents being based on the total active weight of the amphoacetate surfactant.

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**5,744,064**

**KETONE-BASED SURFACTANT AND METHOD FOR TREATING INDUSTRIAL, COMMERICAL, AND INSTITUTIONAL WASTE-WATER**

**Denise Christine Galante; Richard Charles Hoy; Albert Ferris Joseph, all of Charleston; Stephen Wayne King, Scott Depot; Charles Arnold Smith, Charleston, and Cheryl Marie Wizda, Cross Lanes, all of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.**

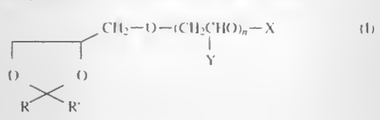
**Filed May 12, 1995, Ser. No. 439,953**

**Int. Cl.[6] B01D** *17/04;* **B01F** *17/00*

**U.S. Cl. 252—358** **16 Claims**

1. A laundry detergent composition consisting essentially of:

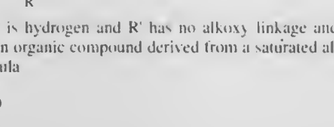
(a) at least about 5% by weight of a nonionic, splittable surfactant having either of, or mixtures of, the formulas



(I)

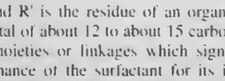
-continued

or,



(II)

of which R and R' are the residue of an organic compound derived from a saturated ketone of the formula



wherein R and R' may be the same or different and are residues of an organic compound which contains a total of about 12 to about 15 carbon atoms and which does not contain a beta-alkoxy substituent or other moieties or linkages which significantly interfere with the performance of the surfactant for its intended purpose; X is hydrogen or the residue of a hydrophobic end-cap; Y is hydrogen, methyl, ethyl, or mixtures thereof; Z is hydrogen, methyl, or ethyl; m is 0 or 1; and n is an integer of 1 to about 40;

(b) about 5% to about 80% builders;

(c) the remainder being inert ingredients.

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**5,744,065**

**ALDEHYDE-BASED SURFACTANT AND METHOD FOR TREATING INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL WASTE-WATER**

**Denise Christine Galante; Richard Charles Hoy; Albert Ferris Joseph, all of Charleston; Stephen Wayne King, Scott Depot; Charles Arnold Smith, Charleston, and Cheryl Marie Wizda, Cross Lanes, all of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.**

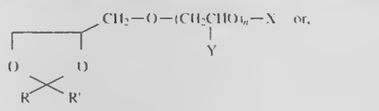
**Filed May 12, 1995, Ser. No. 439,964**

**Int. Cl.[6] G01D** *17/00;* **C11D** *3/00;7/02*

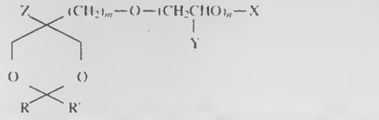
**U.S. Cl. 252—358** **12 Claims**

1. A laundry detergent composition consisting essentially of:

(a) at least about 5% by weight of a nonionic, splittable surfactant having either of, or mixtures of, the formulas



(I)



(II)

of which R is hydrogen and R' has no alkoxy linkage and is the residue of an organic compound derived from a saturated aldehyde of the formula



wherein R is hydrogen and R' is the residue of an organic compound which contains a total of about 12 to about 15 carbon atoms and which contains no moieties or linkages which significantly interfere with the performance of the surfactant for its intended purpose; X is hydrogen or the residue of a hydrophobic end-cap; Y is hydrogen, methyl, ethyl, or mixtures thereof; Z is hydrogen, methyl, or ethyl; m is 0 or 1; and n is an integer of 1 to about 40;

(b) about 5% to about 80% builders;

(c) the remainder being inert ingredients.



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**5,744,066**

**DEFOAMING AND DEAERATING MIXTURES FOR AQUEOUS MEDIA PRONE TO FOAMING**

**Knut Oppenländer, Ludwigshafen; Gabriele Dralle-Voss, Darmstadt, and Rudolf Schuhmacher, Böhl-Iggelheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Mar. 7, 1996, Ser. No. 612,500**

**Claims priority, application Germany, Mar. 13, 1995, 195 08 938.3**

**Int. Cl.[6] B01D** *19/04*

**U.S. Cl. 252—358** **6 Claims**

1. A defoaming and deaerating oil-in-water emulsion where the oil phase is present in an amount of 5 to 75% by weight of the emulsion, wherein the oil phase comprises

a) from 99 to 20% of a component selected from the group consisting of (i) at least one fatty alcohol having at least 12 carbon atoms, (ii) distillation residues obtainable in the course of the production of alcohols having at least 12 carbon atoms by the oxo process or by the Ziegler process, and (iii) mixtures thereof,

b) from 1 to 80% of a component selected from the group consisting of at least one ester of a sugar alcohol having (i) at least 4 OH groups or (ii) at least 2 OH groups and at least one intramolecular ether bond, and a fatty acid having at least 20 carbon atoms, in a molar ratio of 1:at least 1.9, wherein when said ester contains free OH groups, said ester is optionally wholly or partly esterified with $C_{12}$-$C_{18}$-carboxylic acids, and optionally,

c) a compound selected from the group consisting of (i) fatty acid esters of alcohols having at least 22 carbon atoms and $C_1$-$C_{36}$-carboxylic acids, (ii) fatty acid esters of $C_{12}$-$C_{22}$-carboxylic acids and monohydric, dihydric, or trihydric $C_1$-$C_{20}$-alcohols, (iii) polyethylene waxes, (iv) natural waxes and (v) mixtures thereof, and optionally

d) a compound selected from the group consisting of (i) hydrocarbons having a boiling point above 200° C., (ii) fatty acids having from 12 to 22 carbon atoms, and (iii) mixtures thereof.

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**5,744,067**

**PRODUCTION OF $H_2$-RICH GAS**

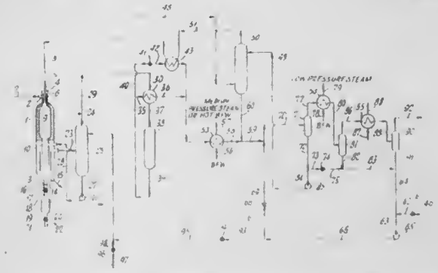
**Frederick Charles Jahnke, Rye, N.Y., assignor to Texaco Inc., White Plains, N.Y.**

**PCT No. PCT/US94/12022, § 371 Date May 21, 1996, § 102(e) Date May 21, 1996, PCT Pub. No. WO95/15290, PCT Pub. Date Jun. 8, 1995**

**Continuation of Ser. No. 159,610, Dec. 1, 1993, Pat. No. 5,358,696. This PCT application Oct. 19, 1994, Ser. No. 656,216**

**Int. Cl.[6] C07C** *1/02;* **C06D** *1/02;* **C10J** *1/02;* **C08J** *69/00*

**U.S. Cl. 252—373** **7 Claims**



1. A method for the production of a hydrogen-rich gas, comprising:

a) partially oxidizing a fuel selected from the group consisting of a water-saturated gaseous hydrocarbonaceous fuel, a liquid hydrocarbonaceous fuel, and mixtures thereof, with an oxidant gas in a gas generator to form a process gas stream comprising CO, $H_2$, and $H_2O$,

b) cooling and scrubbing the process gas stream with water to produce a clean process gas stream at a temperature of about 300° to 600° F.;

c) heating the clean process gas stream to a temperature of about 400° to 800° F. to form a heated process gas stream;

d) reacting the heated process gas stream in a catalytic water-gas shift conversion zone to produce a hydrogen-rich shifted process gas stream;

e) cooling and dewatering the hydrogen enriched shifted process gas stream to produce a shift condensate;

f) separating the shift condensate from the remaining hydrogen enriched shifted process gas;

g) saturating a gaseous hydrocarbonaceous feed stream with at least a portion of the shift condensate to form the water saturated gaseous hydrocarbonaceous fuel that is partially oxidized in said gas generator.

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**5,744,068**

**BLENDS OF POLYPHENYLENE ETHERS AND POLYESTERAMIDES**

**Christian Maria Emile Bailly, Brasschaat, Belgium; Bret Ja Chisholm, Mt. Vernon, Ind., and Henricus Gerardus C. Denissen, Weelde, Belgium, assignors to General Electric Company, Pittsfield, Mass.**

**Continuation of Ser. No. 590,852, Jan. 24, 1996, abandoned. This application Feb. 7, 1997, Ser. No. 797,370**

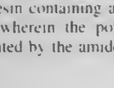
**Int. Cl.[6] C08L** *71/12;77/12*

**U.S. Cl. 525—391** **30 Claims**

1. A thermoplastic resin blend comprising:

A. a poly(phenylene ether) resin comprising a poly(phenylene ether) resin having orthoester functional moieties; and

B. a polyesteramide resin containing at least about 10 mole % aliphatic moieties, wherein the polyesteramide resin comprises units represented by the amide formula (I):



(I)

and the ester formula (II)



(II)

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**5,744,069**

**WATER SOLUABLE METAL ANTICORROSIVE**

**Akio Maeda, Hikari, and Makoto Kanekiyo, Kumage County, both of Japan, assignors to Chiyoda Chemical Kabushiki Kaisha, Yamaguchi, Japan**

**Filed Nov. 15, 1994, Ser. No. 339,816**

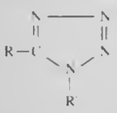
**Claims priority, application Japan, Nov. 24, 1993, 5-293571**

**Int. Cl.[6] C09K** *11/14*

**U.S. Cl. 252—394** **7 Claims**

1. A method for treating surface portions of a metal comprised of iron, copper, and alloys thereof to prevent corrosion thereof comprising the steps of:

(a) dissolving in water a carboxylic acid and at least one water soluble tetrazole compound of the formula



wherein R and R' are each independently selected from the group consisting of hydrogen, an alkyl group having 1 to 20 carbon atoms, a cycloalkyl group, a phenyl group, an alkylphenyl group,

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an amino group, a mercapto group, an alkylmercapto group and water soluble salts thereof, thereby to form an aqueous solution, and thereafter;

(b) contacting said surface portions of said metal with said solution.

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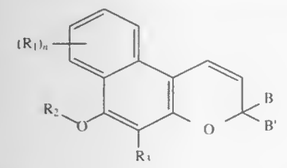
**5,744,070**

## PHOTOCHROMIC SUBSTITUTED NAPHTHOPYRAN COMPOUNDS

**Anil Kumar, Pittsburgh, Pa., assignor to Transitions Optical, Inc., Pinellas Park, Fla.**

**Filed Dec. 20, 1995, Ser. No. 575,439**
**Int. Cl.[6] G02B *5/23*; C07D *311/92***
**U.S. Cl. 252—586** **20 Claims**

1. A naphthopyran compound represented by the following graphic formula:



wherein:

(a) $R_1$ is $C_1$-$C_6$ alkyl, $C_5$-$C_7$ cycloalkyl, chloro, fluoro, the group, $—OR_4$, or the group, —C(O)W, W being $C_1$-$C_6$ alkyl, $—OR_5$ or $—N(R_6)R_7$, wherein $R_4$ is hydrogen, allyl, $C_1$-$C_6$ alkyl, phenyl, $C_1$-$C_6$ monoalkyl substituted phenyl, $C_1$-$C_6$ monoalkoxy substituted phenyl, phenyl($C_1$-$C_3$)alkyl, $C_1$-$C_6$ monoalkyl substituted phenyl($C_1$-$C_3$)alkyl, $C_1$-$C_6$ monoalkoxy substituted phenyl($C_1$-$C_3$)alkyl, $C_1$-$C_6$ alkoxy($C_2$-$C_4$)alkyl, $C_1$-$C_6$ monofluoroalkyl, $C_1$-$C_6$ monochloroalkyl, $C_1$-$C_6$ alkylcarbonyl, monochloro($C_1$-$C_6$)alkylcarbonyl, monofluoro($C_1$-$C_6$)alkylcarbonyl, $C_1$-$C_6$ monoalkylaminocarbonyl, mono- or di-substituted arylcarbonyl, said aryl group being phenyl or naphthyl, wherein $R_5$ is hydrogen, allyl, $C_1$-$C_6$ alkyl, phenyl, $C_1$-$C_6$ monoalkyl substituted phenyl, $C_1$-$C_6$ monoalkoxy substituted phenyl, phenyl($C_1$-$C_3$)alkyl, $C_1$-$C_6$ monoalkyl substituted phenyl($C_1$-$C_3$)alkyl, $C_1$-$C_6$ monoalkoxy substituted phenyl($C_1$-$C_3$)alkyl, $C_1$-$C_6$ alkoxy($C_2$-$C_4$)alkyl, $C_1$-$C_6$ monofluoroalkyl or $C_1$-$C_6$ monochloroalkyl, and wherein $R_6$ and $R_7$ are each selected from the group consisting of hydrogen, $C_1$-$C_6$ alkyl, $C_5$-$C_7$ cycloalkyl, phenyl, mono- substituted and di-substituted phenyl, or $R_6$ and $R_7$ together with the attached nitrogen atom form an unsubstituted, mono- substituted or di-substituted heterocyclic ring selected from the group consisting of indolinyl, morpholino, piperidino, 1-pyrrolidyl, 1-pyrrolinyl, 1-imidazolidyl, 2-imidazolin-1-yl, 2-pyrazolidyl and 1-piperazinyl, said phenyl, naphthyl and heterocyclic ring substituents being $C_1$-$C_6$ alkyl or $C_1$-$C_6$ alkoxy, and n is the integer 0, 1, 2 or 3;

(b) $R_2$ is hydrogen, or the group, —C(O)X, wherein X is hydrogen, $C_1$-$C_6$ alkyl, $C_1$-$C_6$ alkoxy, $C_1$-$C_6$ monofluoroalkyl, $C_1$-$C_6$ monochloroalkyl, phenyl($C_1$-$C_3$)alkyl, mono($C_1$-$C_6$)alkyl substituted phenyl($C_1$-$C_3$)alkyl, mono($C_1$-$C_6$)alkoxy substituted phenyl($C_1$-$C_3$)alkyl, $C_1$-$C_6$ alkoxy($C_2$-$C_4$)alkyl, $C_3$-$C_7$ cycloalkyl, mono($C_1$-$C_4$)alkyl substituted $C_3$-$C_7$ cycloalkyl, $C_1$-$C_6$ alkylamino, allyl, or the unsubstituted, mono-substituted or di-substituted member selected from the group consisting of phenyl, naphthyl, phenoxy and phenylamino, said group substituents being $C_1$-$C_6$ alkyl or $C_1$-$C_6$ alkoxy;

(c) $R_3$ is hydrogen or a $C_1$-$C_6$ alkyl; and

(d) B and B' are each selected from the group consisting of:

(i) unsubstituted, mono-, di- and tri-substituted phenyl;

(ii) the unsubstituted, mono- and di-substituted heterocyclic aromatic groups pyridyl, benzofuran-2-yl, benzofuran-3-yl, benzothien-2-yl, benzothien-3-yl, dibenzothienyl, dibenzofuranyl, and carbazolyl, said aryl and heterocyclic substituents described in (i) and (ii) being selected from the group consisting of hydroxy, amino, $C_1$-$C_6$ monoalkylamino, $C_1$-$C_6$ dialkylamino, morpholino, piperidino, 1-indolinyl, pyrrolidyl, 1-imidazolidyl, 2-imidazolin-1-yl, 2-pyrazolidyl, pyrazolinyl, 1-piperazinyl, $C_1$-$C_6$ alkyl, $C_1$-$C_6$ haloalkyl, $C_1$-$C_6$ alkoxy, mono($C_1$-$C_6$)alkoxy($C_1$-$C_3$)alkyl, acryloxy, methacryloxy and halogen, said halogen or (halo) group being fluoro or chloro; and

(iii) $C_1$-$C_6$ alkyl, $C_1$-$C_6$ haloalkyl, $C_1$-$C_6$ alkoxy($C_1$-$C_4$)alkyl, $C_3$-$C_6$ cycloalkyl, mono($C_1$-$C_6$) alkoxy($C_3$-$C_6$)cycloalkyl, mono($C_1$-$C_6$)alkyl($C_3$-$C_6$)cycloalkyl, and halo($C_3$-$C_6$)cycloalkyl, each of said halo groups being fluoro or chloro; or

(iv) B and B' taken together form a member selected from the group consisting of saturated $C_7$-$C_{12}$ spiro-bicyclic hydrocarbon rings, and saturated $C_7$-$C_{12}$ spiro-tricyclic hydrocarbon rings.

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**5,744,071**

## PROCESSES FOR PREPARING ALKYNYL KETONES AND PRECURSORS THEREOF

**Philip Franklin Sims, Cherryville, and Anne Pautard-Cooper, Gastonia, both of N.C., assignors to FMC Corporation, Philadelphia, Pa.**

**Filed Nov. 19, 1996, Ser. No. 752,684**
**Int. Cl.[6] C07F *1/02*; *3/02***
**U.S. Cl. 260—665 R** **42 Claims**

1. A process for making metallated acetylenes, comprising contacting a mixture comprising at least one acetylenic compound and at least one saturated or unsaturated hydrocarbon which is different from said at least one acetylenic compound with an organometallating agent under conditions sufficient to produce metallated acetylenic compound.

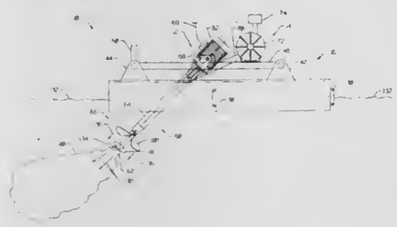
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**5,744,072**

## METHOD OF TREATING WASTE WATER

**Rudolf R. Karliner, Minnetonka, Minn., assignor to Aeration Industries International, Inc., Chaska, Minn.**

**Filed May 3, 1996, Ser. No. 642,445**
**Int. Cl.[6] B01F *3/04***
**U.S. Cl. 261—87** **3 Claims**



1. A method of treating waste water, comprising the steps of:

providing an aerator/mixer including an elongate drive shaft having a first end a second end, the first end being coupled to a selectively rotatable power source, a compressed air source in fluid communication with a tubular shaft; a first propeller coupled to the drive shaft proximate the drive shaft second end; a second propeller, larger than the first propeller, coupled to the drive shaft between the first propeller and the first end of the drive shaft;

submerging the second end of the drive shaft and the propellers in waste water;

delivering air to the second end of the drive shaft from the compressed air source when the propellers are rotating to aerate the waste water; and



reducing the delivery of air to the second end of the drive shaft from the compressed air source when the propellers are rotating to mix the waste water.

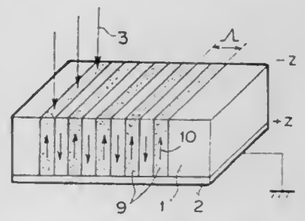
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**5,744,073**

## FABRICATION OF FERROELECTRIC DOMAIN REVERSALS

**Yasukazu Nihei; Yoji Okazaki, and Akinori Harada, all of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 132,277, Oct. 6, 1993, abandoned. This application Sep. 20, 1995, Ser. No. 531,280**
**Claims priority, application Japan, Oct. 19, 1992, 4-280001; Jan. 19, 1993, 5-006599**
**Int. Cl.[6] B29D *11/00*; G02B *1/00***
**U.S. Cl. 264—1.21** **19 Claims**




1. A method for fabricating domain reversals, the method characterized in that domain reversals are defined by exposing localized surface areas of a unpolarized ferroelectric material, which possesses a nonlinear optical effect, to high energy beams in a predetermined pattern to create a charge on said localized surface areas and thereby establish an electric field between said localized surface areas and corresponding localized surface areas on the opposite side of said ferroelectric material, and the ferroelectric material is then subjected to a heat treatment hot enough to render uniform the refractive index of said ferroelectric material which was subjected to said electric field, said heat treatment being below the Curie temperature of the ferroelectric material.

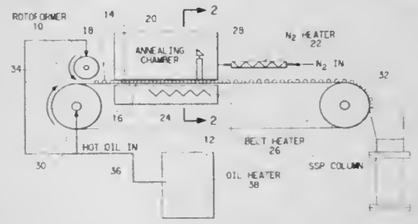
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**5,744,074**

## PROCESS FOR FORMING CRYSTALLINE POLYMER PELLETS

**Jan M. Stouffer, Hockessin; Elwood Neal Blanchard, Wilmington, both of Del., and Kenneth Wayne Leffew, Kennett Square, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Division of Ser. No. 376,599, Jan. 20, 1995, Pat. No. 5,633,018. This application Aug. 8, 1996, Ser. No. 694,084**
**Int. Cl.[6] B01J *4/02***
**U.S. Cl. 264—8** **3 Claims**




1. A process for solid-state polymerization of a polyester polymer having a glass transition temperature $T_g$ greater than about 25° C. comprising:

(a) forming molten droplets by metering a polyester polymer melt through a plurality of outlets, each 0.5 to 5 mm in diameter, in a rotatable container; and

(b) collecting the molten droplets or crystallizing pellets, as they are formed, onto a moving solid surface, adding or removing heat so that the surface is maintained within a predetermined temperature range above 50° C. within a crystallization zone, such that the pellets are maintained in contact with the surface within the crystallization zone for a predetermined period of time;

(c) introducing the pellets produced in step (b) into a solid-state polymerization reactor for increasing the molecular weight of the polyester polymer.

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**5,744,075**

## METHOD FOR RAPID FABRICATION OF FIBER PREFORMS AND STRUCTURAL COMPOSITE MATERIALS

**James W. Klett, Knoxville; Timothy D. Burchell, Oak Ridge, and Jeffrey L. Bailey, Clinton, all of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.**

**Filed May 19, 1995, Ser. No. 444,986**
**Int. Cl.[6] C01B *31/02*; *31/04*; B29C *41/16*; *71/02***
**U.S. Cl. 264—29.6** **20 Claims**

1. A method of making a densified carbon matrix carbon fiber composite preform comprising the following steps:

Step 1, providing an aqueous slurry comprising carbon fibers, carbonizable organic powder and a rigidizer, said rigidizer having a softening point temperature range and a volatilization temperature range;

Step 2, vacuum molding said slurry to form a molded part;

Step 3, drying said molded part at a temperature greater than said softening point temperature range of said rigidizer and a temperature less than said volatilization temperature range of said rigidizer to form a dry rigidized molded part having said carbon fibers uniformly dispersed and randomly oriented therein;

Step 4, hot pressing said dry rigidized molded part to form a hot pressed part; and

Step 5, carbonizing said hot pressed part under an inert atmosphere for a time and temperature sufficient to form a densified carbon matrix carbon fiber composite preform.

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**5,744,076**

## METHOD FOR MAKING INSULATED CONCRETE WALL TIE SYSTEM

**Kenneth I. Baxter, 19475 200th, Big Rapids, Mich. 49307**

**Division of Ser. No. 298,767, Aug. 31, 1994, Pat. No. 5,582,388, which is a continuation-in-part of Ser. No. 217,260, Mar. 24, 1994, Pat. No. 5,409,193. This application Sep. 17, 1996, Ser. No. 724,052**
**Int. Cl.[6] E04B *2/84***
**U.S. Cl. 264—35** **2 Claims**

1. A method of forming an insulated poured concrete wall comprising the steps of:

positioning pouring forms in a vertical, parallel, spaced relationship to define a space therebetween;

placing tie bars at intervals between said forms, across said space, and securing said tie bars to said forms;

placing retaining strips within said space adjacent said forms, said strips defining elongated sockets oriented toward each other and configurated to receive the edges of insulation panels;

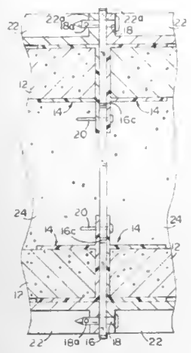
placing spring clips on said retaining strips and said tie bars to secure said retaining strips to said tie bars;

inserting insulation panels within said space with the edges of the insulation panels engaging and being held in the elongated sockets of said strips;

injecting uncured concrete into said space and against said insulation panels;

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curing said concrete; and

removing said forms but leaving said spring clips, retaining strips and tie bars with the resulting insulated concrete wall.

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**5,744,077**

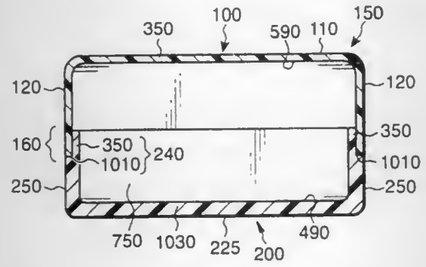
**METHOD FOR FABRICATING A COMPOSITE STRUCTURE**

**William E. Grisch, Elburn, and Francis L. Massey, St. Charles, both of Ill., assignors to Applied Composites, Corp., St. Charles, Ill.**

**Continuation of Ser. No. 524,818, Sep. 7, 1995, abandoned. This application Feb. 19, 1997, Ser. No. 802,689**

**Int. Cl.[6] B29C *44/06;44/12***

**U.S. Cl. 264—46.6** **12 Claims**




1. A method of manufacturing a composite structural article having a desired shape, the method comprising the steps of:

a) premolding a rigid non-metallic, plastic exterior shell corresponding to the desired shape of the composite structural article and having at least two ends, the exterior shell also having an inner surface defining a cavity therein, and means formed as part of said exterior shell for interlocking said at least two ends to create a seamless outer surface of said exterior shell, said means for interlocking said at least two ends comprising varied wall thicknesses of the shell at said ends;

b) interlocking said at least two ends;

c) applying to the premolded exterior shell structural means for prohibiting deformation of said exterior shell;

d) injecting a foam reaction mixture into the cavity such that the foam reaction mixture expands and fills the cavity and adheres to the inner surface of the exterior shell to create the composite structural article with a foam core of uniform density, the structural means withstanding pressure induced by the expanding foam and maintaining the desired shape of the composite structural article; and

e) separating the composite structural article from the structural means.

**5,744,078**

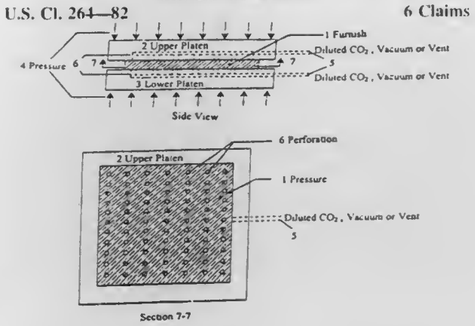
**ACCELERATED PROCESSING OF CEMENT-BONDED PARTICLEBOARD AND FIBERBOARD**

**Parviz Soroushian, Ingham, Mich., and Khodabakhsh Ostovari, Orange, Calif., assignors to DPD, Inc., Lansing, Mich.**

**Filed Sep. 3, 1996, Ser. No. 706,780**

**Int. Cl.[6] C04B *40/00***

**U.S. Cl. 264—82** **6 Claims**




1. A method of accelerated curing of cement-bonded particleboard and fiberboard where the furnish comprises natural or synthetic particles and fibers, a calcareous cementitious binder, moisture and, optionally, concrete additives and aggregates;

natural or synthetic particles are about 1–1000 mm in length, about 0.1–10 mm in width and about 0.01–1 mm in thickness, and natural or synthetic fibers are about 0.005–5 mm in equivalent cross-sectional diameter and about 0.5–100 mm in length; these particles and fibers may be obtained from virgin or recycled sources;

the calcareous cementitious binder is at least one of Portland cement, Portland pozzolan cement, Portland slag cement, coal fly ash and ground granulated blast furnace slag;

the optional aggregates comprise at least one of light-weight and normal-weight aggregates of mineral or synthetic sources;

the particle or fiber-to-binder ratio in the furnish ranges from about 0.01 to about 2.0 by weight, and the water-to-binder ratio ranges from about 0.05 to about 2.0 by weight; if lime is used, it is added at about 0.01 to about 0.5 lime-to-binder weight ratio;

the furnish is blended, compacted under pressure to about 2–40 mm thickness and about 0.2–2.5 $g/cm^3$ density, and at least one of the top and bottom faces of the furnish are subjected to diluted carbon dioxide gas injection and ventilation in order to accelerate the curing process of the calcareous cementitious binder and produce sufficient strength and stiffness in about 0.5–30 minutes to resist spring-back upon release of the compaction pressure and to tolerate subsequent handling and processing stresses; the diluted carbon dioxide comprises about 1%–50% carbon dioxide gas and about 50%–99% inert gases or air, and its relative humidity ranges from 0% to 100% and its temperature from −100° C. to 200° C.; the application pressure of the diluted carbon dioxide gas ranges from the atmospheric pressure to about 5000 KPa.

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**5,744,079**

**PROCESS FOR PRODUCING COMPRESSION MOLDED ARTICLE OF LIGNOCELLULOSE TYPE MATERIAL**

**Tadashi Kimura; Toshihide Kobayashi; Katsuhiko Sakurai; Kensuke Tani, all of Yokohama, and Mitsuhiro Yoshida, Kanagawa-ken, all of Japan, assignors to Nippon Polyurethane Industry Co., Ltd., Tokyo, Japan**

**Filed Jul. 9, 1997, Ser. No. 890,292**

**Int. Cl.[6] B27N *3/00***

**U.S. Cl. 264—109** **8 Claims**

1. A process for producing a compression molded article of a lignocellulose type material by use of an organic polyisocyanate compound as a binder, the process which comprises carrying out adhesion by use of the following components:

(A) an organic polyisocyanate,

(B) an aqueous emulsion of a wax having a melting point ranging from 50° C. to 160° C.,

(C) an organic phosphate ester derivative, and

(D) optionally water.

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**5,744,080**

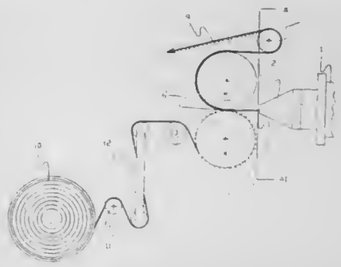
**LAMINATED HOOK FASTENER**

**William J. Kennedy; George A. Provost, both of Manchester, and Gerald F. Rocha, Bedford, all of N.H., assignors to Velcro Industries B.V., Netherlands, Netherlands Antilles**

**Continuation of Ser. No. 319,267, Oct. 6, 1994, Pat. No. 5,518,795, which is a continuation of Ser. No. 80,348, Jun. 21, 1993, abandoned, which is a division of Ser. No. 747,876, Aug. 16, 1991, Pat. No. 5,260,015. This application May 21, 1996, Ser. No. 651,170**

**Int. Cl.[6] B29C *47/02***

**U.S. Cl. 264—167** **27 Claims**



1. The method of making a striplike hook fastener component comprised of plastic material, the component having a base portion and a great multiplicity of hooklike projections extending from and integral with one surface of said base portion, laminated with a sheet material capable of performing a function other than serving as structure of the hook fastener component,

the method comprising:

providing a cooled, rigid rotating forming roller having inwardly extending, fixed, hook-forming cavities defined in its periphery,

to the exterior of said forming roller, applying molten plastic material for filling the hook forming cavities and providing said base portion,

introducing to said roller a sheet material having a function other than serving as structure of the fastener component to the molten plastic material on the exterior of the forming roller under pressure conditions that cause said sheet material to become united with said plastic material, thus forming an in situ laminate, the side of said sheet material directed oppositely from the side united with said plastic material remaining substantially free of said plastic material, and,

after the molten plastic is cooled to a desired temperature, withdrawing said laminate from said forming roller including withdrawing said hooklike projections from said hook forming cavities without opening said cavities.

14. An apparatus for forming a fastener structure comprising:

an extruder for delivering a predetermined width of heated, moldable resin;

a rigid molding roll having inwardly extending, fixed mold cavities defining fastener elements disposed about the periphery of the molding roll, the molding roll disposed to receive the resin on the periphery of the molding roll;

a mechanism arranged to introduce a running length of material to the resin on the exterior of the molding roll,

and a mechanism for withdrawing the resulting product from the fixed cavities of the molding roll.

**5,744,081**

**BUILDING MATERIAL MANUFACTURING METHOD**

**Masanori Tanigawa; Kazuhiko Mitoma, and Shusuke Matsumura, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Jun. 18, 1996, Ser. No. 664,619**

**Claims priority, application Japan, Jun. 19, 1995, 7-152085; Jun. 19, 1995, 7-152086**

**Int. Cl.[6] B29C *33/38***

**U.S. Cl. 264—219** **7 Claims**



1. A method of manufacturing a building material comprising:

(a) obtaining and storing three-dimensional data on a selected surface pattern;

(b) displaying on a screen a first image based on two-dimensional data of said three-dimensional data, and shaping said first image thus displayed;

(c) displaying on said screen a second image which is obtained by adding height data of said three-dimensional data to said first image thus shaped and evaluating said second image being displayed;

(d) arranging pieces cut on said screen from said second image which has been shaped and evaluated, at predetermined positions, to process a miniature size model image;

(e) displaying said miniature size model image on said screen and evaluating said miniature size model image being displayed;

(f) arranging said miniature size model image selected through evaluation at predetermined positions to process a full size model image;

(g) forming a building material model according to three-dimensional data of said full size model image and evaluating said building material model thus formed;

(h) and forming a mold according to three-dimensional data corresponding to said building material model; and

(i) forming a building material by use of said mold.

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**5,744,082**

**PROCESS FOR MOLDING A CLOSURE CAP USING A PIVOTABLE MOLD PART**

**Kenneth Bak, Pittsfield, Mass., assignor to Marland Mold, Inc., Pittsfield, Mass.**

**Filed Nov. 19, 1996, Ser. No. 752,250**

**Int. Cl.[6] B29C *45/40***

**U.S. Cl. 264—238** **8 Claims**

1. A process for forming a one piece flip-top cap comprising the steps of:

injecting a molten material into a mold cavity defined on one side by a first mold part, an interior mold core and a pivotable mold part and on the other side by a second mold part;

forming from the molten material a one piece flip-top cap having a body and a lid connected by a living hinge, said lid body having interconnection means for maintaining a closed relationship between the lid and body;

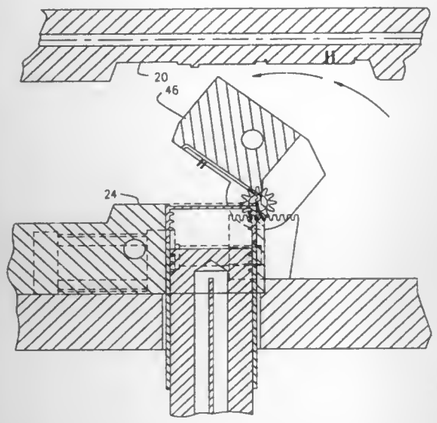
cooling the one piece flip-top cap;

retracting the second mold part from the first mold part, interior mold core and pivotable mold part on which the one piece flip-top cap is seated;

pivoting the pivotable mold part from an original position to a sealing position, wherein the lid is pivoted about the living

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hinge so that the interconnection means maintains the one piece flip-top cap in its closed configuration;

activating one or more pull straps to ensure sealing of the lid to the body;

pivoting the pivotable mold part back from the sealing position to the original position;

ejecting the one piece flip-top cap from the mold by means of an ejector sleeve situated within the first mold part.

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**5,744,083**

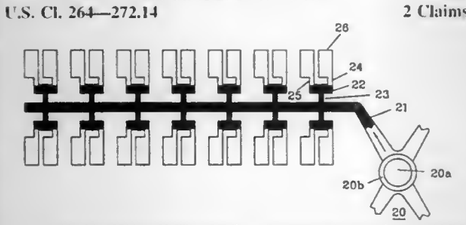
**METHOD FOR MOLDING SEMICONDUCTOR PACKAGES**

**George A. Bednarz, and Teong Yu Lim, both of Singapore, Singapore, assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 262,814, Jun. 21, 1994, Pat. No. 5,624,691. This application Nov. 6, 1996, Ser. No. 744,669**

**Int. Cl.[6] B29C** *45/14;45/02*

**U.S. Cl. 264—272.14** **2 Claims**




1. A method for molding semiconductor packages in a transfer mold, comprising the steps of:

flowing mold compound into a runner, the runner tapered from a first cross-section at a first end where the mold compound enters the runner to a second cross-section at a second end, the first cross-section being larger than the second cross-section;

flowing mold compound from the runner into a plurality of reservoir gates, each of the reservoir gates having a first end connected to the runner and a second end, each of the reservoir gates having a cross-section, the cross-sections of the reservoir gates increasing from the first end of the runner to the second end of the runner;

flowing mold compound from the reservoir gates into a plurality of reservoirs, each reservoir connected to a second end of a reservoir gate, each reservoir having a cross-section that is larger than the cross-section of the reservoir gate to which it is connected, the cross-sections of the reservoirs decreasing from the first end of the runner to the second end of the runner;

flowing mold compound from the reservoirs into a plurality of cavity gates, each cavity gate having a first end connected to a reservoir and a second end, each cavity gate having a cross-section that is smaller than the cross-section of the reservoir to which it is connected; and

flowing mold compound from the cavity gates into a plurality of cavities containing semiconductor packages and filling the cavities, each cavity connected to a second end of a cavity gate.

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**5,744,084**

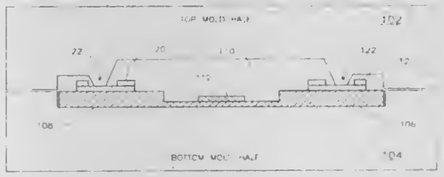
**METHOD OF IMPROVING MOLDING OF AN OVERMOLDED PACKAGE BODY ON A SUBSTRATE**

**Chok J. Chia, Cupertino; Seng-Sooi Lim, San Jose, and Maniam Alagaratnam, Cupertino, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.**

**Filed Jul. 24, 1995, Ser. No. 506,164**

**Int. Cl.[6] B29C** *45/14;70/70*

**U.S. Cl. 264—276** **4 Claims**




1. Method of forming an overmolded package body on a substrate, comprising:

providing a mold having a top mold half with a cavity and a bottom mold half;

providing a sealing structure on the top mold half and at a periphery of the cavity, the sealing structure having a ridge, the ridge having a height in the sealing structure;

providing a substrate having a top and a bottom surface;

disposing a dam structure on the top surface of the substrate, wherein the dam structure has an edge.

forming a groove having a depth in the dam structure edge.

adjusting the depth of the groove to obtain a desired distance from the bottom surface of the substrate, whereby a uniform clamping pressure is exerted by the sealing structure on the dam structure, irrespective of the thickness of the substrates;

disposing the substrate in the bottom mold half wherein the bottom surface of the substrate is proximate to the bottom mold half and the dam structure opposes the sealing structure;

bringing the mold halves together, so that the sealing structure contacts the dam structure so as to form a seal thereby; and

filling the cavity with molding compound.

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**5,744,085**

**PIPE-END EXPANDING METHOD AND A TOOL THEREFOR**

**Bengt Sörberg, Kungsör, Sweden, assignor to Wirsbo Bruks AB, Virsbo, Sweden**

**PCT No. PCT/SE94/00945, § 371 Date Mar. 27, 1996, § 102(e) Date Mar. 27, 1996, PCT Pub. No. WO95/10000, PCT Pub. Date Apr. 13, 1995**

**PCT Filed Oct. 7, 1994, Ser. No. 619,549**

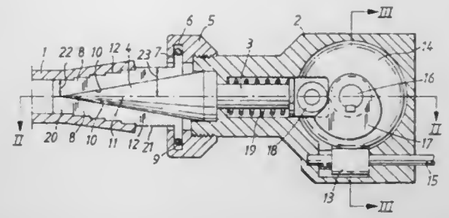
**Claims priority, application Sweden, Oct. 7, 1993, 9303295**

**Int. Cl.[6] B29C** *57/04*

**U.S. Cl. 264—296** **2 Claims**

1. A method of expanding a pipe-end made of a plastic material that has a memory capacity by a tool which includes a plurality of jaws that are movable radially in relation to a centre axis between a retracted position and an outer expanded position, said jaws having outer jaw surfaces for engagement with an inner surface of the pipe-end and which lie adjacent one another in the retracted position of the jaws and have an at least generally circular-arcuate shape in cross-section, said tool including means for moving the






jaws between the positions, a radial distance of respective outer jaw surfaces from a centre axis increasing from an insertion end to a rear end, and for expanding the pipe-end, comprising:

inserting the jaws a given distance into the pipe-end with the jaws retracted,

then expanding the pipe-end successively in a plurality of expansion stages by

moving the jaws in each expansion stage through a small radial distance, wherein the jaws are moved from the retracted position radially outwards to the outer expanded position of said jaws, in relation to a final radial expansion of the pipe-end, and

moving the jaws to the retracted position and inserting the jaws while retracted further into the pipe-end between each expansion stage.

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**5,744,086**

**SLUSH MOLDING OF POLYOLEFIN POWDER COMPOSITIONS AND THE COMPOSITIONS**

**Martin Hallam, Ferrara, Italy, assignor to Montell North America Inc., Wilmington, Del.**

**Continuation of Ser. No. 284,020, Aug. 1, 1994, abandoned. This application Jan. 6, 1997, Ser. No. 779,173**

**Claims priority, application Italy, Aug. 3, 1993, MI93A1764**

**Int. Cl.[6] B29C** *41/18;71/02;* **C08L** *33/00*

**U.S. Cl. 264—296** **7 Claims**

1. A process for the manufacture of a laminar article, comprising slush molding a polyolefin composition in powder form, said composition comprising the following fractions:

A) 10–40 parts by weight of an isotactic propylene homopolymer with an isotactic index higher than 80, or a random copolymer of propylene with a comonomer selected from the group consisting of (1) ethylene, (2) a $C_4$-$C_{10}$ alpha-olefin having the formula $CH_2$=CHR, wherein R is an alkyl radical with 2–8 carbon atoms, and (3) a mixture of (1) and (2), said copolymer having a comonomer content from 1 to 10% by weight, and an isotactic index, in boiling n-heptane, higher than 80;

B) 1–20 parts by weight of a copolymer fraction wherein the copolymer is selected from the group consisting of (1) ethylene and propylene, (2) ethylene, propylene, and an alpha-olefin as defined in (A)(2), and (3) ethylene and an alpha-olefin as defined in (A)(2), which copolymer fraction is insoluble in xylene at ambient temperature and has an ethylene content equal to or greater than 80% by weight;

C) 50–80 parts by weight of an ethylene copolymer fraction wherein the copolymer is selected from the group consisting of (1) ethylene and propylene, (2) ethylene, propylene, and an alpha-olefin as defined in (A)(2), and (3) ethylene and an alpha-olefin as defined in (A)(2), said copolymer fraction being soluble in xylene at ambient temperature, and having an intrinsic viscosity in tetrahydronaphthalene at 135° C. ranging from 1 to 1.4 dl/g

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**5,744,087**

**MEDICAL ARTICLES AND METHOD THEREFOR**

**Joel L. Williams, Cary, N.C., and Hugh T. Conway, Verona, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.**

**Filed Sep. 26, 1994, Ser. No. 311,985**

**Int. Cl.[6] B28B** *3/06;5/00*

**U.S. Cl. 264—297.2** **5 Claims**

1. A method for preparing a medical article comprising:

a) depositing a nonthermoplastic polymer selected from the group consisting of a crosslinked polymer and a non-crosslinked polyolefin having a weight average molecular weight of 1,000,000 or more into a mold of a continuous compression molding apparatus;

b) applying heat and pressure to said nonthermoplastic polymer in the mold whereby an article having the shape of the mold is formed in the mold; and

c) removing said article from the mold.

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**5,744,088**

**METHOD AND APPARATUS FOR MANUFCTURING HOLLOW OBJECTS, IN PARTICULAR PLASTIC PREFORMS**

**Dirk De Cuyper, Dendermonsesteenweg, Belgium, assignor to Simeco, Engi, Switzerland**

**PCT No. PCT/BE94/00007, § 371 Date Jul. 19, 1995, § 102(e) Date Jul. 19, 1995, PCT Pub. No. WO94/16871, PCT Pub. Date Aug. 4, 1994**

**PCT Filed Jan. 20, 1994, Ser. No. 495,611**

**Claims priority, application Belgium, Jan. 20, 1993, 9300055**

**Int. Cl.[6] B29C** *45/00;45/40*

**U.S. Cl. 264—297.2** **9 Claims**

1. Method for manufacturing hollow plastic preforms for subsequent processing to plastic objects, comprising injecting raw material for manufacturing said preforms (**50**) into a mould (**30**) which has a cavity side (**32**) and a corresponding mandrel side (**13**), between which sides the preforms (**50**) are formed, opening the mould at its cavity side and mandrel side, transferring the preforms to mandrels (**31**) at the mandrel side, moving a first gripper element (**41**) having a set of accommodation elements (**16**) thereon by a drive unit (**21**) in a preset direction of movement between a deflected, disconnected position (B), in which said first gripper element (**41**) is not active, and a working position (C) at which said accommodation elements (**16**) are directed towards the mandrel side of the mould, transferring the preforms (**50**) to said accommodation elements of the first gripper element (**41**) by suction means (**60**), each preform being accommodated in a corresponding accommodation element (**16**), moving at least one second gripper elements (**42**) by a second drive unit (**22**), between said disconnected position (B) and said working position (C) at the mandrel side (**33**) of the mould (**30**), and synchronizing the movements of said first and said at least one second gripper elements (**41**, **42**) with each other to receive and discharge the formed preforms in succession.

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**5,744,089**

**METHOD AND APPARATUS FOR THE IN-LINE IMPREGNATION OF FIBERS WITH A NON-AQUEOUS CHEMICAL TREATMENT**

**Andrew Woodside; Margaret Woodside, both of Pickerington; David Shipp, Newark, and Frank J. Macdonald, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Technology Inc., Summit, Ill.**

**Continuation of Ser. No. 487,948, Jun. 7, 1995, abandoned. This application Jun. 10, 1997, Ser. No. 872,232**

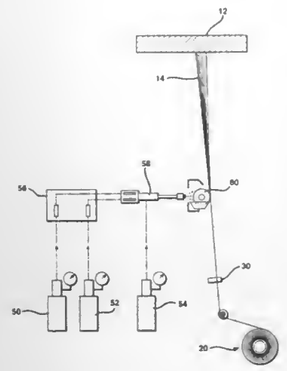
**Int. Cl.[6] B29C** *47/88*

**U.S. Cl. 264—211.14** **10 Claims**

1. A process for the in-line pre-impregnation of glass or synthetic fibers with a non-aqueous chemical treatment, comprising the steps of:

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(a) drawing fibers from a heated bushing;
(b) supplying a curable, non-aqueous chemical treatment agent to a formulator;
(c) supplying a curing agent to the formulator;
(d) metering at a selected ratio the non-aqueous chemical treatment agent and the curing agent as a mixture from the formulator to a spray gun;
(e) spraying the mixture from the spray gun onto an applicator roll while contacting the applicator roll with the fibers; and
(f) gathering the fibers using a gathering device.

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**5,744,090**

**PROCESS FOR THE MANUFACTURE OF CONDUCTIVE FIBERS USABLE IN ELECTROSTATIC CLEANING DEVICES**

**Lewis O. Jones; Joseph A. Swift, both of Ontario, and Ronald F. Ziolo, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jan. 13, 1997, Ser. No. 781,304**
**Int. Cl.[6] D01F *1/09***
**U.S. Cl. 264—427** **13 Claims**

1. A method of making a conductive fiber, comprising forming a fiber shape from a mixture comprising at least one fiber forming material and conductive magnetic materials, applying a magnetic field to the fiber shape such that the conductive magnetic materials migrate toward a periphery of the fiber shape, and after applying the magnetic field, solidifying the fiber shape to obtain the conductive fiber.

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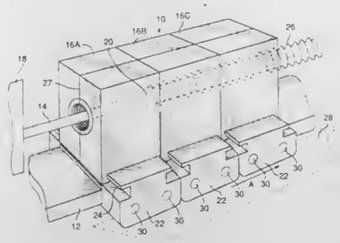
**5,744,091**

**APPARATUS FOR MAKING ANNULARLY RIBBED PLASTIC PIPE AND METHOD OF MAKING SUCH PIPE**

**Manfred A. A. Lupke, 92 Elgin Street, Thornhill, Ontario, Canada, L3T 1W6**

**PCT No. PCT/CA93/00552, § 371 Date Jun. 19, 1996, § 102(e) Date Jun. 19, 1996, PCT Pub. No. WO95/17295, PCT Pub. Date Jun. 29, 1995**
**PCT Filed Dec. 20, 1993, Ser. No. 666,385**
**Int. Cl.[6] B29C *49/04***
**U.S. Cl. 264—508** **8 Claims**

1. Apparatus for forming thermoplastic pipe having a profiled surface, said apparatus comprising a nozzle having an extrusion orifice feeding extrudate in a downstream direction to a mold path having a longitudinal axis extending from said nozzle, first and second mold blocks on said mold path which are closable to form the pipe and which are openable to release the pipe, the first mold block being in an upstream position relative to the second mold block, the mold blocks being moved together with one another and with the pipe in the downstream direction when the mold blocks are closed, and the mold blocks being opened and sequentially moved in an upstream direction along an axis contiguous with the axis of the mold path while the extrudate continues to move in the downstream direction with the first mold block being moved in the upstream direction before the second mold block such that the mold blocks never pass one another on the mold path and the mold blocks then being reclosed around the extrudate at a position to maintain consistency of the profile of the pipe.



8. A method of forming thermoplastic pipe having a profiled surface, said method comprising feeding an extrudate in a downstream direction from an extruder nozzle to a mold path having a longitudinal axis extending from the nozzle with first and second mold blocks being located on the mold path, the mold blocks being closable around the extrudate to form the pipe and being openable to release the pipe, the first mold block being in an upstream position relative to the second mold block, moving the mold blocks together with one another and with the extrudate in the downstream direction when the mold blocks are closed, opening and sequentially moving the mold blocks in an upstream direction along an axis contiguous with the axis of the mold path while the extrudate continues to move in the downstream direction, the first mold block being moved in the upstream direction before the second mold block such that the mold blocks never pass one another on the mold path, and then reclosing the mold blocks around the extrudate at a position to maintain consistency of the profiled surface of the pipe.

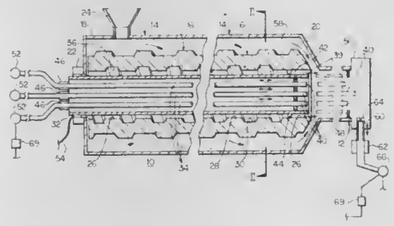
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**5,744,092**

**AXIALLY MOVABLE CLUSTER CONDUITS FOR PLASTIC PROCESSING IN A SCREW MACHINE**

**Donald N. Halgren, 35 Central St., and Desider G. Csongor, 19 Bennett St., both of Manchester, Mass. 01944**

**Continuation-in-part of Ser. No. 511,055, Aug. 3, 1995, Pat. No. 5,670,112, and a continuation-in-part of Ser. No. 393,200, Feb. 23, 1995, abandoned. This application Dec. 30, 1996, Ser. No. 773,875**
**Int. Cl.[6] B29C *45/00***
**U.S. Cl. 264—572** **3 Claims**



1. A method of injecting a plastic into a mold for the manufacture of a plastic part therefrom, comprising the steps of:
providing an elongated rotatable screw shaft within an elongated barrel housing;
arranging a longitudinally directed bore through said elongated screw shaft from a proximal location therein, to a distal tip end thereof;



providing at least one longitudinally movable delivery conduit in said bore of said screw shaft, said delivery conduit being longitudinally movable with respect to said screw shaft, so as to permit a medium to be directed through said delivery conduit in said screw shaft to or from said proximal location in said screw shaft into or from the plastic downstream of said distal end of said screw shaft;
supplying a medium to said proximal location of said conduit to permit said medium to be delivered by said conduit in said screw shaft and into said plastic at said distal end of said screw shaft, said medium being supplied to or withdrawn from said conduit being selected from the group consisting of: a vapor, a cooling gas, a heated gas, a liquid, a solid material, a plastic material, a powder material, a reinforcing fiber, an electrical conductor, and an electrical resistor;
introducing said plastic between the barrel housing and said screw shaft;
rotating said screw shaft to plasticate said plastic and injecting said plasticated plastic into said mold;
moving said delivery conduit longitudinally with respect to said screw shaft; and
directing at least one of said mediums through said delivery conduit to permit controlled delivery and/or withdrawal of one or more of said mediums therethrough to allow said infected plastic to be treated by at least one of said mediums.

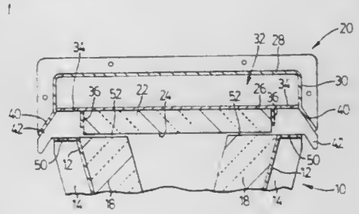
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**5,744,093**

**COVER FOR LAUNDERS**

**John Albert Davis, King, Canada, assignor to Desom Environmental Systems Limited, Ontario, Canada**

**Filed Jul. 9, 1996, Ser. No. 677,415**
**Int. Cl.[6] C21B *7/14***
**U.S. Cl. 266—45** **19 Claims**



1. For use with an open-topped vessel adapted to contain molten metal, a cover comprising,
a heat-insulative layer sized and adapted to span the open top of the vessel,
spacer means for maintaining a gap of substantially uniform width between said heat-insulative layer and the open top of the vessel,
housing means associated with said layer and defining an evacuation plenum,
connection means forming part of said housing means and adapted to allow an exhaust device to exhaust gaseous materials from said evacuation plenum,
air-guide means adapted for location adjacent said gap, and adapted to direct outside air into said evacuation plenum such that the path taken by the outside air is intersected by any gaseous materials exiting through said gap, thus entraining such gaseous materials into the evacuation plenum, and
expulsion means comprising at least one burner which delivers hot products of combustion to the vessel below the heat insulative layer, thus adding heat energy to the contents of the vessel while raising the pressure therein, thereby promoting the expulsion of said gaseous materials through said gap.

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**5,744,094**

**TREATMENT OF MATERIAL**

**Helge Bakketun Castberg, Kolbotn, Norway; Karin Bergmann, Willingham, United Kingdom; Peter John Hyde, Cowlinge, United Kingdom; Karen Margaret Montgomery Ness, Glasgow, United Kingdom, and Christopher John Stanley, St. Ives, United Kingdom, assignors to Elopak Systems AG, Glattbrugg, Switzerland**

**PCT No. PCT/GB92/00671, § 371 Date Feb. 24, 1994, § 102(e) Date Feb. 24, 1994, PCT Pub. No. WO92/18170, PCT Pub. Date Oct. 29, 1992**
**PCT Filed Apr. 13, 1992, Ser. No. 122,599**
**Claims priority, application United Kingdom, Apr. 12, 1991, 9107751**
**Int. Cl.[6] A61L *2/10;2/16***
**U.S. Cl. 422—24** **43 Claims**

1. A method of sterilizing a solid surface, comprising providing a continuous solid surface, and irradiating said surface with laser UV of a wavelength which is bactericidal and producing a power density of laser UV at said surface such that the laser UV does not deleteriously melt said solid surface and yet renders microorganisms thereat non-viable.

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**5,744,095**

**MEDICAL ASSAY CASSETTE**

**Henry J. Smith, 38 Landing, Laguna Niguel, Calif. 92651**

**Filed Nov. 14, 1995, Ser. No. 557,336**
**Int. Cl.[6] G01N *1/00;33/543;* A61J *1/05***
**U.S. Cl. 422—58** **10 Claims**

1. A cassette for assaying a human condition comprising a casing defining a cavity within said cassette, a viewing aperture disposed in said casing and extending to said cavity for viewing an indication of said human condition of a human, a blood well disposed in said casing and extending to said cavity for receiving human blood to be assayed, an assay membrane disposed in said cavity for absorbing said human blood through the blood well and providing said indication, said human blood diffuses from said blood well through said assay membrane towards said viewing aperture, wherein improvement comprises,
a needle for puncturing said human to draw said human blood, said needle disposed in said cavity and extending outwardly through said casing of said cassette, said needle having a base end secured within said casing and having a needle end extending outwardly from said casing of said cassette for puncturing said human, and
a covering means mounted onto said cassette, said covering means having a first cover position for exposing said needle end while covering said viewing aperture and a second cover position for covering said needle end while exposing said viewing aperture.

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**5,744,096**

**AUTOMATED IMMUNOASSAY CASSETTE**

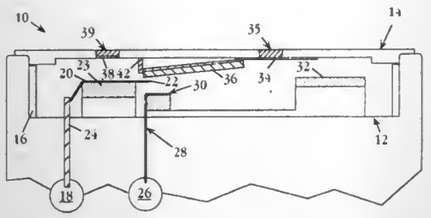
**Ronald M. Jones, Mountain View; Eric G. Barr, Fremont, and Gary E. Hewett, San Leandro, all of Calif., assignors to Cholestech Corporation, Hayward, Calif.**

**Filed Feb. 21, 1997, Ser. No. 803,677**
**Int. Cl.[6] G01N *35/10***
**U.S. Cl. 422—58** **12 Claims**

1. An immunoassay cassette for use in detecting an analyte in a body-fluid sample, comprising
(a) a base;
(b) a reagent support;
(c) means for mounting said support on said base for relative movement with respect thereto from an initial at-rest position, to first and second operational positions.

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said base having (i) a sample well for containing said sample, (ii) a sample-transfer strip for transferring sample in the sample well to a sample-transfer position, (iii) a wash reservoir for containing a wash solution, (iv) a wash-transfer strip for transferring wash solution in the wash reservoir to a wash-transfer position, and (v) a takeup pad for imbibing wash solution;

said reagent support having (i) an analyte detection zone, and (ii) a reaction strip, comprising capillary means for transferring said body fluid sample from the sample-transfer position to the detection zone, when the reagent support is moved to its first operational position, and for transferring wash solution from the wash-transfer position to the detection zone, when the reagent support is moved to its second operational position,

said takeup pad being effective to imbibe liquid from said detection zone when the reagent support is moved to its second operational position; and

(d) reagent means for producing a detectable, analyte-dependent reaction product at said detection zone, said reagent means being disposed in a fluid pathway defined by said sample-transfer strip, reaction strip, and detection zone.

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**5,744,097**

**DNA BASE SEQUENCER**

**Hiroaki Machida; Yuusuke Miyazaki, both of Saitama-ken; Shinichi Takagi, Kounosu, and Yoshinori Mishina, Saitama-ken, all of Japan, assignors to Hitachi Electronics Engineering, Co., Ltd., Tokyo, Japan**

**Filed Mar. 26, 1996, Ser. No. 621,888**

**Claims priority, application Japan, Mar. 27, 1995, 7-093043; Feb. 23, 1996, 8-061904**

**Int. Cl.[6] G01N** *15/06;33/00;* **C12M** *1/00;* **C12N** *15/00*

**U.S. Cl. 422—68.1** **13 Claims**

1. In a DNA base sequencer including an electrophoresis plate having a gel electrolyte layer held between two glass plates, one of which is partially cut away on a top edge thereof in the direction of width, an assay compartment for accommodating said electrophoresis plate in a vertical position, a lower reservoir of a buffer solution in which a lower part of the gel electrolyte layer in the electrophoresis plate is to be immersed, an upper reservoir of a buffer solution in which an upper part of said gel electrolyte layer is to be immersed, photoexciting laser light applying means by which laser light is emitted from the electrophoresis plate in such a way that the laser light crosses the electrophoresis lanes in said plate at right angles thereto, and fluorescence detecting means by which the fluorescence emitted from a DNA fragment illuminated with the laser light is picked up and converted to an electric signal, the improvement comprising a shark's tooth comb made of a water-swellable paper is inserted from the top edge of said electrophoresis plate into the space between the two glass plates, either the top or bottom edge of said shark's tooth comb being provided with a plurality of teeth which are each tapered from the root toward the tip.

**5,744,098**

**DEVICE FOR THE AUTOMATIC EXAMINATION OF BLOOD SAMPLES**

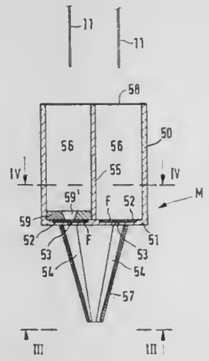
**Michael Kratzer, Munich, and Volker Freiherr von der Goltz, Seeon, both of Germany, assignors to Dade International Inc., Deerfield, Ill.**

**Division of Ser. No. 889,329, May 28, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 460,352**

**Claims priority, application Germany, May 28, 1991, 41 17 482.8; Mar. 26, 1992, 42 09 871.8**

**Int. Cl.[6] G01N** *33/48*

**U.S. Cl. 422—73** **11 Claims**




1. A measuring unit for use in a device for the automatic examination of blood samples comprising:

a blood sampling vessel having a base wall, at least one separating wall dividing the vessel into at least two chambers;

each chamber having an outlet located on the base wall of the vessel a capillary associated with each outlet and positioned adjacent the base wall, and a filter unit associated with each outlet and located adjacent to the base wall;

each filter unit having at least one aperture in communication with its associated outlet; and

each capillary being in communication with its associated outlet;

wherein the measuring unit is formed as a disposable unit.

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**5,744,099**

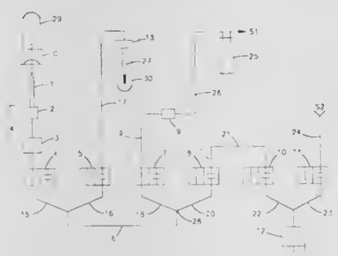
**APPARATUS FOR TRANSFER OF BIOLOGICAL FLUIDS**

**Eric S. Chase, Walnut Creek, and Harvey L. Schulte, Los Altos, both of Calif., assignors to Cytek Development Inc., Fremont, Calif.**

**Filed Sep. 15, 1995, Ser. No. 528,847**

**Int. Cl.[6] G01N** *35/10*

**U.S. Cl. 422—82** **19 Claims**



1. An apparatus for undiluted aspirating and dispensing of liquids, comprising:



a conduit system including an aspiration path and a dispense path, said aspiration path including a portion of said dispense path;

means for cleaning and drying said aspiration and dispense paths prior to aspiration of said liquid;

aspirating means for undiluted aspirating said liquid from a sample vessel into and along said aspiration path including said dispense path portion of said aspiration path, said paths being cleaned and dried prior to said aspiration of said liquid;

dispensing means for undiluted dispensing said liquid along and out of said portion of said dispense path and into at least one receiving vessel; and

gaseous pushing means intersecting said dispense path at one end thereof and for generating a gaseous interface at said dispense end and pushing said liquid in front of said gaseous interface along and out of said dispense path and into said at least one receiving vessel.

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**5,744,100**

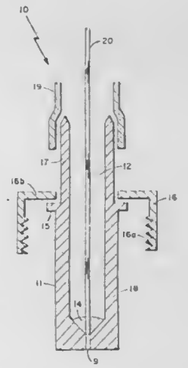
**CONNECTORIZED CAPILLARIES FOR USE WITH SEPARATION INSTRUMENTATION COMPONENTS**

**Srdjan Krstanovic, Windham, N.H., assignor to Orion Research, Inc., Beverly, Mass.**

**Continuation of Ser. No. 346,341, Nov. 29, 1994, Pat. No. 5,494,641, which is a continuation of Ser. No. 31,007, Mar. 12, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 466,360**

**Int. Cl.[6] B01L** *11/00*

**U.S. Cl. 422—103** **38 Claims**




26. A device for interconnecting capillary tubes used in a separation instrument comprising:

a connectorized capillary consisting of:

a body, having an internal cavity, the cavity running in parallel with a major axis of the body and tapering to a body end portion, the cavity having a capillary tube fastened therein, and the cavity having an outlet opening located in the tapered body end portion;

a receptacle, for accepting the body; and

a fastener located peripherally about the body, for fastening the tapered body end portion to the receptacle;

wherein the receptacle comprises a flow cell for performing separation instrumentation functions.

**5,744,101**

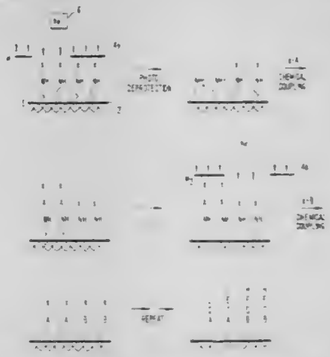
**PHOTOLABILE NUCLEOSIDE PROTECTING GROUPS**

**Stephen P. A. Fodor, Palo Alto; Lubert Stryer, Stanford; James L. Winkler, Palo Alto; Christopher P. Holmes, Sunnyvale, and Dennis W. Solas, San Francisco, all of Calif., assignors to Affymax Technologies N.V., United Kingdom**

**Division of Ser. No. 624,120, Dec. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 492,462, Mar. 7, 1990, Pat. No. 5,143,854, which is a continuation-in-part of Ser. No. 362,901, Jun. 7, 1989, abandoned. This application Feb. 14, 1995, Ser. No. 388,321**

**Int. Cl.[6] C08F** *2/46;* **C12Q** *1/68*

**U.S. Cl. 422—131** **11 Claims**



1. A reactor system for synthesizing a plurality of polymer sequences on a substrate comprising:

a flow cell;

a substrate mounted on said flow cell forming a cavity between said substrate and said flow cell;

a system for delivering selected monomer containing reaction fluids to said cavity;

a mask;

a translation stage for moving said mask or said substrate from a first relative location to a second relative location;

an energy source for directing energy through said mask, at selected regions of said substrate at selected times; and

an appropriately programmed digital computer for selectively directing a flow of reaction fluids into said cavity, selectively activating said translation stage and selectively illuminating said substrate so as to form a plurality of diverse, known polymer sequences on said substrate at predetermined locations.

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**5,744,102**

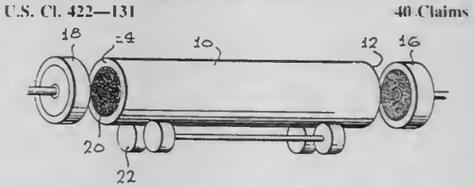
**SOLID PHASE SYNTHESIZER**

**James Scott Eadie, San Diego, Calif., assignor to Chugai Biopharmaceuticals, Inc., San Diego, Calif.**

**Filed Jan. 30, 1996, Ser. No. 593,631**

**Int. Cl.[6] C08F** *2/00*

**U.S. Cl. 422—131** **40 Claims**




1. A solid phase synthesizer, comprising:

a generally horizontal and generally cylindrical elongated vessel for holding a solid support and liquid having two ends, each end having a porous blocker to prevent the solid support from leaving said vessel but allowing passage of the liquid from said vessel.

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a particulate solid support held within said vessel, having a size sufficient to prevent passage of said support through said blocker, and

a liquid reagent with components sufficient for synthesis of a polymer selected from the group consisting of DNA, RNA, proteins, oligonucleotides, carbohydrates, and peptides, on said particulate solid support.

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**5,744,103**

## HYDROCARBON ADSORBENT FOR EXHAUST GAS CLEANING, EXHAUST GAS CLEANING CATALYST AND EXHAUST GAS CLEANING DEVICE

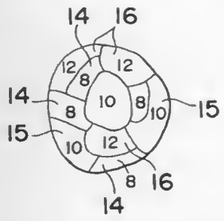
**Hiroshi Yamada, Hatsukaichi; Toshitsugu Ueoka; Akihide Takami, both of Hiroshima, and Naoko Sakatani, Hiroshima-ken, all of Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan**

**Filed Sep. 29, 1994, Ser. No. 314,251**

**Claims priority, application Japan, Sep. 30, 1993, 5-245073; Aug. 19, 1994, 6-195447**

**Int. Cl.[6] B01D** *50/00;* **B01J** *29/06*

**U.S. Cl. 422—171** **17 Claims**




1. An adsorbent component in the form of layered silicate powder for the absorption of a hydrocarbon comprising a plurality of particles with each of said particles having at least two metal containing crystalline silicate layers wherein each layer has a different pore diameter and an outer silicate layer has a larger pore diameter relative to an inner silicate layer.

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**5,744,104**

## ELECTRICALLY HEATED CATALYTIC CONVERTER FOR AN ENGINE

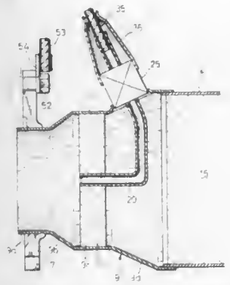
**Kazuhiro Sakurai, Gotenba; Koji Shimoji, Susono; Tohru Yoshinaga, and Kiyohiko Watanabe, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan**

**Filed Feb. 22, 1995, Ser. No. 392,306**

**Claims priority, application Japan, Feb. 25, 1994, 6-028550**

**Int. Cl.[6] F01N** *3/10*

**U.S. Cl. 422—174** **9 Claims**



1. An electrically heated catalytic converter for an engine comprising:

a catalyst;

a substrate coated with said catalyst;

a cylindrical casing connected to an exhaust gas passage of an engine, and accommodating said substrate therein;

an electric heater disposed in said casing for heating said substrate;

a rod electrode having a first end and a second end, said first end of the rod electrode being connected to said electric heater, said rod electrode extending from said electric heater and penetrating a wall of said casing disposed adjacent to said second end of said rod electrode, wherein, at least a portion of said rod electrode including said second end is formed as a hollow pipe having a hollow space therein and wherein an intermediate part of the hollow pipe portion extending within said casing is squeezed so that opposite sides of the hollow pipe portion are brought into contact with one another to seal the hollow space inside the intermediate part and wherein the squeezed part of the hollow pipe portion is separated from the first and second ends of the rod electrode; and

an electric supply cable inserted and fit into said hollow pipe portion of the rod electrode at said second end thereof.

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**5,744,105**

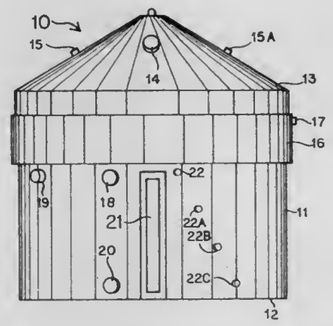
## SLURRY REACTOR

**Keith Stormo, Moscow, Id., assignor to Innovative BioSystems, Inc., Moscow, Id.**

**Continuation of Ser. No. 426,566, Apr. 21, 1995, Pat. No. 5,616,304. This application Sep. 3, 1996, Ser. No. 708,120**

**Int. Cl.[6] B01F** *13/02;7/20;* **C12M** *1/06*

**U.S. Cl. 422—227** **28 Claims**




1. A stirrer blade for a bioslurry reactor and for connection to a fluid source, said stirrer blade comprising:

a first end and a second end;

a leading side and a dissimilar trailing side;

a hollow space and a fluid inlet to the hollow space near the blade first end for connection with a fluid source;

the stirrer blade leading side having a fluid outlet opening from the hollow space; and

said stirrer blade being without mechanical drive means.

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**5,744,106**

## HEATED SCENT DISPENSER

**Richard E. Eagle, 2068 Carleton Rockwood Rd., Carleton, Mich. 48117**

**Filed Oct. 15, 1996, Ser. No. 730,152**

**Int. Cl.[6] A61L** *9/03;* **A01M** *31/00*

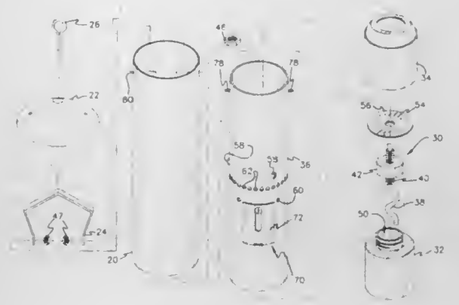
**U.S. Cl. 422—306** **1 Claim**

1. A heated scent dispenser for heating aromatic liquids and solids comprising:

A vertically disposed inner housing having a top end, a bottom end and a substantially hollow interior for containing a fluid reservoir, a burner assembly, and a fuel tank attached to the bottom thereto;

said fuel tank being attached to said bottom end of said inner housing and being capable of containing a quantity of fuel;






said burner being disposed above and axially aligned with said fuel tank, the burner capable of igniting said fuel to supply heat to said reservoir;

a first baffle disposed below said burner to control air flow into said inner housing to insure constant flame;

the fluid reservoir being disposed above and axially aligned with said fuel tank and said burner;

a dome top to prevent ambient weather conditions from interfering with dispensing of said scent;

and an outer housing for containing said inner housing, said outer housing removably attached to said inner housing and spaced therefrom to allow said fumes to be exhausted from said scent dispenser.

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**5,744,107**

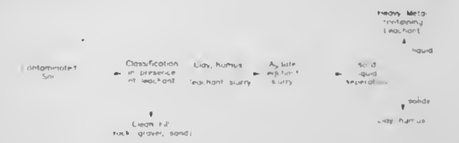
## PROCESS FOR REMOVING HEAVY METALS FROM SOIL

**William E. Fristad; Michael J. Virnig, both of Santa Rosa, and Jonathan M. Cassel, Half Moon Bay, all of Calif., assignors to Henkel Corporation, Plymouth Meeting, Pa.**

**Continuation-in-part of Ser. No. 930,638, Aug. 17, 1992, Pat. No. 5,494,649, which is a continuation-in-part of Ser. No. 771,286, Oct. 3, 1991, abandoned. This application Dec. 16, 1994, Ser. No. 359,245**

**Int. Cl.[6] C22B** *13/00;43/00*

**U.S. Cl. 423—1** **22 Claims**




1. A process for removing heavy metals from contaminated soil which comprises mixing said soil and a liquid leachant composition which is an aqueous solution of (i) a strong acid selected from the group consisting of hydrochloric acid and sulfuric acid in a concentration of about 0.01M to about 1.0 molar the anion of which forms a water-soluble salt with said heavy metals and (ii) from about 1 to about 20% by weight of an alkali metal, alkaline earth metal, or an ammonium, salt having one or more anions which form water-soluble salts with said heavy metals, in such a manner as to disperse at least part of said soil in the leachant to form a liquid phase containing dispersed soil solids and for a period of time sufficient to transfer at least a portion of the heavy metals from the dispersed solids to a soluble species in the liquid phase.

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**5,744,108**

## PROCESS FOR THE THERMAL TREATMENT OF TITANIUM DIOXIDE IN A CIRCULATING FLUIDIZED BED AND THE USE THEREOF

**Bernd-Michael Holle; Eckhard Bayer, both of Krefeld, and Jörg Krekel, Essen, all of Germany, assignors to Bayer AG, Leverkusen, Germany**

**Filed Jan. 2, 1997, Ser. No. 778,873**

**Claims priority, application Germany, Jan. 15, 1996, 196 01 143.4**

**Int. Cl.[6] C01G** *23/00;23/047*

**U.S. Cl. 423—74** **24 Claims**



1. A process for the production of titanium dioxide pigments comprising the following steps:

a) adding titanium raw materials to sulphuric acid to form a decomposing solution;

b) hydrolyzing the decomposing solution;

c) filtering the decomposing solution to obtain a solid filter product;

d) washing the solid filter product to obtain a titanium dioxide hydrolyzate;

e) adding rutile nuclei and doping chemicals to the titanium dioxide hydrolyzate to form a calcining mixture;

f) agglomerating the calcining mixture into particle sizes of an average diameter of from 0.02 to 10 mm;

g) thermally treating the agglomerated calcining mixture in a heated apparatus, wherein the agglomerated calcining mixture is stirred up by a flow of gas directed from below upwards in such a way that a gas-solids mixture is formed, and the gas-solids mixture flows from below upwards through the apparatus and, in a second apparatus connected in series, is separated into gaseous and solid components with the solids being returned to the heated apparatus, and the product is removed from the lower part of the heated apparatus.

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**5,744,109**

## CONTINUOUS PROCEDURE FOR THE SIMULTANEOUS COLLECTION AND PRECIPITATION OF MERCURY IN GASES CONTAINING IT

**Fernando Sitges Menendez, Salinas-Castrillon; Francisco Alvarez Tamargo, Luanco; Francisco Tamargo Garcia, Salinas-Castrillon; Matias Rodriguez Valcarcel, Piedras Blancas-Castrillon, and Cavodonga Muruzabal Sitges, Salinas-Castrillon, all of Spain, assignors to Asturiana de Zinc, S.A., Asturias, Spain**

**Continuation of Ser. No. 548,140, Oct. 25, 1995, abandoned. This application Mar. 13, 1996, Ser. No. 614,540**

**Claims priority, application Spain, Oct. 26, 1994, 9402221**

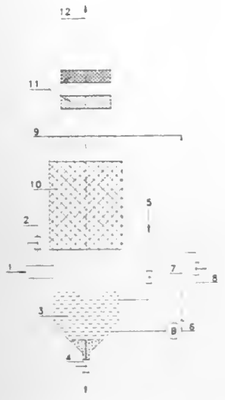
**Int. Cl.[6] B01D** *53/64*

**U.S. Cl. 423—210** **6 Claims**

1. Continuous procedure for the simultaneous collection and precipitation of mercury from gasses containing it and regenerating

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precipitation reagent, in a single stage, comprising contacting said gases, in a single stage washing tower, with a solution containing a thiocyonate complex of Hg (II) in acid medium, and simultaneously injecting gaseous hydrogen sulfide in said washing tower to precipitate mercuric sulfide and regenerate the Hg (II) complex in condition for immediate use in said single stage.

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**5,744,110**

**METHOD FOR THE REMOVAL OF CARBON DIOXIDE FROM COMBUSTION EXHAUST GAS**

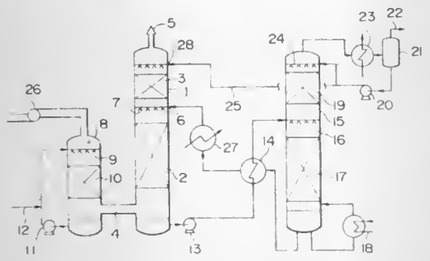
**Tomio Mimura; Shigeru Shimojo, both of Osaka; Masaki Iijima, Tokyo, and Shigeaki Mitsuoka, Hiroshima, all of Japan, assignors to The Kansai Electric Power Co., Inc., Osaka, and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of Japan**

**Continuation of Ser. No. 399,551, Mar. 7, 1995, abandoned. This application Aug. 21, 1996, Ser. No. 701,069**

**Claims priority, application Japan, Mar. 9, 1994, 6-038267; Oct. 6, 1994, 6-242914**

**Int. Cl.[6] B01D** *53/62*

**U.S. Cl. 423—226** **4 Claims**



1. A method for the removal of $CO_2$ present in combustion exhaust gas containing oxygen gas which comprises bringing combustion exhaust gas at atmospheric pressure into contact with a mixed aqueous solution containing, as an absorbent, 100 parts by weight of potassium dimethylaminoacetate (X) per 1 to 25 parts by weight of piperazine (Y), the concentration of the potassium dimethylaminoacetate (X) in the mixed aqueous solution being in the range of 15 to 65% by weight, and said solution having a saturated absorption value of $CO_2$ above 41 $Nm^3/m^3$, an initial degree of $CO_2$ absorption above 87% and an average amount of heat required for regeneration of the absorbent below 12 kcal/mol, send average being taken over measurements at every 0.10 interval in the range from 0 to 1.10 of the molar ratio of $CO_2$ to absorbent at testing temperatures ranging from 20° C. to 80° C.

**5,744,111**

**METHOD FOR CLEANING EXHAUST GAS**

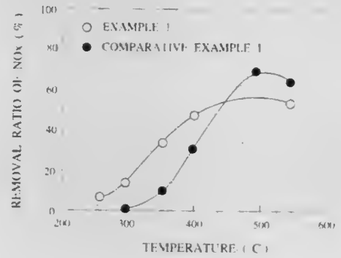
**Gyo Muramatsu; Kazuhiko Ogiwara; Kiyohide Yoshida; Akira Abe; Naoko Irite; Shoji Mochida, and Katsuji Onai, all of Kumagaya, Japan, assignors to Kabushiki Kaisha Riken, Tokyo, Japan**

**Continuation of Ser. No. 336,908, Nov. 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 84,983, Jul. 2, 1993, abandoned. This application Sep. 3, 1996, Ser. No. 718,009**

**Claims priority, application Japan, Jul. 3, 1992, 4-200638; Oct. 5, 1992, 4-290760; Oct. 15, 1992, 4-302840; Oct. 15, 1992, 4-302899; Oct. 15, 1992, 4-302981; Oct. 23, 1992, 4-309433; Nov. 13, 1992, 4-328895; Nov. 20, 1992, 4-335478; Nov. 24, 1992, 4-336583; Dec. 15, 1992, 4-358348; Dec. 25, 1992, 4-358235; Dec. 25, 1992, 4-358316; Jan. 13, 1993, 5-020566; Dec. 24, 1993, 5-347506**

**Int. Cl.[6] C01B** *21/00*

**U.S. Cl. 423—235** **4 Claims**




1. A method of cleaning an exhaust gas containing nitrogen oxides and oxygen in an amount larger than its stoichiometric amount relative to unburned components in said exhaust gas, which comprises

(a) disposing an exhaust gas cleaner in a flow path of said exhaust gas, said exhaust gas cleaner consisting essentially of a first catalyst disposed on an exhaust gas inlet side of the exhaust gas cleaner, a second catalyst disposed on an exhaust gas outlet side of the exhaust gas cleaner, and optionally a cleaner substrate for supporting said first catalyst and said second catalyst,

wherein said first catalyst consists essentially of 0.2–20 weight % on a metal basis of a first catalytically active component supported by a porous inorganic oxide body and consisting essentially of Ag or an oxide thereof and at least one element selected from the group consisting of Sn, Al, Ga and In; and

wherein said second catalyst consists essentially of a second catalytically active component supported by a porous inorganic oxide body and consisting essentially of 0.1–15 weight % on a metal basis of Cu and 4 weight % on a metal basis or less of at least one element selected from the group consisting of alkali metal elements and rare earth elements; all of said percentages being based on the amount of said porous inorganic oxide body;

(b) introducing a reducing agent selected from the group consisting of hydrocarbons and oxygen-containing organic compounds into said exhaust gas on an upstream side of said exhaust gas cleaner; and

(c) bringing said exhaust gas into contact with said exhaust gas cleaner at a temperature of 200°–600° C., thereby removing said nitrogen oxides.



**5,744,112**

**METHOD FOR CLEANING EXHAUST GAS**

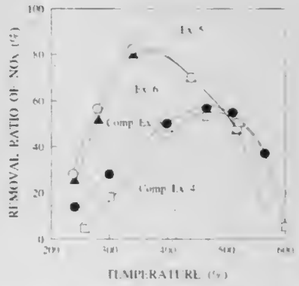
**Naoko Irite; Akira Abe, and Kiyohide Yoshida, all of Kumagaya, Japan, assignors to Kabushiki Kaisha Riken, Tokyo, Japan**

**Continuation of Ser. No. 378,258, Jan. 26, 1995, abandoned. This application May 13, 1996, Ser. No. 647,259**

**Claims priority, application Japan, Feb. 10, 1994, 6-037860; Feb. 10, 1994, 6-037876; Apr. 6, 1994, 6-092949; Apr. 6, 1994, 6-092962; May 24, 1994, 6-133586; May 24, 1994, 6-133602; Dec. 5, 1994, 6-329949; Dec. 5, 1994, 6-330018**

**Int. Cl.[6] C01C** *3/00*

**U.S. Cl. 423—236** **3 Claims**




1. A method for removing nitrogen oxides by reduction, and unburned components of carbon monoxide and hydrocarbons by oxidation, from an exhaust gas containing nitrogen oxides and oxygen in an amount larger than the stoichiometric amount of said oxygen relative to said unburned components in said exhaust gas, which comprises:

disposing an exhaust gas cleaner in a flow path of said exhaust gas, said exhaust gas cleaner consisting essentially of a first catalyst consisting essentially of a first porous inorganic oxide supporting 0.2–15 weight % of an Ag component, 0.01–10 weight % of a W component and 0.001–1 weight % of a Pt component, said weight percentages being expressed by metal basis, said Ag component being at least one selected from the group consisting of Ag and compounds thereof, said Pt component being at least one selected from the group consisting of Pt, Pd, Ru, Rh, and Ir, and said W component being at least one selected from the group consisting of W, V, Mn, Mo, Nb and Ta;

introducing into said exhaust gas upstream of said exhaust gas cleaner (1) at least one reducing agent selected from the group consisting of hydrocarbons and oxygen-containing organic compounds having at least two carbon atoms or (2) a fuel containing said at least one reducing agent; and

bringing the resulting exhaust gas containing said reducing agent into contact with said exhaust gas cleaner at 150°–650° C., thereby causing a reaction of said nitrogen oxides with said reducing agent to remove said nitrogen oxides by reduction and unburned components of carbon monoxide and hydrocarbons by oxidation from said exhaust gas.

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**5,744,113**

**PROCESS AND CATALYST FOR DECOMPOSING OXIDES OF NITROGEN**

**Erich Hums, Hessdorf, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Continuation of Ser. No. 539,844, Oct. 6, 1995, abandoned, which is a continuation-in-part of Ser. No. 250,280, May 27, 1994, abandoned. This application Jun. 16, 1997, Ser. No. 876,763**

**Claims priority, application Germany, May 27, 1993, 43 17 581.3**

**Int. Cl.[6] C01B** *21/00*

**U.S. Cl. 423—239.1** **25 Claims**

1. A method of decomposing oxides of nitrogen, which comprises contacting gases containing oxides of nitrogen with a catalyst comprising a catalytically active component which is an aluminum silicate having a three-sheet structure, and catalytically decomposing the oxides of nitrogen into nitrogen and oxygen substantially without a reducing agent.

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**5,744,114**

**METHOD OF PREPARING DENTIFRICE-COMPATIBLE SILICA PARTICULATES**

**Jacques Persello, Montluel, France, assignor to Rhone-Poulenc Chimie, Courbevoie Cedex, France**

**Continuation of Ser. No. 784,994, Oct. 30, 1991, abandoned, which is a division of Ser. No. 261,935, Oct. 25, 1988, abandoned. This application Jul. 16, 1996, Ser. No. 682,332**

**Claims priority, application France, Nov. 4, 1987, 87 15276**

**Int. Cl.[7] C01B** *33/12*

**U.S. Cl. 423—335** **22 Claims**

1. A process for the preparation of silica particulates adapted for formulation into dentifrice compositions, having a surface chemistry as to be at least 50% compatible with zinc values, and having a number of OH functions, expressed as OH/nm$^2$ of at most 15 and a zero charge point of from 3 to 6.5, the process comprising steps of reacting a silicate with an acid to form a suspension or gel of silica, separating silica particulates from said suspension or gel, first washing said silica particulates with water and then conducting an acid treatment by washing said silica particulates with an inorganic acid solution until said silica particulates have a pH≦7 followed by drying said silica particulates, the pH of the silica suspension or gel being adjusted to a value of at most 6 prior to the first washing step.

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**5,744,115**

**PREPARATION PROCESS OF HYDRAZINE HYDRATE**

**Yasuhisa Kuriyama; Nobuhiro Nagata, and Kiyoshi Yoshida, all of Yokkaichi, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan**

**Filed Jul. 19, 1996, Ser. No. 684,402**

**Claims priority, application Japan, Aug. 14, 1995, 7-207071**

**Int. Cl.[6] C01B** *21/16*

**U.S. Cl. 423—407** **19 Claims**

1. A process for preparing hydrazine hydrate which comprises hydrolyzing a ketazine in a distillation column in the presence of at least one member selected from the group consisting of (1) a nonionic surface active agent having a polyoxyethylene group in its molecule and (11) silicon dioxide, to obtain said hydrazine hydrate.

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**5,744,116**

**REACTION OF URANIUM FLUORIDES WITH MINERAL ACIDS TO RECOVER HYDROGEN FLUORIDE**

**Brian C. Olson, Cobourg; John H. Wang, Saskatoon, both of Canada; Dennis W. Prediger, Bassano, Italy; Marlo S. Savoie, and Dennis G. Garratt, both of Cobourg, Canada, assignors to Cameco Corporation, Port Hope, Canada**

**Filed Dec. 8, 1994, Ser. No. 354,161**

**Int. Cl.[6] C01B** *7/19*

**U.S. Cl. 423—483** **36 Claims**

1. A process for producing hydrogen fluoride, which process comprises (1) reacting a uranium fluoride compound with a strong mineral acid to form a reaction mixture comprising hydrogen fluoride and a uranium salt of the mineral acid and (11) recovering gaseous hydrogen fluoride from the reaction mixture.

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5,744,117

## FEED PROCESSING EMPLOYING DISPERSED MOLTEN DROPLETS

**Mark A. Wilkinson, Lexington, and Christopher J. Nagel, Wayland, both of Mass., assignors to Molten Metal Technology, Inc., Waltham, Mass.**

**Continuation-in-part of Ser. No. 46,693, Apr. 12, 1993, Pat. No. 5,395,405. This application Mar. 7, 1995, Ser. No. 399,825**

**Int. Cl.[6] A62D** *3/00*

**U.S. Cl. 423—563** **32 Claims**

1. A method for converting a gaseous organic component of an organic feed gas stream, wherein said organic component is essentially gaseous, to form a product in at least one phase, comprising the steps of:

a) forming a process zone, wherein the process zone includes a process molten bath and a process gas space disposed over the process molten bath;

b) dispersing molten droplets of said molten bath across the process gas space;

c) directing the feed gas stream directly into the process gas space of the process zone, wherein the gaseous organic component is exposed to said molten droplets; and

d) directing a co-reactant into the process molten bath, whereby the gaseous organic component reacts with the co-reactant to form a product in at least one phase.

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5,744,118

## METHOD FOR THE SYNTHESIS OF MIXED METAL OXIDE POWDERS

**Kunio Imamura, Tokyo, Japan; John F. DiGregorio, Los Lunas; Douglas M. Smith, Albuquerque, both of N. Mex.; Hirozumi Izawa, Chiba, and Tetsuhiko Yamaguchi, Kawasaki, both of Japan, assignors to Showa Denko K.K., Tokyo, Japan**

**Continuation-in-part of Ser. No. 282,509, Aug. 3, 1994. This application Mar. 28, 1995, Ser. No. 413,472**

**Int. Cl.[6] C01F** *1/00;* **C01G** *25/00;1/00*

**U.S. Cl. 423—593** **6 Claims**

1. A method for synthesis of a mixed metal oxide powder, said method comprising:

(a) combining a liquid absorbent resin with at least one solution containing at least two metallic salts, such that at least two metals are present in the liquid absorbent resin after said combining is completed;

(b) after said combining, swelling and gelling the liquid absorbent resin to form a swollen gel, wherein the liquid absorbent resin swells by absorbing said at least one solution;

(c) changing at least one of the pH and temperature of the swollen gel to form a precursor material;

(d) pyrolyzing the precursor material to form a pyrolyzed precursor material; and

(e) calcining the pyrolyzed precursor material to form a mixed metal oxide powder;

wherein the at least one solution containing at least two metallic salts is combined with the liquid absorbent resin at a salt/resin ratio of 1 or less.

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5,744,119

## PREPARATION OF A RADIOCONJUGATE FORMULATION

**Christopher Phillips, Brandamore, Pa., assignor to Sterling Winthrop, New York, N.Y.**

**Continuation of Ser. No. 60,349, May 11, 1993, abandoned. This application Nov. 21, 1994, Ser. No. 345,467**

**Int. Cl.[6] A61K** *51/08;51/10*

**U.S. Cl. 424—1.49** **14 Claims**

1. A method of labeling a protein conjugate comprising a targeting moiety covalently bonded to a terpyridine complexant moiety, with a metal radionuclide to form a radioconjugate comprising:

(a) providing the protein conjugate in an acetate buffer and

(b) adding a metal radionuclide to the protein conjugate so as to react the metal radionuclide; and

the protein conjugate.

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5,744,120

## TERNARY RADIOPHARMACEUTICAL COMPLEXES

**David Scott Edwards, Burlington, and Shuang Liu, Chelmsford, both of Mass., assignors to The DuPont Merick Pharmaceutical Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 218,861, Mar. 28, 1994, which is a continuation-in-part of Ser. No. 40,336, Mar. 30, 1993, abandoned. This application Apr. 3, 1995, Ser. No. 415,908**

**Int. Cl.[6] A61K** *51/00;* **A61M** *36/14*

**U.S. Cl. 424—1.64** **30 Claims**

1. A radiopharmaceutical of formula:

$$[(Q)_{d'}L_{n'}—C_h']_i—M_j(A_{l1})_x(A_{l2})_y \quad (1)$$

wherein:

Q is a biologically active molecule;

d' is 1 to 20;

$L_{n'}$ is a linking group of formula:

$$M^1—[Y^1(CR^{55}R^{56})_f(Z^1)_{f'}Y^2]_{f''}—M^2,$$

wherein:

$M^1$ is $—[(CH_2)_gZ^1]_{g'}—(CR^{55}R^{56})_{g''}—$;

$M^2$ is $—(CR^{55}R^{56})_{g''}—[Z^1(CH_2)_g]_{g'}—$;

g is independently 0–10;

g' is independently 0–1;

g" is independently 0–10;

f is independently 0–10;

f' is independently 0–1;

f" is independently 0–1;

$Y^1$ and $Y^2$, at each occurrence, are independently selected from: a bond, O, $NR^{56}$, C=O, C(=O)O, OC(=O)O, C(=O)NH—, C=$NR^{56}$, S, SO, $SO_2$, $SO_3$, NHC(=O), $(NH)_2C(=O)$, $(NH)_2C$=S;

$Z^1$ is independently selected at each occurrence from a $C_6$–$C_{14}$ saturated, partially saturated, or aromatic carbocyclic ring system, substituted with 0–4 $R^{57}$; and a heterocyclic ring system, optionally substituted with 0–4 $R^{57}$;

$R^{55}$ and $R^{56}$ are independently selected at each occurrence from: hydrogen; $C_1$–$C_{10}$ alkyl substituted with 0–5 $R^{57}$; alkaryl wherein the aryl is substituted with 0–5 $R^{57}$;

$R^{57}$ is independently selected at each occurrence from the group: hydrogen, OH, $NHR^{58}$, $C(=O)R^{58}$, $OC(=O)R^{58}$, $OC(=O)OR^{58}$, $C(=O)OR^{58}$, $C(=O)NR^{58}$—, C≡N, $SR^{58}$, $SOR^{58}$, $SO_2R^{58}$, $NHC(=O)R^{58}$, $NHC(=O)NHR^{58}$, $NHC(=S)NHR^{58}$; or, alternatively, when attached to an additional molecule Q, $R^{57}$ is independently selected at each occurrence from the group: O, $NR^{58}$, C=O, C(=O)O, OC(=O)O, C(=O)N—, C=$NR^{58}$, S, SO, $SO_2$, $SO_3$, NHC(=O), $(NH)_2C(=O)$, $(NH)_2C$=S; and,

$R^{58}$ is independently selected at each occurrence from the group:, hydrogen; $C_1$–$C_6$ alkyl; benzyl, and phenyl;

x and y are independently 1 or 2;

z is independently 1–4;

$M_j$ is a transition metal radionuclide selected from the group: $^{99m}$Tc, $^{186}$Re and $^{188}$Re;

$C_h$ is a radionuclide metal chelator coordinated to transition metal radionuclide $M_j$, and is independently selected at each occurrence, from the group: $R^{40}N$=$N^+$=, $R^{40}R^{41}N$—N=, $R^{40}N$=, and $R^{40}N$=N(H)—, wherein

$R^{40}$ is independently selected at each occurrence from the group: a bond to $L_{n'}$, $C_1$–$C_{10}$ alkyl substituted with 0–3 $R^{52}$, aryl substituted with 0–3 $R^{52}$, cycloalkyl substituted with 0–3 $R^{52}$, heterocycle substituted with 0–3 $R^{52}$, heterocycloalkyl substituted with 0–3 $R^{52}$, aralkyl substituted with 0–3 $R^{52}$ and alkaryl substituted with 0–3 $R^{52}$;

$R^{41}$ is independently selected from the group: hydrogen, aryl substituted with 0–3 $R^{52}$, $C_1$–$C_{10}$ alkyl substituted with 0–3 $R^{52}$, and a heterocycle substituted with 0–3 $R^{52}$;

$R^{52}$ is independently selected at each occurrence from the group: a bond to $L_{n'}$, =O, F, Cl, Br, I, $—CF_3$, – CN, $—CO_2R^{53}$, $—C(=O)R^{53}$, $—C(=O)N(R^{53})_2$, —CHO, $—CH_2OR^{53}$, $—OC(=O)R^{53}$, $—OC(=O)OR^{53a}$, $—OR^{53}$, $—OC(=O)N(R^{53})_2$, $—NR^{53}C(=O)R^{53}$, $—NR^{54}C(=O)OR^{53a}$, $—NR^{53}C(=O)N(R^{53})_2$, $—NR^{54}SO_2N(R^{53})_2$, $—NR^{54}SO_2R^{53a}$, $—SO_3H$, $—SO_2R^{53a}$, $—SR^{53}$, $—S(=O)R^{53a}$, $—SO_2N(R^{53})_2$, $—N(R^{53})_2$, $—NHC(=NH)NHR^{53}$, $—C(=NH)NHR^{53}$, =NOR[53], $NO_2$, $—C(=O)NHOR^{53}$, $—C(=O)NHNR^{53}R^{53a}$, $—OCH_2CO_2H$, 2-(1-morpholino)ethoxy;

$R^{53}$, $R^{53a}$, and $R^{54}$ are each independently selected at each occurrence from the group: hydrogen, $C_1$–$C_6$ alkyl, and a bond to $L_{n'}$;

$A_{l1}$ is a first ancillary ligand selected from the group:
dioxygen ligand,
functionalized aminocarboxylate, and
halide;

$A_{l2}$ is an ancillary ligand capable of stabilizing the radiopharmaceutical selected from the group:
$A^9$ and $A^{10}$—W—$A^{11}$,

wherein:

$A^9$ is independently selected at each occurrence from the group: $PR^{61}R^{62}R^{63}$ and $AsR^{61}R^{62}R^{63}$;

$A^{10}$ and $A^{11}$ are independently selected at each occurrence from the group: $PR^{61}R^{62}$ and $AsR^{61}R^{62}$;

W is a spacer group selected from the group: $C_1$–$C_{10}$ alkyl substituted with 0–3 $R^{70}$, aryl substituted with 0–3 $R^{70}$, cycloalkyl substituted with 0–3 $R^{70}$, heterocycle substituted with 0–3 $R^{70}$, heterocycloalkyl substituted with 0–3 $R^{70}$, aralkyl substituted with 0–3 $R^{70}$ and alkaryl substituted with 0–3 $R^{70}$;

$R^{61}$, $R^{62}$, and $R^{63}$ are independently selected at each occurrence from the group: $C_1$–$C_{10}$ alkyl substituted with 0–3 $R^{70}$, aryl substituted with 0–3 $R^{70}$, cycloalkyl substituted with 0–3 $R^{70}$, heterocycle substituted with 0–3 $R^{70}$, aralkyl substituted with 0–3 $R^{70}$, alkaryl substituted with 0–3 $R^{70}$, and arylalkaryl substituted with 0–3 $R^{70}$;

$R^{70}$ is independently selected at each occurrence from the group: F, Cl, Br, I, $—CF_3$, —CN, $—CO_2R^{71}$, $—C(=O)R^{71}$, $—C(=O)N(R^{71})_2$, $—CH_2OR^{71}$, $—OC(=O)R^{71}$, $—OC(=O)OR^{71a}$, $—OR^{71}$, $—OC(=O)N(R^{71})_2$, $—NR^{71}C(=O)R^{71}$, $—NR^{71}C(=O)OR^{71}$, $—NR^{71}C(=O)N(R^{71})_2$, $SO_3^-$, $—NR^{71}SO_2N(R^{71})_2$, $—NR^{71}SO_2R^{71a}$, $—SO_3H$, $—SO_2R^{71}$, $—S(=O)R^{71}$, $—SO_2N(R^{71})_2$, $—N(R^{71})_2$, $—N(R^{71})_3^+$, $—NHC(=NH)NHR^{71}$, $—C(=NH)NHR^{71}$, $=NOR^{71}$, $NO_2$, $—C(=O)NHOR^{71}$, $—C(=O)NHNR^{71}R^{71a}$, $—OCH_2CO_2H$; and

$R^{71}$ and $R^{71a}$ are independently selected at each occurrence from the group: hydrogen and $C_1$–$C_6$ alkyl; and

pharmaceutically acceptable salts thereof.

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5,744,121

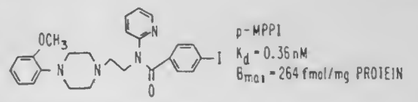
## SEROTONIN (5-HT$_{1A}$) RECEPTOR LIGANDS AND IMAGING AGENTS

**Hank F. Kung, Wynnewood, Pa., assignor to The Trustees of the University of Pennsylvania, Philadelphia, Pa.**

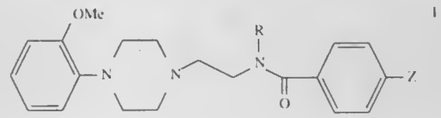
**Division of Ser. No. 209,985, Mar. 11, 1994, Pat. No. 5,609,849. This application Sep. 12, 1996, Ser. No. 712,901**

**Int. Cl.[6] A61K** *51/04;* **C07D** *401/00;403/00;241/02*

**U.S. Cl. 424—1.85** **12 Claims**




1. Compounds of the formula



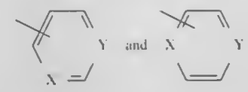

I



where

Z is selected from the group consisting of iodine, bromine and fluorine;

R is selected from the group consisting of




X and Y are independently selected from the group consisting of N and CH, provided that at least one of X and Y is N;

and pharmaceutically acceptable salts thereof.

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5,744,122

## DIAGNOSIS AND TREATMENT OF CANCER HAVING CLONAL MACROPHAGE INVOLVEMENT

**Michael S. McGrath, Burlingame; Brian Herndier, San Francisco, and Bruce Shiramizu, Pacifica, all of Calif., assignors to University of California, San Francisco, San Francisco, Calif.**

**Division of Ser. No. 286,745, Aug. 5, 1994, Pat. No. 5,580,715. This application Feb. 15, 1996, Ser. No. 601,865**

**Int. Cl.[6] A61K** *49/00;* **C12Q** *1/70;1/68*

**U.S. Cl. 424—9.2** **5 Claims**

1. An isolated macrophage of a mammal having integrated into its genome an HIV transcriptional controlling sequence positioned relative to the gene encoding fes/fps such that the presence of said HIV transcriptional controlling sequence and expression of said fes/fps results in macrophage proliferation.

5. A method of screening for a candidate therapeutic agent that reduces the viability of a macrophage in vivo, said method comprising:

a) injecting the macrophage of claim 1 into a tissue of a non-human mammal;

b) growing said macrophage in said mammal until a tumor is present;

c) administering to said mammal said candidate therapeutic agent; and

d) determining the effect of said candidate therapeutic agent on said tumor.

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5,744,123

## AEROSOL FORMULATIONS CONTAINING P134A AND PARTICULATE MEDICAMENTS

**Rachel Ann Akehurst; Anthony James Taylor, and David Andrew Wyatt, all of Ware, Great Britain, assignors to Glaxo Group Limited, London, England**

**Continuation of Ser. No. 302,435, Sep. 9, 1994, abandoned, which is a continuation of Ser. No. 94,174, Sep. 29, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 462,558**

**Claims priority, application United Kingdom, Dec. 12, 1991, 9126405; Feb. 6, 1992, 9202522**

**Int. Cl.[6] A61K** *9/12*

**U.S. Cl. 424—45** **17 Claims**

1. A pharmaceutical formulation consisting essentially of (i) one or more particulate medicaments, and (ii) 1,1,1,2-tetrafluoroethane as propellant, which formulation contains less than 0.0001% w/w surfactant based upon the weight of medicament, the particulate medicament being present in an amount from 0.005 to 5% w/w relative to the total weight of the formulation and having a particle size of less than 100 microns, wherein one of the said one or more medicaments is a bronchodilator selected from the group consisting of ephedrine, adrenaline, fenoterol, formoterol, isoprenaline, metaproterenol, phenylephrine, phenylpropanolamine, pirbuterol, reproterol, rimuterol, terbutaline, isoetharine, tulobuterol, orciprenaline or (−)-4-amino-3,5-dichloro-α-[[[6-[2-(2-pyridinyl)ethoxy]hexyl] amino]methyl]benzenemethanol or a physiologically acceptable salt thereof.

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5,744,124

## NITROGLYCERIN-CONTAINING HYDROPHILIC AQUEOUS PUMPABLE SPRAY COMPOSITION

Karin Klokkers-Bethke, Rödermark, and Ulrich Münch, Monheim/Rhld., both of Germany, assignors to Schwarz Pharma AG, Monheim, Germany

Continuation of Ser. No. 731,126, Jul. 15, 1991, abandoned. This application May 26, 1992, Ser. No. 890,314

Claims priority, application Germany, Aug. 17, 1990, 4026072.0

Int. Cl.[6] A61K *9/12;31/04*

U.S. Cl. 424—47 9 Claims

1. A medicinal product for the buccal administration of nitroglycerin to a patient in need of nitroglycerin therapy comprising:

a container having a pump spray means for dispensing a spray dosage of a composition in the container into the buccal area of a patient's mouth;

the composition being a hydrophilic aqueous pump spray composition comprising 0.15 to 0.50 weight/% of nitroglycerin, 24.50 to 24.85 weight/% of ethanol, 32.00 weight/% of 1,2-propyleneglycol and 43.00 weight/% of purified water and having a pH of 3 to 6; and

the composition and the container containing no propellant.

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5,744,125

## COSMETIC MELANINS

John M. Pawelek, Hamden, and James T. Platt, Milford, both of Conn., assignors to Yale University, New Haven, Conn.

Continuation-in-part of Ser. No. 109,286, Aug. 19, 1993, abandoned. This application Feb. 23, 1995, Ser. No. 392,589

Int. Cl.[6] A61K *7/44;7/42*

U.S. Cl. 424—59 31 Claims

1. A melanin polymer consisting of monomeric units selected from the group consisting of 3-aminotyrosine, 3,4-dihydroxybenzoic acid, 3-amino, 4-hydroxybenzoic acid, aloin, emodin, alizarin, tyrosine, dihydroxyphenylalanine, 4,5-dihydroxynaphthalene-2-sulfonic acid, 3-nitrotyrosine, 3-dimethylamino phenol and p-aminobenzoic acid, and further consisting of a co-monomer, which is an agent that enhances substantivity of the melanin polymer to human skin, said co-monomer being co-polymerized with the monomeric units, said melanin polymer characterized by being substantive to human skin and hair and being soluble in an aqueous cosmetic buffer at physiological pH and temperature.

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5,744,126

## COSMETICS CONTAINING SILICONE SURFACE-MODIFIED PARTICLES OF TITANIUM OXIDE AND ZINC OXIDE

Masaakira Horino, Sagamihara, and Yukio Hasegawa, Kasukabe, both of Japan, assignors to Miyoshi Kasei, Inc., Saitama, Japan

Filed May 31, 1996, Ser. No. 656,369

Claims priority, application Japan, Jun. 2, 1995, 7-158814; May 1, 1996, 8-134280

Int. Cl.[6] A61K *7/42;7/44;* C09D *1/00;* C09C *1/02*

U.S. Cl. 424—59 11 Claims

1. A cosmetic comprising file particles of titanium oxide surface-modified with silicone and fine particles of zinc oxide surface-modified with silicon, wherein the ratio of the fine particles of titanium oxide surface-modified with silicone to the fine particles of zinc oxide surface-modified with silicone is 9.8:0.2 to 5:5, the mean particle size of secondary flocculation of fine particles of titanium oxide is 0.5 to 3.0 μm, and the mean particle size of secondary flocculation of fine particles of zinc oxide is 0.2 to 3.5 μm.

5,744,127

## DERIVATIVES OF BENZOXAZOLE USEFUL AS UV FILTERS

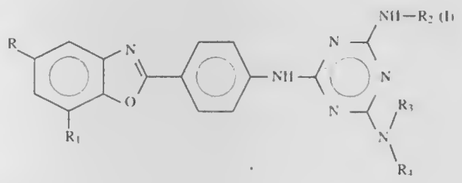
Raspanti Giuseppe, and Zanchi Giorgio, both of Bergamo, Italy, assignors to 3V Inc., Weehawken, N.J.

Filed Sep. 20, 1996, Ser. No. 710,777

Int. Cl.[6] C07D *251/54;263/57;* A61K *7/42*

U.S. Cl. 424—59 14 Claims

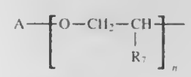
1. Compounds of formula (I):



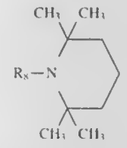
(I)

in which

R and $R_1$, which can be the same or different, are hydrogen, linear or branched $C_1$–$C_8$ alkyl; —$OR_5$ wherein $R_5$ is a $C_1$–$C_4$ alkyl; —$COOR_6$ wherein $R_6$ is linear or branched $C_1$–$C_{24}$ alkyl; $C_7$–$C_{12}$ aralkyl or $C_5$–$C_8$ cycloalkyl or a group of formula (II) or (III):



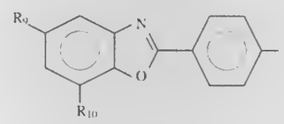
(II)



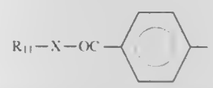
(III)

in which A is linear or branched $C_1$–$C_8$ alkyl; $C_5$–$C_8$ cycloalkyl; $C_6$–$C_{10}$ aryl, optionally substituted with one or more $C_1$–$C_4$ alkyl; $R_7$ and $R_8$ are independently hydrogen or methyl, n can have values from 1 to 10;

$R_2$ is a group of formula (IV) or (V),



(IV)



(V)

in which $R_9$ and $R_{10}$, which can be the same or different, have the same meaning of R;

$R_{11}$ is linear or branched $C_1$–$C_{24}$ alkyl or a group of formula II or III;

X is oxygen or NH;

$R_3$ is linear or branched $C_1$–$C_{16}$ alkyl, optionally interrupted by one or more oxygen bridges; a group of formula (III), (IV) or (V);

$R_4$ is hydrogen, linear or branched alkyl $C_1$–$C_{16}$; or

$R_3$ and $R_4$ together with the nitrogen which they are linked to and optionally also to an oxygen atom form a 5–7 member heterocyclic ring, optionally substituted with $C_1$–$C_4$ alkyl groups.



5,744,128

## USE OF EMU OIL FOR STIMULATING SKIN AND HAIR GROWTH

Michael F. Holick, 31 Bishop La., Sudbury, Mass. 01776

Filed May 3, 1995, Ser. No. 433,789

Int. Cl.[6] A61K *7/44;35/12*

U.S. Cl. 424—60 10 Claims

1. A method of inducing proliferation of mammalian skin cells, comprising

contacting said cells by topically applying emu oil or a biologically active fraction thereof to the skin of a mammal in an amount effective to induce proliferation of said skin cells.

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5,744,129

## AQUEOUS LIP GLOSS AND COSMETIC COMPOSITIONS CONTAINING COLORED SULFOPOLYESTERS

Suzanne Winegar Dobbs, 304 Highridge Rd., Kingsport, Tenn. 37660-3417; James John Krutak, Sr., 6305 Booth Crt., Kingsport, Tenn. 37663-3613, and Terry Ann Oldfield, 2121 Beechnut Dr., Kingsport, Tenn. 37660-4761

Filed Oct. 10, 1996, Ser. No. 728,455

Int. Cl.[6] A61K *7/04;7/021;7/025*

U.S. Cl. 424—61 16 Claims

1. A method of coloring lips and skin comprising applying to the lip and skin an amount necessary for the naked eye to detect coloration of at least one water-dispersible sulfopolyester and a colorant reacted into or reacted onto the sulfopolyester backbone.

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5,744,130

## ANTIPERSPIRANT GEL-SOLID STICK COMPOSITIONS SUBSTANTIALLY FREE OF SELECT POLAR SOLVENTS

Gerald John Guskey, Montgomery, and Thomas Vincent Orr, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 20, 1996, Ser. No. 770,307

Int. Cl.[6] A61K *7/32;7/34;7/36;7/38*

U.S. Cl. 424—66 26 Claims

1. An anhydrous antiperspirant gel-solid stick composition comprising:

(a) from about 0.5% to about 60% by weight of particulate antiperspirant active;

(b) from about 1% to about 15% by weight of a solid non-polymeric gellant that is substantially free of organic polymeric gellants, dibenzylidene alditol, inorganic thickening agents, amides of N-acyl amino acid, esters of N-acyl amino acid, or combinations thereof; and

(c) from about 10% to about 80% by weight of anhydrous liquid carrier having a solubility parameter of from about 3 to about 13 $(cal/cm^3)^{0.5}$ which is substantially free of polar, water-immiscible, organic carrier liquids;

wherein the composition has a visible residue index of from about 11 to about 30 L-value, a product hardness of from about 500 gram-force to about 5,000 gram-force, and a ratio of an elastic to viscous moduli of from about 0.1 to about 100.

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5,744,131

## SEQUENCE-DIRECTED DNA-BINDING MOLECULES COMPOSITIONS AND METHODS

Cynthia A. Edwards, Menlo Park; Kirk E. Fry, Palo Alto, both of Calif.; Charles R. Cantor, Boston, and Beth M. Andrews, Maynard, both of Mass., assignors to Genelabs Technologies, Inc., Redwood City, Calif.

Division of Ser. No. 996,783, Dec. 23, 1992, which is a continuation-in-part of Ser. No. 723,618, Jun. 27, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 476,876

Int. Cl.[6] A61K *31/74;* G01N *33/566;33/558*

U.S. Cl. 424—78.08 3 Claims

1. A DNA binding agent which binds with base sequence specificity to a duplex DNA target region containing at least two four base-pair sequences separated by no more than 20 basepairs, comprising

a linear non-oligonucleotide, non-peptide oligomer composed of small molecule subunits and having a molecular weight less than about 10,000 daltons, said oligomer consisting of

a first subunit that has sequence preferential binding to one of said four-base pair sequences, said sequence preferential binding to said four-base pair sequence in said duplex DNA having been determined by a binding assay which consists essentially of

(i) adding a test small molecule to a test system composed of (a) a duplex DNA having adjacent screening and test sequences that are separated from one another by no more than about 20 base-pairs, and (b) a DNA-binding protein that binds to said screening sequence, wherein the binding to said screening sequence is substantially independent of the composition of said adjacent test sequence, but wherein the binding to said screening sequence is affected by the binding of small molecules to said adjacent test sequence,

(ii) incubating the test small molecule in the test system for a time period sufficient to permit binding of said small molecule to the test sequence in the duplex DNA, and

(iii) identifying said small molecule as having sequence preferential binding to said four base-pair sequence if the amount of DNA binding protein bound to said screening sequence of said duplex DNA before said adding is substantially different than the amount of DNA-binding protein bound after said adding of test small molecule to said test system; and

at least one additional subunit having sequence preferential binding to another of said four-base pair sequences in said target region, said sequence preferential binding to said other four base-pair sequence in said duplex DNA having been determined by said binding assay,

wherein at least one of said subunits is a non-intercalating DNA-binding small molecule.

| | | | |
|---|---|---|---|
| TTCCTTCC | TTACTTCC | TACCTTCC | TAACTTCC |
| TTCCTTAC | TTACTTAC | TACCTTAC | TAACTTAC |
| TTCCTACC | TTACTACC | TACCTACC | TAACTACC |
| TTCCTAAC | TTACTAAC | TACCTAAC | TAACTAAC |

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5,744,132

## FORMULATIONS FOR IL-12

Nicholas W. Warne, Methuen; Thomas J. Crowley, Malden, and Tracy M. Smith, Lawrence, all of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Continuation of Ser. No. 384,062, Feb. 6, 1995, abandoned. This application Jan. 14, 1997, Ser. No. 783,523

Int. Cl.[6] A61K *45/05*

U.S. Cl. 424—85.2 4 Claims

1. A composition comprising about 1 to about 1000 μg/ml IL-12, about 2% sucrose, about 4.15% mannitol, about 10 mM sodium succinate, and about 0.02% polysorbate TWEEN-20, and having a pH of about 5.6.

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5,744,133

**EXPRESSION OF A TUMOR-SPECIFIC ANTIGEN BY A RECOMBINANT VECTOR VIRUS AND USE THEREOF IN PREVENTITIVE OR CURATIVE TREATMENT OF THE CORRESPONDING TUMOR**

**Richard Lathe; Marie-Paule Kieny, both of Strashourg, and Guerrino Meneguzzi, Nice, all of France, assignors to Transgene S.A., France**

**Continuation of Ser. No. 248,463, May 24, 1994, abandoned, which is a continuation of Ser. No. 126,021, Sep. 24, 1993, abandoned, which is a continuation of Ser. No. 984,242, Dec. 1, 1992, abandoned, which is a continuation of Ser. No. 546,318, Jul. 2, 1990, abandoned, which is a continuation-in-part of Ser. No. 84,852, Aug. 13, 1987, abandoned. This application Dec. 15, 1994, Ser. No. 357,138**

**Claims priority, application France, Aug. 13, 1986, 86 11700; Mar. 6, 1989, 89 02897**

**Int. Cl.[6] A01N** *63/00;* **C12N** *15/86;7/01;7/04*

**U.S. Cl. 424—93.2** **26 Claims**

1. A method of treating tumors using recombinant vaccinia viruses encoding an immunogenic part of a tumor-specific antigen of a virus that induced said tumors, comprising the steps of:

a) preparing a recombinant vaccinia virus comprising

i) a heterologous DNA sequence which codes at least for a region essential for inducing an immune response to the tumor-specific antigen and

ii) regulatory elements required for expression of said DNA sequence in higher cells,

wherein said heterologous DNA sequence and said regulatory elements are cloned within a non-essential region of said vaccinia virus; and

b) administering said recombinant vaccinia virus to humans or animals having said tumors.

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5,744,134

**IMMUNOGLOBULIN AND FIBER-CONTAINING COMPOSITION FOR HUMAN GASTROINTESTINAL HEALTH**

**Stephen M. Paul, San Clemente, Calif., assignor to Metagenics, Inc., San Clemente, Calif.**

**Continuation of Ser. No. 437,316, May 9, 1995, Pat. No. 5,531,989, which is a continuation-in-part of Ser. No. 331,140, Oct. 28, 1994, Pat. No. 5,531,988. This application Jul. 1, 1996, Ser. No. 674,115**

**Int. Cl.[6] A01N** *63/04;* **A61K** *35/00;39/395;47/00*

**U.S. Cl. 424—93.4** **20 Claims**

1. A bacteria and fiber-containing composition for promoting gastrointestinal health comprising:

(a) about 40 to about 60% of a beneficial human intestinal microorganism; and

(b) about 40 to about 60% of soluble dietary fiber, wherein said fiber is a member selected from the group consisting of inulin, fructo-oligosaccharides, pectin, guar gum, and mixtures thereof.

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5,744,135

**METHOD OF RAISING AN IMMUNE RESPONSE WITH AN ANTI-IDIOTYPIC ANTIBODY HAVING CORRESPONDENCE WITH HUMAN HEPATITIS B SURFACE ANTIGEN**

**Yasmin Thanavala; Arvind Thakur, both of Williamsville, N.Y.; Ivan Roitt, Golders Green, United Kingdom, and Michael Pride, Houston, Tex., assignors to Health Research, Inc., Buffalo, N.Y., and University College London, London, England**

**Continuation of Ser. No. 167,336, Dec. 15, 1993, Pat. No. 5,531,990. This application Jan. 19, 1996, Ser. No. 589,011**

**Int. Cl.[6] A61K** *39/395;38/03;* **C07K** *16/08;16/42*

**U.S. Cl. 424—131.1** **2 Claims**

1. A method for causing an immune response to human Hepatitis B surface antigen Hepatitis B surface antigen (HBsAg) which consists essentially of raising an immune response to an antiidiotypic antibody designated 2F10 produced by a monoclonal antibody having ATCC deposit number HB11966 or to a 15 amino acid sequence (SEQ ID NO.1) of a heavy chain hypervariable region of said antibody, said sequence being partially homologous with the group specific (a) determinant of Hepatitis B surface antigen and a synthetic peptide corresponding to said sequence, which sequence can duplicate the B and T cells stimulatory activity of the intact anti-idiotypic antibody and hepatitis B surface antigen.

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5,744,136

**Patent Not Issued For This Number**

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5,744,137

**OIL EMULSION VACCINES PREPARED WITH ANIMAL, VEGETABLE, AND SYNTHETIC OILS USING A MIXTURE OF NONIONIC SURFACTANTS**

**Henry D. Stone, Winterville, Ga., assignor to The United States of America as represented by the Secretary of the Agriculture, Washington, D.C.**

**Filed Feb. 6, 1995, Ser. No. 384,184**

**Int. Cl.[6] A61K** *39/00;9/66;7/00;* **A01N** *65/00*

**U.S. Cl. 424—184.1** **8 Claims**

1. A water-in-oil emulsion vaccine comprising an adjuvant consisting essentially of

(a) a mixture of at least two non-ionic surfactants wherein said surfactants are mixed in equal proportions, and

(b) a water-in-oil emulsion;

wherein an antigen is directly emulsified into an oil phase of said water-in-oil emulsion.

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5,744,138

**PROCESS FOR SEPARATING ORGANOGERMANIUM COMPOUNDS AND INORGANOGERMANIUM COMPOUNDS FROM A GERMANIUM-CONTAINING PHARMACEUTICAL PLANT OR ITS PROCESSED PRODUCTS**

**Mon-Tarng Chen, Hsinchu, Taiwan, assignor to Food Industry Research & Development Institute, Hsinchu, Taiwan**

**Filed Dec. 6, 1996, Ser. No. 761,350**

**Claims priority, application Taiwan, Oct. 21, 1996, 85112865**

**Int. Cl.[6] A01N** *65/00;59/16;* **B01D** *15/08*

**U.S. Cl. 424—195.1** **15 Claims**

1. A process for separating organogermanium compounds and inorganogermanium compounds from a germanium-containing pharmaceutical plant or its processed products, comprising the following sequential steps of:

(a) providing an extract from a germanium-containing pharmaceutical plant or its processed products;

(b) applying the extract into a combination column including a cation exchange resin in the lower part of the column and an anion exchange resin in the upper part of the column, whereby organogermanium compounds in the extract is capable of binding with the anion exchange resin in the upper part of the column;

(c) eluting the combination column with deionized water and collecting the eluate so as to obtain inorganogermanium solution containing substantially no organogermanium compounds;

(d) eluting the combination column with an alkaline solution, whereby the organogermanium compounds previously bound with the anion exchange resin release, and the alkaline matrix of the alkaline solution binds with the cation exchange resin in the lower part of the column; and

(e) eluting the combination column with deionized water and collecting the eluate so as to obtain organogermanium solution containing substantially no inorganogermanium compounds.



5,744,139

**INSULIN-LIKE GROWTH FACTOR I (IGF-1) INDUCED IMPROVEMENT OF DEPRESSED T4/T8 RATIOS**

**Kenneth A. Kudsk, Memphis, Tenn., assignor to University of Tennessee Research Corporation, Knoxville, Tenn.**

**Division of Ser. No. 28,821, Mar. 10, 1993, abandoned, which is a continuation of Ser. No. 771,901, Oct. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 722,813, Jun. 28, 1991, Pat. No. 5,202,119. This application Feb. 24, 1995, Ser. No. 394,338**

**Int. Cl.[6] A61K** *38/30;45/05*

**U.S. Cl. 424—198.1** **12 Claims**

1. A method for increasing the T4/T8 ratio in a human with a depressed T4/T8 ratio comprising:

a. determining that the human has a depressed T4/T8 ratio;

b. administering to the human from about 1 μg/kg/day to about 10 mg/kg/day of body weight of IGF-1; and

c. monitoring the T4/T8 ratio of the human to determine if additional administration of IGF-1 is desirable.

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5,744,140

**FLAVIVIRUS RECOMBINANT POXVIRUS VACCINE**

**Enzo Paoletti, Delmar, and Steven Elliot Pincus, East Greenbush, both of N.Y., assignors to Virgenetics Corporation, Troy, N.Y.**

**Continuation of Ser. No. 729,800, Jul. 17, 1991, abandoned, which is a continuation-in-part of Ser. No. 714,687, Jun. 13, 1991, Pat. No. 5,514,375, which is a continuation-in-part of Ser. No. 711,429, Jun. 6, 1991, abandoned, which is a continuation of Ser. No. 567,960, Aug. 15, 1990, abandoned. This application Apr. 7, 1994, Ser. No. 224,391**

**Int. Cl.[6] A61K** *39/275;39/295;* **C12N** *7/01*

**U.S. Cl. 424—199.1** **16 Claims**

1. A recombinant avipox virus comprising DNA coding for Japanese encephalitis virus protein M or a precursor to protein M, and Japanese encephalitis virus protein E, NS1 and NS2A, in a nonessential region of the avipox genome.

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5,744,141

**FLAVIVIRUS RECOMBINANT POXVIRUS IMMUNOLOGICAL COMPOSITION**

**Enzo Paoletti, Delmar, and Steven Elliot Pincus, East Greenbush, both of N.Y., assignors to Virogenetics Corporation, Troy, N.Y.**

**Division of Ser. No. 224,391, Apr. 7, 1994, Pat. No. 5,744,140, and a continuation-in-part of Ser. No. 105,483, Aug. 12, 1993, Pat. No. 5,494,807, which is a continuation of Ser. No. 847,951, Mar. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 713,967, Jun. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 666,056, Mar. 7, 1991, abandoned, said Ser. No. 224,391 is a continuation of Ser. No. 729,800, Jul. 17, 1991, abandoned, which is a continuation-in-part of Ser. No. 714,687, Jun. 13, 1991, Pat. No. 5,514,375, which is a continuation-in-part of Ser. No. 711,429, Jun. 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 567,960, Aug. 15, 1990, abandoned, said Ser. No. 714,687 is a continuation-in-part of Ser. No. 713,967, Jun. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 666,056, Mar. 7, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 484,304**

**Int. Cl.[6] A61K** *39/285;39/295;* **C07K** *14/18;* **C12N** *7/01*

**U.S. Cl. 424—199.1** **17 Claims**

1. A recombinant poxvirus comprising DNA coding for at least one flavivirus structural protein, wherein the flavivirus is Yellow Fever virus or Dengue virus and the poxvirus is selected from the group consisting of: an avipox virus,

a vaccinia virus wherein the open reading frames for the thymidine kinase gene, a hemorrhagic region, an A type inclusion body region, a hemagglutinin gene, a host range gene region and a large subunit, ribonucleotide reductase have been deleted therefrom,

a vaccinia virus wherein regions C7L-K1L, J2R, B13R+ B14R, A26L, A56R, and I4L have been deleted therefrom, and

a NYVAC vaccinia virus.

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5,744,142

**SELF-ASSEMBLING RECOMBINANT PAPILLOMAVIRUS CAPSID PROTEINS**

**Douglas R. Lowy, Washington, D.C.; John T. Schiller, Silver Spring, and Reinhard Kirnbauer, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.**

**Division of Ser. No. 32,869, Mar. 16, 1993, Pat. No. 5,437,951, which is a continuation-in-part of Ser. No. 941,371, Sep. 3, 1992. This application Jun. 7, 1995, Ser. No. 475,782**

**Int. Cl.[6] A61K** *39/12;* **C12N** *7/00;15/37;7/04*

**U.S. Cl. 424—204.1** **10 Claims**

1. A method of immunization of a host mammal in which a desired immune response is produced to a papillomavirus, comprising the step of:

administering to said host, according to an immunizing dosage schedule, a self-assembled HPV16 capsid comprising at least one papillomavirus L1 conformational epitope produced by the method comprising the step of permitting a genetic construct, comprising a papillomavirus L1 gene, to direct recombinant expression in a transformed eukaryotic host cell of said papillomavirus L1 conformational epitope by self-assembly of papillomavirus capsids comprising a L1 polypeptide, wherein said L1 polypeptide is characterized as having the amino acid sequence encoded by nucleotide sequence of SEQ ID NO:2.

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5,744,143

**VIRAL VACCINES**

**Louis Joseph Norman Ross, Newbury, England; Simon David Scott, Amsterdam, Netherlands, and Matthew McKinley Binns, Ely, United Kingdom, assignors to Rhône Mérieux, Lyons, France**

**Division of Ser. No. 462,591, Jun. 5, 1995, which is a division of Ser. No. 81,932, Jun. 23, 1993, Pat. No. 5,558,860, which is a continuation-in-part of Ser. No. 669,392, Apr. 29, 1991, abandoned. This application May 29, 1996, Ser. No. 654,931**

**Int. Cl.[6] A61K** *39/255*

**U.S. Cl. 424—229.1** **12 Claims**

1. A vaccine against Marek's Disease, comprising a vector which contains a DNA fragment encoding the gD gene from MDV serotype 1 or 2 or 3.

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5,744,144

**SYNTHETIC MULTIPLE TANDEM REPEAT MUCIN AND MUCIN-LIKE PEPTIDES, AND USES THEREOF**

**Olivera J. Finn; J. Darrell Fontenot, both of Pittsburgh, and Ronald C. Montelaro, Wexford, all of Pa., assignors to University Of Pittsburgh University Patent Committee Policy And Procedures, Pittsburgh, Pa.**

**Filed Jul. 30, 1993, Ser. No. 99,354**

**Int. Cl.[6] A61K** *39/00;45/00;45/05;* **C07K** *1/00*

**U.S. Cl. 424—277.1** **11 Claims**

1. A synthetic muc-1 peptide 105 amino acids in length comprising five sequential 20-amino acid tandem repeats of muc-1 and five additional amino acids, which five additional amino acids either precede the first of the five sequential 20-amino acid tandem repeats or follow the fifth of the five sequential 20-amino acid tandem repeats, wherein said synthetic muc-1 peptide attains native conformation in the absence of glycosylation.

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5,744,145

## PREPARATION OF LIPID COMPOSITIONS FOR COSMETIC PRODUCTS

Constantin Bertoli, Romanel S/Lausanne; Umberto Bracco, Vevey; Angiolino Delvecchio, Taverne, and Armand Malnoe, Givrins, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Oct. 6, 1995, Ser. No. 540,311

Claims priority, application European Pat. Off., Nov. 5, 1994, 94117482

Int. Cl.[6] A61K *7/00;* A23D *5/00;* C11B *3/14*

U.S. Cl. 424—401 13 Claims

1. A process for preparation of a lipid composition comprising preparing a mixture of oils which contain gum, color and odor and wherein the oil mixture comprises rice bran oil and sesame oil and comprises additional oil which comprises oil selected from the group consisting of maize oil, wheat germ oil and sunflower oil so that the oil mixture prepared contains linoleic acid and vitamin E, degumming the prepared oil mixture to obtain a first treated oil mixture, decoloring the first treated oil mixture to obtain a second treated oil mixture and deodorizing the second treated oil mixture to obtain a third treated oil mixture, and wherein the oil mixture is prepared, degummed, decolored and deodorized so that the third treated oil mixture comprises, by weight, from 30% to 50% rice bran oil and from 15% to 25% sesame oil and contains the vitamin E for protecting the oil mixture against oxidation and wherein the second treated oil mixture is deodorized under conditions of temperature and vacuum so that the third treated oil mixture comprises at least 2% by weight unsaponifiable oil matter.

5,744,146

## ANHYDROUS DELIVERY VEHICLE FOR COSMETIC INGREDIENTS

Kimberly T. Peters, 347 Set Point Dr., Piney Flats, Tenn. 37686; Paul A. Rundquist, 2601N John B. Dennis, #1409, Kingsport, Tenn. 37660, and John J. Hiller, 5332 Foxfire Pl., Kingsport, Tenn. 37664

Continuation of Ser. No. 398,828, Mar. 6, 1995, abandoned. This application Apr. 29, 1996, Ser. No. 638,720

Int. Cl.[6] A61K *7/00;7/48*

U.S. Cl. 424—401 5 Claims

1. An anhydrous delivery vehicle for applying cosmetic or pharmaceutically active ingredients to human skin, said anhydrous delivery vehicle consisting essentially of a blend of:

(A) 5 to 30 weight percent of a wax having a melting point of greater than 100° C. and a weight average molecular weight of less than 10,000;

(B) 5 to 30 weight percent of an acetylated monoglyceride;

(C) 15 to 35 weight percent petrolatum having a specific gravity between 0.815 and 0.880 at 60° C., and a melting range between 38° C. and 60° C.;

(D) 0.1 to 30 weight percent of a fatty alcohol having 8 to 22 carbon atoms; and

(E) 0.05 to 50 weight percent of a cosmetically or pharmaceutically active material selected from the group consisting of emollients, sunscreens, vitamins, humectants, botanicals, insect repellents, skin protectants, antiperspirants, bactericides, antiseptics, moisturizers, antioxidants, buffers, pigments, colorants, dyes, fragrances, titanium dioxide, talc, and combinations thereof;

said anhydrous delivery vehicle having superior occlusive barrier properties compared with petroleum jelly alone.

5,744,147

## COSMETIC COMPOSITION CONTAINING AT LEAST ONE SURFACE-ACTIVE AGENT OF THE ALKYLPOLYGLYCOSIDE AND/OR POLYGLYCEROLATED TYPE AND AT LEAST ONE CROSSLINKED COPOLYMER OF MALEIC ANHYDRIDE/(C1-C5) ALKYLVINYL ETHER

Daniéle Cauwet, Paris, and Claude Dubief, Le Chesnay, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 607,204, Feb. 26, 1996, abandoned, which is a continuation of Ser. No. 214,423, Mar. 18, 1994, abandoned. This application Sep. 9, 1996, Ser. No. 709,664

Claims priority, application France, Mar. 24, 1993, 93 03403

Int. Cl.[6] A61K *7/06*

U.S. Cl. 424—401 10 Claims

1. Cosmetic composition, containing, in a cosmetically acceptable medium, 0.1 to 30% by weight, relative to the total weight of the composition, of one or more nonionic polyglycerolated surface-active agent or mixtures thereof corresponding to the formula (IV):

$$R-O+C_3H_5(OH)+_nH \qquad (IV)$$

in which the group $+C_3H_5(OH)-O+$ the following structure:

$$+CH_2-\underset{\displaystyle CH_2OH}{\overset{\displaystyle |}{CH}}-O+ \qquad (IVb)$$

in which R represents $C_{10}$–$C_{14}$ alkyl radicals or mixtures thereof and n denotes a whole or decimal number from 2 to 10, and between 0.2 and 5% by weight, relative to the total weight of the composition, of one or more crosslinked copolymer of maleic anhydride/($C_1$–$C_4$) alkyl vinyl ether which is crosslinked with 1,7-octadiene, the crosslinking agent comprising 1 to 5 mol % relative to the monoalkyl vinyl ether.

5,744,148

## STABILIZATION OF AN UNSTABLE RETINOID IN OIL-IN-WATER EMULSIONS FOR SKIN CARE COMPOSITIONS

Stephan Samuel Habif, Demarest, N.J.; Alexander Lips, London, England; Prem Chandar, Closter, and Mark Edward Rerek, Scotch Plains, both of N.J., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Sep. 20, 1996, Ser. No. 717,046

Int. Cl.[6] A61K *7/48*

U.S. Cl. 424—401 8 Claims

1. A stable oil-in-water emulsion for a skin conditioning composition, the emulsion comprising:

(a) an oil phase comprising from about 0.1% to about 50%, by weight of the emulsion, of oil droplets comprising a fluid oil and from about 0.01% to about 10% by weight of the emulsion of a retinoid selected from the group consisting of retinol, retinyl acetate, and retinyl propionate, wherein the retinoid is solubilized in the oil; and wherein the fluid oil is selected from the group consisting of isostearyl palmitate, tridecyl salicylate, $C_{12-15}$ octaneate, isopropyl stearate, isopropyl myristate and isopropyl palmitate

(b) from about 50% to about 98% of an aqueous phase containing at least 40% water; and

(c) from about 1% to about 20% by weight of the emulsion of a barrier ingredient which comprises a crystal-forming compound and a crystal-sizing compound, wherein the barrier ingredient provides a crystalline barrier layer between the oil droplets and the aqueous phase,

wherein the crystal-forming compound is selected from the group consisting of $C_{12}$–$C_{22}$ fatty acids, mixtures of $C_{12}$–$C_{22}$ fatty acids with their soaps, $C_{12}$–$C_{22}$ fatty alcohols, and mixtures thereof;

wherein the crystal-sizing compound is selected from the group consisting of hydroxylated $C_{12}$–$C_{22}$ fatty acids, hydroxylated fatty $C_{12}$–$C_{22}$ alcohols, and mixtures thereof; and



wherein the average size of an individual crystal in the barrier layer, as determined by a Microscopic Crystal Sizing Test, is in the range of from about 1 μM to about 50 μm;

and wherein the size ratio of an individual oil droplet to an individual crystal in the barrier layer is in the range of from about 5:1 to about 100:1;

and wherein the melting point of a mixture of the fluid oil and the barrier ingredient is in the range of from about 40° C. to about 100° C.

5,744,149

## LAMINATED DUAL TEXTURED TREATMENT PADS

Richard Michael Girardot, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 433,597, May 3, 1995, Pat. No. 5,620,694, which is a continuation of Ser. No. 236,869, Apr. 29, 1994, abandoned, which is a continuation of Ser. No. 104,233, Aug. 10, 1993, abandoned, which is a continuation of Ser. No. 919,678, Jul. 27, 1992, abandoned. This application Dec. 31, 1996, Ser. No. 775,436

Int. Cl.[6] A01N *25/34*

U.S. Cl. 424—402 17 Claims

1. A dual textured laminated treatment pad consisting essentially of:

(a) at least one paper layer having a basis weight from about 35 gsy to about 155 gsy and a thickness from about 0.045 cm to about 0.30 cm, said paper layer comprising cellulosic fibers selected from the group consisting of wood pulp fibers, cotton fibers, hemp fibers, jute fibers, flax fibers, and mixtures thereof, and

(b) at least one synthetic fiber, nonwoven layer having a basis weight from about 20 gsy to about 105 gsy and comprising apertures, wherein the apertures each have an area from about 0.15 $mm^2$ to about 4.1 $mm^2$ and comprise from about 1% to about 50% of the total surface area of said nonwoven layer,

whereby said paper layer is positioned parallel to and in contact with said synthetic nonwoven layer.

5,744,150

## SOFTENED ANTIMICROBIAL SPONGE MATERIAL WITH COLOR CHANGE INDICATION OF ANTIMICROBIAL ACTIVITY

Ronald J. Cercone, East Lyme, Conn., assignor to Xomed Surgical Products, Inc., Jacksonville, Fla.

Filed Jan. 29, 1997, Ser. No. 787,018

Int. Cl.[6] A01N *25/34;* A61F *13/02;* C08J *6/00;* C08F *8/00*

U.S. Cl. 424—404 12 Claims

1. An antimicrobial sponge material composition having a visual indication of an antimicrobial activity comprising a hydroxylated acetalized polyvinyl alcohol complexed with iodine and plastisized with a polyol, said sponge material composition having a yellow or gold colored surface and being capable of both releasing free iodine from the surface and changing surface color from a yellow or gold color to a black color upon surface contact with an aqueous fluid, thereby providing a visual indication that the antimicrobial activity of the sponge material composition has been activated by releasing free iodine.

5,744,151

## SILVER-BASED PHARMACEUTICAL COMPOSITIONS

Christopher C. Capelli, 4500 7th. St., Kenosha, Wis. 53144

Filed Jun. 27, 1996, Ser. No. 671,897

Int. Cl.[6] A01N *25/02;59/16*

U.S. Cl. 424—405 23 Claims

1. A pharmaceutical mixture, comprising:

a) a non-silver-containing medicinal agent; and

b) a silver ion-containing composition, said silver containing composition comprising an acyclic polyether polymer and a stabilizing anion, wherein said acyclic polyether polymer is selected from the group consisting of polyethylene glycol and polypropylene glycol, wherein said anion is selected from the group consisting of chloride, bromide, and iodide, and wherein the ratio of equivalents of said anion to equivalents of said silver ion is greater than 4 to 1 when said anion is chloride, is greater than 2.1 to 1 when said anion is bromide, and is greater than 1.1 to 1 when said anion is iodide, wherein said pharmaceutical mixture is photostable after 72 hours of continuous exposure to ambient room light.

5,744,152

## POLYMERIC COMPOSITIONS AND METHODS OF PRODUCING THEM

John Langley, and Kenneth Charles Symes, both of West Yorkshire, Great Britain, assignors to Allied Colloids Limited, England

Continuation of Ser. No. 193,906, Feb. 9, 1994, abandoned, which is a continuation of Ser. No. 896,840, Jun. 11, 1992, abandoned, which is a continuation of Ser. No. 398,088, Aug. 24, 1989, abandoned. This application Jan. 17, 1995, Ser. No. 373,397

Claims priority, application United Kingdom, Aug. 24, 1988, 8820061; Aug. 24, 1988, 8820062; Japan, Jan. 19, 1989, 8901194

Int. Cl.[6] A01N *25/10;* A61K *9/16*

U.S. Cl. 424—408 11 Claims

1. A process for forming a particulate composition comprising particles comprising a dry matrix formed of an anionic matrix polymer through which an active ingredient is distributed, wherein the amount of polymeric material is at least 0.5 times the weight of active ingredient and is at least 50% of the weight of the matrix, the matrix polymer is soluble or swellable in water at a pH above 7 and is substantially insoluble and non-swellable in water at a lower pH, And the active ingredient is enzymes, fungi, spores, bacteria, cells or antibiotics,

the process comprising:

providing an aqueous phase solution of a salt of the matrix polymer with ammonia whereby the matrix polymer is substantially water insoluble and non-swellable,

dissolving or dispersing the active ingredient in the aqueous phase,

forming a dispersion consisting essentially of the aqueous phase in water immiscible liquid,

subjecting the dispersion to distillation and thereby evaporating water from the aqueous particles and forming solid particles of the matrix polymer having active ingredient distributed throughout,

wherein ammonia of the salt present is evaporated during the distillation and the matrix polymer in salt form is thereby converted to its free acid form whereby the polymer is substantially water insoluble and non-swellable.

5,744,153

## LIQUID DELIVERY COMPOSITIONS

Gerald L. Yewey; Nancy L. Krinick; Richard L. Dunn, all of Fort Collins, Colo.; Michael L. Radomsky, Mountain View; Gerbrand Brouwer, Menlo Park, both of Calif., and Arthur J. Tipton, Birmingham, Ala., assignors to Atrix Laboratories, Inc., Fort Collins, Colo.

Continuation of Ser. No. 487,979, Jun. 7, 1995, abandoned, which is a division of Ser. No. 225,140, Apr. 8, 1994, abandoned. This application Jun. 9, 1997, Ser. No. 871,492

Int. Cl.[6] A61F *2/00;* A61K *9/127;9/52*

U.S. Cl. 424—426 9 Claims

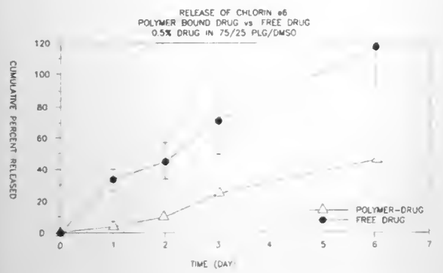
1. A method for the in situ formation of a controlled release implant in or on a subject, comprising:

administering to the subject a flowable composition, and

allowing the flowable composition to contact a body fluid of the subject or an aqueous medium to form the controlled release said implant within or on the subject; wherein.

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the flowable composition comprises an organic solvent in which is dissolved a thermoplastic polymer, and in which is suspended a multiplicity of solid microstructures incorporating an active agent;

the organic solvent is biocompatible, and has a solubility range of miscible to dispersible in the aqueous medium or the body fluid;

the thermoplastic polymer is biocompatible, biodegradable, soluble in the organic solvent, and insoluble in the aqueous medium or the body fluid;

the solid microstructures are insoluble in the organic solvent, the aqueous medium and the body fluid, and are composed of a biocompatible polymer which is biodegradable.

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**5,744,154**

**READY-TO-USE INDOMETHACIN-BASED EYE LOTION**

**Florence Maurin, Vailhauques; Bernard Pages, Monthazin, and Claude Coquelet, Saint Gely du Fesc, all of France, assignors to Laboratoire Chauvin S.A., Montpellier Cedex 1, France**

**Filed Sep. 4, 1996, Ser. No. 706,268**
**Int. Cl.[6] A61F *9/00*; A61K *31/715***
**U.S. Cl. 424—427** **6 Claims**

**1**. Ready-to-use indomethacin eye lotion comprising indomethacin and a beta- or gamma- cyclodextrin etherified with $C_1$–$C_3$ alkyl or $C_1$–$C_4$ hydroxyalkyl groups, in aqueous solution, wherein the cyclodextrin is present in a molar ratio of at least 10/1, with respect to indomethacin and the pH of the solution is from 4.0 to 6.0.

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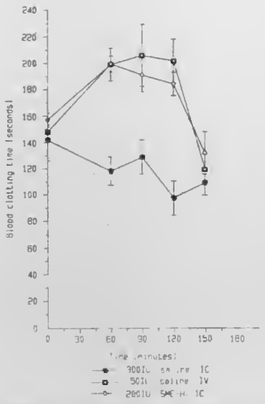
**5,744,155**

**BIOADHESIVE EMULSION PREPARATIONS FOR ENHANCED DRUG DELIVERY**

**Doron Friedman, 33 Alon, Carmei Yosef; Joseph Schwartz, 40 Benjamin Street, and Shimon Amselem, 38 Benjamin, both of Rehovot, all of Israel**

**Filed Aug. 13, 1993, Ser. No. 106,262**
**Int. Cl.[6] A61K *9/107***
**U.S. Cl. 424—434** **42 Claims**

**1**. An oil-in-water emulsion for administration of a drug to a mucosal surface, said emulsion comprising a plurality of submicron particles having an average particle diameter of from 10 nm to 600 nm, said particles having a hydrophobic core of a fat or oil which is surrounded by a surfactant layer, and an aqueous continuous phase; said emulsion further including a drug and a mucoadhesive polymer which is a polymer or copolymer of acrylic acid or methacrylic acid, a poly(methyl vinyl ether/maleic anhydride) copolymer, pectin, alainic acid hyaluronic acid, chitosan, gum tragacanth, karaya gum or carboxymethylcellulose, said hydrophobic core comprising less than 1% (w/w) protein, relative to the weight of the hydrophobic core, and said emulsion comprising less




than 5% (w/w) surfactant, relative to the weight of the hydrophobic core.

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**5,744,156**

**USE OF A SUBSTANCE P ANTAGONIST FOR THE TREATMENT OF SKIN REDDENING OF NEUROGENIC ORIGIN**

**Olivier De Lacharriere, Paris, and Lionel Breton, Versailles, both of France, assignors to Société L'Oréal S.A., Paris, France**

**Filed Dec. 19, 1995, Ser. No. 574,856**
**Claims priority, application France, Dec. 19, 1994, 94 15252**
**Int. Cl.[6] A61L *15/44***
**U.S. Cl. 424—445** **32 Claims**

**1**. A method for treating cutaneous reddening of neurogenic origin comprising topically applying a pharmaceutical or dermatological composition containing an effective amount of at least one substance P antagonist.

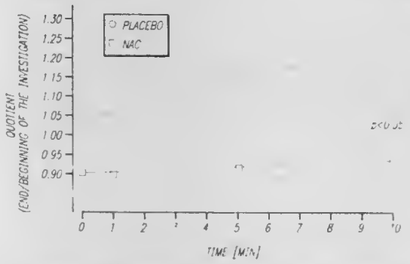
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**5,744,157**

**PREPARATION FOR MAINTAINING AND/OR INCREASING MUSCULAR POWER AND BODY CELL MASS**

**Wulf Dröge, Heidelberg, Germany, assignor to The German Cancer Research Institute, Heidelberg, Germany**

**PCT No. PCT/EP93/02354, § 371 Date Sep. 1, 1995, § 102(e) Date Sep. 1, 1995, PCT Pub. No. WO94/05270, PCT Pub. Date Mar. 17, 1994**
**PCT Filed Aug. 31, 1993, Ser. No. 367,332**
**Claims priority, application Germany, Sep. 1, 1992, 42 29 166.6**
**Int. Cl.[6] A61K *9/127*; *47/42***
**U.S. Cl. 424—450** **15 Claims**




**1**. A method for maintaining and/or increasing muscular power and body cell mass in a subject, comprising administering a pharmaceutical formulation having a thiol as an active compound



wherein the formulation contains about 5 to about 95% by weight of the active compound in an acceptable pharmaceutical carrier to the subject.

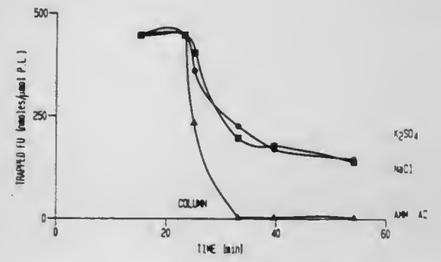
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**5,744,158**

**METHODS OF TREATMENT USING HIGH DRUG-LIPID FORMULATIONS OF LIPOSOMAL-ANTINEOPLASTIC AGENTS**

**Lawrence D. Mayer; Marcel B. Bally; Pieter R. Cullis, all of Vancouver, Canada; Richard S. Ginsberg, Jamesburg, and George N. Mitilenes, Washington, both of N.J., assignors to The Liposome Company, Inc., Princeton, N.J.**

**Continuation of Ser. No. 112,875, Aug. 26, 1993, Pat. No. 5,616,341, which is a continuation of Ser. No. 636,015, Jan. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 22,154, Mar. 5, 1987, abandoned. This application May 25, 1995, Ser. No. 450,830**
**Int. Cl.[6] A61K *9/127***
**U.S. Cl. 424—450** **5 Claims**




**1**. A method of treating an mammal afflicted with a neoplasm, which comprises administering to the animal a composition comprising:

(a) liposomes which comprise an ionizable antineoplastic agent selected from the group consisting of doxorubicin and daunorubicin, a release-inhibiting citrate buffer, and a bilayer comprising a lipid comprising a phospholipid; and,

(b) an aqueous solution external to the liposomes which is basic with respect to the citrate buffer, wherein the weight ratio of antineoplastic agent to lipid in the liposomes is from at least about 0.1:1 to about 3:1.

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**5,744,159**

**PLASMID ENTRAPPING MULTILAMELLAR LIPOSOMES**

**Kunio Yagi, Nagoya; Mariko Kitoh, Kani, and Nobuko Ohishi, Inuyama, all of Japan, assignors to Institute of Applied Biochemistry Gifu-ken, Japan**

**Filed Mar. 14, 1997, Ser. No. 818,716**
**Int. Cl.[6] A61K *9/127*; *48/00*; C12N *15/63***
**U.S. Cl. 424—450** **2 Claims**

**1**. A multilamellar liposome for entrapping plasmids which comprises lipids of N-(α-trimethylammonioacetyl)-didodecyl-D-glutamate chloride (TMAG), dioctanoylphosphatidyl choline (DOPC), and dioleoylphosphatidyl ethanolamine (DOPE) and wherein TMAG occupies 20% mole fraction of the total lipids, DOPC is 40–60% mole fraction and DOPE is 20–40% mole fraction.

**2**. A multilamellar liposome for entrapping plasmids which comprises lipids of N-(α-trimethylammonioacetyl)-didodecyl-D-glutamate chloride (TMAG), didecanoylphosphatidyl choline (DDPC) or dioctanoylphosphatidyl choline (DOPC) and dilauroylphosphatidyl ethanolamine (DLPE) and wherein TMAG occupies 20% mole fraction of the total lipids, DDPC or DOPC is 40% mole fraction and the residual part is DLPE, is 40% mole fraction.

**5,744,160**

**Patent Not Issued For This Number**

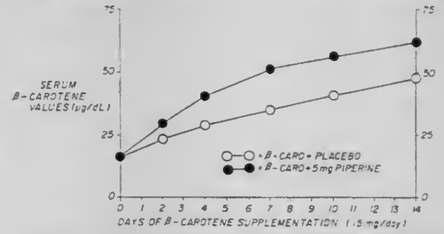
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**5,744,161**

**USE OF PIPERINE AS A BIOAVAILABILITY ENHANCER**

**Muhammed Majeed; Vladimir Badmaev, both of Piscataway, N.J., and Ramaswamy Rajendran, Jayanagar Eastend, India, assignors to Sabinsa Corporation, Piscataway, N.J.**

**Continuation-in-part of Ser. No. 393,738, Feb. 24, 1995, Pat. No. 5,536,506. This application Oct. 30, 1995, Ser. No. 550,496**
**Int. Cl.[6] A61F *2/02*; *6/06*; A61K *9/70*; *9/48***
**U.S. Cl. 424—464** **35 Claims**




**1**. A composition suitable for improving gastrointestinal absorption and systemic utilization of nutritional materials, subsequent increase in nutrient induced thermogenesis, and increase in lean body mass, comprising at least one nutritional material in a nutritionally effective amount and a bioavailability enhancing effective amount of a bioavailability enhancer comprising at least 98% of the alkaloid piperine.

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**5,744,162**

**TRANSDERMAL THERAPEUTIC FORMULATION AND A METHOD OF ADMINISTRATION THEREOF**

**Hideaki Okabe, Urawa; Ichiro Tsuchida, Koshigaya, and Takanori Saito, Misato, all of Japan, assignors to Lintec Corporation, Tokyo, Japan**

**Filed Aug. 13, 1992, Ser. No. 929,044**
**Int. Cl.[6] A61K *9/14***
**U.S. Cl. 424—486** **22 Claims**

**1**. In a transdermal therapeutic adhesive composition comprising an adhesive layer containing a pharmacologically active agent and adapted to adhere the composition to the skin, the improvement wherein the adhesion of the composition to the skin is provided by a polymer having lipophilic monomer units and hydrophilic monomer units in a weight ratio in the range from 98:2 to 0:100, wherein the composition has an adhesive strength of at least 25 g/12 mm and wherein the composition comprises 5 to 100 weight parts of a $C_2$–$C_3$ alcohol, 0 to 50 weight parts of a percutaneous absorption promoter and 10 to 40 weight parts of water, respectively based on 100 weight parts of the polymer.

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**5,744,163**

**SUSTAINED RELEASE FORMULATION OF ANIMAL GROWTH HORMONE AND PROCESS FOR PREPARATION THEREOF**

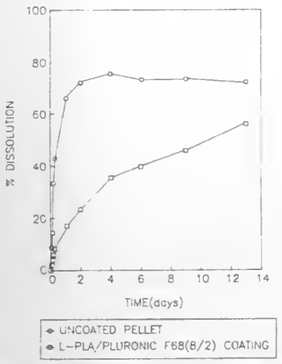
**Ae-Ri Kim; Nam-Joong Kim, and Min-Hee Jung, all of Daejeon, Rep. of Korea, assignors to LG Chemical Ltd., Seoul, Rep. of Korea**

**Filed Nov. 13, 1996, Ser. No. 749,912**
**Claims priority, application Rep. of Korea, Jan. 10, 1996, 96-341**
**Int. Cl.[6] A61K *9/14***
**U.S. Cl. 424—489** **10 Claims**

**1**. A sustained-release formulation of an animal growth hormone comprising a solid pellet containing an animal growth hormone

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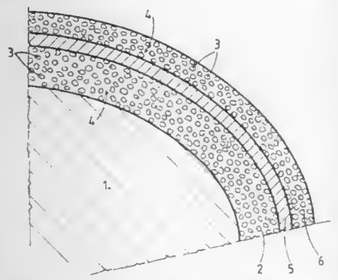

and an excipient; and a film composed of a biodegradable polymer and a poloxamer, wherein said film coats said pellet, and wherein the biodegradable polymer is polylactide (PLA), polyglycolide (PGA), poly(lactide-co-glycolide) (PLGA) or a mixture thereof.

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**5,744,164**
**SUSTAINED RELEASE MICROPARTICULATE CAFFEINE FORMULATION**

**Francoise Chauffard, Vevey; Mark Y. A. Enslen, Yverdon, and Pierre Tachon, Cugy, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland**

**Filed Dec. 16, 1994, Ser. No. 357,689**
**Int. Cl.[6] A61K** *9/16;9/54;9/58;9/60*
**U.S. Cl. 424—496** **14 Claims**



1. A sustained release stimulant composition of microparticles comprising:

a stimulant of xanthine or a xanthine derivative; and

substantially spherical solid cores of pharmaceutically acceptable organic material, having:

a) a first layer substantially surrounding the core which comprises a biodegradable matrix of a water soluble binding agent, a water insoluble release retarding agent, and between about 55–95% by weight of the total amount of stimulant present in the particle, wherein:

i) the binding agent binds the stimulant to the microparticle;

ii) the release retarding agent retards the release of the stimulant from the matrix; and

iii) the stimulant is uniformly distributed in the matrix;

b) a second layer substantially surrounding the first layer which comprises a water insoluble material for further delaying the release of the stimulant from the first layer; and

c) a third layer substantially surrounding the second layer which comprises a biodegradable matrix of a water soluble binding agent, a water insoluble release retarding agent and between about 5–45% by weight of the total amount of the stimulant present in the particle, wherein:

i) the binding agent binds the stimulant to the microparticle;

ii) the release retarding agent retards the release of the stimulant from the matrix; and

iii) the stimulant is uniformly distributed in the matrix.

and further wherein:

A) at least about 20–50% by weight of the total amount of the stimulant present in the composition is capable of being released within about 2 hours following oral administration; and

B) the balance of the stimulant is capable of being released within about 8–10 hours following oral administration.

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**5,744,165**
**NIMESULIDE SALT CYCLODEXTRIN INCLUSION COMPLEXES**

**Joseph Geczy, Bruxelles, Belgium, assignor to Europharmaceutical, S.A., Bruxelles, Belgium, and Cyclolab Cyclodextrin Research and Development Laboratory, Ltd., Budapest, Hungary**

**PCT No. PCT/HU94/00014, § 371 Date Mar. 21, 1995, § 102(e) Date Mar. 21, 1995, PCT Pub. No. WO94/28031, PCT Pub. Date Dec. 8, 1994**
**PCT Filed May 18, 1994, Ser. No. 374,765**
**Claims priority, application Hungary, May 24, 1993, P 93 01518**
**Int. Cl.[6] C08B** *37/16;* **A61K** *47/40;31/63*
**U.S. Cl. 424—499** **21 Claims**

1. An inclusion complex comprising 1) a nimesulide salt selected from an alkali salt and an alkaline earth salt, and 2) a cyclodextrin or a cyclodextrin derivative.

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**5,744,166**
**DRUG DELIVERY COMPOSITIONS**

**Lisbeth Illum, Nottingham, United Kingdom, assignor to Danbiosyst UK Limited, Nottingham, United Kingdom**

**Continuation-in-part of Ser. No. 167,611, Dec. 14, 1993, Pat. No. 5,554,388, which is a continuation of Ser. No. 743,328, Aug. 20, 1991, abandoned. This application Dec. 21, 1995, Ser. No. 576,877**
**Claims priority, application United Kingdom, Feb. 25, 1989, 89045370; WIPO, Feb. 23, 1990, PCT/GB90/00291**
**Int. Cl.[6] A61K** *9/50;9/14;9/20;47/36*
**U.S. Cl. 424—501** **41 Claims**

1. A pharmaceutical composition comprising:

a pharmacologically active agent and a polycationic polymer comprising a plurality of cationic groups, in a pharmaceutically acceptable carrier;

wherein (i) the polycationic polymer is not a polyamino acid which chelates calcium or magnesium ions, (ii) the composition does not consist of microcapsules coated with DEAE-dextran, and (iii) if for administration to gut mucosa, the composition does not consist of the active compound and a solution of DEAE-dextran.

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**5,744,167**
**METHODS FOR THE TREATMENT OF HERPES VIRUS INFECTIONS**

**Satyanarayana Majeti, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

**Division of Ser. No. 654,952, May 29, 1996, Pat. No. 5,658,946. This application Jan. 7, 1997, Ser. No. 779,787**
**Int. Cl.[6] A61K** *31/32;31/19;33/24*
**U.S. Cl. 424—650** **3 Claims**

1. A method for treatment of herpes virus infections in a human or lower animal subject comprising topically administering to the subject:



a. a safe and effective amount of a stannous halide selected from the group consisting of stannous bromide and stannous iodide, or a safe and effective amount of two or more stannous halides with the proviso that a combination of stannous fluoride and stannous chloride cannot be said two or more stannous halides; and

b. one or more pharmaceutically acceptable carriers suitable for topical administration.

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**5,744,168**
**METHODS AND COMPOSITIONS FOR THE PREVENTION AND TREATMENT OF GASTROINTESTINAL DISORDERS**

**Jamesina Anne Fitzgerald, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Dec. 7, 1995, Ser. No. 569,029**
**Int. Cl.[6] A61K** *33/24;31/65*
**U.S. Cl. 424—653** **16 Claims**

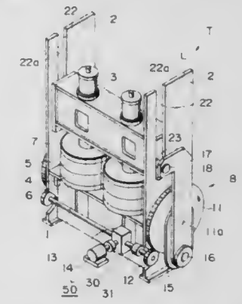
1. A method for treatment of a human or lower animal subject having a gastrointestinal disorder caused or mediated by one or more organisms selected from the group consisting of algae, cyanobacteria, and combinations thereof, comprising administering to the subject from about 50 milligrams to about 5000 milligrams of bismuth, per day for from about 1 to 56 days; and from about 100 milligrams to about 10,000 milligrams of each of one or more antimicrobials, per day, for from about 1 to about 28 days.

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**5,744,169**
**TIRE PRESS**

**Yasuhiko Fujieda, Hudson, Ohio; Hiroyuki Takehayashi, and Masaki Naoi, both of Takasago, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan, and Kobelco Stewart Bolling, Inc., Hudson, Ohio**

**Filed Aug. 8, 1996, Ser. No. 694,026**
**Int. Cl.[6] B29C** *35/02*
**U.S. Cl. 425—47** **5 Claims**



1. A tire press in which a mold comprising an upper mold and a lower mold is opened/closed and clamped by an operation of a crank mechanism, comprising:

a base for supporting the lower mold;

side frames disposed on opposite side of the base and provided with side slots which are vertically extended;

a top slide which slides along the side slots and holds the upper mold; and

a crank mechanism for moving the top slide only in vertical directions,

wherein the crank mechanism includes:

a crank gear;

a lever attached to the crank gear and whose front end is positioned on the outer side of the outer diameter of the crank gear; and

a link connecting a crank fulcrum at the tip of the lever and the top slide which slides along the side slots, and

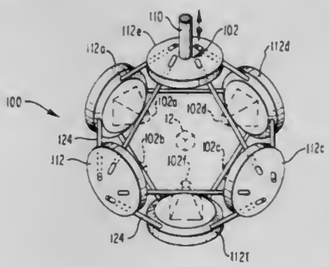
the side slots are vertically formed so as to be deviated from a vertical central line crossing the center of rotation of the crank gear and the crank fulcrum.

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**5,744,170**
**GUIDED HIGH PRESSURE PRESSES**

**H. Tracy Hall, 1711 N. Lambert Ln., Provo, Utah 84604-1858**

**Continuation-in-part of Ser. No. 623,058, Mar. 28, 1996, abandoned, which is a continuation of Ser. No. 234,790, Mar. 14, 1994, abandoned. This application Nov. 18, 1996, Ser. No. 751,412**
**Int. Cl.[6] B30B** *7/00*
**U.S. Cl. 425—77** **20 Claims**



1. A high pressure cubic press device comprising:

six press members at least five of which comprise moveable press members, each of the press members having a face oriented toward a central point and being mechanically interconnected such that the central point is substantially equidistant from each of the faces as the moveable press members are either moved towards or away from each of the other press members;

one to five hydraulic rams each directly connected to one of the moveable press members by means of a piston member for providing pressing forces to the moveable press members and being capable of selectively urging the one to five of the moveable press members connected to a hydraulic ram such that the moveable press members can be selectively moved towards or away from the central point; and

a guide system interconnecting the six press members for distributing the pressing forces from the one to five press members directly connected to a hydraulic ram to other of the moveable press members and for guiding movement of each of the moveable press members such that the moveable press members move simultaneously, synchronously, and symmetrically towards or away from the central point during urging of the at least one hydraulic ram and such that the central point is substantially equidistant from each of the faces of the six press members as the moveable press members are either moved towards or away from the central point, the guide system including rod means for directly connecting each one of the six press members with four of the other press members.

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**5,744,171**
**SYSTEM FOR FABRICATING CONDUCTIVE EPOXY GRID ARRAY SEMICONDUCTOR PACKAGES**

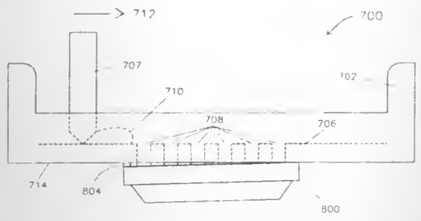
**Mark Schneider, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.**

**Continuation of Ser. No. 429,628, Apr. 27, 1995, abandoned, which is a division of Ser. No. 121,678, Sep. 15, 1993, Pat. No. 5,410,806. This application May 12, 1997, Ser. No. 854,769**
**Int. Cl.[6] H05K** *3/10;3/22*
**U.S. Cl. 425—110** **8 Claims**

1. A system for fabricating a semiconductor device assembly, said system comprising:

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means for attaching a semiconductor device to a printed wiring board having conductive paths thereon;

means for connecting the semiconductor device to the conductive paths on the printed wiring board;

means for encapsulating the semiconductor device and part of the printed wiring board having the semiconductor device attached thereto;

means for depositing conductive epoxy onto selected areas of the printed wiring board such that the conductive epoxy is deposited on the printed wiring board at a desired thickness so as to form conductive epoxy contacts adapted for connection to a printed circuit board, the selected areas being electrically connected to the conductive paths which are connected to the semiconductor device; and

means for partially staging the deposited conductive epoxy contacts.

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**5,744,172**

**EXTRUSION MOLDING MACHINE**

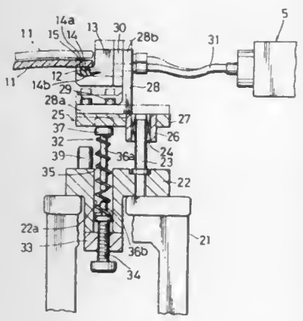
**Nobuhiko Todaka, Toyota, and Yoichi Hirai, Obu, both of Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Obu, Japan**

**Filed Dec. 3, 1996, Ser. No. 759,810**

**Claims priority, application Japan, Dec. 5, 1995, 7-316641; Sep. 24, 1996, 8-251961**

**Int. Cl.[6] B29C *47/02***

**U.S. Cl. 425—113** **10 Claims**




1. An extrusion molding machine for manufacturing a panel unit including a panel and a frame mounted on a peripheral edge of the panel, the extrusion molding machine comprising:

floating molding die means for forming the frame on the peripheral edge of the panel by extrusion molding, said floating molding die means being adapted to follow the fluctuation of the peripheral edge of the panel caused by variation of curvature of the panel while maintaining a constant frame profile during frame application to said panel.

**5,744,173**

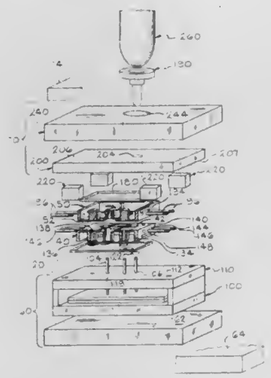
**MOLD INSERTS FOR INJECTION MOLDINGS**

**Robert A. Sterett, Jackson, Mich., assignor to Aeroquip Corporation, Maumee, Ohio**

**Filed Feb. 27, 1996, Ser. No. 607,755**

**Int. Cl.[6] B29C *45/73***

**U.S. Cl. 425—144** **17 Claims**




1. A molding apparatus (**90**) comprising

a core insert (**40**) removably attached to a first, core mounting plate (**110**), the core insert (**40**) having a back side (**130**) and a front side (**140**), the back side (**130**) defining a chamber (**134**) for receiving a cooling fluid, the back side (**130**) having at least one support means (**136**) axially extending in a direction away from the front side (**140**), and

a cavity insert (**50, 250**) removably attached to a second, cavity mounting plate (**200**), the cavity insert (**50, 250**) having a back side (**170, 260**) and a front side (**160, 252**), the back side (**170, 260**) of the cavity insert (**50, 250**) defining a chamber (**164, 264**) for receiving a cooling fluid, the back side (**170, 260**) of the cavity insert having at least one support means (**166, 270**) axially extending in a direction away from the front side (**160, 252**) of the cavity insert (**50, 250**), the front side (**140**) of the core insert (**40**) and the front side (**160, 252**) of the cavity insert (**50, 250**) defining a cavity (**154**) for molding an article;

at least one means (**149**) for circulating a fluid through the chambers (**134** and **154**) of the core insert (**40**) and cavity insert (**50, 250**); and,

at least one pressure bearing means (**220**) adjacent the core (**40**) and cavity (**50, 250**) inserts, the pressure bearing means (**220**) having height that is longer than the combined height of the core insert (**40**) and the cavity insert (**50**), the pressure bearing means (**220**) substantially absorbing the molding pressure when the core insert (**40**) and cavity insert (**50, 250**) are brought into facing engagement under molding pressure during operation of the molding apparatus (**90**), the pressure bearing means substantially transfers the molding pressure from the core insert (**40**) and the cavity insert (**50, 250**) to the core mounting plate (**110**) and the cavity mounting plate (**200**), respectively, during operation of the molding apparatus (**90**).

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**5,744,174**

**Patent Not Issued For This Number**



**5,744,175**

**DEVICE FOR EXPANDING ROTATIONALLY SYMMETRICAL SHAPED PARTS**

**Wolfgang Steinberger, Herzogenaurach; Leo Muntnich, Aurachtal, and Horst Lingner, Herzogenaurach, all of Germany, assignors to INA Walzlager Schaeffler KG, Germany**

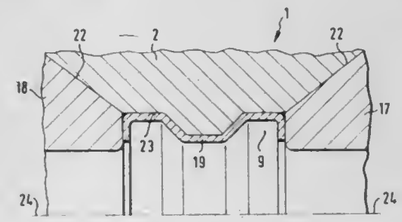
**PCT No. PCT/EP95/00121, § 371 Date Jul. 12, 1996, § 102(e) Date Jul. 12, 1996, PCT Pub. No. WO95/22420, PCT Pub. Date Aug. 24, 1995**

**PCT Filed Jan. 13, 1995, Ser. No. 676,317**

**Claims priority, application Germany, Feb. 18, 1994, 9402710 U**

**Int. Cl.[6] B21D *53/16***

**U.S. Cl. 425—390** **4 Claims**




1. A device for expanding rotationally symmetrical shaped parts (**16**), comprising a divided expanding mold (**1**), a pressure die (**11**) and a pressurizing means (**14**) for pressing the shaped part into a mold cavity, wherein the mold cavity (**9**) of the expanding mold (**1**) is defined in axial directions by continuous end faces (**20,21**) of two spaced annular molds (**17,18**) and in radial direction by an inner peripheral surface of two mold halves (**2,3**).

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**5,744,176**

**INJECTION STRETCH BLOW MOLDING APPARATUS**

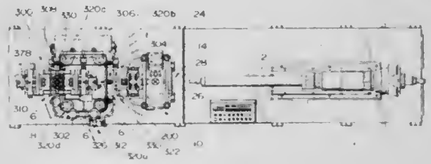
**Minoru Takada; Koichi Sato; Kazuyuki Yokobayashi, all of Ueda, and Shyuichi Ogihara, Komoro, all of Japan, assignors to Nissei Asb Machine Co., Ltd., Nagano, Japan**

**Filed Jun. 7, 1995, Ser. No. 474,746**

**Claims priority, application Japan, Sep. 16, 1994, 6-248416**

**Int. Cl.[6] B29C *49/06;49/12;49/61;49/70***

**U.S. Cl. 425—526** **24 Claims**




1. An injection stretch blow molding apparatus comprising:

a preform molding station for injection molding preforms;

a blow molding station for stretch blow molding the preforms into containers; and

a transfer station for transferring said preforms from the preform molding station to the blow molding station, wherein said preform molding station, said blow molding station, and said transfer station are disposed on a machine bed,

wherein the preform molding station comprises:

a first circulatory carrier for intermittently circulatorily carrying along a first carrying path two sets of injection core molds and two sets of neck cavity molds, each of said neck cavity molds having neck cavity mold halves;

an injection molding section for injection molding the preforms having an injection cavity mold together with which one of the injection core molds and one of the neck cavity molds, stopped in the carrying path, are severally clamped; and

an ejecting section for ejecting the preforms from one of the injection core molds and one of the neck cavity molds, stopped in the carrying path,

wherein said injection molding section comprises:

a lower clamping plate disposed on the machine bed;

an upper clamping plate disposed above said lower clamping plate;

a clamping mechanism for moving said upper clamping plate relative to said lower clamping plate, wherein said one of the injection core molds and one of the neck cavity molds are clamped with said injection cavity mold; and

wherein said ejecting section comprises:

mold opening means for separating said one of the neck cavity molds relative to said one of the injection core molds through a stroke which allows a space between said one of the injection core molds and an inner surface of each of the preforms held by said one of the neck cavity molds; and

neck cavity mold halves opening means which separates said neck cavity mold halves and ejects said preforms after said one of the neck cavity molds is mold-opened.

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**5,744,177**

**INJECTION MOLDING ASSEMBLY**

**Rong-Teng Lin, 58, Ma Yuan West St., Taichung, Taiwan**

**Filed Jun. 11, 1996, Ser. No. 661,866**

**Int. Cl.[6] B29C *45/66***

**U.S. Cl. 425—589** **1 Claim**




1. An injection molding assembly comprises:

a platform,

two slide seats disposed on two upper sides of the platform,

a hollow fixed plate and an injection device disposed on the platform,

a movable plate disposed on the slide seats longitudinally;

a taper hole and a through hole formed in a center of the fixed plate,

the taper hole communicating with the through hole,

a barrel of the injection device inserted in the taper hole,

a nozzle disposed in front of the barrel,

the nozzle passing through the through hole to reach a mold,

a first, second, third and fourth clamping devices disposed on four corners of the locking device to connect a first, second, third and fourth support rods, respectively,

the first, second, third and fourth support rods passing through the locking device, the movable plate and the hollow fixed plate,

the hollow fixed plate having a protruded lateral plate,

a mold support device disposed on a center of the movable plate,

the locking device having a first and second parallel locking plates connecting the movable plate,

a first, second, third and fourth adjusting devices disposed on a right upper corner, left upper corner, left lower corner, and right lower corner of the fixed plate,

each of the support rods having a threaded front section,

each of the first, second, third and fourth adjusting devices having a cushion ring and a hollow nut passed through by each of the corresponding threaded front sections, respectively,

the hollow nut enclosed by a follower gear which engaging with a driving gear,

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the follower gear driving the threaded front section to move rearward and forward,

a bearing disposed between the hollow nut and an adjusting plate,

two positioning bolts fastening the adjusting plate on the hollow fixed plate,

a driving device having the driving gear disposed on the hollow fixed plate, a motor connected to the protruded lateral plate by four screws, a shaft bearing disposed in a center of the motor, a driving pinion disposed on the hollow fixed plate, the driving pinion engaged with a follower pinion, a shaft passing through a center of the shaft bearing and connecting an axle of the driving pinion, and an oil motor connecting the shaft,

each of the first, second, third and fourth clamping devices having a first clamp half nut and a second clamp half nut facing the first clamp half nut,

a left and right lateral positioning seats disposed adjacent to the corresponding clamp half nuts, respectively,

an upper slide rod passing through the left lateral positioning seat, an upper left block, an upper right block, and the right lateral positioning seat,

a lower slide rod passing through the left lateral positioning seat, a lower left block, a lower right block, and, the right lateral positioning seat,

a bottom bolt connecting a rear end of the corresponding support rod,

an inserting block disposed on the bottom bolt abutting a positioning board which extends from the first clamp half nut,

a positioning mount disposed on the positioning board,

a positioning mounting disposed on the second clamp half nut,

a second oil cylinder having a first lid connecting the positioning mounting, a second lid connecting a second cover of the mold support device, a first piston rod disposed in the second oil cylinder, and a piston ring connecting an inner end of the first piston rod,

a first oil hole formed on the first lid,

the first piston rod passing through the positioning mount and the first lid,

the first and fourth clamping devices disposed on an upper and lower ends of the first locking plate, respectively,

the second and third clamping devices disposed on an upper and lower ends of the second locking plate, respectively,

each of the first and second locking plates passed through by a locking piston rod,

each said locking piston rod connecting a locking piston which is inserted in an interior of the movable plate,

a hollow disk covering an opening of the interior of the movable plate,

a second oil hole formed in the hollow disk,

a hollow cushion abutting the hollow disk,

the mold support device having a third oil cylinder which has the second cover, the first cover, an annular ring disposed in the third oil cylinder, a bottom plate abutting the first cover, and a second piston rod connecting the annular ring and passing through the first cover and the bottom plate to connect a pivot of the mold,

the mold support plate and the bottom plate connected by a plurality of slide plates,

a bush disposed between the mold support plate and the slide plates,

an enlarged hole formed in the movable plate to receive the mold support plate,

wherein each oil motor is actuated to drive each said corresponding shaft and each said corresponding driving pinion to rotate, each said corresponding driving pinions drives each said corresponding driving gear to rotate, each said corresponding driving gear drives each said corresponding follower gear and each said corresponding hollow nut to rotate and to move each said corresponding support rod rearward and forward.

**5,744,178**

**RUMINANT FEED ADDITIVE COMPOSITION CONTAINING NOVEL PHOSPHORIC ACID-AMINO ACID-POLYVALENT METAL COMPOSITE SALT AND GASTRIC ANTACID**

**Tnru Ikeda; Toshihide Yukawa; Hisamine Kobayashi; Hiroyuki Sato, and Nnbuyoshi Kitamura, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan**

**Filed Dec. 27, 1996, Ser. No. 774,362**

**Claims priority, application Japan, Dec. 27, 1995, 7-341250**

**Int. Cl.[6] A23K *1/175***

**U.S. Cl. 426—2** **21 Claims**

1. A ruminant feed additive, comprising:

a gastric antacid in an amount effective for controlling the pH of the rumen, and

a phosphoric acid-amino acid-polyvalent metal composite salt,

wherein said phosphoric acid-amino acid-polyvalent metal composite salt comprises at least one alkaline-earth metal selected from the group consisting of Mg, Ca, Sr and Ba, a phosphate moiety of a phosphoric acid selected from the group consisting of orthophosphoric acid, polyphosphoric acids and metaphosphoric acids, and at least one amino acid selected from the group consisting of natural basic amino acids, basic derivatives of natural basic amino acids and basic derivatives of neutral amino acids, and

said phosphoric acid-amino acid-polyvalent metal composite salt is less soluble in neutral or alkaline aqueous solution than in acidic aqueous solution.

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**5,744,179**

**LOW-PHOSPHORUS WHEY PROTEIN, MANUFACTURING METHOD THEREOF, LOW-PHOSPHORUS PURIFIED WHEY HYDROLYSATE AND MANUFACTURING METHOD THEREOF**

**Seiichi Shimamura; Yoshitaka Tamura; Teruhiko Mizota; Yasushi Kawaguchi; Yoko Nagasako, and Hiroshi Ochi, all of Kanagawa, Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan**

**PCT No. PCT/JP93/01729, § 371 Date Sep. 6, 1995, § 102(e) Date Sep. 6, 1995, PCT Pub. No. WO94/12053, PCT Pub. Date Jun. 9, 1995**

**PCT Filed Nov. 26, 1993, Ser. No. 428,129**

**Claims priority, application Japan, Nov. 30, 1992, 4-320857; May 31, 1993, 5-129696**

**Int. Cl.[6] A23C *9/146***

**U.S. Cl. 426—41** **6 Claims**

1. A low-phosphorus whey protein comprising a phosphorus content of up to 0.15 mg per gram of protein.

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**5,744,180**

**COMESTIBLES CONTAINING STABILIZED HIGHLY ODOROUS FLAVOR COMPONENT DELIVERY SYSTEMS**

**Suhraman R. Cherukuri, Towaco, N.J.; Gerald E. Battist, Reston, and Jose F. Zamudio-Tena, Vienna, both of Va., assignors to Fuisz Technologies Ltd., Chantilly, Va.**

**Division of Ser. No. 475,963, Jun. 7, 1995, Pat. No. 5,633,027, which is a division of Ser. No. 286,286, Aug. 5, 1994, Pat. No. 5,556,652. This application Oct. 23, 1996, Ser. No. 735,890**

**Int. Cl.[6] A23D *7/00***

**U.S. Cl. 426—99** **12 Claims**

1. A comestible composition formed by the process comprising:

(i) providing a mixture of a non-fat solid substrate having imbibed therein or coated thereon a blend of a highly odorous flavor oil component and a medium chain triglyceride and

(ii) subjecting said mixture to conditions of temperature and force sufficient to induce flash flow of said substrate, whereby a solid matrix entrapping said highly odorous flavor oil component is formed.



**5,744,181**

**PACKAGING METHOD USING THERMOPLASTIC MATERIALS AND PACKAGE OBTAINED THEREBY**

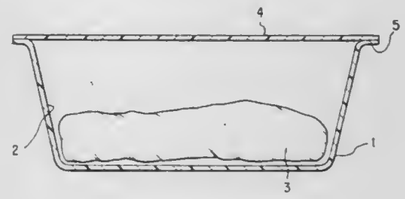
**Jean Denis Sornay, Paris, and Philippe Gomes Da Silva, Evry, both of France, assignors to W. R. Grace & Co.-Conn., Duncan, S.C.**

**Filed Feb. 20, 1996, Ser. No. 603,794**

**Claims priority, application European Pat. Off., Mar. 1, 1995, 95102885**

**Int. Cl.[6] B29C *45/00*; *51/00*; B65B *7/28*; B65D *85/00***

**U.S. Cl. 426—106** **20 Claims**




1. A packaging method comprising:

a) providing a tray with heat-sealable rims;

b) loading said tray with a product to be packaged;

c) applying a heat-sealable lid on top of the tray, the lid comprising a biaxially oriented heat-shrinkable film having a maximum shrink force, measured at the temperature in the lid sealing station during sealing, of 0.05 kg/cm in at least the transverse direction; and

(d) heat-sealing said lid to the tray rims.

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**5,744,182**

**AROMATISATION PROCESS USED IN FOOD PACKAGING**

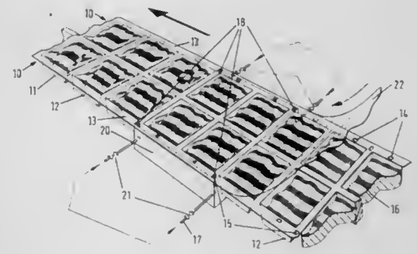
**Bo Andersson, Oxie, Sweden, and Dominique Villot, Lausanne, Switzerland, assignors to Nestec S.A., Vevey, Switzerland**

**Filed Apr. 29, 1996, Ser. No. 640,388**

**Claims priority, application European Pat. Off., May 4, 1995, 95106702**

**Int. Cl.[6] A23L *3/3418***

**U.S. Cl. 426—316** **17 Claims**




1. A process for introducing an aroma into the headspace of a package containing a food product during the gas packaging of the food product which comprises introducing a modified atmosphere into the headspace, and introducing a food acceptable aroma dissolved in a liquid food acceptable gas under pressure into the headspace of the package.

**5,744,183**

**REMOVAL OF SULFIDES FROM ALCOHOLIC BEVERAGES**

**Robert M. Ellsworth, 1770 Dean York La., St. Helena, Calif. 94574, and Gordon Burns, 1324 Los Posadas Rd., Angwin, Calif. 94508**

**Filed Aug. 17, 1995, Ser. No. 516,073**

**Int. Cl.[6] C12C *11/11*; C12G *1/00*; C12H *1/00***

**U.S. Cl. 426—330.4** **12 Claims**

1. A method for the treatment of an alcoholic beverage to remove dissolved sulfides, comprising:

(a) treating a polymer in solid form selected from the group consisting of polyvinylimidazole and copolymers of N-vinylpyrrolidone and N-vinylimidazole with an aqueous solution of a metallic salt selected from the group consisting of salts of copper, silver, iron, nickel, zinc, aluminum and tin;

(b) after said polymer has been so treated, separately contacting said alcoholic beverage with said polymer to adsorb sulfides on said polymer from said alcoholic beverage; and

(c) separating said alcoholic beverage from said polymer.

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**5,744,184**

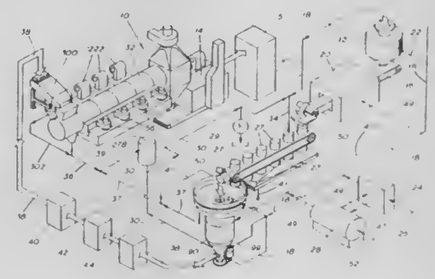
**METHOD FOR EFFICIENT UTILIZATION OF WATER IN PROCESSING FOOD PRODUCTS**

**John Hugh Kendall, Sugar Land; Ranvir Biki Mohindra; Duane Stephen Rutherford, both of Houston, all of Tex.; Satoru Satake, Tokyo, Japan; Sigeharu Kanamoto, and Katsuyuki Kumamoto, both of Mihara, Japan, assignors to Riviana Foods, Inc., Houston, Tex.**

**Continuation of Ser. No. 116,071, Sep. 2, 1993, abandoned. This application Mar. 8, 1996, Ser. No. 610,607**

**Int. Cl.[6] A23L *1/182***

**U.S. Cl. 426—506** **20 Claims**



1. A method of processing rice grains using fresh water and process water comprising the steps of:

steeping the rice grains in water;

cooking the rice grains with water;

collecting excess process water from the steeping or cooking steps;

minimizing the amount of fresh water used in the process by reusing a portion of the collected process water to steep or cook additional rice grains; and

maximizing the collected process water that is reused by steeping and cooking the rice grains at a temperature and pressure that substantially reduces formation of free starch.

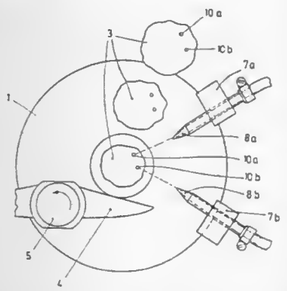
VOL 1209 ISS 4 AP 28 1998 UMI



5,744,185
**PROCESS AND DEVICE FOR EXTRUDING AND COATING FOODSTUFFS**

Heinz Josef Schaaf, Bad Camberg, Germany, assignor to Shaaf Technologie GmbH, Bad Camberg, Germany

PCT No. PCT/EP94/02401, § 371 Date Jan. 2, 1996, § 102(e) Date Jan. 2, 1996, PCT Pub. No. WO95/03703, PCT Pub. Date Feb. 9, 1995
PCT Filed Jul. 20, 1994, Ser. No. 582,985
Claims priority, application Germany, Aug. 3, 1993, 43 26 047.0
Int. Cl.[6] A21C *11/00*; A23P *1/00*
U.S. Cl. 426—516 16 Claims




1. In a process for extruding a material at a predetermined rate of extrusion, spraying-on said material, and cutting-off said material at a predetermined rate of cutting, in which said extruding of said material is by means of an extruder device and cutting-off said material is by means of a cutting device, said cutting-off of said material being performed after said material leaves an extrusion die, thereby producing an extruded material, the improvement comprising

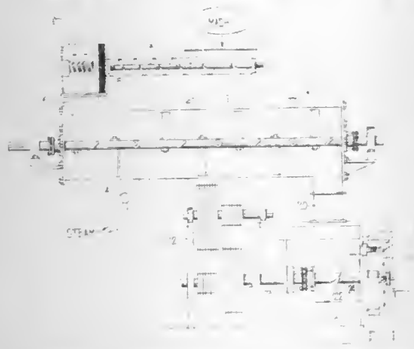
intermittently spraying-on said extruded material at least one additive after said extruded material leaves said extrusion die but before said cutting-off of said extruded material; and

interrupting said spraying-on during said cutting-off of said extruded materiad.

5,744,186
**METHOD FOR PREPARING ANIMAL FOOD PELLETS**

Harold Ronald Harrison, Wichita, Kans., assignor to Pelleting Concepts International, Inc., Wichita, Kans.

Filed Dec. 5, 1996, Ser. No. 760,505
Int. Cl.[6] A23L *1/00*; A23K *1/00*
U.S. Cl. 426—516 14 Claims



1. A method of preparing animal feed pellets wherein the steps comprise

(a) feeding dry mash through a hopper and into a feeder which pushes the mash against a pressure seal;

(b) conditioning the mash with steam under a superatmospheric pressure in a superatmospheric chamber, said chamber being defined at the ends thereof by said pressure seal at a top end and a circular pellet die at a bottom end, said pressure being maintained throughout the superatmospheric chamber to increase conditioning and gelatinization of the mash;

(c) extruding radially said mash through a plurality of orifices of said die to form rods; and

(d) severing transversely the rods to form animal feed pellets

5,744,187
**NUTRITIONAL POWDER COMPOSITION**

Mitchel L. Gaynor, 1070 Park Ave., Ste 1E, New York, N.Y. 10128

Filed Dec. 16, 1996, Ser. No. 767,584
Int. Cl.[6] A23L *2/02*
U.S. Cl. 426—599 2 Claims

1. A beneficial palliative nutritional drink comprising:

(a) a liquid selected from the group consisting of water, fruit juice, and tomato juice;

(b) an algae powder selected from the group consisting of Spirulina, Klamath Lake Blue Green, CGC Chlorella, Australian Dunaliella Salina, Red Dumontiaceae, Wildcrafted-Longicrusis, Digitata Kelp, Bladderwrack, Irish Moss, Pulse, and Alaria;

(c) a green grass juice powder selected from the group consisting of Kamut grass, Barley grass, Oat grass, Wheat grass, Spelt grass, alfalfa grass, and Sinach Octacosanol;

(d) a Chinese herb selected from the group consisting of Siberian Ginseng, Astragalus, Tang-Kuei, Rehmania, Fo-ti, Atractylodes, Hoelen, Codonopsis, Schizandra, Peony Alba, Polygala, Ginger, Citrus peel, Licorice, Wallachi, and Jujuba;

(e) a western herb selected from the group consisting of Ginkgo Biloba, Red Clover, Nettles, Burdock root, Yellow dock, Skullcap, Dandelion, Parsley, Jerusalem Artichoke, Rose hips, Milk thistle, and Echinacie Angustifolia;

(f) a mushroom powder selected from the group consisting of *Ganoderma lucidum, Cordyceps sinensis, Grifola frondosus, Lentinus edodes*, and *Tremella fuciformia*; and

(g) an additional nutrient selected from the group consisting of high pectin apple fiber, soy lecithin, brown rice germ, Royal jelly, Montana bee pollen, Acerola berry juice powder, Japanese Sensia Green Tea, Grapeseed Extract, European billberry, Flaxseed oil, and L-Carnitine.

5,744,188
**PROCESS FOR PREPARING DEHYDRATED BEAN PRODUCTS**

Shanti Kolla, Ontario; Ash Husain, Chino Hills, and Jerry Costales, Fullerton, all of Calif., assignors to Hunt-Wesson, Inc., Fullerton, Calif.

Filed Jun. 19, 1996, Ser. No. 667,115
Int. Cl.[6] A23L *1/201*
U.S. Cl. 426—629 31 Claims

1. A process for preparing rapidly reconstitutable, dehydrated legume products comprising the steps of:

(a) hydrating raw legumes by

(i) treating the raw legumes with an alkaline solution under conditions sufficient to raise the pH of the legumes to from about 6.7 to about 7.7 and the moisture content to from about 30 to about 45 wt %

(ii) neutralizing the thus alkali-treated legumes with an acidic solution under conditions sufficient to lower their pH to from about 5.5 to about 6.5 and raise their moisture content by at least 5 wt % to from about 40 to about 60 wt %



(b) cooking the hydrated legumes; and then

(c) dehydrating the thus cooked legumes.

5,744,189
**METHOD OF ENSILING FODDER**

Bernd Pieper, Dorfstrasse 34, 16818 Wuthenow, Germany

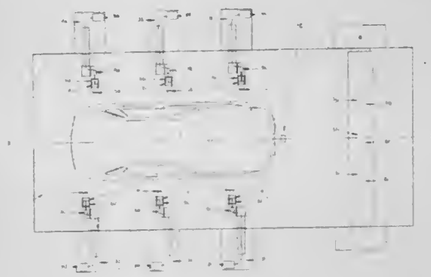
PCT No. PCT/EP94/00478, § 371 Date Nov. 13, 1995, § 102(e) Date Nov. 13, 1995, PCT Pub. No. WO94/18847, PCT Pub. Date Sep. 1, 1994
PCT Filed Feb. 18, 1994, Ser. No. 513,892
Claims priority, application Germany, Feb. 24, 1993, 43 05 683.5
Int. Cl.[6] A23K *3/03*
U.S. Cl. 426—636 20 Claims

1. Method of ensiling fodder made from fresh or wilted silage material, which comprises subjecting said fodder to a homofermentative lactic acid fermentation, while adding solid carbon dioxide to the silage material in an amount of 0.5 to 20 kg per ton of fodder in a manner of distribution that an increased amount of carbon dioxide is added to the oxygen-endangered marginal and superficial zones, wherein the fermentation process is carried out with an amount of silage material large enough, so that the temperature of the silage material is substantially unchanged in relation to the ambient temperature.

5,744,190
**PROCESS AND DEVICE FOR SPRAYING A COATING PRODUCT**

Caryl Thome, Saint-Egreve, France, assignor to Sames S.A., Meylan, France

Filed Nov. 17, 1995, Ser. No. 559,087
Claims priority, application France, Nov. 18, 1994, 94 14047
Int. Cl.[6] B05D *1/02*; B05C *11/00*
U.S. Cl. 427—8 11 Claims

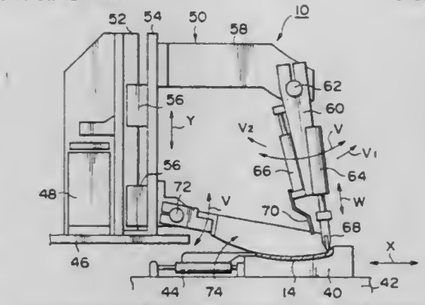


1. In a process for spraying a coating product onto an article from a sprayer to which coating product is supplied from a reservoir equipped with a piston which is moved along a path in order to transport the coating product to the sprayer, wherein the sprayer is positionable at any one of a plurality of positions relative to the article and the piston is positionable at any one of a plurality of positions along the path, each position of the piston corresponding to the position of the sprayer relative to the article the improvement comprising: sensing the position of the sprayer relative to the article and providing an indication of that position; and controllably placing the piston at a position along the path which corresponds to the position of the sprayer relative to the article, in response to the position indication provided in said sensing step.

5,744,191
**METHOD AND APPARATUS FOR USE IN PRODUCING CATHODE RAY TUBE**

Tsuneo Muchi; Yoji Kono, both of Kanagawa, and Kano Shimizu, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 408,573, Mar. 22, 1995, Pat. No. 5,660,875. This application Mar. 26, 1997, Ser. No. 825,167
Claims priority, application Japan, Mar. 23, 1994, 6-051783
Int. Cl.[6] B05D *5/06*
U.S. Cl. 427—64 5 Claims




1. A method of coating a curved surface of a curved panel with ink comprising the steps of:

placing the curved panel in a slide table with the curved surface exposed for coating with the ink;

moving the slide table with the curved panel to a fixed position;

moving a printing block having a curved screen-printing screen and an ink spreader toward the curved panel;

positioning the screen-printing screen at a predetermined clearance from the curved surface;

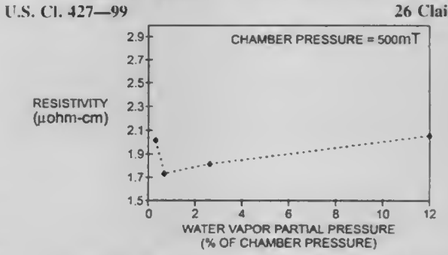
applying the ink to the screen-printing screen; and

forcing the ink through the screen-printing screen and onto the curved surface with the ink spreader.

5,744,192
**METHOD OF USING WATER VAPOR TO INCREASE THE CONDUCTIVITY OF COOPER DESPOSITED WITH CU(HFAC)TMVS**

Tue Nguyen; Yoshihide Senzaki; Masato Kobayashi; Lawrence J. Charneski, all of Vancouver, and Sheng Teng Hsu, Camas, all of Wash., assignors to Sharp Microelectronics Technology, Inc., Camas, Wash., and Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 8, 1996, Ser. No. 745,562
Int. Cl.[6] B05D *5/12*; C23C *16/04*; *16/18*
U.S. Cl. 427—99 26 Claims




1. A method for applying chemical vapor deposition (CVD) copper (Cu) on selected copper-receiving surfaces in an integrated circuit (IC), the copper-receiving surfaces being located inside a chamber having chamber walls and a total chamber pressure which includes a volatile Cu(hfac)TMVS (copper hexafluoroacetylacetonate trimethylvinylsilane) precursor pressure and a water vapor pressure, wherein the partial pressure of water vapor in the chamber is the ratio of the water vapor pressure to the total chamber pressure, the method comprising the steps of:

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a) supplying volatile Cu(hfac)TMVS precursor to the chamber;
b) supplying the water vapor to the chamber, and controlling the supply of water vapor so that the water vapor partial pressure is in the range of 0.3 to 3%;
c) exposing each selected copper-receiving surface to the volatile Cu(hfac)TMVS precursor;
d) simultaneously exposing each selected cooper-receiving surface to the water vapor;
e) depositing Cu on each cooper-receiving surface in response to steps a) through d), whereby the addition of water vapor to the Cu(hfac)TMVS precursor, in the amount described in step b), increases the electrical conductivity across the Cu deposited in step e).

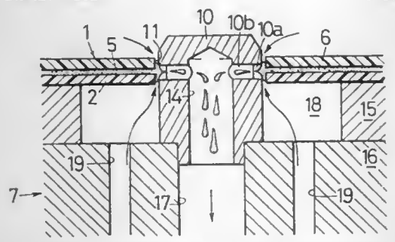
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**5,744,193**

## METHOD OF MANUFACTURING AN OPTICAL DISC AND A PLACING PLATFORM TO BE USED BY THE SAME

**Ryoko Kitano, Tokushima-ken, Japan, assignor to Kitano Engineering Co., Ltd., Komatsushima, Japan**

**Filed May 17, 1996, Ser. No. 650,908**
**Claims priority, application Japan, May 20, 1995, 7-145231**
**Int. Cl.[6] G11B** *7/26*
**U.S. Cl. 427—162** **8 Claims**




1. A method of manufacturing an optical disc having first and second resin substrates each with a central hole therethrough and having uncured adhesive in a space between the first and second resin substrates, comprising the steps of:
placing the optical disc on a placing platform so that the optical disc is supported thereon;
inserting a boss into aligned central holes in the first and second resin substrates so that a gap is defined between a peripheral surface of the boss and an inner edge of each of said first and second resin substrates;
orienting suction openings oriented around a periphery of the boss adjacent a radially inner edge of a space between said first and second substrates occupied by the uncured adhesive; and
rotating the first and second resin substrates to effect a radially outward spreading of the uncured adhesive while simultaneously drawing ambient air through the gaps and into the suction openings to effect a pressure reduction thereat and a radially inward spreading of the uncured adhesive.

3. A placing platform arrangement for supporting an optical disc having first and second resin substrates each with a central hole therethrough and having uncured adhesive in a space between the first and second resin substrates, comprising:
a table having a support surface thereon adapted to support the first resin substrate thereon, the table having means defining an opening therein;
a hollow boss mounted on said table so as to be oriented in the first central hole of the first resin substrate, an interior of the hollow boss being connected to the opening in said table, the boss having suction openings oriented around a periphery of the boss adjacent a radially inner edge of the first resin substrate and connected to the hollow interior of the boss;
rotation means for simultaneously rotating the first and second resin substrates to effect a radially outward spread of the uncured adhesive in a space between the first and second resin substrates; and
suction means for effecting a pressure reduction at a radially inner edge of the space between the first and second resin substrates and a radially inward spread of the uncured adhesive.

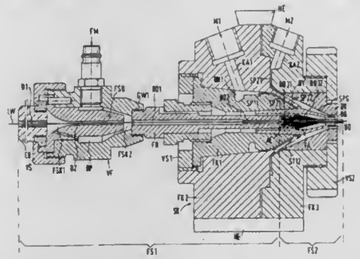
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**5,744,194**

## PROCESS AND DEVICE FOR COATING AT LEAST ONE OPTICAL WAVEGUIDE

**Thomas Müller, Sonneberg; Frank Renner, Neustadt; Wilfried Reissenweber, Rödental, and Reiner Schneider, Ebersdorf, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**PCT No. PCT/DE94/01511, § 371 Date Jun. 21, 1996, § 102(e) Date Jun. 21, 1996, PCT Pub. No. WO95/17694, PCT Pub. Date Jun. 29, 1995**
**PCT Filed Dec. 20, 1994, Ser. No. 666,395**
**Claims priority, application Germany, Dec. 23, 1993, 43 44 250.1**
**Int. Cl.[6] B05D** *5/06*
**U.S. Cl. 427—163.2** **16 Claims**



1. In a process for coating at least one optical waveguide with a filling compound, the coating being undertaken in at least two successive filling stages and part of the filling compound being wiped off by means of a wiping device of a reduced cross section between a first and second filling stages, the improvement comprising feeding a proportion of the filling compound which is wiped off in the region of the wiping device past the wiping device in the passage direction of the optical waveguide via a bypass to the second filling stage for coating the optical waveguide with filling compound in the second filling stage.

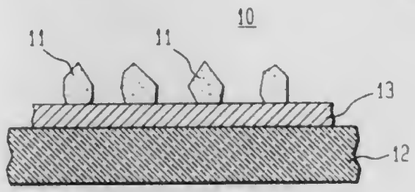
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**5,744,195**

## FIELD EMISSION DEVICES EMPLOYING ENHANCED DIAMOND FIELD EMITTERS

**Sungho Jin, Millington; Gregory Peter Kochanski, Dunellen; Lawrence Seibles, Piscataway, and Wei Zhu, North Plainfield, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Division of Ser. No. 331,458, Oct. 31, 1994, Pat. No. 5,637,950. This application Nov. 19, 1996, Ser. No. 752,234**
**Int. Cl.[6] C23C** *16/26*; **B05D** *3/06*
**U.S. Cl. 427—249** **8 Claims**




1. A method for making a diamond field emitter comprising the steps of:
providing a substrate;



growing diamond material on said substrate in the form of diamond islands less than 10 μm in diameter, said diamond material grown by CVD deposition of a gas consisting of more than 2 atomic percent of carbon in hydrogen at a temperature less than 900° C., whereby said diamond material is grown as diamond characterized by a broadband diamond peak at K=1332 $cm^{-1}$ in Raman spectroscopy with a full width at half maximum in the range 7–11 $cm^{-1}$;
said diamond material emitting electrons in a current density of at least 0.1 $mA/mm^2$ at an applied field of 25 V/μm or less.

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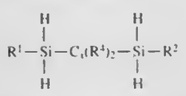
**5,744,196**

## LOW TEMPERATURE DEPOSITION OF SILICON DIOXIDE USING ORGANOSILANES

**Ravi Kumar Laxman, Encinitas, and Arthur Kenneth Hochberg, Solana Beach, both of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**Continuation of Ser. No. 368,571, Jan. 4, 1975, abandoned. This application Jul. 11, 1996, Ser. No. 678,277**
**Int. Cl.[6] C23C** *16/40*
**U.S. Cl. 427—255.3** **7 Claims**

1. A process for low temperature chemical vapor deposition of silicon dioxide, comprising the steps of
a) heating a substrate upon which the silicon dioxide is to be deposited to a temperature in the range of approximately 150° to 500° C. in a vacuum maintained at a pressure in the range of approximately 50 to 750 mTorr;
b) introducing into said vacuum an organosilane containing feed and an oxygen containing feed, said organosilane containing feed consisting essentially of one or more compounds having the general formula:



wherein $R^1$ and $R^2$ are independently alkyl, alkenyl, alkynyl, or aryl, having $C_1$ to $C_6$, or $R^1$ and $R^2$ are combined to form an alkyl chain $C_x(R^3)_2$, where $R^3$ is independently H, $C_yH_{2y+1}$, and x=1–6, and $R^4$ is independently H, $C_yH_{2y+1}$ where y=1–6; and
c) maintaining said temperature and vacuum thereby causing a thin film of the silicon dioxide to deposit on the substrate.

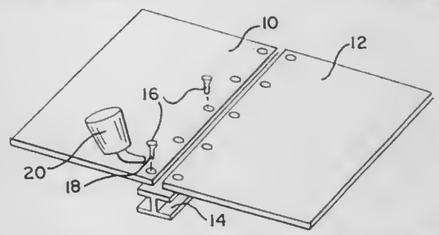
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**5,744,197**

## METHOD OF PROTECTING ALUMINUM SKINS OF LAND VEHICLES FROM CORROSION

**Darrell Van Eck, West Dundee, Ill., assignor to J. B. Faith Co., Elgin, Ill.**

**Continuation-in-part of Ser. No. 702,845, Aug. 26, 1996, abandoned. This application Jul. 21, 1997, Ser. No. 897,432**
**Int. Cl.[6] B05D** *3/00*
**U.S. Cl. 427—328** **18 Claims**




1. A method, for use upon a body of a vehicle and having at least one metal skin and stringer that are assembled together with at least one fastener of a dissimilar metal inserted into said skin and stringer, comprising the steps of:
applying to a distal end of at least one said fastener an amount of a bedding compound generally sufficient to coat the fastener in all its areas which contact the metal skin and stringer, the bedding compound comprising metallic zinc suspended in a petroleum base;
inserting the fastener, before significant hardening of the bedding compound, into and through portions of the skin and stringer of said vehicle body and securing the fastener therein; and
removing from the surface of the skin and from the exposed surface of the fastener substantially all said bedding compound that is left after securing the fastener.

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**5,744,198**

## METHOD OF DEPOSITING METAL SULFIDE FILMS FROM METAL THIOCARBOXYLATE COMPLEXES WITH MULTIDENTATE LIGANDS

**Mark Hampden-Smith; Klaus Kunze, and May Nyman, all of Albuquerque, N. Mex., assignors to The University of New Mexico, Albuquerque, N. Mex.**

**Filed Feb. 27, 1996, Ser. No. 607,363**
**Int. Cl.[6] B05C** *3/02*; *5/06*
**U.S. Cl. 427—376.6** **19 Claims**

1. A method of depositing a metal sulfide film on a substrate, said method comprising the steps of:
dissolving in a solvent at least one metal compound precursor comprising at least one thiocarboxylate ligand SECR and at least one solubility-improving ligand L, to produce a solution, wherein:
a) E is selected from the group consisting of O and S and R is selected from the group consisting of alkyl, aryl, substituted alkyl, substituted aryl, halogenated alkyl, and halogenated aryl; and
b) L is selected from the group of organic monodentate ligands, organic multidentate ligands, and $R^1O$ ligands, wherein $R^1O$ is selected from the group of alkyloxide and aryloxide;
coating the solution onto a substrate; and
heating the substrate to a reaction temperature sufficient to decompose said at least one metal compound precursor to form a metal sulfide film of at least one metal on the substrate.

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**5,744,199**

## METHOD OF SEALING OPENINGS IN STRUCTURAL COMPONENTS OF BUILDINGS FOR CONTROLLING THE PASSAGE OF SMOKE

**Eric Jude Joffre; Robert Mark Schroeder; Arthur James Tselepis, and Andreas Thomas Franz Wolf, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Oct. 31, 1996, Ser. No. 740,576**
**Int. Cl.[6] B05D** *1/02*; *3/00*
**U.S. Cl. 427—389** **25 Claims**

1. A method of sealing openings in structural components of a building to reduce the amount of smoke which may pass through the openings, which method comprises:
(a) substantially filling an opening in a structural component with a support material so that a filled opening is formed;
(b) applying a coating of a water-based silicone emulsion composition having a viscosity from 1000 mPa s to 120,000 mPa s measured at 24° C. and 2.5 rpm, over the filled opening, the structural component adjacent to the filled opening and any objects passing therethrough; and
(c) allowing the water-based silicone emulsion composition to cure into a continuous elastomeric film having a minimum thickness of 0.25 mm, which adheres to the support material in the filled opening, the adjacent structural components and any objects passing therethrough and having a movement capability of at least ±3%, the film sealing the filled opening and reducing the amount of smoke which may pass through the filled opening.

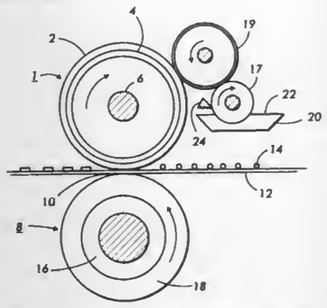
VOL 1209 ISS 4 AP 28 1998 UMI



5,744,200
**VOLUME GRAFTED ELASTOMER SURFACES AND METHODS THEREOF**

Santokh S. Badesha, Pittsford; George J. Heeks, Rochester, and Arnold W. Henry, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 1996, Ser. No. 625,563
Int. Cl.[6] B05D *3/02*
U.S. Cl. 427—387 15 Claims




1. A method for providing a volume grafted elastomer surface on a supporting substrate consisting essentially of in sequential order:
a) dissolving a fluoroelastomer;
b) adding an amino silane as a dehydrofluorinating agent and curing agent in an amount of from about 0.5 to about 10 weight percent based on the weight of fluoroelastomer;
c) adding a polymerization initiator, a polyorganosiloxane and adding an additional amount of amino silane to form a homogeneous volume graft polymer; and
d) subsequently providing at least one layer of the homogeneous volume grafted elastomer solution to said supporting substrate.

5,744,201
**METHOD FOR TREATING CARPET USING PH ADJUSTMENT**

John C. Chang, New Brighton; Shou-Lu G. Wang, Woodbury; Irvin F. Dunsmore, Ham Lake, and Robert F. Kamrath, Mahtomedi, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 685,381, Jul. 23, 1996, abandoned. This application Apr. 15, 1997, Ser. No. 839,599
Int. Cl.[6] B05D *3/02*
U.S. Cl. 427—393.4 22 Claims

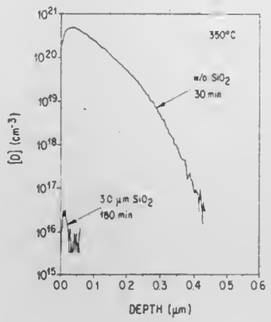
1. A method for treating a fibrous substrate, comprising the steps of:
providing, at a first pH, a solution comprising a fluorochemical agent and a salt of a methacrylic acid containing polymer;
providing a fibrous substrate;
adjusting the pH of the solution to a second pH at which the solution imparts water or oil repellency to the fibrous substrate; and
applying the solution to the fibrous substrate;
wherein the solution is stable at the first pH.

5,744,202
**ENHANCEMENT OF HYDROGENATION OF MATERIALS ENCAPSULATED BY AN OXIDE**

Norbert H. Nickel, Berlin, Germany, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1996, Ser. No. 723,749
Int. Cl.[6] C23C *14/14*
U.S. Cl. 427—527 12 Claims

1. A method for enhancing the hydrogenation of a material encapsulated by an oxide, comprising:




forming an injection layer selected from the group consisting of Au and Pt on an oxide-encapsulated material; and
hydrogenating said material with an atomic hydrogen source such as a hydrogen plasma.

5,744,203
**ALIGNMENT LAYER FOR LIQUID CRYSTALS**

Takamasa Harada, Inzaimachi; Fumie Nozawa, Asaka; Masami Ubukata, and Haruhiko Itoh, both of Tokoraozawa, all of Japan, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

PCT No. PCT/EP94/01754, § 371 Date Oct. 18, 1995, § 102(e) Date Oct. 18, 1995, PCT Pub. No. WO94/28458, PCT Pub. Date Dec. 8, 1994
PCT Filed May 30, 1994, Ser. No. 535,030
Claims priority, application Japan, May 28, 1993, 5-127276; May 13, 1994, 6-100119
Int. Cl.[6] G02F *1/1337*
U.S. Cl. 428—1 12 Claims

1. An alignment layer for liquid crystals comprising a material from the group consisting of:
(1) at least one polymer (A) selected from the group consisting of a polyurethane, a polyester, a polycarbonate and a polyurea each containing a siloxane compound as a polymer constituting component;
(2) a mixture (B) of a siloxane compound and at least one polymer selected from the group consisting of a polyurethane, a polyester, a polyimide, a polycarbonate and a polyurea; or
(3) a mixture of the polymer (A) and the mixture (B); and
(4) a mixture of the polymer (A) and at least one polymer (D) selected from the group consisting of a polyurethane, a polyester, a polyimide, a polycarbonate, a polyurea, a polyamide and a cellulose-based compound.

5,744,204
**LAMINATES COMPRISING COEXTRUDED LIQUID CRYSTAL POLYMER FILMS AND DISCARDABLE THERMOPLASTIC OUTSIDE LAYERS**

Randy Douglas Jester, Greer, S.C., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed Dec. 5, 1996, Ser. No. 761,042
Int. Cl.[6] B32B *27/32*; G02F *1/1335*
U.S. Cl. 428—1 13 Claims

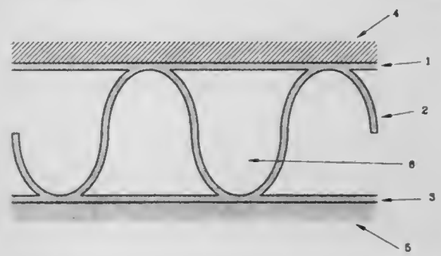
1. A laminate comprising a liquid crystal polymer film in the middle and a non-adherent, non-liquid crystalline polymer film on both sides of said liquid crystal polymer film, wherein said non-adherent, non-liquid crystalline polymer film is suitable to be subsequently delaminated from said laminate.



5,744,205
**SEMI-SEALED OR SEALED PACKAGE FOR PRESERVING PRODUCE COMPOSED OF RESIN COVERED PAPER**

Yoshitake Kawai, Yokohama; Kazuo Taira, Tokyo, and Kanemichi Yamaguchi, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 12,855, Feb. 3, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 472,647
Claims priority, application Japan, Feb. 6, 1992, 4-65481
Int. Cl.[6] B65D *85/34*
U.S. Cl. 428—34.2 37 Claims

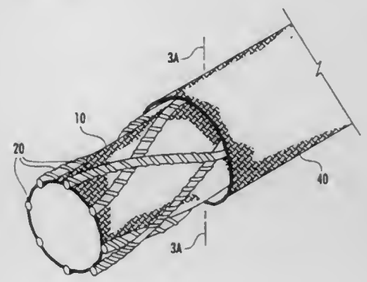



1. A package for preserving freshness of a produce, comprising:
a corrugated fiber board composed of:
(A) an outer wall having a carbon dioxide permeability coefficient $Pco_2$ of $5\times10^{-10}$ $cm^3$(STP)cm/$cm^2$·s·cmHg or greater at a temperature of 27° C.;
(B) a corrugating medium; and
(C) an inner wall having a water-vapor transmission rate of 100 g/$m^2$ day or less at a temperature of 27° C.; and
sealing tape substantially sealing end parts of the corrugated fiber board which are exposed to an outer surface of the package.

5,744,206
**BRAIDED SLEEVING WITH RIB STRANDS**

Jaime Elstein Russek, and Marcelo Mejia Garcia, both of Mexico City, Mexico, assignors to Vitrica, S.A. de C.V., Mexico City, Mexico

Continuation of Ser. No. 475,222, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 223,557, Apr. 6, 1994, abandoned, and Ser. No. 285,653, Aug. 3, 1994, abandoned. This application Nov. 6, 1996, Ser. No. 746,145
Int. Cl.[6] B29D *22/00*; B32B *1/08*
U.S. Cl. 428—36.3 27 Claims




1. A tubular sleeving, comprising:
a principal braid of flexible filaments; and
at least two braided ribs braided into and around the circumference of said principal braid in opposite helical directions, each of said braided ribs including a core around which filaments are braided.

5,744,207
**ARTICLES COATED WITH ELECTROPHOTOGRAPHIC TONER RECEPTIVE RELEASE COATINGS**

Joseph T. Bartusiak, Brooklyn Park; Steven S. Kantner, St. Paul; Ramesh C. Kumar, Maplewood, and Timothy A. Mertens, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 525,398, Sep. 8, 1995, abandoned, which is a continuation-in-part of Ser. No. 247,344, May 23, 1994, abandoned, which is a continuation of Ser. No. 40,876, Mar. 31, 1993, abandoned. This application Nov. 21, 1996, Ser. No. 752,821
Int. Cl.[6] A61F *13/02*
U.S. Cl. 428—41.8 7 Claims

1. An image receiving article comprising:
(a) a liner having a front face and a back face;
(b) a layer of release coating coated over a portion of the front face of a liner wherein the release coating comprising a polymer having at least one vinyl polymeric segment having a $T_g$ between −10° C. and 65° C. present at a weight percent great enough to provide the copolymer with the capability of substantially anchoring toner particles emitted by an electrophotoconductive device and at least one siloxane polymeric segment having a number average molecular weight above about 100 and is present at a weight percent great enough to provide the copolymer with a surface release value not greater than about 11 Newtons/dm;
(c) a layer of pressure sensitive adhesive; and
(d) at least one layer of substrate having a front and a back face.

5,744,208
**GLASS-CERAMICS CONTAINING LITHIUM DISILICATE AND TRIDYMITE**

George H. Beall, Big Flats, and Jeffrey T. Kohli, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jun. 24, 1994, Ser. No. 265,192
Int. Cl.[6] G11B *5/66*
U.S. Cl. 428—64.1 14 Claims



1. A magnetic memory storage device comprising a head pad and rigid information disk, the disk comprising a rigid disc substrate having a layer of magnetic media on the surface thereof, wherein the substrate consists essentially of a glass-ceramic material, said glass-ceramic material comprised of a plurality of lithium disilicate crystals and a plurality of tridymite crystals, said glass-ceramic material having a composition consisting essentially, expressed in terms of weight percent on the oxide basis, of 75–95% $SiO_2$, 3–15% $Li_2O$, 0–6% $Al_2O_3$, 0–6% $K_2O$ and a nucleating agent selected from the group consisting of 0–0.2% Pd and 0–5% $P_2O_5$ with the proviso that if Pd is absent the $P_2O_5$ amount is at least 0.5% and if $P_2O_5$ is absent then the Pd amount is at least 0.005%, and up to 15% of optional ingredients in the indicated proportions selected from the group consisting of $B_2O_3$, $Na_2O$, ZnO, MgO, CaO, SrO, $ZrO_2$, $TiO_2$, F, $Sb_2O_3$, $As_2O_3$, PbO and BaO.

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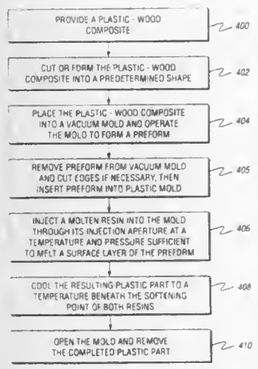
5,744,209
**SCENTED MAT PRODUCT AND METHOD FOR MAKING THE MAT PRODUCT**
Timothy H. Parkes, Chattanooga, Tenn., assignor to Remington Industries, Inc., Benton, Tenn.
Continuation of Ser. No. 332,735, Nov. 1, 1994, abandoned. This application Nov. 18, 1996, Ser. No. 751,248
Int. Cl.[6] B32B *27/12;27/22;27/30*
U.S. Cl. 428—96 15 Claims




1. A durable scented mat product which comprises a textile layer, a backing layer formed from a composition which contains a polyvinyl chloride and a plasticizer, said backing layer being irremovably secured to said textile layer by curing, and a volatile scent-emitting component, said scent-emitting component being incorporated into said composition prior to curing said volatile scent-emitting component being a scent which is continuously emitted into the environment surrounding the mat at substantially an original strength level for a period of at least four months after the mat is exposed to the environment.

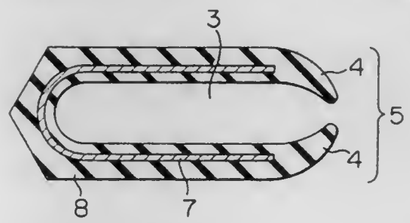
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5,744,210
**NATURAL WOOD-COVERED PLASTIC PART SUCH AS A VEHICLE PART AND METHOD OF MANUFACTURING SAME**
William G. Hofmann, Grosse Pointe Park, and David J. Davis, Troy, both of Mich., assignors to Larry J. Winget, Leonard, Mich.
Continuation-in-part of Ser. No. 551,517, Nov. 1, 1995, abandoned. This application Mar. 25, 1996, Ser. No. 621,519
Int. Cl.[6] B32B *5/12;21/04*
U.S. Cl. 428—106 15 Claims




1. A natural wood-covered plastic part comprising:
a plastic-wood composite having a wood veneer layer disposed between a first plastic layer and a second plastic layer, the composite at least partially bonded together by naturally occurring lignin at a bond between each of the first and second plastic layers and the wood veneer layer and formed into a preform having a predetermined shape, the plastic-wood composite having a top and bottom surface; and
a plastic structural substrate bonded to the bottom surface of the plastic-wood composite through sufficient heat and pressure but insufficient to break the bonds at least partially provided by the naturally occurring lignin so as to form the natural wood-covered plastic part.

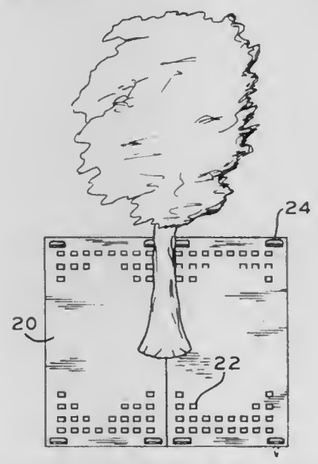
5,744,211
**MOLDED ARTICLE**
Rikizou Nakata, Aichi-ken, and Hidenori Hayashi, Gifu, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai-Gun, Japan
Continuation of Ser. No. 71,039, Jun. 2, 1993, abandoned, which is a continuation of Ser. No. 887,388, May 21, 1992, abandoned, which is a division of Ser. No. 605,100, Oct. 30, 1990, abandoned. This application Jan. 7, 1994, Ser. No. 178,626
Claims priority, application Japan, Oct. 31, 1989, 1-285239
Int. Cl.[6] B32B *3/04*
U.S. Cl. 428—122 11 Claims




1. A molded article comprising:
a glass accommodating groove having a glass run portion which contacts a movable glass surface, the glass run consisting of:
a rubber blend of a nitrile rubber and 15–60% by weight of polyvinyl chloride; and
a lubricant consisting of a paraffinic process oil, wherein the paraffinic process oil has a viscosity of 8 to 105 cPs at 100° C., and wherein the paraffinic process oil is present in an amount of 2–10 parts per 100 parts of the rubber blend.

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5,744,212
**APPARATUS AND METHOD FOR GATHERING AND REMOVING YARD WASTE**
Robert J. Meeks, 1303 Sidney St., Fort Wayne, Ind. 46803
Filed Sep. 27, 1995, Ser. No. 534,398
Int. Cl.[6] B32B *3/24*
U.S. Cl. 428—131 15 Claims

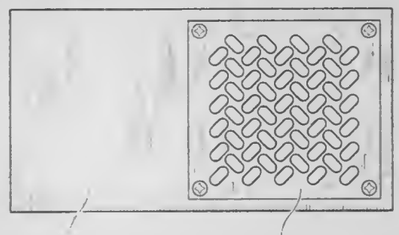



1. A yard waste gathering and removal apparatus, comprising:
a laminar sheet having a plurality of apertures therethrough, said apertures adapted to allow communication of air and moisture through said laminar sheet, the area of said laminar sheet between said plurality of apertures defining a plurality of dividing strips, each said dividing strip having a width substantially equal to the width of said apertures, said dividing strips preventing the yard waste from passing through said laminar sheet, said laminar sheet being manufactured from clear material, whereby sunlight is allowed to pass therethrough; and
a plurality of spikes engaging said laminar sheet and adapted to attach to the ground.



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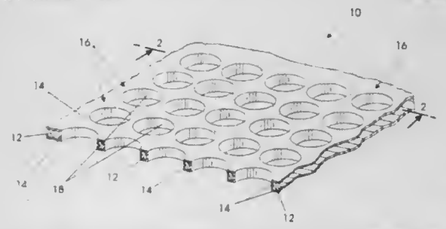
5,744,213
**ENCLOSURE PANEL WITH HERRINGBONE APERTURE PATTERN**
Thomas E. Nelson, Crestwood, Ky., assignor to Soltech, Inc., Louisville, Ky.
Filed Aug. 25, 1995, Ser. No. 537,150
Int. Cl.[6] A47B *81/06;* B32B *3/24*
U.S. Cl. 428—131 13 Claims




1. An enclosure panel for closing an access opening in a compartment with a heat-generating and noise-generating component therein, said enclosure panel comprising:
a main panel body constructed and arranged to be attachable to said compartment so as to substantially cover said access opening; wherein said main panel body defines an insert opening and said insert opening has an insert opening cover; and
a plurality of oblong slots defined by said insert opening cover, said plurality of oblong slots arranged into a plurality of columns, each column being configured with a substantially uniform herringbone pattern.

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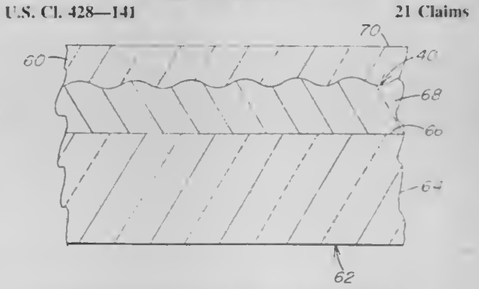
5,744,214
**CORROSION RESISTANT MOLYBDENUM MASK**
Peter Henry Berasi, Hopewell Junction, and Hsing Hsiung Chen, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 30, 1997, Ser. No. 792,815
Int. Cl.[6] B32B *15/04;3/10*
U.S. Cl. 428—137 4 Claims




1. A mask for sputter deposition of electrically conductive materials on areas of a substrate, comprising:
a molybdenum mask having openings arranged to form a pattern representative of the areas of said substrate; and
a carbide coating disposed on the external surfaces of said mask, said carbide coating being formed of a material selected from the group consisting of chromium carbide, titanium carbide, vanadium carbide, zirconium carbide, niobium carbide, molybdenum carbide, hafnium carbide, tantalum carbide, and tungsten carbide.

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5,744,215
**REDUCTION OF HAZE IN TRANSPARENT COATINGS**
George A. Neuman, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Jan. 4, 1996, Ser. No. 582,795
Int. Cl.[6] B32B *3/26*
U.S. Cl. 428—141 21 Claims




1. An article having reduced surface haze comprising:
a substrate having a coating layer over a major surface of the substrate, the coating layer having a major surface facing away from the substrate defined as a first major surface and an opposite major surface facing the substrate, the first major surface having valleys and peaks wherein light beams incident on the first major surface are reflected from the first major surface as first surface reflected light beams whereby the first major surface of the coating layer has a level of surface haze, and
a haze reducing film deposited on the first major surface of the coating layer wherein the haze reducing film is a crystalline coating film deposited by a technique selected from the group consisting of pyrolytic coating and sputter coating, the haze reducing film while being deposited on the first major surface contacts the first major surface filling in the valleys of the first major surface, the film as deposited has a major surface facing away from the first major surface of the coating layer defined as a second major surface, the second major surface having valleys and peaks with the distance between the valleys and peaks of the second major surface being less than the distance between the valleys and peaks of the surface of the first major surface wherein the light beams incident on the second major surface are reflected from the second major surface as second surface reflected light beams wherein the second surface reflected light beams are less diffused than the first surface reflected light beams such that the level of surface haze of the second major surface is less than the level of surface haze of the first major surface to provide the article having reduced surface haze.

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5,744,216
**MAGNETIC RECORDING MEDIUM HAVING AN UNDERLAYER WITH COBALT CONTAINING PARTICLES OF ALPHA $Fe_2O_3$ OR ALPHA FeOOH**
Narito Goto; Yasunobu Kobayashi; Hideaki Wakamatsu, and Shunichi Iwamaru, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Feb. 15, 1996, Ser. No. 602,008
Claims priority, application Japan, Feb. 20, 1995, 7-030525; Sep. 29, 1995, 7-252943
Int. Cl.[6] G11B *5/708*
U.S. Cl. 428—141 10 Claims

1. A magnetic recording medium comprising a support having thereon a substantially non-magnetic layer containing non-

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magnetic particles dispersed in a binder and a magnetic layer containing ferromagnetic particles dispersed in a binder, wherein said non-magnetic particles are $\alpha$-$Fe_2O_3$ or $\alpha$-FeOOH, each of which contains Co in an amount of 0.5 to 30% by weight of the content of Fe.

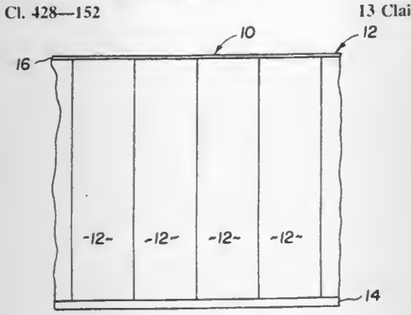
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5,744,217

## DECORATIVE WALLPAPER AND METHODS OF MAKING AND APPLYING

Siu Tsang Kam, Dallas, Tex., assignor to Chinese Art Gallery, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 414,614, Mar. 31, 1995, Pat. No. 5,562,955. This application Oct. 7, 1996, Ser. No. 727,792
Int. Cl.[6] B44C *1/14;7/00*
U.S. Cl. 428—152 13 Claims




1. A wallpaper with a decorative scene, comprising: a substrate adapted to be attached to a wall; and a cover attached to said substrate, said cover including a plurality of wrinkled metal foil parts, each of the plurality of wrinkled metal foil parts having a front and a back, a thin, flexible material connected to the back of each of the plurality of metal foil parts, and the decorative scene disposed on the fronts of the plurality of metal foil parts.

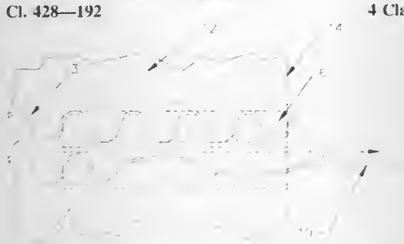
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5,744,218

## LAMINATED PANEL WITH AN EMBEDDED WIRING HARNESS

Jim Barnes, 6090 Fall Creek Rd., Indianapolis, Ind. 46220

Filed Apr. 23, 1996, Ser. No. 636,318
Int. Cl.[6] B32B *3/02*
U.S. Cl. 428—192 4 Claims



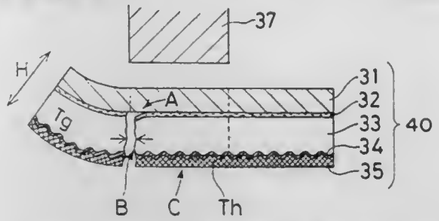
1. A laminated panel with an embedded wiring harness comprising:
a length of wire with a portion deformed into a circuitous pattern;
a plurality of layers of material;
said length of wire being positioned between two of said plurality of layers of material;
said plurality of layers of material being laminated together into a laminate and cut to include an edge boundary; and
said portion deformed into a circuitous pattern being exposed at said edge boundary and being capable of further deformation to extend a segment of said length of wire away from said edge boundary.

5,744,219

## TRANSFER FOIL HAVING REFLECTING LAYER WITH SURFACE RELIEF PATTERN RECORDED THEREON

Shigehiko Tahara, Tokyo, Japan, assignor to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 352,423, Dec. 8, 1994, abandoned, which is a continuation of Ser. No. 84,506, Jun. 29, 1993, abandoned, which is a continuation of Ser. No. 826,063, Jan. 24, 1992, Pat. No. 5,300,169. This application Jan. 4, 1995, Ser. No. 368,595
Claims priority, application Japan, Jan. 28, 1991, 3-8384; Feb. 1, 1991, 3-12183; Mar. 11, 1991, 3-43932
Int. Cl.[6] B32B *3/00*
U.S. Cl. 428—195 17 Claims




1. A transfer foil comprising a releasable base film, a resin layer, a reflecting layer, and a heat-sensitive adhesive layer which are stacked in the mentioned order, and having a surface relief pattern formed on the resin layer on the side thereof where the reflecting layer is provided, said transfer foil being partially heated by a thermal head from the said releasable base film so that said surface relief pattern enables transfer of a precise region, wherein:
the peel strength (A) between said releasable base film and said resin layer is larger than the film breaking strength (B) of said resin layer, and the initial bond strength of said heat-sensitive adhesive layer is larger than said peel strength (A).

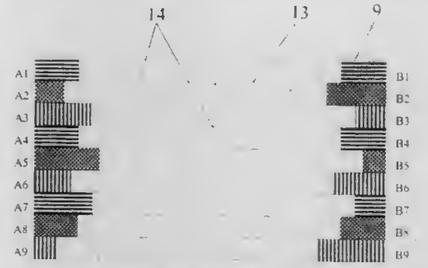
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5,744,220

## THERMOSETTING LAMINATE

Peter Ringö, Hollviken, Sweden, assignor to Perstorp AB, Perstorp, Sweden

Continuation-in-part of Ser. No. 167,964, Mar. 29, 1994, abandoned. This application Aug. 16, 1996, Ser. No. 696,571
Claims priority, application Sweden, Jul. 2, 1991, 9102050
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—195 14 Claims




1. A decorative thermosetting laminate (11), comprising two or more layers (3, 4, 5), the laminate (11) being produced by laminating the different layers (3, 4, 5) at a high pressure and at an increased temperature, wherein at least one layer is a decorative layer (4) consisting of at least one patterned decor paper (9) impregnated with at least one thermosetting resin, the decor paper (9) having a bar design composed of a plurality of parallel rows of bars (14), each bar (14) having a defined pattern, the bars (14) in adjoining rows being mutually offset in a longitudinal direction, the bar design allowing said laminate (11) to be divided into m longitudinal units or panels each consisting of p rows of bars, whereby said unit or panel comprises m×p rows of bars, the pattern



of each left end bar (A1–A9) matching the pattern of corresponding right end bar (B1–B9) of each unit or panel and the pattern of these bars matching the pattern of corresponding end bars (A, B) in corresponding rows of all m units or panels.

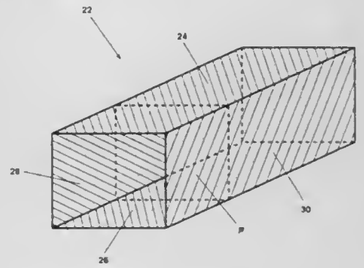
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5,744,221

## FLEXIBLE HIGH-DAMPING COMPOSITE STRUCTURES AND FABRICATION THEREOF

Roger M. Crane, Arnold; Armando L. Santiago, Annapolis, and Wayne C. Jones, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 945,041, Sep. 15, 1992, Pat. No. 5,308,675. This application May 3, 1994, Ser. No. 237,579
Int. Cl.[6] B32B *3/00*
U.S. Cl. 428—196 29 Claims




1. A composite structure, comprising:
fabric material having a plurality of fibers which are integrally interrelated in the form of said fabric material;
high strain-to-failure viscoelastic matrix material contiguously disposed in relation to some said fibers; and
conventional matrix material contiguously disposed in relation to other said fibers, said conventional matrix material being selected from the group of resins consisting of epoxy, urea, polyester, vinylester, phenolic, polyimide, bismaleimide, melamine and silicone.

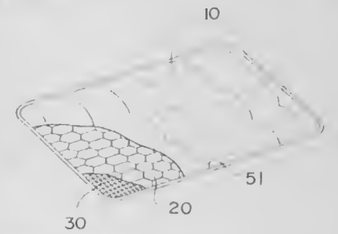
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5,744,222

## BEDDING MATERIAL CONTAINING ELECTRETIC FIBERS

Toshio Sugihara, Tokyo, Japan, assignor to Life Energy Industry Inc., Tokyo, Japan

Filed Jul. 10, 1996, Ser. No. 677,888
Int. Cl.[6] B32B *3/00*
U.S. Cl. 428—196 9 Claims




1. A bedding comprising:
a front cloth;
a textural three-dimensional structure woven three-dimensionally; and
a rear cloth; wherein fibers within at least a portion of said front cloth, said textural three-dimensional structure, and said rear cloth are electretic fibers which contain microparticles of tourmaline; and
peripheral portions of said front cloth, said textural three-dimensional structure, and said rear cloth are mutually affixed;
wherein said electretic fibers are affixed with 0.05–7.0% by weight of tourmaline and 1.0–10% by weight of ceramics.

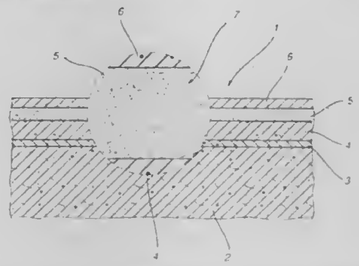
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5,744,223

## MARKING OF VEHICLES TO HINDER THEFT AND/OR UNAUTHORIZED SALE

Günter Abersfelder, Sindelfingen; Stefan Hahn, Denkendorf; Stefan Uhl, Stuttgart, and Winfried Degen, Esslingen, all of Germany, assignors to Mercedes Benz AG, Germany

Filed Oct. 17, 1994, Ser. No. 324,476
Claims priority, application Germany, Oct. 16, 1993, 43 35 308.8
Int. Cl.[6] B32B *3/00*
U.S. Cl. 428—206 7 Claims




1. Arrangement for preventing theft of a vehicle comprising:
microscopic information carriers having dimensions in the range of microns, each of said information carriers being encoded with identifying secondary information concerning the vehicle, said information carriers being contained in a vehicle coating of said vehicle at least at selected locations, said vehicle coating being selected from the group consisting of a top coating paint, an inner coating paint, an underseal coating and a protective wax coating;
whereby said secondary information encoded on said information carriers may be detected and compared with stored primary information concerning said vehicle to detect alteration of said secondary information.

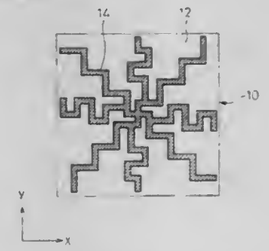
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5,744,224

## BOARD FOR MOUNTING SEMICONDUCTOR CHIP

Yukiharu Takeuchi, and Shigetsugu Muramatsu, both of Nagano, Japan, assignors to Shinko Electric Industries Co., Ltd., Nagano, Japan

Filed Oct. 31, 1995, Ser. No. 550,995
Claims priority, application Japan, Nov. 29, 1994, 6-294639
Int. Cl.[6] B32B *15/04;* H01L *23/498*
U.S. Cl. 428—209 22 Claims




1. A semiconductor chip mounting board comprising:
a base material made of resin;

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a metallized pattern formed on a surface of said base material which defines a die-pad area on which a semiconductor chip is to be mounted and which is capable of electrically connecting a rear surface of the semiconductor chip to said metallized pattern via the die-pad area; and

said metallized pattern comprising a plurality of zigzag shaped pattern lines along imaginary straight line segments radially, outwardly extending from a position on said die-pad area; and

said metallized pattern extending continuously over the die-pad area.

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**5,744,225**

**HEAT INSULATING BOARD AND METHOD FOR HEAT INSULATION BY USING THE SAME**

**Yumiko Kujirai; Masami Kujirai, and Yukio Kujirai, all of Warabi, Japan, assignors to Kabushiki Kaisha Sekuto Kagaku, Japan**

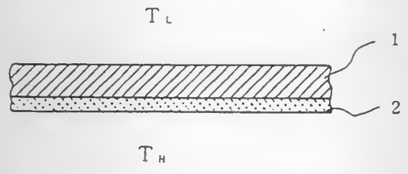
**PCT No. PCT/JP94/01459, § 371 Date Feb. 22, 1996, § 102(e) Date Feb. 22, 1996, PCT Pub. No. WO95/06839, PCT Pub. Date Mar. 9, 1995**

**PCT Filed Sep. 2, 1994, Ser. No. 600,976**

**Claims priority, application Japan, Sep. 3, 1993, 5-243998**

**Int. Cl.[6] B32B** *9/00*

**U.S. Cl. 428—212** **12 Claims**




$T_H > T_L$

1. A heat insulating board for shielding heat dissipation from a high temperature zone to a low temperature zone by being disposed between the high temperature zone and the low temperature zone, said board consisting essentially of a composite body of an opaque heat-conducting base body positioned to face the low temperature zone and a heat conductive transparent layer positioned to face the high temperature zone, the said transparent layer having a heat volume and an absorption of heat of radiation smaller than the heat volume and absorption of heat of radiation of the said base body.

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**5,744,226**

**MULTILAYERD THERMAL TRANSFER MEDIUM FOR MATTE FINISH PRINTING**

**Michael W. Olmstead, West Carrollton; Thomas C. Miller, Jr., Kettering, and Thomas J. Obringer, Vandalia, all of Ohio, assignors to NCR Corporation, Dayton, Ohio**

**Filed Jun. 27, 1996, Ser. No. 671,050**

**Int. Cl.[6] B41M** *5/26*

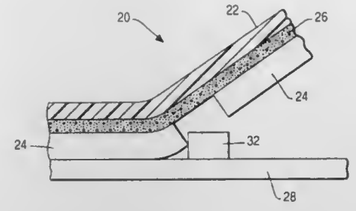
**U.S. Cl. 428—212** **11 Claims**

1. A thermal transfer medium which consists essentially of:

a flexible substrate,

a first coating positioned on said substrate having a coat weight of from 1 to 5 mg/4 $in^2$ and comprising pigment and at least 40 weight percent of a binder resin, based on dry components; and

a thermally sensitive second coating positioned on said first coating having a coat weight of from 5 to 15 mg/4 $in^2$ and comprising colorant, a binder resin distinct from binder resin of the first coating and at least 40 weight percent wax, based on the dry components;




wherein the first coating has a softening point higher than that of the second coating so as to provide for transfer of the second coating without the first coating to a receiving substrate upon application of heat by a thermal transfer print head.

wherein the second coating is transferred in an amount sufficient so as not to permit reuse of said second coating.

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**5,744,227**

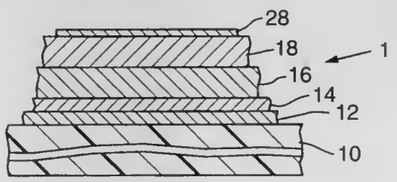
**ANTIREFLECTIVE COATINGS COMPRISING A LUBRICATING LAYER HAVING A SPECIFIC SURFACE ENERGY**

**Clark I. Bright, Half Moon Bay; F. Eugene Woodard, Los Altos; Steven J. Pace, San Mateo, and Julius G. Kozak, Antioch, all of Calif., assignors to Southwall Technnlogies Inc., Palo Alto, Calif.**

**Filed Apr. 3, 1995, Ser. No. 417,058**

**Int. Cl.[6] B32B** *5/16*

**U.S. Cl. 428—216** **17 Claims**




1. A durable body having antireflection properties comprising

a polymer substrate presenting a surface sought to be antireflected,

a hardcoat layer formed on said surface to provide structural strength, the substrate having the hardcoat layer being sufficiently flexible to accommodate forming the substrate into a web,

a multilayer antireflection coating on said hardcoat layer comprising at least two immediately adjacent pairs of layers, each layer of the antireflection coating having a thickness of less than 1500 angstroms, each such pair having, in order,

a first layer of electrically conductive transparent inorganic material having an index of refraction of from 1.7 to 2.6 and a thickness of from about 50 to 1500 angstroms, the first layer being the closer layer to the polymer substrate within said pair of layers, and

a second layer of transparent inorganic material having an index of refraction of from 1.29 to 1.7 and a thickness of from 50 to 1500 angstroms, with

a lubricating layer having a surface energy not greater than 40 dynes/cm on a side of the multilayer antireflection coating opposite to the polymer substrate.



**5,744,228**

**USE OF SYNTHETIC FIBERS IN A GLUELINE TO INCREASE RESISTANCE TO SAG IN WOOD AND WOOD COMPOSITE STRUCTURES**

**Daniel A. Tingley, 3310 SW. Willamette Ave., Corvallis, Oreg. 97333**

**Continuation-in-part of Ser. No. 596,420, Feb. 2, 1996, abandoned, which is a continuation of Ser. No. 439,155, May 11, 1995, abandoned, which is a continuation of Ser. No. 205,714, Mar. 4, 1994, abandoned. This application Mar. 12, 1996, Ser. No. 614,853**

**Int. Cl.[6] B32B** *5/08;5/16;21/08;* **E04C** *3/12*

**U.S. Cl. 428—292.4** **23 Claims**

1. A wood laminate structural member having increased resistance to sag for bearing sag-inducing large applied load forces over an open span, comprising:

a beam having plural wood laminae bonded together with their lengths generally aligned along a longitudinal axis, each of the plural wood laminae having at least one major surface adhesively bonded to a major surface of an adjacent wood laminae;

the beam having opposed free ends adapted to be carried by supports so that the major surfaces of the plural wood laminae span an open area to bear the sag-inducing large applied load forces; and

an adhesive layer of increased shear strength between the adjacent major surfaces of the plural wood laminae forming an adhesive bond line between them, the adhesive layer including a mixture of wood adhesive and high strength,, high modulus fiber material distributed throughout the adhesive layer and characterized by a fiber material-to-wood adhesive weight ratio that does not exceed about 5 percent and that achieves and maintains adhesion of the adjacent wood laminae and by gap filling properties in the adhesive bond line in which elements of fiber material in the adhesive bond line extend into gaps in the major surfaces of the first and second wood laminae by contacting but not extending substantially into any one of the plural wood laminae to improve adhesion and to resist shear stress resulting from the load forces.

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**5,744,229**

**GLASS FIBER MAT MADE WITH POLYMER-REACTED ASPHALT BINDER**

**James R. Gleason, and Donn R. Vermillion, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Technology Inc., Summit, Ill.**

**Filed Aug. 28, 1995, Ser. No. 519,957**

**Int. Cl.[6] B32B** *11/02;17/04*

**U.S. Cl. 428—297.4** **19 Claims**

1. A glass fiber mat comprising:

between about 68% and about 90% glass fibers and between about 10% and about 32% binder, by weight of the glass fiber mat,

wherein the binder comprises between about 2% and about 90% of an aqueous emulsion of polymer modified asphalt produced by the reaction of an asphalt with a polymer and a surfactant and between about 10% and about 98% thermosetting resin selected from the group consisting of phenol/formaldehyde, resorcinol/formaldehyde, urea/formaldehyde, melamine/formaldehyde, and mixtures thereof, by weight of the binder, and wherein the polymer which modifies the asphalt is selected from the group consisting of thermoplastic polymers, thermoset polymers, and mixtures thereof.

**5,744,230**

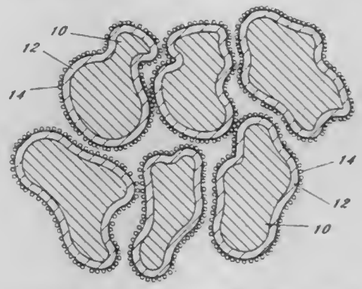
**MICROBIAL ACOUSTICAL TILES**

**Felix G. Janssen, 20 Minnetonka Rd., Sea Ranch Lakes, Fla. 33308**

**Continuation of Ser. No. 600,587, Oct. 16, 1990, abandoned. This application Jul. 15, 1994, Ser. No. 275,647**

**Int. Cl.[6] B32B** *3/26*

**U.S. Cl. 428—305.5** **10 Claims**




1. A porous acoustical tile having an outer surface and an interior body including pores, said porous acoustical tile of sufficient strength for installation containing an amount of a microbicide sufficient to inhibit growth of a micro-organism or virus on the outer surface and the interior body pores thereof, the tile being composed of granular base material and 5 to 20% (by volume of the tile composition) binder material, the grains of base material being coated with a layer of the binder material, the coated grains defining said interior body pores and said microbicide being incorporated within said layer of binder material and exposed at said interior body pores and outer tile surface.

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**5,744,231**

**COMPOSITE FOAM MOLDED ARTICLE, PROCESS FOR PRODUCTION THEREOF COMPOSITION**

**Toshio Igarashi, Kynto; Sueharu Shinohara, Takatsuki; Masayuki Tatsumi, Ibaraki; Tadashi Hikasa, Sodegaura, and Hiroaki Mendori, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Division of Ser. No. 975,966, Nov. 13, 1992, Pat. No. 5,532,055, which is a continuation of Ser. No. 886,410, May 21, 1992, abandoned. This application Jan. 31, 1996, Ser. No. 594,409**

**Claims priority, application Japan, May 23, 1991, 3-118712; Jun. 24, 1991, 3-151595; Aug. 29, 1991, 3-218506; Aug. 29, 1991, 3-218523; Nov. 21, 1991, 3-306163**

**Int. Cl.[6] B32B** *3/26;27/32*

**U.S. Cl. 428—318.6** **15 Claims**

1. An integrally molded composite article integrally formed comprising (I) a nonfoam layer formed from (A) a thermoplastic elastomer powder composition and (II) a foamed layer formed from a foamable composition comprised of (i)(B) a thermoplastic synthetic resin powder or (ii)(B) a thermoplastic synthetic resin powder, (C) a heat decomposable foaming agent and (D) a liquid coating agent;

said thermoplastic elastomer powder (A) for the nonfoam layer comprised of a composition of an ethylene α-olefin copolymer rubber and a polyolefin resin or a thermoplastic elastomer powder comprised of a partially cross-linked composition of an ethylene-α-olefin copolymer rubber and a polyolefin resin, said ethylene α-olefin rubber having a Mooney viscosity ($ML_{1-4}100°$ C.) of 130 to 350, said thermoplastic elastomer powder having a complex dynamic viscosity $\eta^*(1)$ at 250° C. and a frequency of 1 radian/sec of not more than $1.5\times10^5$ poise and having a Newtonian viscosity index n, calculated by the following formula using the above-mentioned complex dynamic viscosity $\eta^*(1)$ and the complex dynamic viscosity $\eta^*(100)$ at a frequency of 100 radians/sec, of not more than 0.67:

$n=\{t\log\eta^*(1)-\log\eta^*(100)\}/2$.

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5,744,232
**LOW LOSS, THICK FILM METALLIZATIONS FOR MULTILAYER MICROWAVE PACKAGING**
**Alex Bailey, Hampstead; Andrew J. Piloto, Columbia, both of Md., and Deborah P. Partlow, Export, Pa., assignors to Northrop Grumman Corporation, Los Angeles, Calif.**
**Filed Jul. 11, 1996, Ser. No. 680,260**
**Int. Cl.[6] B23B** *5/16*
**U.S. Cl. 428—323** **11 Claims**

1. A thick film metallization for use in microwave devices comprising monosized, spherical metal particles in an organic vehicle.

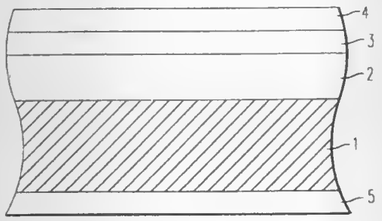
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5,744,233
**METHOD OF COATING LUMINESCENT POWDERS, LUMINESCENT POWDERS AND COATED OBJECT**
**Joachim Opitz, Aachen, and Walter Mayr, Würselen, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**
**Filed Sep. 8, 1995, Ser. No. 526,023**
**Claims priority, application Germany, Sep. 9, 1994, 44 32 035.3**
**Int. Cl.[6] B32B** *5/16;* **H01J** *29/10;* **B05D** *7/00*
**U.S. Cl. 428—328** **10 Claims**

1. A method of providing luminescent powders with a coating comprising silicon dioxide comprising dispersing luminescent particles in a solution comprising at least one metallo-organic compound of silicon and, optionally, one or more metallo-organic compounds of further elements, in one aqueous organic solvent mixture having a pH value of $1<pH<5$ and then adding ammonia to the resultant dispersion to catalyze hydrolysis of the metallo-organic compound(s) to oxides.

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5,744,234
**MAGNETIC RECORDING MEDIUM**
**Noriyuki Kitaori; Osamu Yoshida; Hirohide Mizunoya; Katsumi Sasaki; Yuzo Matsuo; Shigemi Wakabayashi, and Akira Shiga, all of Haga-gun, Japan, assignors to Kao Corporation, Tokyo, Japan**
**Filed Oct. 23, 1995, Ser. No. 547,115**
**Claims priority, application Japan, Nov. 30, 1994, 6-296922**
**Int. Cl.[6] B32B** *5/00;* **G11B** *5/68;5/70;5/64*
**U.S. Cl. 428—332** **7 Claims**




1. A metal deposition magnetic recording medium comprising a support and at least one magnetic layer formed thereon by deposition, said recording medium having a residual magnetic flux density and a coercive force which satisfy the relationships of (1) and (2):

$$4.8 < \frac{Br \cdot H_{CV}}{(H_{CL})^2} < 6.0 \quad (1)$$

$$1.0 < \frac{Br \cdot H_{CL}}{(H_{CV})^2} < 1.5 \quad (2)$$

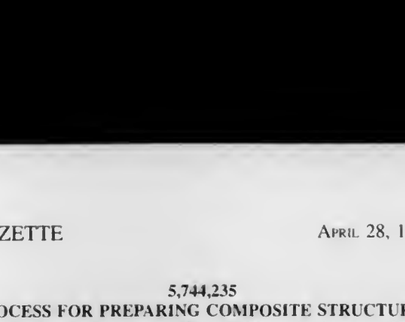
Br: Residual magnetic flux density
$H_{CV}$: Coercive force in the vertical direction
$H_{CL}$: Coercive force in the longitudinal direction.

5,744,235
**PROCESS FOR PREPARING COMPOSITE STRUCTURES**
**Robert Dennis Creehan, Arlington, Mass., assignor to Hyperion Catalysis International, Cambridge, Mass.**
**Division of Ser. No. 896,317, Jun. 10, 1992, Pat. No. 5,445,327, which is a continuation of Ser. No. 386,912, Jul. 27, 1989, abandoned. This application Jun. 5, 1995, Ser. No. 462,869**
**Int. Cl.[6] D02G** *3/00*
**U.S. Cl. 428—364** **26 Claims**

1. A composite prepared according to a process comprising the steps of:
mixing at least one filler and a matrix material thereby forming a mixture; and
subjecting said fillers and said matrix material to a combination of sheer and impact forces under reaction conditions including reaction time sufficient to reduce the size of agglomerates formed by said fillers to a value no greater than 1,000 times the size of said fillers to disperse said fillers throughout said matrix material.

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5,744,236
**HOLLOW FIBERS IMPREGNATED WITH SOLID PARTICLES**
**Ronald P. Rohrbach, Flemington Hunterdon, N.J.; Gordon W. Jones, Toledo, Ohio; Peter D. Unger, Convent Station, N.J.; Daniel Bause, Flanders, N.J.; Lixin Xue, Morristown, N.J., and Russell Dondero, North Arlington, N.J., assignors to AlliedSignal Inc., Morristown, N.J.**
**Filed Nov. 27, 1996, Ser. No. 758,039**
**Int. Cl.[6] D02G** *3/00*
**U.S. Cl. 428—372** **11 Claims**



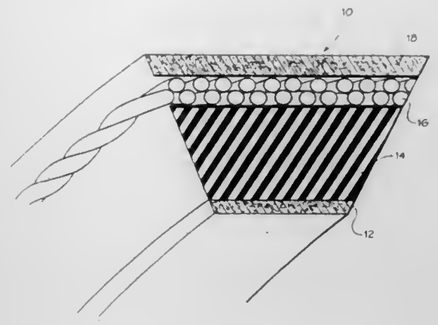

5. A fiber comprising:
an elongated strand;
an internal cavity formed in said strand;
an elongated opening extending along the outer surface of said elongated strand and connecting said internal cavity to the outer surface of said elongated strand; and,
a plurality of solid particles, the majority of which are smaller than one half of the width of the elongated opening, disposed and permanently retained within said internal cavity.

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5,744,237
**HETEROFILAMENTS FOR CORD REINFORCEMENT IN RUBBER GOODS**
**Harry W. Stanhope, Concord, N.C., assignor to Hoechst Celanese Corporation, Somerville, N.J.**
**Division of Ser. No. 323,164, Oct. 13, 1994, which is a continuation-in-part of Ser. No. 20,875, Feb. 19, 1993, abandoned. This application Jun. 10, 1996, Ser. No. 662,430**
**Int. Cl.[6] B32B** *5/02;* **D02G** *3/00*
**U.S. Cl. 428—373** **3 Claims**

1. A method of manufacturing a multifilament heterofilament yarn comprising: providing a plurality of individual heterofila-

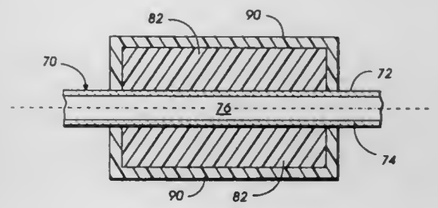





ments each comprising a core component composed of synthetic polymeric material having a given melting point temperature and a sheath component surrounding said core component essentially of poly(butylene terephthalate) polymer having a melting point temperature of said synthetic polymeric material; bundling together said plurality of individual heterolilaments to form a multifilament composite; and melting the sheath components of the heterofilaments at a temperature between the melting point temperatures of said core and sheath components into a multifilament composite yarn.

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5,744,238
**DIMENSIONALLY STABLE SHEET HANDLING SHAFT ASSEMBLY AND METHOD OF MAKING SAME**
**Stephen Limperis, and JoAnne M. Hallett, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.**
**Filed Oct. 2, 1995, Ser. No. 537,952**
**Int. Cl.[6] B32B** *25/00*
**U.S. Cl. 428—411.1** **6 Claims**




1. A shaft assembly having stable dimensions for forming a precise sheet drive nip in a sheet handling machine, the shaft assembly comprising:
(a) a shaft member having an outer surface;
(b) a sheet drive-effecting member formed on said outer surface of said shaft member, said sheet drive-effecting member consisting essentially of a first molded material and having desired external dimensions; and
(c) an elastomeric alloy thermoplastic elastomer (TPE) material layer formed over said desired external dimensions of said sheet drive-effecting member for forming the precise sheet drive nip, said elastomeric alloy TPE material consisting essentially of a thermoplastic vulcanizate (TPV) including a plastic material phase and a vulcanized rubber phase said vulcanized rubber phase of said thermoplastic vulcanizate comprising an ethylene-propylene rubber.

5,744,239
**ADDITION OF ANTIMICROBIAL AGENTS TO PAVEMENT MARKING MATERIALS**
**Gina M. Buccellato, Eagan; Rochelle R. Robideau, St. Paul; Keith M. Hoffmann, North St. Paul, and Gregory F. Jacobs, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Filed Sep. 27, 1996, Ser. No. 723,209**
**Int. Cl.[6] B32B** *9/04*
**U.S. Cl. 428—411.1** **33 Claims**

1. A pavement marking system comprising:
a preformed pavement marking comprising at least one layer, the marking having a pavement contacting surface; and
an adhesive composition comprising an antimicrobial agent applied to the pavement contacting surface of the pavement marking.

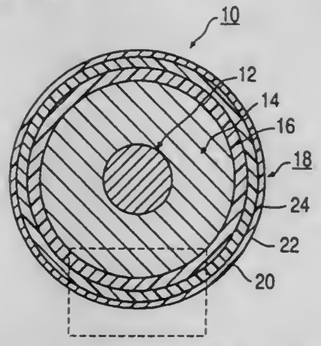
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5,744,240
**BASECOAT COLOR SHIFT INHIBITOR**
**Matthew T. Lane, Bowling Green, and David Braun, Whitehouse, both of Ohio, assignors to BASF Corporation, Mount Olive, N.J.**
**Filed Oct. 4, 1996, Ser. No. 755,133**
**Int. Cl.[6] B32B** *9/04*
**U.S. Cl. 428—411.1** **3 Claims**

1. A multi-layer coating composition comprising:
a) a basecoat layer containing binder and pigment,
b) a clear intermediate barrier coat layer comprising at least one polymer, oligomer or combination thereof in a carrier composition, and
c) a low volatile organic content clearcoat containing reactive diluents and having a volatile organic content of from about 0.1 to 3.5 pounds per gallon, and
wherein, said clearcoat is applied over said basecoat and said clear intermediate layer.

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5,744,241
**FLUOROPOLYMER COATED ELASTOMERIC ROLLERS AND STRUCTURES**
**Alex Ray Hobson, Elkton, Md.; Robert L. Sassa, Newark, Del.; Steven H. Speck, North East, Md., and Tit-Keung Lau, Wilmington, Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.**
**Continuation of Ser. No. 317,971, Oct. 4, 1994. This application Dec. 4, 1995, Ser. No. 567,377**
**Int. Cl.[6] B32B** *27/32;* **B29D** *7/00*
**U.S. Cl. 428—422** **13 Claims**




1. A composite release coating that consists essentially of:
an expanded polytetrafluoroethylene (ePTFE) skin having a non-porous exposed surface and a porous adhered surface, the exposed surface being rendered non-porous by the addition of a fluorocarbon solution selected from the group consisting of

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PTFE, FEP, PFA, ETFE, and amorphous fluoropolymers within the porous structure of the ePTFE skin;

an adhesive layer, the adhesive layer imbibed within the porous ePTFE skin on the adhered surface; and

a substratum to which the adhesive layer bonds the ePTFE skin.

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5,744,242

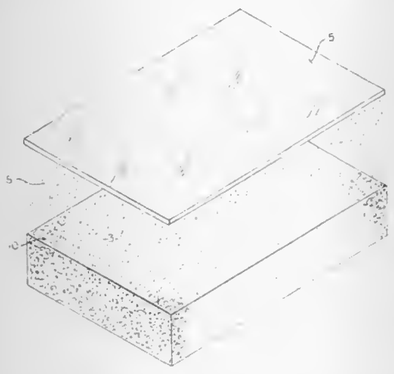
**PROTECTIVE LINER ARTICLE AND METHOD OF MAKING IT**

**Henry A. Mullen, Jefferson County, Ky., assignor to Imrie-Gielow, Inc., St. Louis, Mo.**

**Filed Apr. 24, 1996, Ser. No. 637,150**

**Int. Cl.[6] B32B 17/06**

**U.S. Cl. 428—427** **16 Claims**




1. A protective liner article comprising a cellulated block of borosilicate glass and a sheet of glassy, material bonded to a broad face of said block, said sheet and said block having coefficients of expansion sufficiently compatible to permit the sheet and block to maintain their bond through the range of temperature to which they are subjected, said block having a degradation temperature lower than the fusing temperature of said glassy sheet material, said sheet being exposed to a corrosive atmosphere whereby the cellulated block and a surface on which said block is mounted are protected by said sheet.

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5,744,243

**COATING COMPOSITION AND ARTICLES PREPARED THEREWITH**

**Huawen Li, Delmont, Pa.; Alan E. Wang, Hoffman Estates, Ill., and Suryya K. Das, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Division of Ser. No. 408,438, Mar. 22, 1995, Pat. No. 5,580,819. This application Sep. 10, 1996, Ser. No. 709,799**

**Int. Cl.[6] B32B 9/04**

**U.S. Cl. 428—447** **15 Claims**

1. A coating composition consisting essentially of the composition obtained by mixing (1) the acid catalyzed hydrolysis and condensation products of a water-silane monomer mixture, and (2) a film-forming amount of a solution of solution polymerized organic polymer having functional groups selected from the group consisting of amino, hydroxy and carboxy, hydroxy and amino, amino and carboxy, and amino, hydroxy and carboxy, said polymer being compatible with said silane monomer and the acid catalyzed condensation products of said silane monomer, said coating composition forming a coating that exhibits an increase in luminous transmittance after treatment with an aqueous electrolyte solution.

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5,744,244

**TAMPER-PROOF ELECTRONIC COATINGS**

**Robert Charles Camilletti; Loren Andrew Haluska, and Keith Winton Michael, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Division of Ser. No. 548,851, Oct. 26, 1995, Pat. No. 5,693,701. This application Jun. 19, 1997, Ser. No. 878,134**

**Int. Cl.[6] B32B 9/04**

**U.S. Cl. 428—447** **12 Claims**

1. A method of forming a tamper-proof coating on an electronic device comprising:

applying a coating composition comprising a silica precursor resin and an inorganic salt onto an electronic device, wherein the inorganic salt is one which reacts with a wet etch to yield an acid or base that damages the electronic device; and

heating the coated substrate at a temperature sufficient to convert the coating composition into a ceramic coating.

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5,744,245

**PRECIOUS METAL COMPOSITION**

**Peter T. Bishop, Reading, United Kingdom, assignor to Johnson Matthey Public Limited Company, London, United Kingdom**

**Division of Ser. No. 155,827, Nov. 23, 1993, Pat. No. 5,401,535, which is a division of Ser. No. 875,412, Apr. 29, 1992, Pat. No. 5,281,635. This application Feb. 3, 1995, Ser. No. 383,219**

**Claims priority, application United Kingdom, May 17, 1991, 10757; Jul. 19, 1991, 15621**

**Int. Cl.[6] B32B 17/00**

**U.S. Cl. 428—457** **16 Claims**

1. A transfer, comprising: a transfer substrate and dried thereon a composition which comprises, polymeric resin and a solution, in water and a co-solvent, of a thiolate of a precious metal selected from the group consisting of one or more of platinum, palladium, gold and silver, the composition before drying containing 3–22% by weight of the precious metal as the thiolate, and the co-solvent, resin, and thiolate being such that as the composition on a substrate dries and is progressively heated in firing, the water evaporates off to leave a homogeneous composition of the resin and thiolate in the co-solvent, then the co-solvent evaporates off to leave a homogeneous composition of the thiolate in the resin, and then the thiolate decomposes to the precious metal while the resin volatilizes.

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5,744,246

**OXYGEN SCAVENGING RIBBONS AND ARTICLES EMPLOYING THE SAME**

**Ta Yen Ching, Novato, Calif., assignor to Chevron Chemical Company, San Ramon, Calif.**

**Continuation of Ser. No. 321,728, Oct. 12, 1994, abandoned, which is a continuation-in-part of Ser. No. 308,136, Sep. 19, 1994, Pat. No. 5,450,994. This application Oct. 28, 1996, Ser. No. 740,366**

**Int. Cl.[6] B32B 3/10;27/34**

**U.S. Cl. 428—474.4** **21 Claims**

1. A package material having an oxygen scavenging article located therein, wherein said article is heat sealed at two ends of said package material and the majority of the article remains unattached to said package material, said article comprising a heat sealable polymer resin layer as an exterior surface of the article, an oxygen scavenging material layer, and a polymeric selective barrier layer between the oxygen scavenging material layer and the heat sealable polymer layer.



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5,744,247

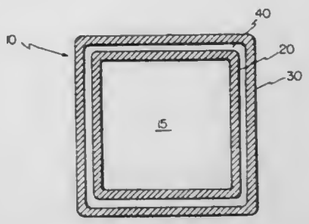
**PACKAGE HAVING IMPROVED BARRIER PROPERTIES**

**George Anderson, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.**

**Division of Ser. No. 950,903, Sep. 24, 1992, Pat. No. 5,500,303. This application Dec. 6, 1995, Ser. No. 568,089**

**Int. Cl.[6] B32B 27/08**

**U.S. Cl. 428—475.5** **5 Claims**




1. A composite film barrier for packaging an oxygen sensitive product comprising an inner ply of an oxygen permeable polymeric material disposed adjacent the product, an outer ply of an oxygen permeable polymeric material spaced away from the inner ply, and a substantially anaerobic space defined by the inner and outer plies to form the barrier, each of the inner and outer plies having an oxygen resistance, wherein the ratio of the oxygen transmittance rate of the inner ply to the sum of the oxygen transmittance rate of the outer ply and the oxygen transmittance rate of the inner ply is between about 0.4 and about 0.6, wherein the total amount of oxygen transmitted by the barrier over a period of time is less than the amount of oxygen transmitted over the same period of time by a single ply film having an oxygen transmittance rate which is approximately equal to the total oxygen transmittance of the inner and outer plies.

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5,744,248

**COATING COMPOSITIONS CURABLE BY RADIATION AND THEIR USE FOR PREPARING COATED SUBSTRATES**

**Jürgen Meixner, Krefeld; Wolfgang Fischer, Meerbusch; Manfred Müller, Mönchengladbach, and Günter Ruf, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Jan. 28, 1997, Ser. No. 789,047**

**Claims priority, application Germany, Feb. 6, 1996, 196 04 185.6**

**Int. Cl.[6] C08L 67/08**

**U.S. Cl. 428—482** **2 Claims**

1. A coating composition, which is curable by UV radiation and contains

I) 0 to 95 parts by weight of at least one binder curable by radiation and containing maleate, fumarate and/or acryloyl groups other than those of component II),

II) 5 to 100 parts by weight of a mixture of

A) 20 to 80 parts by weight of at least one polyester resin prepared from fatty acids, provided that at least 20 wt. % of component A) is a fatty acid having a number average molecular weight of 112 to 400 and the acid component used to prepare the polyester consists of said fatty acids and a member selected from the group consisting of aromatic monocarboxylic acids containing 7 to 15 carbon atoms, aromatic polycarboxylic acids containing 6 to 15 carbon atoms and their intramolecular anhydrides, and

B) 20 to 80 parts by weight of at least one compound containing (meth)acryloyl groups, having a viscosity at 23° C. of 10 to 1,000 mPa.s and having a number average molecular weight of 170 to 1,000, and

III) 0.5 to 10 wt. %, based on the total weight of components I) and II), of a photoinitiator,

wherein the sum of the parts by weight of components I) and II) adds up to 100, based on the weight of components II and III, and the sum of the parts by weight of components A) and B) adds up to 100, based on the weight of components A) and B).

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5,744,249

**WEATHER-RESISTANT, PLASTICIZER-FREE, DEEP-DRAWABLE FILM**

**Walter Kopytko, Waldkraiburg, Germany, assignor to Benecke-Kaliko AG, Germany**

**Division of Ser. No. 436,604, May 8, 1995, abandoned, which is a continuation of Ser. No. 304,636, Aug. 30, 1994, abandoned, which is a continuation of Ser. No. 50,114, Aug. 16, 1993, abandoned. This application Jan. 19, 1996, Ser. No. 588,860**

**Claims priority, application Germany, Oct. 15, 1991, 41 34 111.2; WIPO, Oct. 14, 1992, PCT/EP92/02358**

**Int. Cl.[6] B32B 27/08**

**U.S. Cl. 428—516** **20 Claims**

1. A method for improving the processability of a film-forming mixture used for producing a weather-resistant, plasticizer-free, deep-drawable film by providing a mixture which consists essentially of (a) 30–70 wt. % of a semi-crystalline ethylene/propylene/diene terpolymer containing about 56–76 wt. % ethylene, about 15–30 wt. % propylene, and about 9–14 wt. % of a diene and having a melt flow index MFI (230/2.16) of about 5–15 g/10 min. and (b) 70–30 wt. % of an ethylene or propylene copolymer having a melt flow index MFI (230/2.16) of greater than 2.5 g/10 min, plasticizing and homogenizing the mixture at an elevated temperature, and molding the plasticized mixture into a film by extruding, calenderizing, or casting.

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5,744,250

**ADHESION COMPOSITIONS FOR MULTILAYER STRUCTURES**

**I-Hwa Lee, Wilmington; Stephen Robert Tanny, Newark; Anthony Matthew Angelo, Wilmington, all of Del., and Stewart Carl Feinberg, Exton, Pa., assignors to E. I. du Pont de Nmeours and Company, Wilmington, Del.**

**Continuation of Ser. No. 516,034, Aug. 15, 1995, abandoned, which is a continuation-in-part of Ser. No. 312,955, Sep. 30, 1994, abandoned, which is a continuation-in-part of Ser. No. 174,860, Dec. 29, 1993, abandoned. This application Dec. 6, 1996, Ser. No. 761,682**

**Int. Cl.[6] B32B 27/08;27/32**

**U.S. Cl. 428—516** **2 Claims**

1. A multilayer structure consisting essentially of:

a first layer comprising an ionomer or acid copolymer; and a second layer comprising a bonding resin consisting essentially of:

a) a thermoplastic base polymer comprising:

an ethylene-alpha olefin polymer having a density less than 0.915 and greater than or equal to 0.850 grams per cubic centimeter selected from ethylene-butene-propylene polymer or ethylene-butene polymer.; and

b) an elastomer grafted with a carboxylic acid moiety or any of the following derivatives of a carboxylic acid moiety, anhydride, ester, amide, imide or metal salt,

whereby the weight percent of a) in the second layer is in the range of 55–90 wt % and the weight percent of b) in the second layer is in the range of 10–30 wt %, and wherein the elastomer is selected from ethylene-propylene diene rubber or styrene-ethylene-butylene-styrene rubber.

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5,744,251

## CELLULOSIC COMPOSITION AND ARTICLE

Paul Edmund DuCharme, Jr., Tinley Park; Norman Abbye Protnoy, Clarendon Hills; John Markulin, Oak Lawn, and Myron Donald Nicholson, Lemont, all of Ill., assignors to Viskase Corporation, Chicago, Ill.

Division of Ser. No. 342,287, Nov. 18, 1994, Pat. No. 5,603,884. This application Apr. 15, 1996, Ser. No. 632,051

Int. Cl.[6] B32B *23/00;23/02*

U.S. Cl. 428—536 9 Claims

1. A shaped fibrous cellulosic article comprising a continuous phase of nonderivatized regenerated cellulose and uniformly dispersed partially solubilized fibers of a cellulosic fibrous material bound to or composited with the continuous phase.

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5,744,252

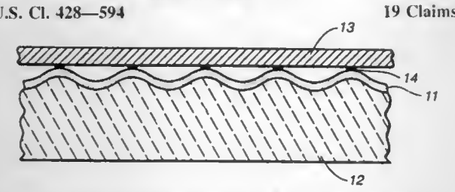
## FLEXIBLE CERAMIC-METAL INSULATION COMPOSITE AND METHOD OF MAKING

Daniel J. Rasky, Palo Alto; Paul M. Sawko, San Jose; Paul Kolodziej, Redwood City, and Demetrius A. Kourtides, Gilroy, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 700,368, May 6, 1991, abandoned, which is a division of Ser. No. 410,576, Sep. 21, 1989, Pat. No. 5,038,693. This application Jun. 11, 1993, Ser. No. 75,367

Int. Cl.[6] B32B *18/00*

U.S. Cl. 428—594 19 Claims




14. An integral metal sheet surfaced flexible thermal protection article, which article comprises:

a thin metallic sheet having an upper surface and a lower surface as a surface component;

a woven flexible ceramic fabric structure which is filled with a ceramic insulation; and

a multiplicity of high temperature metallic or ceramic contact points or contact lines of a brazing material which contact discrete separate regions of the lower surface of the metallic sheet and the woven flexible ceramic fabric structure and connecting the metallic sheet and ceramic fabric, with the proviso that the total surface area of the contact points or contact lines are about 10% or less of the total surface area of the lower surface of the metallic sheet.

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5,744,253

## THIN-FILM RECORDING MEDIUM WITH THIN CHROMIUM UNDERLAYER

Brij Bihari Lal, San Jose, and Tadashi Shinohara, Fremont, both of Calif., assignors to HMT Technology Corporation, Fremont, Calif.

Filed Oct. 22, 1992, Ser. No. 964,745

Int. Cl.[6] G11B *23/00*

U.S. Cl. 428—611 4 Claims

1. A magnetic thin-film medium comprising

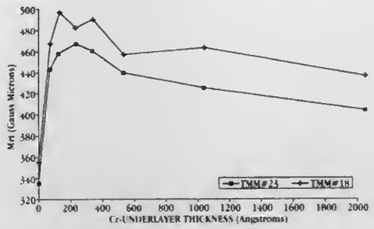
a disc-like substrate,

formed on the substrate surface, a sputtered Cr underlayer having a thickness between about 100–300 Å, and

a sputtered magnetic thin-film layer formed from a Co alloy and having a thickness between 250–800 Å,

said medium being characterized by

(i) a coercivity greater than about 1200 Oe;




(ii) a loop squareness ratio of greater than about 0.75; and

(iii) an $M_rt$ value that is substantially greater than that obtained at a Cr underlayer thickness greater than about 500 Å.

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5,744,254

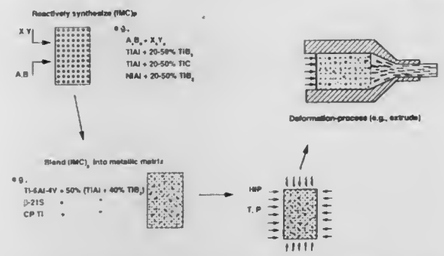
## COMPOSITE MATERIALS INCLUDING METALLIC MATRIX COMPOSITE REINFORCEMENTS

Stephen L. Kampe, Alum Ridge, Va., and Leontios Christodoulou, London, England, assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Filed May 24, 1995, Ser. No. 448,858

Int. Cl.[6] C22C *1/09;1/08*

U.S. Cl. 428—614 30 Claims




1. A solid composite material comprising a continuous matrix having composite reinforcements disposed therein, the composite reinforcements comprising an intermetallic matrix with ceramic particulates dispersed therein.

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5,744,255

## ALUMINUM ALLOY BRAZING MATERIAL AND BRAZING SHEET ADAPTABLE FOR HEAT EXCHANGES

Takeyoshi Doko; Koji Okada; Tokinori Onda; Hiroaki Takeuchi, and Yoji Hirano, all of Tochigi, Japan, assignors to Furukawa Electric Co., Ltd., Tokyo, Japan, and Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 189,976, Feb. 1, 1994, abandoned. This application Sep. 3, 1996, Ser. No. 707,091

Claims priority, application Japan, Aug. 3, 1993, 5-212377; Aug. 6, 1993, 5-214879; Aug. 10, 1993, 5-218019; Aug. 31, 1993, 5-238971; Aug. 31, 1993, 5-240563; Sep. 6, 1993, 5-245967; Sep. 6, 1993, 5-245968; Sep. 7, 1993, 5-242106; Sep. 30, 1993, 5-267962

Int. Cl.[6] B32B *15/20;* F28F *19/06;21/08*

U.S. Cl. 428—654 20 Claims

1. An aluminum alloy brazing sheet comprising, in weight percent:

a brazing material, a core material and a sacrificial material;

said brazing material being an aluminum alloy including from about 7.0% to about 12.0% of Si, over 0.8% to about 8.0% of Cu, and from about 0.05% to about 0.5% of Fe;

said brazing material further including at least one member selected from the group consisting of from about 0.5% to about 5.5% of Zn, from about 0.002% to about 0.3% of In and from about 0.002% to about 0.3% of Sn;

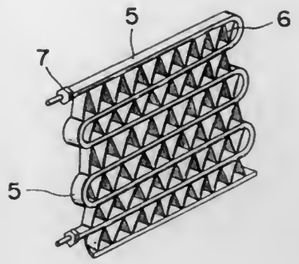
a balance of said brazing material being substantially Al and inevitable impurities;

said core material being an aluminum alloy including from about 0.6% to about 2.5% of Si, from about 0.5% to about 2.5% of Cu co-existing with said Si, and from about 0.05% to about 2.0% of Mn; a balance of said core material being substantially Al and inevitable impurities;

said sacrificial material being an aluminum alloy including at least one member selected from the group consisting of from about 0.5% to about 6.0% of Zn, from about 0.002 to about 0.3% of In, and from about 0.002% to about 0.3% of Sn; and

a balance of said sacrificial material being substantially Al and inevitable impurities.






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5,744,256

## MAGNETIC RECORDING MEDIUM AND METHOD OF PRODUCING SAME

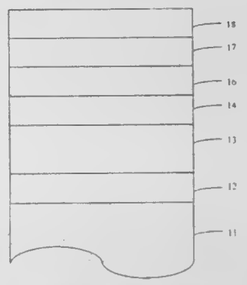
Noriyoshi Goda; Shinya Matsuoka; Tatsuo Kawaide, all of Odawara, and Takaaki Shirakura, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 16, 1992, Ser. No. 945,527

Claims priority, application Japan, Sep. 17, 1991, 3-262556

Int. Cl.[6] G11B *5/66*

U.S. Cl. 428—694 T 14 Claims




1. A magnetic recording medium comprising:

a non-magnetic plated substrate;

a non-magnetic underlying layer disposed on said substrate; and

a magnetic recording layer having a columnar crystal structure wherein said magnetic recording layer is disposed on said underlying layer, said magnetic recording layer comprising a plurality of magnetic alloy layers for magnetic recording, said plurality of magnetic alloy layers being comprised of:

an uppermost magnetic recording layer; and

at least one lower magnetic recording layer, wherein the average particle diameter of columnar crystals in a surface of said uppermost magnetic recording layer of said magnetic recording layer is smaller than in a surface of said lower magnetic recording layer; and a protective layer disposed on said magnetic recording layer.

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5,744,257

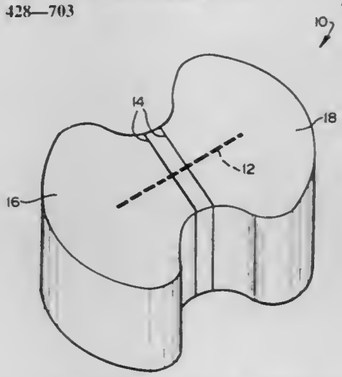
## PRODUCTION OF COMPOSITES

Pieter Andries Blatt Carstens, Pretoria, South Africa, assignor to Atomic Energy Corporation of South Africa Limited, Pelindaba, South Africa

Filed Mar. 3, 1995, Ser. No. 398,098

Int. Cl.[6] B32B *17/00*

U.S. Cl. 428—703 7 Claims




1. A composite material which comprises a settable cementitious substrate component reinforced by reinforcing material to which the cementitious component adheres by setting in contact with said reinforcing material, the surface of said reinforcing material to which the cementitious substrate component adheres, having been modified by surface fluorination with the reinforcing material being in the form of polymeric fibers uniformly and randomly distributed throughout the cementitious component, said fibers having lengths from 3 mm to 600 mm and widths from 5 μm to 1300 μm, and with the proportion of fibers in the cementitious component being from 0.3% to 85% by volume.

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5,744,258

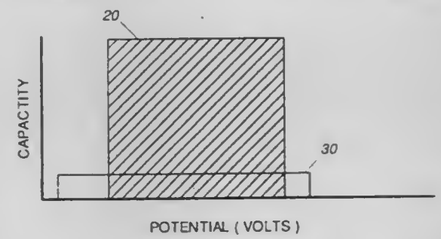
## HIGH POWER, HIGH ENERGY, HYBRID ELECTRODE AND ELECTRICAL ENERGY STORAGE DEVICE MADE THEREFROM

Lijun Bai; Changming Li, both of Vernon Hills, Ill.; Anaba A. Anani; George Thomas, both of Lawrenceville, Ga.; Han Wu, Barrington; Ke Keryn Lian, Palatine, both of Ill.; Frank R. Denton, III, and Jason N. Howard, both of Lawrenceville, Ga., assignors to Motorola,Inc., Schaumburg, Ill.

Filed Dec. 23, 1996, Ser. No. 774,048

Int. Cl.[6] H01M *4/36*

U.S. Cl. 429—3 18 Claims




1. A hybrid electrode for a high power, high energy, electrical storage device, said hybrid electrode comprising:

a current collector;

a first electroactive material; and

a second electroactive material,

wherein:

the first electroactive material has a higher energy density than the second electroactive material;

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the second electroactive material has a higher rate capability than the first electroactive material; and

one of the first and second electroactive materials is formed as a first discrete layer in contact with the current collector, and the other of the first and second electroactive materials is formed as a second discrete layer deposited onto the first discrete layer.

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**5,744,259**

**NICKEL POSITIVE ELECTRODE FOR ALKALINE STORAGE BATTERY AND SEALED NICKEL-METAL HYDRIDE STORAGE BATTERY**

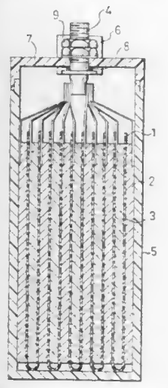
**Kazuhiro Ohta; Yukihiro Okada; Kiyoshi Hayashi, all of Neyagawa; Hiromu Matsuda, Kawabe-gun, and Yoshinori Toyoguchi, Yao, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan**

**Filed May 21, 1996, Ser. No. 646,824**

**Claims priority, application Japan, May 25, 1995, 7-126574; Jun. 16, 1995, 7-150522**

**Int. Cl.[6] H01M** *10/30*

**U.S. Cl. 429—59** **5 Claims**



1. A nickel positive electrode for an alkaline storage battery comprising a nickel hydroxide powder having its particle surfaces covered with particles of a cobalt hydroxide powder, wherein said cobalt hydroxide powder has a specific surface area of 10 $m^2/g$ or larger and a particle diameter of one-half or less of that of said nickel hydroxide powder.

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**5,744,260**

**BATTERY PACK**

**Jae-Hoon Sim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Japan**

**Filed Jul. 25, 1996, Ser. No. 686,352**

**Int. Cl.[6] H01M** *6/42*

**U.S. Cl. 429—99** **9 Claims**



1. A battery pack comprising:

a first case including a first lid, a first cell receiving portion for receiving and supporting first and second battery cells, and a first connecting portion for connecting the first cell receiving portion with said first lid, wherein said first and second battery cells are arranged physically in parallel and connected electrically in series to each other, said first lid includes a pair of first apertures formed at an upper surface thereof, a pair of second apertures formed at a side surface of said first lid, and a pair of terminal member supporting portions having recesses for connecting the first apertures with the second recesses, and said first lid, the first cell receiving portion, and the first connecting portion are integrally formed,

a second case including a second lid engaged with said first lid, a second cell receiving portion for receiving and supporting said first and second battery cells by engagement with the first cell receiving portion, and a second connecting portion for connecting the second cell receiving portion with said second lid, wherein said second lid, the second cell receiving portion, and the second connecting portion are integrally formed; and

first and second terminal members each having a connecting end inserted through one of the first apertures to be electrically connected with one of electrodes of said first and second battery cells, and a fixing end inserted through one of the second apertures, wherein the fixing ends of said first and second terminal members are bent toward an inner side of said first case to be fixed to said first case, and said first and second terminal members are located on the terminal member supporting portions.

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**5,744,261**

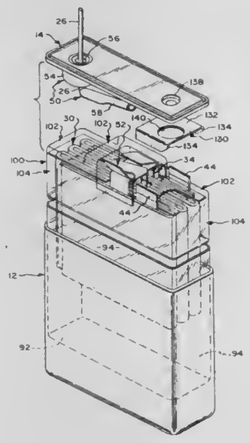
**INSULATING INCLOSURE FOR LITHIUM BATTERIES**

**Barry C. Muffoletto, Alden, and Raymond J. Kuwik, Lancaster, both of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.**

**Continuation of Ser. No. 886,725, May 21, 1992, abandoned. This application Dec. 6, 1996, Ser. No. 761,164**

**Int. Cl.[6] H01M** *6/14*

**U.S. Cl. 429—131** **11 Claims**



1. An electrochemical cell for delivering high current pulses comprising:

a) a conductive casing closed at one end and having an opening at the opposite end thereof closed by a conductive lid;

b) terminal means on said lid for making electrical connection to a load;

c) a lithium anode assembly within said casing and connected electrically thereto;



d) a cathode assembly within said casing comprising a plurality of plates and a corresponding plurality of cathode leads each extending from one of said plates in a region near said lid;

e) insulated cathode conductor means extending through said lid having an outer end for making electrical connection to said load and having an inner end adjacent said cathode assembly;

f) cathode connector means for making electrical connection between said inner end of said cathode conductor means and said leads of said cathode plates, said conductor means being located in close proximity to said lid;

g) an electrolyte within said casing and operatively contacting components of said anode and cathode assemblies;

h) first insulating means for insulating said casing from components therein and being in the form of a cup having a relatively thin base portion extending along said closed end of said casing and a relatively thin wall portion extending from said base along within said casing toward said lid and defining an opening facing said lid; and

i) second insulating means for insulating said lid from components in said casing so as to prevent a short circuit between said lid or casing and said cathode assembly caused by formation of lithium clusters in the region between said lid or casing and said cathode connector means, said second insulating means being in the form of a cup having a relatively thin base portion extending along said lid and a relatively thin wall portion extending from said base along within said casing and toward said wall of said first insulating means and defining an opening facing said base portion of said first insulating means,

j) so that the openings defined in said first and second insulating means face toward each other.

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**5,744,262**

**STABLE HIGH-VOLTAGE ELECTROLYTE FOR LITHIUM SECONDARY BATTERY**

**Cheng-Hung Cheng, Taipei; Ching-Yih Yao, Miaoli Hsien; Chia-Yu Yang, Hsinchu; Sheng-Hua Shih, Chang-Hua; Tung-Han Kao, Hsinchu; Jin-Ming Chen, Taichung, and Weir-Mirn Hurng, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan**

**Continuation-in-part of Ser. No. 476,516, Jun. 7, 1995, abandoned. This application Sep. 23, 1996, Ser. No. 717,875**

**Int. Cl.[6] H01M** *6/16*

**U.S. Cl. 429—197** **11 Claims**

1. A lithium secondary battery comprising:

(a) a coke-based cathode;

(b) an organic electrolyte comprising:

(i) a lithium salt; and

(ii) an organic solvent mixture consisting essentially of a carbonate and an acetate; wherein said carbonate and said acetate are provided in a volume ratio of carbonate/acetate ranging from 80/20 to 20/80, and said lithium salt has a concentration of between 0.6 and 1.5M; wherein said carbonate is propylene carbonate.

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**5,744,263**

**ALKALINE STORAGE BATTERIES AND NICKEL ELECTRODES HAVING PLURALITY OF SUBSTRATES**

**Toru Inagaki, Kamakura; Katsuhiro Okamoto, Toyohashi; Hiroki Takeshima, and Yohei Hattori, both of Fujisawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

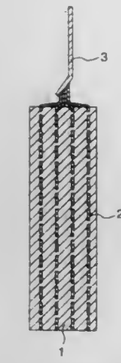
**Filed Nov. 22, 1996, Ser. No. 754,135**

**Claims priority, application Japan, Apr. 18, 1996, 8-096492**

**Int. Cl.[6] H01M** *10/30*

**U.S. Cl. 429—206** **5 Claims**

1. An alkaline storage battery comprising a nickel positive electrode, a negative electrode and an alkaline electrolyte, wherein said nickel positive electrode comprises a plurality of electrode leaves each of which comprises an electroconductive substrate coated with an active material and which are laminated and integrated so that the electroconductive substrate and the active material layer are alternated with each other, a plurality of said electroconductive substrates being electrically and mechanically connected through a part of the respective electroconductive substrates, said electroconductive substrate having a thickness of 5–60 μm, said active material layer coated on the electroconductive substrate having a thickness of 20–250 μm.



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**5,744,264**

**LITHIUM ION ELECTROCHEMICAL CELL**

**Jeremy Barker, Henderson, Nev., assignor to Valence Technology, Inc., Henderson, Nev.**

**Filed Jun. 13, 1996, Ser. No. 665,105**

**Int. Cl.[6] H01M** *10/40;4/50;4/52*

**U.S. Cl. 429—218** **25 Claims**

1. An electrochemical cell comprising:

an anode comprising an anode active material comprising graphitized microbead carbon particles;

a cathode comprising a cathode active material wherein the amount of cathode active material present is sufficient to intercalate the anode active material to attain an effective anode specific capacity of greater than 372 mAh/g; and

an electrolyte containing an electrolyte solution that is interposed between the anode and cathode.

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**5,744,265**

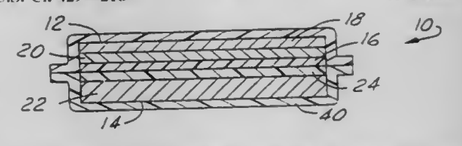
**LITHIUM CELL HAVING MIXED LITHIUM—METAL—CHALCOGENIDE CATHODE**

**Jeremy Barker, and M. Yazid Saidi, both of Henderson, Nev., assignors to Valence Technology, Inc.**

**Filed Jun. 13, 1996, Ser. No. 665,106**

**Int. Cl.[6] H01M** *4/48;4/58*

**U.S. Cl. 429—218** **11 Claims**



1. A lithium ion battery which comprises a positive electrode and a negative electrode; said negative electrode comprising an active material consisting of an intercalation material in a pre-charge state; said positive electrode comprising an active material consisting of first and second lithium-containing intercalation compounds which are different from one another, the fist being a lithium copper oxide compound and the second being a lithium metal chalcogenide compound other than lithium copper oxide.

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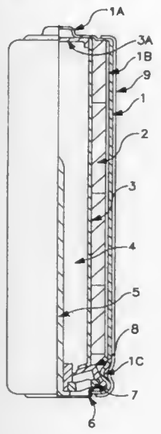


5,744,266

## BATTERIES AND A METHOD OF MANUFACTURING POSITIVE ACTIVE MATERIAL FOR THE BATTERIES

Jun Nunome, Moriguchi; Takuya Nakashima, Neyagawa; Hiroshi Yoshizawa, Hirakata, and Seiji Tao, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 31, 1997, Ser. No. 791,586
Claims priority, application Japan, Feb. 2, 1996, 8-017279; Feb. 2, 1996, 8-017280; Mar. 5, 1996, 8-047177
Int. Cl.[6] H01M *4/50*
U.S. Cl. 429—224 12 Claims



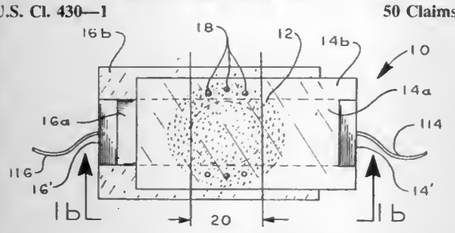

1. A battery including manganese oxides comprising:
a manganese dioxide or a double oxide of manganese and lithium as a positive active material; and
a surface modification layer on said manganese oxides of a compound including an oxide of at least one element selected from the group consisting of titanium, cobalt, nickel, strontium, and lanthanum.

5,744,267

## AZO-DYE-DOPED PHOTOREFRACTIVE POLYMER COMPOSITES FOR HOLOGRAPHIC TESTING AND IMAGE PROCESSING

Klaus Meerholz; Bernard Kippelen; Nasser N. Peyghambarian; Scott R. Lyon; Henry K. Hall, Jr.; Anne B. Padias; (NFN) Sandalphon, and Boris L. Volodin, all of Tucson, Ariz., assignors to Arizona Board of Regents, Tucson, Ariz.

Continuation of Ser. No. 321,737, Oct. 12, 1994, abandoned. This application Sep. 10, 1996, Ser. No. 710,084
Int. Cl.[6] G03H *1/04;* G03C *1/72*
U.S. Cl. 430—1 50 Claims



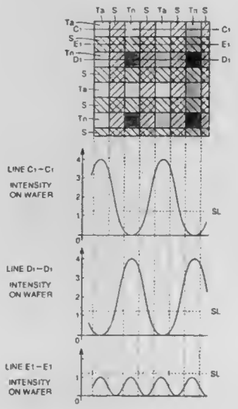

1. A photorefractive polymer composite comprising a second-order, non-linear optical dye, a polymeric photoconductor, a photosensitizer, and a photoconductive plasticizer having a molecular weight of less than 1,000 g/mole, said refractive composite having a glass transition temperature, said photoconductive plasticizer acting to plasticize said photorefractive polymer composite beyond any plasticizing effect provided by said second-order, non-linear optical dye, said photoconductive plasticizer acting to lower said glass transition temperature such that said glass transition temperature is at or below about 20° C. and said photorefractive composite has a diffraction efficiency derived from the p-polarized readout that is greater than about 13% and approaches 100%.

5,744,268

## PHASE SHIFT MASK, METHOD OF MANUFACTURING A PHASE SHIFT MASK AND METHOD OF FORMING A PATTERN WITH PHASE SHIFT MASK

Shuji Nakao, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1997, Ser. No. 780,266
Claims priority, application Japan, Sep. 6, 1996, 8-236466
Int. Cl.[6] G03F *9/00*
U.S. Cl. 430—5 7 Claims




1. A phase shift mask comprising:
a substrate having first, second, third and fourth light transmission regions allowing transmission of exposure light therethrough, having a shield region interrupting exposure light, and provided at a main surface of said third light transmission region with a trench such that a phase of the exposure light transmitted through said third light transmission region is different from that of the exposure light transmitted through said first and second light transmission regions;
a semi-shield film formed on the main surface of said substrate for damping the intensity of the exposure light, covering said second and fourth light transmission regions, and exposing said first and third light transmission regions;
a phase shift film formed on the main surface of said substrate, covering said fourth light transmission region and exposing said first, second and third light transmission regions for setting a phase of the exposure light transmitted through said fourth light transmission region to be different from that of the exposure light transmitted through said first and second light transmission regions and to be substantially equal to that of the exposure light transmitted through said third light transmission region; and
a shield film formed on the main surface of said substrate, covering said shield region and exposing said first, second, third and fourth light transmission regions.

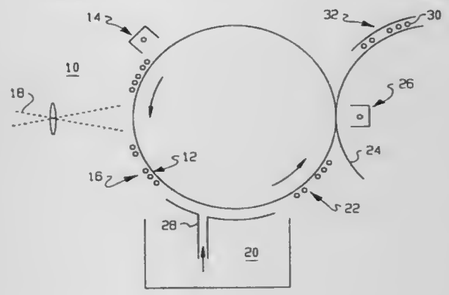


5,744,269

## METHOD FOR PROTECTING DEVELOPED ELECTROSTATIC IMAGES USING AN AMPHIPATHIC TONER

Romit Bhattacharya, Morris Plains; Giovanni Perrotta, Wayne; Achyut Bhalchandra Deshpande, South Orange, and Paul Rocco Bilancio, Oak Ridge, all of N.J., assignors to Specialty Toner Corporation, Fairfield, N.J.

Filed Nov. 25, 1996, Ser. No. 774,324
Int. Cl.[6] G03G *13/20;3/00*
U.S. Cl. 430—18 24 Claims




1. A method for protecting developed electrostatic images on a substrate, which comprises:
electrostatically applying an amphipathic liquid toner over a developed electrostatic image on a substrate, said amphipathic liquid toner comprising:
a carrier fluid of an electrically resistive hydrocarbon solvent, having an electrical resistivity of at least about $10^9$ ohm•cm, a dielectric constant of less than about 3, and a boiling point from about 68° C. to about 250° C.,
an amphipathic, non-gel copolymer, which is insoluble as a whole in the carrier fluid, said amphipathic, non-gel copolymer having at least one polymer segment that is soluble in the carrier fluid and at least one polymer segment that is insoluble in the carrier fluid, wherein the soluble polymer segment comprises at least one alkyl acrylate or alkyl methacrylate monomer or at least one alkyl acrylate or alkyl methacrylate monomer and at least one vinyl aromatic monomer; and wherein the insoluble polymer segment comprises at least one vinyl ester monomer or at least one vinyl ester monomer and at least one acrylic acid or methacrylic acid monomer, and
at least one charge control agent to provide an electrostatic charge; and
fixing the amphipathic liquid toner, forming a protective layer on the developed electrostatic image on the substrate.

15. A developed electrostatic image on a substrate, produced according to the method of claim 1.

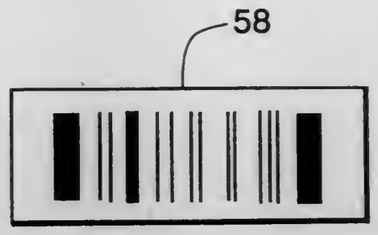
5,744,270

## CODED MARKING ON AN INTERIOR SURFACES OF A CRT FACEPLATE PANEL AND METHOD OF MAKING SAME

Samuel Pearlman, Lancaster; Robert Anthony Duschl, Lititz; Anthony Stanley Baran, Lancaster; Glenn William Brunner, Landisville; George Simon Gadbois, and Frank Thomas DiAugustine, both of Lancaster, all of Pa., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Division of Ser. No. 287,331, Aug. 8, 1994, abandoned. This application Mar. 18, 1996, Ser. No. 620,741
Int. Cl.[6] G03B *41/00;* G03C *5/00*
U.S. Cl. 430—25 6 Claims

1. In a method of providing a coded marking on a CRT faceplate panel having a viewing area and a periphery with a mold-match line and a sealing edge, said viewing area including a luminescent screen having a plurality of different light-emitting phosphors, the improvement wherein said method comprising the steps of:




depositing a suitable negative photoresist on an interior surface of said panel, said negative photoresist extending across said viewing area and onto said periphery;
illuminating, imagewise, areas of said negative photoresist on both said viewing area and said periphery, between said viewing area and said mold-match line, with actinic radiation to selectively change the solubility thereof;
contacting said periphery of said interior surface of said panel between said mold-match line and said sealing edge with an expandable light shield of a light trimming device and illuminating said negative photoresist between said mold-match line and said sealing edge with actinic radiation to change the solubility thereof;
developing said negative photoresist to remove the more soluble areas thereby exposing underlying portions of said viewing area and said periphery of said panel while leaving retained areas of less soluble negative photoresist;
overcoating the retained areas of less soluble negative photoresist and the exposed portions of said viewing area and said periphery of said panel with a light-absorbing material;
drying said light-absorbing material to form a coating which overlies the retained areas of less soluble negative photoresist and is adhered to the exposed portions of said viewing area and said periphery of said panel;
patterning said light-absorbing coating by removing the retained areas of less soluble negative photoresist with said overlying light-absorbing material thereon while leaving said coating of light-absorbing material adhered to the exposed portions of said viewing area and said periphery of said panel, thereby forming openings in said light-absorbing material on said viewing area, a coded marking including a pattern of light-absorbing material and uncoated areas on said periphery of said panel between said viewing are and said match mold line, and a clear sidewall from to said sealing edge to said match mold line;
serially depositing said different light-emitting phosphors onto said viewing area of said panel, each of said different light-emitting phosphors being deposited into adjacent openings formed in said viewing area; and
aluminizing said viewing area and said coded marking, whereby said coded marking is readable from said exterior surface of said panel.

5,744,271

## PHOTOCONDUCTOR FOR ELECTROPHOTOGRAPHY

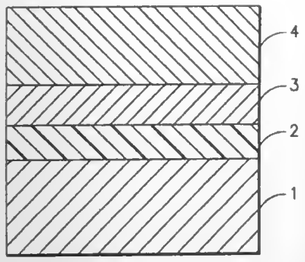
Koichi Aizawa, and Shigemichi Ito, both of Nagano, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 27, 1996, Ser. No. 722,466
Claims priority, application Japan, Sep. 28, 1995, 7-250294
Int. Cl.[6] G03G *5/14*
U.S. Cl. 430—58 4 Claims

1. A photoconductor for electrophotography comprising:
a conductive substrate;
an undercoating layer on said conductive substrate,
said undercoating layer containing resin and particles of metal oxide dispersed in said resin;
said resin including soluble polyamide resin as a main component thereof;
said particles of metal oxide being anatase titanium dioxide;
surfaces of said particles of metal oxide being coated with aminosilane;

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an organic charge generation layer on said undercoating layer; and

an organic charge transport layer on said charge generation layer.

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**5,744,272**

**ELECTROPHOTOGRAPHIC RECORDING MATERIAL FOR THE PRODUCTION OF PRINTING PLATES**

**Andreas Elsaesser, Idstein; Werner Frass, Wiesbaden; Fritz-Feo Grabley, Koenigstein, and Gábor Jerling, Wiesbaden, all of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Germany**

**Filed Mar. 25, 1996, Ser. No. 620,951**

**Claims priority, application Germany, Mar. 23, 1995, 195 10 526.5**

**Int. Cl.[6] G03G** *5/05*

**U.S. Cl. 430—96** **19 Claims**

1. An electrophotographic recording material comprising:

an electrically conductive base layer;

a photoconductive layer which can be de-coated with alkaline solutions, said photoconductive layer comprising an organic photoconductor, a sensitizer and a binder comprising a mixture of:

a) a copolymer containing units composed of a first vinyl aromatic compound and units composed of a maleic partial ester, and

b) a copolymer containing units composed of a second vinyl aromatic compound and units of (meth)acrylic acid, wherein said second vinyl aromatic compound may be the same or different from said first vinyl aromatic compound;

and wherein the weight ratio of copolymer (a) to copolymer (b) is 20:1 to 1:2.

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**5,744,273**

**LAMINATABLE BACKING SUBSTRATES CONTAINING FLUORO COMPOUNDS FOR IMPROVED TONER FLOW**

**Shadi L. Malhotra, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 2, 1996, Ser. No. 720,643**

**Int. Cl.[6] G03G** *13/14*

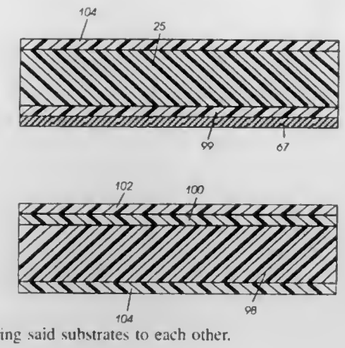
**U.S. Cl. 430—97** **20 Claims**

1. A method of creating simulated photographic-quality prints using non-photographic imaging, including the steps of:

providing a coated transparent substrate having a toner image formed thereon using a non-photographic imaging process;

providing one surface of a backing substrate with a first coating comprising a polymeric adhesive binder having a glass transition temperature less than 55° C., an antistatic agent, a lightfastness inducing agent, an optional filler;

providing said one surface of said backing substrate with a second coating in contact with said first coating wherein said second coating comprises a hydrophilic polymer having a melting point of greater than 50° C., an antistatic agent, a lightfastness inducing agent, an optional filler; and a fluoro compound containing from 1 to about 25 fluorine atoms;




adhering said substrates to each other.

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**5,744,274**

**N-(2-CYANOETHENYL)SULFONAMIDES HAVING TWO FUNCTIONALITIES AND TONER COMPOSITIONS CONTAINING THEM**

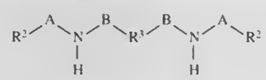
**John C. Wilson, and Peter S. Alexandrovich, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 10, 1996, Ser. No. 644,757**

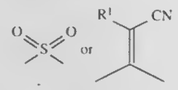
**Int. Cl.[6] G03G** *9/087;9/097;9/10*

**U.S. Cl. 430—106.6** **7 Claims**

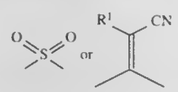
1. A toner comprising a polymeric binder and a charge control agent having the general structure:



wherein one of A and B is either:



and the other of A and B is the other of:



$R^1$ is selected from the group consisting of hydrogen; alkyl containing from 1 to 20 carbons; cycloalkyl containing from 3 to 18 carbons; unsubstituted aromatic ring systems; aromatic ring systems substituted with one or more alkyl, halo, nitro, cyano, hydroxy, alkoxy, carboxy, carboalkoxy, amino, dialkylamino, acyl, trihalomethyl or alkysulfonyl; heteroaromatic ring systems; alkanoyl; alkoxycarbonyl; aminocarbonyl; alkylaminocarbonyl; aralkylaminocarbonyl; alkylsulfonyl; aroyl; aryloxycarbonyl; arylaminocarbonyl; arylsulfonyl; and arylsulfonyl substituted with one or more alkyl, hydroxy, alkoxy, carboxy, carboalkoxy, nitro, halo, cyano, amino, dialkylamino, acyl, trihalomethyl or alkylsulfonyl;

$R^2$ is independently selected from the group consisting of alkyl containing from 1 to 20 carbons; cycloalkyl containing from 3 to 18 carbons; unsubstituted aromatic ring systems; aromatic ring systems substituted with one or more alkyl, hydroxy, alkoxy, carboxy, carboalkoxy, nitro, halo, cyano, amino, dialkylamino, acyl, trihalomethyl or alkylsulfonyl; heteroaromatic ring systems; and, when $R^2$ is attached to the ethenyl group, $R^2$ is optionally ethenyl, unsubstituted or substituted with alkyl containing from 1 to 20 carbons or aryl containing from 5 to 10 carbons or aryl substituted with alkyl, hydroxy, carboxy, carboalkoxy, nitro, halo, cyano, amino, dialkylamino, acyl, trihalomethyl, or alkylsulfonyl; and



$R^3$ is selected from the group consisting of alkylene; arylene; arylenedialkylene; alkylenediarylene; oxydialkylene; and oxydiarylene;

wherein each aromatic and heteroaromatic ring system has a solitary ring or 2 to 3 linked or fused rings, and containing from 3 to 34 carbons.

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**5,744,275**

**COATED CARRIER PARTICLES**

**Michael J. Duggan, Webster; Thomas C. Dombroski, Rochester, and Scott M. Silence, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Mar. 28, 1997, Ser. No. 829,552**

**Int. Cl.[6] G03G** *9/113*

**U.S. Cl. 430—108** **37 Claims**

1. A composition comprised of a core and thereover a mixture of a first and second polymer, and wherein said first polymer contains a conductive component, and said second polymer is a crosslinked poly(urethane).

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**5,744,276**

**TONER FOR DEVELOPING ELECTROSTATIC IMAGE CONTAINING HIGHER AND LOWER MOLECULAR WEIGHT POLYMER COMPONENTS**

**Manabu Ohno, Funabashi; Hiroyuki Suematsu, Yokohama; Akihiko Nakazawa, Kanagawa-ken; Nobuyuki Okubo, Yokohama, and Shunji Suzuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 30, 1994, Ser. No. 220,044**

**Claims priority, application Japan, Mar. 31, 1993, 5-095005; Jun. 29, 1993, 5-182205; Jun. 29, 1993, 5-182206**

**Int. Cl.[6] G03G** *9/087*

**U.S. Cl. 430—109** **19 Claims**

1. A toner composition for developing an electrostatic image, comprising: polymer components, a colorant and a metal-containing organic compound, wherein

the composition shows a melt index (at 125° C., 10 kg-load) of 5–25 g/10 min., and

the polymer components are characterized by

(a) having a THF (tetrahydrofuran)-insoluble content from 0 to 5 wt. %,

(b) including a THF-soluble content thereof providing a GPC (gel permeation chromatography) chromatogram showing

i) a main peak in a molecular weight region of $2\times10^4$–$3\times10^4$, and a sub-peak or shoulder in a molecular weight region of at least $10^5$, and

ii) an areal percentage of 3–10% in a molecular weight region of at least $10^6$, and

(c) including a polymer component (H) providing the sub-peak or shoulder in the molecular weight region of at least $10^5$ obtained by polymerization using a polyfunctional polymerization initiator and a mono-functional polymerization initiator, said polymer component (H) comprising a monomer unit (A) having at least one species of carboxyl group, carboxylic acid salt group or carboxylic anhydride group.

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**5,744,277**

**ELECTROSTATOGRAPHIC TONERS AND DEVELOPERS CONTAINING (1,2-BENZISOTHIAZOL-3-(2H)-YLIDENE 1,1-DIOXIDE) ACETATE-TERMINATED POLYMER CHARGE-CONTROL AGENTS**

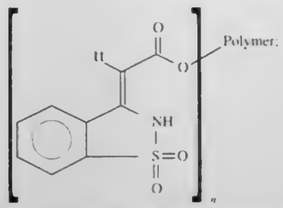
**John C. Wilson, and Robert D. Fields, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 14, 1997, Ser. No. 818,811**

**Int. Cl.[6] G03G** *9/097*

**U.S. Cl. 430—110** **8 Claims**

1. An electrostatographic toner comprising a polymeric binder and a (1,2-benzisothiazol-3(2H)-ylidene 1,1-dioxide)acetate-terminated polymer charge-control agent having the general structure (I):



(I)

wherein n can be as high as the number of hydroxyl groups in the polymer from which structure I is derived.

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**5,744,278**

**TONER FOR DEVELOPING AN ELECTROSTATIC IMAGE AND PROCESS FOR PRODUCING A TONER**

**Yasukazu Ayaki, Numazu; Takeshi Ikeda, Kawasaki; Tetsuro Fukui, Yokohama; Yoshinobu Baba, Yokohama; Hitoshi Itabashi, Yokohama, and Yayoi Nagao, Mishima, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 8, 1997, Ser. No. 835,878**

**Claims priority, application Japan, Apr. 9, 1996, 8-111165; Feb. 28, 1997, 9-045658**

**Int. Cl.[6] G03G** *9/087*

**U.S. Cl. 430—110** **26 Claims**

1. A toner for developing an electrostatic image comprising at least a binder resin and a colorant, wherein:

the toner (i) contains 0.1 to 15 parts by weight of colorant per 100 parts by weight of binder resin, (ii) has a number average particle size of 0.5 to 6.0 μm, (iii) has a coefficient of variation of 20% or less based on a number distribution, (iv) has a capsule structure comprising a shell layer and a core; and said toner has solvent-mixture-soluble resin components extracted with a solvent mixture of ethanol and methyl ethyl ketone, the maximum glass transition temperature (Tg1) of a first soluble resin component obtained by extracting until 10% by weight of the total weight of the solvent mixture soluble resin components, and the maximum glass transition temperature (Tg2) of a second soluble resin component of the remainder satisfy the following relations:

$Tg1>Tg2$ and $Tg1\geqq50°$ C.

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**5,744,279**

**SILVER HALIDE PHOTOGRAPHIC MATERIAL**

**Toshihide Ezoe; Toshiaki Kubo; Hiroshi Takeuchi; Kazunobu Katoh; Shigeo Hirano; Kazuki Yamazaki; Takashi Hoshimiya; Minoru Sakai, and Tetsuo Yoshida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Feb. 1, 1996, Ser. No. 595,478**

**Claims priority, application Japan, Feb. 3, 1995, 7-37817; Feb. 3, 1995, 7-37823; Feb. 3, 1995, 7-37824; Feb. 3, 1995, 7-37827; Feb. 14, 1995, 7-47901; Feb. 23, 1995, 7-58236**

**Int. Cl.[6] G03C** *1/06*

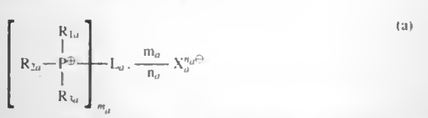
**U.S. Cl. 430—264** **16 Claims**

1. A silver halide photographic material comprising a support having provided thereon at least one silver halide emulsion layer, at least one layer of said emulsion layer and other hydrophilic colloid layers containing at least one hydrazine nucleating agent having, in the vicinity of the hydrazine group, an anionic group or a nonionic group which forms an intramolecular hydrogen bond with a hydrogen atom of the hydrazine, and containing a member selected from the group consisting of onium salt compounds represented by formula (a), (b) or (c) and amine compounds repre-

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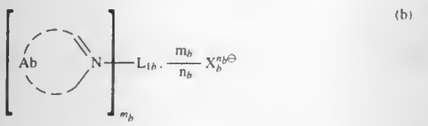


sented by formula (d), (e), (f), (g), (h), (i) or (j):

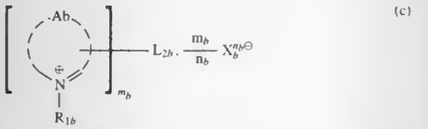


(a)

wherein $R_{1a}$, $R_{2a}$ and $R_{3a}$ each represents an alkyl group, a cycloalkyl group, an aryl group, an alkenyl group, a cycloalkenyl group or a heterocyclic residue, which each may be substituted; $m_a$ represents an integer of from 1 to 4; $L_a$ represents an $m_a$-valent organic group bonded to the P atom through the carbon atom thereof; $n_a$ represents an integer of from 1 to 3; $X_a$ represents an $n_a$-valent anion; and $X_a$ may be linked to $L_a$;



(b)



(c)

wherein $A_b$ represents an organic group necessary for completing the heterocyclic ring; $R_{1b}$ represents an alkyl group or an aryl group; $L_{1b}$ and $L_{2b}$ each represents an $m_b$-valent organic group; $X_b$ represents an anion group; $X_b$ may be linked to $R_{1b}$, $L_{1b}$ or $L_{2b}$; $m_b$ represents an integer of from 1 to 6; and $n_b$ represents an integer of from 1 to 3;



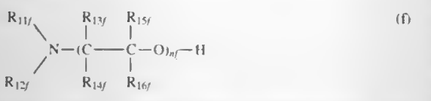
(d)

wherein $Y_d$ represents a group which adsorbs to silver halide; $X_d$ represents a divalent linking group comprising an atom or an atomic group selected from a hydrogen atom, a carbon atom, a nitrogen atom, an oxygen atom and a sulfur atom; $A_d$ represents a divalent linking group; $B_d$ represents an amino group which may be substituted or a nitrogen-containing heterocyclic ring; $m_d$ represents 1, 2 or 3; and $n_d$ represents 0 or 1;



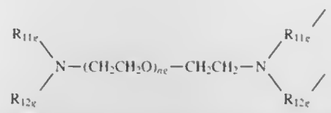
(e)

wherein $R_{1e}$ and $R_{2e}$ each represents a hydrogen atom or an aliphatic residue; $R_{1e}$ and $R_{2e}$ may be combined with each other to form a ring; $R_{3e}$ represents a divalent aliphatic group; $X_{1e}$ represents a divalent heterocyclic ring containing a nitrogen atom, an oxygen atom or a sulfur atom; $n_e$ represents 0 or 1; $M_e$ represents a hydrogen atom, an alkali metal, an alkaline earth metal or an amidino group;



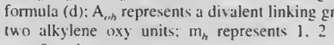
(f)

wherein $R_{11f}$ and $R_{12f}$ each represents a hydrogen atom, an alkyl group having from 1 to 30 carbon atoms, an alkenyl group having from 3 to 30 carbon atoms or an aralkyl group having from 7 to 30 carbon atoms, provided that when $R_{11f}$ and $R_{12f}$ represent an alkyl group at the same time, the total carbon number of $R_{11f}$ and $R_{12f}$ is 10 or more, that $R_{11f}$ and $R_{12f}$ are not a hydrogen atom at the same time and the $R_{11f}$ and $R_{12f}$ may be combined with each other to form a ring; $n_f$ represents an integer of from 2 to 50; and $R_{13f}$, $R_{14f}$, $R_{15f}$ and $R_{16f}$ each represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms;



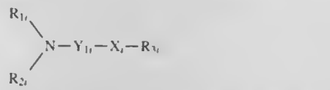
(g)

wherein $R_{11e}$ and $R_{11e}'$ each has the same meaning as $R_{11f}$ in formula (f), $R_{12e}$ and $R_{12e}'$ each has the same meaning as $R_{12f}$ in formula (f), and $n_e$ represents an integer of 2 to 50:



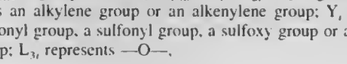
(h)

wherein $X_h$, $Y_h$ and $B_h$ each has the same meaning as $X_d$, $Y_d$ and $B_d$ in formula (d); $A_{rh}$ represents a divalent linking group having at least two alkylene oxy units; $m_h$ represents 1, 2 or 3; and $n_h$ represents 0 or 1;



(i)

wherein $R_{1i}$ and $R_{2i}$ each represents an alkyl group, an alkenyl group or an alkynyl group and $R_{1i}$ and $R_{2i}$ may form a ring; $R_{3i}$ represents a hydrogen atom, an alkyl group, an alkenyl group, an alkynyl group, an aryl group or a heterocyclic group; $L_{1i}$ represents a divalent linking group; $X_i$ represents an —[S—$L_{2i}$—$Y_i$—$(L_{3i})_{ni}$]— group or an —[$(L_{3i})_{ni}$—$Y_i$—$L_{2i}$—S]— group; $L_{2i}$ represents an alkylene group or an alkenylene group; $Y_i$ represents a carbonyl group, a sulfonyl group, a sulfoxy group or a phosphoryl group; $L_{3i}$ represents —O—,



or —N—N—;

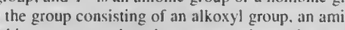
$Z_{1i}$, $Z_{2i}$ and $Z_{3i}$ each represents a hydrogen atom, an alkyl group, an alkenyl group, an alkynyl group, an aryl group or a heterocyclic group; and $n_i$ represents 0 or 1; and



(j)

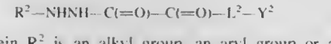
wherein $R_{1j}$, $R_{2j}$ and $R_{3j}$ each represents an alkyl group, an alkenyl group or an alkynyl group, provided that the compound represented by formula (j) has a thioether group and a partial structure of —$(O—Y_j)_{pj}$—; $Y_j$ represents an alkylene group which may be substituted, an alkenylene group which may be substituted or an arylene group which may be substituted; and $p_j$ represents an integer of 2 or greater;

wherein the hydrazine nucleating agent is a member selected from the compounds represented by formula (i), (ii) or (iv):



(i)

wherein $R^1$ is an alkyl group, an aryl group or a heterocyclic group, $L^1$ is a divalent linking group having an electron withdrawing group, and $Y^1$ is an anionic group or a nonionic group selected from the group consisting of an alkoxyl group, an amino group, an alkylthio group, a carbonyl group, a carbamoyl group, an alkoxycarbonyl group, an urethane group, an ureido group, an acyloxy group, and an acylamino group, the nonionic group having a lone electron pair and at least one of an oxygen atom, a nitrogen atom, a sulfur atom and a phosphorus atom and being capable of forming an intramolecular hydrogen bond between the lone electron pair and the hydrogen atom of the hydrazine bond to form a 5-, 6-, or 7-membered ring, and:

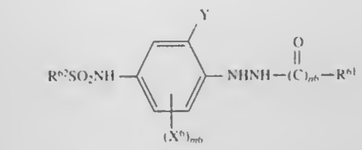


(ii)

wherein $R^2$ is an alkyl group, an aryl group or a heterocyclic group, $L^2$ is an alkylene group, an arylene group, a —NH-alkylene group, an —O-alkylene group, or a —NH-arylene group, an $Y^2$ is an anionic group or a nonionic group selected from the group



consisting of an alkoxyl group, an amino group, an alkylthio group, a carbonyl group, a carbamoyl group, an alkoxycarbonyl group, an urethane group, an ureido group, an acyloxy group, and an acylamino group, the nonionic group having a lone electron pair and at least one of an oxygen atom, a nitrogen atom, a sulfur atom and a phosphorus atom and being capable of forming an intramolecular hydrogen bond between the lone electron pair and the hydrogen atom of the hydrazine bond to form a 5-, 6-, or 7-membered ring; or



(vi)

wherein $R^{61}$ and $R^{62}$ each independently represents an alkyl group, an alkenyl group, an alkynyl group, an aryl group, a heterocyclic group, an alkoxy group or an amino group, $X_6$ is a group capable of bonding to the benzene ring, m6 is an integer of 0 to 3, and n6 is an integer of 1 or 2, provided that when n6 is 1, $R^{61}$ is an alkyl group, an alkenyl group, an alkynyl group, an aryl group or a heterocyclic group which each have an electron-withdrawing group, and Y is an anionic group or nonionic group selected from the group consisting of an alkoxyl group, an amino group, an alkylthio group, a carbonyl group, a carbamoyl group, an alkoxycarbonyl group, an urethane group, an ureido group, an acyloxy group, and an acylamino group, the nonionic group having a lone electron pair and at least one of an oxygen atom, a nitrogen atom, a sulfur atom and a phosphorus atom and being capable of forming an intramolecular hydrogen bond between the lone electron pair and the hydrogen atom of the hydrazine bond to form a 5-, 6- or 7-membered ring, and when n6 is 2, $R^{61}$ is an amino group or an alkoxy group and Y is an anionic group.

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**5,744,280**

## STORAGE-STABLE PHOTOIMAGEABLE DEUTERO LEUCO DYE/PHOTOOXIDATION COMPOSITIONS WITH IMPROVED LEUCO DYE

**William Frank Mooney, III, Sayre, Pa., and Jeffrey J. Patricia, Apalachin, N.Y., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Sep. 5, 1996, Ser. No. 711,764**

**Int. Cl.[6] G03C *1/492*; G03F *5/00***

**U.S. Cl. 430—270.1** **24 Claims**

1. A photoimageable composition comprising:

(a) a deuterated leuco dye or salt thereof; and

(b) a photooxidant.

14. A process for preparing an image on a substrate comprising, in order:

(i) applying a photoimageable composition on a first substrate, wherein the photoimageable composition comprises:

(a) a deuterated leuco dye or salt thereof; and

(b) a photooxidant;

(ii) drying the coated photoimageable composition to form a photoimageable layer on a first substrate;

(iii) imagewise exposing the layer to form imaged and non-imaged areas; and

(iv) fixing the exposed layer having imaged and non-imaged areas to form an image on the first substrate.

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**5,744,281**

## RESIST COMPOSITION FOR FORMING A PATTERN AND METHOD OF FORMING A PATTERN WHEREIN THE COMPOSITION 4-PHENYLPYRIDINE AS AN ADDITIVE

**Hirokazu Niki; Hiromitsu Wakabayashi; Rumiko Hayase, all of Yokohama; Naohiko Oyasato, Kawaguchi; Yasunobu Onishi, Yokohama; Kazuo Sato, Yokohama; Kenji Chiba, Yokohama, and Takao Hayashi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation-in-part of Ser. No. 781,512, Jan. 9, 1997, abandoned, which is a continuation of Ser. No. 302,319, Sep. 8, 1994, Pat. No. 5,658,706. This application May 1, 1997, Ser. No. 848,747**

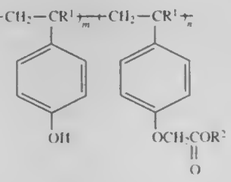
**Claims priority, application Japan, Sep. 14, 1993, 5-228969; Jun. 7, 1994, 6-125006**

**Int. Cl.[6] G03F *7/00*04; *7/039***

**U.S. Cl. 430—270.1** **6 Claims**

1. A resist composition for forming a pattern, which comprises:

(a) a compound represented by the following formula (1) and satisfying the following inequalities:



Formula (1)

wherein $R^1$ is hydrogen atom or methyl group, $R^2$ is a monovalent organic group, m is 0 or a positive integer, n is a positive integer, and m and n satisfying a condition of $0.03 \leqq n/(m+n) \leqq 1$;

$4{,}000 \leqq Mw \leqq 50{,}000$

$1.10 \leqq Mw/Mn \leqq 2.50$

wherein Mw and Mn respectively represent a weight-average molecular weight and number-average molecular weight as they are converted in styrene;

(b) a compound capable of generating an acid when irradiated with light; and

(c) 4-phenylpyridine.

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**5,744,282**

## PHOTOSENSITIVE RESIN COMPOSITIONS AND PHOTOSENSITIVE ELEMENT USING THE SAME

**Tatsuya Ichikawa, and Tatsuo Chiba, both of Hitachi, Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan**

**Filed Apr. 10, 1996, Ser. No. 630,479**

**Claims priority, application Japan, Apr. 19, 1995, 7-093536; Apr. 27, 1995, 7-104480; Jun. 28, 1995, 7-162445**

**Int. Cl.[6] G03F *7/033***

**U.S. Cl. 430—284.1** **6 Claims**

1. A photosensitive resin composition comprising:

(A) a binder polymer having carboxyl groups;

(B) at least one photopolymerizable compound having a polymerizable ethylenically unsaturated group in the molecule,

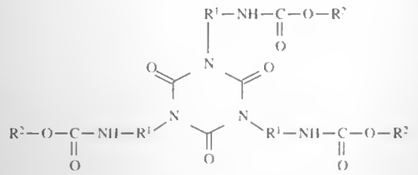
(C) a photoinitiator; and

(D) a dicyandiamide,

said component (B) containing a compound represented by the formula (I):

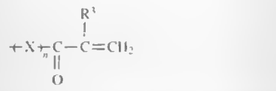
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(I)

wherein $R^1$ is a divalent organic group and $R^2$ represents the formula (II):



(II)

wherein $R^3$ is a hydrogen atom or a methyl group; X is an alkylene oxide group; and n is an integer of 1 to 14.

**4**. A photosensitive resin composition comprising:

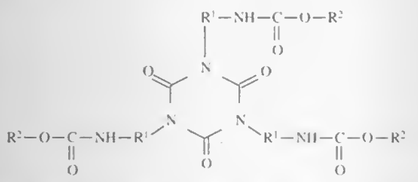
(A) a binder polymer having carboxyl groups, which is soluble or swellable in an alkaline aqueous solution and has an acid value of 100 to 500 and a weight-average molecular weight of 20,000 to 300,000;

(B) at least one photopolymerizable compound having a polymerizable ethylenically unsaturated group in the molecule;

(C) a photoinitiator; and

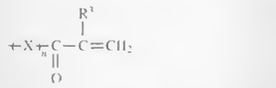
(D) a dicyandiamide,

said component (B) containing a compound represented by the formula (I):



(I)

wherein $R^1$ is a divalent organic group and $R^2$ represents the formula (II):



(II)

wherein $R^3$ is a hydrogen atom or a methyl group; X is an alkylene oxide group; and n is an integer of 1 to 14.

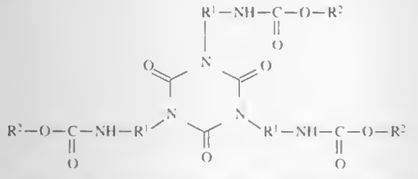
**5**. A photosensitive resin composition comprising:

(A) a binder polymer having carboxyl groups;

(B) at least one photopolymerizable compound having a polymerizable ethylenically unsaturated group in the molecule; and

(C) a photoinitiator,

said component (B) containing a compound represented by the formula (I):



(I)

wherein $R^1$ is a divalent organic group and $R^2$ represents the formula (II):



(II)

wherein $R^3$ is a hydrogen atom or a methyl group; X is $—CH_2—CH_2—O—$; and n is an integer of 1 to 14.

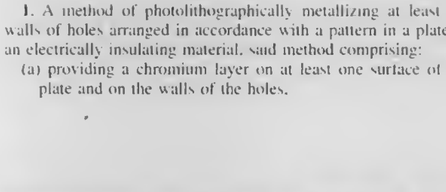
**6**. A photosensitive resin composition comprising:

(A) a binder polymer having carboxyl groups;

(B) at least one photopolymerizable compound having a polymerizable ethylenically unsaturated group in the molecule; and

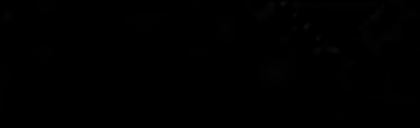
(C) a photoinitiator,

said component (B) containing a compound represented by the formula (I):



(I)

wherein $R^1$ is a divalent organic group and $R^2$ represents the formula (II):



(II)

wherein $R^3$ is a hydrogen atom or a methyl group; X is $—(CH_2)_m—O—$, where m is an integer of 3 to 6; and n is an integer of 1 to 14.

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**5,744,283**

**METHOD OF PHOTOLITHOGRAPHICALLY METALLIZING AT LEAST THE INSIDE OF HOLES ARRANGED IN ACCORDANCE WITH A PATTERN IN A PLATE OF AN ELECTRICALLY INSULATING MATERIAL**

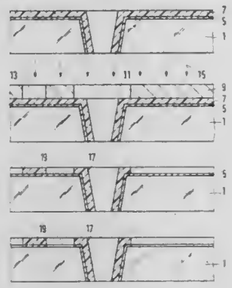
**Gijsbertus A.C.M. Spierings; Willem L.C.M. Heijboer, and Leo O. Reneeus, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 419,588, Apr. 7, 1995, abandoned. This application Dec. 4, 1995, Ser. No. 566,779**

**Claims priority, application European Pat. Off., Apr. 12, 1994, 94200976.2**

**Int. Cl.[6] G03F** *7/00*

**U.S. Cl. 430—313** **11 Claims**



**1**. A method of photolithographically metallizing at least the walls of holes arranged in accordance with a pattern in a plate of an electrically insulating material, said method comprising:

(a) providing a chromium layer on at least one surface of the plate and on the walls of the holes,



(b) providing an aluminum layer on said chromium layer,

(c) providing a metal layer of a metal selected from the group consisting of chromium, cobalt, nickel, zirconium and titanium and alloys of at least two of said metals on said aluminum layer,

(d) electrophoretically providing a photosensitive, negative electrophoretic lacquer coating on said metal layer, .

(e) exposing said lacquer coating to radiation in accordance to a pattern to form exposed and unexposed portions of said lacquer coating, said exposed portions being formed at least in the holes,

(f) developing said lacquer coating so as to remove said unexposed portions of said lacquer coating and uncover portions of said metal layer present underneath said unexposed portions of said lacquer coating,

(g) removing, by etching, said uncovered portions of said metal layer and underlying portions of said aluminum and chromium layers while preserving said exposed portions of said lacquer coating and portions of said chromium, aluminum and metal layers underlying said exposed portions of said lacquer coating and

(h) stripping said exposed portions of said lacquer coating from portions of said metal layer underlying said exposed portions of said lacquer coating.

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**5,744,284**

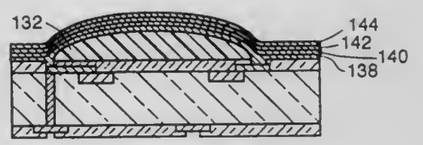
**METHOD FOR FABRICATING RESILIENT Z-AXIS CONTACTS FOR ELECTRICALLY INTERCONNECTING INTEGRATED CIRCUITS ON A PLURALITY OF STACKED CARRIERS**

**Soyeon P. Lauh, Los Angeles; Michael J. Little, Woodland Hills; James A. Foschaar, Thousand Oaks; Hugh L. Garvin, Malibu, and Michael W. Yung, Los Angeles, all of Calif., assignors to Hughes Aircraft Company**

**Continuation of Ser. No. 470,725, Jun. 6, 1995, abandoned. This application Apr. 9, 1997, Ser. No. 835,627**

**Int. Cl.[6] G03F** *7/26*

**U.S. Cl. 430—313** **9 Claims**




**1**. A method for fabricating flexible, resilient and compliant z-axis contacts for electro-mechanically interconnecting integrated circuits on a plurality of stacked carriers, the fabrication of contacts on each carrier comprising:

providing a carrier having integrated circuitry with at least one contact pad exposed through an insulator layer that covers the integrated circuitry;

forming a first photoresist pattern on a surface of the insulator layer with an approximately rectangular shape;

reflowing the first photoresist pattern to provide a smooth shape that conforms with a predetermined contact shape suitable for forming the z-axis contact with a high strength and leaves the at least one contact pad and a portion of the insulator layer exposed;

depositing one metal layer over the first photoresist, in contact with the exposed portion of the insulator layer, and affixed to the at least one contact pad, said one metal layer comprising a compound that makes the z-axis contact flexible, resilient and compliant;

depositing another metal layer over said one metal layer, said other metal layer comprising a good conductor that makes the z-axis contact conductive;

forming a second photoresist pattern on the other metal layer over the first photoresist pattern to conform with the predetermined contact shape;

etching the metal exposed by the second photoresist pattern down to the insulator layer such that the z-axis contact is affixed to the at least one contact pad and extends therefrom with the predetermined shape; and

removing the first and second photoresist patterns to define the flexible, resilient and compliant z-axis contact that is capable of flexing when contacted with an opposing z-axis contact on another one of the stacked carriers to provide an electro-mechanical connection between the contacting contacts.

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**5,744,285**

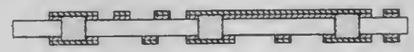
**COMPOSITION AND PROCESS FOR FILLING VIAS**

**John James Felten, Chapel Hill, and Stephan Padlewski, Raleigh, both of N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jul. 18, 1996, Ser. No. 683,351**

**Int. Cl.[6] G03C** *5/00*

**U.S. Cl. 430—318** **3 Claims**



**1**. A method for forming electrically conductive vias between electrically functional layers separated by a dielectric layer comprising the sequential steps:

A. Forming via holes in a copper-clad substrate which separates electrically functional layers;

B. Filling the via holes with a via fill composition comprising 85–93 wt % of a trimodal conductive mixture wherein the trimodal conductive mixture consists of particles of spherical silver, flake silver and silver-coated copper dispersed in an organic medium;

C. Drying the composition;

D. Removing residue from the surface of the substrate;

E. Subjecting the filled substrate to heat;

F. Preparing the surface of the filled substrate for plating;

G. Plating the filled substrate by electrolytic flash;

H. Preparing the surface of the plated substrate;

I. Applying a photoresist to the prepared substrate;

J. Exposing the photoresist to generate a pattern;

K. Developing and removing the exposed photoresist;

L. Etching the exposed copper;

M. Stripping the remaining photoresist from the copper.

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**5,744,286**

**POLYIMIDE PATTERNING**

**Jin-o Choi, 253 Wyeth Dr., Getzville, N.Y. 14068**

**Filed Feb. 12, 1996, Ser. No. 599,915**

**Int. Cl.[6] G03F** *7/30;7/40*

**U.S. Cl. 430—326** **20 Claims**

**1**. A method of making a polyimide pattern on a substrate comprising

(A) preparing a solution in an organic solvent of a polyamic acid and about 1 to about 10 wt. % of a photosensitive system that becomes more soluble in an aqueous base developer when exposed to actinic light;

(B) forming a coating of said solution on a substrate;

(C) evaporating solvent from said coating;

(D) applying a positive photoresist over said coating;

(E) exposing said positive photoresist and said coating to a pattern of actinic light;

(F) removing the exposed portions of said photoresist;

(G) removing exposed portions of said coating by dissolution in an aqueous base developer;

(H) removing remaining photoresist; and

(I) imidizing polyamic acid coating remaining on said substrate.

**15**. In a process for making a polyimide pattern on a substrate wherein a positive photoresist is applied to a coating of a polyamic acid on a substrate, the photoresist is exposed to a pattern of actinic light, and the exposed portions of the photoresist and the polyamic

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acid coating therebeneath are removed, an improvement which makes the sidewall of the pattern more vertical comprising mixing into said polyamic acid about 1 to about 10 wt. % of a photosensitive system that becomes more soluble in aqueous base when exposed to actinic light and removing said therebeneath polyamic acid coating using an aqueous medium.

18. A method of making a polyimidesiloxane pattern on a substrate comprising

(A) preparing a solution in an organic solvent of

(1) about 1 to about 10 wt. % of a photosensitizer that becomes more soluble in water after exposure to ultraviolet light; and

(2) a polyamic acid that is the 1:2 to 2:1 molar reaction product of

(a) aromatic dianhydride; and

(b) diamine, where said diamine is about 70 to about 99 wt. % aromatic diamine that does not contain siloxane groups and about 1 to about 30 wt. % of a diamine that does contain siloxane groups;

(B) heating said solution to imidize about 20 to about 40% of the amic acid groups in said polyamic acid;

(C) forming a coating of said solution on a substrate;

(D) heating said coating to evaporate organic solvent therefrom and solidify said coating;

(E) applying a layer of a positive photoresist to said solidified coating;

(F) exposing said layer of positive photoresist and said underlying coating to a pattern of ultraviolet light;

(G) removing those portions of said positive photoresist that were exposed to ultraviolet light, thereby exposing the polyamic acid coating thereunder;

(H) removing said exposed polyamic acid coating using an aqueous developer;

(I) removing photoresist layer that remains on said polyamic acid coating; and

(J) heating polyamic acid coating that remains on said substrate to a temperature sufficient to form polyimidesiloxane.

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**5,744,287**

## PHOTOGRAPHIC SILVER HALIDE MEDIA FOR DIGITAL OPTICAL RECORDING

**Michael Richard Roberts; Alphonse Dominic Camp, both of Rochester; Richard Lee Parton, Webster, and Daniel John Collins, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Nov. 17, 1995, Ser. No. 560,551**

**Int. Cl.[6] G03C** *7/30*

**U.S. Cl. 430—363** **23 Claims**

1. A photographic element comprising a layer comprising a cyan dye forming coupler, a layer comprising a magenta dye forming coupler and a layer comprising a yellow dye forming coupler, wherein said all coupler containing layers further comprise silver halide emulsions sensitive to visible light, and said emulsions comprise greater than 95 percent chloride and said element when exposed at less than 50 microseconds per pixel in each color record and at a resolution between 200 and 500 pixels per inch provides after development a maximum gamma between 3.4 and 6.0 in at least one color record layer within a log exposure range not exceeding 1.1 and

a fill-in Dmax in the cyan dye forming layer, designated $D_c$, that is $\geq 1.7$;

a fill-in Dmax in the magenta dye forming layer, designated $D_m$, that is $\geq 1.4$,

a fill-in Dmax in the yellow dye forming layer, designated $D_y$, that is $\geq 1.3$,

and a fill-in exposure range in each color record that is $\leq 1.1$ log E.

**5,744,288**

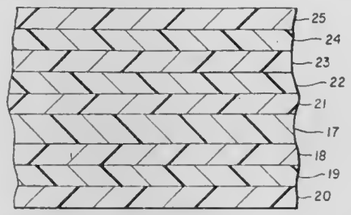
## METHOD FOR RAPID PROCESSING OF DUPLITIZED COLOR SILVER HALIDE PHOTOGRAPHIC ELEMENTS

**John M. Buchanan; Anne E. Bohan, and Richard P. Szajewski, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Apr. 7, 1997, Ser. No. 834,557**

**Int. Cl.[6] G03C** *7/407*

**U.S. Cl. 430—383** **33 Claims**




1. A method for processing comprising:

color developing an imagewise exposed light sensitive silver halide color photographic element exhibiting a sensitivity of at least ISO 25, and comprising a support having thereon at least two color recording units,

each of said at least two color recording units being sensitive to a distinct region of the electromagnetic spectrum, and each comprising at least one silver halide emulsion layer having light sensitive silver halide emulsion grains in reactive association with a compound capable of forming an image dye during a color development step, thereby providing at least two such silver halide emulsion layers sensitive to distinct regions of the electromagnetic spectrum in said element,

wherein said support is interposed between two of said silver halide emulsion layers sensitive to distinct regions of the electromagnetic spectrum,

with a color developer having a pH of from about 9 to about 12, and comprising a color developing agent at from about 0.01 to about 0.1 mol/l, and bromide ion at up to about 0.5 mol/l, at a temperature at or above about 30° C. for up to about 4 minutes.

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**5,744,289**

## SOLID PROCESSING AGENT PACKAGING BODY FOR SILVER HALIDE PHOTOGRAPHIC MATERIAL AND PROCESSING AGENT SUPPLYING METHOD

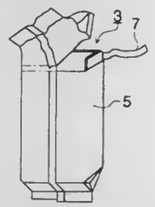
**Hideo Kobayashi; Shinji Shikata, and Tomohiro Uchida, all of Hino, Japan, assignors to Konica Corporation, Japan**

**Filed Mar. 25, 1997, Ser. No. 827,050**

**Claims priority, application Japan, Jul. 10, 1995, 8-180585; Mar. 29, 1996, 8-076563**

**Int. Cl.[6] G03C** *5/29;7/407;* **B65D** *33/02*

**U.S. Cl. 430—465** **14 Claims**




1. A solid processing agent packaging body, comprising:

solid processing agents for processing a silver halide photographic material;

an internal plate member including

an approximately rectangular-shaped base plate having four sides, and



three side plates provided on three sides Of the base plate and bent in the same direction so that the three side plates define three inner side surfaces and a floor surface of the base plate on the internal plate member and the three inner side surfaces and the floor surface form an accommodation space; and

a moisture proof bag in which the solid processing agents and the internal plate member are packaged in such a manner that the solid processing agents are accommodated in the accommodation space on the base plates.

the moisture proof bag having a sealed open portion which is opened when the solid processing agents are discharge from the moisture proof bag, wherein the sealed open portion is located at a position corresponding to an open side of the base plate on which the three side plates are not provided so that the solid processing agents are discharge through the accommodation space through the open side of the base plate and the opened sealed open portion of the moisture proof bag.

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**5,744,290**

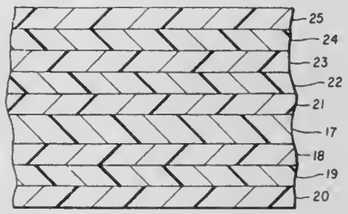
## DUPLITIZED COLOR SILVER HALIDE PHOTOGRAPHIC ELEMENT SUITABLE FOR USE IN RAPID IMAGE PRESENTATION

**Richard P. Szajewski, Rochester, and Gary L. House, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Apr. 7, 1997, Ser. No. 826,696**

**Int. Cl.[6] G03C** *1/46*

**U.S. Cl. 430—503** **20 Claims**




1. A light sensitive silver halide color photographic element exhibiting a sensitivity of at least ISO 25, and comprising a support having thereon at least two color recording units,

each of said at least two color recording units being sensitive to a distinct region of the electromagnetic spectrum, and each comprising at least one silver halide emulsion layer having light sensitive silver halide emulsion grains in reactive association with a compound capable of forming an image dye during a color development step, thereby providing at least two such silver halide emulsion layers sensitive to distinct regions of the electromagnetic spectrum in said element,

wherein said support is interposed between two of said silver halide emulsion layers sensitive to distinct regions of the electromagnetic spectrum.

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**5,744,291**

## 3D PHOTOGRAPHIC PRINT MATERIAL

**Sunny Leong-Pang Ip, 1609 Walden Pond Rd., NW., Suwanee, Ga. 30174**

**Filed Apr. 3, 1997, Ser. No. 832,519**

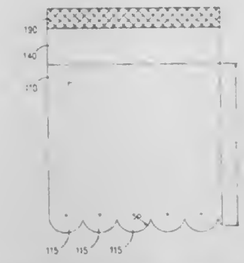
**Int. Cl.[6] G03C** *1/825*

**U.S. Cl. 430—504** **14 Claims**

1. A print material for making 3D and animation pictures consisting of:

a view-separating screen having a substantially flat first surface and a second surface having a multiplicity of view-separating elements;

an image forming layer disposed on the first surface of said view-separating screen; and




an anti-halation layer coated on said image forming layer opposite from said view-separating screen.

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**5,744,292**

## SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING A DISPERSION OF SOLID FINE GRAINS

**Hiroyuki Yoneyama, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan**

**Filed Jan. 29, 1996, Ser. No. 593,373**

**Claims priority, application Japan, Jan. 30, 1995, 7-031872**

**Int. Cl.[6] G03C** *1/815;1/875*

**U.S. Cl. 430—510** **11 Claims**

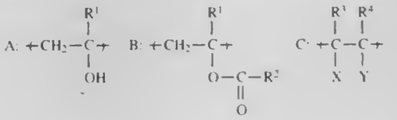
1. A silver halide photographic light-sensitive material, comprising, in at least one photographic layer constituting the material, a dispersion containing fine grains of a solid dye represented by general formula (II), wherein the solid dye represented by general formula (II) has been subjected to heat treatment at 40° C. or higher, and wherein the dispersion further contains a compound represented by general formula (I):

$$D \leftarrow X)_y \qquad \text{formula (II)}$$

wherein D represents a residue of a compound having a chromophoric group; X represents a dissociating hydrogen atom, or a group having a dissociating hydrogen atom, which atom or group bonds to D directly or via a divalent connecting group; and y is an integer of 1 to 7:

$$P \leftarrow (S \leftarrow_{m} R)_n \qquad \text{formula (I)}$$

wherein R represents a hydrogen atom, a hydrophobic group, or a hydrophobic polymer; P contains at least one of the recurring units A, B, and C as illustrated below, and represents a polymer having a polymerization degree of 10 to 3500; m is 0 or 1, and n is 1 or 2:




wherein $R^1$ represents a hydrogen atom or an alkyl group having 1 to 6 carbon atom(s); $R^2$ represents a hydrogen atom or an alkyl group having 1 to 10 carbon atom(s); $R^3$ represents a hydrogen atom or a methyl group; $R^4$ represents a hydrogen atom, a methyl group, a $-CH_2COOH$ group or an ammonium salt or metal salt thereof, or a cyano group; X represents a hydrogen atom, a $-COOH$ group or an ammonium salt or metal salt thereof, or a $-CONH_2$ group; and Y represents a $-COOH$ group or an ammonium salt or metal salt thereof, an $-SO_3H$ group or an ammonium salt or metal salt thereof, an $-OSO_3H$ group or an ammonium salt or metal salt thereof, a $-CH_2SO_3H$ group or an ammonium salt or metal salt thereof, a $-CONHC(CH_3)_2CH_2SO_3H$ group or an ammonium salt or metal salt thereof, or a $-CONHCH_2CH_2CH_2N^+(CH_3)_3Cl$ group, wherein the polymer P comprises an amount of the recurring unit A from 50 mol % to 100 mol %, and an amount of the recurring unit C of 10 mol % or less.

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5,744,293

## SEMICONDUCTOR DEVICE HAVING ANTIREFLECTIVE LAYER CONTAINING ORGANIC RESIN WITH DISPERSED CARBON PARTICLES

Katsuya Okumura, Poughkeepsie, and Tsuyoshi Shibata, Fishkill, both of N.Y., assignors to Kabushiki Kaisha Toshiba, Kanagawa-Ken, Japan

Continuation of Ser. No. 377,730, Jan. 25, 1995, abandoned. This application Mar. 21, 1997, Ser. No. 821,412
Int. Cl.[6] G03F *7/11;* G03C *1/825*
U.S. Cl. 430—512 6 Claims

1. A semiconductor device prepared with an antireflective layer applied on a substrate and a photoresist layer applied on the antireflective layer, said antireflective layer comprising an organic resin having carbon particles dispersed therein, wherein the antireflective layer has an extinction coefficient larger than 0.23 and a refraction index between about 1.6 and 1.8 at a light wavelength of 250 nm, wherein the carbon particles have a particle size less than 100 Å and the amount of carbon particles dispersed in the resin is about 5 to 30 wt % based on the resin.

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5,744,294

## RADIOGRAPHIC ELEMENT MODIFIED TO PROVIDE PROTECTION FROM VISUAL FATIGUE

Robert E. Dickerson, Hamlin, and Rickey J. Seyler, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1997, Ser. No. 846,696
Int. Cl.[6] G03C *1/04*
U.S. Cl. 430—521 12 Claims

1. A radiographic element comprised of

a transparent film support having first and second major faces,

hydrophilic colloid layers coated on at least one of the first and second major faces including at least one radiation-sensitive silver halide emulsion layer, and

a blue anthraquinone dye forming a portion of at least one of the support and the hydrophilic colloid layers,

WHEREIN, transmission of red light through the radiographic element when imagewise exposed and processed to produce a viewable image is reduced by the incorporation in at least one of the hydrophilic colloid layers of at least one ionic linear condensation polymer containing a cyan phthalocyanine dye.

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5,744,295

## ANTISTATIC COMPOSITION CONTAINING ANIONIC AND CATIONIC SURFACE ACTIVE AGENTS WHEREIN BOTH SURFACE ACTIVE AGENTS COMPRISES POLYOXYALKYLENE GROUPS

Alan Robert Pitt, Sandridge; Julian Claudius Caesar, Stratford, and Colin James Gray, Wealdstone, all of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1994, Ser. No. 298,009
Claims priority, application United Kingdom, Sep. 24, 1993, 9319790
Int. Cl.[6] G03C *1/85*
U.S. Cl. 430—527 18 Claims

1. An antistatic composition comprising a hydrophilic colloid, an anionic surface active agent and a cationic surface active agent, wherein both the cationic and anionic surface active agents comprise at least one polyoxyalkylene group.

5,744,296

## SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Sadayasu Ishikawa, and Katsuhiko Suzuki, both of Hino, Japan, assignors to Konica Corporation, Japan

Filed Dec. 17, 1996, Ser. No. 768,128
Claims priority, application Japan, Dec. 20, 1905, 7-331774
Int. Cl.[6] G03C *1/005;1/035*
U.S. Cl. 430—567 12 Claims

1. A silver halide color photographic light sensitive material comprising a support having thereon a silver halide emulsion layer, wherein said silver halide emulsion layer comprises silver halide grains having a variation coefficient of grain size of 20% or less and at least 50% of the total projected area of said silver halide grains is accounted for by tabular grains having an aspect ratio of 5 or more; and said silver halide grains have an average silver iodide content of 4 mol % or more and comprising:

(1) a core portion having a silver iodide content of 15 mol % or less

(2) a shell portion having a silver iodide content of 8 mol % or more, and

(3) a surface phase having a silver iodide content higher than the average silver iodide content,

and wherein said silver halide grains have a distinct core/shell structure.

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5,744,297

## HIGH CHLORIDE (100) TABULAR GRAIN EMULSIONS CONTAINING LARGE, THIN TABULAR GRAINS

Yun C. Chang; Rajesh V. Mehta, and Lois A. Buitano, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 603,792, Feb. 20, 1996, Pat. No. 5,663,041. This application Mar. 11, 1997, Ser. No. 814,209
Int. Cl.[6] G03C *1/035*
U.S. Cl. 430—567 7 Claims

1. A radiation-sensitive emulsion comprised of a dispersing medium and silver halide grains

wherein at least 70 percent of total grain projected area is accounted for by tabular grains

(a) having {100} major faces,

(b) containing greater than 50 mole percent chloride, based on silver,

(c) having a mean equivalent circular diameter in the range of from 2.0 to 5.0 μm, and

(d) exhibiting a mean thickness of 0.1 μm or less.

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5,744,298

## DNA SEQUENCES WHICH ENCODE IMMUNOREACTIVE HCMV-SPECIFIC PEPTIDES

Werner Stöber, Lahntal; Leszek Wieczorek, and Robert Ziegelmaier, both of Marburg, all of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Germany

Division of Ser. No. 388,883, Feb. 13, 1995, which is a continuation of Ser. No. 200,305, Feb. 23, 1994, abandoned, which is a continuation of Ser. No. 936,219, Aug. 27, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 460,874
Claims priority, application Germany, Aug. 29, 1991, 4128684.7
Int. Cl.[6] C12Q *1/70;1/68;* C07H *21/02;21/04*
U.S. Cl. 435—5 4 Claims

1. An isolated and purified DNA fragment consisting of HCMV DNA sequence, wherein said HCMV DNA sequence is contained within the DNA encoding

amino acids 718–880 of the HCMV protein pp150, and wherein said HCMV DNA sequence encodes one or more peptides which

react specifically with antibodies against the HCMV pp150 protein, wherein said one or more peptides are selected from the group consisting of:

$As_e$-gly ala gly ala ala ile leu-$Bs_m$ (peptide 1)(SEQ ID NO:1),

$Cs_n$-arg ala trp ala leu-$Ds_o$ (peptide 2)(SEQ ID NO:2), and

$Es_p$-ala ser arg asp ala ala-$Fs_q$ (peptide 3)(SEQ ID NO:3).



where AS, BS, CS, DS, ES and FS are, independently of one another, any appropriate amino acid and

e is an integer from 0 to 22,

m is an integer from 0 to 25,

n and o are, independently of one another, integers from 0 to 18, and

p and q are, independently of one another, integers from 0 to 11.

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5,744,299

## HUMAN PARAINFLUENZA VIRUS-1 ASSAY

Kelly J. Henrickson, Oconomowoc, and Jiang Fan, Wauwatosa, both of Wis., assignors to MCW Research Foundation, Milwaukee, Wis.

Filed Nov. 3, 1995, Ser. No. 552,907
Int. Cl.[6] C12Q *1/70;1/68;* C12P *19/34;* C07H *21/04*
U.S. Cl. 435—5 19 Claims

1. A method for evaluating a biological sample for the presence or absence of human parainfluenza virus 1 infection, comprising the steps of

(a) isolating RNA from a biological sample,

(b) creating cDNA from the isolated RNA,

(c) exposing the cDNA to a pair of oligonucleotide primers selected from SEQ ID NOs:1–9 or inverse complements of SEQ ID NOs:1–9 under conditions in which the primers will selectively amplify a human parainfluenza virus 1 sequence if the human parainfluenza virus 1 is present and will not amplify other sequences, wherein an amplification product is produced if the human parainfluenza virus 1 is present; and

(d) determining whether the amplified product is present.

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5,744,300

## METHODS AND REAGENTS FOR THE IDENTIFICATION AND REGULATION OF SENESCENCE-RELATED GENES

Maarten H. K. Linskens; Kenneth S. Hirsch, both of Palo Alto; Bryant Villeponteau; Junli Feng, both of San Carlos; Walter Funk, Union City, and Michael David West, Belmont, all of Calif., assignors to Geron Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 235,180, Apr. 29, 1994, Pat. No. 5,580,726, and Ser. No. 38,766, Mar. 24, 1993, Pat. No. 5,489,508. This application Oct. 31, 1994, Ser. No. 332,420
Int. Cl.[6] C12Q *1/68;* C12P *19/34;* C07H *21/04*
U.S. Cl. 435—6 17 Claims

1. A method of screening to identify one or more test compounds that can alter gene expression in senescent cells, which method comprises:

(a) contacting senescent cells with test compound;

(b) determining mRNA expression patterns in said senescent cells by determining expression levels of mRNA of two or more senescence-related genes; and

(c) correlating an alteration in mRNA expression of two or more senescent related genes in said senescent cells with a compound that can alter gene expression in a senescent cell.

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5,744,301

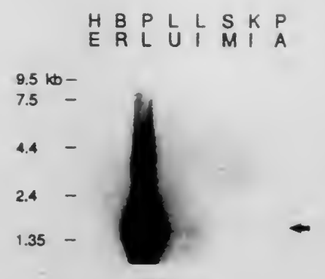
## METHODS OF DETECTION OF EPSTEIN BARR VIRUS INDUCED GENES EXPRESSED IN THE PLACENTA

Mark Birkenbach, Tinley Park, Ill., and Elliott Kieff, Brookline, Mass., assignors to Brigham and Women's Hospital, Boston, Mass.

Continuation-in-part of Ser. No. 352,678, Nov. 30, 1994, which is a continuation of Ser. No. 980,518, Nov. 25, 1992, abandoned. This application Feb. 2, 1995, Ser. No. 383,750
Int. Cl.[6] C12Q *1/68*
U.S. Cl. 435—6 ? Claims

1. A method of assessing or monitoring fetal or placental development comprising:

a) taking a maternal serum sample from a patient;




b) detecting the level or size of EBI-3 nucleic acid or EBI-3 protein in said sample to obtain a first result wherein said fetal or placental development is assessed or monitored by comparing said first result with a control result.

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5,744,302

## METHOD FOR SEPARATING MOLECULES

Jonathan L. Sessler; Brent L. Iverson; Vladimir Král; Kevin Shreder, all of Austin, Tex.; Hiroyuki Furuta, Oita, Japan, and Richard E. Thomas, Port Smith, R.I., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Division of Ser. No. 424,288, Apr. 20, 1995, which is a continuation-in-part of Ser. No. 964,607, Oct. 21, 1992, Pat. No. 5,457,195. This application May 11, 1995, Ser. No. 438,948
Int. Cl.[6] C12Q *1/68;1/70;* C12P *19/34;* C07H *21/04*
U.S. Cl. 435—6 20 Claims

1. A method for separating a first molecule from a mixture of at least two molecules, the method comprising contacting said mixture with a matrix-supported expanded porphyrin to separate said first molecule from said mixture, wherein the matrix-supported expanded porphyrin further comprises a nucleobase-containing group.

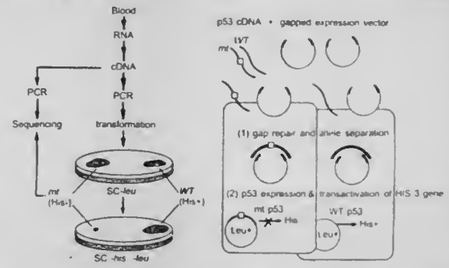
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5,744,303

## FUNCTIONAL ASSAY FOR TRANSCRIPTIONAL REGULATOR GENES

Richard Iggo, Epalinges, Switzerland; Stephen H. Friend, Concord, Mass.; Thierry Frebourg, Rouen, France, and Chikashi Ishioka, Bookline, Mass., assignors to The General Hospital Corporation, Boston, Mass., and Institut Suisse de Recherches Experimentales, Switzerland

Continuation of Ser. No. 46,033, Apr. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 956,696, Oct. 1, 1992, abandoned. This application May 22, 1995, Ser. No. 447,179
Int. Cl.[6] C12Q *1/68;* C12P *19/34*
U.S. Cl. 435—6 31 Claims




1. A method for determining whether an individual carries a mutation in a gene which encodes a polypeptide which has a DNA mediated biological activity, said method comprising:

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(a) obtaining a first and a second cDNAs from a cell sample from said individual, each of said cDNAs corresponding to an allele of said gene;
(b) providing a nucleic acid comprising a binding site operably linked to DNA encoding a detectable protein such that the production of said detectable protein is regulated by interaction of said polypeptide with said binding site;
(c) transfecting said first and second cDNAs and said nucleic acid into yeast cells which naturally express low levels or none of said polypeptide to produce transfected yeast cells, wherein
i) said first and second cDNAs are cotransfected with a plurality of copies of a gap excision repair vector which comprises a centromere, and
ii) said transfecting is carried out under conditions which promote homologous recombination of said first and second cDNAs with separate copies of said vector such that said cDNAs are stably incorporated into separate copies of said vector and are transfected into separate cells;
(d) separating said transfected cells for individual examination; and
(e) examining the level of said detectable protein in said transfected cells, said level being correlated with the presence of a mutation in at least one of said alleles of said gene.

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**5,744,304**

**INFLAMMATION-INDUCED EXPRESSION OF A RECOMBINANT GENE**

**Robert S. Munford, Dallas, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.**

**Filed May 30, 1995, Ser. No. 456,103**
**Int. Cl.[6] C12Q** *1/68*
**U.S. Cl. 435—6** **10 Claims**

1. A method of providing inflammation responsive protein expression in a cell comprising the steps of:
(a) introducing into a cell a vector that includes a selected protein gene under the transcriptional control of a heterologous inflammation responsive promoter; and
(b) contacting said cell with a cytokine or inducing said cell to produce a cytokine wherein said cytokine activates the inflammation responsive promoter gene.

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**5,744,305**

**ARRAYS OF MATERIALS ATTACHED TO A SUBSTRATE**

**Stephen P.A. Fodor, Palo Alto; Lubert Stryer, Stanford; J. Leighton Read, Palo Alto, all of Calif., and Michael C. Pirrung, Durham, N.C., assignors to Affymetrix, Inc., Santa Clara, Calif.**

**Division of Ser. No. 390,272, Feb. 16, 1995, Pat. No. 5,489,678, and a continuation-in-part of Ser. No. 456,887, Jun. 1, 1995, which is a division of Ser. No. 954,646, Sep. 30, 1992, Pat. No. 5,445,934, which is a division of Ser. No. 850,356, Mar. 12, 1992, Pat. No. 5,405,783, which is a division of Ser. No. 492,462, Mar. 7, 1990, Pat. No. 5,143,854, which is a continuation-in-part of Ser. No. 362,901, Jun. 7, 1989, abandoned, said Ser. No. 390,272 is a continuation of Ser. No. 624,120, Dec. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 492,462, Mar. 7, 1990, Pat. No. 5,143,854, which is a continuation-in-part of Ser. No. 362,901, Jun. 7, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 466,632**
**Int. Cl.[6] C12Q** *1/68;* **C07H** *21/04;21/02*
**U.S. Cl. 435—6** **26 Claims**

1. An array of oligonucleotides, the array comprising:
a planar, non-porous solid support having at least a first surface: and
a plurality of different oligonucleotides attached to the first surface of the solid support at a density exceeding 400 different oligonucleotides/cm$^2$, wherein each of the different oligonucleotides is attached to the surface of the solid support in a different predefined region, has a different determinable sequence, and is at least 4 nucleotides in length.



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**5,744,306**

**METHODS FOR NUCLEIC ACID DETECTION, SEQUENCING, AND CLONING USING EXONUCLEASE**

**James J. Murtagh, Jr., Atlanta, Ga., and Frederik B.J.M. Thunnissen, Maastricht, Netherlands, assignors to Emory University, Atlanta, Ga.**

**Continuation-in-part of Ser. No. 49,264, Apr. 19, 1993, Pat. No. 5,518,901. This application Jun. 7, 1995, Ser. No. 479,723**
**Int. Cl.[6] C12Q** *1/68;* **C12P** *19/34;* **C07H** *21/02;21/04*
**U.S. Cl. 435—6** **13 Claims**

1. A method of detecting the presence of a nucleotide sequence within a double-stranded DNA in a sample comprising:
a. digesting the double-stranded DNA with an exonuclease which converts at least a portion of the double-stranded DNA to single-stranded DNA;
b. hybridizing the single-stranded DNA with i) a first nucleic acid probe adapted with a moiety which can be captured to a solid support, and ii) a second nucleic acid probe labeled with a detectable moiety which can hybridize with the single-stranded DNA adjacent the hybridized first nucleic acid probe;
c. ligating the hybridized first and second nucleic acid probes;
d. capturing the moiety on the first nucleic acid probe to the solid support;
e. denaturing the ligated first and second nucleic acid probes from the hybridized single-stranded DNA;
f. removing uncaptured labeled probe; and
g. detecting captured detectable moiety, the presence of captured detectable moiety indicating the presence of the nucleotide sequence within the double-stranded DNA in the sample.

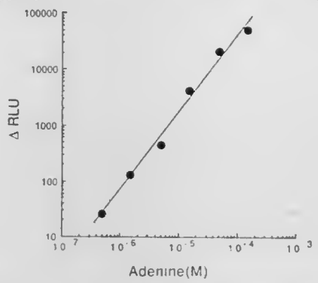
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**5,744,307**

**METHOD FOR MEASURING ADENYL GROUP-CONTAINING SUSBSTANCES**

**Naotaka Kuroda; Kenichiro Nakashima; Shuzo Akiyama, all of Nagasaki; Kamon Shirakawa, Saitama; Naofumi Sato, Saitama, and Toshinori Kanamori, Saitama, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 109,721, Aug. 19, 1993, abandoned. This application Sep. 12, 1995, Ser. No. 527,097**
**Claims priority, application Japan, Feb. 26, 1993, 5-062631; Mar. 26, 1993, 5-067906**
**Int. Cl.[6] C12Q** *1/68*
**U.S. Cl. 435—6** **24 Claims**




1. A method for measuring an adenyl group-containing substance which comprises:



(i) deriving a chemiluminescent substance by reacting a compound represented by the following formula 1 with an adenyl group in the substance to be measured, in the presence of an acid catalyst;

$$R^1—CO—R^2 \quad (1)$$

wherein $R^1$ is a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, an alkenyl group having 1 to 12 carbon atoms, an alkynyl group having 1 to 12 carbon atoms, an aryl group having 1 to 18 carbon atoms or an aromatic heterocyclic group having 1 to 18 carbon atoms;
wherein said $R^1$ may be substituted or ring-condensed with at least one group selected from the group consisting of a carboxyl group, hydroxyl group, amino group, amide group, sulfonamide group, sulfide group, sulfoxide group, sulfone group, nitro group, a halide atom, mercapto group, carbonyl group, azide group, an alkylamino group having 1 to 12 carbon atoms, an alkyl group having 1 to 12 carbon atoms, an alkenyl group having 1 to 12 carbon atoms, an alkynyl group having 1 to 12 carbon atoms, an alkoxy group having 1 to 12 carbon atoms, a polyalkoxy group, an aryl group, an aryloxy group, and a heterocyclic group; and
the group itself which substitutes or ring-condenses the $R^1$ may be substituted or ring-condensed with at least one group selected from the group consisting of a carboxyl group, hydroxyl group, amino group, amide group, sulfonamide group, sulfide group, sulfoxide group, sulfone group, nitro group, a halide atom, mercapto group, carbonyl group, azide group, an alkylamino group having 1 to 12 carbon atoms, an alkyl group having 1 to 12 carbon atoms, an alkenyl group having 1 to 12 carbon atoms, an alkynyl group having 1 to 12 carbon atoms, an alkoxy group having 1 to 12 carbon atoms, a polyalkoxy group, an aryl group, an aryloxy group, and a heterocyclic group;
and wherein
$R^2$ is an aldehyde group or a group represented by $—CH(OR^3)(OR^4)$ in which $R^3$ and $R^4$ are the same or different groups which may form a ring by their partial binding and are selected from a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, an alkenyl group having 1 to 12 carbon atoms, an alkynyl group having 1 to 12 carbon atoms, and an aryl group having 1 to 18 carbon atoms;
wherein said $R^3$ and $R^4$ can be substituted or ring-condensed with at least one group selected from the group consisting of a carboxyl group, hydroxyl group, amino group, amide group, sulfonamide group, sulfide group, sulfoxide group, sulfone group, nitro group, a halide atom, mercapto group, carbonyl group, azide group, an alkylamino group having 1 to 12 carbon atoms, an alkyl group having 1 to 12 carbon atoms, an alkenyl group having 1 to 12 carbon atoms, an alkynyl group having 1 to 12 carbon atoms, an alkoxy group having 1 to 12 carbon atoms, a polyalkoxy group, an aryl group, an aryloxy group, and a heterocyclic group; and
the group itself which substitutes or ring-condenses the $R^3$ and $R^4$ groups can be substituted or ring-condensed with at least one group selected from the group consisting of a carboxyl group, hydroxyl group, amino group, amide group, sulfonamide group, sulfide group, sulfoxide group, sulfone group, nitro group, a halide atom, mercapto group, carbonyl group, azide group, an alkylamino group having 1 to 12 carbon atoms, an alkyl group having 1 to 12 carbon atoms, an alkenyl group having 1 to 12 carbon atoms, an alkynyl group having 1 to 12 carbon atoms, an alkoxy group having 1 to 12 carbon atoms, a polyalkoxy group, an aryl group, an aryloxy group, and a heterocyclic group;
and
(ii) qualitatively or quantitatively measuring said substance to be measured using luminescent intensity obtained from said chemiluminescent substance as an index.

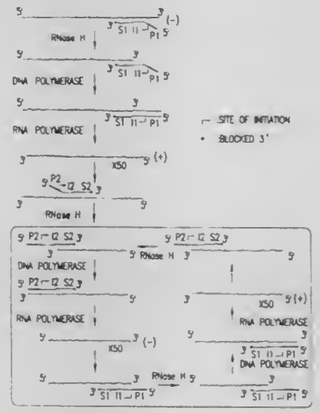
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**5,744,308**

**CHIMERA OLIGONUCLEOTIDE AND ITS UTILIZATION FOR OBTAINING TRANSCRIPTS OF A NUCLEIC ACID**

**Françoise Guillou-Bonnici, Villeurbanne; Philippe Cleuziat, Lyons; François Mallet, Villeurbanne, all of France; Pierre Levasseur, Watertown, Mass., and William McAllister, Edison, N.J., assignors to Bio Merieux, Marcy l'Etoile, France**

**Filed Sep. 26, 1995, Ser. No. 533,912**
**Claims priority, application France, Sep. 26, 1994, 94 11455**
**Int. Cl.[6] C12Q** *1/68;* **C12P** *19/34*
**U.S. Cl. 435—6** **9 Claims**




1. A chimeric oligonucleotide for amplifying a target sequence of a nucleic acid, said target sequence having a downstream sequence, said oligonucleotide having successively, from a first 5' end to a first 3' end:
a first oligonucleotide segment of the DNA type, said first segment comprising a sense sequence of a promoter of an RNA polymerase;
a second oligonucleotide segment of the DNA type, said second segment having a second 3' end and a 3' region comprising the second 3' end, and comprising a transcription initiation site for said promoter, at least said 3' region being one that hybridizes with at least a part of said downstream sequence; and
a third oligonucleotide segment of the RNA type, said third segment comprising a third 5' end, a third 3' end and a 5' region comprising the third 5' end, at least said 5' region being one that hybridizes with a part of said target sequence contiguous to said at least a part of said downstream sequence, said third segment being blocked at said third 3' end.

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**5,744,309**

**Patent Not Issued For This Number**

VOL 1209 ISS 4 AP 28 1998 UMI



5,744,310

## BAX PROMOTER SEQUENCE AND SCREENING ASSAYS FOR INDENTIFYING AGENTS THAT REGULATE BAX GENE EXPRESSION

John C. Reed, Rancho Santa Fe, Calif., assignor to The Burnham Institute, La Jolla, Calif.

Filed Jul. 29, 1996, Ser. No. 688,145
Int. Cl.[6] C12Q *1/68*; C12P *21/00*; C12N *5/10*; C07H *21/04*
U.S. Cl. 435—6 25 Claims

1. An isolated bax promoter having the nucleotide sequence shown as position -3885 to position -1 in FIG. 1 (SEQ ID NO: 1).

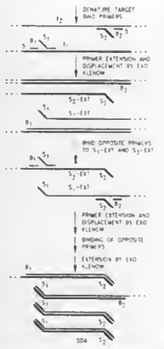
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5,744,311

## STRAND DISPLACEMENT AMPLIFICATION USING THERMOPHILIC ENZYMES

Melinda S. Fraiser, Durham; Catherine A. Spargo, Cary; George Terrance Walker, Chapel Hill; Mark Van Cleve, Durham; David James Wright, Carrboro, all of N.C., and Michael C. Little, Baltimore, Md., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 229,279, Apr. 18, 1994. This application Aug. 22, 1996, Ser. No. 701,269
Int. Cl.[6] C12Q *1/68*; C12P *19/34*
U.S. Cl. 435—6 9 Claims



1. A method for amplifying a target sequence comprising:

A) providing a single-stranded nucleic acid containing the target sequence, the single-stranded nucleic acid having a 5' end and a 3' end;

B) binding an amplification primer for SDA to the 3' end of the single-stranded nucleic acid such that the primer forms a 5' single stranded overhang, the amplification primer comprising a recognition/cleavage site for a thermophilic restriction endonuclease which does not cut the target nucleic acid sequence, and;

C) amplifying the target sequence at 50° C.–60° C. in a reaction comprising the steps of

i) extending the amplification primer on the single-stranded nucleic acid in the presence of

a) a thermophilic DNA polymerase having a temperature optimum for polymerizing activity of 65° C.–75° C., the polymerase having strand displacing activity and lacking 5'-3' exonuclease activity,

b) deoxynucleoside triphosphates,

c) at least one derivatized deoxynucleoside triphosphate, and

d) a thermophilic restriction endonuclease which nicks the recognition/cleavage site when the site is hemimodified by incorporation of the derivatized deoxynucleoside triphosphate, the endonuclease having a temperature optimum for cleavage of double-stranded DNA of 50° C.–65° C., thereby producing a double-stranded product comprising the target sequence and a double-stranded hemimodified restriction endonuclease recognition/cleavage site;

ii) nicking the double stranded hemimodified restriction endonuclease recognition/cleavage site with the restriction endonuclease;

iii) extending from the nick using the DNA polymerase, thereby displacing a copy of the target sequence from the double-stranded product, and;

iv) repeating the nicking, extending and displacing steps such that the target sequence is amplified.

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5,744,312

## THERMOSTABLE DNA POLYMERASE FROM *THERMOANAEROBACTER-THERMOHYDROSULFURICUS*

Joseph A. Mamone, Parma; Maria Davis, Twinsburg, and Dan Sba, Euclid, all of Ohio, assignors to Amersham Life Science, Inc., Cleveland, Ohio

Filed Dec. 13, 1996, Ser. No. 766,014
Int. Cl.[6] C12N *9/12*;*15/54*; C12P *19/34*; C12Q *1/68*
U.S. Cl. 435—6 33 Claims

1. An enzymatically active DNA polymerase having at least 80% identity in its amino acid sequence to the DNA polymerase of *Thermoanaerobacter thermohydrosulfuricus*.

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5,744,313

## ASSAY EMPLOYING NOVEL PROTEIN DOMAIN WHICH BINDS TYROSINE PHOSPHORYLATED PROTEINS

Lewis T. Williams, Tiburon, and William Michael Kavanaugh, Mill Valley, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Dec. 9, 1994, Ser. No. 353,550
Int. Cl.[6] G01N *33/53*
U.S. Cl. 435—7.1 21 Claims

1. A method of determining whether a test compound is an agonist or antagonist of a growth factor activation signaling pathway in a cell, comprising:

contacting the cell with the test compound in the presence of a growth factor;

lysing the cell to produce a cell lysate; and

determining an amount of a phosphorylated ligand to a PTB domain present in said cell lysate, said determining step comprising the steps of contacting the cell lysate with an isolated polypeptide which comprises a PTB domain, and which isolated polypeptide does not contain an SH2 domain, and determining an amount of protein in the cell lysate that binds to said isolated polypeptide; and

comparing the amount of phosphorylated ligand to a PTB domain from said determining step to an amount of phosphorylated ligand to a PTB domain in a cell lysate prepared from a cell contacted with a growth factor in the absence of said test compound, an increase or decrease in the amount of said phosphorylated ligand in the presence of said test compound being indicative that the compound is an agonist or antagonist of the growth factor activation signaling pathway, respectively.

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5,744,314

## PERIPLASMIC MEMBRANE-BOUND SYSTEM FOR DETECTING PROTEIN-PROTEIN INTERACTIONS

Rolf Menzel, Princeton Junction, and Scott T. Taylor, West Windsor, both of N.J., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Continuation of Ser. No. 121,201, Sep. 13, 1993, Pat. No. 5,521,066. This application May 3, 1996, Ser. No. 642,552
Int. Cl.[6] C12Q *1/02*; C12N *15/12*
U.S. Cl. 435—7.2 29 Claims

1. A prokaryotic host cell comprising

(a) a transmembrane fusion protein having



(i) a toxR region having a toxR DNA-binding region and a toxR hydrophobic transmembrane region, and

(ii) a periplasmic region capable of spontaneously forming a dimer; and

(b) a nucleic acid molecule having a reporter gene operatively linked to the ctx operon;

wherein dimer formation is signaled by expression of the reporter gene.

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5,744,315

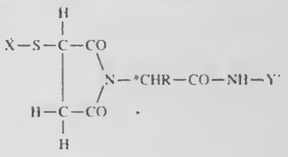
## COMPOUNDS FROM BIOPOLYMERS AND EFFECTOR SUBSTANCES WHICH ARE LINKED VIA OPTICALLY ACTIVE AMINO ACID DERIVATIVES, PROCESSES FOR THE PREPARATION THEREOF AND THE USE THEREOF

Heinz-Jürgen Friesen, and Peter Hermentin, both of Marburg, Germany, assignors to Behring Diagnostics GmbH, Marburg, Germany

Division of Ser. No. 201,209, Feb. 24, 1994, Pat. No. 5,484,722, which is a division of Ser. No. 549,102, Jul. 6, 1990, Pat. No. 5,321,142. This application Jun. 7, 1995, Ser. No. 487,647
Claims priority, application Germany, Jul. 10, 1989, 39 22 608.5
Int. Cl.[6] G01N *33/535*;*33/563*; A61K *121/00*
U.S. Cl. 435—7.9 9 Claims

1. A method of assay for an analyte comprising the steps of:

(a) providing a conjugate of the formula I



in which *C is an asymmetric carbon atom and R is the side chain of a natural amino acid, of methionine sulfone or of cysteic acid.

X is the radical of the thiol component and

Y is the radical of the amino coupling component comprising a specific binding partner for the analyte to be assayed linked to a marker substance;

(b) contacting a sample containing an analyte to be assayed with the conjugate; and

(c) detecting or measuring the amount of the marker substance bound to the analyte.

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5,744,316

## ISOLATED, TYROSINASE DERIVED PEPTIDES AND USES THEREOF

Bernard Lethe; Vincent Brichard; Aline Van Pel, all of Brussels; Thomas Wölfel, Mainz, and Thierry Boon-Falleur, Brussels, all of Belgium, assignors to Ludwig Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 233,305, Apr. 26, 1994, Pat. No. 5,519,117, which is a continuation-in-part of Ser. No. 203,054, Feb. 28, 1994, Pat. No. 5,530,096, which is a continuation-in-part of Ser. No. 81,673, Jun. 23, 1993, Pat. No. 5,487,974, which is a continuation-in-part of Ser. No. 54,714, Apr. 28, 1993, which is a continuation-in-part of Ser. No. 994,928, Dec. 22, 1992, abandoned. This application Jan. 17, 1996, Ser. No. 587,391
Int. Cl.[6] G01N *33/53*; A61K *39/385*;*38/04*
U.S. Cl. 435—7.24 10 Claims

1. A method for identifying a subject for treatment with a therapeutic agent which is specific for complexes of an HLA-B44 molecule and a peptide of formula Xaa Glu Ile Trp Arg Asp Ile Asp Phe (SEQ ID. NO: 12) wherein Xaa is any amino acid but serine, and wherein said complexes are present on surfaces of abnormal cells of said subject, comprising

(i) contacting a sample containing abnormal cells, which has been taken from said subject, with a cytolytic T cell specific for said complexes, and

(ii) determining lysis of at least some of said abnormal cells as an indication that the subject is a candidate for said treatment.

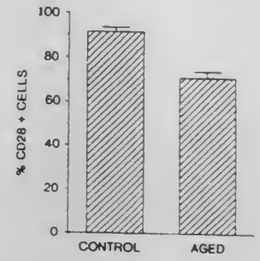
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5,744,317

## DIAGNOSTIC TEST FOR REPLICATIVE SENESCENCE IN T CELLS

Rita B. Effros, Pacific Palisades, Calif., assignor to The Reagents of the University of California, Oakland, Calif.

Continuation of Ser. No. 307,508, Sep. 16, 1994, abandoned. This application Nov. 22, 1996, Ser. No. 755,291
Int. Cl.[6] G01N *33/53*;*33/555*;*33/567*; C07K *16/00*
U.S. Cl. 435—7.24 13 Claims




1. A method to identify replicatively senescent T-cells in a sample containing T-cells comprising:

determining the presence or absence of CD28 and CD3 on a surface of the cells of said sample; and

identifying replicatively senescent T-cells as possessing CD3 ($CD3^+$) and lacking CD28 ($CD28^-$); wherein replicatively senescent T-cells are characterized as being unable to undergo cell division and wherein a first monoclonal antibody that binds to CD3 and a second monoclonal antibody that binds to CD28 are used to identify the presence or absence of CD3 and CD28 on the surface of said cells.

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5,744,318

## MONOCLONAL ANTIBODY FOR THE DETECTION OF ADVANCED GLYCOSYLATION ENDPRODUCTS IN BIOLOGICAL SAMPLES

Henry W. Founds, Mendham, and Homayoun Sadeghi, Sparta, both of N.J., assignors to Alteon Inc., Ramsey, N.J.

Filed Dec. 30, 1994, Ser. No. 367,507
Int. Cl.[6] C07K *16/44*; C12Q *1/28*; G01N *33/53*
U.S. Cl. 435—7.92 23 Claims

1. A method for detecting the presence of advanced glycosylation endproducts (AGES) in a biological sample comprising the steps of:

a) contacting a sample suspected of containing AGEs with a monoclonal antibody or antigen binding fragment thereof under conditions which allow for the formation of reaction complexes comprising the monoclonal antibody or antigen binding fragment thereof and the AGEs; and

b) detecting the formation of reaction complexes comprising the monoclonal antibody or antigen binding fragment thereof and AGEs in the sample;

wherein detection of the formation of reaction complexes indicates the presence of AGEs in the sample, and wherein the monoclonal antibody or antigen-binding fragment thereof is monoclonal antibody 4G9 as produced by hybridoma 4G9.

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deposited with the American Type Culture Collection (ATCC) and assigned Accession Number CRL 11626.

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**5,744,319**
**AVIAN TRYPTASE POLYCLONAL ANTIBODY AND PURIFICATION METHOD FOR USE IN HUMAN TRYPTASE IMMUNOASSAY**

**Andrew L. Niles, and Mary Haak-Frendscho, both of Madison, Wis., assignors to Promega Corporation, Madison, Wis.**

**Division of Ser. No. 555,130, Nov. 8, 1995, Pat. No. 5,594,116. This application May 23, 1996, Ser. No. 652,813**
**Int. Cl.[6] G01N** *33/53;33/537;33/543*
**U.S. Cl. 435—7.94** **12 Claims**

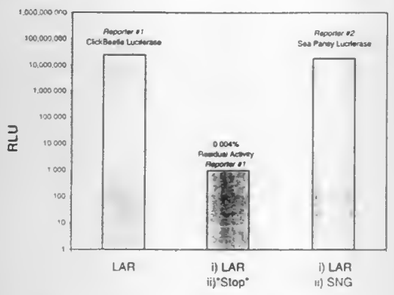
1. Avian-derived anti-human tryptase polyclonal antibodies which specifically bind to and capture tryptase from solution.

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**5,744,320**
**QUENCHING REAGENTS AND ASSAYS FOR ENZYME-MEDIATED LUMINESCENCE**

**Bruce A. Sherf, Waunakee; Keith V. Wood, Madison, and Elaine T. Schenborn, Middleton, all of Wis., assignors to Promega Corporation, Madison, Wis.**

**Filed Jun. 7, 1995, Ser. No. 472,546**
**Int. Cl.[6] C12Q** *1/66;1/00;1/37;* **C09K** *11/06*
**U.S. Cl. 435—8** **60 Claims**




1. A method of assaying enzyme-mediated luminescence reactions comprising:
(a) initiating at least one enzyme-mediated luminescence reaction; then
(b) quantifying luminescence energy produced by the luminescence reaction; and then
(c) quenching photon emission from the enzyme-mediated luminescence reaction by introducing at least one quench reagent to the luminescence reaction.

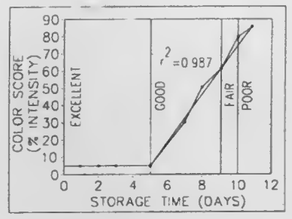
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**5,744,321**
**DETECTION OF FISH SPOILAGE BY COLORIMETRY**

**Patrick Harewood, N. Branford, Conn., assignor to GEM Biomedical, Inc., Hamden, Conn.**

**Filed Feb. 21, 1997, Ser. No. 803,946**
**Int. Cl.[6] C12Q** *1/04;1/00;1/02*
**U.S. Cl. 435—34** **13 Claims**

1. A rapid, on-site method for indicating the degree of spoilage, if any, of finfish by quantifying the bacterial level present therein, comprising the steps of:
(a) cutting a small predetermined quantity of flesh from a representative finfish;
(b) kneading said flesh with a small predetermined quantity of a liquid bacterial nutrient broth for a brief period of time and then filtering off a small portion of the liquid extract;



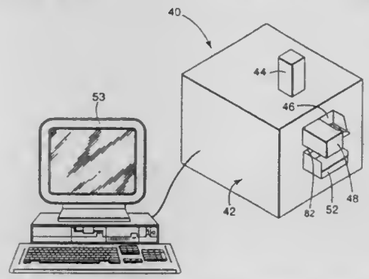

(c) adding to the liquid extract a small predetermined quantity of an indicator reagent comprising a water-soluble ionized salt of a colorless tetrazolium dye which is reducible to form a water-insoluble colored formazan compound upon reaction with any bacteria present in the liquid, and allowing to stand for several minutes at room temperature;
(d) mixing a small amount of a surfactant with the liquid extract,
(e) mixing a small amount of a lower aliphatic alcohol with the liquid extract, and
(f) comparing the color of the liquid extract with a control color chart carrying colors of increasing intensity representative of various increasing concentrations of said colored formazan compound which is correlated to the concentration of said bacteria, whereby the absence of color indicates the presence of a low level of bacteria, if any, and the intensity of the color, if present, indicates the relative level of bacteria present and the degree of spoilage of the fish being examined.

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**5,744,322**
**AUTOMATED INCUBATING AND IMAGING SYSTEM FOR A DISPOSABLE MICROORGANISM CULTURING DEVICE AND METHOD OF USE**

**Gary E. Krejcarek, White Bear; Patrick A. Mach, Shorewood; Scott D. Morgan, Cottage Grove, and Thomas A. Turgeon, Fridley, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**PCT No. PCT/US94/14515, § 371 Date Aug. 29, 1996, § 102(e) Date Aug. 29, 1996, PCT Pub. No. WO95/16768, PCT Pub. Date Jun. 22, 1995**
**Continuation-in-part of Ser. No. 168,681, Dec. 17, 1993, abandoned. This PCT application Dec. 15, 1994, Ser. No. 646,291**
**Int. Cl.[6] C12Q** *1/06;* **C12M** *1/34*
**U.S. Cl. 435—39** **9 Claims**




1. An apparatus (**40**) for counting microorganism colonies on at least one disposable microorganism culturing medium having a substantially planar substrate (**21**); the substrate adapted to fit within and be supported by a holder (**20**) comprising:
a) imaging means for detecting colonies on the substantially planar substrate (**24**); and
b) holder positioning for storing and queuing one or more holders (**20**) and adapted for moving the holders sequentially into a predetermined position (**70**) relative to the imaging means; wherein the holder positioning means comprises
i) a frame (**54**) defining a first queuing area (**56**) and a second queuing area (**58**);



ii) hoist means (**62**) for adjusting the height of one or more holders (**20**) stacked within the first queuing area (**56**);
iii) first conveyor means (**66**) for displacing a holder (**20**) at the bottom of a stack within the second queuing area (**58**) to the bottom of the first queuing area (**56**);
iv) second conveyor means (**68**) for displacing a holder (**20**) at the top of a stack within the first queuing area (**56**) to the top of the second queuing area (**58**); and
v) control means for operating the hoist means (**62**) and the first and second conveyor means (**66, 68**) in a predetermined sequence.

6. A method of hinging microorganism colonies on at least one disposable microorganism culturing medium having a substantially planar substrate (**21**) comprising the steps of:
a) providing one or more holders (**20**) adapted to support the substantially planar substrate (**21**);
b) queuing and moving the holders (**20**) sequentially into a predetermined position (**70**) in an apparatus of claim 1 at two or more predetermined times; and
c) imaging the substantially planar substrates (**21**) in the predetermined position at the predetermined times and storing information about the images so obtained.

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**5,744,323**
**PROCESS FOR PRODUCING HEME PROTEINS**

**Henrik Dalbøge; Ejner Bech Jensen, and Karen Gjesing Welinder, all of Virum, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark**

**Continuation of Ser. No. 119,077, Sep. 15, 1993, abandoned. This application Sep. 30, 1994, Ser. No. 315,671**
**Claims priority, application European Pat. Off., Mar. 22, 1991, 91610022**
**Int. Cl.[6] C12N** *15/52;9/08*
**U.S. Cl. 435—69.1** **6 Claims**

1. A process for the extracellular production of a heterologous heme protein in a strain of *Aspergillus sp.*, the heterologous heme protein being an oxidoreductase selected from the group consisting of a peroxidase or a haloperoxidase, the process comprising:
(a) transforming a suitable strain of an *Aspergillus sp.* with a recombinant DNA vector which comprises a DNA sequence, wherein the DNA sequence encoding the peroxidase is derived from a *Coprinus sp.* and a DNA sequence encoding a preregion permitting secretion of the expressed heme protein, wherein the preregion is derived from a gene encoding an *Aspergillus sp* amylase selected from the group consisting of *A. oryzae* TAKA amylase, *A. niger* neutral α-amylase, *A. niger* acid-stable α-amylase, *A. niger* glucoamylase, or the peroxidase produced by *Coprinus cinereus* or macrorhizus and
(b) culturing the transformed strain of *Aspergillus sp.* in a suitable culture medium under conditions conducive to the production of the heme protein.
(c) subsequently recovering the heme protein produced by the *Aspergillus sp.* in step (b) from the culture.

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**5,744,324**
**NUCLEIC ACIDS ENCODING POTASSIUM CHANNELS WHICH FORM INWARD RECTIFIER, G-PROTEIN ACTIVATED, MAMMALIAN, HETEROMULTIMERIC, POTASSIUM CHANNELS AND USES THEREOF**

**Henry A. Lester, South Pasadena; Norman Davidson, Sierra Madre, and Paulo Kofuji, Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.**

**Continuation-in-part of Ser. No. 66,371, Mar. 21, 1993. This application Mar. 7, 1996, Ser. No. 614,801**
**Int. Cl.[6] C12N** *15/12;15/63;5/10;* **G01N** *33/48*
**U.S. Cl. 435—69.1** **19 Claims**

1. Isolated nucleic acid comprising at least two genes, wherein each gene encodes a different inward rectifier, G-protein activated, mammalian, potassium Kir3.0 polypeptide, wherein said Kir3.0 polypeptides are characterized by their ability to cause a change in potassium flow across a Xenopus oocyte cell membrane upon their combined expression therein, and wherein each of said genes hybridizes under low stringency conditions to a complement of a nucleic acid coding for a Kir3.0 polypeptide selected from the group consisting of Kir3.1, Kir3.2, Kir3.3 and Kir3.4.

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**5,744,325**
**PROCESS FOR PRODUCING N-ACETYLGLUCOSAMINE-6-PHOSPHATE DEACETYLASE**

**Shizu Fujishima; Naoko Yamano, both of Ikeda; Akihiko Maruyama, and Takanori Higashihara, both of Tsukuba, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan**

**Filed Feb. 26, 1997, Ser. No. 806,613**
**Claims priority, application Japan, Mar. 4, 1996, 8-075250**
**Int. Cl.[6] C12P** *21/04;* **C12N** *9/80;1/12*
**U.S. Cl. 435—71.2** **7 Claims**

1. A process for producing N-acetylglucosamine-6-phosphate deacetylase comprising incubating a microorganism which is the marine low temperature bacterium P2K-5 strain (Vibrio sp. P2K-5 strain, FERM BP-5769) to produce N-acetylglucosamine-6-phosphate deacetylase and recovering N-acetylglucosamine-6-phosphate deacetylase from the culture thus obtained.

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**5,744,326**
**USE OF VIRAL CIS-ACTING POST-TRANSCRIPTIONAL REGULATORY SEQUENCES TO INCREASE EXPRESSION OF INTRONLESS GENES CONTAINING NEAR-CONSENSUS SPLICE SITES**

**Charles R. Ill, Encinitas, Calif., and Scott Bidlingmaier, New Haven, Conn., assignors to The Immune Response Corporation, Carlsbad, Calif.**

**Filed Mar. 11, 1996, Ser. No. 683,839**
**Int. Cl.[6] C12N** *15/63;15/79;* **C07H** *21/04*
**U.S. Cl. 435—172.3** **15 Claims**

9. A method for increasing expression of an intronless gene containing one or more near consensus splice sites, the method comprising operably linking one or more copies of a viral cis-acting post-transcriptional regulatory element to the gene so that the post-transcriptional regulatory element is transcribed along with the gene as a gene transcript and causes export of the gene transcript from the nucleus into the cytoplasm of a cell.

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**5,744,327**
**METHODS FOR PRODUCING INSULIN IN RESPONSE TO NON-GLUCOSE SECRETAGOGUES**

**Christopher B. Newgard, Dallas, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.**

**PCT No. PCT/US92/04737, § 371 Date Jun. 23, 1994, § 102(e) Date Jun. 23, 1994, PCT Pub. No. WO92/21979, PCT Pub. Date Dec. 10, 1992**
**Continuation-in-part of Ser. No. 819,326, Jan. 13, 1992, Pat. No. 5,427,940, which is a continuation-in-part of Ser. No. 710,038, Jun. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 483,224, Feb. 20, 1990, Pat. No. 5,175,085. This PCT application Jun. 2, 1992, Ser. No. 162,044**
**Int. Cl.[6] C12P** *21/02;* **C12N** *15/00*
**U.S. Cl. 435—69.4** **37 Claims**

1. A method for producing insulin comprising:
(a) culturing a cell capable of secreting insulin, the cell comprising a hexokinase IV gene, an insulin gene and a GLUT-2 gene, wherein at least one of said genes is a recombinant gene introduced into the cell by means of a recombinant vector;
(b) stimulating said cell to secrete insulin; and
(c) collecting the secreted insulin.

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5,744,328

## PRODUCTION OF PROTEINS IN PROCARYOTES

Gwen G. Krivi, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 975,205, Nov. 22, 1992, Pat. No. 5,399,489, which is a continuation of Ser. No. 299,376, Jan. 23, 1989, abandoned, which is a continuation of Ser. No. 704,362, Feb. 22, 1985, Pat. No. 4,861,868. This application Mar. 10, 1995, Ser. No. 402,088

Int. Cl.[6] C12N *15/18*

U.S. Cl. 435—69.4 20 Claims

1. A method for bacterially producing bovine growth hormone, said bovine growth hormone comprising a mature bovine growth hormone having a naturally occurring amino acid sequence including an N-terminus alanine, which method comprises causing expression in selected bacteria of a DNA sequence coding for bovine growth hormone, in which sequence the codon for the N-terminus alanine is immediately downstream of a translation start signal methionine codon, said bacteria internally producing said hormone including an N-terminus alanine from the product of said expression, said expression being effective to produce said hormone in the form of refractile bodies that are visible using a phase contrast microscope, and recovering said hormone having an N-terminus alanine produced within said bacteria.

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5,744,329

## DNA ENCODING FUSED DI-BETA GLOBINS AND PRODUCTION OF PSEUDOTETRAMERIC HEMOGLOBIN

Stephen J. Hoffman, Denver; Douglas L. Looker, Lafayette; Mary S. Rosendahl, Broomfield; Gary L. Stetler, Denver, all of Colo.; Michael Wagenbach, Osaka, Japan; David C. Anderson, Lafayette; Antony James Mathews, Louisville, both of Colo., and Kiyoshi Nagai, Cambridge, England, assignors to Somatogen, Inc., Boulder, Colo.

Division of Ser. No. 789,179, Nov. 8, 1991, Pat. No. 5,545,727, which is a continuation-in-part of Ser. No. 671,707, Apr. 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 374,161, Jun. 30, 1989, abandoned, Ser. No. 379,116, Jul. 13, 1989, abandoned, and Ser. No. 349,623, May 10, 1989, abandoned. This application May 19, 1995, Ser. No. 444,942

Int. Cl.[6] C12P *21/06;* C07H *17/00;* C07K *14/805*

U.S. Cl. 435—696 19 Claims

1. A recombinant DNA molecule comprising expressible first and second DNA sequences encoding first and second beta globin-like polypeptide sequences, the first and second DNA sequences linked with a linker DNA sequence encoding a linker amino acid sequence, and first and second beta globin-like polypeptide sequences and said linker amino acid sequences being expressed as a single polypeptide chain, said chain being capable of associating with alpha globin and incorporating heme to form a hemoglobin-like protein with reversible oxygen-binding activity.

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5,744,330

## CATABOLITE NON-REPRESSED SUBSTRATE-LIMITED YEAST STRAINS

David J. Domingues, Plymouth, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Division of Ser. No. 335,685, Nov. 8, 1994, Pat. No. 5,508,047, which is a continuation-in-part of Ser. No. 144,236, Oct. 27, 1993, Pat. No. 5,494,686, which is a continuation-in-part of Ser. No. 829,453, Jan. 31, 1992, abandoned, said Ser. No. 335,685 is a continuation-in-part of Ser. No. 87,616, Jul. 2, 1993, Pat. No. 5,492,702, which is a continuation-in-part of Ser. No. 26,927, Mar. 5, 1993, abandoned. This application May 8, 1995, Ser. No. 436,979

Int. Cl.[6] C12P *19/02;7/06*

U.S. Cl. 435—105 4 Claims

1. A method for converting whey to glucose and ethanol comprising:

providing a yeast cell of a genus species *Saccharomyces cerevisiae* strain selected from one or more of ATCC No. 74306, 74307, 74308 and 74309 solely utilizing galactose as a carbohydrate source in the presence of glucose;

interspersing the yeast cell into whey; and

extracting glucose and ethanol produced by the action of the yeast cell on the whey.

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5,744,331

## PROCESS FOR PRODUCING L-LEUCINE

Tetsuo Nakano, Machida; Masato Ikeda; Kuniki Kino, both of Hofu, all of Japan, and Satoru Furukawa, Chesterfield, Mo., assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1995, Ser. No. 496,788

Claims priority, application Japan, Jun. 30, 1994, 6-149679

Int. Cl.[6] C12P *13/06*

U.S. Cl. 435—116 6 Claims

1. A process for producing L-leucine which comprises culturing in a medium a microorganism belonging to the genus Escherichia in the culture, and recovering L-leucine therefrom, wherein the microorganism has resistance to a leucine analogue and which produces at least 3.4 g/l L-leucine, and is derived from an L-valine-producing strain.

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5,744,332

## PREPARATION OF LACTAMS FROM ALIPHATIC α ω DINITRILES

Robert Di Cosimo, Rockland, Del.; Robert Donald Fallon, Elkton, Md.; John Edward Gavagan, and Frank Edward Herkes, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 17, 1996, Ser. No. 650,073

Int. Cl.[6] C12P *17/10;17/12*

U.S. Cl. 435—121 20 Claims

1. A process for the preparation of five-membered ring lactams or six-membered ring lactams from aliphatic α,ω-dinitriles, comprising:

(a) contacting an aliphatic α,ω-dinitrile in an aqueous reaction mixture with an enzyme catalyst characterized by either

1) an aliphatic nitrilase activity, or

2) a combination of nitrile hydratase and amidase activities, whereby the aliphatic α,ω-dinitrile is converted to an ω-nitrilecarboxylic acid ammonium salt;

(b) contacting the aqueous product mixture resulting from step (a) with hydrogen and a hydrogenation catalyst, whereby the ω-nitrilecarboxylic acid ammonium salt is converted directly to the corresponding lactam without isolation of the intermediate ω-nitrilecarboxylic acid, ω-nitrilecarboxylic acid ammonium salt, ω-aminocarboxylic acid or ω-aminocarboxylic acid ammonium salt; and

(c) recovering the lactam from the aqueous product mixture resulting from step (b).

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5,744,333

## PROCESS FOR THE EXTRACTION OF TAXOL AND DERIVATIVES THEREOF FROM ROOTS OF PLANTS OF THE GENUS TAXUS

Ermanno Cociancich, and Roberto Pace, both of Milan, Italy, assignors to Indena SPA, Milan, Italy

Continuation of Ser. No. 881,504, May 11, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 487,919

Claims priority, application Italy, Jan. 31, 1992, MI92A0181

Int. Cl.[6] C12P *17/02*

U.S. Cl. 435—123 13 Claims

1. A process for isolating taxol from plants of the genus Taxus, which comprises:

cultivating a species of Taxus selected from the group consisting of *T. media* "Hicksii", *T. media* "Hill" and *T. media* "dark green spreader", for a time sufficient to obtain plant roots having a concentration of taxol of from about 0.08% to 0.15% (w/w), and either a concentration of baccatin-III of from about 0.02% to 0.06% (w/w) or a concentration of 10-desacetylbaccatin-III of from about 0.03% to 0.08% (w/w);

harvesting the plant-roots;

extracting a mixture of taxol and either baccatin-III or 10-desacetylbaccatin-III in said amounts from the plant roots; and

isolating the taxol from the extracted mixture.

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5,744,334

## PLANT PROMOTER USEFUL FOR DIRECTING THE EXPRESSION OF FOREIGN PROTEINS TO THE PLANT EPIDERMIS

Michael S. Dobres, Philadelphia, and Sevnur Mandaci, Ardley, both of Pa., assignors to Drexel University, Philadelphia, Pa.

Division of Ser. No. 299,953, Sep. 2, 1994. This application Jun. 2, 1995, Ser. No. 459,415

Int. Cl.[6] A01H *5/00;* C12N *5/04;15/82*

U.S. Cl. 435—172.3 4 Claims

1. A method of transforming plants comprising:

a. providing a plant,

b. preparing a construct of a Blec promoter sequence of SEQ ID NO: 1 or a fragment thereof having epidermal specific activity and a heterologous gene, thereby producing a promoter-gene construct, and

c. transforming said plant with said promoter-gene construct thereby producing a transformed plant.

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5,744,335

## PROCESS OF TRANSFECTING A CELL WITH A POLYNUCLEOTIDE MIXED WITH AN AMPHIPATHIC COMPOUND AND A DNA-BINDING PROTEIN

Jon A. Wolff, Madison, Wis.; Jeffery Fritz, Nashville, Tenn.; Vladimir Budker, and James Hagstrom, both of Madison, Wis., assignors to Mirus Corporation, Madison, Wis.

Filed Sep. 19, 1995, Ser. No. 530,598

Int. Cl.[6] C12N *15/64;* A61K *38/16;* C07H *21/00*

U.S. Cl. 435—172.3 15 Claims

1. A process of transfecting a polynucleotide into a cell comprising: associating a selected cell with an amphipathic compound, an effective amount of a polynucleotide-binding protein, the polynucleotide-binding protein is selected from the group consisting of histone and histone with a nuclear localizing signal, and a selected polynucleotide, in solution, wherein encapsulation of the polynucleotide by the amphipathic compound is not required for transfection.

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5,744,336

## DNA CONSTRUCTS FOR CONTROLLED TRANSFORMATION OF EUKARYOTIC CELLS

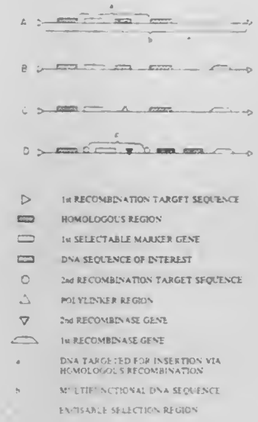
Thomas K. Hodges, and Leszek A. Lyznik, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Division of Ser. No. 10,997, Jan. 29, 1993, Pat. No. 5,527,695. This application Mar. 8, 1996, Ser. No. 612,551

Int. Cl.[6] C07H *21/04;* C12N *15/63*

U.S. Cl. 435—172.3 15 Claims

1. A DNA construct for transforming a eukaryotic cell, said construct comprising a multifunctional DNA sequence flanked by a pair of directly repeated site-specific recombination sequences, said multifunctional DNA sequence comprising a gene encoding a selectable marker, and a DNA sequence of interest, wherein said DNA sequence of interest is flanked by nucleotide sequences sharing homology to a predetermined nucleotide sequence present




in the eukaryotic cell, and said DNA sequence of interest being targeted for insertion via homologous recombination into the DNA of the eukaryotic cell, and the selectable marker gene is operably linked to a regulatory sequence that expresses the gene in the eukaryotic cell.

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5,744,337

## INTERNAL GELATION METHOD FOR FORMING MULTILAYER MICROSPHERES AND PRODUCT THEREOF

Ronald R. Price, Stevensville, and Mariam Monshipouri, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 26, 1995, Ser. No. 587,798

Int. Cl.[6] C12N *11/10;* A23L *1/0532;* B01J *13/18*

U.S. Cl. 435—178 19 Claims

1. A process for preparing polysaccharide microspheres having a diameter of about 2μ–1000μ by internally controlled gelation, comprising the steps of:

providing an aqueous phase by blending, in the presence of water, a first component with a second component, thereby forming an aqueous phase,

said first component comprising a di- or trivalent metal salt in a concentration effective to significantly promote gelling of said polysaccharide in said aqueous phase,

said second component comprising a water-soluble polysaccharide and a polymerization inhibitor for inhibiting the polymerization of said polysaccharide in a concentration effective to significantly inhibit the gelling of said polysaccharide in said aqueous phase,

said first component or said second component further comprising an active substance,

mixing, before significant gelation of said polysaccharide in said aqueous phase occurs, said aqueous phase with a non-aqueous phase with agitation to form an emulsion, in a ratio of said aqueous phase to said non-aqueous phase such that said emulsion is an o/w/o emulsion, said non-aqueous phase comprising a water-immiscible solvent, said emulsion comprising said active substance entrapped within polysaccharide microspheres having a diameter of about 2μ–2000μ;

allowing said polysaccharide microspheres, having said active substance entrapped therein, to gel, thus forming, in said emulsion, gelled microspheres having a diameter of 2μ–2000μ, said gelled microspheres having said active substance entrapped therein;

breaking said emulsion comprising said gelled microspheres to form a broken emulsion; and

collecting said gelled microspheres from said broken emulsion.

8. The method of claim 1, wherein the active substance is a live microbial cell or a viable spore.

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5,744,338

**DNA ENCODING SERYL TRNA SYNTHETASE FROM *STAPHYLOCOCCUS AUREUS***

John Edward Hodgson, and Elizabeth Jane Lawlor, both of Malvern, Pa., assignors to SmithKline Beecham p.l.c., Brentford, United Kingdom

Filed Jan. 17, 1997, Ser. No. 785,050

Claims priority, application United Kingdom, Jan. 19, 1996, 9601099; Oct. 30, 1996, 9622617

Int. Cl.[6] C12N *9/00;15/00;1/20;* C07H *21/04*

U.S. Cl. 435—183 24 Claims

1. An isolated polynucleotide comprising a polynucleotide sequence selected from the group consisting of:

(a) a polynucleotide having at least a 95% identity to a polynucleotide encoding a polypeptide comprising amino acids 1 to 428 of SEQ ID NO:2; and

(b) a polynucleotide which is complementary to the polynucleotide of (a).

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5,744,339

**THIOMETHYLENE GROUP-CONTAINING ALDEHYDE CYSTEINE AND SERINE PROTEASE INHIBITORS**

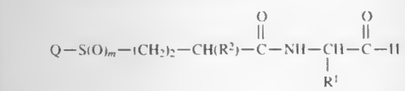
Sankar Chatterjee, Wynnewood, Pa., assignor to Cephalon, Inc., West Chester, Pa.

Filed Aug. 30, 1996, Ser. No. 706,184

Int. Cl.[6] C12N *9/99;9/48;* C07C *321/00;* A01N *37/18*

U.S. Cl. 435—184 16 Claims

1. A compound of the structure:



wherein:

Q is aryl having from 6 to 14 carbons, heteroaryl having from 6 to 14 ring atoms, aralkyl having from 7 to 15 carbons, heteroalkyl having from 2 to 7 carbons, or arylheteroalkyl wherein the aryl portion can be unfused or fused with the heteroalkyl ring;

m is 0, 1, or 2;

$R^1$ and $R^2$ are independently H, alkyl having from 1 to 14 carbons, cycloalkyl having 3 to 10 carbons, or a natural or unnatural side chain of an L-amino acid, said alkyl and cycloalkyl groups being optionally substituted with one or more J groups; and

J is halogen, lower alkyl, aryl, heteroaryl, amino optionally substituted with one to three aryl or lower alkyl groups, guanidino, alkoxycarbonyl, alkoxy, hydroxy, or carboxy.

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5,744,340

**EXPRESSION OF HUMAN INDUCIBLE NITRIC OXIDE SYNTHASE**

James D. Fossetta, Roseland; Charles A. Lunn, Somerville, and Daniel Lundell, Flemington, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jun. 9, 1995, Ser. No. 488,702

Int. Cl.[6] C12N *9/02;1/20;15/00;* C12P *21/06*

U.S. Cl. 435—189 13 Claims

1. A transformed bacterial host cell which expresses human inducible nitric oxide synthase (iNOS) iNOS and human calmodulin under conditions permitting the coexpression thereof.

5,744,341

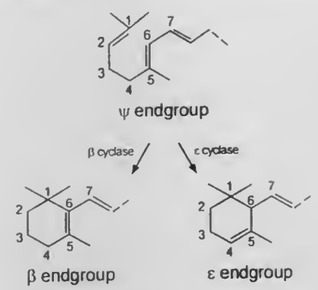
**GENES OF CAROTENOID BIOSYNTHESIS AND METABOLISM AND A SYSTEM FOR SCREENING FOR SUCH GENES**

Francis X. Cunningham, Jr., Chevy Chase, and Zairen Sun, Hyattsville, both of Md., assignors to University of Maryland College Park, College Park, Md.

Filed Mar. 29, 1996, Ser. No. 624,125

Int. Cl.[6] C12N *1/21;9/02;15/53;15/63*

U.S. Cl. 435—189 7 Claims




1. An isolated eukaryotic enzyme which is a ε cyclase enzyme having the amino acid sequence of SEQ ID NO: 2.

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5,744,342

**PROTEIN HAVING HEAT-RESISTANT MALATE DEHYDROGENASE ACTIVITY**

Atsushi Sogabe; Seiji Takeshima; Kazumi Yamamoto; Shinichi Teshima; Shigenori Emi, and Yoshihisa Kawamura, all of Tsuruga, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 270,013, Jul. 1, 1994, Pat. No. 5,686,294. This application Apr. 7, 1997, Ser. No. 838,418

Claims priority, application Japan, Jul. 2, 1993, 5-164701

Int. Cl.[6] C12N *9/04*

U.S. Cl. 435—190 6 Claims

1. A purified heat-resistant malate dehydrogenase, which shows a residual activity of at least 60% after preserving at 40° C. for 10 days in a solution state and which further has the following properties:

Action: reversibly catalyzing the following reaction:

L-maleic acid+NAD$^+$—oxaloacetic acid+NADH+H$^+$

Substrate specificity: specific oxidation of L-maleic acid or specific reduction of oxaloacetic acid

pH stability: pH 3.0–9.0

Molecular weight: 140,000 (gel filtration), 38,000 (SDS-PAGE)

Amino acid sequence: SEQ ID NO: 2.

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5,744,343

**UBIQUITIN CONJUGATING ENZYMES**

Giulio Draetta, Winchester; Mark Rolfe, Newton Upper Falls; Jens W. Eckstein, Cambridge, and Guillaume Cottarel, Chestnut Hill, all of Mass., assignors to Mitotix, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 247,904, May 23, 1994, which is a continuation-in-part of Ser. No. 176,937, Jan. 4, 1994, abandoned. This application Sep. 13, 1994, Ser. No. 305,520

Int. Cl.[6] C12N *9/10;1/20;15/00;* C07H *21/04*

U.S. Cl. 435—193 27 Claims

1. An isolated nucleic acid comprising a nucleotide sequence which encodes a ubiquitin conjugating enzyme (UbCE) polypeptide having an amino acid sequence at least 95% identical to at least one of SEQ ID Nos. 2, 4 or 6, which UbCE polypeptide catalyzes ubiquitin conjugation.



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5,744,344

Patent Not Issued For This Number

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5,744,345

**HYPERTHERMOSTABLE β-GALACTOSIDASE GENE, ENZYME ENCODED THEREBY, AND PROCESS FOR PRODUCTION**

Atsushi Shimada; Miki Odate, both of Shiga-ken; Nobuto Koyama, Kyoto-fu; Kimikazu Hashino, Osaka-fu; Kiyozo Asada, Shiga-ken, and Ikunoshin Kato, Kyoto-fu, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto-fu, Japan

Continuation-in-part of Ser. No. 175,533, Dec. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 128,079, Sep. 29, 1993, abandoned. This application Jun. 14, 1995, Ser. No. 489,733

Claims priority, application Japan, Oct. 5, 1992, 4-288156; Jan. 8, 1993, 5-16846; Dec. 6, 1993, 5-339188; Jun. 14, 1994, 6-154356

Int. Cl.[6] C12N *9/38;15/56*

U.S. Cl. 435—207 8 Claims

1. An isolated and purified β-galactosidase derived from Pyrococcus having a residual activity of about 80% or above after being subjected to heat treatment at 90° C. for 120 minutes, and having the following physiochemical properties:

(1) activity and substrate specificity: having an activity of hydrolyzing lactose into galactose and glucose and another activity of hydrolyzing o-nitrophenyl-β-D-galactopyranoside into o-nitrophenol and galactose;

(2) optimum temperature: 80°–95° C.; and

(3) stable pH range: 5–10.

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5,744,346

**β-SECRETASE**

Susanna M. S. Chrysler, San Bruno; Sukanto Sinha, San Francisco; Pamela S. Keim, San Mateo, and John P. Anderson, San Francisco, all of Calif., assignors to Athena Neurosciences, Inc., South San Francisco, Calif.

Filed Jun. 7, 1995, Ser. No. 480,498

Int. Cl.[6] C12N *9/64;9/50;6/48*

U.S. Cl. 435—226 6 Claims

1. An isolated β-secretase enzyme having the following characteristics:

an ability to cleave the 695-amino acid isotype of β -amyloid precursor protein between amino acids 596 and 597; and

an apparent molecular weight in the range from 260 kD to 300 kD when measured by gel exclusion chromatography.

5,744,347

**YOLK SAC STEM CELLS AND THEIR USES**

Thomas E. Wagner, and Michael R. Antczak, both of Albany, Ohio, assignors to Ohio University Edison Biotechnology Institute, Athens, Ohio

Continuation-in-part of Ser. No. 90,229, Jul. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 880,375, May 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 730,250, Jul. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 4,077, Jan. 16, 1987, Pat. No. 5,032,407. This application Apr. 6, 1994, Ser. No. 223,902

Int. Cl.[6] C12N *5/00*

U.S. Cl. 435—240.2 36 Claims

1. A cellular composition comprising a substantially homogeneous population of cultured murine stem cells displaying a phenotype of CD34$^-$, MHC Class I$^-$ and MHC Class II$^-$ which are capable of giving rise to blood cells.

19. A cellular composition comprising a substantially homogeneous population of cultured human stem cells displaying a phenotype of CD34$^+$, MHC class I$^-$ and MHC class II$^-$ which are capable of giving rise to blood cells.

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5,744,348

**TSH RECEPTOR**

Roger D. Cone, Oregon City, Oreg., assignor to New England Medical Center Hospitals, Inc., Boston, Mass.

Division of Ser. No. 146,835, Oct. 29, 1993, Pat. No. 5,614,363, which is a continuation-in-part of Ser. No. 565,669, Aug. 10, 1990, abandoned, which is a division of Ser. No. 404,899, Sep. 8, 1989, abandoned. This application Jun. 2, 1995, Ser. No. 459,107

Int. Cl.[6] C12N *5/10;15/12*

U.S. Cl. 435—252.3 15 Claims



1. A purified nucleic acid comprising the nucleotide sequence set forth in FIG. 6 or a nucleotide sequence complementary to that set forth in FIG. 6.

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5,744,349

**DNA SEQUENCES ENCODING HUMAN MYT1 KINASE**

Helen Piwnica-Worms, Ladue, Mo., assignor to Washington University, St. Louis, Mo.

Filed Mar. 5, 1996, Ser. No. 610,731

Int. Cl.[6] C12N *15/54*

U.S. Cl. 435—252.3 6 Claims

1. A DNA sequence encoding the amino acid sequence of Myt1Hu, as set forth in SEQ ID NO:2.

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5,744,350

**DNA ENCODING TRIOL POLYKETIDE SYNTHASE**

**Victor A. Vinci, Charlottesville; Michael J. Conder, Harrisonburg, both of Va.; Phyllis C. McAda; Christopher D. Reeves, both of Woodenville, Wash.; John Rambosek, Seattle, Wash.; Charles Ray Davis, Lynnwood, Wash., and Lee E. Hendrickson, Carnation, Wash., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation of Ser. No. 148,132, Nov. 2, 1993, abandoned. This application May 25, 1995, Ser. No. 450,332**

**Int. Cl.[6] C12N** *1/15;15/54*

**U.S. Cl. 435—254.11** **6 Claims**

1. Purified DNA encoding triol polyketide synthase from a microorganism selected from the group consisting of *Monascus ruber* and *Penicillum citrinum*.

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5,744,351

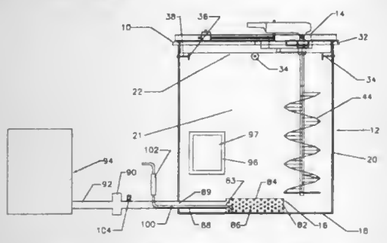
**APPARATUS FOR COMPOSITING ORGANIC WASTE**

**Michael Bryan-Brown, Box 17, Whitingham, Vt. 05361**

**Filed May 22, 1996, Ser. No. 651,757**

**Int. Cl.[6] C12M** *1/02;1/06*

**U.S. Cl. 435—290.2** **17 Claims**



1. A bioreactor for composting organic waste comprising:
a container for holding said organic waste, said container having a top opening and a center line;
a lid cover rotatably positioned over said top opening for enclosing said container, said lid cover operable to rotate about said center line of said container;
a mixing assembly for stirring said organic waste being held in said container; and
a slide system for mounting said mixing assembly to said lid cover and enhancing structural support of said lid cover, said slide system providing radial movement for said mixing assembly in said container, said lid cover providing rotational movement of said mixing assembly in said container.

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5,744,352

**Patent Not Issued For This Number**

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5,744,353

**CYTOLYTIC T CELL LINES WHICH BIND TO COMPLEXES OF TUMOR REJECTION ANTIGENS AND HLA-B44 MOLECULES**

**Jean Herman; Pierre Coulie; Thierry Boon-Falleur; Pierre van der Bruggen, and Immanuel Luescher, all of Brussels, Belgium, assignors to Ludwig Institute for Cancer Research, New York, N.Y.**

**Division of Ser. No. 602,506, Feb. 20, 1996, which is a continuation-in-part of Ser. No. 531,864, Sep. 21, 1995, which is a continuation-in-part of Ser. No. 373,636, Jan. 17, 1995, which is a continuation-in-part of Ser. No. 253,503, Jun. 3, 1994, Pat. No. 5,589,334. This application Feb. 6, 1997, Ser. No. 796,883**

**Int. Cl.[6] C12N** *5/06*

**U.S. Cl. 435—325** **3 Claims**

1. An isolated, cytolytic T cell clone which is specific for complexes of SEQ ID NO: 17 and an HLA-B44 molecule.

5,744,354

**CALCINEURIN INHIBITORY COMPOUNDS AND ANCHORING PROTEIN TO INDUCE IL-2 GENE EXPRESSION**

**Robert Owen Lockerbie, Kirkland, Wash.; John D. Scott; Vincent M. Coghlan, both of Portland, Oreg.; Monique L. Howard, Seattle, and W. Michael Gallatin, Mercer Island, both of Wash., assignors to ICOS Corporation, Bothell, Wash., and The State of Oregon, acting by and through the Oregon State Board of Higher Education, and on behalf of Oregon Health Sciences University, Portland, Oreg.**

**Continuation-in-part of Ser. No. 344,227, Nov. 23, 1994. This application Mar. 15, 1995, Ser. No. 404,731**

**Int. Cl.[6] A61K** *38/00;* **C12N** *5/08*

**U.S. Cl. 435—325** **6 Claims**

1. A method for inducing interleukin-2 gene expression in T cells comprising contacting T cells with a peptide comprising an amino acid sequence consisting of:

Gly—Arg—Arg—Asn—Ala—Ile—Asp—His
(SEQ ID NO: 5), or
Asp—Leu—Ile—Glu—Gly—Ala—Ala—Ser—Arg—Ile—Val—Asp—Ala—Val—Ile—Glu—Gln—Val—Lys—Ala—Ala—Gly—Ala
(SEQ ID NO: 9).

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5,744,355

**CDNA CLONING AND EXPRESSION OF HUMAN LIVER ESTROGEN SULFOTRANSFERASE**

**Richard M. Weinshilboum; Ibrahim A. Aksoy, and Thomas C. Wood, all of Rochester, Minn., assignors to Mayo Foundation for Medical Education and Research, Rochester, Minn.**

**Continuation-in-part of Ser. No. 325,562, Oct. 18, 1994. This application May 9, 1995, Ser. No. 437,795**

**The portion of the term of this patent subsequent to Oct. 18, 2014, has been disclaimed.**

**Int. Cl.[6] C12N** *1/21;5/10;9/10;15/54*

**U.S. Cl. 435—325** **8 Claims**

1. A cell line, the genome of which has been augmented by a chromosomally integrated DNA segment having a nucleotide sequence that encodes a human estrogen sulfotransferase having the amino acid sequence of SEQ ID NO:2 or a biologically active fragment of said human estrogen sulfotransferase.

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5,744,356

**SPECIFIC ANTIBODIES AGAINST AN EPITOPE EXISTING WITHIN THE A/B REGION OF ESTROGEN RECEPTOR PROTEINS**

**Abdulmaged M. Traish, Belmont, Mass., assignor to Trustees of Boston University, Boston, Mass.**

**Continuation-in-part of Ser. No. 419,975, Apr. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 243,652, May 13, 1994, abandoned, which is a continuation-in-part of Ser. No. 784,626, Nov. 1, 1991, Pat. No. 5,312,752, which is a continuation of Ser. No. 388,091, Jul. 31, 1989, abandoned. This application Jul. 31, 1995, Ser. No. 509,570**

**Int. Cl.[6] C07K** *16/28;* **C12N** *5/12*

**U.S. Cl. 435—334** **8 Claims**

1. A monoclonal antibody specific for an epitope within amino acid residues 1–184 of an estrogen receptor protein, said monoclonal antibody having binding specificity for a single epitope within the A/B domains in the activated but untransformed (4S) forms and in the activated and transformed (5S) forms of estrogen receptor protein but which does not bind with native (8S) forms of estrogen receptor protein.



5,744,357

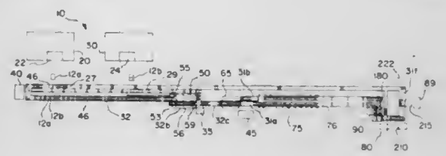
**CONTACT LENS PRODUCTION LINE PALLET SYSTEM**

**Daniel Tsu-Fang Wang, Jacksonville, Fla.; Kaj Bjerre, Ballerup, Denmark; Svend Christensen, Allinge, Denmark; Ture Kindt-Larsen, Holte, Denmark; Wallace Anthony Martin, Orange Park, Fla.; Craig William Walker, and Michael Francis Widman, both of Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.**

**Continuation of Ser. No. 257,786, Jun. 10, 1994, abandoned. This application Oct. 7, 1996, Ser. No. 729,711**

**Int. Cl.[6] B29C** *33/34;* **B29D** *11/00*

**U.S. Cl. 425—347** **33 Claims**



1. A production line pallet system for producing a contact lens comprising:
(a) a pallet, one or more contact lens mold assemblies carried on said pallet, a contact lens production line having one or more process stations, said pallet being conveyed along said production line, and said one or more stations including a process station for assembling said contact lens mold assemblies, each said contact lens mold assembly comprising a first mold half and a complementary second mold half, said pallet having one or more first recesses formed in a surface thereof for receiving either one or more first mold halves or one or more complementary second mold halves prior to assembling said contact lens mold assemblies;
(b) a conveyor device for transporting said pallet from one process station to another process station through said production line;
(c) registration means formed in said pallet surface for enabling precise positioning of said pallet at one or more process stations in said production line facility; and
(d) said pallet surface further includes means for enabling viewing of contact lens production at said pallet surface, said means for enabling viewing includes an optic viewing device and a blind recess in said pallet surface for accommodating said optic viewing device for viewing production operations at various locations throughout said contact lens production line.

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5,744,358

**METHOD AND DEVICE FOR DIAGNOSING AND DISTINGUISHING CHEST PAIN IN EARLY ONSET THEREOF**

**George Jackowski, Inglewood, Canada, assignor to Spectral Diagnostics Inc., Toronto, Canada**

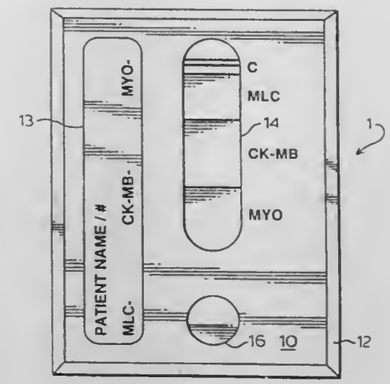
**Continuation of Ser. No. 420,298, Apr. 11, 1995, Pat. No. 5,604,105, which is a continuation-in-part of Ser. No. 26,453, Mar. 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 695,381, May 3, 1991, Pat. No. 5,290,678. This application Sep. 5, 1996, Ser. No. 707,594**

**Claims priority, application Canada, Oct. 12, 1990, 2027434**

**Int. Cl.[6] G01N** *33/573;33/558*

**U.S. Cl. 435—7.4** **13 Claims**

1. A method for rapidly diagnosing the cause of chest pain of a patient in the early onset thereof, which method comprises the steps of:
a) contacting a sample of serum, plasma, or blood from a patient with at least three antibody pairs, each of which antibody pairs comprises an antibody reagent member and an immobilized capture antibody member, wherein the antibody reagent member of each antibody pair is labeled with an observable or measurable moiety, and
i) the first antibody pair specifically binds myoglobin,
ii) the second antibody pair specifically binds CK-MB,




iii) the third antibody pair specifically binds to a protein selected from the group consisting of myotin light chain, troponin I, and troponin T;
whereby upon adding sample to the antibody pairs, analytes present in the sample and complementary to the antibody pairs will bind to the antibody pair; and
b) visualizing or measuring the moiety and diagnosing the cause of chest pain thereby.z

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5,744,359

**Patent Not Issued For This Number**

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5,744,360

**METHODS FOR HARVESTING ADIPOSE TISSUE CONTAINING AUTOLOGOUS MICROVASCULAR ENDOTHELIAL CELLS**

**Can B. Hu, Irvine; Keith E. Myers, Lake Forest, and Robert C. Peterson, Dove Canyon, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.**

**Continuation of Ser. No. 270,073, Jul. 1, 1994, abandoned. This application May 9, 1996, Ser. No. 647,155**

**Int. Cl.[6] C12N** *5/00;* **A61N** *1/30;* **A61B** *17/20;* **A61M** *1/00*

**U.S. Cl. 435—366** **19 Claims**



1. A method of collecting fat tissue from a patient, said method comprising the steps of:
providing an elongated tubular cannula having a distal tip end and an opposite proximal end, a lumen extending in said cannula, and an aperture opening outwardly from said lumen on said cannula adjacent to said distal tip end and defining a tissue cutting edge surface;
inserting said cannula into a patient so that said aperture contacts fat tissue;
cutting said fat tissue with said tissue cutting edge surface;
creating a suction force in said lumen to draw said fat tissue from the patient through said aperture into said lumen;
selectively controlling the amount of suction to said lumen; and
collecting said fat tissue from said lumen into a collection chamber, wherein said collection chamber includes an entrance port through which said fat tissue passes from said lumen in the step of collecting, said method further comprising the step of discharging said fat tissue from said collection chamber through said entrance port and through a homogenizing member having apertures with cutting edge surfaces and sized to lower the viscosity of the fat tissue by disrupting a

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connective matrix without exposing cellular components within said fat tissue to excessive shearing forces.

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5,744,361

## EXPANSION OF HUMAN HEMATOPOIETIC PROGENITOR CELLS IN A LIQUID MEDIUM

**Ronald Hoffman, and John Brandt, both of Palo Alto, Calif., assignors to Indiana University, Bloomington, Ind.**

**Continuation-in-part of Ser. No. 226,513, Mar. 31, 1994, and a continuation-in-part of Ser. No. 133,093, Oct. 12, 1993, Pat. No. 5,409,825, which is a continuation-in-part of Ser. No. 682,344, Apr. 9, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 467,661**

**Int. Cl.[6] C12N** *5/00;* **A01N** *63/00;65/00*

**U.S. Cl. 435—372** **7 Claims**

1. A method of culturing human hematopoietic stem cells, the method comprising:

culturing an initial population of human hematopoietic stem cells comprising less than 10% lineage committed cells in a serum-free, liquid culture medium comprising at least about 10 ng/ml of mast cell growth factor; wherein said medium is free of stromal cells and comprises at least one cytokine selected from the group consisting of interleukin 3 at a concentration of at least about 500 pg/ml, granulocyte macrophage colony stimulating factor at a concentration of at least about 100 pg/ml and IL-3/GM-CSF fusion protein at a concentration of at least about 1 ng/ml;

wherein during said culturing the number of assayable human hematopoietic stem cells is maintained or increased.

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5,744,362

## ANTISENSE OLIGONUCLEOTIDE MODULATION OF RAF GENE EXPRESSION

**Brett P. Monia, Carlsbad, Calif.; Pierre Martin, Rheinfelden, and Karl-Heinz Altmann, Reinach, both of Switzerland, assignors to Isis Pharmaceuticals, Inc., Carlsbad, Calif., and Ciba-Geigy, Ltd., Basel, Switzerland**

**Continuation-in-part of Ser. No. 250,856, May 31, 1994, Pat. No. 5,563,255. This application Jun. 5, 1995, Ser. No. 463,912**

**Int. Cl.[6] A61K** *31/70;* **C07H** *21/00;21/02;* **C12N** *5/08*

**U.S. Cl. 435—375** **7 Claims**

2. A method of inhibiting the expression of human raf comprising contacting tissues or cells which express human raf with an oligonucleotide consisting of SEQ ID NO: 1 and at least one 2'-O—$CH_2CH_2OCH_3$ modification.

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5,744,363

## METHOD FOR ESTABLISHING A TUMOR-CELL LINE BY PREPARING SINGLE-CELL SUSPENSION OF TUMOR CELLS FROM TUMOR BIOPSIES

**Rama Mukherjee, and Manu Jaggi, both of New Delhi, India, assignors to National Institute of Immunology, New Delhi, India**

**Continuation-in-part of Ser. No. 727,679, Oct. 8, 1996. This application Dec. 13, 1996, Ser. No. 764,571**

**Claims priority, application India, Aug. 16, 1996, 1822/96; Oct. 31, 1996, 2381/96**

**Int. Cl.[6] C12N** *5/00*

**U.S. Cl. 435—378** **19 Claims**

1. A method of preparing a single-cell suspension of tumor cells, the method comprising injecting cell culture medium into an isolated tumor or a portion thereof to flush out the tumor cells.

5,744,364

## PTOM36 CONSTRUCTS AND TOMATO CELLS TRANSFORMED THEREWITH

**Colin Roger Bird, Bracknell; Donald Grierson, Shepshed; John Anthony Ray, Bracknell, and Wolfgang Walter Schuch, Crowthorne, all of England, assignors to Zeneca Limited, London, England**

**Continuation of Ser. No. 847,037, Apr. 16, 1992, abandoned. This application Feb. 28, 1995, Ser. No. 396,531**

**Claims priority, application United Kingdom, Oct. 20, 1989, 8923716**

**Int. Cl.[6] C12N** *5/14;15/29;15/52;15/82*

**U.S. Cl. 435—419** **8 Claims**

1. A DNA construct comprising the DNA sequence of the clone pTOM36 which is preceded by a transcriptional inititation region operative in plants and positioned so that the construct can generate pTOM36 mRNA in plant cells.

8. A tomato cell transformed with the DNA construct of claim 1.

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5,744,365

## METHOD FOR MEASURING THE LEVEL OF CARBOXYLATE ANION IN ENGINE COOLANT

**Regis J. Pellet, Croton-on-Hudson; Leonard S. Bartley, Jr., Newburg, and Paul M. V. Van de Ven, Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.**

**Filed Mar. 18, 1997, Ser. No. 819,907**

**Int. Cl.[6] G01N** *21/78*

**U.S. Cl. 436—6** **6 Claims**

1. A method for determining the presence or absence of a corrosion-inhibitory level of carboxylate anion in used engine coolant which comprises:

a) obtaining a known quantity of the engine coolant as a representative sample thereof, the sample containing a level of carboxylate anion to be determined;

b) adding a fixed quantity of a source of aluminum cation to the sample, the aluminum cation complexing with the carboxylate anion to form an insoluble aluminum-carboxylate complex, there being free aluminum cation present in the sample when the level of carboxylate anion therein is below an effective corrosion-inhibitory amount and there being no free aluminum cation present in the sample when the level of carboxylate anion is at an effective corrosion-inhibitory amount;

c) adding a color indicator to the sample which forms an irreversibly colored complex with any free aluminum cation present therein at a pH which results in the colored complex, the sample being adjusted to within this pH if necessary to permit the formation of such colored complex; and,

d) observing the color of any complex which may have formed between free aluminum cation and the color indicator to determine the level of carboxylate anion in the sample, the sample being adjusted to a different pH if necessary in order to cancel out any color that may have resulted from the presence of excess color indicator in the sample.

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5,744,366

## MESOSCALE DEVICES AND METHODS FOR ANALYSIS OF MOTILE CELLS

**Larry J. Kricka, Berwyn, and Peter Wilding, Paoli, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.**

**Continuation-in-part of Ser. No. 184,577, Jan. 21, 1994, Pat. No. 5,427,946, which is a continuation of Ser. No. 877,661, May 1, 1992, Pat. No. 5,296,375. This application Nov. 14, 1994, Ser. No. 338,380**

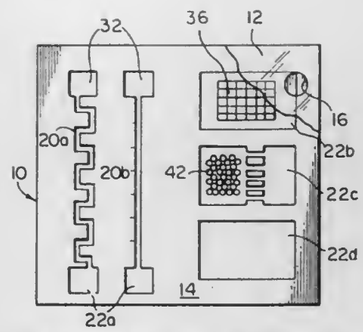
**Int. Cl.[6] G01N** *33/483*

**U.S. Cl. 436—63** **13 Claims**

1. A method of analyzing a fluid sample having cells characterized by their motility, comprising:

a) providing a device comprising:






a solid substrate having a flow system which comprises at least one elongate flow channel of mesoscale cross-sectional dimension, and a receiving well communicating with said at least one channel and defining a starting point in said channel; and

a cover for said substrate closing said channel and having a first port in registry with said receiving well, for introducing said sample into said receiving well so as to enable the motile cells of the sample to travel from the receiving well to progress points along the at least one channel, said cover further defining a second port in registry with said at least one channel at a point therealong, said flow system being filled with a carrier fluid;

b) introducing said sample into said receiving well;

c) controlling the resident conditions of the combined carrier fluid and sample to assure motility of said cells in said carrier fluid;

d) observing the cells in the flow system;

e) collecting data based on said observation; and

f) completing the analysis using said data.

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5,744,367

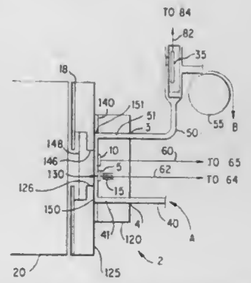
## MAGNETIC PARTICLE BASED ELECTROCHEMILUMINESCENT DETECTION APPARATUS AND METHOD

**David B. Talley, Olney, and Jonathan K. Leland, Silver Spring, both of Md., assignors to IGEN International, Inc., Gaithersburg, Md.**

**Filed Nov. 10, 1994, Ser. No. 339,237**

**Int. Cl.[6] G01N** *21/76*

**U.S. Cl. 436—172** **23 Claims**




7. A method for measuring electrochemiluminescence from a sample composition, wherein said sample composition contains an electrochemiluminescent (ECL) active species that comprises an ECL-active moiety and a magnetically responsive particle, said method comprising:

a. introducing a known volume of said sample composition into a cell which contains an electrode;

b. collecting the ECL active species that comprise an ECL active moiety linked to a magnetically responsive particle on a surface of said electrode by imposition of a magnetic field on said magnetically responsive particles;

c. imposing a voltage on said electrode of sufficient magnitude to induce luminescence from the ECL active species within the sample composition; and

d. measuring the luminescence emitted from the sample composition;

wherein the magnetic field imposed on said magnetically responsive particles is provided by a capture magnet positioned adjacent the electrode surface and wherein said capture magnet is selected from the group consisting of one or more channel magnets and one or more sandwich magnets.

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5,744,368

## METHODS FOR THE DETECTION OF SOLUBLE AMYLOID β-PROTEIN (BAP) OR SOLUBLE TRANSTHYRETIN (TTR)

**Dmitry Y. Goldgaber, Setauket; Alexander L. Schwarzman, St. James, and Moisés Eisenberg-Grünberg, Port Jefferson Station, all of N.Y., assignors to Research Foundation of State University of New York, Albany, N.Y.**

**Filed Nov. 4, 1993, Ser. No. 148,117**

**Int. Cl.[6] G01N** *33/566;33/53*

**U.S. Cl. 436—501** **9 Claims**

1. An in vitro method to detect the ability of a soluble transthyretin (TTR) present in a sample, to specifically bind soluble amyloid β protein (βAP), said method comprising:

(a) contacting the sample containing the soluble TTR with βAP to form a transthyretin (TTR)/βAP complex, and;

(b) detecting said complex wherein the presence of said complex indicates the ability of the soluble TTR to specifically bind βAP.

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5,744,369

**Patent Not Issued For This Number**

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5,744,370

## FABRICATING METHOD OF A SILICON THIN FILM AND METHOD FOR MANUFACTURING A SOLAR CELL USING THE FABRICATING METHOD

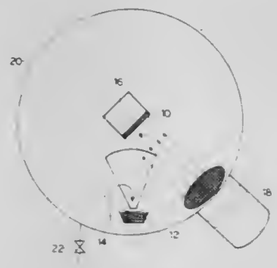
**Naoki Nakamura, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan**

**Filed Jul. 31, 1996, Ser. No. 690,591**

**Claims priority, application Japan, Aug. 1, 1995, 7-216778**

**Int. Cl.[6] H01L** *31/20*

**U.S. Cl. 437—4** **11 Claims**




1. A fabricating method of a silicon (Si) thin film which is formed on a substrate by electron beam deposition during which assist ions are simultaneously applied.

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wherein the energy of the applied assist ions is in the range of 300 to 1500 eV, and an I/A ratio, a ratio of a number of applied assist ions to a number of deposited Si atoms, is in the range of 0.2 to 1.1.

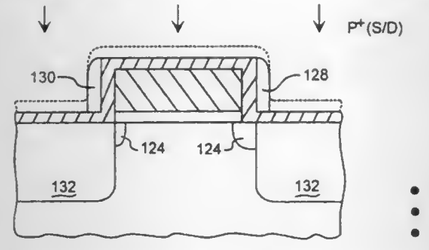
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**5,744,371**

## ASYMMETRICAL P-CHANNEL TRANSISTOR HAVING A BORON MIGRATION BARRIER AND LLD IMPLANT ONLY IN THE DRAIN REGION

**Daniel Kadosh, 2803 W. 50th St., Austin, Tex. 78731, and Brad T. Moore, 1502 Johny Miller Trail, Austin, Tex. 78746**

**Filed Oct. 1, 1996, Ser. No. 720,735**
**Int. Cl.[6] H01L** *21/265*
**U.S. Cl. 437—24** **13 Claims**




1. A method for forming a p-channel transistor, comprising:
forming a layer of gate oxide upon a silicon substrate and thereafter forming a layer of polycrystalline silicon upon said gate oxide;
implanting a first p-type dopant into said polycrystalline silicon at a peak concentration density residing at a first depth below an upper surface of said polycrystalline silicon and implanting barrier atoms into said polycrystalline silicon at a peak concentration density residing at a second depth below the upper surface of said polycrystalline silicon, wherein said second depth is greater than said first depth;
removing portions of said implanted polycrystalline silicon and gate oxide to form a gate conductor interposed between an exposed pair of silicon substrate regions comprising a source region and a drain region;
depositing a layer of nitride across said drain region, said source region and said gate conductor;
forming an opening through said layer of nitride to expose only said drain region and a sidewall surface of said gate conductor adjacent said drain region;
implanting a second p-type dopant through said opening and into the exposed said drain region;
growing a drain-side spacer oxide upon the exposed said drain region and said sidewall surface;
removing said layer of nitride; and
implanting a third p-type dopant into said source region and said drain region.

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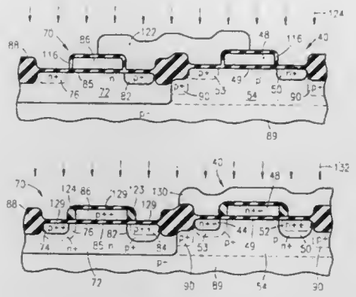
**5,744,372**

## FABRICATION OF COMPLEMENTARY FIELD-EFFECT TRANSISTORS EACH HAVING MULTI-PART CHANNEL

**Constantin Bulucea, Milpitas, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.**

**Division of Ser. No. 420,927, Apr. 12, 1995. This application Jun. 1, 1995, Ser. No. 456,454**
**Int. Cl.[6] H01L** *21/336;21/8238*
**U.S. Cl. 437—34** **12 Claims**

1. A method of fabricating a complementary transistor structure from a semiconductive body having a device region of a first conductivity type and a device region of a second conductivity type opposite to the first conductivity type, the structure including (a) first source and drain zones of the second conductivity type




laterally separated by a first channel zone in the first device region, the first drain zone comprising a first main drain portion and a more lightly doped first drain extension located between the first channel zone and the first main drain portion, the first channel zone comprising a first output channel portion and a more heavily doped first input channel portion that respectively meet the first drain extension and the first source zone, and (b) second source and drain zones of the first conductivity type laterally separated by a second channel zone in the second device region, the second drain zone comprising a second main drain portion and a more lightly doped second drain extension located between the second channel zone and the second main drain portion, the second channel zone comprising a second output channel portion and a more heavily doped second input channel portion that respectively meet the second drain extension and the second source zone, the method comprising the steps of:
providing first and second gate electrodes respectively above, and insulatingly spaced apart from, the first and second device regions;
introducing first semiconductor dopant of the first conductivity type simultaneously (a) into part of the first channel zone to define the first input channel portion and (b) into part of the second device region to define the second drain extension;
introducing second semiconductor dopant of the second conductivity type simultaneously (a) into part of the second channel zone to define the second input channel portion and (b) into part of the first device region to define the first drain extension; and
introducing (a) third semiconductor dopant of the second conductivity type into a pair of laterally separated parts of the first device region to define the first source zone and the first main drain portion continuous with the first drain extension and (b) fourth semiconductor dopant of the first conductivity type into a pair of laterally separated parts of the second device region to define the second source zone and the second main drain portion continuous with the second drain extension.

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**5,744,373**

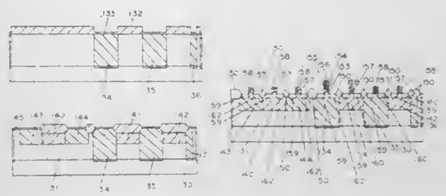
## METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

**Katsujiro Arai, Osaka, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan**

**Division of Ser. No. 213,362, Mar. 15, 1994, Pat. No. 5,374,840, which is a continuation of Ser. No. 2,511, Jan. 8, 1993, abandoned, which is a continuation of Ser. No. 623,651, Dec. 21, 1990, abandoned. This application Sep. 20, 1994, Ser. No. 310,001**
**Claims priority, application Japan, Apr. 25, 1898, 1-104957**
**Int. Cl.[6] H01L** *21/265;21/70;27/00*
**U.S. Cl. 437—59** **3 Claims**

1. A process for manufacturing a semiconductor device, comprising the steps of:
a) forming on a semiconductor substrate of one conductivity an epitaxial layer of a conductivity type reverse to that of said semiconductor substrate;






b) forming an insulating film on said epitaxial layer of a first thickness;
c) etching said insulating film over a first portion of the epitaxial layer into a film having a second thickness;
d) forming in said first portion a first impurity layer of the same conductivity as said semiconductor substrate at a depth such that the first impurity layer reaches said substrate;
e) forming a second impurity layer in a second portion of the epitaxial layer other than said first portion by implanting a first ion therein;
f) forming an insulating film at least over the second impurity layer in said second portion of the epitaxial layer;
g) forming a third impurity layer in a third portion of the epitaxial layer other than the first portion, the second portion and a remaining portion of the epitaxial layer by implanting a second portion ion therein; and
i) subsequently forming an electrical functional device on at least said first impurity layer.

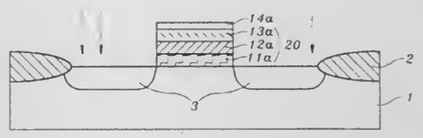
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**5,744,374**

## DEVICE AND MANUFACTURING METHOD FOR A FERROELECTRIC MEMORY

**Jong Moon, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Division of Ser. No. 620,209, Mar. 22, 1996, Pat. No. 5,621,681. This application Nov. 18, 1996, Ser. No. 751,389**
**Claims priority, application Rep. of Korea, Mar. 22, 1995, 95-6108**
**Int. Cl.[6] H01L** *21/70;27/00*
**U.S. Cl. 437—60** **5 Claims**



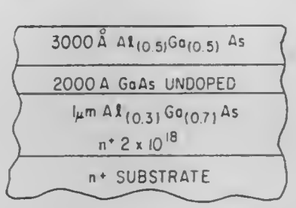

1. A method for manufacturing a ferroelectric memory device, comprising the steps of:
forming a device isolation region in a area of a semiconductor substrate of a first conductivity type;
sequentially depositing a yttrium oxide film, a ferroelectric film, and a conductive film over the surface of the semiconductor substrate;
forming a mask pattern over the yttrium oxide film, ferroelectric film, and gate conductive film;
forming a gate electrode, a ferroelectric gate film and a yttrium oxide gate film by etching the conductive film, the ferroelectric film and the yttrium oxide film, using the mask pattern as an etching mask; and
forming a source/drain region by ion-implanting a second conductivity impurity into the semiconductor substrate.

**5,744,375**

## CAPPED ANNEAL

**Yung-Chung Kao, and Donald L. Plumton, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 483,030, Jun. 7, 1995, abandoned, which is a division of Ser. No. 347,916, Dec. 1, 1994, which is a division of Ser. No. 900,226, Jun. 17, 1992, Pat. No. 5,391,515, which is a continuation of Ser. No. 623,488, Dec. 4, 1990, abandoned, which is a continuation of Ser. No. 264,237, Oct. 28, 1988, abandoned. This application Jun. 5, 1996, Ser. No. 658,294**
**Int. Cl.[6] H01L** *21/324*
**U.S. Cl. 437—133** **8 Claims**




1. A method of annealing a semiconductor layer, comprising the steps of:
(a) forming an epitaxial cap layer over said semiconductor layer, said semiconductor layer comprising a compound semiconductor material having constituent elements in a proportion according to $Al_xGa_{1-x}As$, and said cap layer comprising a compound semiconductor material having said constituent elements in a proportion according to $Al_yGa_{1-y}As$, wherein $y>x$ and $x>0$
(b) heating said cap layer and said semiconductor layer; and
(c) removing said cap layer after said heating step.

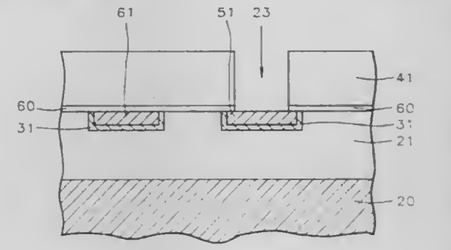
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**5,744,376**

## METHOD OF MANUFACTURING COPPER INTERCONNECT WITH TOP BARRIER LAYER

**Lap Chan, SF, Calif., and Jia Zhen Zheng, Singapore, Singapore, assignors to Chartered Semiconductor Manufacturing Pte, Ltd, Singapore, Singapore**

**Filed Apr. 8, 1996, Ser. No. 630,709**
**Int. Cl.[6] H01L** *21/28*
**U.S. Cl. 437—190** **13 Claims**




1. A method for manufacturing a copper connector in an integrated circuit comprising:
(a) providing a silicon substrate;
(b) depositing a first insulating layer on said silicon substrate;
(c) patterning and then etching said first insulating layer to form a trench therein;
(d) depositing a first barrier layer on said first insulating layer and on all walls of said trench;
(e) depositing a copper layer on said first barrier layer so as to more than fill said trench;

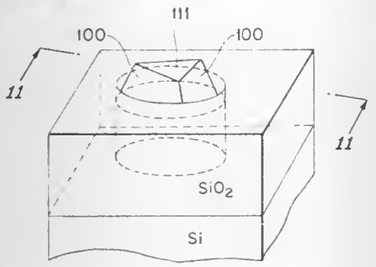
VOL 1209 ISS 4 AP 28 1998 UMI



(f) removing said copper layer and said first barrier layer down to the level of said first insulating layer, thereby forming a damascene connector having an upper surface;
(g) depositing a second barrier layer on said first insulating layer and said upper surface of said damascene connector;
(h) depositing a second insulating layer on said second barrier layer; and
(i) patterning and then etching said second insulating layer to form a via passing through said second insulating layer and said second barrier layer to said upper surface of the damascene connector.

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**5,744,377**
**METHOD FOR FORMING A THIN FILM AND APPARATUS OF FORMING A METAL THIN FILM UTILIZING TEMPERATURE CONTROLLING MEANS**
**Atsushi Sekiguchi; Tsukasa Kobayashi, and Shinji Takagi, all of Fuchu, Japan, assignors to Anelva Corporation, Tokyo, Japan**
**Continuation of Ser. No. 9,446, Jan. 27, 1993, Pat. No. 5,594,280, which is a continuation-in-part of Ser. No. 760,830, Sep. 18, 1991, abandoned, which is a continuation of Ser. No. 466,562, Jan. 17, 1990, abandoned, which is a division of Ser. No. 424,796, Oct. 20, 1989, abandoned, which is a division of Ser. No. 253,820, Oct. 6, 1988, Pat. No. 4,963,423. This application Nov. 22, 1995, Ser. No. 561,747**
**Claims priority, application Japan, Oct. 8, 1987, 62-254268; Feb. 2, 1988, 63-22463; Mar. 25, 1988, 63-71160**
**Int. Cl.[6] H01L *21/44***
**U.S. Cl. 438—674** **15 Claims**

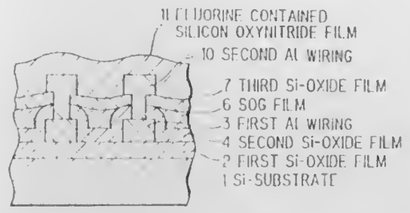



1. A method for constructing an interconnecting material for an electronic device comprising the steps:
depositing a flat substrate;
bonding an insulative layer to a first surface of the substrate;
forming apertures in the insulative layer for exposing the substrate;
bonding an aluminum film, having a single crystal layer, to a second surface of the insulative layer by thermal chemical vapor deposition (CVD);
the aluminum film having a thickness throughout the apertures that is greater than the thickness of the insulative layer, to ensure that the film completely fills the apertures.

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**5,744,378**
**METHOD FOR FABRICATING A SEMICONDUCTOR DEVICE HAVING MULTILEVEL INTERCONNECTIONS**
**Tetsuya Homma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**
**Continuation of Ser. No. 355,625, Dec. 14, 1994, abandoned. This application Nov. 25, 1996, Ser. No. 755,198**
**Claims priority, application Japan, Dec. 14, 1993, 5-312417**
**Int. Cl.[6] H01L *21/28***
**U.S. Cl. 437—195** **12 Claims**

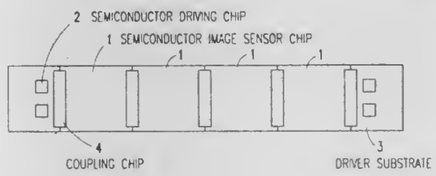
1. A method for fabricating a semiconductor device, comprising the steps of:




forming a first wiring on an insulating film surface of a semiconductor substrate;
forming an insulating layer on said first wiring;
forming a spin-on-glass film on said insulating layer;
partly etching said spin-on-glass film so as to remove said spin-on-glass film formed on said insulating layer in a region above said first wiring;
forming a further insulating layer on said spin-on-glass film;
forming a via-hole through said further insulating layer and said insulating layer to expose said first wiring;
connecting a second wiring to said first wiring through said via-hole; and
forming on said second wiring and on said further insulating film, an insulating layer of fluorine contained silicon oxynitride by chemical vapor deposition process using fluoroalkoxysilane gas containing nitrogen atoms, and gas containing oxygen atoms,
while substrate temperature does not exceed 200° C.

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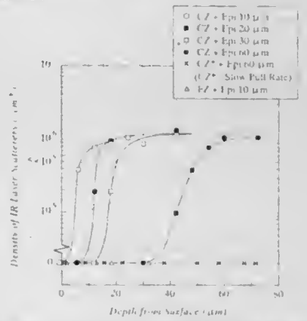
**5,744,379**
**SEMICONDUCTOR DEVICE COMPOSED OF PLURAL SEMICONDUCTOR CHIPS AND COUPLING MEANS WHICH COUPLE THE SEMICONDUCTOR CHIPS TOGETHER**
**Masaaki Mandai; Hitoshi Takeuchi; Yutaka Saito, and Tomoyuki Yoshino, all of Tokyo, Japan, assignors to Seiko Instruments, Inc., Tokyo, Japan**
**Division of Ser. No. 54,074, Apr. 27, 1993. This application Jun. 6, 1995, Ser. No. 491,581**
**Claims priority, application Japan, Apr. 27, 1992, 4-108159; Oct. 22, 1992, 4-284666; Nov. 6, 1992, 4-297193; Nov. 10, 1992, 4-299650; Feb. 18, 1993, 5-29493**
**Int. Cl.[6] H01L *21/18***
**U.S. Cl. 437—208** **10 Claims**




1. A method of producing a semiconductor device comprised of a plurality of semiconductor chips, a semiconductor driving chip for driving the semiconductor chips, a driver substrate for mounting thereon the semiconductor driving chip, and coupling chips, the method comprising:
the first step of aligning the semiconductor chips and the driver substrate to set relative positions thereof in a common plane;
the second step, performed after the first step, of coupling an adjacent pair of the semiconductor chips with each other and coupling a semiconductor chip and the driver substrate with each other by means of the coupling chips; and
the third step of mounting the semiconductor driving chip on the driver substrate.



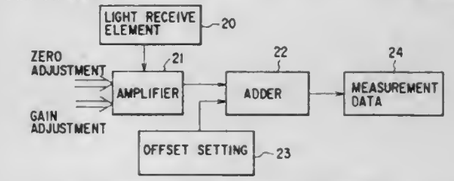
**5,744,380**
**METHOD OF FABRICATING AN EPITAXIAL WAFER**
**Noriyuki Uemura; Hisami Motoura; Masashi Nishimura, and Mitsuo Kohno, all of Kanagawa-ken, Japan, assignors to Komatsu Electronic Metals Co., Ltd., Kanagawa-ken, Japan**
**Continuation of Ser. No. 294,760, Aug. 23, 1994, abandoned. This application Feb. 26, 1997, Ser. No. 806,310**
**Claims priority, application Japan, Aug. 23, 1993, 5-231025**
**Int. Cl.[6] H01L *21/66*; G01N *21/88***
**U.S. Cl. 438—14** **4 Claims**




1. A process of fabricating an epitaxial wafer having a surface layer where semi-conductor devices are to be formed, said surface layer having a density of IR laser scatterers less than $5\times10^5$ pieces/cm$^3$, characterized in that said process comprises the steps of:
forming on a substrate a first epitaxial sub-layer having the same conductivity type and substantially the same electrical resistivity as the substrate, said first sub-layer being grown to have a sufficient thickness so that a density of IR laser scatterers at least at the surface region of the first sub-layer becomes less than $5\times10^5$ pieces/cm$^3$, and
forming on said first sub-layer a second epitaxial sub-layer having a higher electrical resistivity than the first sub-layer, said second sub-layer being grown to have a sufficient thickness so that the second sub-layer becomes said surface layer where the semi-conductor devices are to be formed.

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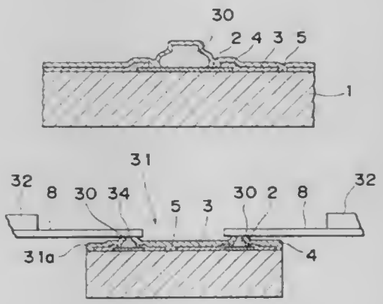
**5,744,381**
**METHOD OF INSPECTING A PATTERN FORMED ON A SAMPLE FOR A DEFECT, AND AN APPARATUS THEREOF**
**Mitsuo Tabata, Yokohama; Toru Tojo, Kanagawa-ken; Toshiyuki Watanabe, Yokohama, and Hideo Tsuchiya, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**
**Filed Mar. 12, 1996, Ser. No. 614,063**
**Claims priority, application Japan, Mar. 13, 1995, 7-052947; Mar. 17, 1995, 7-059265**
**Int. Cl.[6] G01R *31/26*; H01L *21/66*; G03F *9/00*; G01N *21/00***
**U.S. Cl. 438—16** **9 Claims**




1. A pattern defect inspection method comprising:
a light irradiating step of irradiating light on a sample on which a pattern is formed;
a light receive step of receiving a pattern image of the sample obtained by light irradiation by the light irradiating step;
an amplify step of amplifying an output from the light receive step;
a prepare step of preparing multi-valued design pattern image data from binary design data corresponding to the pattern image of the sample;
an offset adjust step of adjusting an offset of a light receive element amplifier, such that measurement data of a translucent portion which regards the translucent portion of the pattern formed on a surface of the sample as a non-transparent portion corresponds to design pattern image data corresponding to the translucent portion;
a gain adjust step of adjusting a gain of the light receive element amplifier, such that measurement data of a transparent portion of the pattern formed on the sample surface corresponds to design pattern image data corresponding to the transparent portion; and
an inspect step of inspecting the pattern formed on the sample surface for a defect, by comparing measurement data obtained from an output of the light receive element amplifier with design pattern image data, while the offset and gain being kept adjusted.

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**5,744,382**
**METHOD OF PACKAGING ELECTRONIC CHIP COMPONENT AND METHOD OF BONDING OF ELECTRODE THEREOF**
**Yoshifumi Kitayama, Hirakata; Kazuhiro Mori, Katano; Keiji Saeki, Kobe, and Takashi Akiguchi, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**
**Division of Ser. No. 193,359, Feb. 3, 1994, abandoned, which is a continuation of Ser. No. 882,131, May 13, 1992, abandoned. This application Aug. 27, 1996, Ser. No. 703,879**
**Int. Cl.[6] H01L *21/44***
**U.S. Cl. 438—106** **24 Claims**

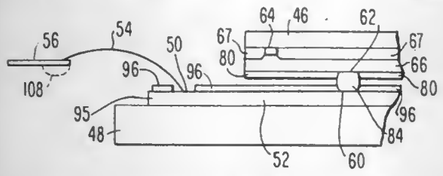



1. A method of bonding an external electrode to an electronic chip component including a wafer having an active surface, an electrode formed on a portion of said active surface, and a passivation film covering a portion of said active surface not covered by said electrode and a portion of said electrode, with another portion of said electrode not being covered by said passivation film, said method comprising:
providing an organic protective film covering entirely and providing an air barrier for said another portion of said electrode and said passivation film;
pressing said external electrode directly against a portion of said protective film covering said another portion of said electrode and thereby destroying locally only said portion of said protective film while not destroying any other area of said protective film and thereby maintaining said air barrier, thus bringing said external electrode into contact with said another portion of said electrode; and
electrically and mechanically banding said external electrode to said another portion of said electrode.

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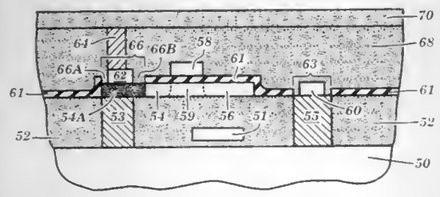
5,744,383
**INTEGRATED CIRCUIT PACKAGE FABRICATION METHOD**
**Donald S. Fritz, San Jose, Calif., assignor to Altera Corporation, San Jose, Calif.**
**Filed Nov. 17, 1995, Ser. No. 560,362**
**Int. Cl.[6] H01L *21/60***
**U.S. Cl. 438—111** **17 Claims**




1. A method of integrated circuit packaging comprising the steps of:
providing an integrated circuit die having a top die surface, circuitry on said top die surface, and die array pads on said top die surface connected to said circuitry;
providing a leadframe having a plurality of wire bonding fingers;
providing an interposer having a rigid substrate with a top substrate surface, interposer array pads arranged in a pattern on said top substrate surface for mating with said die array pads when said top die surface faces said top substrate surface, interposer wire bonding pads arranged about the periphery of said top substrate surface, and interposer routing lines for connecting said interposer array pads to said interposer wire bonding pads;
providing metal bumps for forming connections between said die array pads and said interposer array pads;
providing a housing;
electrically connecting said die array pads to said interposer array pads with said metal bumps;
electrically connecting said wire bonding fingers and said interposer wire bonding pads by providing bond wires and by wire bonding said bond wires between said wire bonding fingers and said interposer wire bonding pads; and
encapsulating said die, said leadframe, said interposer, said bond, said metal bumps, and said wire bonding fingers in said housing.

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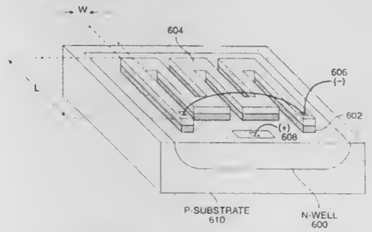
5,744,384
**SEMICONDUCTOR STRUCTURES WHICH INCORPORATE THIN FILM TRANSISTORS**
**Eric Adler, Jericho, Vt.; Subhash Balakrishna Kulkarni, Peekskill, N.Y.; Randy William Mann, Jericho, Vt.; Werner Alois Rausch, Stormville, N.Y., and Luigi Ternullo, Jr., Colchester, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**
**Division of Ser. No. 536,725, Sep. 29, 1995, Pat. No. 5,670,812. This application Sep. 19, 1996, Ser. No. 716,001**
**Int. Cl.[6] H01L *21/00***
**U.S. Cl. 438—152** **7 Claims**




1. A method of constructing an improved FET structure, comprising the steps of:
(i) forming a stud on a substrate or insulator-covered substrate; and
(ii) forming a thin film transistor (TFT) over the stud, wherein a diffusion region of the TFT is in contact with an upper terminus of the stud;
and wherein a contact layer is formed on top of at least a portion of the diffusion region, said contact layer being formed simultaneously with formation of a transistor gate electrode of the TFT.

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5,744,385
**COMPENSATION TECHNIQUE FOR PARASITIC CAPACITANCE**
**Pirooz Hojabri, San Jose, Calif., assignor to Plato Labs, Inc., San Jose, Calif.**
**Filed Mar. 21, 1997, Ser. No. 822,989**
**Int. Cl.[6] H01L *27/02***
**U.S. Cl. 438—238** **6 Claims**



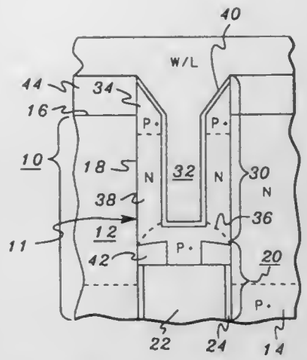

1. In a semiconductor device, a method for realizing a compensation capacitor replicating parasitic capacitance of a polysilicon resistor comprising the steps of:
forming a well region having impurities of a first conductivity type inside a substrate having impurities of a second conductivity type;
forming a layer of dielectric material on top of said well region, said dielectric material having a shape identical to a shape of the polysilicon resistor;
forming a layer of polysilicon material on top of said layer of dielectric material;
forming a contact at a first end of said layer of polysilicon material and a contact at a second end of said layer of polysilicon material;
electrically shorting said first contact to said second contact to form a top plate of the compensation capacitor; and
forming a contact in said well region to from a bottom plate of the compensation capacitor.

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5,744,386
**METHOD OF FABRICATING A MEMORY CELL IN A SUBSTRATE TRENCH**
**Donald McAlpine Kenney, Shelburne, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.**
**Division of Ser. No. 361,606, Dec. 22, 1994, Pat. No. 5,641,694. This application Mar. 19, 1996, Ser. No. 618,228**
**Int. Cl.[6] H01L *21/8242***
**U.S. Cl. 438—245** **14 Claims**

1. A method for forming a memory cell in a monocrystalline substrate, said method comprising the steps of:
(a) forming a trench in said substrate, said trench having a sidewall, and an upper portion and a lower portion;
(b) fabricating a storage node in the lower portion of said trench formed in step (a); and
(c) fabricating an access transistor in the upper portion of said trench formed in step (a), including
(i) growing monocrystalline epitaxial material on an exposed trench sidewall in the upper portion of said trench formed in step (a) such that the direction of growth is substantially laterally inward towards a center region of said trench, said epitaxial material grown on the exposed trench sidewall in

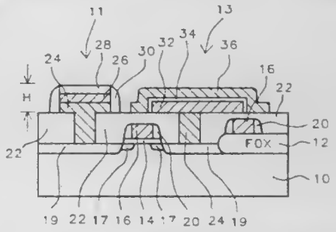





the upper portion of the trench comprising a bulk region of said access transistor, said bulk region of said access transistor being directly electrically connected to said monocrystalline substrate for receiving a back biasing potential therefrom, and
(ii) forming a gate electrode in the center region of said upper trench portion proximate said bulk region such that when said gate electrode is appropriately biased an inversion layer forms in said bulk region near said gate electrode.

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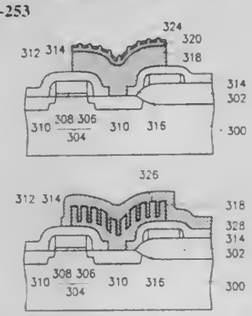
5,744,387
**METHOD FOR FABRICATING DYNAMIC RANDOM ACCESS MEMORY WITH A FLAT TOPOGRAPHY AND FEWER PHOTOMASKS**
**Horng-Huei Tseng, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan**
**Filed Mar. 7, 1997, Ser. No. 813,722**
**Int. Cl.[6] H01L *21/8242***
**U.S. Cl. 438—253** **21 Claims**




1. A method for fabricating dynamic random access memory (DRAM) having a flat topography on a semiconductor substrate, comprising the steps of:
providing said semiconductor substrate having device areas surrounded and electrically isolated from each other by field oxide areas and further providing field effect transistors having gate electrodes formed from a patterned first polysilicon layer and having sidewall spacers formed from a first insulating layer and having source/drain contact areas adjacent to said gate electrodes in said device areas;
depositing a second insulating layer having a planar surface;
anisotropically etching openings in said second insulating layer to said source/drain contact areas and forming concurrently bit line contact openings and capacitor node contact openings for said field effect transistors;
depositing a second polysilicon layer thereby filling said bit line contact openings and said capacitor node contact openings;
planarizing said second polysilicon layer by partially etching back said second polysilicon layer; forming a silicide layer on said second polysilicon layer;
depositing a third insulating layer on said silicide layer;
forming bit lines extending over said bit line contact openings by patterning said third insulating layer, said silicide layer, and said second polysilicon layer, and concurrently leaving portions of said second polysilicon layer in said capacitor node contact openings, thereby forming capacitor node contacts for capacitors;
depositing a conformal fourth insulating layer and anisotropically etching back to the surface of said second insulating layer thereby forming sidewall spacers on said bit lines;
depositing a blanket third polysilicon layer on said second insulating layer and over and electrically contacting said capacitor node contacts formed from said second polysilicon layer;
patterning said third polysilicon layer leaving portions over said capacitor node contacts and adjacent to said bit lines, thereby forming capacitor bottom electrodes;
forming an interelectrode dielectric layer on said capacitor bottom electrodes;
depositing a blanket fourth polysilicon layer on said interelectrode dielectric layer over said capacitor bottom electrodes and elsewhere on said substrate surface;
patterning said fourth polysilicon layer leaving portions over said capacitor bottom electrodes and adjacent to said bit lines to form top electrodes, thereby forming said DRAM having said flat topography.

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5,744,388
**PROCESS OF MAKING A STORAGE CAPACITOR FOR DRAM MEMORY CELL**
**Anchor Chen, Pingtung City, Taiwan, assignor to United Microelectronics Corporation, Taiwan**
**Filed Jun. 11, 1996, Ser. No. 661,384**
**Claims priority, application Taiwan, May 27, 1996, 85106287**
**Int. Cl.[6] H01L *21/70***
**U.S. Cl. 438—253** **15 Claims**




1. A process for fabricating a storage capacitor for a memory cell unit in a dynamic random access memory semiconductor device, comprising the steps of:
a. forming a field oxide layer and a transistor on a silicon substrate of the device, wherein the transistor comprises a gate and a pair of source/drain regions;
b. covering the transistor with a first dielectric layer;
c. forming a contact opening in the first dielectric layer over one of the source/drain regions to reveal a surface of the one source/drain region;
d. forming a first electrically conducting layer inside the contact opening, the first electrically conducting layer covering the revealed surface of the one source/drain region and the first dielectric layer;
e. forming a second electrically conducting layer having a rugged surface, on the surface of the first electrically conducting layer;
f. performing a photolithographic procedure using a photomask layer to etch into the second and first electrically conducting layers, such that grooves are cut in a grid-like configuration in the second and first electrically conducting layers, forming a first electrode of the storage capacitor;

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g. forming a second dielectric layer covering the surface of the grid-like configuration of the second and first electrically conducting layers, wherein the second dielectric layer forms a storage dielectric of the storage capacitor; and

h. forming a third electrically conducting layer covering the surface of the second dielectric layer, wherein the third electrically conducting layer forms a second electrode of the storage capacitor.

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**5,744,389**

**METHOD FOR FABRICATING A SEMICONDUCTOR DEVICE HAVING A CAPACITOR**

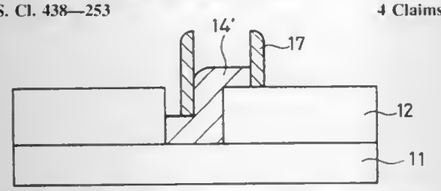
**Dae Young Kim, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea**

**Division of Ser. No. 743,140, Nov. 4, 1996, Pat. No. 5,668,412, which is a continuation of Ser. No. 438,402, May 10, 1995, abandoned. This application Mar. 19, 1997, Ser. No. 822,549**

**Claims priority, application Rep. of Korea, May 11, 1994, 94-10271**

**Int. Cl.[6] H01L** *21/8242*

**U.S. Cl. 438—253** **4 Claims**




1. A method for fabricating a semiconductor device, comprising the steps of:

depositing a lower insulating layer over MOSFETs established in a semiconductor substrate;

selectively etching the lower insulating layer by use of a storage electrode contact mask, to form a plurality of contact holes which are regularly arranged in both rows and columns;

depositing a conductive layer for a storage electrode and an insulating layer, in sequence;

subjecting the insulating layer and the conductive layer to etch by use of a storage electrode mask, to form a plurality of stack structures, each of which consists of an insulating layer pattern and a conductive layer pattern, said storage electrode mask being so arranged as to overlap partly with each of the contact holes;

forming a conductive layer spacer at each side wall of the stack structures; and

removing the insulating layer patterns from the stack structures, to form a plurality of storage electrodes.

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**5,744,390**

**METHOD OF FABRICATING A DRAM CELL WITH A PLURALITY OF VERTICAL EXTENSIONS**

**Fang-Ching Chao, Hsinchu, Taiwan, assignor to United Microelectronics Corporation, Taiwan**

**Filed Oct. 25, 1996, Ser. No. 736,926**

**Claims prinrity, application Taiwan, Aug. 16, 1996, 85109999**

**Int. Cl.[6] H01L** *21/8242*

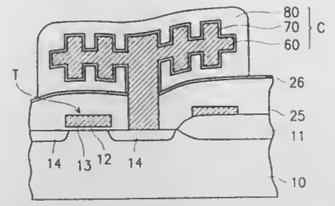
**U.S. Cl. 438—254** **20 Claims**

1. A method of fabricating a DRAM cell, comprising the steps of:

(a) forming a transfer transistor having a gate electrode and source-drain electrode areas on a semiconductor substrate;

(b) forming first, second and third insulating layers in sequence on the semiconductor substrate and the transfer transistor;

(c) forming a contact opening by seriatim etching through the third, second and first insulating layers exposing one of the source-drain electrode areas of the transfer transistor as a contact area;




(d) forming a plurality of first trenches by etching an upper portion of the third insulating layer

(e) forming a first conductive layer extending over the third insulating layer and filling the contact opening and the plurality of first trenches;

(f) forming a plurality of second trenches by etching an upper portion of the first conductive layer, wherein the structure of the first conductive layer thereby includes a vertical frame contacting the contact area through the contact opening, and a horizontal plate having a plurality of extending areas which extend out vertically therefrom on upper and lower surfaces thereof;

(g) selectively etching the first conductive layer to define a pattern of a storage electrode of a capacitor;

(h) using the second insulating layer as an etching stop, removing the third insulating layer by isotropic etching;

(i) forming a dielectric layer on exposed surfaces of the storage electrode; and

(j) forming a second conductive layer, which acts as an opposed electrode of the capacitor, on the dielectric layer.

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**5,744,391**

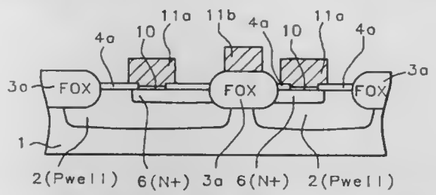
**METHOD TO IMPROVE ISOLATION BETWEEN EEPROM DEVICES VIA A FIELD OXIDE ANNEAL**

**Jen-Te Chen, Changhua City, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan**

**Filed Jan. 15, 1997, Ser. No. 783,982**

**Int. Cl.[6] H01L** *21/336*

**U.S. Cl. 438—264** **16 Claims**




8. A method of fabricating an erasable electrical programmable read only memory, (EEPROM), cell, on a semiconductor substrate, using a post-tunnel ion implantation anneal procedure, used to reduce the etch rate of a field oxide, (FOX), region, in solutions containing hydrofluoric acid, thus improving the isolation between tunnel transistor devices in said EEPROM cell, separated by said FOX region, comprising the steps of:

ion implanting a first conductivity imparting dopant into a first portion of said semiconductor substrate, to form P well regions in said first portion of said semiconductor substrate, to be used for said tunnel transistor devices;

forming FOX regions in said semiconductor substrate, between said P well regions;

growing a sacrificial silicon oxide layer on the surface of said P well regions, between said FOX regions;

ion implanting a second conductivity imparting dopant into regions of said P well regions, adjacent to said FOX region, to create tunnel implant regions, for said tunnel transistor devices, and also ion implanting a second conductivity imparting dopant into a top portion of said FOX region, located between said tunnel implant regions, of said tunnel transistor devices;

annealing to distribute said second conductivity imparting dopant from said top portion of said FOX region, throughout said FOX region, reducing concentration of said second conductivity imparting dopant, in said top portion of said FOX region;

opening a hole in said sacrificial silicon oxide layer, exposing top surface of said tunnel implant region;

a first pre-clean procedure;

growing a tunnel oxide layer on top surface of said tunnel implant region, exposed in said hole, in said sacrificial silicon oxide layer;

a second pre-clean procedure;

depositing a polysilicon layer; and

patterning of said polysilicon layer to create polysilicon gate structures, in regions overlying tunnel oxide layer, for said tunnel transistor devices, and creating said polysilicon gate structure, overlying said FOX region, where said FOX region is located between said tunnel transistor devices.



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**5,744,392**

**PROCESS FOR FABRICATING A MULTI-STAGE READ-ONLY MEMORY DEVICE**

**Chen-Chung Hsu, Taichung, Taiwan, assignor to United Microelectronics Corporation, Taiwan**

**Filed Mar. 11, 1996, Ser. No. 612,823**

**Int. Cl.[6] H01L** *21/8246*

**U.S. Cl. 438—275** **8 Claims**




1. A process for fabricating a multi-stage read-only memory device, comprising the steps of:

preparing a silicon substrate;

forming in the substrate a plurality of parallel disposed buried bit lines of a first conductivity type, said buried bit lines including at least a first bit line, a second bit line, and a third bit line;

forming an oxide layer on the silicon substrate, the oxide layer having a first thickness over the plurality of buried bit lines and a second thickness over intervals between each adjacent pair of the plurality of buried bit lines, the first thickness being greater than the second thickness;

forming first openings through the oxide layer on the first bit line so as to expose the first bit line and second openings through the oxide layer on the second bit line so as to expose the second bit line;

performing a first ion implantation process through the first openings on the first bit line so as to form ion regions of a second conductivity type in the first bit line;

performing a second ion implantation process through the second openings on the second bit line, so as to form base regions of the second conductivity type in first collector regions of the second bit line and then performing a third ion implantation process through the second openings so as to form emitter regions of the first conductivity type in the second bit line, thus creating bipolar transistors;

forming a plurality of parallel disposed word lines each of which crosses each of the plurality of bit lines to form a plurality of intersections, the bit lines crossing the first and second bit lines so as to cover the first and second openings, thus creating diode memory cells at the junction between the first bit line and the thick oxide layer covering the first bit line, bipolar transistor memory cells at the junction between the second bit line and the thick oxide layer covering the second bit line, and permanently-OFF transistor memory cells at the junction between the third bit line and the rest of the thick oxide layer.

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**5,744,393**

**METHOD FOR PRODUCTION OF A READ-ONLY-MEMORY CELL ARRANGEMENT HAVING VERTICAL MOS TRANSISTORS**

**Lothar Risch, Neubiberg; Franz Hofmann; Wolfgang Rösner, both of München, and Wolfgang Krautschneider, Hohenthann, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

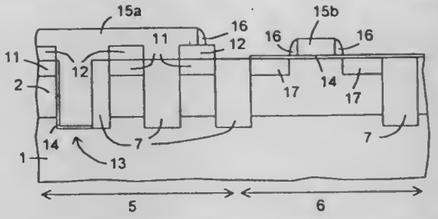
**PCT No. PCT/DE95/01365, § 371 Date Apr. 17, 1997, § 102(e) Date Apr. 17, 1997, PCT Pub. No. WO96/13064, PCT Pub. Date May 2, 1996**

**PCT Filed Oct. 5, 1995, Ser. No. 836,175**

**Claims priority, application Germany, Oct. 20, 1994, 44 37 581.6**

**Int. Cl.[6] H01L** *21/8246*

**U.S. Cl. 438—275** **9 Claims**




1. A method for production of a read-only-memory cell arrangement, the method comprising the steps of:

forming a cell field on a main surface of a semiconductor substrate wherein the cell field has first memory cells in which a first logic value is stored and which comprise at least one MOS transistor which is vertical with respect to the main surface and has second memory cells in which a second logic value is stored and which do not comprise a MOS transistor;

doping the semiconductor substrate by a first conductance type provided with a first doped region which is doped by a second conductance type, opposite to the first, and abuts the main surface in the area of the cell field;

producing a plurality of insulation trenches which run essentially parallel in the form of strips that extend from the main surface through the first doped region into the semiconductor substrate;

producing a second region which is doped by a first conductance type having a shallower depth than the first doped region and abutting the main surface; and

opening holes to form vertical MOS transistors wherein the holes extend from the main surface through the first doped region into the semiconductor substrate to overlap the boundary surface between one of the insulation trenches and the adjacent part of the second doped region whose surface is provided with a gate dielectric and a gate electrode.

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**5,744,394**

**METHOD FOR FABRICATING A SEMICONDUCTOR DEVICE HAVING COPPER LAYER**

**Katsuji Iguchi, Yamatokoriyama; Tsukasa Doi, Kitakatsuragi-gun; Masanori Murakami, Kyoto, and Takeo Oku, Hitachinaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Apr. 23, 1997, Ser. No. 839,025**

**Claims priority, application Japan, Aug. 26, 1996, 8-224018**

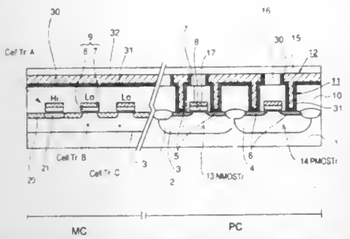
**Int. Cl.[6] H01L** *21/8246*

**U.S. Cl. 438—276** **4 Claims**

1. A process for fabricating a semiconductor device, comprising the steps of:

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(i) forming a plurality of transistors on a semiconductor substrate;
(ii) forming an insulating film on the resulting substrate including the transistors, followed by the formation of a contact hole and an interconnection trench in desired regions of the insulating film;
(iii) forming a barrier layer in the contact hole and the interconnection trench, followed by filling the contact hole and the interconnection trench with copper or a copper alloy to form a metal interconnection layer on the barrier layer;
(iv) conducting a selective ion implantation into at least one of the plurality of transistors using a resist pattern as a mask to control its threshold voltage after the completion of the interconnection layer; and
(v) annealing the entire resulting substrate for activation, uniformly.

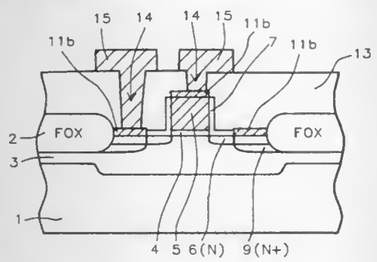
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**5,744,395**

**LOW RESISTANCE, SELF-ALIGNED, TITANIUM SILICIDE STRUCTURES, USING A SINGLE RAPID THERMAL ANNEAL PROCEDURE**

**Shau-Lin Shue, and Chen-Hua Douglas Yu, both of Hsin-chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan**

**Filed Oct. 16, 1996, Ser. No. 730,384**
**Int. Cl.[6] H01L *21/336***
**U.S. Cl. 438—305** **22 Claims**




1. A method of forming a MOSFET device, on a semiconductor substrate, in which the metal silicide, of a polycide gate structure, is formed during the deposition of a metal, and a one step RTA step, comprising the steps of:
forming field oxide regions in said semiconductor substrate;
ion implanting a first conductivity imparting dopant into said semiconductor substrate to create a P well region;
growing a gate insulator layer on areas of said semiconductor substrate, not covered by said field oxide regions;
depositing a polysilicon layer on said gate insulator layer and on said field oxide regions;
patterning of said polysilicon layer to form a polysilicon gate structure;
ion implanting a second conductivity imparting dopant into a region of said semiconductor substrate, not covered by said field oxide regions, and not covered by said polysilicon gate structure, to form lightly doped source and drain regions;
depositing a first insulator sidewall layer on said polysilicon gate structure, as well as on said field oxide regions, and on said lightly doped source and drain regions;
depositing a second insulator sidewall layer on said first sidewall insulator layer;
anisotropic RIE of said second insulator sidewall layer, and of said first insulator sidewall layer, to create a composite insulator spacer on the sides of said polysilicon gate structure, comprised of a second insulator spacer overlying a first insulator spacer;
ion implanting a third conductivity imparting dopant into a region of said semiconductor substrate, not covered by said polysilicon gate structure, not covered by said composite insulator spacer, and not covered by said field oxide region, to form heavily doped source and drain region;
depositing a metal layer at conditions in which a high resistance, metal silicide layer is formed on said heavily doped source and drain regions, and on top surface of said polysilicon gate structure, while said metal layer remains unreacted on surface of said field oxide regions, and on the surface of said composite insulator spacer;
depositing a titanium nitride layer on said high resistance, metal silicide layer, and on said metal layer;
effecting a one step rapid thermal anneal, converting said high resistance, metal silicide layer to a low resistance, metal silicide layer;
removing said titanium nitride layer, from the surface of said low resistance, metal silicide layer, and from the surface of said metal layer, and removing said metal layer from the surface of said composite insulator spacer, and from the surface of said field oxide regions, resulting in said polycide structure, comprised of said low resistance, metal silicide layer, overlying said polysilicon gate structure;
removing said second insulator spacer from said composite insulator spacer;
depositing an interlevel dielectric layer;
opening contact holes, in said interlevel dielectric layer, to said heavily doped source and drain regions, and to said polycide structure; and
forming metal contacts to said heavily doped source and drain region, and to said polycide structure.

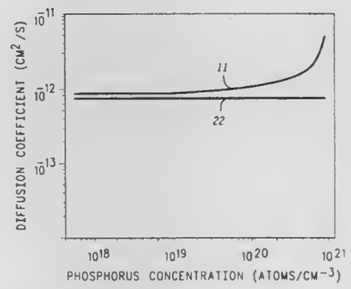
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**5,744,396**

**SEMICONDUCTOR DEVICE FORMED ON A HIGHLY DOPED N+ SUBSTRATE**

**Herng-Der Chiou, Tempe, and Geoffrey J. Crabtree, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Division of Ser. No. 493,607, Jun. 22, 1995, Pat. No. 5,553,566. This application May 31, 1996, Ser. No. 658,908**
**Int. Cl.[6] H01L *21/225***
**U.S. Cl. 438—501** **13 Claims**




1. A semiconductor device comprising:
a n type semiconductor substrate made essentially of silicon and having a first dopant that lowers the resistivity of the n type semiconductor substrate wherein the first dopant consists essentially of phosphorus with a first concentration of $1\times10^{18}$ to $1.6\times10^{20}$ atoms per $cm^3$; and
said n type semiconductor substrate also having a second dopant of a second concentration that compensates for lattice mismatch stress created by the first dopant wherein the second dopant is essentially germanium.

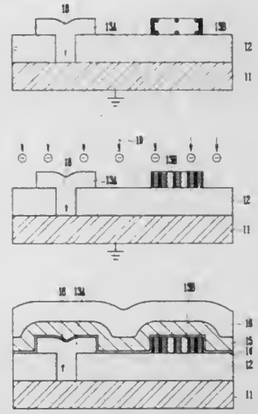


**5,744,397**

**METHOD OF PLANARIZING AN INSULATING LAYER**

**Dong Sun Sheen, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyungki-Do, Rep. of Korea**

**Filed Dec. 20, 1996, Ser. No. 771,571**
**Claims priority, application Rep. of Korea, Dec. 23, 1995, 1995-55136**
**Int. Cl.[6] H01L *21/425***
**U.S. Cl. 438—516** **4 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:
forming lower metal patterns on an insulation layer formed on a silicon substrate;
irradiating an electron beam to electrically neutralize the charge distribution in said lower metal patterns;
forming an interlayer insulating layer on said insulation layer including said lower metal patterns; and
forming an $O_3$-TEOS layer on said interlayer insulating layer.

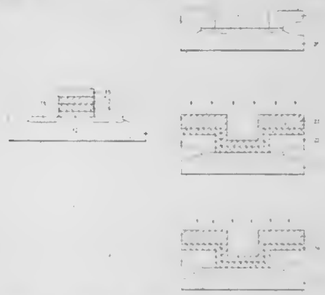
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**5,744,398**

**METHOD OF FORMING ELECTRODE OF SEMICONDUCTOR DEVICE**

**Jeong Soo Byun, and Byung Hak Lee, both of Chungcheongbuk-do, Rep. of Korea, assignors to IG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea**

**Filed Jan. 23, 1997, Ser. No. 788,107**
**Claims priority, application Rep. of Korea, Jul. 31, 1996, 1996/31654**
**Int. Cl.[6] H01L *21/44;21/48***
**U.S. Cl. 438—592** **27 Claims**



1. A method of forming an electrode of a semiconductor device, the method comprising the steps of:
forming an insulating layer on a semiconductor substrate;
forming a tungsten silicide layer on the insulating layer;
implanting impurity ions into the tungsten silicide layer to form an impurity region in a lower portion off the tungsten silicide layer; and
carrying out a heat treatment on the substrate and the tungsten silicide layer to form a polysilicon layer in a portion of the tungsten silicide layer adjacent the substrate.

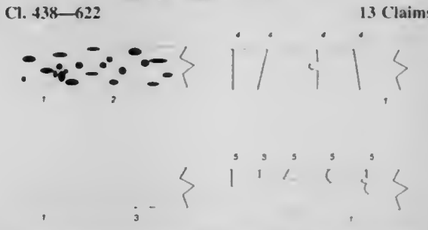
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**5,744,399**

**PROCESS FOR FORMING LOW DIELECTRIC CONSTANT LAYERS USING FULLERENES**

**Michael D. Rostoker, Boulder Creek, and Nicholas F. Pasch, Pacifica, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.**

**Filed Nov. 13, 1995, Ser. No. 557,721**
**Int. Cl.[6] H01L *21/316***
**U.S. Cl. 438—622** **13 Claims**



1. A process for lowering the dielectric constant of an insulation layer on a semiconductor wafer which comprises:,
a) forming on the wafer a composite layer comprising matrix-forming insulation material and a fullerene; and
b) removing the fullerene from the composite layer to leave an open porous structure comprising the insulation material.

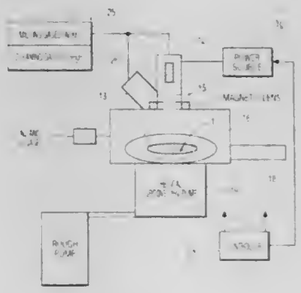
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**5,744,400**

**APPARATUS AND METHOD FOR DRY MILLING OF NON-PLANAR FEATURES ON A SEMICONDUCTOR SURFACE**

**Timothy Scott Dyer, Tempe, Ariz., assignor to Accord Semiconductor Equipment Group, Tempe, Ariz.**

**Filed May 6, 1996, Ser. No. 643,575**
**Int. Cl.[6] C23F *1/04*; H01L *21/473***
**U.S. Cl. 438—631** **9 Claims**



1. Apparatus for ion milling non-planar features on a semiconductor wafer surface, said feature having hills and valleys defined thereby, said apparatus comprising first and second ion beam guns, said first gun being positioned to direct a beam along a direction normal to said surface and including means for directing said beam uniformly over said entire surface, said beam being of an intensity and for a duration to form said hills and valleys into sharp peaks and shallow valleys, said peaks having steep slopes, said second

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ion beam gun being positioned to direct an ion beam at said slopes and having an intensity and duration to mill said peaks at a rate faster than the rate at which said valleys are milled thereby, said second beam being directed at a radial portion of said wafer as said wafer is rotated, said apparatus including means for rotating said wafer while said second ion gun is activated for reducing the height of said peaks relative to said valleys.

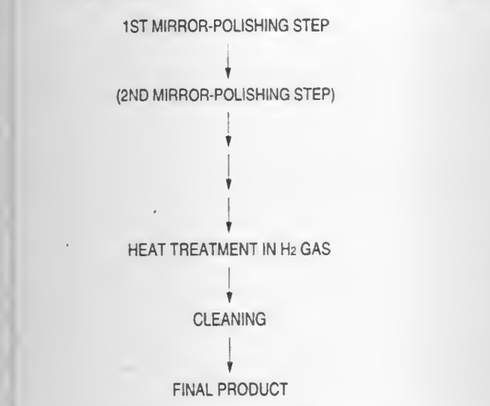
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**5,744,401**

**SILICON WAFER MANUFACTURING METHOD ELIMINATING FINAL MIRROR-POLISHING STEP**

**Hiroshi Shirai; Jun Yoshikawa, both of Kanagawa; Youji Ogawa, Niigata; Kazuhiko Kashima; Kazuya Ookubo, both of Kanagawa; Yukari Kohtari, Niigata; Norihiro Shimoi, Niigata; Masayuki Sanada, Niigata, and Shuji Tobashi, Kanagawa, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan**

**Filed Mar. 22, 1996, Ser. No. 620,195**
**Claims priority, application Japan, Mar. 24, 1995, 7-090135**
**Int. Cl.[6] H01L *21/00***
**U.S. Cl. 438—693** **7 Claims**




**1**. A manufacturing method of a silicon wafer, comprising the steps of:

preparing a silicon wafer having surface roughness Ra of 0.70–1.00 nm; and

heat-treating the silicon wafer at a temperature not lower than 1,200° C. for 30 minutes to 4 hours in a hydrogen gas atmosphere, to thereby produce a silicon wafer product having surface roughness Ra of less than 0.60 nm.

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**5,744,402**

**METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES**

**Yuji Fukazawa, Yokohama, and Kazuhiko Takase, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

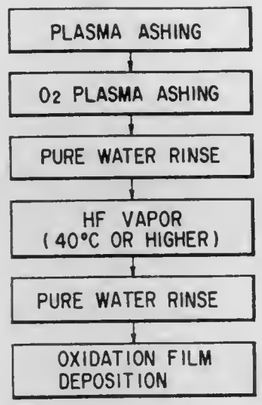
**Filed Nov. 29, 1995, Ser. No. 564,741**
**Claims priority, application Japan, Nov. 30, 1994, 6-296413**
**Int. Cl.[6] H01L *21/30;21/336***
**U.S. Cl. 438—734** **23 Claims**

**1**. A method of manufacturing semiconductor devices, comprising the steps of:

forming a conductive film on a silicon oxide film provided on a semiconductor substrate;

forming a resist pattern on the conductive film formed on the silicon oxide film;

selectively dry-etching the conductive film with the resist pattern as a mask to form a pattern of the conductive film; and




heating the semiconductor substrate to 40° C. or higher and exposing the conductive film pattern to HF vapor, to thereby remove reaction products adhered in the dry-etching step to an exposed surface portion of the pattern of the conductive film.

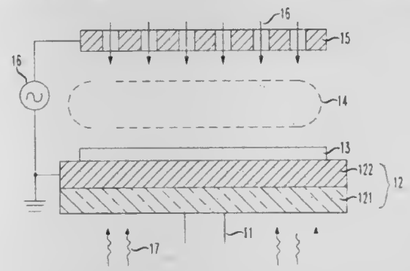
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**5,744,403**

**DIELECTRIC FILM DEPOSITION METHOD AND APPARATUS**

**Edward Alan Dein, Horsham; Michael Douglas Gross, Allentown, and Richard Allen Pudliner, Whitehall, all of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Continuation of Ser. No. 401,369, Aug. 31, 1989, abandoned. This application Jun. 25, 1991, Ser. No. 719,699**
**Int. Cl.[6] H01L *21/02***
**U.S. Cl. 438—761** **13 Claims**




**1**. In the manufacture of integrated-circuit semiconductor devices, a method for depositing a layer of silicon oxide material on a semiconductor wafer, having a first surface said method comprising:

exposing a first surface of said wafer to a plasma in a reactant flow, said flow being directed through a perforated gas inlet member at said first surface in a direction essentially perpendicular to said first surface, said perforated gas inlet member having a diameter; and

CHARACTERIZED IN THAT said wafer is placed essentially concentrically on a supporting member having a second surface which significantly extends past the edge of said first surface, said supporting member having a diameter which is greater than the said diameter of said gas inlet member, whereby radial variations in the thickness of said layer are reduced.



**5,744,404**

**CRYSTALLINE ODOR ADSORBING ZEOLITE DELIVERY SYSTEM**

**Michelle A. Titterton, Lake Zurich, and Patricia E. Summers, Glencoe, both of Ill., assignors to UOP, Des Plaines, Ill.**

**Filed Dec. 2, 1996, Ser. No. 752,980**
**Int. Cl.[6] A62B *7/10;* B01D *53/04***
**U.S. Cl. 442—63** **7 Claims**

**1**. An article of manufacture suitable for applying a layer of a crystalline zeolitic molecular sieve onto a surface, the article comprising a porous article impregnated with a slurry comprising from about 48 wt % to about 68 wt % water, from about 15 wt % to about 25 wt % ethanol, from about 0.5 wt % to about 2.0 wt % of a suspending agent, from about 0.1 wt % to about 0.3 wt % of a preservative and from about 5.0 wt % to about 25.0 wt % of a crystalline zeolitic molecular sieve having a framework $SiO_2/Al_2O_3$ ratio of at least 18.

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**5,744,405**

**PRODUCT OF VAPOR DEPOSITION AND METHOD OF MANUFACTURING SAME**

**Jiichiro Okumura, Kusatsu, and Takao Negishi, Otsu, both of Japan, assignors to Toray Industries, Inc., Japan**

**PCT No. PCT/JP94/01379, § 371 Date Apr. 18, 1996, § 102(e) Date Apr. 18, 1996, PCT Pub. No. WO96/06216, PCT Pub. Date Feb. 29, 1996**
**PCT Filed Aug. 22, 1994, Ser. No. 633,807**
**Int. Cl.[6] B32B *9/04***
**U.S. Cl. 442—71** **18 Claims**

**1**. A product of vapor deposition comprising a vapor deposited thin film of a metal or an inorganic substance formed on at least a part of a surface of an organic substrate through an intermediate agent, said intermediate agent consisting essentially of a silicone resin and an adherent form of silicon dioxide formed by plasma treatment of the silicone resin.

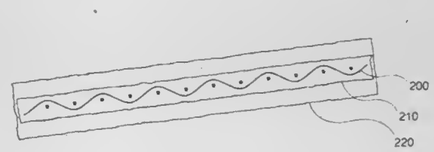
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**5,744,406**

**METHOD FOR EASY REMOVAL OF FATS, OILS AND GREASE FROM MIXTURES WITH WATER AND AQUEOUS COMPONENTS**

**Robert J. Novak, 4720 Dartmouth Ave. N., St. Petersburg, Fla. 33713**

**Filed Apr. 15, 1996, Ser. No. 631,925**
**Int. Cl.[6] E02B *15/04;* C09K *3/32;* B32B *5/00***
**U.S. Cl. 442—121** **18 Claims**




**1**. A device for absorbing fats, greases, and oils, comprising:

a fabric substrate;

a coating of hydrophobic material applied to the fabric substrate; and

a coating of oleophilic material applied to the fabric substrate.

**10**. A device for absorbing fats, greases, and oils, comprising:

a fabric substrate;

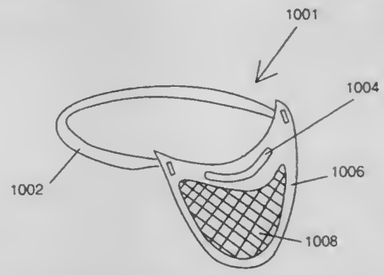
a coating comprising a mixture of at least one hydrophobic and at least one oleophilic material applied to the fabric substrate.

**5,744,407**

**PHOTOCATALYTIC FACE MASK**

**Ali Tabatabaie-Raissi; Nazim Z. Muradov, both of Melbourne, and Philip W. Fairey, III, Merritt Island, all of Fla., assignors to University of Central Florida, Orlando, Fla.**

**Division of Ser. No. 403,305, Mar. 14, 1995, Pat. No. 5,604,339. This application Oct. 7, 1996, Ser. No. 726,781**
**Int. Cl.[6] A62B *18/02***
**U.S. Cl. 442—121** **8 Claims**




**1**. A face mask for destroying harmful toxic airborne volatile organic compounds(VOCs) such as formaldehyde and terpenes, comprising:

a base support material having an upper side and a lower side, the lower side for covering a portion of a face of a wearer;

a layer of $TiO_2$ impregnated material overlying the upper side of the base support material;

elastic means for attaching the lower side of the base support material over a portion of a wearer's face; and

means for activating the impregnated material wherein airborne VOCs are destroyed by the impregnated layer.

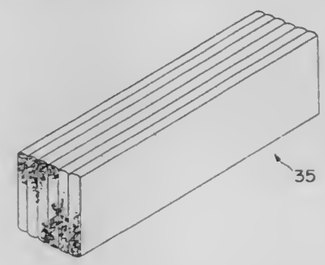
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**5,744,408**

**FIBROUS PRODUCT AND METHOD THEREOF WITH THERMOPLASTIC POLYMERIC IMPREGNANT**

**Robert J. Rossi, 2212 Edgefield Rd., Spartanburg, S.C. 29302**

**Division of Ser. No. 394,557, Feb. 27, 1995, Pat. No. 5,482,751, which is a continuation of Ser. No. 4,955, Jan. 15, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 470,183**
**Int. Cl.[6] B32B *5/10***
**U.S. Cl. 442—383** **13 Claims**




**1**. An improved article of manufacture, said article of manufacture comprising:

a fibrous structure of initially discrete layers, each said layer having first and second sides, at least one side of each said layer having a surface with fibers protruding therefrom, said structure being comprised of preshrunk fibers having an initial shrinkage of no more than about 2 percent; and

said structure being impregnated with a polymeric impregnant comprising a thermoplastic polymer.

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5,744,409

## OPTICAL GLASS

Kazuaki Hashimoto, and Koichi Sato, both of Tokyo, Japan, assignors to Hoya Corporation, Japan

Filed Jan. 3, 1997, Ser. No. 778,675
Int. Cl.[6] C03C *3/078;3/089;3/064;4/20*
U.S. Cl. 501—65 5 Claims

1. An optical glass containing, as glass components,
30–55 wt % of $SiO_2$,
5–30 wt % of $B_2O_3$,
the total amount of $SiO_2$ and $B_2O_3$ being 56–70 wt % and the $SiO_2/B_2O_3$ weight ratio being 1.3–12.0,
7–12 wt % of $Li_2O$, in which 7 wt % is excluded,
0–5 wt % of $Na_2O$,
0–5 wt % of $K_2O$,
the total amount of $Li_2O$, $Na_2O$ and $K_2O$ being 7 to 12 wt % in which 7 wt % is excluded,
10–30 wt % of BaO,
0–10 wt % of MgO,
0–20 wt % of CaO,
0–20 wt % of SrO, and
0–20 wt % of ZnO
the total amount of BaO, MgO, CaO, SrO and ZnO being 10–30 wt %, and the total amount of $SiO_2$, $B_2O_3$, $Li_2O$ and BaO being at least 72 wt %.

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5,744,410

## HIGH THERMAL CONDUCTIVE SILICON NITRIDE SINTERED BODY, METHOD OF PRODUCING THE SAME AND PRESS-CONTACTED BODY

Michiyasu Komatsu; Kazuo Ikeda; Nobuyuki Mizunoya; Yoshitoshi Sato; Tatsuya Imaizumi, and Kazuyuki Kondo, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

PCT No. PCT/JP96/01559, § 371 Date Oct. 4, 1996, § 102(e) Date Oct. 4, 1996, PCT Pub. No. WO97/00837, PCT Pub. Date Jan. 9, 1997
PCT Filed Jun. 7, 1996, Ser. No. 700,358
Claims priority, application Japan, Jun. 23, 1995, 7-158206; Dec. 28, 1995, 7-344237
Int. Cl.[6] C04B *35/584*
U.S. Cl. 501—97.2 29 Claims

1. A high thermal conductive silicon nitride sintered body which comprises more than more than 7.5% to at most 17.5% by weight of a rare earth element in terms of the amount of an oxide thereof; and at most 0.3% by weight of Li, Na, K, Fe, Ca, Mg, Sr, Ba, Mn and B as impurity cationic elements in terms of a total amount thereof, and having a thermal conductivity of at least 80 W/m·K.

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5,744,411

## ALUMINUM NITRIDE SINTERED BODY WITH HIGH THERMAL CONDUCTIVITY AND ITS PREPARATION

JunHong Zhao; Theresa A. Guiton; Yi-Hung Chiao; William Rafaniello, all of Midland, Mich.; Noboru Hashimoto, Suita, Japan; Kyoji Tanaka, Kouriyama, Japan; Susumu Kajita, Hirakata, Japan, and Hiroyoshi Yoden, Kadoma, Japan, assignors to The Dow Chemical Company, Midland, Mich.

PCT No. PCT/US94/04256, § 371 Date Dec. 7, 1995, § 102(e) Date Dec. 7, 1995, PCT Pub. No. WO95/02563, PCT Pub. Date Jan. 26, 1995
PCT Filed Apr. 18, 1994, Ser. No. 557,025
Int. Cl.[6] C04B *35/581;35/582*
U.S. Cl. 501—98.5 18 Claims

1. A sinterable aluminum nitride powder composition, for producing an aluminum nitride body having a thermal conductivity in the excess of 120 W/m.k comprising aluminum nitride powder and a sintering aid combination that consists essentially of a rare earth metal oxide source, an alkaline earth metal oxide source, a boron source selected from the group consisting of aluminum boride, aluminum diboride, calcium boride, yttrium boride, strontium boride, barium boride, cerium boride, praseodymium boride, samarium boride and neodymium boride, and optionally, a source of aluminum oxide, wherein the alkaline earth metal oxide source is in an amount sufficient to provide an equivalent alkaline earth metal oxide content within a range of from 0.2 to 5 percent by weight, the rare earth metal oxide source is present in an amount sufficient to provide an equivalent rare earth metal oxide content within a range of from 0.25 to 5 percent by weight, and the source of boron is present in an amount sufficient to provide an equivalent boron content within a range of from 0.01 to 1 percent by weight, all percentages being based upon sinterable composition weight.

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5,744,412

## COMPOSITION AND PROCESS FOR MAKING AN INSULATING REFRACTORY MATERIAL

Alan Pearson, Murrysville, and Thomas G. Swansiger, Apollo, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed May 13, 1996, Ser. No. 644,440
Int. Cl.[6] C04B *35/101*
U.S. Cl. 501—127 17 Claims

1. A composition suitable for making an insulating refractory material, said composition comprising:
a) about 45–65 parts by weight calcined alumina powder, having an average particle size greater than about 50 microns,
b) about 30–45 parts by weight flash activated alumina powder having an average particle size of about 10 microns or less,
c) about 1–10 parts by weight of an organic polymeric binder,
d) about 1–12 parts by weight starch or modified starch, and
e) a liquid vehicle.

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5,744,413

## CRYOLITE RESISTANT REFRACTORY LINER

Edmund A. Cortellini, North Brookfield, Mass., assignor to Saint-Gobain/Norton Industrial Ceramics Corporation, Worcester, Mass.

PCT No. PCT/US95/12133, § 371 Date Mar. 11, 1997, § 102(e) Date Mar. 11, 1997, PCT Pub. No. WO96/09999, PCT Pub. Date Apr. 4, 1996
PCT Filed Sep. 25, 1995, Ser. No. 809,963
Int. Cl.[6] C04B *35/185*
U.S. Cl. 501—128 16 Claims

1. A monolithic cryolite-resistant refractory liner for use in aluminum production comprising:
i) between 75 wt % and 95 wt % alumina-silica refractory grain,
ii) between 1 wt % and 10 wt % of a sealant selected from the group consisting of feldspar and nepheline.

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5,744,414

## PROCESS FOR PREPARING AN OLEFIN POLYMERISATION CATALYST

Charles Jenny, Lavera, France, assignor to BP Chemicals Limited, United Kingdom

Filed Jun. 28, 1994, Ser. No. 267,464
Claims priority, application France, Jul. 13, 1993, 93 08915
Int. Cl.[6] B01J *31/00*
U.S. Cl. 502—103 14 Claims

1. A process for the preparation of an olefin polymerization solid catalyst composition comprising at least one transition metal, a magnesium compound and a halogen, which process comprises either:
(i) sequentially first contacting an olefin with a solid product (B) containing a magnesium compound substantially free of any transition metal compound, said magnesium compound being capable of reducing a transition metal compound (A), and thereafter contacting the products resulting from step (i) with at least one compound (A) of a transition metal at its maximum valency of Group IV, V or VI of the Periodic Classification of the Elements in liquid form under conditions such that the olefin at least partially polymerizes; or
(ii) simultaneously contacting an olefin with a solid product (B) containing a magnesium compound substantially free from any transition metal compound, said magnesium compound being capable of reducing a transition metal compound (A), and with at least one compound (A) of a transition metal at its maximum valency of Group IV, V or VI of the Periodic Classification of the Elements in liquid form, under conditions such that the olefin at least partially polymerizes during the said simultaneous contacting.



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5,744,415

## RARE EARTH METAL CATALYST FOR OLEFIN POLYMERIZATION

Timothy Todd Wenzel, Charleston, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 28, 1995, Ser. No. 580,468
Int. Cl.[6] C08F *4/42*
U.S. Cl. 502—121 5 Claims

1. A catalyst composition for the polymerization of olefins, which comprises:
a) a catalyst having a formula selected from the group consisting of

$$Q_pL_{2-m}MX_nM''(ED)_o \quad (1)$$

$$[Q_pL_2MR']_2 \quad (2)$$

$$Q_pL_2MR'(ED)_o \quad (3)$$

wherein
Q is a bridging group containing one or more Group IVA elements;
L is a cyclopentadienyl, indenyl, or fluorenyl ligand;
M is scandium, yttrium, or a Lanthanide metal;
X is a halide, hydride, aryl group or alkyl group;
M'' is a Group I, II, or IIIA metal;
ED is an electron donor ligand;
R' is an alkyl group, an aryl group, or a hydride;
m is 1 or 2;
p is 0 or 1, and p is 0 when m is 1;
n is equal to the value [3+(the valence of M'')−m], and
o is an integer from 0 to 4;
wherein an electron donor residue containing at least one Group VA or IVA element is present as a substituent of an L or Q; and
b) an activating cocatalyst of the formula $R_xM'$, wherein R is alkyl, aryl, or hydride; M' is a Group I, II, or IIIA metal or a Group I, II, or IIIA metal complexed with oxygen, nitrogen, or a halide; and x is equal to the valence of M'.

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5,744,416

## CATALYST SYSTEM FOR POLYCARBONATE MANUFACTURE

Larry I. Flowers; Paul D. Sybert, both of Evansville, and David L. Ramsey, Mt. Vernon, all of Ind., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 241,306, May 10, 1994, Pat. No. 5,510,449. This application Feb. 8, 1996, Ser. No. 597,420
Int. Cl.[6] B01J *31/00*
U.S. Cl. 502—152 11 Claims

1. A catalyst composition to catalyze the interfacial condensation reaction to produce polycarbonates, polyesters, copolymers, or mixtures thereof, said catalyst composition comprising a first catalyst selected from the group consisting of:
$(R)_4N^+X^-$
$R^1(R_3)_3Q^+X^-$ and
$(R^2)_a(R^1)_{3-a}N{-}(CH_2)_n{-}N(R^3)_{3-a}(R^2)_a2X^-$
where R is selected from the same or different $C_{1-10}$ alkyl group, $R^1$ is a $C_{11-20}$ alkyl group, $R^2$ is selected from the same or different $C_{11-20}$ alkyl group, $R^3$ is selected from the same or different $C_{1-10}$ alkyl group, Q is a nitrogen or phosphorus atom, X is a halogen atom, or an $-OR^4$ group, $R^4$ is a member selected from H, $C_{1-18}$ alkyl or $C_{6-18}$ aryl, "n" is a whole number from 4 to 6 and "a" is a whole number equal to 0 or 1; and from 0.006 to 0.14 moles of a second catalyst which is a methyl tertiary amine per mole of the first catalyst.

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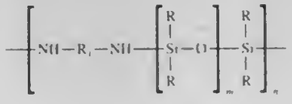
5,744,417

## SUPPORTED CATALYST

Sandor Nagy, Grand Island, and John A. Tyrell, Williamsville, both of N.Y., assignors to Lyondell Petrochemical Company, Houston, Tex.

Filed May 2, 1996, Ser. No. 643,102
Int. Cl.[6] C08F *4/64*
U.S. Cl. 502—155 20 Claims

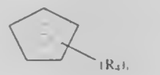
1. A supported catalyst comprising the reaction product of
(a) a silylamine polymer having the general formula



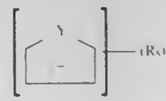
where each R is an alkyl from $C_1$ to $C_6$ or an aryl from $C_6$ to $C_{10}$, $R_1$ is a divalent aliphatic or aromatic group from $C_2$ to $C_{20}$, "m" is 1 to about 100, and "n" is 2 to about 500, with
(b) an organometallic compound having the general formula

$$Q{-}M{-}(X)_t$$

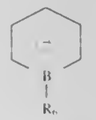
where Q is selected from the group consisting of:
(i.) a cyclopentadienyl ring structure of the formula:



wherein each $R_4$ is a $C_1$ to $C_{20}$ hydrocarbyl group and further wherein two adjacent $R_4$ groups may form a ring fused to the cyclopentadienyl ring and s is a number from 0 to 5;
(ii.) an alkyl substituted pyrrolyl or phospholyl ring of the formula:



wherein Y is nitrogen or phosphorus and $R_4$ is a $C_1$ to $C_{10}$ alkyl group or a $C_6$ to $C_{10}$ aryl group; and t is 1 to the maximum number of substitutable positions.
(iii.) a borabenzene ring of the formula:

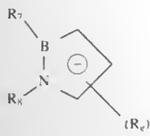


wherein $R_6$ is hydrogen, $N(R)_2$, or —OR or R.

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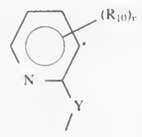


(iv.) a heterocyclic ring of the formula:

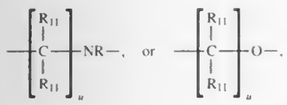


wherein $R_7$ is R, alkaryl from $C_6$ to $C_{12}$, aralkyl from $C_6$ to $C_{12}$, hydrogen or $Si(R)_3$, $R_8$ is $R_6$, halogen, COR, COOR, SOR, or SOOR, $R_9$ is $R_8$, OR, $N(R)_2$, SR, or a fused ring system; and z is 1 to 4;

The Q ligand can also be:



where Y is O, S, NR,



each $R_{10}$ is independently selected from the group consisting of $C_1$ to $C_6$ alkyl, $C_1$ to $C_6$ alkoxy, $C_6$ to $C_{16}$ aryl, halogen, and $CF_3$, each $R_{11}$ is a hydrogen or $C_1$ to $C_6$ alkyl, v is 0 to 4, and u is 1 to 4, each X is independently selected from the group consisting of halogen, alkyl from $C_1$ to $C_6$, and dialkylamino from $C_1$ to $C_6$, M is zirconium, titanium, or hafnium and M is bonded to a nitrogen in said silylamine polymer, and the ratio of nitrogens bonded to M in said silylamine polymer to M atoms is 1:1 to 3:1.

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**5,744,418**

## REDOX CATALYST SYSTEM FOR THE INITIATION OF EMULSION POLYMERIZATION

**Martin Jakob, Kelkheim, Germany, assignor to Clariant GmbH, Frankfurt, Germany**

**Filed Dec. 4, 1996, Ser. No. 759,831**

**Claims priority, application Germany, Dec. 7, 1995, 195 45 609.2**

**Int. Cl.**[6] **B01J** *31/00*

**U.S. Cl. 502—160** **12 Claims**

**1**. A redoxcatalyst capable of being used for free-radical emulsion polymerization of ethylenically unsaturated compounds, comprising at least one oxidizing agent and at least one reducing agent, said reducing agent comprising an at least bifunctional aldehyde having at least 3 carbon atoms which is completely masked as a bisulfite adduct.

**5,744,419**

## PROCESS FOR THE PREPARATION OF AN IMPROVED SUPPORTED CATALYST, CONTAINING NICKEL AND COBALT, WITH OR WITHOUT NOBLE METALS, USEFUL FOR THE OXIDATIVE CONVERSION OF METHANE, NATURAL GAS AND BIOGAS TO SYNGAS

**Vasant Ramchandra Choudhary; Balu Shivaji Uphade; Ajit Singh Mamman, and Amarjeet Munshiram Rajput, all of Maharashtra, India, assignors to Council of Scientific And Industrial Research, New Delhi, India**

**Continuation-in-part of Ser. No. 359,035, Dec. 19, 1994. This application Aug. 21, 1995, Ser. No. 517,213**

**Int. Cl.**[6] **B01J** *23/40;23/72;23/58*

**U.S. Cl. 502—326** **10 Claims**

**1**. A process for the preparation of a supported catalyst, containing oxides of nickel and cobalt, deposited on a precoated support, represented by the formula:

$$A_aCo_bNiO_c(x)/MO_d(y)/S$$

wherein: A is a noble metal element selected from the group consisting of Ru, Rh, Pd, Pt, Ir, Os, or a mixture thereof, Co is cobalt; Ni is nickel; O is oxygen; M is an alkaline earth element selected from the group consisting of Be, Mg, or a mixture thereof, a is an A/Ni mole ratio in the range of 0 to about 0.1; b is a Co/Ni mole ratio in the range of about 0.01 to about 2.0; c is a number of oxygen atoms needed to fulfill the valence requirement of $A_aCo_bNi$; d is a number of oxygen atoms required to fulfill the valence requirement of M; S is a catalyst support comprising sintered, porous refractory inert solids comprising alumina, silica, silica-alumina, silicon carbide, zirconia, hafnia or a mixture thereof and having a surface area in the range of about 0.002 $m^2g^{-1}$ to about 5.0 $m^2g^{-1}$; y is a weight percent loading of the alkaline earth oxides, $MO_d$, precoated on the support in the range of about 0.3 wt. % to about 30 wt. %; and x is a wt. % loading of the group VIII transition metal oxides, $A_aCo_bNiO_c$, deposited on the precoated support in the range of about 0.3 wt. % to about 30 wt. %, useful for the oxidative conversion of methane, natural gas and biogas to syngas by processes involving partial oxidation with oxygen or oxidative steam and/or $CO_2$ reforming with oxygen of methane or light hydrocarbons to syngas, which comprises:

(1) precoating the surface of the support by the deposition of $MO_d$ by impregnating or coating the support with a compound represented by the formula: $MZ_h$, wherein: M is alkaline earth element selected from the group consisting of Be, Mg, or a mixture thereof; Z is an anion selected from the group consisting of nitrate, acetate, formate, oxalate, hydroxide, carbonate and oxide anions; and h is a number of Z required to fulfill the valence requirement of M in the compound, which on decomposition converts into oxide form, in quantity sufficient to obtain a loading of $MO_d$ on the support in the range of about 0.3 wt. % to about 30 wt. %;

(2) subsequent drying of the wet mass by heating it in air or under vacuum first slowly at about 50° C. for about 6 h and then at about 120° C. for about 2 h,

(3) subsequent decomposition of the dried mass by heating it in air, inert gas or under vacuum at a temperature in the range of about 400° C. to about 600° C. for a period in the range of about 0.5 h to about 5 h;

(4) and calcining it at a temperature in the range of about 750° C. to about 1200° C. in air, inert gas or under vacuum for a period in the range of about 0.1 to about 10 h, to obtain the support precoated with $MO_d$, and

(5) depositing $A_aCo_bNiO_c$ on the surface of the precoated support by impregnating or coating it with the compounds of nickel, cobalt and noble metals, represented by the formulae: $NiY_g$, $CoY_f$ and $AX_e$, respectively, wherein: Ni is nickel; Co is cobalt, A is a noble metal element selected from the group consisting of Ru, Rh, Pd, Pt, Ir, Os, or their mixture; Y is an anion selected from the group consisting of nitrate, acetate, formate, oxalate, oxide, carbonate and hydroxide anions; X is an anion selected from the group consisting of nitrate, acetate, chloride and $(H_2Cl_6)^{-4}$ anions; g and f are numbers of Y needed to fulfill the valence requirement of Ni and Co, respectively, in their compounds; and e is a number of X needed to fulfill the valence requirement of A in its compound, which on decomposition convert into their oxide form, with A/Ni and Co/Ni mole ratios in the range of 0 to about 0.1 and about 0.01 to about 2.0, respectively, and in quantities sufficient to obtain a loading of $A_aCo_bNiO_c$ on the precoated support in the range of about 0.3 wt. % to about 30 wt. %,

(6) subsequent drying of the wet catalyst mass by heating it in air or under vacuum first slowly at about 50° C. for about 6 h and further at about 120° C. for about 2 h, and

(7) subsequent decomposition of the dried catalyst mass by heating in air, inert gas or under vacuum at a temperature in the range of about 400° C. to about 600° C. for a period in the range of about 0.5 h to about 5 h and

(8) finally calcining it in air, inert gas or under vacuum at a temperature in the range of about 750° C. to about 1200° C. for a period in the range of about 0.1 to about 10 h.



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**5,744,420**

## ADSORPTION OF CHELATED ORGANOMETALLIC COMPOUNDS ONTO ALUMINA-BASED ADSORBENTS

**Jean-Luc Le Loarer, Salindres, and Christophe Nedez, Asnieres sur Seine, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France**

**Filed Jul. 8, 1996, Ser. No. 677,562**

**Claims priority, application France, Jul. 7, 1995, 95 08227**

**Int. Cl.**[6] **B01J** *20/00;23/00;* **C02F** *1/42;* **B01D** *15/04*

**U.S. Cl. 502—415** **20 Claims**

**1**. Adsorbent alumina particulates having chelated organometallic compound values adsorbed thereon, said alumina particulates comprising coagulated droplets, extrudates or crushed particles having a volume of pores with a diameter greater than 80 Å of at least 0.15 $cm^3/g$ and a particle size of less than 4 mm.

**17**. A process comprising adsorbing chelated organometallic compound values from a medium of polymerization by contacting said medium with the adsorbent alumina particulates as defined by claim **1**.

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**5,744,421**

## MONOLITHIC CARBONACEOUS ARTICLE

**Ken K. Robinson, St. Charles, and Rodney L. Mieville, Glen Ellyn, both of Ill., assignors to Mega-Carbon Company, St. Charles, Ill.**

**Filed Feb. 13, 1996, Ser. No. 600,882**

**Int. Cl.**[6] **B01J** *20/02*

**U.S. Cl. 502—416** **26 Claims**

**1**. A temperature-resistant microporous, monolithic carbonaceous article exhibiting substantially no change in compressive strength upon heating to 350° C. and consisting essentially of active carbon and a silsesquioxane binder present in an amount up to about 20 percent, based on the weight of the article, and said article having an open pore structure, a surface area in excess of about 2000 $m^2/g$ of article, a pore size distribution such that at least 50 percent of total pore volume is constituted by pores less than about 2 nanometers diameter and 80 percent of total pore volume by pores less than about 4 nanometers diameter, and a bulk density of at least about 0.25 grams/cubic centimeter.

**7**. An aqueous carbon slip suitable for the preparation of an adsorbent article, said aqueous slip comprising porous carbonaceous particles with water-filled pores and a silsesquioxane binder in an aqueous emulsion; said binder being present in an amount up to about 20 percent by weight, based on the dry weight of the carbonaceous particles.

**13**. A process for the manufacture of microporous, monolithic carbonaceous article which comprises:

combining activated carbon having a surface area of at least about 2000 $m^2/g$ with an aqueous emulsion of a silsesquioxane to form a carbon slip;

forming said carbon slip into a shaped article; and

curing said shaped article.

**5,744,422**

## ASSEMBLAGE FOR THERMAL DYE TRANSFER

**Steven Evans, Rochester; Helmut Weber, Webster; Kristine B. Lawrence, and Robert A. Guistina, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 19, 1997, Ser. No. 878,704**

**Int. Cl.**[6] **B41M** *5/035;5/38*

**U.S. Cl. 503—227** **10 Claims**

**6**. A process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a polymeric binder, and imagewise transferring said dye to a dye-receiving element to form said dye transfer image, wherein said dye-donor element comprises a support having thereon sequentially repeating dye layer patches of a dye dispersed in a polymeric binder, at least one of said dye patches containing a pendant basic-substituted dye having the formula:

$$A\text{-}(L\text{-}B)_m$$

wherein:

A represents a thermally transferable dye residue,

L represents a divalent linking group,

B represents a basic substituent, and

m represents an integer of from 1 to 3; and

said dye-receiving element comprises a support having thereon a polymeric dye image-receiving layer which contains a hydrated transition metal or metalloid salt of a strong acid.

**7**. The process of claim **6** wherein said polymeric dye image-receiving layer comprises an acrylic polymer, a styrene polymer, a polyester, a polyamide, a polyurethane, a polyolefin or a phenolic resin.

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**5,744,423**

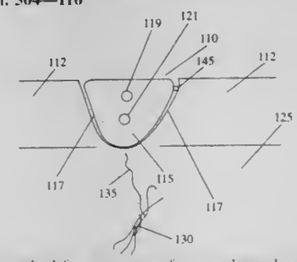
## METHOD AND COMPOSITION FOR PROTECTING PAVEMENT STRUCTURE FROM GROWTH OF PLANTS IN SPLITS OF THE STRUCTURE

**Peter Van Voris, Richland; Dominic A. Cataldo, Kennewick, both of Wash.; Frederick G. Burton, Stansbury Park, Utah, and W. Eugene Skiens, Wilsonville, Oreg., assignors to Battelle Memorial Institute, Richland, Wash.**

**Continuation-in-part of Ser. No. 376,621, Jan. 23, 1995, abandoned, which is a continuation of Ser. No. 154,640, Nov. 18, 1993, abandoned, which is a continuation of Ser. No. 33,056, Mar. 10, 1993, abandoned, which is a continuation of Ser. No. 914,224, Jul. 13, 1992, abandoned, which is a continuation of Ser. No. 402,065, Sep. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 555,113, Nov. 23, 1983, Pat. No. 5,116,414, which is a continuation-in-part of Ser. No. 314,869, Oct. 26, 1981, abandoned, and a continuation-in-part of Ser. No. 314,810, Oct. 26, 1981, abandoned. This application Jun. 7, 1995, Ser. No. 482,238**

**Int. Cl.**[6] **A01N** *25/10;25/34;33/18*

**U.S. Cl. 504—116** **12 Claims**




**1**. A method for protecting, for a prolonged period of time, the structural integrity of pavement with a split therein, said method comprising the following steps:

(a) placing a polymeric matrix containing a pre-emergence herbicide in said split;

(b) sealing said split with a sealer permitting migration of the herbicide thereinto and therethrough;

(c) allowing the temperature of the sealer to cause said herbicide to release from said polymeric matrix and migrate into and

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through said sealer onto the interface between the sealer and the split and into the soil surrounding the split to form a herbicidal zone adjacent said sealer, the concentration of the pre-emergence herbicide in said zone being sufficiently high to prevent germination of seeds therein;

(d) allowing the temperature of the sealer to continually release said pre-emergence herbicide from said polymeric matrix and migrate into and through said sealer into said herbicidal zone to maintain the herbicide in said zone at a sufficiently high concentration to prevent germination of seeds therein.

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**5,744,424**

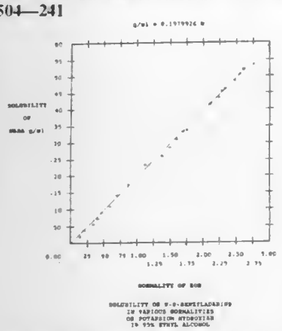
## PLANT GROWTH PROMOTER COMPOSITION COMPRISING N-6-BENZYLADENINE, AN ALCOHOL, AND A METAL HYDROXIDE

**Richard R. Dedolph, Taylorsville, Ky., assignor to Caudill Seed Company, Inc., Louisville, Ky.**

**Continuation-in-part of Ser. No. 160,736, Dec. 3, 1993, Pat. No. 5,455,220. This application Oct. 2, 1995, Ser. No. 538,015**

**Int. Cl.[6] A01N** *25/02;25/22;43/90*

**U.S. Cl. 504—241** **19 Claims**



1. A plant growth promoter composition for regulation and promotion of the growth rate and characteristics of plants comprising N-6-Benzyladenine concentrated in a solubilizing agent comprising at least 1% of a water soluble organic hydroxy compound selected from the group consisting of glycerine, ethanol, methanol, ethylene glycol, polypropylene glycol, and propylene glycol, and a metal hydroxide-soluble in a water solution.

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**5,744,425**

## SACCHARIN DERIVATIVES

**Peter Plath, Frankenthal; Uwe Kardorff, Mannheim; Wolfgang von Deyn, Neustadt; Stefan Engel, Wörrstadt; Jürgen Kast, Böhl-Iggelheim; Harald Rang, Altrip; Hartmann König, Heidelberg; Matthias Gerber, Limburgerhof; Helmut Walter, Obrigheim, and Karl-Otto Westphalen, Speyer, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**PCT No. PCT/EP95/02973, § 371 Date Feb. 3, 1997, § 102(e) Date Feb. 3, 1997, PCT Pub. No. WO96/05182, PCT Pub. Date Feb. 22, 1996**

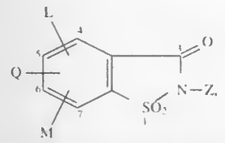
**PCT Filed Jul. 27, 1995, Ser. No. 776,582**

**Claims priority, application Germany, Aug. 8, 1994, 44 27 995.7**

**Int. Cl.[6] C07D** *275/06;* **A01N** *43/80*

**U.S. Cl. 504—269** **7 Claims**

1. A saccharin derivative of the formula I



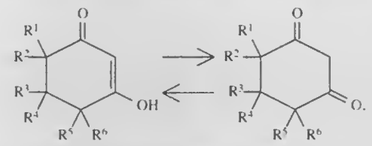
where the substituents have the following meanings:

L and M are hydrogen, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkylthio, chlorine, cyano, methylsulfonyl, nitro or trifluoromethyl;

Z is hydrogen, $C_1$–$C_4$-alkyl, $C_3$–$C_8$-cycloalkyl, $C_3$–$C_6$-alkenyl, $C_3$–$C_5$-alkynyl, $C_1$–$C_4$-acyl, benzyl or phenyl, the phenyl rings in each case being unsubstituted or substituted by halogen or $C_1$–$C_4$-alkyl;

Q is a radical CO—J;

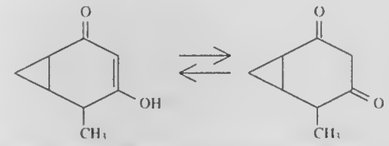
J is a 2-linked cyclohexane-1,3-dione ring of the formula II



II

where either $R^1$ to $R^6$ are hydrogen or methyl, or, if $R^1$, $R^2$, $R^3$, $R^5$ and $R^6$ are hydrogen, $R^4$ is 2-ethylthiopropyl, tetrahydropyran-3-yl, tetrahydropyran-4-yl, tetrahydrothiopyran- 3-yl or 1-methylthiocyclopropyl,

or, if $R^1$, $R^4$ and $R^5$ are hydrogen and $R^6$ is methyl, $R^2$ and $R^3$ form a three-membered ring such that a 2-linked bicyclo-[ 4.1.0]heptane ring of the formula III results



III

and agriculturally customary salts of the compounds I.

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**5,744,426**

## SUBSTITUTED 3-PHENYLPYRAZOLES

**Christoph-Sweder von dem Bussche-Hünnefeld, Mannheim; Ralf Klintz, Gruenstadt; Gerhard Hamprecht, Weinheim; Elisabeth Heistracher, Ludwigshafen; Peter Schäfer, Ottersheim; Klaus Ditrich, Gönnheim; Karl-Otto Westphalen, Speyer; Matthias Gerber, Limburgerhof, and Helmut Walter, Obrigheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**PCT No. PCT/EP95/02062, § 371 Date Nov. 26, 1996, § 102(e) Date Nov. 26, 1996, PCT Pub. No. WO95/33728, PCT Pub. Date Dec. 14, 1995**

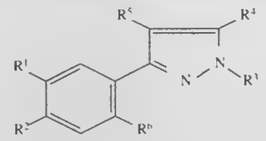
**PCT Filed May 31, 1995, Ser. No. 750,231**

**Claims priority, application Germany, Jun. 3, 1994, 44 19 517.6**

**Int. Cl.[6] A01N** *43/56;* **C07D** *231/20*

**U.S. Cl. 504—282** **5 Claims**

1. A substituted 3-phenylpyrazole of the formula I



I

where

$R^1$ is $-C(R^8)=C(R^7.R^{12})$ with

$R^8$ being hydrogen,

$R^7$ being halogen, $C_1$–$C_4$-haloalkyl or $C_2$–$C_4$-alkenyl and $R^{12}$ being $-COOR^{29}$ or $CO-N(R^{34},R^{35})$ whereas $R^{29}$,$R^{34}$ and $R^{35}$ are independently hydrogen or $C_1$–$C_8$-alkyl;

$R^2$ is halogen;

$R^3$ is $C_1$–$C_4$-alkyl;

$R^4$ is $C_1$–$C_4$-haloalkoxy;

$R^5$ is halogen and

$R^6$ is hydrogen or halogen.



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**5,744,427**

## THALLIUM OXIDE SUPERCONDUCTOR AND METHOD OF PREPARING THE SAME

**Yasuko Torii, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan**

**Continuation of Ser. No. 43,131, Jan. 11, 1993, abandoned, which is a continuation of Ser. No. 675,212, Mar. 26, 1991, abandoned. This application Apr. 25, 1994, Ser. No. 232,847**

**Claims priority, application Japan, Mar. 26, 1990, 2-77463; Mar. 26, 1990, 2-77464; Mar. 26, 1990, 2-77465; Mar. 26, 1990, 2-77466; Mar. 27, 1990, 2-80419; Mar. 27, 1990, 2-80420; Mar. 27, 1990, 2-80422**

**Int. Cl.[6] H01L** *39/24*

**U.S. Cl. 505—433** **13 Claims**

1. A method of preparing a thallium oxide superconductor, comprising the steps of:

providing a thallium oxide raw material powder;

providing a sheath of metal from the group consisting of silver and silver alloy;

sintering said thallium oxide raw material powder, thereby providing a thallium oxide superconductive material;

filling said sheath with said thallium oxide superconductive material thereby providing a wire;

deforming said wire into a tape consisting of said thallium oxide superconductive material surrounded by said metal;

performing a first heat treatment on said thallium oxide superconductive material and said metal of said tape at a temperature between about 700° C. and about 920° C., then

applying a compressive load to said metal and said thallium oxide superconductive material of said tape; and then

performing a second heat treatment on said thallium oxide superconductive material and said metal of said tape at a temperature between about 750° C. and about 870° C., wherein said temperature of said first heat treatment is higher than said temperature of said second heat treatment.

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**5,744,428**

## PROCESS USING GELLAN AS A FILTRATE REDUCER FOR WATER-BASED DRILLING FLUIDS

**Eric Dreveton, Chanopost; Jacqueline Lecourtier, Rueil Malmaison; Daniel Ballerini, St Germain En Laye, and Lionel Choplin, Nancy, all of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France**

**Continuation of Ser. No. 362,859, Dec. 23, 1994, abandoned. This application Apr. 15, 1996, Ser. No. 632,315**

**Claims priority, application France, Dec. 24, 1993, 93 15719**

**Int. Cl.[6] C09K** *7/02*

**U.S. Cl. 507—110** **17 Claims**

1. In a process used in a well drilled through at least one geologic formation having a certain permeability, said process comprising circulating a water-based fluid in said well, the improvement comprising adding a sufficient mount of gellan in said fluid to reduce filtration of said water-based fluid and control the permeability of the walls of said well drilled in said formation.

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**5,744,429**

## MIXED ETHYLENE ALPHA OLEFIN COPOLYMER MULTIFUNCTIONAL VISCOSITY MODIFIERS USEFUL IN LUBE OIL COMPOSITIONS

**David Yen-Lung Chung, Edison, N.J.; Paul Brice, Abingdon; Steven James Searis, Wantage, both of England; Mark Joseph Struglinski, Bridgewater, and John Brooke Gardiner, Mountainside, both of N.J., assignors to Exxon Chemical Patents Inc, Linden, N.J.**

**Division of Ser. No. 414,074, Mar. 31, 1995, abandoned, which is a division of Ser. No. 989,418, Dec. 11, 1992, Pat. No. 5,427,702. This application Jun. 27, 1996, Ser. No. 671,563**

**Int. Cl.[6] C10M** *149/06;133/52*

**U.S. Cl. 508—221** **19 Claims**

1. Multifunctional viscosity index improver composition comprising a mixture of derivatized ethylene-alpha olefin Copolymer A and derivatized ethylene-alpha olefin Copolymer B, said A and B derivatized copolymers being:

(a) present in said mixture at a blend weight ratio of A:B of from about 2.3:1 to about 0.18:1, and (b) derived from copolymer having a number average molecular weight of from about 20,000 to about 100,000 and wherein:

A. derivatized Copolymer A comprises the adduct of:

(i) ethylene-alpha olefin copolymer comprising from about 30 to about 60 weight percent monomer units derived from ethylene and from about 70 to about 40 weight percent monomer units derived from alpha olefin, functionalized with mono- or dicarboxylic acid material; and

(ii) at least one nucleophilic amine; and

B. derivatized Copolymer B comprises the adduct of:

(i) ethylene-alpha olefin copolymer, comprising from about 60 to about 80 weight percent monomer units derived from ethylene and from about 40 to about 20 weight percent monomer units derived from alpha olefin, functionalized with mono- or dicarboxylic acid material; and

(ii) at least one nucleophilic amine; with the proviso that the respective weight percents of ethylene derived monomer units present in said A and B derivatized copolymers differs by at least 5 weight percent.

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**5,744,430**

## ENGINE OIL COMPOSITION

**Kiyoshi Inoue; Yasuhisa Yamada; Akira Yaguchi, and Masakuni Hirata, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan**

**Filed Apr. 25, 1996, Ser. No. 637,482**

**Claims priority, application Japan, Apr. 28, 1995, 7-127351; Jun. 15, 1995, 7-172698**

**Int. Cl.[6] C10M** *141/00*

**U.S. Cl. 508—295** **11 Claims**

1. An engine oil composition comprising:

(a) a base oil having a kinematic viscosity of from 2 to 8 $mm^2/s$ at 100° C. and a total amount of aromatics of 2 to 15% by weight;

(b) calcium salicylate detergent in an amount of from 0.5 to 1.2% by weight as converted to the concentration of sulfated ash;

(c) a zinc dialkyldithiophosphate in an amount of from 0.04 to 0.10% by weight as converted to the concentration of phosphorus;

(d) a succinimide ashless dispersant in an amount of from 0.05 to 0.20% by weight as converted to the concentration of nitrogen, the succinimide ashless dispersant containing a polybutenyl group having a number-average molecular weight of from 900 to 3500;

(e) a phenol ashless antioxidant in an amount of from 0.1 to 3.0% by weight;

(f) a molybdenum dithiocarbamate friction modifier in an amount of from 0.02 to 0.15% by weight as converted to the concentration of molybdenum; and

(g) a viscosity index improver in such an amount that the kinematic viscosity of said composition ranges from 5.6 to 12.5 $mm^2/s$ at 100° C. and selected from the group consisting of ethylene-propylene copolymer, polymethacrylate, graft copolymer of ethylene-propylene copolymer and polymethacrylate and mixtures thereof of ethylene-propylene copolymer and polymethacrylate, said improver having a molecular weight range of from 50,000 to 1,000,000;

wherein the weight percentages in the components (b), (c), (d), (e) and (f) are based on the total weight of said engine oil composition.

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5,744,431

## CONDUCTIVE LUBRICANT FOR MAGNETIC DISK DRIVES

Arthur Fred Diaz, San Jose; Robert D. Johnson, Morgan Hill; Thomas Edward Karis, San Martin; Holayanahally S. Nagaral, Morgan Hill, all of Calif., and My Thanh Nguyen, Montclair, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 479,496, Jun. 7, 1995, abandoned, which is a division of Ser. No. 370,594, Jan. 10, 1995, abandoned. This application Nov. 15, 1996, Ser. No. 749,711

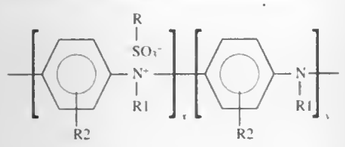
Int. Cl.[6] C10M *151/04*

U.S. Cl. 508—410 3 Claims

1. A process of preparing a disk drive conductive grease for use in a closed hard disk drive apparatus comprising the steps of:

mixing an antistatic additive with a non-ferrous oil lubricant until said antistatic additive dissolves therein;

adding a thickener to form a conductive grease, wherein said anti-static additive is a conducting polyaniline derivative made soluble with long chain organic acid or hydrocarbon side chain having the basic chemical structure:



where R is selected from the group consisting of dodecyl benzyl and camphor; $R_1$ is selected from the group consisting of H, alkyl, benzyl, and allyl; and $R_2$ is selected from the group consisting of H, alkyl, alkoxy, and halide; where $0<x/y<1$.

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5,744,432

## STAMPING LUBRICANTS

Jeff A. Barnhorst; Roger H. Garst, both of Cincinnati, Ohio; Ronald H. Gordon, Marlboro, N.J., and Eugene R. Zehler, West Chester, Ohio, assignors to Henkel Corporation, Plymouth Meeting, Pa.

Continuation-in-part of Ser. No. 404,783, Mar. 15, 1995, Pat. No. 5,569,406. This application Oct. 28, 1996, Ser. No. 739,486

Int. Cl.[6] C10M *173/02*

U.S. Cl. 508—431 22 Claims

1. An aqueous-based stamping lubricant composition comprising: (1) water; (2) from about 6% to about 15% of a polyester that is water-soluble or readily emulsifiable in water wherein said polyester is the reaction product of one or more dicarboxylic acids and a polyalkylene glycol; (3) from about 0.5% to about 10% of one or more $C_8$–$C_{18}$ alkylalcohols having an average degree of ethoxylation of from about 3 to about 8; (4) from about 0.5% to about 2.0% of the salt of a phosphate ester of an ethoxylated $C_8$–$C_{18}$ alkyl alcohol having an average degree of ethoxylation of from about 3 to about 8; and (5) from about 0.5% to about 3.0% of an alkanolamine.

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5,744,433

## METAL POWDER COMPOSITION FOR WARM COMPACTION AND METHOD FOR PRODUCING SINTERED PRODUCTS

Helge Storström, and Björn Johansson, both of Höganäs, Sweden, assignors to Höganäs AB, Höganäs, Sweden

PCT No. PCT/SE95/00636, § 371 Date Nov. 29, 1996, § 102(e) Date Nov. 29, 1996, PCT Pub. No. WO95/33589, PCT Pub. Date Dec. 14, 1995

PCT Filed Jun. 1, 1995, Ser. No. 750,040

Claims priority, application Sweden, Jun. 2, 1994, 9401922

Int. Cl.[6] C10M *149/18*

U.S. Cl. 508—454 21 Claims

1. A metal powder composition for warm compaction comprising an iron-based powder and a lubricant powder consisting essentially of an amide oligomer having a weight-average molecular weight $M_w$ between 1,000 and 30,000 and a melting point peak in the range of 120° to 200° C.

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5,744,434

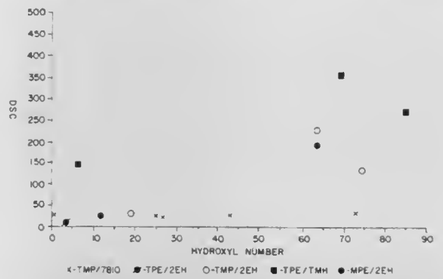
## POLYOL ESTER COMPOSITIONS WITH UNCONVERTED HYDROXYL GROUPS

Richard Henry Schlosberg, Bridgewater; Haven S. Aldrich, Westfield, both of N.J.; Lavonde Denise Sherwood-Williams, Baton Rouge, La.; John S. Szobota, Morristown, N.J.; Martin Anthony Krevalis, Baton Rouge, La.; Daniel P. Leta, Flemington, N.J.; David Gary Lawton Holt, Brights Grove, Canada, and Fay H. Gordon, Oxford, England, assignors to Exxon Chemical Patents Inc., Houston, Tex.

Continuation-in-part of Ser. No. 403,366, Mar. 14, 1995. This application Mar. 14, 1996, Ser. No. 615,380

Int. Cl.[6] C10M *129/74*

U.S. Cl. 508—485 46 Claims




1. A synthetic ester composition exhibiting thermal and oxidative stability which comprises the reaction product of:

a branched or linear alcohol having the general formula $R(OH)_n$, wherein R is an aliphatic or cyclo-aliphatic group having from about 2 to 20 carbon atoms and n is at least 2; and

at least one linear mono-carboxylic acid which has a carbon number in the range between about $C_2$ to $C_{12}$; wherein said synthetic ester composition has between about 5–35% unconverted hydroxyl groups, based on the total amount of hydroxyl groups in said branched or linear alcohol.

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5,744,435

## PERFUMES FOR LAUNDRY AND CLEANING COMPOSITIONS

Frederick Anthony Hartman, Cincinnati; Mark Robert Sivik, Fairfield; John Cort Severns, West Chester; Scott William Waite, Cincinnati, all of Ohio, and Cynthia Lee Eddy, West Harrison, Ind., assignors to The Procter & Gamble Company, Cincinnati, Ohio

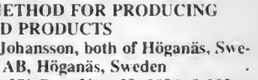
Division of Ser. No. 517,941, Aug. 22, 1995, Pat. No. 5,652,205, which is a division of Ser. No. 277,558, Jul. 19, 1994, abandoned. This application Apr. 25, 1997, Ser. No. 846,162

Int. Cl.[6] C11D *3/50*

U.S. Cl. 510—101 16 Claims

1. Laundry and cleaning compositions comprising:

(a) from about 0.01% to about 10%, by weight of the composition, of a nonionic or anionic ester of an allylic alcohol perfume having the formula:



wherein R is selected from the group consisting of nonionic or anionic substituted or unsubstituted $C_1$–$C_{30}$ straight, branched or cyclic alkyl, alkenyl, alkynyl, alkylaryl, or aryl group; each of R', R", and R'" is independently selected from the group consisting of hydrogen, or a nonionic or anionic substituted or unsubstituted $C_1$–$C_{25}$ straight, branched or cyclic alkyl, alkenyl, alkynyl, alkylaryl, or aryl group; and n is an integer of 1 or greater; and

(b) from about 90% to about 99.99%, by weight of the composition, of ingredients useful for formulating laundry and cleaning compositions.

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5,744,436

## AZEOTROPIC COMPOSITIONS CONTAINING PERFLUORINATED CYCLOAMINOETHER

Richard M. Flynn, Mahtomedi, and Daniel R. Vitcak, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 369,505, Jan. 6, 1995, Pat. No. 5,484,489, which is a division of Ser. No. 41,693, Apr. 1, 1993, Pat. No. 5,401,429. This application Jan. 16, 1996, Ser. No. 586,994

Int. Cl.[6] C11D *7/30;7/26;7/32;* C09K *5/04*

U.S. Cl. 510—178 2 Claims

1. An azeotropic composition consisting essentially of about 50 to 40 weight percent perfluoro-N-methyl-morpholine and about 50 to 60 weight percent 1-fluoro-1,1- dichloroethane, which when fractionally distilled, produces a distillate fraction that is an azeotrope of perfluoro-N-methyl-morpholine and 1-fluoro-1,1-dichloroethane that boils at about 27° C. at atmospheric pressure.

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5,744,437

## SINGLE PHASE LIQUID COMPOSITION FOR CLEANING AND PAINT STRIPPING AND USE THEREOF

Edward A. Rowe, Grand Island; Hang-Chang Bobby Chen, Getzville, and Mark E. Lindrose, Buffalo, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

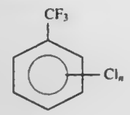
Continuation-in-part of Ser. No. 339,519, Nov. 14, 1994, abandoned. This application Nov. 25, 1996, Ser. No. 753,464

Int. Cl.[6] C11D *3/20;3/24;1/22;* B08B *3/08*

U.S. Cl. 510—204 21 Claims

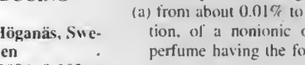
1. A liquid composition comprising

(A) about 2 to about 20 wt % of a solvent having the general formula



wherein "n" is 1 or 2;

(B) about 4 to about 50 wt % of a cosolvent having the formula



where $R_1$ and $R_2$ are each independently selected from alkyl from $C_1$ to $C_6$ and "m" is 1 or 2;

(C) 2 to about 40 wt % of an alkanol from $C_1$ to $C_3$, where the total of cosolvent plus alkanol is about 41 to about 68 wt %;

(D) 0 to about 5 wt % of a surfactant; and

(E) about 7 to about 56 wt % water, said composition being a single phase.

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5,744,438

## AMMONIUM BICARBONATE/AMMONIUM CARBAMATE ACTIVATED BENZYL ALCOHOL PAINT STRIPPER

John Distaso, Orange, Calif., assignor to Elf Atochem North America, Inc., Philadelphia, Pa.

Continuation of Ser. No. 340,919, Nov. 17, 1994, Pat. No. 5,569,410. This application Jul. 26, 1996, Ser. No. 686,787

Int. Cl.[6] C11D *7/50*

U.S. Cl. 510—207 11 Claims

1. A paint stripping composition comprising

(a) a continuous benzyl alcohol organic phase containing an emulsifying agent and a predominant amount of benzyl alcohol sufficient to form said continuous phase,

(b) a discrete water phase dispersed in the continuous organic phase, said water phase containing water and an ammonium compound selected from the group consisting of

(i) ammonium carbamate,

(ii) ammonium bicarbonate,

(iii) ammonium carbamate acid carbonate and combinations thereof,

wherein said ammonium compound is present in an amount sufficient to activate the paint stripping activity of the composition.

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5,744,439

## COMPOSITIONS AND PROCESS FOR BLEACHING SURFACES AND/OR REMOVING LIMESCALE THEREFROM

Heather Elizabeth Bonett, Hull, England, assignor to Reckitt & Colman Products Limited, London, United Kingdom

Filed Feb. 1, 1996, Ser. No. 595,358

Claims priority, application United Kingdom, Feb. 1, 1995, 9501922

Int. Cl.[6] C23G *1/02*

U.S. Cl. 510—247 9 Claims

1. A process for providing limescale removal at a surface, comprising applying to that surface an aqueous composition having a pH of 2 or less and comprising a mixture of

(a) an aqueous composition comprising hydrogen peroxide or an organic peracid having a pH of greater than 2 but less than 7, and

(b) an acidic composition comprising an acid selected from the group consisting of hydrochloric acid, sulphamic acid, tartaric acid, phosphoric acid, oxalic acid, citric acid and salicylic acid

wherein the components (a) and (b) are mixed not more than two hours before being applied to the surface requiring limescale removal.

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5,744,440

## HARD SURFACE CLEANING COMPOSITIONS INCLUDING A VERY SLIGHTLY WATER-SOLUBLE ORGANIC SOLVENT

Augustine Liu, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 347,589, Nov. 30, 1994, Pat. No. 5,503,778, which is a continuation of Ser. No. 39,642, Mar. 30, 1993, abandoned. This application Feb. 6, 1996, Ser. No. 597,681

Int. Cl.[6] C11D *3/28;1/75;3/43*

U.S. Cl. 510—362 16 Claims

1. A composition suitable for removing soap scum and mineral scale as may be found in household bathrooms, the composition comprising:

a) an organic solvent having a surface tension of no more than about 30 dynes/cm at 0.1 weight percent in water, and which is very slightly water-soluble;

b) an amine oxide coupler present at a concentration of at least 3 times the amount required to completely solubilize the organic solvent (as observed visually with no magnification);

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c) a strong organic acid; and

d) a weak organic acid;

wherein the soap scum removal rate improves when the amine oxide coupler is present at a weight which is at least three times that weight required to completely solubilize the organic solvent.

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**5,744,441**

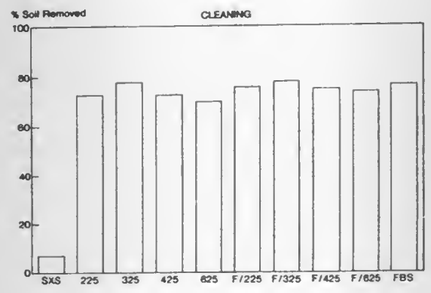
**ENHANCED PERFORMANCE OF AMPHOTERIC SURFACTANTS**

**Allen D. Urfer, Lansdale, and Michael Counts, Bethlehem, both of Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.**

**Continuation of Ser. No. 252,122, Jun. 1, 1994, abandoned. This application Aug. 16, 1996, Ser. No. 689,954**

**Int. Cl.[6] C11D** *1/94;3/22;3/28*

**U.S. Cl. 510—433** **20 Claims**




1. A process for making a hydrotrope consisting essentially of combining an alkyl polyglycoside having the formula I:

$$R_1O(Z)_a \quad (I)$$

wherein $R_1$ is a monovalent organic radical having from about 6 to about 30 carbon atoms; Z is saccharide residue having 5 or 6 carbon atoms; a is a number having a value from 1 to about 6 and an amphoteric surfactant, in a percent actives ratio of about 1:1.

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**5,744,442**

**REGULATION OF CELLULAR INVASIVENESS**

**Carl D. Richards, Hamilton, Canada; Mohammed Shoyab, Seattle, Wash.; Jack Gauldie, Hamilton, Canada, and Thomas Joseph Brown, Poulsbo, Wash., assignors to Bristol Meyers Squibb Company, New York, N.Y., and McMaster University, Hamilton, Canada**

**Filed Aug. 26, 1992, Ser. No. 935,097**

**Int. Cl.[6] A01N** *37/18;* **C07K** *14/475*

**U.S. Cl. 514—2** **5 Claims**

1. A method for promoting healing of an injury in a patient comprising administering to said patient a tissue inhibitor of metalloproteinase (TIMP) increasing effective amount of a therapeutic composition comprising oncostatin-M.

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**5,744,443**

**Patent Not Issued For This Number**

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**5,744,444**

**HPTH-FRAGMENT-(1-37), THE PREPARATION THEREOF, MEDICAMENTS CONTAINING SAME AND THE USE THEREOF**

**Wolf-Georg Forssmann, Hanover; Franz Herbst, Nussloch; Peter Schulz-Knappe, Neustadt; Knut Adermann, Hanover, and Michael Gagelmann, Schriersheim, all of Germany, assignors to HaemoPep Pharma GmbH, Hanover, Germany**

**Continuation of Ser. No. 155,658, Nov. 22, 1993, abandoned, which is a continuation of Ser. No. 863,291, Jun. 29, 1992, abandoned. This application May 12, 1995, Ser. No. 440,117**

**Claims priority, application Germany, Oct. 27, 1989, 39 35 738.4; WIPO, Oct. 25, 1990, PCT/EP90/01807**

**Int. Cl.[6] A61K** *38/17;* **C07K** *4/435*

**U.S. Cl. 514—12** **6 Claims**

1. An isolated hPTH fragment-(1-37) consisting of the amino acid sequence according to SEQ ID NO:1 or an amidated, acetylated, phosphorylated, or glycosylated derivative thereof.

2. A method for treating hypoparathyroidism comprising administering to a patient in need of such treatment, an amount of the fragment according to claim 1 effective to treat hypoparathyroidism.

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**5,744,445**

**METHOD OF TREATING PULMONARY DISEASE STATES WITH NON-NATURALLY OCCURING AMPHIPATHIC PEPTIDES**

**Jesse M. Jaynes, Baton Rouge, La., and Gordon R. Julian, Cary, N.C., assignors to Demeter Biotechnologies, Ltd., Durham, N.C.**

**Continuation of Ser. No. 39,620, Jun. 4, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 457,798**

**Int. Cl.[6] A61K** *38/00;38/10;38/16*

**U.S. Cl. 514—12** **20 Claims**

1. A method for treating a pulmonary disease state in a warm-blooded animal in need thereof, comprising in vivo delivery by oral or aerosol means to a corporeal situs in the warm-blooded animal of an amount of a non-naturally occurring amphipathic peptide effective for treatment of such disease state, wherein the peptide is selected from the group consisting of SEQ ID Nos. 1–38, wherein the disease state is selected from the group consisting of: cystic fibrosis, neoplasias, bronchogenic cancers, pneumonia, bronchopulmonary viral infections, and bronchopulmonary microbial infections.

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**5,744,446**

**HYBRID HUMAN/ANIMAL FACTOR VIII**

**John S. Lollar, Decatur, Ga., and Marschall S. Runge, Galveston, Tex., assignors to Emory University, Atlanta, Ga.**

**Continuation-in-part of Ser. No. 212,133, Mar. 11, 1994, Pat. No. 5,663,060, which is a continuation of Ser. No. 864,004, Apr. 7, 1992, Pat. No. 5,364,771. This application Jun. 7, 1995, Ser. No. 474,503**

**Int. Cl.[6] A61K** *38/00;* **C12P** *21/04;* **C12N** *15/00;* **C07K** *14/755*

**U.S. Cl. 514—12** **20 Claims**

1. A procoagulant hybrid factor VIII comprising human factor VIII having a sequence of amino acids substituted for a sequence selected from the group of A2 domain fragments consisting of amino acids 373–540, 373–508, 445–508, 484–508, 404–508, 489–508 and 484–489 according to SEQ ID NO:2, the substitution being a corresponding sequence of a non-human mammalian factor VIII.



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**5,744,447**

**Patent Not Issued For This Number**

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**5,744,448**

**HUMAN FOLLICLE STIMULATING HORMONE RECEPTOR**

**Christie Ann Kelton, Hopkinton; Shirley Vui Yen Cheng, Boston; Noreen Patrice Nugent, Framingham, and Rene Lynn Schweickhardt, Quincy, all of Mass., assignors to Applied Research Systems ARS Holding N.V., Curacao, Netherlands Antilles**

**Division of Ser. No. 670,085, Mar. 15, 1991. This application Jun. 7, 1995, Ser. No. 487,886**

**Int. Cl.[6] A61K** *38/16;* **C07K** *14/72*

**U.S. Cl. 514—12** **15 Claims**

1. A method of reducing endogenous human follicle stimulating hormone (FSH) bioactivity in a patient, comprising administering to said patient, in an amount effective to reduce the endogenous FSH bioactivity, a polypeptide capable of binding FSH which includes a contiguous portion of the extracellular domain of the human FSH receptor, said domain having the sequence of amino acids 1-349 of SEQ ID NO:2 which portion retains substantially the same FSH-binding characteristics as the complete extracellular domain, or a polypeptide which includes a mutein of said portion which mutein retains at least 95% identity with said portion and which mutein retains substantially the same FSH-binding characteristic as said portion.

6. A method of preventing follicle growth and maturation in a female patient, comprising administering to said patient, in an amount effective to prevent follicle growth and maturation, a polypeptide capable of binding human follicle stimulating hormone (FSH) which includes a contiguous portion of the extracellular domain of the human FSH receptor, said domain having the sequence of amino acids 1-349 of SEQ ID NO:2 which portion retains substantially the same FSH-binding characteristics as the complete extracellular domain, or a polypeptide which includes a mutein of said portion which mutein retains at least 95% identity with said portion and which mutein retains substantially the same FSH-binding characteristic as said portion.

11. A method of preventing spermatogenesis in a male patient, comprising administering to said patient, in an amount effective to prevent spermatogenesis, a polypeptide capable of binding human follicle stimulating hormone (FSH) which includes a contiguous portion of the extracellular domain of the human FSH receptor, said domain having the sequence of amino acids 1-349 of SEQ ID NO:2 which portion retains substantially the same FSH-binding characteristics as the complete extracellular domain, or a polypeptide which includes a mutein of said portion which mutein retains at least 95% identity with said portion and which mutein retains substantially the same FSH-binding characteristic as said portion.

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**5,744,449**

**LETHAL TOXIN NEUTRALIZING FACTORS**

**Binie V. Lipps, and Frederick W. Lipps, both of 4509 Mimosa Dr., Bellaire, Tex. 77401**

**Continuation-in-part of Ser. No. 310,340, Sep. 22, 1994, Pat. No. 5,576,297, which is a continuation-in-part of Ser. No. 58,387, May 10, 1993, abandoned. This application Jun. 3, 1996, Ser. No. 657,163**

**Int. Cl.[6] A61K** *38/10;38/16;* **C07K** *7/08;14/47*

**U.S. Cl. 514—14** **20 Claims**

1 2 3 4



1. A peptide having a molecular weight in the range of 250 to 2,500 g/mole and comprising at least a 3 amino acid portion of the sequence set forth in Sequence ID. No. 1.

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**5,744,450**

**GNRH ANALOGS**

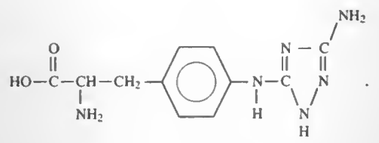
**Carl A. Hoeger, San Marcos; Jean E. F. Rivier, La Jolla; Paula Guess Theobald, Oceanside; John S. Porter, Leucadia; Catherine L. Rivier, and Wylie Walker Vale, Jr., both of La Jolla, all of Calif., assignors to The Salk Institute For Biological Studies, LaJolla, Calif.**

**Division of Ser. No. 210,619, Mar. 18, 1994, Pat. No. 5,580,957, which is a continuation-in-part of Ser. No. 78,965, Jun. 17, 1993, Pat. No. 5,352,796, and a continuation-in-part of Ser. No. 6,729, Jan. 21, 1993, Pat. No. 5,296,468, which is a continuation-in-part of Ser. No. 669,695, Mar. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 545,239, Jun. 27, 1990, Pat. No. 5,169,932, which is a continuation-in-part of Ser. No. 428,827, Oct. 30, 1989, abandoned. This application Jun. 2, 1995, Ser. No. 460,246**

**Int. Cl.[6] A61K** *38/00*

**U.S. Cl. 514—15** **9 Claims**

1. A GnRH agonist peptide or a nontoxic salt thereof, said peptide having the formula: pGlu-His-Trp-Ser-Tyr-U*-$AA_7$-Arg-Pro-$AA_{10}$ wherein $AA_7$ is Nle, Leu, NML, (A)Phe, Met, Nva, Tyr, (B)Trp or PAL; A is H, Cl, F, $NO_2$, $CH_3$ or Br; B is H, $NO_2$, $NH_2$, $OCH_3$, F, Cl, Br, $CH_3$, $N^{in}$For or $N^{in}$Ac; $AA_{10}$ is Gly-$NH_2$, NHNH-$CONH_2$ or NH(R); R is lower alkyl; and U* is a D-isomer having the formula:



5,744,451

## N-SUBSTITUTED GLUTAMIC ACID DERIVATIVES WITH INTERLEUKIN-1 β CONVERTING ENZYME INHIBITORY ACTIVITY

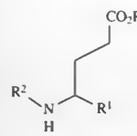
**Hamish John Allen; Subbashis Banerjee, both of Shrewsbury; Kenneth Dale Brady, Worcester, all of Mass.; John Cooke Hodges, Ann Arbor; Catherine Rose Kostlan, Saline, both of Mich., and Robert Vincent Talanian, Harvard, Mass., assignors to Warner-Lambert Company, Morris Plains, N.J., and BASF A.G., Ludwigshafen, Germany**

**Filed Aug. 13, 1996, Ser. No. 700,716**

**Int. Cl.[6] A61K** *38/05;38/06;38/09*

**U.S. Cl. 514—18** **5 Claims**

**1.** A compound of Formula I or a pharmaceutically acceptable salt thereof wherein:

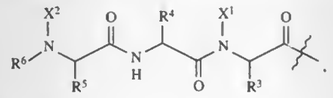


I

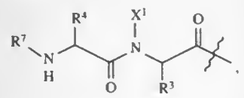
R is H;

$R^1$ is CHO, $COCH_3$, $COCF_3$, $CH(OCH_3)_2$ or CN; and

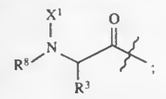
$R^2$ is a tripeptide of the formula



a dipeptide of the formula

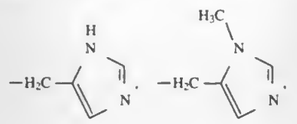


an amino acid derivative of the formula

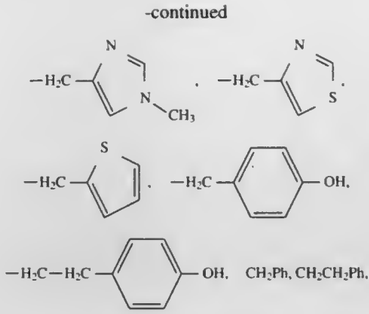


or an amide, urea, or sulfonamide of the formula $R^8$ and $R^2$ is amide when $R^1$ is not CN;

wherein $R^3$ and $R^4$ are each independently H, $CH_3$, $C_2H_5$, n—$C_3H_7$, $CH(CH_3)_2$, n—$C_4H_9$, $CH_2CH(CH_3)_2$, $CH(CH_3)C_2H_5$, $CH_2OH$, $CH_2SH$, $CH_2CH_2OH$, $CH_2CH_2SCH_3$, $CH(OH)CH_3$, $CH_2CH{=}CH_2$,

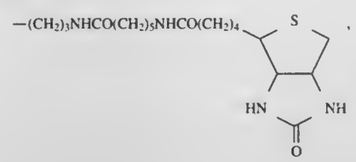


-continued

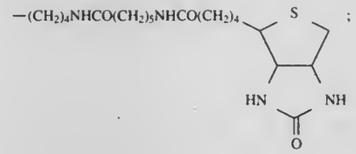


$(CH_2)_3NH_2$, $(CH_2)_4NH_2$, $(CH_2)_3NHCOCH_3$, $(CH_2)_4NHCOCH_3$, $(CH_2)_3NHCOPh$, $(CH_2)_4NHCOPh$, $(CH_2)_3NHCO_2CH_2Ph$, $(CH_2)_4NHCO_2CH_2Ph$, $CH_2CH_2CO_2H$,

$CH_2CH_2CONH_2$,



or

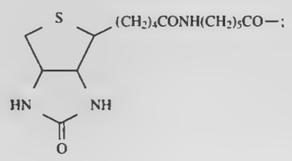


;

$X^1$ and $X^2$ are each independently H, or $CH_3$;

$R^5$ is $CH_2Ph$, $CH_2CH_2Ph$, $CH_2(4—HO—Ph)$, $CH_2CH_2(4—HO—Ph)$, $CH_2$-cyclohexyl, $CH_2CH_2$-cyclohexyl, $CH_2CH(CH_3)_2$, $CHCH_2$-(2-naphthyl), or $CH_2$-(3-indolyl);

$R^6$ is $CH_3CO$, $CH_3CH_2CO$, $CH_3SO_2$, $CH_3CH_2SO_2$, or



$R^7$ is $PhCH_2OCO$, $PhCH_2CH_2OCO$, $PhCH_2CH_2CO$, $Ph(CH_2)_3CO$, $PhCH_2NHCO$, $PhCH_2CH_2NHCO$, (2-naphthyl)-$CH_2CO$, or (2-naphthyl)-$CH_2CH_2CO$; and

$R^8$ is $R^9CO$, $R^9OCO$, $R^9NHCO$, or $R^9SO_2$ where $R^9$ is alkyl, alkenyl, aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, heterocycle, or (heterocycle)alkyl wherein when $R^2$ is amide $R^9$ is not aryl.



5,744,452

## γ-L-GLUTAMYL CONTAINING IMMUNOMODULATOR COMPOUNDS AND METHODS THEREWITH

**Alexander A. Kolobov, Sestroretsk; Andrey S. Simbirtsev, St.-Petersburg; Sergey V. Kulikov, St.-Petersburg; Alexey N. Prusakov, St. Petersburg; Natalia M. Kalinina, St. Petersburg; Natalia V. Pigareva, St. Petersburg; Alexander U. Kotov, St. Petersburg; Vladimir M. Shpen, St. Petersburg; Oleg A. Kaurov, St. Petersburg, and Sergey A. Ketlinsky, St. Petersburg, all of Russian Federation, assignors to Edward T. Wei, Berkeley, Calif.**

**Filed Apr. 18, 1996, Ser. No. 634,718**

**Claims priority, application Russian Federation, Nov. 29, 1995, 95119704; Dec. 6, 1995, 95120266**

**Int. Cl.[6] A61K** *38/00;31/40;31/38;* **C07D** *333/22*

**U.S. Cl. 514—19** **14 Claims**

**1.** The compound N-acetyl-γ-L-glutamyl-L-tryptophan.

5,744,453

## POLYAMINE CONJUGATES FOR TREATMENT OF INFECTION

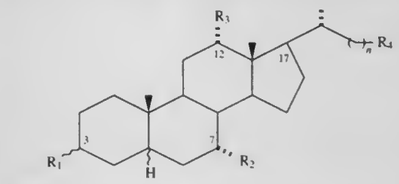
**Clifford S. Mintz, 6 Pebble Rd., East Windsor, N.J. 08570; Natan A. Kogan, 38-B Cedar Lake, Highland Park, N.J. 08904; Ramesh Kakarla, 111B Taylor Ave., East Brunswick, N.J. 08816; Helena R. Axelrod, 15 Piedmont Dr., Cranbury, N.J. 08512, and Michael J. Sofia, 3 Holly La., Lawrenceville, N.J. 08658**

**Filed Jan. 5, 1996, Ser. No. 583,809**

**Int. Cl.[6] A61K** *31/21;31/16;31/13*

**U.S. Cl. 514—26** **27 Claims**

**25.** A method for preventing or inhibiting the growth of at least one microorganism, comprising contacting a microorganism whose growth is to be prevented or inhibited with an effective amount of one or more compounds represented by the formula (I)



(I)

in which

$R_1$ can be an H, OH, $OR_5$, $NH_2$, $NHR_6$ or $NR_6R_7$;

$R_2$ and $R_3$ may be the same or different and can be an H, OH or $OR_5$;

$R_4$ can be $CONH_2$, $CONHR_6$, $CONR_6R_7$, $CH_2NH_2$, $CH_2NHR_6$, $CH_2NR_6R_7$, $CO_2—Y—NH_2$, $CO_2—Y—NHR_6$, or $CO_2—Y—NR_6R_7$;

$R_5$ is a protected or unprotected glycosyl moiety comprising 1–10 monosaccharide units in which the glycosidic linkage at the anomeric carbon atom of each monosaccharide unit is independently alpha or beta;

$NH_2$, $NHR_6$, and $NR_6R_7$ represent an unsubstituted amino group, a monosubstituted amino group, and a disubstituted amino group, respectively, in which $R_6$ and $R_7$ may be the same or different and represent a hydrocarbon group comprising 1–15 carbon atoms substituted with one or more unsubstituted, monosubstituted or disubstituted amino groups;

Y represents a linear or branched alkylene group comprising 1–10 carbon atoms;

n is an integer from 0–10;

or its salts;

provided that if $R_1$ is OH and $R_2$ is OH and $R_3$ is H, or if $R_1$ is OH and $R_2$ is H or OH and $R_3$ is OH, then $R_4$ cannot be a $CONH_2$, $CONHCH_2CH_2N(C_2H_5)_2$, $CON(CH_2CH_2)_2N—CH_3$, $CH_2NH_2$, $CH_2NHCH_2CH_2N(C_2H_5)_2$, or $CH_2N(CH_2CH_2)_2N—CH_3$ group.

5,744,454

## ANTHRACYCLINE DERIVATIVES

**Antonino Suarato; Michele Caruso; Alberto Bargiotti, all of Milan; Dario Ballinari, Milanese, and Jacqueline Lansen, San Vittore Olona, all of Italy, assignors to Pharmacia & Upjohn S.p.A., Milan, Italy**

**PCT No. PCT/EP95/03480, § 371 Date May 6, 1996, § 102(e) Date May 6, 1996, PCT Pub. No. WO96/07665, PCT Pub. Date Mar. 14, 1996**

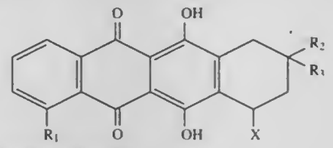
**PCT Filed Sep. 5, 1995, Ser. No. 635,957**

**Claims priority, application United Kingdom, Sep. 8, 1994, 9148260**

**Int. Cl.[6] A61K** *31/70;* **C07H** *15/24*

**U.S. Cl. 514—34** **31 Claims**

**1.** A method of treating amyloidosis comprising administering to a patient in need thereof an effective amount of an anthracycline of formula



A

wherein $R_1$ represents:

hydrogen or hydroxy;

a group of formula $OR_4$ in which $R_4$ is $C_1$–$C_6$ alkyl, $C_5$–$C_6$ cycloalkyl or $CH_2Ph$, with the phenyl(Ph) ring optionally substituted by 1, 2 or 3 substituents selected from the group consisting of F, Cl, Br, $C_1$–$C_6$alkyl, $C_1$–$C_6$ alkoxy and $CF_3$; or

a group of formula $OSO_2R_5$ in which $R_5$ is $C_1$–$C_6$ alkyl or Ph optionally substituted by 1, 2 or 3 substituents selected from the group consisting of halogen such as F, Cl or Br and $C_1$–$C_6$ alkyl;

$R_2$ represents hydrogen, hydroxy or $OR_4$ as above defined;

$R_3$ represents hydrogen, methyl or a group of formula $YCH_2R_6$ in which Y is CO, $CH_2$, CHOH or a group of formula



in which m is 2 or 3 and

$R_6$ is hydrogen or hydroxy;

a group of formula $NR_7R_8$ in which

$R_7$ and $R_8$ are each independently selected from the group consisting of:

a) hydrogen,

b) a $C_1$–$C_6$ alkyl or $C_2$–$C_6$ alkenyl group optionally substituted with hydroxy, CN, $COR_9$, $COOR_9$, $CONR_9R_{10}$, $O(CH_2)_nNR_9R_{10}$ (n is 2 to 4) or $NR_9R_{10}$, in which $R_9$ and $R_{10}$ are each independently selected from the group consisting of hydrogen, $C_1$–$C_{12}$ alkyl, $C_2$–$C_{12}$ alkenyl or phenyl optionally substituted by one or more substituents selected from the group consisting of $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy, F, Br, Cl, $CF_3$, OH, $NR_2$ or CN,

c) $C_3$–$C_6$ cycloalkyl optionally substituted with $COR_9$, $COOR_9$ or OH, wherein $R_9$ is as above defined,

d) phenyl $C_1$–$C_4$ alkyl or phenyl $C_2$–$C_4$ alkenyl optionally substituted on the phenyl ring by one or more, substituents selected from the group consisting of $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy, F, Br, Cl, $CF_3$, OH, $NH_2$ or CN,

e) $COR_9$, $COOR_9$, $CONR_9R_{10}$, $COCH_2NR_9R_{10}CONR_9COOR_{10}$, $SO_2R_9$ in which $R_9$ and $R_{10}$ are as above defined, or

$R_7$ and $R_8$ together with nitrogen form:

f) a morpholino ring optionally substituted with $C_1$–$C_4$ alkyl or $C_1$–$C_4$ alkoxy,

g) a piperazino ring optionally substituted by $C_1$–$C_6$ alkyl, $C_2$–$C_6$ alkenyl or phenyl optionally substituted by one or more, substituents selected from the group con-

VOL 1209 ISS 4 AP 28 1998 UMI



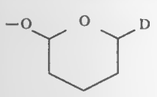
sisting of $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy, F, Br, Cl, $CF_3$, OH, $NH_2$ or CN, and

h) a pyrrolidino or piperidino or tetrahydropyridino ring optionally substituted by OH, $NH_2$, COOH, $COOR_9$ or $CONR_9R_{10}$ wherein $R_9$ and $R_{10}$ are as above defined, $C_1$–$C_6$ alkyl, $C_2$–$C_6$ alkenyl or phenyl optionally substituted by one or more substituents selected from the group consisting of $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy, F, Br, Cl, $CF_3$, OH, $NH_2$, or CN;

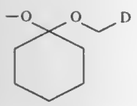
a group of formula $OR_4$ or $SR_4$ in which $R_4$ is as above defined;

a group of formula O—Ph, wherein the phenyl (Ph) ring is optionally substituted by nitro, amino or $NR_7R_8$ as above defined; or

a group of formula B or C:



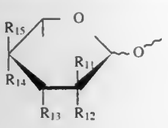
B



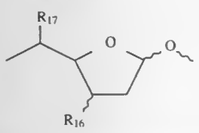
C

wherein D is a group of formula $COOR_9$ or $CONR_7R_8$ in which $R_7$, $R_8$ and $R_9$ are as above defined; and

X represents a sugar residue of formula X1 or X2



X1

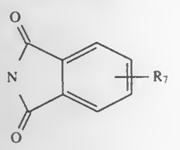


X2

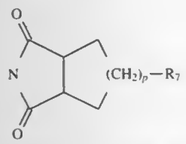
wherein:

$R_{11}$ and $R_{12}$ are both hydrogen or one of $R_{11}$ and $R_{12}$ is hydrogen and the other is F, Cl, Br or I;

$R_{13}$ represents hydrogen, hydroxy, $C_1$–$C_4$ alkoxy, amino, $NHCOCF_3$, $N{=}C(C_6H_5)_2$, $NHCOR_9$, $NHCONR_7R_8$ or a group of formula E or F



E



F

in which $R_7$, $R_8$ and $R_9$ are as above defined and p is 0 or 1;

$R_{14}$ and $R_{15}$ represent hydrogen or one of $R_{14}$ or $R_{15}$ is hydrogen and the other is OH, F, Cl, Br, I or a group of formula $OSO_2R_5$ wherein $R_5$ is as above defined;

$R_{16}$ represents $CH_2OH$ or $R_{13}$ as above defined;

$R_{17}$ represents F, Cl, Br, I or a group of formula $OSO_2R_5$ wherein $R_5$ is as above defined;

and pharmaceutically acceptable salts thereof; with the proviso that the compound of the formula A is not 4'-iodo-4'-deoxydoxorubicin.

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**5,744,455**

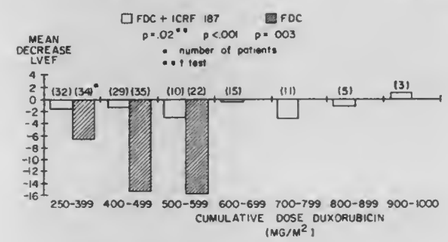
## REDUCTION OF ANTHRACYCLINE-INDUCED CARDIOTOXICITY

**James Leonard Speyer, New York, N.Y.; Franco Mario Muggia, Los Angeles, Calif., and Michael David Green, North Carlton, Australia, assignors to New York University, New York, N.Y.**

**Continuation of Ser. No. 860,581, Mar. 27, 1992, Pat. No. 5,242,901, which is a continuation of Ser. No. 702,741, Apr. 15, 1993, abandoned, which is a continuation of Ser. No. 579,174, Sep. 5, 1990, abandoned, which is a continuation of Ser. No. 149,114, Jan. 27, 1988, abandoned. This application Sep. 3, 1993, Ser. No. 116,399**

**Int. Cl.[6] A61K** *31/495;31/70*

**U.S. Cl. 514—34** **8 Claims**




1. A biologically effective human anti-neoplastic composition, comprising in admixture:

an anthracycline; and

a cardioprotective amount of (+)-1,2-bis(3,5-dioxopiperazinyl-1-yl)propane.

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**5,744,456**

## METHODS FOR OBTAINING PRODUCTION OF A GENE PRODUCT IN A HOST CELL IN VIVO OR IN VITRO USING A DNA MOLECULE FOR INTEGRATION SITE INDEPENDENT GENE EXPRESSION

**Franklin Grosveld, and Dimitris Kioussis, both of London, Great Britain, assignors to Medical Research Council, London, United Kingdom**

**Division of Ser. No. 312,498, Sep. 26, 1994, Pat. No. 5,532,143, which is a continuation of Ser. No. 920,536, Jul. 28, 1992, abandoned, which is a continuation of Ser. No. 346,996, May 11, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 481,034**

**Claims priority, application United Kingdom, Aug. 7, 1987, 8718779**

**Int. Cl.[6] A61K** *48/00;* **C12N** *15/67;15/85;5/10*

**U.S. Cl. 514—44** **14 Claims**

1. In a method of obtaining production of a gene product in a host cell wherein the host cell contains a recombinant gene encoding the gene product, the improvement comprising, prior to introducing said gene into said host cell,

providing said recombinant gene operatively linked to a dominant activator sequence that is specific for a particular mammalian cell-type:

said dominant activator sequence being characterized in that, in naturally occurring DNA:

(I) it is associated with a naturally occurring gene that is expressed in a tissue-specific manner; and

(II) it is associated with a DNase I super hypersensitive site; and

wherein said dominant activator sequence is characterized in that it stimulates expression of said recombinant gene when said DNA molecule is integrated into a genome of a host cell of said mammalian cell-type, such that said expression:

(a) is dependent on the number of copies of said gene that are integrated into said genome in that said expression increases as said number of copies of said gene increases; and

(b) is independent of the integration site of said DNA molecule in said genome,

wherein said gene product is produced in said host cell in a manner that is tissue-specific for said particular mammalian cell-type.



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**5,744,457**

## COMPOSITIONS AND METHODS FOR INHIBITING THROMBOGENESIS

**Jeffrey I. Weitz, Ancaster; Jack Hirsh, Hamilton, and Edward Young, Oakville, all of Canada, assignors to Hamilton Civic Hospitals Research Development Inc., Canada**

**Continuation-in-part of Ser. No. 412,332, Mar. 31, 1995, abandoned. This application Oct. 6, 1995, Ser. No. 540,324**

**Int. Cl.[6] A61K** *31/725;* **C08B** *37/10*

**U.S. Cl. 514—56** **29 Claims**

1. A method for inhibiting thrombus formation in a patient without inducing a clinically unsafe increase in systemic bleeding, said method comprising the step of administering to the patient a pharmacologically acceptable dose of a heparin cofactor II-specific (HCII-specific) catalytic agent capable of inactivating clot-bound thrombin, said HCII-specific catalytic agent having:

(i) a heparin cofactor II specific activity against heparin cofactor II of about 2 to about 5 units/mg in an anti-factor IIa assay;

(ii) an antithrombin III (ATIII) specific activity against factor Xa of about 0.2 to about 1.5 units/mg in an anti-factor Xa assay; and

(iii) a solubility in aqueous media ranging from about 150 to about 1,000 mg/ml;

wherein:

said HCII-specific catalytic agent is a heparin preparation having a molecular weight ranging from about 3,000 Daltons to about 8,000 Daltons.

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**5,744,458**

## KAPPA AGONIST COMPOUNDS AND PHARMACEUTICAL FORMULATIONS THEREOF

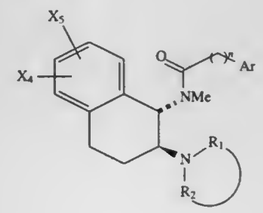
**Lawrence I. Kruse, Haddonfield, N.J.; An-Chih Chang, Phoenixville, Pa.; Diane L. DeHaven-Hudkins; John J. Farrar, both of Chester Springs, Pa.; Forrest Gaul, Glen Moore, Pa.; Virendra Kumar, Paoli, Pa.; Michael Anthony Marella, Exton, Pa.; Alan L. Maycock, Malvern, Pa., and Wei Yuan Zhang, Collegeville, Pa., assignors to Adolor Corporation, Malvern, Pa.**

**Division of Ser. No. 796,078, Feb. 5, 1997, Pat. No. 5,688,955, which is a continuation-in-part of Ser. No. 612,680, Mar. 8, 1996, Pat. No. 5,646,151. This application Jul. 23, 1997, Ser. No. 899,086**

**Int. Cl.[6] A61K** *31/40;* **C07D** *207/04*

**U.S. Cl. 514—91** **15 Claims**

1. A compound of the formula II or a pharmaceutically acceptable salt thereof



(II)

wherein

n=1–3;

$R_1$ and $R_2$ are independently $=CH_3$; $—(CH_2)_m$, where m=4–8, $—CH_2CH(OH)(CH_2)_2—$; $—CH_2CH(F)(CH_2)_2—$; $—(CH_2)_2O(CH_2)_2—$; or $—(CH_2)_2CH{=}CHCH_2—$;

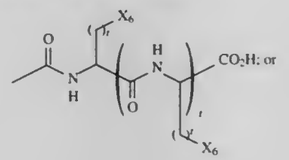
Ar=unsubstituted or mono-, or di-substituted phenyl wherein said substituents are selected from the group consisting of halogen, $OCH_3$, $SO_2CH_3$, $CF_3$, amino, alkyl, and 3,4-dichloro; benzothiophenyl; benzofuranyl; naphthyl; diphenyl methyl; or 9-fluorene;

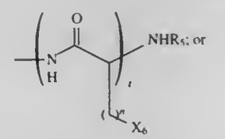
$X_4$ and $X_5$ are independently

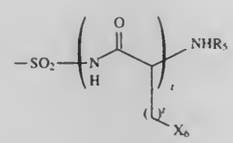
$—Op(O)(OBn)_2$; $—OP(O)(OH)_2$; $—CO_2H$; $—SO_3H$; $—SO_3H$; $—O(CH_2)_nCO_2H$;

$—NHSO_2CH_3$; $—CONH(CH_2)_tCO_2H$; or $—SO_2NH(CH_2)_tCO_2H$; wherein s=1–5

or $X_4$ and $X_5$ are independently







wherein

t=1–20

$R_5$=—H or —Ac

$X_6$=$—CO_2H$; $—NHSO_2CH_3$; $—NHP(O)(OBn)_2$; $—NHP(O)(OH)_2$; $—OP(O)(OBn)_2$; or $—OP(O)(OH)_2$.

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**5,744,459**

## PHOSPHOLIPID COMPOUNDS AND USE THEREFOR

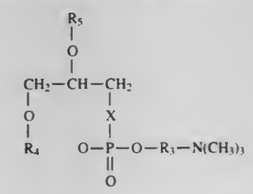
**Alexandros Makriyannis, Ashford, Conn.; Richard I. Duclos, Jr., Dorchester, Mass., and Donna J. Fournier, Glastonbury, Conn., assignors to University of Connecticut, Storrs, Conn.**

**Continuation of Ser. No. 972,138, Nov. 5, 1992, Pat. No. 5,489,580. This application Feb. 5, 1996, Ser. No. 596,962**

**Int. Cl.[6] A61K** *31/685;* **C07F** *9/10;9/40*

**U.S. Cl. 514—114** **9 Claims**

1. A compound represented by the formula:



and physiologically acceptable salts thereof, wherein

$R_4$ is a C12 to C20 saturated or unsaturated, straight or branched, aliphatic hydrocarbon chain, which can be substituted with one or more substituents selected from the group

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consisting of a hydroxyl, halogen, alkyl, cycloalkyl, aryl, alkoxy, alkoxycarbonyl, alkylthio and amino; and

$R_5$ is a C1 to C5 saturated or unsaturated, straight or branched, aliphatic hydrocarbon chain;

X is a valency bond, a $—CH_2—$ group or an oxygen; and

$R_3$ is a substituted C2 saturated or unsaturated, alkyl or alkenyl, wherein one or more substituents are selected from the group consisting of a hydroxyl, halogen, alkyl, cycloalkyl, aryl, alkoxy, alkoxycarbonyl, alkylthio and amino.

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**5,744,460**

## COMBINATION FOR TREATMENT OF PROLIFERATIVE DISEASES

**Marcel Müller, Allschwil, Switzerland; Thomas Geiger, Freiburg, Germany; Karl-Heinz Altmann, Reinach, Switzerland; Doriano Fabbro, Arlesheim, Switzerland; Nicholas M. Dean, Encinitas, Calif.; Brett Monia, Carlsbad, Calif., and Clarence Frank Bennett, Carlsbad, Calif., assignors to Novartis Corporation, Summit, N.J.**

**Filed Mar. 7, 1996, Ser. No. 612,775**

**Int. Cl.[6] A61K** *31/44;31/53;31/70;31/445;31/505;48/00;* **C07H** *21/04*

**U.S. Cl. 514—44** **12 Claims**

**1.** A method for treating cancer in a mammal comprising administering to said mammal:

(a) an antisense oligonuclotide targeted to PKC consisting of 10–35 nucleotides comprising the following nucleic acid sequence:

5'-GTT CTC GCT GGT GAG TTT CA-3' SEQ ID NO:1,

or a sequence that differs from said sequence by up to 3 nucleotides, or a derivative of said oligonucleotide, and

(b) a chemotherapeutic agent or combination thereof selected from the following:

(i) vinblastine,

(ii) cisplatin,

(iii) 5-fluorouracil,

(iv) mitomycin,

(v) adriamycine

(vi) vinblastine and adriamycine, or

(vii) 5-fluorouracil and adriamycine;

wherein component (a) and/or (b) can be present in the form of a pharmaceutically acceptable salt, if at least one salt-forming group is present, and wherein the combination of (a) and (b) has a synergistic anti-tumor effect.

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**5,744,461**

## LIPID DERIVATIVES OF PHOSPHONOACIDS FOR LIPOSOMAL INCORPORATION AND METHOD OF USE

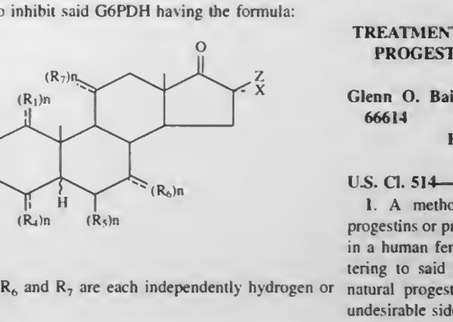
**Karl Y. Hostetler, Del Mar, and Raj Kumar, San Diego, both of Calif., assignors to NeXstar Pharmaceuticals, Inc., Boulder, Colo.**

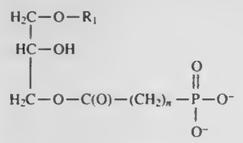
**Division of Ser. No. 993,133, Dec. 18, 1992, Pat. No. 5,463,092, which is a continuation-in-part of Ser. No. 440,898, Nov. 22, 1989, Pat. No. 5,194,654. This application May 26, 1995, Ser. No. 451,221**

**Int. Cl.[6] A01N** *57/18*

**U.S. Cl. 514—141** **23 Claims**

**1.** A method for treating a viral infection in a mammal, comprising administering to a mammal in need thereof an effective antiviral amount of a compound of the formula



wherein n is 0 or 1, and $R_1$ is a linear, branched or cyclic aliphatic group having 0 to 6 double bonds, and is covalently linked to a C atom of a glycerol group through an ether or vinyl ether bond.

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**5,744,462**

## STEROIDS USEFUL AS ANTI-CANCER AND ANTI-OBESITY AGENTS

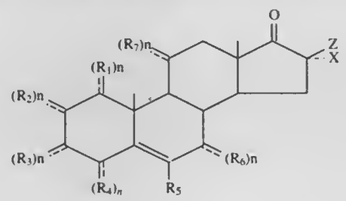
**Arthur G. Schwartz, Philadelphia, and Marvin Louis Lewbart, Media, both of Pa., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.**

**Division of Ser. No. 196,606, Feb. 15, 1994, Pat. No. 5,656,621, which is a continuation of Ser. No. 912,927, Jul. 13, 1992, abandoned, which is a division of Ser. No. 326,355, Mar. 21, 1989, Pat. No. 5,157,031, which is a continuation of Ser. No. 867,112, May 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 762,584, Aug. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 519,550, Aug. 2, 1983, abandoned. This application Jun. 7, 1995, Ser. No. 488,352**

**Int. Cl.[6] A61K** *31/56;* **C07J** *9/00;11/00;13/00*

**U.S. Cl. 514—177** **40 Claims**

**1.** A process for inhibiting the enzyme G6PDH in a mammalian host which comprises administering to a host a compound in an amount effective to inhibit said G6PDH having the formula:



wherein

$R_1$, $R_2$, $R_4$, $R_5$, $R_6$ and $R_7$ are each independently hydrogen or lower alkyl;

$R_3$ is hydrogen;

X is halogen, hydroxy, hydrogen, or lower alkyl;

Z is lower alkyl or hydrogen; and

n is 1 or 2;

with the proviso that at least one of X and Z is other than hydrogen.

**11.** A process for inhibiting the enzyme G6PDH in a mammalian host which comprises administering to a host a compound in an amount effective to inhibit said G6PDH having the formula:



wherein

$R_1$, $R_2$, $R_4$, $R_5$, $R_6$ and $R_7$ are each independently hydrogen or lower alkyl;

$R_3$ is hydrogen;

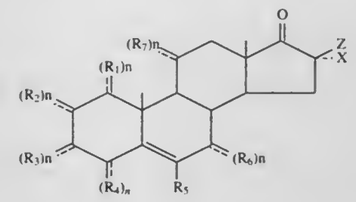
X is halogen, hydroxy, hydrogen or lower alkyl;

Z is lower alkyl or hydrogen; and

n is 1 or 2;

with the proviso that at least one of X and Z is other than hydrogen.

**21.** A process for the treatment of cancer selected from the group consisting of skin, breast, colon and lung cancer, said process comprising administering to a host a therapeutically effective amount of a compound having the formula:



wherein

$R_1$, $R_2$, $R_4$, $R_5$, $R_6$ and $R_7$ are each independently hydrogen or lower alkyl;

$R_3$ is hydrogen;

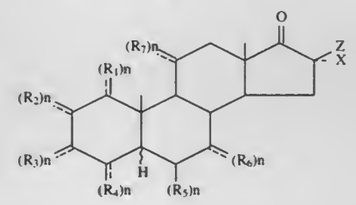
X is halogen, hydroxy, hydrogen or lower alkyl;

Z is lower alkyl or hydrogen; and

n is 1 or 2;

with the proviso that at least one of X and Z is other than hydrogen.

**31.** A process for the treatment of cancer selected from the group consisting of skin, breast, colon and lung cancer, said process comprising administering to a host a therapeutically effective amount of a compound having the formula:



wherein

$R_1$, $R_2$, $R_4$, $R_5$, $R_6$ and $R_7$ are each independently hydrogen or lower alkyl;

$R_3$ is hydrogen;

X is halogen, hydroxy, hydrogen, lower alkyl, or lower alkoxy;

Z is lower alkyl or hydrogen; and

n is 1 or 2;

with the proviso that at least one of X and Z is other than hydrogen.



amount effective to inhibit said G6PDH having the formula:



wherein

$R_1$, $R_2$, $R_4$, $R_5$, $R_6$ and $R_7$ are each independently hydrogen or lower alkyl;

$R_3$ is hydrogen;

X is halogen, hydroxy, hydrogen or lower alkyl;

Z is lower alkyl or hydrogen; and

n is 1 or 2;

with the proviso that at least one of X and Z is other than hydrogen.

**21.** A process for the treatment of cancer selected from the group consisting of skin, breast, colon and lung cancer, said process comprising administering to a host a therapeutically effective amount of a compound having the formula:



wherein

$R_1$, $R_2$, $R_4$, $R_5$, $R_6$ and $R_7$ are each independently hydrogen or lower alkyl;

$R_3$ is hydrogen;

X is halogen, hydroxy, hydrogen or lower alkyl;

Z is lower alkyl or hydrogen; and

n is 1 or 2;

with the proviso that at least one of X and Z is other than hydrogen.

**31.** A process for the treatment of cancer selected from the group consisting of skin, breast, colon and lung cancer, said process comprising administering to a host a therapeutically effective amount of a compound having the formula:



wherein

$R_1$, $R_2$, $R_4$, $R_5$, $R_6$ and $R_7$ are each independently hydrogen or lower alkyl;

$R_3$ is hydrogen;

X is halogen, hydroxy, hydrogen, lower alkyl, or lower alkoxy;

Z is lower alkyl or hydrogen; and

n is 1 or 2;

with the proviso that at least one of X and Z is other than hydrogen.

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**5,744,463**

## TREATMENT OF SIDE EFFECTS OF PROGESTINS AND PROGESTERONE ANALOGUES USED FOR BIRTH CONTROL

**Glenn O. Bair, 5520 SW. Lincolnshire Cir., Topeka, Kans. 66614**

**Filed Jun. 3, 1996, Ser. No. 656,737**

**Int. Cl.[6] A61K** *31/56*

**U.S. Cl. 514—177** **10 Claims**

**1.** A method for treating the undesirable side effects of progestins or progesterone analogues administered for birth control in a human female, said method comprising the step of administering to said female a pharmaceutical composition comprising natural progesterone in an amount effective in alleviating said undesirable side effects and a pharmaceutically acceptable carrier.

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**5,744,464**

## ANTIGESTAGENS FOR THE INHIBITION OF UTERINE SYNTHESIS OF PROSTAGLANDIN

**Walter Elger; Krzysztof Chwalisz; Sybille Beier, and Marianne Fahnrich, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany**

**Continuation of Ser. No. 581,444, Sep. 10, 1990, abandoned, which is a continuation of Ser. No. 100,682, Sep. 24, 1987, abandoned. This application Jul. 26, 1993, Ser. No. 96,360**

**Claims priority, application Germany, Sep. 26, 1986, 36 33 244.5**

**Int. Cl.[6] A61K** *31/56*

**U.S. Cl. 514—179** **23 Claims**

**1.** A method for the treatment of dysmenorrhea in a mammal, comprising treating dysmenorrhea by administering to the mammal host an effective amount of a steroidal antigestagen whereby uterine synthesis of prostaglandin is inhibited.

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**5,744,465**

## METHOD OF INHIBITING A β-LACTAMASE ENZYME BY ADMINISTERING NOVEL 2-THIOSUBSTITUTED CARBAPENEMS

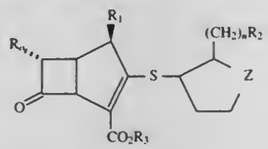
**Yang-I Lin, Tappan; Panayota Bitha, Nanuet; Subas Sakya, Pomona, all of N.Y.; Timothy W. Strohmeyer, Demarest; Karen Bush, Princeton, both of N.J.; Carl Bernard Ziegler, Pearl River, and Gregg Brian Feigelson, Airmont, both of N.Y., assignors to American Cyanamid Company, Madison, N.J.**

**Division of Ser. No. 182,781, Jan. 26, 1994, Pat. No. 5,602,118, which is a continuation-in-part of Ser. No. 33,684, Mar. 16, 1993, abandoned. This application May 23, 1995, Ser. No. 448,295**

**Int. Cl.[6] A61K** *31/395*

**U.S. Cl. 514—210** **1 Claim**

**1.** A method of inhibiting a bacterial produced susceptible Beta-lactamase enzyme in a mammal in need thereof which comprises administering to said mammal an effective inhibitory amount of a compound of the formula:

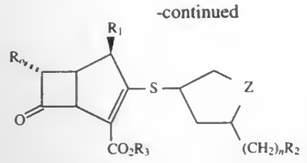


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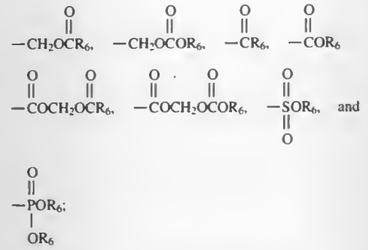


wherein:

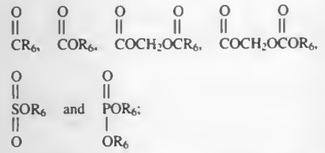
(A) Z is oxygen;

(B) $R_a$ is hydrogen, $(C_1–C_2)$alkyl, $CH_2OR_4$, $CH_2NHR_5$, $CH(OR_4$, $CH_3$, $CHFCH_3$ or $CH(NHR_5)CH_3$; wherein

(i) $R_4$ is selected from hydrogen, and moieties of the formulae:



(ii) $R_5$ is selected from hydrogen, and moieties of the formulae:



(iii) $R_6$ is selected from a straight, branched or substituted $(C_1–C_{18})$alkyl, $(C_2–C_{18})$alkenyl, unsubstituted or substituted $(C_3–C_7)$monocyclo $(C_1–C_{10})$ alkyl, unsubstituted or substituted $(C_5–C_{10})$ bicyclo $(C_1–C_{10})$ alkyl, aryl or substituted aryl, heteroaryl or substituted heteroaryl and, heterocyclyl or substituted heterocyclyl; wherein the heterocyclyl moiety is a monocyclic or bicyclic group having 1–10 carbon atoms and 1–4 heteroatoms selected from oxygen, nitrogen and sulfur atoms and each ring of the heterocycle is comprised of 4 to 7 atoms, the heteroaryl group is an aromatic monocyclic or bicyclic heterocyclic group of 5–12 atoms wherein the heteroatom or heteroatoms are selected from 1–4 oxygen, nitrogen and sulfur atoms; the substitution for the alkyl, monocycloalkyl and bicycloalkyl moieties are selected from trifluoromethyl, pentafluoroethyl, amino, mono$(C_1–C_6)$alkylamino, di$(C_1–C_6)$alkylamino, hydroxy, $(C_1–C_6)$alkoxy, $(C_3–C_6)$cycloalkoxy, carboxy, $(C_2–C_{10})$carboalkoxy, cyano and $(C_1–C_{10})$carboxamido; the substitution for the aryl, heteroaryl and heterocyclyl moieties is selected from $(C_1–C_6)$alkyl, $(C_1–C_6)$mono-, di- or polyfluoroalkyl, hydroxy, $(C_1–C_6)$alkoxy, $(C_3–C_8)$ cycloalkoxy, amino, mono $(C_1–C_6)$alkylamino, di-$(C_1–C_6)$alkylamino, carboxy, $(C_2–C_{10})$carboalkoxy, cyano and $(C_1–C_{10})$carboxamido; $R_1$ is straight or branched $(C_1–C_8)$alkyl, straight or branched $(C_2–C_8)$alkenyl, $(C_3–C_8)$cycloalkyl; or $(CH_2)_nR$; wherein n' is an integer of from 1–6; R is selected from $CF_3$, $C_2F_5$, fluorine, chlorine, bromine, hydroxy, alkoxy, nitrile, azido, amidino, formamidino, guanidino and $NR'R''$; wherein

(i) R' and R" are independently selected from hydrogen, straight or branched $(C_1–C_6)$alkyl, straight or branched $(C_1–C_6)$alkoxy, 2-hydroxyethyl, 2-azidoethyl and 2-aminoethyl;

(ii) and when R' is hydrogen or straight or branched $(C_1–C_6)$alkyl, R" is selected from amino, hydroxy, mono $(C_1–C_6)$alkylamino, di $(C_1–C_6)$alkyl-amino, acyl, benzoyl, dihydroxybenzoyl, an acyl residue of an amino acid or peptide said amino acid selected from the group consisting of alanine, glycine, arginine, cysteine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, aminopimelic acid and threonine, and straight or branched substituted $(C_1–C_6)$alkyl wherein said alkyl substituent is selected from hydroxy, $(C_1–C_6)$alkoxy, azido, amino, mono $(C_1–C_6)$alkylamino, di-$(C_1–C_6)$alkylamino, guanidino, nitrile, carboxy, formimidoyl and phenyl; or

(iii) R' and R" taken together with the associated nitrogen is an unsubstituted or substituted monocyclic or bicyclic heterocyclic ring having up to four (4) heteroatoms in each ring independently selected from oxygen, nitrogen and sulfur, wherein said substituent is selected from straight or branched $C_1–C_6$)alkyl, straight or branched $(C_1–C_6)$alkoxy, $(C_3–C_8)$cycloalkyl, $(C_3–C_8)$cycloalkoxy, trifluoromethyl, hydroxy, halogen selected from bromine, chlorine, fluorine and iodine, amino, nitrile, carboxy, carbamido, carbamoyl, straight or branched mono$(C_1–C_6)$alkylamino, straight or branched di $(C_1–C_6)$alkylamino, and amino $(C_1–C_6)$alkyl;

(D) n is an integer from 1–3;

(E) $R_2$ is:

(i) $—OCOCH_3$, $—OCOCF_3$, $—OSO_2Ph$, azido;

(ii) a moiety of the formula:

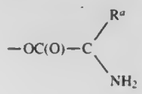
$—S(O)_n·R^a$

wherein n" is an integer from 0–2; and $R^a$ is

(a) hydrogen or an

(b) organic group bonded via a carbon atom selected from substituted or unsubstituted $(C_1–C_6)$alkyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, substituted or unsubstituted heteroaryl $(C_1–C_6)$alkyl, and substituted or unsubstituted heterocyclyl; said substitution is selected from $(C_1–C_6)$alkyl, hydroxy $(C_1–C_6)$ alkoxy, phenyl, heterocyclyl, amino, amidino, guanidino, carboxamido, carbamoyl $(C_1–C_6)$alkanoylamino, and mono- and di $(C_1–C_6)$alkylamino;

(iii) hydroxy, $—OR^a$, $—OC(O)R^a$, $—OC(O)OR^a$, $—OC(O)NR^aR^a$ and

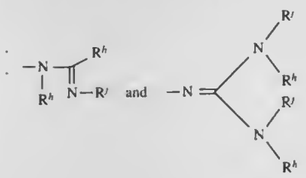


wherein $R^a$ is independently selected and is as hereinabove defined;

(iv) organic residue bonded via a nitrogen atom, selected from:

(a) $NO_2$ and $NR^hR^l$ wherein $R^h$ and $R^l$ are independently selected from hydrogen, amino, substituted amino, substituted or unsubstituted $(C_1–C_8)$alkyl, aryl, wherein the substituents in the above mentioned substituted alkyl and amino are selected from the group consisting of amino, mono-, di- and tri $(C_1–C_6)$alkylamino, hydroxyl, oxo, carboxyl, alkoxyl, chloro, fluoro, bromo, nitro, $—SO_2NH_2$, phenyl, benzyl, acyloxy, alkoxylcarbonyloxy, cycloalkoxycarbonyloxy and carboxamido;

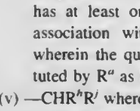
(b) moieties of the formulae:



wherein $R^h$ and $R^l$ are as hereinabove defined;

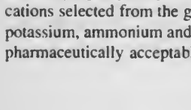


(c) acylamino moiety of the formula:



wherein $R^h$ and $R^l$ are as hereinabove defined;

(d) an amino moiety having an acyl residue of an amino acid or peptide represented by the formula:



wherein $R^h$ is as hereinabove defined; $R^m$ is hydrogen or an acyl residue of an amino acid or peptide said amino acid selected from the group consisting of alanine, glycine, arginine, cysteine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, aminopimelic acid and threonine; and $R^l$ is hydrogen, benzyl, and straight or branched $(C_1–C_6)$alkyl which optionally substituted with halo, hydroxy, amino, guanidinyl, carboxy, phenyl, aminocarbonyl, alkylthio, hydroxyphenyl or heterocyclyl as defined herein above;

(e) an acyclic quaternary ammonio moiety of the formula:



$B^-$ $—NR_7R_8R_9$

wherein $R_7$, $R_8$ and $R_9$ are the same or different and are selected from hydrogen, a straight or branched $(C_1–C_6)$ alkyl, and substituted $(C_1–C_6)$alkyl, wherein the substitution is selected from hydroxy, $(C_1–C_6)$alkoxy, azido, amino, $(C_1–C_6)$alkylamino, di $(C_1–C_6)$-alkylamino, guanidino, nitrile, carboxy, formimidoyl and phenyl; alternatively, $R_7$ and $R_8$ taken together are $—(CH_2)_2X(CH_2)_2—$, wherein X is $(CH_2)_w$, wherein w is an integer from 0 to 2, oxygen, sulfur, NH, $NR^h$, NOH and $NOR^h$ wherein $R^h$ is as hereinabove defined and $B^-$is a physiologically acceptable anion and;

(f) a quaternized heteroaryl wherein the heteroaryl moiety has at least one positively charged nitrogen atom in association with a physiologically acceptable anion, wherein the quaternized heteroaryl is optionally substituted by $R^a$ as hereinabove defined or;

(v) $—CHR^hR^l$ wherein $R^h$ and $R^l$ are as hereinabove defined, provided that when $R_2$ is $—CHR^hR^l$ then $R^h$ and $R^l$ cannot both be hydrogen;

(F) $R_3$ is selected from hydrogen; a straight or branched $(C_1–C_4)$ alkyl group; a $(C_1–C_4)$alkoxymethyl group; a straight or branched 1-$(C_1–C_5)$aliphatic acyloxy-ethyl or methyl group; a straight; branched or cyclic 1-$(C_1–C_6)$alkoxycarbonyloxyethyl or methyl group; a phthalidyl group; and a water soluble cations selected from the group consisting of lithium, sodium, potassium, ammonium and tetra $(C_1–C_4)$alkyl ammonium or a pharmaceutically acceptable salt thereof.

**5,744,466**

## THERAPEUTIC HETEROCYCLIC COMPOUNDS

**Robert Charles Glen, East Essex; David Lawrence Selwood, Hertfordshire, both of United Kingdom; Graeme Richard Martin, Palo Alto, Calif., and Christopher James Foster, Stevenage, United Kingdom, assignors to The Wellcome Foundation Limited, United Kingdom**

**PCT No. PCT/GB95/00142, § 371 Date Oct. 7, 1996, § 102(e) Date Oct. 7, 1996, PCT Pub. No. WO95/20588, PCT Pub. Date Aug. 3, 1995**

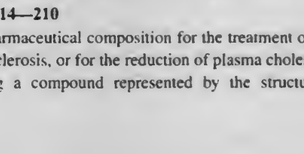
**PCT Filed Jan. 25, 1995, Ser. No. 682,615**

**Claims priority, application United Kingdom, Jan. 26, 1994, 9401436**

**Int. Cl.[6] A61K** *31/415;31/42;* **C07C** *325/00;* **C07D** *403/06*

**U.S. Cl. 514—210** **7 Claims**

1. A compound of formula (I)



(I)

wherein

R and $R^1$ are each independently hydrogen or $C_{1-4}$alkyl or R and $R^1$ are linked to form an azetidine ring;

A is $C_{3-6}$ cycloalkyl or $C_{1-3}$ alkyl-$C_{3-6}$ cycloalkyl;

n is an integer of from 0 to 3;

W is a group (i) or (ii):



(i)



(ii)

wherein $R^2$ is hydrogen or $C_{1-4}$ alkyl;

X is —O—, —S—, —NH— or $—CH_2—$;

Y is oxygen or sulphur;

and the chiral centre * is in its (S) or (R) form or is a mixture thereof in any proportions;

or a salt, solvate, or physiologically functional derivative thereof.

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**5,744,467**

## SULFUR-SUBSTITUTED AZETIDINONE COMPOUNDS USEFUL AS HYPOCHOLESTEROLEMIC AGENTS

**Brian A. McKittrick, Bloomfield; Sundeep Dugar, Bridgewater, and Duane A. Burnett, Fanwood, all of N.J., assignors to Schering Corporation**

**Division of Ser. No. 463,619, Jun. 5, 1995, Pat. No. 5,633,246, which is a continuation-in-part of Ser. No. 342,197, Nov. 18, 1994, Pat. No. 5,624,920. This application Jan. 8, 1997, Ser. No. 813,585**

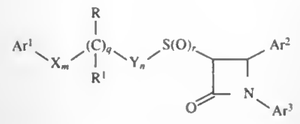
**Int. Cl.[6] A61K** *31/395;* **C07D** *205/08*

**U.S. Cl. 514—210** **12 Claims**

1. A pharmaceutical composition for the treatment or prevention of atherosclerosis, or for the reduction of plasma cholesterol levels, comprising a compound represented by the structural formula

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or a pharmaceutically acceptable salt thereof, wherein:

$Ar^1$ is aryl, $R^{10}$-substituted aryl or heteroaryl;

$Ar^2$ is aryl or $R^4$-substituted aryl;

$Ar^3$ is aryl or $R^5$-substituted aryl;

X and Y are independently selected from the group consisting of $—CH_2—$, —CH(lower alkyl)- and —C(dilower alkyl)-;

R is $—OR^6$, $—O(CO)R^6$, $—O(CO)OR^9$ or $—O(CO)NR^6R^7$; $R^1$ is hydrogen, lower alkyl or aryl; or R and $R^1$ together are =O;

q is 0 or 1;

r is 0, 1 or 2;

m and n are independently 0, 1, 2, 3 or 4; provided that the sum of m, n and q is 2, 3 or 4;

$R^4$ is 1–5 substituents independently selected from the group consisting of lower alkyl, $—OR^6$, $—O(CO)R^6$, $—O(CO)OR^9$, $—O(CH_2)_{1-5}OR^6$, $—O(CO)NR^6R^7$, $—NR^6R^7$, $—NR^6(CO)R^7$, $—NR^6(CO)OR^9$, $—NR^6(CO)NR^7R^8$, $—NR^6SO_2R^9$, $—COOR^6$, $—CONR^6R^7$, $—COR^6$, $—SO_2NR^6R^7$, $S(O)_{0-2}R^9$, $—O(CH_2)_{1-10}—COOR^6$, $—O(CH_2)_{1-10}CONR^6R^7$, -(lower alkylene)$COOR^6$ and $—CH=CH—COOR^6$;

$R^5$ is 1–5 substituents independently selected from the group consisting of $—OR^6$, $—O(CO)R^6$, $—O(CO)OR^9$, $—O(CH_2)_{1-5}OR^6$, $—O(CO)NR^6R^7$, $—NR^6R^7$, $—NR^6(CO)R^7$, $—NR^6(CO)OR^9$, $—NR^6(CO)\ NR^7R^8$, $—NR^6SO_2R^9$, $—COOR^6$, $—CONR^6R^7$, $—COR^6$, $—SO_2NR^6R^7$, $S(O)_{0-2}R^9$, $—O(CH_2)_{1-10}—COOR^6$, $—O(CH_2)_{1-10}CONR^6R^7$, $—CF_3$, —CN, $—NO_2$, halogen, -(lower alkylene)$COOR^6$and $—CH=CH—COOR^6$;

$R^6$, $R^7$ and $R^8$ are independently selected from the group consisting of hydrogen, lower alkyl, aryl and aryl-substituted lower alkyl;

$R^9$ is lower alkyl, aryl or aryl-substituted lower alkyl; and

$R^{10}$ is 1–5 substituents independently selected from the group consisting of lower alkyl, $—OR^6$, $—O(CO)R^6$, $—O(CO)OR^9$, $—O(CH_2)_{1-5}OR^6$, $—O(CO)\ NR^6R^7$, $—NR^6R^7$, $—NR^6(CO)R^7$, $—NR^6(CO)OR^9$, $—NR^6(CO)NR^7R^8$, $—NR^6SO_2R^9$, $—COOR^6$, $—CONR^6R^7$, $—COR^6$, $—SO_2NR^6R^7$, $S(O)_{0-2}R^9$, $—O(CH_2)_{1-10}—COOR^6$, $—O(CH_2)_{1-10}CONR^6R^7$, $—CF_3$, —CN, $—NO_2$ and halogen; a cholesterol biosynthesis inhibitor and a pharmaceutically acceptable carrier.

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**5,744,468**

**HYPOTENSIVE INTRAOCULAR PRESSURE ACTIVITY OF CLOZAPINE AND SULPIRIDE**

**Tong-Ho Lin, 7F-1, No.200, Sec.1, Fu-Hsing S.Rd., Taipei, and Ing-Jun Chen, Kaohsiung, both of Taiwan, assignors to Tong-Ho Lin, Taipei, Taiwan**

**Filed Oct. 23, 1996, Ser. No. 736,010**

**Int. Cl.[6] A61K** *31/55;31/40*

**U.S. Cl. 514—220** **19 Claims**

1. A method for treating glaucoma, decreasing intraocular pressure and increasing blood flow of the retina comprising the step of: administering to a patient in need thereof, an effective dose of an ocular pharmaceutical composition comprising a member selected from the group consisting of clozapine and sulpiride and a pharmaceutically acceptable carrier.

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**5,744,469**

**METHOD FOR TREATING DERMATITIS**

**Pierre V. Tran, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Filed Nov. 26, 1996, Ser. No. 756,996**

**Int. Cl.[6] A61K** *31/55;31/38*

**U.S. Cl. 514—220** **12 Claims**

1. A method for treating fungal dermatitis comprising administering an effective amount of 2-methyl-4 -(4-methyl-1-piperazinyl)-10H-thieno[2,3-b][1,5]benzodiazepine or a pharmaceutically acceptable salt thereof to a patient in need of such treatment.

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**5,744,470**

**METHOD FOR TREATING INSOMNIA**

**Pierre Van Tran, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Filed Feb. 10, 1997, Ser. No. 799,052**

**Int. Cl.[6] A61K** *31/55*

**U.S. Cl. 514—220** **11 Claims**

1. A method for treating insomnia comprising administering to a mammal in need of such treatment, an effective amount olanzapine, or a pharmaceutically acceptable salt thereof.

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**5,744,471**

**PYRIDAZION QUINOLINE COMPOUNDS**

**Thomas Michael Bare, West Chester, Pa.; Timothy Wayne Davenport, New Castle; James Roy Empfield, Bear, both of Del.; Jeffrey Alan McKinney, Palo Alto, Calif., and Richard Bruce Sparks, Linwood, Pa., assignors to Zeneca Limited, London, United Kingdom**

**PCT No. PCT/GB94/02295, § 371 Date Apr. 17, 1996, § 102(e) Date Apr. 17, 1996, PCT Pub. No. WO95/11244, PCT Pub. Date Apr. 27, 1995**

**PCT Filed Oct. 20, 1994, Ser. No. 637,641**

**Claims priority, application United Kingdom, Oct. 22, 1993, 9321854; Aug. 25, 1994, 9417171**

**Int. Cl.[6] A61K** *31/50;* **C07D** *471/04;471/14;491/14*

**U.S. Cl. 514—248** **6 Claims**

1. A compound selected from the group consisting of:

7-chloro-4-hydroxy-2-(4-methoxy-2-methylphenyl)-1,2,5,10-tetrahydropyridazino-[4,5-b]quinoline-1,10-dione;

7-chloro-2-(4-chloro-2-methylphenyl)-4-hydroxy-1,2,5,10-tetrahydropyridazino-[4,5-b] qinoline-1,10-dione;

7-chloro-2-(2,4-dimethylphenyl)-4-hydroxy-1,2,5,10-tetrahydropyridazino-[4,5-b] quinoline-1,10-dione;

7-chloro-2-(3,4-dihydroxyphenyl)-4-hydroxy-1,2,5,10-tetrahydropyridazino-[4,5-b] quinoline-1,10-dione;

7-chloro-2-(3,4-dimethoxyphenyl)-4-hydroxy-1,2,5,10-tetrahydropyridazino-[4,5-b] quinoline-1,10-dione; and

7,9-dichloro-2-(2,4-dimethylphenyl)-4-hydroxy-1,2,5,10-tetrahydropyridazino-[4,5-b] quinoline-1,10-dione; or pharmaceutically acceptable salts thereof or tautomers thereof.



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**5,744,472**

**1-(N'-(ARYLALKYLAMINOALKYL)) AMINOISOINDOLES; A NEW CLASS OF DOPAMINE RECEPTOR SUBTYPE SPECIFIC LIGANDS**

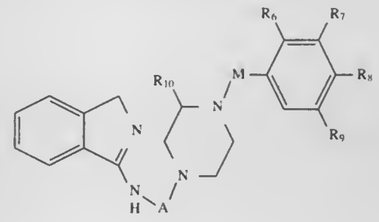
**Xiao-shu He, Branford, Conn.; Brian de Costa, Toronto, Canada, and Jan W. F. Wasley, Madison, Conn., assignors to Neurogen Corporation, Branford, Conn.**

**Filed Jun. 5, 1995, Ser. No. 463,430**

**Int. Cl.[6] A61K** *31/495;31/50;* **C07D** *401/02;403/02*

**U.S. Cl. 514—253** **6 Claims**

1. A compound of the formula:



or the pharmaceutically acceptable salts thereof wherein:

A represents alkylene of 2–5 carbon atoms;

M represents a bond or alkylene of 1–2 carbon atoms;

$R_7$, $R_8$, and $R_9$ independently represent hydrogen, halogen, hydroxy, lower alkyl, or lower alkoxy;

$R_6$ represents alkoxy of 1–6 carbon atoms; and

$R_{10}$ represents hydrogen or lower alkyl.

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**5,744,473**

**PIPE IV INHIBITORS: "BIS-COMPOUNDS"**

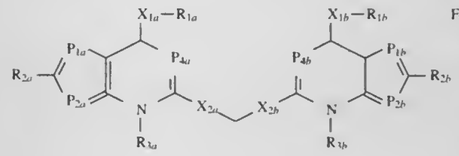
**Mark Chasin, Manalapan, N.J.; Peter Hofer, Liestal, Switzerland, and David Cavalla, Cambridge, United Kingdom, assignors to Euro-Celtique, S.A., Luxembourg, Luxembourg**

**Filed Sep. 16, 1996, Ser. No. 714,581**

**Int. Cl.[6] C07D** *519/00;* **A61K** *31/52;31/505;31/44*

**U.S. Cl. 514—262** **17 Claims**

1. A compound of Formula I,



Formula I

its pharmaceutically acceptable salts, wherein:

$X_{1a}$, $X_{1b}$ are independently selected from —NH and —N-lower alkyl;

$X_{2a}$, $X_{2b}$ are optionally present and are independently selected from S(O)n, O, $CH_2$, and NH;

$P_{1a}$, $P_{1b}$, $P_{2a}$, $P_{2b}$, $P_{4a}$, and $P_{4b}$ are N;

$R_{1a}$, $R_{1b}$, $R_{2a}$, $R_{2b}$, $R_{3a}$ and $R_{3b}$ are independently selected from H, $C_1$–$C_6$ alkyl, $C_3$–$C_6$ branched alkyl, $C_3$–$C_6$ cycloalkyl, said alkyl groups being optionally substituted with halogen, aryl or pyridyl group(s), said aryl and pyridyl group(s) being optionally substituted with hydroxy, alkoxy, cycloalkoxy, halogen, alkyl, or cycloalkyl; and n is an integer from 0 to 2.

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**5,744,474**

**TREATMENT OF INCONTINENCE**

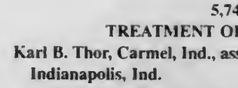
**Karl B. Thor, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation of Ser. No. 158,121, Nov. 24, 1993, abandoned. This application Apr. 20, 1995, Ser. No. 425,703**

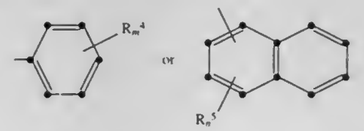
**Int. Cl.[6] A61K** *31/135;31/34;31/38;31/44*

**U.S. Cl. 514—357** **19 Claims**

1. A method of treating urinary incontinence in a human in need of such treatment, comprising administering to such human an effective incontinence-reducing dose of venlafaxine or a compound of the formula



wherein: $R^1$ is $C_5$–$C_7$ cycloalkyl, thienyl, halothienyl, ($C_1$–$C_4$ alkyl)thienyl, furanyl, pyridyl or thiazolyl;



each of $R^2$ and $R^3$ independently is hydrogen or methyl;

each $R^4$ independently is halo, $C_1$–$C_4$ alkyl, $C_1$–$C_3$ alkoxy or trifluoromethyl;

each $R^5$ independently is halo, $C_1$–$C_4$ alkyl or trifluoromethyl;

m is 0, 1 or 2;

n is 0 or 1; or

a pharmaceutically acceptable acid addition salt thereof.

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**5,744,475**

**URACIL DERIVATIVES, AND ANTITUMOR EFFECT POTENTIATOR AND ANTITUMOR AGENT CONTAINING THE SAME**

**Shingo Yano, Kawagoe; Yukio Tada, Higashimatsuyama; Hideki Kazuno; Tsutomu Sato, both of Hanno; Junichi Yamashita, Honjo; Norihiko Suzuki, Hidaka; Tomohiro Emura, Iruma; Masakazu Fukushima, Hanno, and Tetsuji Asao, Tokorozawa, all of Japan, assignors to Taiho Pharmaceutical Co., Ltd., Tokyo, Japan**

**PCT No. PCT/JP96/00828, § 371 Date Nov. 21, 1996, § 102(e) Date Nov. 21, 1996, PCT Pub. No. WO96/30346, PCT Pub. Date Oct. 3, 1996**

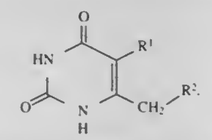
**PCT Filed Mar. 28, 1996, Ser. No. 737,677**

**Claims priority, application Japan, Mar. 29, 1995, 7-071667**

**Int. Cl.[6] A01N** *43/54;43/64;* **C07D** *239/00;239/02*

**U.S. Cl. 514—274** **14 Claims**

1. A uracil derivative represented by the following formula (1):



(1)

wherein $R^1$ represents a chlorine, bromide or iodine atom or a cyano or lower alkyl group; and $R^2$ is selected from the group consisting of a 4–5 membered heterocyclic group having 1–3 nitrogen atoms, piperidine and piperazine, which may be substituted by one or more lower alkyl, imino, hydroxyl, hydroxymethyl, methanesulfonyloxy, amino or nitro groups; or a salt thereof.

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5,744,476

## DOPAMINE $D_1$ AGONISTS FOR THE TREATMENT OF DEMENTIA

**Kenneth Walter Locke, Littleton, and Thomas David Steele, Acton, both of Mass., assignors to Interneuron Pharmaceuticals, Inc., Lexington, Mass.**

**Filed Jun. 27, 1994, Ser. No. 266,816**
**Int. Cl.[6] A61K** *31/435*
**U.S. Cl. 514—284** **18 Claims**

1. A method of raising extracellular brain acetylcholine levels to improve cognition in a human having senile or presenile dementia associated with neurodegeneration which comprises administering to said human in need of such treatment an effective amount of dihydrexidine, said effective amount being from about 0.1 to about 10 mg/kg.

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5,744,477

## METHOD FOR TREATMENT OF OBESITY USING PROLACTIN MODULATORS AND DIET

**Anthony H. Cincotta, and Albert H. Meier, both of Andover, Mass., assignors to The Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La., and Ergo Research Corporation, Wakefield, R.I.**

**Continuation-in-part of Ser. No. 995,292, Dec. 22, 1992, Pat. No. 5,585,347, which is a continuation-in-part of Ser. No. 719,745, Jun. 24, 1991, Pat. No. 5,344,832, which is a continuation-in-part of Ser. No. 463,327, Jan. 10, 1990, abandoned, which is a continuation-in-part of Ser. No. 192,332, May 10, 1988, abandoned. This application Jan. 7, 1994, Ser. No. 178,569**
**Int. Cl.[6] A61K** *31/44*
**U.S. Cl. 514—288** **32 Claims**

1. A method for reducing weight in a patient in need of such treatment comprising in combination the steps of:
(a) administering daily to said patient a predetermined amount of a prolactin inhibitor confined to a first predetermined time; and
(b) restricting said patient's daily caloric intake.

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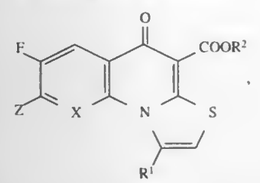
5,744,478

## THIAZOLO [3,2-A] QUINOLINE AND THIAZOLO [3,2-A] NAPHTHYRIDINE DERIVATIVES

**Thomas Jaetsch, Köln; Werner Hallenbach, Monheim; Thomas Himmler, Odenthal; Klaus-Dieter Bremm, Recklinghausen; Rainer Endermann, Wuppertal; Franz Pirro, Langenfeld, all of Germany; Michael Stegemann, Kansas City, Mo., and Heinz-Georg Wetzstein, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

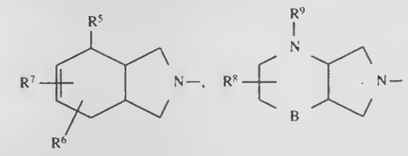
**PCT No. PCT/EP95/03315, § 371 Date Feb. 21, 1997, § 102(e) Date Feb. 21, 1997, PCT Pub. No. WO96/06848, PCT Pub. Date Mar. 7, 1996**
**PCT Filed Aug. 21, 1995, Ser. No. 793,795**
**Claims priority, application Germany, Sep. 1, 1994, 44 31 122.2**
**Int. Cl.[6] A61K** *31/435;31/535;* **C07D** *513/04;519/00*
**U.S. Cl. 514—291** **7 Claims**

1. The compounds of the formula (I)



(I)

in which
$R^1$ represents hydrogen or methyl which is optionally substituted by halogen or methoxy,
$R^2$ represents hydrogen, alkyl having 1 to 4 carbon atoms which is optionally substituted by hydroxyl, methoxy, amino, methylamino or dimethylamino, or (5-methyl-2-oxo-1,3-dioxol-4-yl)methyl,
X represents nitrogen or C—$R^4$, wherein
$R^4$ represents hydrogen, halogen or methoxy or together with $R^1$ can form a bridge of the structure —O—$CH_2$— or —S—$CH_2$—,
Z represents the radicals of the structures



wherein
$R^5$ is represents hydrogen, hydroxyl, —$NR^{10}R^{11}$, hydroxymethyl, —$CH_2$—$NR^{10}R^{11}$, carboxyl, methoxycarbonyl or ethoxycarbonyl,
where
$R^{10}$ represents hydrogen, $C_1$–$C_3$-alkyl, which is optionally substituted by hydroxyl, alkoxycarbonyl having 1 to 4 C atoms in the alkoxy moiety or $C_1$–$C_3$-acyl,
$R^{11}$ represents hydrogen or methyl,
$R^6$ represents hydrogen, straight-chain or branched $C_1$–$C_3$-alkyl or cyclopropyl,
$R^7$ represents hydrogen or methyl,
$R^8$ represents hydrogen or methyl,
$R^9$ represents hydrogen, methyl or radicals of the structures —CH=CH—$COOR^9$, —$CH_2$—$CH_2$—$COOR^9$, —$CH_2$—CO—$CH_3$, —$CH_2$—$CH_2$—CN,
$R^9$ represents methyl or ethyl,
B represents —$CH_2$—, O or a direct bond,
or a pharmaceutically utilizable hydrate or acid addition salt thereof, or an alkali metal, alkaline earth metal, silver or guanidinium salt of the carboxylic acid on which it is based.

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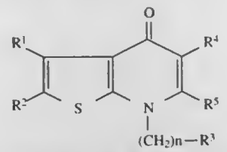
5,744,479

## THIENOPYRIDINE COMPOUNDS WHICH HAVE USEFUL PHARMACEUTICAL ACTIVITY

**Shuichi Furuya; Nobuo Choh; Masataka Harada, and Satoshi Sasaki, all of Tsukuba, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

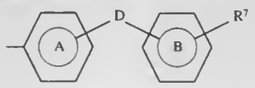
**Filed Jan. 7, 1997, Ser. No. 779,608**
**Claims priority, application Japan, Oct. 19, 1995, 7-271639**
**Int. Cl.[6] A61K** *31/33;* **C07D** *419/02*
**U.S. Cl. 514—301** **28 Claims**

1. A compound of the formula:



(I)

wherein each of $R^1$ and $R^2$ is independently a hydrogen atom or a group which is (1) an optionally substituted hydrocarbon residue, (2) an optionally substituted acyl group, (3) a carbamoyl group, (4) an optionally substituted heterocyclic group which bonds through a carbon atom of the heterocyclic group, (5) a carboxyl group or an ester or amide thereof, (6) a cyano group, (7) a nitro group, (8) a group of the formula: —$NR^{14}R^{15}$, wherein $R^{14}$ is a hydrogen atom, an optionally substituted hydrocarbon residue, an optionally substituted hydrocarbon residue-oxy group, an optionally substituted acyl group, an optionally substituted hydroxyl group, an optionally substituted heterocyclic group, or a group of the formula: —$SO_p$—$R^{16}$, wherein p is an integer of 1 or 2, $R^{16}$ is an optionally substituted hydrocarbon residue, $R^{15}$ is a hydrogen atom or an optionally substituted hydrocarbon residue, and the group —$NR^{14}R^{15}$ may form an optionally substituted cyclic amino group, (9) a group of the formula: —O—$R^{17}$, wherein $R^{17}$ is a hydrogen atom, an optionally substituted hydrocarbon residue, an optionally substituted acyl group or an optionally substituted heterocyclic group, or (10) a group of the formula: —$S(O)_t$—$R^{18}$, wherein $R^{18}$ is a hydrogen atom, an optionally substituted heterocyclic group, and t is an integer of 0 to 2,
$R^3$ is an optionally substituted homo-cyclic group,
$R^4$ is (1) an optionally substituted 3- to 8-membered heterocyclic group having at least one nitrogen atom in a ring or (2) a group which is an optionally substituted amino group, an optionally substituted hydroxyl group, or an optionally substituted mercapto group,
$R^5$ is hydrogen or a group which is (1) an optionally substituted hydrocarbon residue, (2) an optionally substituted acyl group, (3) a carbamoyl group, (4) an optionally substituted heterocyclic group which bonds through a carbon atom of the heterocyclic group, (5) a carboxyl group or a ester or amide thereof, or (6) a cyano group,
n is an integer of 0 to 3,
with the proviso that when $R^4$ is tetrazolyl or a group which is (1) a nitro group, (2) a group of the formula: —$NR^{14}R^{15}$,
wherein $R^{14}$ is a hydrogen atom, an optionally substituted hydrocarbon residue, an optionally substituted hydrocarbon residue-oxy group, an optionally substituted acyl group, an optionally substituted hydroxyl group, an optionally substituted heterocyclic group, or a group of the formula: —$SO_p$—$R^{16}$, where p is an integer of 1 or 2, $R^{16}$ is an optionally substituted hydrocarbon residue, $R^{15}$ is a hydrogen atom or an optionally substituted hydrocarbon residue, and the group —$NR^{14}R^{15}$ may form or an optionally substituted cyclic amino group, (3) a group of the formula —O—$R^{17}$, wherein $R^{17}$ is a hydrogen atom, an optionally substituted hydrocarbon residue, an optionally substituted acyl group or an optionally substituted heterocyclic group, or (4) a group of the formula: —$S(O)_t$—$R^{18}$, wherein $R^{18}$ is a hydrogen atom, an optionally substituted hydrocarbon residue or an optionally substituted heterocyclic group, and t is an integer of 0 to 2, and n is 1, $R^3$ is not a group of the formula:



wherein $R^7$ is an optionally substituted 5–7 membered heterocyclic residue, having as a group capable of constituting the ring, carbonyl group, thiocarbonyl group, an optionally oxidized sulfur atom or a group convertible into them, D is a direct bond or a spacer having an atomic length of two or less between the ring B and the ring A, and A and B are independently an optionally substituted aromatic hydrocarbon residue optionally containing a hetero-atom or an optionally substituted heterocyclic residue, or a salt thereof.

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5,744,480

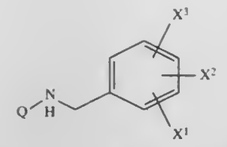
## FLUOROALKOXYBENZYLAMINO DERIVATIVES OF NITROGEN CONTAINING HETEROCYCLES

**John Adams Lowe, III, Stonington, Conn., and Terry Jay Rosen, Foster City, Calif., assignors to Pfizer Inc., New York, N.Y.**

**Division of Ser. No. 167,881, Dec. 14, 1993, which is a continuation-in-part of Ser. No. 717,943, Jun. 20, 1991. This application May 22, 1995, Ser. No. 443,418**
**Int. Cl.[6] C07D** *453/02;* **A61K** *31/44*
**U.S. Cl. 514—305** **20 Claims**

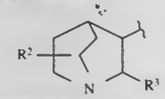
1. A compound of formula





I

wherein
$X^1$ is hydrogen, ($C_1$–$C_{10}$) alkoxy optionally substituted with from one to three fluorine atoms or ($C_1$–$C_{10}$) alkyl optionally substituted with from one to three fluorine atoms;
$X^2$ and $X^3$ are independently selected from halo, hydrogen, nitro, ($C_1$–$C_{10}$) alkyl optionally substituted with from one to three fluorine atoms, ($C_1$–$C_{10}$) alkoxy optionally substituted with from one to three fluorine atoms, trifluoromethyl, hydroxy, phenyl, cyano, amino, ($C_1$–$C_6$)-alkylamino, di-($C_1$–$C_6$)alkylamino, —C(=O)—NH—($C_1$–$C_6$) alkyl, ($C_1$–$C_6$) alkyl-C(=O)—NH—($C_1$–$C_6$) alkyl, hydroxy($C_1$–$C_4$)alkyl, ($C_1$–$C_4$)alkoxy($C_1$–$C_4$)alkyl, —NHC(=O)H and —NHC(=O)—($C_1$–$C_6$) alkyl; and
Q is a group of the formula



III

wherein $R^2$ is hydrogen or ($C_1$–$C_6$) alkyl;
$R^3$ is phenyl, biphenyl, naphthyl, pyridyl, benzhydryl, thienyl or furyl, and $R^3$ may optionally be substituted with from one to three substituents independently selected from halo, ($C_1$–$C_{10}$) alkyl optionally substituted with from one to three fluorine atoms and ($C_1$–$C_{10}$) alkoxy optionally substituted with from one to three fluorine atoms;
with the proviso that when neither $X^1$, $X^2$ nor $X^3$ is a fluorinated alkoxy group, $R^3$ is an aryl group substituted with a fluorinated alkoxy group.

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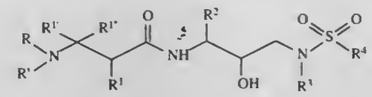
5,744,481

## β-AMINO ACID HYDROXYETHYLAMINO SULFONAMIDES USEFUL AS RETROVIRAL PROTEASE INHIBITORS

**Michael L. Vazquez, Gurnee; Richard A. Mueller, Glencoe, both of Ill.; John J. Talley, St. Louis, Mo.; Daniel Getman, Chesterfield, Mo.; Gary A. DeCrescenzo, St. Peters, Mo., and John N. Freskos, Clayton, Mo., assignors to G.D. Searle & Co., St. Louis, Mo.**

**Continuation of Ser. No. 485,524, Jun. 7, 1995, abandoned, which is a division of Ser. No. 110,911, Aug. 24, 1993, abandoned, which is a continuation-in-part of Ser. No. 934,984, Aug. 25, 1992, abandoned. This application Apr. 25, 1997, Ser. No. 845,392**
**Int. Cl.[6] A61K** *31/18;31/47;* **C07C** *311/18;* **C07D** *215/48*
**U.S. Cl. 514—311** **47 Claims**

1. Compound represented by the formula:



wherein:
R represents hydrogen, alkoxycarbonyl, aralkoxycarbonyl, alkylcarbonyl, cycloalkylcarbonyl, cycloalkylalkoxycarbonyl, cycloalkylalkanoyl, alkanoyl, aralkanoyl, aroyl, aryloxycarbonyl, aryloxycarbonylalkyl, aryloxyalkanoyl, heterocyclylcarbonyl, heterocyclyloxycarbonyl, heterocyclylalkanoyl, heterocyclylalkoxycarbonyl, heteroaralkanoyl, heteroaralkoxycarbonyl, heteroaryloxy-carbonyl, heteroaroyl, alkyl, alkenyl, cycloalkyl, aryl, aralkyl, aryloxyalkyl, heteroaryloxyalkyl, hydroxyalkyl, aminocarbonyl, aminoalkanoyl, and mono- and disubstituted aminocarbonyl and mono- and disubstituted aminoalkanoyl radicals wherein the

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substituents are selected from alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroaryl, heteroaralkyl, heterocycloalkyl, heterocycloalkyalkyl radicals, or where said aminoalkanoyl radical is disubstituted, said substituents along with the nitrogen atom to which they are attached form a heterocycloalkyl or heteroaryl radical;

R' represents hydrogen and radicals as defined for $R^3$ or R and R' together with the nitrogen to which they are attached represent heterocycloalkyl and heteroaryl radical;

$R^1$ represents hydrogen, $—CH_2SO_2NH_2$, $—CH_2CO_2CH_3$, $—CO_2CH_3$, $—CONH_2$, $—CH_2C(O)NHCH_3$, $—C(CH_3)_2(SH)$, $—C(CH_3)_2(SCH_3)$, $—C(CH_3)_2(S[O]CH_3)$, $—C(CH_3)_2(S[O]_2CH_3)$, alkyl. haloalkyl, alkenyl, alkynyl and cycloalkyl radicals, and amino acid side chains selected from asparagine, S-methyl cysteine and the sulfoxide (SO) and sulfone ($SO_2$) derivatives thereof, isoleucine, allo-isoleucine, alanine, leucine, tert-leucine, phenylalanine, ornithine, histidine, norleucine, glutamine, threonine, glycine, allothreonine, serine, aspartic acid, beta-cyano alanine and valine side chains;

$R^{1'}$ and $R^{1''}$ independently represent hydrogen and radicals as defined for $R^1$, or one of $R^{1'}$ and $R^{1''}$, together with $R^1$ and the carbon atoms to which $R^1$, $R^{1'}$ and $R^{1''}$ are attached, represent a cycloalkyl radical;

$R^2$ represents alkyl, aryl, cycloalkyl, cycloalkylalkyl and aralkyl radicals, which radicals are optionally substituted with a group selected from alkyl and halogen radials, $—NO_2$, $—C\equiv N$, $CF_3$, $—OR^9$, $—SR^9$, wherein $R^9$ represents hydrogen and alkyl radicals;

$R^3$ represents alkyl, haloalkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkyl, heteroaryl, heterocycloalkylalkyl, aryl, aralkyl, heteroaralkyl, aminoalkyl and mono- and disubstituted aminoalkyl radicals, wherein said substituents are selected from alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroaryl, heteroaralkyl, heterocycloalkyl, and heterocycloalkylalkyl radicals, or in the case of a disubstituted aminoalkyl radical, said substituents along with the nitrogen atom to which they are attached, form a heterocycloalkyl or a heteroaryl radical; and

$R^4$ represents radicals as defined by $R^3$.

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**5,744,482**

**SEROTONIN AGONIST IN COMBINATION WITH A TACHYKININ RECEPTOR ANTAGONIST IN THE TREATMENT OR PREVENTION OF MIGRAINE**

**Marlene L. Cohen, Carmel; Kirk W. Johnson, Indianapolis, and Lee A. Phebus, Fountaintown, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Filed Oct. 5, 1994, Ser. No. 318,391**

**Int. Cl.[6] A61K** *31/405;31/445*

**U.S. Cl. 514—316** **5 Claims**

1. A method for the treatment or prevention of migraine in a mammal which comprises administering to a mammal in need thereof the tachykinin receptor antagonist (R)-3-(1H-indol-3-yl)-1-[N-(2 -methoxybenzyl)acetylano]-2-[N-(2-(4-(piperidin-1-yl)piperidin-1yl)acetyl)amino]propane and the serotonin agonist sumatriptan.

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**5,744,483**

**NEUROPROTECTIVE COMPOUNDS**

**Todd W. Butler, Salem, and Bertrand L. Chenard, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.**

**PCT No. PCT/IB94/00365, § 371 Date Oct. 24, 1996, § 102(e) Date Oct. 24, 1996, PCT Pub. No. WO95/20587, PCT Pub. Date Aug. 3, 1995**

**PCT Filed Nov. 21, 1994, Ser. No. 687,542**

**Int. Cl.[6] A61K** *31/445;* **C07D** *405/04*

**U.S. Cl. 514—320** **17 Claims**

1. A compound 3R*4S*3-[4-(4-fluorophenyl)-4-hydroxy-piperidin-1-yl]-chroman- 4,7-diol, its optical isomers and pharmaceutically acceptable salts.

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**5,744,484**

**LUBELUZOLE INTRAVENOUS SOLUTIONS**

**Marc Karel Jozef François, Kalmthout; Jozef Peeters, Beerse, and Christiane Grabriëlla Gerardus Maria Heyns, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium**

**PCT No. PCT/EP95/04520, § 371 Date Apr. 23, 1997, § 102(e) Date Apr. 23, 1997, PCT Pub. No. WO96/15790, PCT Pub. Date May 30, 1996**

**PCT Filed Nov. 16, 1995, Ser. No. 817,740**

**Claims priority, application European Pat. Off., Nov. 24, 1994, 94203422**

**Int. Cl.[6] A61K** *31/445*

**U.S. Cl. 514—321** **15 Claims**

1. A solution for intravenous administration containing water, lubeluzole or a pharmaceutically acceptable addition salt thereof, an isotonizing agent, and acid and base substances to adjust the pH of the solution in the range from 2.5 to 3.6.

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**5,744,485**

**CARBAMATES AND UREAS AS MODIFIERS OF MULTI-DRUG RESISTANCE**

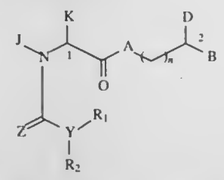
**Robert Edward Zelle, Stow, and Matthew W. Harding, Acton, both of Mass., assignors to Vertex Pharmaceuticals Incorporated, Cambridge, Mass.**

**Continuation-in-part of Ser. No. 218,120, Mar. 25, 1994, abandoned. This application Jan. 23, 1995, Ser. No. 377,283**

**Int. Cl.[6] C07D** *211/32;* **A61K** *31/445*

**U.S. Cl. 514—318** **19 Claims**

1. A compound of formula (I):



(I)

wherein:

A is $CH_2$, oxygen, NH or N—(C1–C4 alkyl);

B and D are independently:

Ar, (C1–C6)-straight or branched alkyl, (C2–C6)-straight or branched alkenyl or alkynyl, (C5–C7)-cycloalkyl substituted (C1–C6)-straight or branched alkyl, (C3–C6)-straight or branched alkenyl or alkynyl, (C5–C7)-cycloalkenyl substituted (C1–C6)-straight or branched alkyl, (C3–C6)-straight or branched alkenyl or alkynyl, Ar-substituted (C1–C6)-straight or branched alkyl, Ar-substituted (C3–C6)-straight or branched alkenyl or alkynyl;

wherein any one of the $CH_2$ groups of said alkyl chains may be optionally replaced by a heteroatom selected from the group consisting of O, S, SO, $SO_2$, and NR;

wherein R is selected from the group consisting of hydrogen, (C1–C4)-straight or branched alkyl, (C3–C4)-straight or branched alkenyl or alkynyl, and (C1–C4) bridging alkyl wherein a bridge is formed between the nitrogen and a carbon atom of said heteroatom-containing chain to form a ring, and wherein said ring is optionally fused to an Ar group;

J and K are taken together with the nitrogen and carbon atoms to which they are respectively bound to form a 5–7 membered heterocyclic ring which may contain a heteroatom selected from the group consisting of O, S, SO and $SO_2$;

Z is O or S;

Y is O or N; wherein:

when Y is O, then $R_1$ is a lone pair and $R_2$ is selected from the group consisting of Ar, (C1–C6)-straight or branched alkyl, and (C3–C6)-straight or branched alkenyl or alkynyl; and

when Y is N, then $R_1$ and $R_2$ are independently selected from the group consisting of Ar, (C1–C6)-straight or branched alkyl, and (C3–C6)-straight or branched alkenyl or alkynyl; or $R_1$ and $R_2$ are taken together to form a heterocyclic 5–6 membered ring selected from the group consisting of pyrrolidine, imidazolidine, pyrazolidine, piperidine, and piperazine;

wherein Ar is a carbocyclic aromatic group selected from the group consisting of phenyl, 1-naphthyl, 2-naphthyl, indenyl, azulenyl, fluorenyl and anthracenyl;

or a heterocyclic aromatic group selected from the group consisting of 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, pyrrolyl, oxazolyl, thiazolyl, imidazolyl, pyrazolyl; 2-pyrazolinyl, pyrazolidinyl, isoxazolyl, isotiazolyl, 1,2,3-oxadiazolyl, 1,2,3-triazolyl, 1,3,4-thiadiazolyl, pyridazinyl, pyrimidinyl, pyrazinyl, 1,3,5-triazinyl, 1,3,5-trithianyl, indolizinyl, indolyl, isoindolyl, 3H-indolyl, indolinyl, benzo[b]furanyl, benzo[b]thiophenyl, 1H-indazolyl, benzimidazolyl, benzthiazolyl, purinyl, 4H-quinolizinyl, quinolinyl, 1,2,3,4-tetrahydroquinolinyl, isoquinolinyl, 1,2,3,4-tetrahydroisoquinolinyl, cinnolinyl, phthalazinyl, quinazolinyl, quinoxalinyl, 1,8-naphthyridinyl, pteridinyl, carbazolyl, acridinyl, phenazinyl, phenothiazinyl, and phenoxazinyl;

wherein Ar is optionally substituted with one to three substituents which are independently selected from the group consisting of hydrogen, halogen, hydroxyl, nitro, $SO_3H$, trifluoromethyl, trifluoromethoxy, (C1–C6)-straight or branched alkyl, (C2–C6)-straight or branched alkenyl, O—(C1–C4)-straight or branched alkyl, O—(C3–C4)-straight or branched alkenyl, O-benzyl, O-phenyl, 1,2-methylenedioxy, $—NR_3R_4$, carboxyl, N-, N,N-dicarboxamides, morpholinyl, piperidinyl, O—X, $CH_2—(CH_2)_q—X$, $O—(CH_2)_q—X$, $(CH_2)_q—O—X$ and $CH=CH—X$;

wherein $R_3$ and $R_4$ are independently selected from the group consisting of (C1–C6)-straight or branched alkyl, (C3–C6)-straight or branched alkenyl, hydrogen and benzyl; or wherein $R_3$ and $R_4$ can be taken together to form a 5–6 membered heterocyclic ring;

wherein X is selected from the group consisting of 4-methoxyphenyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, pyrazyl, quinolyl, 3,5-dimethylisoxazoyl, isoxazoyl, 2-methylthiazoyl, thiazoyl, 2-thienyl, 3-thienyl and pyrimidyl;

wherein q is 0–2; and

n is 0 or 1;

provided that when n is 0; A, Z, and Y are oxygen; J and K together form a six membered piperidine ring; $R_2$ is t-butyl and B is 3-phenylpropyl, then D is not 2-phenylethyl, 2-(3-pyridyl)-ethyl, 3-(2-pyridyl)-propyl, 3-(3-pyridyl)-propyl, or 3-chloropropyl; and provided that when n is 0 or 1; A, Z, and Y are oxygen; J and K together form a six membered piperidine ring; $R_2$ is t-butyl and B is benzyl, then D is not 2-phenylethyl or 3-(3-indolyl)-propyl.

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**5,744,486**

**PYRIDINONE THROMBIN INHIBITORS**

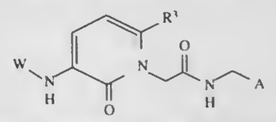
**Philip E. Sanderson, Philadelphia; Adel M. Naylor-Olsen; Dona L. Dyer, both of Lansdale; Joseph P. Vacca, Telford; Richard C. A. Isaacs, Harleysville; Bruce D. Dorsey, Maple Glen, and Mark E. Fraley, North Wales, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**Division of Ser. No. 669,189, Jun. 24, 1996, Pat. No. 5,668,289. This application Mar. 31, 1997, Ser. No. 829,406**

**Int. Cl.[6] A61K** *31/445;* **C07D** *211/06*

**U.S. Cl. 514—318** **13 Claims**

1. A compound having the formula:



I

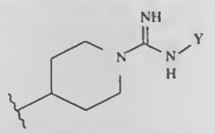
wherein W is $R^1$, $R^1OCO$. $R^1CO$. $R^1SO_2$, $(R^1)_m(CH_2)_nNH_qCO$, where n is 0–4, m is 1 or 2, and q is 0 or 1, with the proviso that where n is 1–4,q is 1 and m is 1, and where n is 0, m is 1 or2, and q is 0or 1, and where n is 0, m is 2and q is 0, $R^1$ can be the same or different;

$R^1$ is $R^2(CH_2)_n$, where n is 0–4, $(R^2)(OR^2)CH(CH_2)_p$, where p is 1–4, $(R^2)_2CH(CH_2)_n$, where n is 0–4 and $R^2$ can be the same or different, and wherein $(R^2)_2$ can also be a ring substituent on CH represented by $C_{3-7}$ cycloalkyl, $C_{7-12}$ bicyclic alkyl, or a 5- to 7- membered mono- or bicyclic heterocyclic ring which can be saturated or unsaturated, and which contains from one to three heteroatoms selected from the group consisting of N, O and S, and $R^2O(CH_2)_p$, wherein p is 1–4;

$R^2$ is hydrogen, phenyl, unsubstituted or substituted with one or more of $C_{1-4}$ linear or branched alkyl, $C_{1-4}$ linear or branched alkoxy, halogen, trifluoromethyl, hydroxy, COOH, or $CONH_2$, naphthyl, biphenyl, a 5- to 7- membered mono- or a 9- to 10-membered bicyclic heterocyclic ring which can be saturated or unsaturated, and which contains from one to three heteroatoms selected from the group consisting of N, O and S, $COOR^6$, $C_{1-4}$ linear or branched alkyl, $C_{3-7}$ cycloalkyl, or $C_{7-12}$ bicyclic alkyl;

$R^3$ is hydrogen, $C_{1-4}$ linear or branched alkyl, $C_{3-7}$ cycloalkyl, or trifluoromethyl;

A is chosen from one of the following Radicals:



IV

Y is hydrogen, hydroxy, or CN;

$R^6$ is hydrogen, or $C_{1-4}$ linear or branched alkyl,

and pharmaceutically acceptable salts thereof.

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**5,744,487**

**PROLINEAMIDE DERIVATIVES**

**Masahiro Ohshima; Norimichi Iwase; Shigeo Sugiyama; Koichi Sugawara; Misao Okitsu; Yoshikuni Tamao, and Yasuhiro Morinaka, all of Yokohama, Japan, assignors to Mitsubishi Chemical Corporation, Japan**

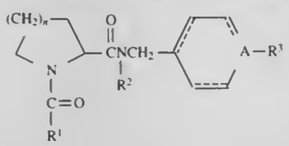
**Filed Jan. 26, 1995, Ser. No. 378,615**

**Claims priority, application Japan, Jan. 27, 1994, 6-007733**

**Int. Cl.[6] A61K** *31/40;* **C07D** *207/09*

**U.S. Cl. 514—326** **9 Claims**

1. A prolineamide derivative represented by the formula (I):



(I)

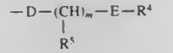
wherein:

A is a carbon atom or a nitrogen atom;

n is an integer of 0 to 2;

a broken line indicates that adjacent carbons are connected by a double or single bond;

$R^1$ is



wherein:

D and E independently indicate a single bond or an optionally branched $C_1$–$C_6$ alkylene group;

$R^4$ is a $C_1$–$C_6$ alkyl group;

$—OR^6$.

$R^6$ is a hydrogen atom, a $C_1$–$C_6$ alkyl group, an optionally substituted $C_6$–$C_{10}$ aryl group, an optionally substituted $C_3$–$C_8$ cycloalkyl group or an optionally substituted $C_7$–$C_{12}$ aralkyl group;

$—SR^7$.

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$R^7$ is a $C_1$–$C_6$ alkyl group, an optionally substituted $C_6$–$C_{10}$ aryl group, an optionally substituted $C_3$–$C_8$ cycloalkyl group or an optionally substituted $C_7$–$C_{12}$ aralkyl group;

—$SOR^8$,

$R^8$ is an optionally substituted $C_6$–$C_{10}$ aryl group or an optionally substituted $C_3$–$C_8$ cycloalkyl group;

—$SO_2R^9$,

$R^9$ is an optionally substituted $C_6$–$C_{10}$ aryl group or an optionally substituted $C_3$–$C_8$ cycloalkyl group;

—$COR^{10}$,

$R^{10}$ is a hydroxyl group, a $C_1$–$C_6$ alkoxy group, an optionally substituted $C_6$–$C_{10}$ aryl group or an optionally substituted $C_3$–$C_8$ cycloalkyl group;

—$NHR^{11}$,

$R^{11}$ is a $C_1$–$C_6$ alkyl group, an optionally substituted $C_6$–$C_{10}$ aryl group, an optionally substituted $C_3$–$C_8$ cycloalkyl group or an optionally substituted $C_7$–$C_{12}$ aralkyl group;

—$NHCOR^{12}$,

$R^{12}$ is a $C_1$–$C_6$ alkoxy group, an optionally substituted $C_6$–$C_{10}$ aryl group, an optionally substituted $C_3$–$C_8$ cycloalkyl group or an optionally substituted $C_7$–$C_{12}$ aralkyloxy group;

—$NHSO_2R^{13}$,

$R^{13}$ is a $C_1$–$C_6$ alkyl group, an optionally substituted $C_6$–$C_{10}$ aryl group, an optionally substituted $C_3$–$C_8$ cycloalkyl group, an optionally substituted $C_7$–$C_{12}$ aralkyl group, or an optionally substituted 5- to 10-membered heterocyclic group;

an optionally substituted $C_6$–$C_{10}$ aryl group;

an optionally substituted $C_3$–$C_8$ cycloalkyl group;

an optionally substituted 5- to 10-membered heterocyclic group; or

—$SiR^{14}R^{15}R^{16}$,

$R^{14}$, $R^{15}$, and $R^{16}$ independently indicate a $C_1$–$C_6$ alkyl group;

$R^5$ is a —$OR^{17}$,

$R^{17}$ is a hydrogen atom,

—$SiR^{22}R^{23}R^{24}$,

$R^{22}$, $R^{23}$, and $R^{24}$ independently indicate a $C_1$–$C_6$ alkyl group,

a $C_1$–$C_6$ alkyl group, or

an optionally substituted 5- to 10-membered heterocyclic group;

—$OCOR^{18}$,

$R^{18}$ is a hydrogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ alkoxy group, an amino group, a $C_1$–$C_6$ alkylamino group, a $C_2$–$C_{12}$ dialkylamino group or a $C_2$–$C_7$ alkenylamino group;

—$NHR^{19}$,

$R^{19}$ is a hydrogen atom, a $C_1$–$C_6$ alkyl group or an optionally substituted $C_7$–$C_{12}$ aralkyl group;

—$NHCOR^{20}$,

$R^{20}$ is a hydrogen atom, a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, an optionally substituted $C_3$–$C_8$ cycloalkyl group, a $C_2$–$C_7$ carboxyalkyloxy group, a $C_2$–$C_7$ alkenyloxy group, an optionally substituted $C_6$–$C_{10}$ aryl group, an optionally substituted $C_6$–$C_{10}$ aryloxy group, a $C_3$–$C_9$ alkoxycarbonylalkoxy group, a $C_2$–$C_{12}$ dialkylamino group or an optionally substituted $C_7$–$C_{12}$ aralkyloxy group; or

—$NHSO_2R^{21}$,

$R^{21}$ is a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_2$–$C_7$ carboxylalkyl group, an optionally substituted $C_6$–$C_{10}$ aryl group, a $C_3$–$C_9$ alkoxycarbonylalkyl group or an optionally substituted $C_7$–$C_{12}$ aralkyl group; and

m is 0 or 1;

$R^2$ is a hydrogen atom or a $C_1$–$C_6$ alkyl group; and

$R^3$ is —$C(=NR^{25})NH_2$,

$R^{25}$ is a hydrogen atom, a $C_1$–$C_6$ alkyl group, a $C_2$–$C_7$ acyl group, a $C_2$–$C_7$ acyloxy group, a $C_1$–$C_6$ alkoxy group, a $C_2$–$C_7$ alkoxycarbonyl group, a $C_2$–$C_7$ alkoxycarbonyloxy group, a hydroxyl group or a $C_2$–$C_7$ hydroxyalkylcarbonyloxy group;

—NH—$C(=NR^{25})NH_2$,

$R^{25}$ is a defined above; or

—$NHR^{26}$,

$R^{26}$ is a hydrogen atom, a $C_1$–$C_6$ alkyl group, a $C_2$–$C_7$ acyl group, a $C_2$–$C_7$ alkoxycarbonyl group or a 5-$C_1$–$C_3$ alkyl-1,3-dioxol-2-on- 4-ylmethyl group;

each of said 5- to 10-membered heterocyclic groups is selected from the group consisting of a furan ring, tetrahydrofuran ring, pyran ring, benzofuran ring, chroman ring, thiophene ring, benzothiophene ring, pyrrole ring, imidazole ring, pyrazole ring, triazole ring, pyridine ring, piperidine ring, pyrazine ring, piperazine ring, pyrimidine ring, indole ring, benzimidazole ring, purine ring, quinoline ring, phthalazine ring, guinazoline ring, cinnoline ring, oxazole ring, thiazole ring or morpholine ring;

each of said optional substituents being selected from the group consisting of a $C_1$–$C_6$ alkyl group, a $C_1$–$C_6$ haloalkyl group, a $C_1$–$C_6$ alkoxy group, a hydroxyl group, a carboxyl group, a $C_2$–$C_7$ carboxyalkyl group, a $C_2$–$C_7$ carboxyalkyloxy group, a $C_2$–$C_7$ acyl group, a $C_2$–$C_7$ acyloxy group, a $C_2$–$C_7$ alkoxycarbonyl group, a $C_2$–$C_7$ alkoxycarbonyloxy group, a $C_8$–$C_{13}$ aralkyloxycarbonyl group, a $C_3$–$C_9$ alkoxycarboxyalkoxy group and a halogen atom;

provided that $R^3$ is —$C(=NR^{25})NH_2$ ($R^{25}$ is a defined above) when A is a nitrogen atom, or a salt or hydrate thereof.

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**5,744,488**

## INDOLE DERIVATIVES THROMBOXANE A2 ANTAGONISTS

**Peter Edward Cross; Kevin Neil Dack; Roger Peter Dickinson, and John Steele, all of Sandwich, United Kingdom, assignors to Pfizer Inc., New York, N.Y.**

**PCT No. PCT/EP94/02660, § 371 Date Feb. 23, 1996, § 102(e) Date Feb. 23, 1996, PCT Pub. No. WO95/06046, PCT Pub. Date Mar. 2, 1995**

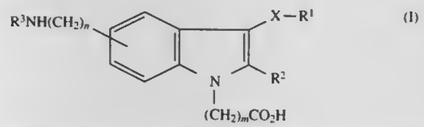
**PCT Filed Aug. 9, 1994, Ser. No. 601,013**

**Claims priority, application United Kingdom, Aug. 26, 1993, 9317764**

**Int. Cl.[6] A61K** *31/44;* **C07D** *401/06*

**U.S. Cl. 514—339** **9 Claims**

1. A compound of formula (I):



(I)

or a pharmaceutically acceptable salt or biolabile ester thereof, wherein $R^1$ is $C_1$–$C_4$ alkyl, phenyl optionally substituted by up to three substituents independently selected from $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, halogen and $CF_3$, or is 1-imidazolyl, 3-pyridyl or 4-pyridyl;

$R^2$ is H or $C_1$–$C_4$ alkyl,

$R^3$ is $SO_2R_4$ or $COR^4$ where $R^4$ is $C_1$–$C_4$ alkyl, $C_1$–$C_3$ perfluoroalkyl$(CH_2)_p$, $C_3$–$C_6$ cycloalkyl$(CH_2)_p$, aryl$(CH_2)_p$, furyl$(CH_2)_p$, thienyl$(CH_2)_p$ or pyridyl$(CH_2)_p$, p being 0, 1 or 2, or $R^4$ may be $NR^5R^8$ where $R^5$ is H or $C_1$–$C_4$ alkyl and $R^6$ is $C_1$–$C_6$ alkyl, $C_3$–$C_6$ cycloalkyl or aryl;

X is $CH_2$ or a direct link, with the proviso that when $R^1$ is 1-imidazolyl then X is $CH_2$;

m is 2, or 3;

n is 0, 1 or 2,

and wherein the group $(CH_2)_nNHR^3$ is attached at the 5-position when n is 0 or 1, or at the 5- or 4-position when n is 2.



**5,744,489**

## METHOD OF TREATING GASTROINTESTINAL MOTILITY DISORDERS

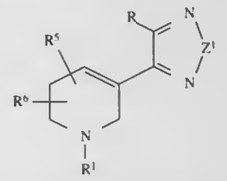
**Beverley Greenwood, 6593 Manchester Dr., Fishers, Ind. 46308**

**Continuation of Ser. No. 171,060, Dec. 21, 1993, abandoned. This application May 30, 1995, Ser. No. 350,871**

**Int. Cl.[6] A61K** *31/44;31/41*

**U.S. Cl. 514—340** **17 Claims**

1. A method of treating a gastrointestinal hypermotility disorder in a subject in need thereof comprising administering to said subject an effective amount of a compound of formula I



(I)

wherein

$Z^1$ is oxygen or sulphur;

R is hydrogen; halogen; amino; —NHCO—$R^2$; $C_{3-7}$-cycloalkyl: $C_{4-10}$-(cycloalkylalkyl); —$Z^2$—$C_{3-7}$-cycloalkyl optionally substituted with $C_{1-6}$-alkyl; —$Z^2$—$C_{4-10}$-(cycloalkylalkyl); —$Z^2$—$C_{4-10}$-(cycloalkenylalkyl); —$Z^2$—$C_{4-10}$-(methylenecycloalkylakyl); —NH—$R^2$; —$NR^2R^3$; —NH—$OR^2$; phenyl; phenoxy; benzoyl; benzyloxycarbonyl; tetrahydronaphthyl; indenyl; $R^2$; —$Z^2R^2$; —$SOR^2$; —$SO_2R^2$; —$Z^2R^2$—$Z^3$—$R^3$; —$Z^2$—$R^2$—$Z^3$—$R^3$—$Z^4$—$R^4$; —$Z^2$—$R^2$—CO—$R^3$; —$Z^2$—$R^2$—$CO_2$—$R^3$; —$Z^2$—$R^2$—$O_2C$—$R^3$; —$Z^2$—$R^2$—CONH—$R^3$; or —$Z^2$—$R^2$—NHCO$R^3$; wherein $Z^2$, $Z^3$ and $Z^4$ independently are oxygen or sulphur, and $R^2$, $R^3$ and $R^4$ independently are straight or branched $C_{1-5}$-alkyl, straight or branched $C_{2-15}$-alkenyl, straight or branched $C_{2-15}$-alkynyl, each of which is optionally substituted with halogen(s), —OH, —CN, —$CF_3$, —SH, —COOH, —NH—$R^2$, —$NR^2R^3$, $C_{1-6}$-alkyl ester, one or two phenyl, phenoxy, benzoyl or benzyloxycarbonyl wherein each aromatic group is optionally substituted with one or two halogen, —CN, $C_{1-4}$-alkyl or $C_{1-4}$-alkoxy;

$R^5$ and $R^6$ may be present at any appropriate position and independently are hydrogen, straight or branched $C_{1-5}$-alkyl, straight or branched $C_{2-5}$-alkenyl, straight or branched $C_{2-5}$-alkynyl, straight or branched $C_{1-10}$-alkoxy, —OH, halogen, —$NH_2$, carboxy, or straight or branched $C_{1-5}$-alkyl substituted with —OH; and

$R^1$ is hydrogen, straight or branched $C_{1-5}$-alkyl, straight or branched $C_{2-5}$-alkenyl or straight or branched $C_{2-5}$-alkynyl; or a pharmaceutically acceptable salt thereof.

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**5,744,490**

**Patent Not Issued For This Number**

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**5,744,491**

## 3-AMIDOPYRAZOLE DERIVATIVES, PROCESS FOR PREPARING THESE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

**Robert Boigegrain, Assas; Danielle Gully, Saubens; Francis Jeanjean, Valflaunes, and Jean-Charles Molimard, Saint-Gely-du-Fesc, all of France, assignors to Sanofi, Paris, France**

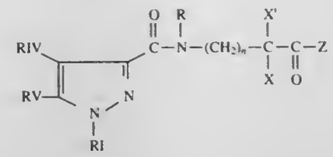
**Division of Ser. No. 394,756, Feb. 27, 1995, Pat. No. 5,616,592, which is a division of Ser. No. 119,830, Sep. 13, 1993, Pat. No. 5,420,141, which is a continuation of Ser. No. 747,359, Aug. 20, 1991, abandoned. This application Jan. 2, 1997, Ser. No. 778,105**

**Claims priority, application France, Aug. 20, 1990, 90 10486**

**Int. Cl.[6] C07D** *401/12;403/12;* **A61K** *31/44;31/415*

**U.S. Cl. 514—341** **4 Claims**

1. A 3-amidopyrazole of formula (I):



(I)

in which:

X is hydrogen;

X' is a $C_3$–$C_7$ cycloalkyl group; or

X and X', together with the carbon atom to which they are linked, form a $C_3$—$C_{12}$ cycloalkyl group optionally substituted by a $C_1$–$C_3$ alkyl;

$R_I$ represents:

a phenyl group substituted by $R_a$, $R'_a$ and $R''_a$, wherein $R_a$, $R'_a$ and $R''_a$ each independently represent a hydrogen atom, a halogen atom, a hydroxyl, a linear or branched $C_1$–$C_4$ alkyl group, a $C_1$–$C_4$ alkoxy group, a trifluoromethyl group, a trifluoromethoxy group, a nitro group, a carboxyl group or an amino group;

a tetrahydronaphthyl group; or

a naphthyl group substituted by $R_a$, $R'_a$ and $R''_a$ as defined above;

R represents hydrogen or linear or branched $C_1$–$C_4$ alkyl;

n represents 0, 1, 2 or 3;

Z represents

a hydroxyl group;

a $C_1$–$C_6$ alkoxy group;

an oxygen atom substituted with a carboxylic acid-protecting group, wherein the carboxylic acid-protecting group is selected from the group consisting of tert-butyl, benzyl, benzyl substituted with a halogen atom, $C_1$–$C_6$ alkyl, trifluoromethyl, trifluoromethoxy or carboxyl group;

an amino group; or

a nitrogen atom substituted with a carboxyalkyl group in which the alkyl group is a linear or branched $C_1$–$C_6$ group;

$R_{IV}$ represents a hydrogen atom, a halogen atom or a $C_1$–$C_6$ alkyl group;

$R_V$ represents:

a phenyl group substituted by $R_5$, $R'_5$ and $R''_5$, where $R_5$, $R'_5$ and $R''_5$ each independently represent a hydrogen atom, a halogen atom, a linear or branched $C_1$–$C_4$ alkyl group, a hydroxyl group, a $C_1$–$C_4$ alkoxy group, a nitro group, a trifluoromethyl group, a trifluoromethoxy group, a cyano group, an amino group, a carboxyl group, a $C_1$–$C_4$ carboxyalkyl group or a phenyl group;

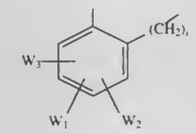
a naphthyl group unsubstituted or substituted with a $C_1$–$C_4$ alkyl group;

a pyridyl group;

a styryl group unsubstituted or substituted with a $C_1$–$C_4$ alkyl group;

or alternatively $R_{IV}$ and $R_V$ considered together represent:

a group



in which the phenyl group substitutes the pyrazole at position 5 and the group —$(CH_2)_i$— in which i=1 to 3 substitutes the pyrazole at position 4; $W_1$, $W_2$ and $W_3$ substitute the benzene ring and independently represent hydrogen, a halogen atom or a hydroxyl group;

or one of its pharmaceutically acceptable, crystallization or separation salts with organic or inorganic acids or with inorganic or organic bases.

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**5,744,492**

## METHOD FOR INHIBITING ANGIOGENESIS

**Elise C. Kohn, Olney; Lance A. Liotta, Potomac, and Riccardo Alessandro, Bethesda, all of Md., assignors to United States of America, Washington, D.C.**

**Continuation-in-part of Ser. No. 123,614, Sep. 17, 1993, abandoned. This application Mar. 10, 1994, Ser. No. 209,651**

**Int. Cl.[6] A61K** *31/41*

**U.S. Cl. 514—359** **7 Claims**

1. A method of treating diseases associated with angiogenesis in a host, comprising treating said host with an effective amount of a compound of formula:

$$Y—(CH_2)_p—Ar^1.X—Ar^2 \quad (I)$$

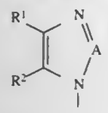
wherein:

p is an integer of from 0 to 4;

$Ar^1$ and $Ar^2$ are each aromatic moieties independently selected from the group consisting of phenyl, naphthyl, and substituted versions thereof in which the substituents are members selected from the group consisting of halogen, nitro, carboxyl and alkoxy;

X is a linking moiety selected from the group consisting of O, S, $SO_2$, CO, CHCN, straight chain alkyl, alkoxy, and alkoxyalkyl; and

Y is a nitrogen-containing heterocyclic moiety of the formula



(II)

wherein:

A is N or CH,

$R^1$ is a member selected from the group consisting of hydrogen, $—CONH_2$, $—CONHR^5$, $—CO_2H$, $—CO_2R^5$, $—SO_2NH_2$,

$R^2$ is a member selected from the group consisting of hydrogen, $—NH_2$, $—NHCOC_6H_5$, $—NHCOR^5$, —NHCHO, $—NHR^5$, $—N(R^5)_2$ and

$R^5$ is lower alkyl of from 1 to 6 carbon atoms; said diseases being members selected from the group consisting of diabetic retinopathy, hemangiomata, collagen vasculidities, and proliferative nephropathies.

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**5,744,493**

## 3-AMIDOPYRAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

**Robert Boigegrain, Assas; Danielle Gully, Saubens; Francis Jeanjean, Valflaunes, and Jean-Charles Molimard, Saint-Gely-du-Fesc, all of France, assignors to Sanofi, Paris, France**

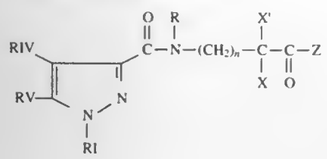
**Division of Ser. No. 393,829, Feb. 24, 1995, Pat. No. 5,635,526, which is a division of Ser. No. 119,830, Sep. 13, 1993, Pat. No. 5,420,141, which is a continuation of Ser. No. 747,359, Aug. 20, 1991, abandoned. This application Dec. 31, 1996, Ser. No. 775,150**

**Claims priority, application France, Aug. 20, 1990, 90 10486**

**Int. Cl.[6] A61K** *31/41*; **C07D** *409/04;403/04*

**U.S. Cl. 514—359** **4 Claims**

1. A 3-amidopyrazole of formula (I):



(I)

in which:

X and X', together with the carbon atom to which they are linked, form an adamantylidene group;

$R_I$ represents:

a 1,2,3-benzothiadazole group;

R represents hydrogen or linear or branched $C_1$–$C_4$ alkyl group;

n represents 0, 1, 2 or 3;

Z represents

a hydroxyl group;

a $C_1$–$C_6$ alkoxy group;

an oxygen atom substituted with a carboxylic acid-protecting group, wherein the carboxylic acid-protecting group is selected from the group consisting of tert-butyl, benzyl, benzyl substituted with a halogen atom, $C_1$–$C_6$ alkyl, trifluoromethyl, trifluoromethoxy or carboxyl group;

an amino group; or

a nitrogen atom substituted with a carboxyalkyl group in which the alkyl group is a linear or branched $C_1$–$C_6$ group;

$R_{IV}$ represents a hydrogen atom, a halogen atom or a $C_1$–$C_6$ alkyl group;

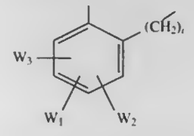
$R_V$ represents:

a phenyl group substituted by $R_5$, $R'_5$ and $R''_5$, where $R_5$, $R'_5$ and $R''_5$ each independently represent a hydrogen atom, a halogen atom, a linear or branched $C_1$–$C_4$ alkyl group, a hydroxyl group, a $C_1$–$C_4$ alkoxy group, a nitro group, a trifluoromethyl group, a trifluoromethoxy group, a cyano group, an amino group, a carboxyl group, a $C_1$–$C_4$ carboxyalkyl group or a phenyl group;

a styryl group unsubstituted or substituted with a $C_1$–$C_4$ alkyl group;

or alternatively $R_{IV}$ and $R_V$ considered together represent:

a group



in which the phenyl group substitutes the pyrazole at position 5 and the group $—(CH_2)_i—$ in which i=1 to 3 substitutes the pyrazole at position 4; $W_1$, $W_2$ and $W_3$ substitute the benzene ring and independently represent hydrogen, a halogen atom or a hydroxyl group;

or one of its pharmaceutically acceptable, crystallization or separation salts with organic or inorganic acids or with inorganic or organic bases.

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**5,744,494**

## SYNERGISTIC COMPOSITIONS CONTAINING BENZIMIDAZOLE ANTHELMINTICS AND METHYLENEDIOXYPHENYL COMPOUNDS

**Quintin Archibald McKellar, Lochwinnoch, and Hafid Abdelaali Benchaoui, Glasgow, both of United Kingdom, assignors to British Technology Group Limited, London, England**

**PCT No. PCT/GB94/00193, § 371 Date Jul. 25, 1995, § 102(e) Date Jul. 25, 1995, PCT Pub. No. WO94/17798, PCT Pub. Date Aug. 18, 1994**

**PCT Filed Feb. 2, 1994, Ser. No. 495,486**

**Claims priority, application United Kingdom, Feb. 3, 1993, 9302107**

**Int. Cl.[6] A61K** *31/415;31/36*

**U.S. Cl. 514—388** **14 Claims**

1. A pharmaceutical composition which comprises an anthelmintically effective amount of a benzimidazole or pro-drug thereof together with

a methylenedioxyphenyl synergist;

provided that the benzimidazole anthelmintic is not thiabendazole.



**5,744,495**

## N, N-DIETHYL-8, 8-DIPROPYL-2-AZASPIRO[4.5] DECANE-2-PROPANAMINE

**Raymond E. Dagger, Warminster, and Carolyn W. Grady, Philadelphia, both of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.**

**Filed Jul. 12, 1996, Ser. No. 679,480**

**Int. Cl.[6] A61K** *31/40*; **C07D** *209/54*

**U.S. Cl. 514—409** **4 Claims**

1. The compound N,N-diethyl-8,8-dipropyl-2-azaspiro[4,5]decane-2-propanamine dimaleate, said dimaleate having a solubility in water 0.1% HCl and methanol similar to that of the corresponding dihydrochloride and a melting point lower than the dihydrochloride and being less hygroscopic and more stable in storage than the dihydrochloride.

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**5,744,496**

## METHOD OF TREATING CARDIAC INSUFFICIENCY USING ANGIOTENSIN-CONVERTING ENZYME INHIBITORS

**Rainer Henning, Hattersheim am Main; Hansjörg Urbach, Kronberg/Taunus; Volker Teetz, Hofheim am Taunus; Rolf Geiger, Frankfurt am Main, and Bernward Schölkens, Kelkheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**

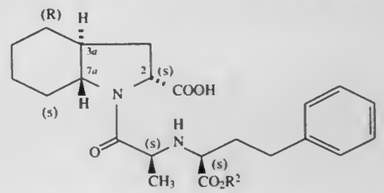
**Division of Ser. No. 188,745, Jan. 31, 1994, Pat. No. 5,403,856, which is a continuation of Ser. No. 920,173, Jul. 27, 1992, abandoned, which is a continuation of Ser. No. 636,001, Jan. 3, 1991, abandoned, which is a continuation of Ser. No. 313,491, Feb. 22, 1989, abandoned, which is a continuation of Ser. No. 721,705, Apr. 10, 1985, abandoned. This application Dec. 20, 1994, Ser. No. 359,860**

**Claims priority, application Germany, Apr. 12, 1984, 34 13710.6**

**Int. Cl.[6] A61K** *31/40*

**U.S. Cl. 514—412** **8 Claims**

1. A method for treating cardiac insufficiency in a mammal comprising the step of administering to a mammal in recognized need of, and for the purpose of said treatment, an amount of a substantially pure angiotensin-converting enzyme inhibitor of the following formula, or a pharmaceutically acceptable salt thereof, effective for said treatment, said formula having the structure



wherein $R^2$ is hydrogen, methyl, ethyl or benzyl.

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**5,744,497**

## TRINUCLEAR CATIONIC PLATINUM COMPLEXES HAVING ANTITUMOR ACTIVITY AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

**Mariella Valsecchi; Marco Conti; Luisa Del Greco; Carlo Bugatti; Ernesto Menta; Ferdinando Giuliani; Carla Manzotti; Silvano Spinelli, all of Monza, Italy, and Nicholas Farrell, Richmond, Va., assignors to Boehringer Mannheim Italia, S.p.A., Milan, Italy**

**PCT No. PCT/EP95/01074, § 371 Date Sep. 27, 1996, § 102(e) Date Sep. 27, 1996, PCT Pub. No. WO95/26968, PCT Pub. Date Oct. 12, 1995**

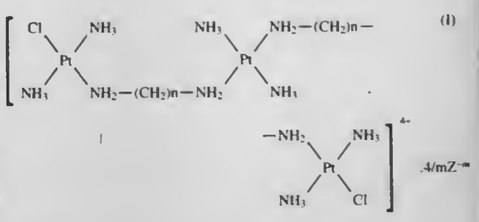
**PCT Filed Mar. 22, 1995, Ser. No. 714,083**

**Claims priority, application Italy, Mar. 31, 1994, MI94A0610**

**Int. Cl.[6] C07F** *15/00*; **A61K** *31/28*

**U.S. Cl. 514—492** **19 Claims**

1. A compound of formula (I)



(I)

wherein:

n is an integer from 2 to 7 included;

$Z^{-m}$ is an anion selected from chloride, bromide, iodide, nitrate, sulfate;

m is the integer 1 or 2.

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**5,744,498**

## INHIBITING GROWTH AND SPREAD OF MALIGNANCY AND RETARDING DNA BREAKS

**Ronald T. Stanko, 795 Scrubgrass Rd., Pittsburgh, Pa. 15234, assignor to Ronald T. Stanko, Pittsburgh, Pa.**

**Division of Ser. No. 194,857, Feb. 14, 1994, Pat. No. 5,612,374. This application Sep. 16, 1996, Ser. No. 714,656**

**Int. Cl.[6] A61K** *31/19*

**U.S. Cl. 514—557** **8 Claims**

1. A method for inhibiting the growth of an adenocarcinoma in the liver, lung or lymph node in a mammal comprising administering orally into the mammal's digestive system a therapeutically effective dose of pyruvate.

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**5,744,499**

## APOPTOSIS-MODULATING FACTORS INFLUENCING THE INTRACELLULAR CONCENTRATION OF METHIONAL/MALONDIALDEHYDE

**Gérard Anthony Quash, Francheville, and Alain Doutheau, Lyons, both of France, assignors to Centre International de Recherches Dermatologiques Galderma, Valbonne, France**

**Filed Dec. 28, 1995, Ser. No. 579,244**

**Claims priority, application France, Dec. 29, 1994, 94 15884**

**Int. Cl.[6] A61K** *31/15*

**U.S. Cl. 514—639** **48 Claims**

1. A regimen for modulating apoptosis in a mammalian organism in need of such treatment, comprising administering to such organism, for such period of time as is required to elicit the desired response, an effective apoptosis-modulating amount of at least one active species selected from among methional, malondialdehyde, or factor influencing mammalian intracellular concentration of methional or malondialdehyde.

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**5,744,500**

## USE OF R-ENANTIOMER OF N-PROPARGYL-1-AMINOINDAN, SALTS, AND COMPOSITIONS THEREOF

**Moussa B. H. Youdim, Remez Tivon; John P. M. Finberg, Tivon; Ruth Levy, Tel-Aviv; Jeffrey Sterling; David Lerner, both of Jerusalem; Haim Yellin, Ramat-Gan, and Alex Veinberg, Rehovot, all of Israel, assignors to Teva Pharmaceutical Industries, Ltd., Jerusalem, and Technion Research and Development Foundation Ltd., Haifa, both of Israel**

**Continuation-in-part of Ser. No. 411,398, Mar. 28, 1995, Pat. No. 5,532,415, which is a continuation of Ser. No. 139,517, Oct. 18, 1993, abandoned, which is a continuation-in-part of Ser. No. 63,455, May 18, 1993, Pat. No. 5,387,612, which is a continuation of Ser. No. 632,184, Dec. 21, 1990, abandoned. This application May 22, 1995, Ser. No. 446,439**

**Claims priority, application Israel, Jan. 3, 1990, 92952**

**Int. Cl.[6] A61K** *31/135*

**U.S. Cl. 514—647** **39 Claims**

1. A method of treating brain ischemia or stroke in a subject which comprises administering to the subject an amount of R(+)--

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N-propargyl-1-aminoindan or a pharmaceutically acceptable salt thereof effective to treat brain ischemia or stroke in the subject.

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**5,744,501**

## METHOD FOR TREATING LATE LUTEAL PHASE DYSPHORIC DISORDER

**Michael J. Norden, 701 Dexter Ave. N. #300, Seattle, Wash. 98109**

**Division of Ser. No. 715,992, Sep. 19, 1996, which is a continuation of Ser. No. 186,232, Jan. 25, 1994, Pat. No. 5,589,512, which is a continuation of Ser. No. 870,360, Apr. 17, 1992, Pat. No. 5,283,263, which is a division of Ser. No. 610,339, Nov. 5, 1990, Pat. No. 5,114,976, which is a continuation of Ser. No. 294,461, Jan. 6, 1989, abandoned. This application Mar. 11, 1997, Ser. No. 815,462**

**Int. Cl.[6] A61K** *31/135;31/435;31/15;31/445;31/34*

**U.S. Cl. 514—649** **5 Claims**

1. A method for treatment of Late Luteal Phase Dysphoric Disorder comprising administering an effective amount of a serotonin re-uptake blocker to a patient in need of such treatment.

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**5,744,502**

## METHOD FOR INCREASING THE PRODUCTION OF/IN BREEDING AND PRODUCTION ANIMALS IN THE POULTRY INDUSTRY

**Åke Lignell, Värmdö; Curt Nicolin, Grödinge; Lars-Hakån Larsson, and Johan Inborr, both of Lidköping, all of Sweden, assignors to Astacarotene AB, Gustavsberg, Sweden**

**PCT No. PCT/SE95/01061, § 371 Date Apr. 30, 1997, § 102(e) Date Apr. 30, 1997, PCT Pub. No. WO96/08977, PCT Pub. Date Mar. 28, 1996**

**PCT Filed Sep. 19, 1995, Ser. No. 793,803**

**Claims priority, application Sweden, Sep. 19, 1994, 9403147**

**Int. Cl.[6] A23K** *1/18;1/16*

**U.S. Cl. 514—725** **5 Claims**

1. A method of increasing the production of/in breeding and production animals in the poultry industry comprising feeding said animals with a feed supplemented with at least one type of xanthophylles.

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**5,744,503**

## RECYCLING POLYESTER AND RECOVERING GLYCOLS

**Brad L. Smith, and Gary E. Wilkins, both of Wilmington, N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.**

**Filed Feb. 1, 1996, Ser. No. 595,690**

**Int. Cl.[6] C08J** *11/18;11/04*

**U.S. Cl. 521—48** **19 Claims**

1. A method for recovering glycols from depolymerized polyester comprising extracting aromatic contaminants from the glycols by:

providing a glycol rich stream from a process to depolymerize polyethylene terephthalate polyester, the glycol rich stream comprising glycols, water, and aromatic contaminants;

adding a solvent selected from the group consisting of p-xylene, o-xylene and m-xylen to the glycol rich stream to form a mixture;

resolving the mixture to form a glycol rich component and an aromatic contaminant rich component; and

recovering glycols from the glycol rich component.

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**5,744,504**

## DIGUANAMINES AND PREPARATION PROCESS, DERIVATIVES AND USE THEREOF

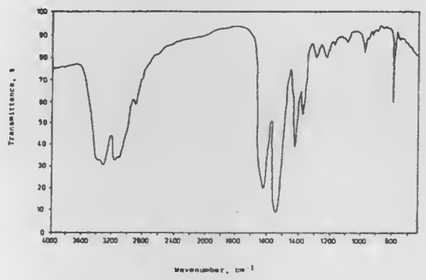
**Tetsuya Oishi, Kanagawa-Ken; Jin Suzuki, Tokyo; Kouhei Ohkawa, Kanagawa-ken; Satoshi Furusawa, Chiba-ken, and Hiroshi Ono, Osaka, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan**

**Division of Ser. No. 619,084, Mar. 21, 1996, Pat. No. 5,646,240, which is a division of Ser. No. 414,011, Mar. 30, 1995, Pat. No. 5,648,446, which is a division of Ser. No. 201,391, Feb. 24, 1994, Pat. No. 5,596,039, which is a continuation-in-part of Ser. No. 186,550, Jan. 26, 1994, abandoned, which is a continuation of Ser. No. 983,855, Mar. 2, 1993, abandoned. This application Feb. 14, 1997, Ser. No. 801,130**

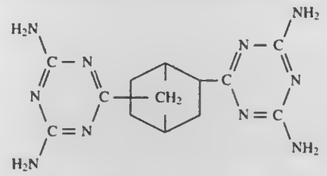
**Claims priority, application Japan, Feb. 24, 1993, 5-035199; Feb. 24, 1993, 5-035200; Mar. 3, 1993, 5-043048; Mar. 12, 1993, 5-051775; Apr. 14, 1993, 5-035198; Apr. 14, 1993, 5-087499**

**Int. Cl.[6] C08J** *9/00*

**U.S. Cl. 521—50** **16 Claims**

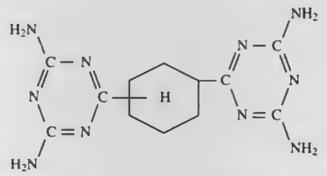


1. A thermosetting molding composition comprising an amino resin and a reinforcing material, said amino resin having been obtained by reacting at least one aldehyde with an amino compound comprising at least one diguanamine selected from diguanamines represented by the following formula (1):



(1)

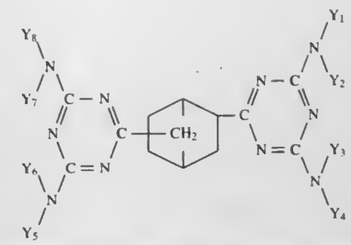
wherein the bonding sites of the 4,6-diamino-1,3,5-triazin-2-yl groups are the 2,5- or 2,6 -positions, or by the following formula (2):



(2)

wherein the bonding sites of the 4,6-diamino-1,3,5-triazin-2-yl groups are the 1,2-, 1,3 -or 1,4-positions, or obtained by reacting at least one aldehyde with an amino compound comprising at least one diguanamine derivative selected from diguanamine derivatives represented by the following formula (11):





(11)

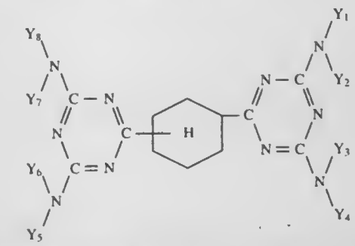
wherein the bonding sites of the 1,3,5-triazin-2-yl groups are the 2,5- or 2,6-positions, and $Y_1$, $Y_2$, $Y_3$, $Y_4$, $Y_5$, $Y_6$, $Y_7$ and $Y_8$ are the same or different and individually represent a substituent selected from the group consisting of a hydrogen atom and groups containing at least two carbon atoms, with the proviso that at least one of $Y_1$, $Y_2$, $Y_3$, $Y_4$, $Y_5$, $Y_6$, $Y_7$ and $Y_8$ is a group containing at least two carbon atoms, said group being selected from the group consisting of aliphatic groups, alicyclic groups, aromatic groups, heterocyclic groups containing 2 to 30 carbon atoms, groups represented by $HO—Y_9—$ in which $Y_9$ is a divalent group containing at least 2 carbon atoms, groups represented by the following formula (13):

$$HO—(—Y_{10}—O—)_m—Y_9— \quad (13)$$

wherein $Y_{10}$ is a group selected from the group consisting of ethylene, trimethylene and tetramethylene, m is an integer selected from 1 to 100, and $Y_9$ has the same meaning as defined above, and groups represented by the following formula (14):

$$HO—(—Y_{10}—O—)_m—CH_2— \quad (14)$$

wherein $Y_{10}$ and m have the same meanings as defined in formula (13), or by the following formula (12):



(12)

wherein the bonding sites of the 1,3,5-triazin-2-yl groups are the 1,2-, 1,3- or 1,4 -positions and $Y_1$, $Y_2$, $Y_3$, $Y_4$, $Y_5$, $Y_6$, $Y_7$ and $Y_8$ have the same meanings as defined in formula (11) with the proviso that at least one of $Y_1$, $Y_2$, $Y_3$, $Y_4$, $Y_5$, $Y_6$, $Y_7$ and $Y_8$ is a group containing at least two carbon atoms, said group being selected from the group consisting of aliphatic groups, alicyclic groups, aromatic groups, heterocyclic groups containing 2 to 30 carbon atoms, groups represented by $HO—Y_9—$ in which $Y_9$ is a divalent group containing at least 2 carbon atoms, groups represented by the following formula (13):

$$HO—(—Y_{10}—O—)_m—Y_9— \quad (13)$$

wherein $Y_{10}$ is a group selected from the group consisting of ethylene, trimethylene and tetramethylene, m is an integer selected from 1 to 100, and $Y_9$ has the same meaning as defined above, and groups represented by the following formula (14):

$$HO—(—Y_{10}—O—)_m—CH_2— \quad (14)$$

wherein $Y_{10}$ and m have the same meanings as defined in formula (13).

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**5,744,505**

## PREFOAMED POLYOLEFIN BEADS PRODUCED BY EXTRUSION

**Joachim Fischer, Grosskarlbach; Franz-Josef Dietzen, Ludwigshafen; Gerd Ehrmann, Deidesheim; Isidoor De Grave, Wachenheim, and Jens Rieger, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**PCT No. PCT/EP95/03946, § 371 Date Apr. 10, 1997, § 102(e) Date Apr. 10, 1997, PCT Pub. No. WO96/11971, PCT Pub. Date Apr. 25, 1996**

**PCT Filed Oct. 6, 1995, Ser. No. 809,735**

**Claims priority, application Germany, Oct. 15, 1994, 44 36 980.8**

**Int. Cl.[6] C08J** *9/18;9/22;9/36*

**U.S. Cl. 521—60** **4 Claims**

1. A process for producing prefoamed polyolefin beads having a crystal structure which in a DSC curve (obtained by heating from 3 to 6 mg of the foam beads to 220° C. at a heating rate of 20° C./min in a differential calorimeter), show a peak typical of the polyolefin and a high-temperature peak where the distance between the two peaks is at leas' 5° C., which comprises:

A. saturating granules of a crystalline polyolefin with a physical blowing agent at a temperature which is from 50° to 180° C. below the crystalline melting point of the polyolefin and at least 10° C. below the boiling point of the blowing agent, in a feed zone of an extruder,

B. homogenizing the polyolefin containing blowing agent at increasing temperature in a homogenizing zone of the extruder, where the material temperature is from 2° to 50° C. below the crystalline melting point of the pure polyolefin,

C. holding the melt at this temperature for from 1 to 60 min at this temperature in a holding zone, and

D. extruding the polyolefin containing blowing agent into the open atmosphere, with accompanying expansion, and finally granulating the material.

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**5,744,506**

## PROCESS FOR MAKING ABSORBENT FORAM MATERIALS FOR AQUEAOUS FLUIDS MADE FROM HIGH INTERNAL PHASE EMULSIONS HAVING VERY HIGH WATER-TO-OIL RATIOS

**Stephen Allen Goldman, Cincinnati; Michelle Renee Peace, Mason, and Paul Seiden, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Division of Ser. No. 655,041, May 28, 1996, Pat. No. 5,741,581, which is a division of Ser. No. 563,866, Nov. 29, 1995, Pat. No. 5,650,222, which is a continuation of Ser. No. 370,922, Jan. 10, 1995, abandoned. This application Sep. 26, 1996, Ser. No. 721,648**

**Int. Cl.[6] C08J** *9/28*

**U.S. Cl. 521—64** **10 Claims**

1. A process for the preparation of an absorbent polymeric foam material which comprises the steps of:

A) forming a water-in-oil emulsion from:

1) an oil phase comprising:

a) from about 85 to about 98% by weight of a monomer component capable of forming a copolymer having a Tg value of below about 35° C. or lower, the monomer component comprising:

i) from about 45 to about 70% by weight of a substantially water-insoluble, monofunctional monomer capable of forming a polymer having a Tg of about 25° C. or less;

ii) from about 10 to about 30% by weight of a substantially water-insoluble, monofunctional comonomer capable of imparting toughness about equivalent to that provided by styrene;

iii) from about 5 to about 25% by weight of a first substantially water-insoluble, polyfunctional crosslinking agent selected from the group consisting of divinylbenzenes, trivinylbenzenes, divinyltoluenes, divinylxylenes,

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divinylnaphthalenes divinylalkylbenzenes, divinylphenanthrenes, divinylbiphenyls, divinyldiphenylmethanes, divinylbenzyls, divinylphenylethers, divinyldiphenylsulfides, divinylfurans, divinylsulfide, divinylsulfone, and mixtures thereof; and

iv) from 0 to about 15% by weight of a second substantially water-insoluble, polyfunctional crosslinking agent selected from group consisting of polyfunctional acrylates, methacrylates, acrylamides, methacrylamides, and mixtures thereof; and

b) from about 2 to about 15% by weight of an emulsifier component which is soluble in the oil phase and which is suitable for forming a stable water-in-oil emulsion, said emulsifier component comprising a primary emulsifier having at least about 40% by weight emulsifying components selected from the group consisting of diglycerol monoesters of branched $C_{16}$–$C_{24}$ fatty acids, linear unsaturated $C_{16}$–$C_{22}$ fatty acids, and linear saturated $C_{12}$–$C_{14}$ fatty acids; sorbitan monoesters of branched $C_{16}$–$C_{24}$ fatty acids, linear unsaturated $C_{16}$–$C_{22}$ fatty acids, and linear saturated $C_{12}$–$C_{14}$ fatty acids; diglycerol monoaliphatic ethers of branched $C_{16}$–$C_{24}$ alcohols, linear unsaturated $C_{16}$–$C_{22}$ alcohols, and linear saturated $C_{12}$–$C_{14}$ alcohols, and mixtures thereof; and

2) a water phase comprising an aqueous solution containing: (a) from about 0.2 to about 20% by weight of a water-soluble electrolyte; and (b) an effective amount of a polymerization initiator;

3) a volume to weight ratio of water phase to oil phase in the range of from about 55:1 to about 100:1; and

B) polymerizing the monomer component in the oil phase of the water-in-oil emulsion to form a polymeric foam material.

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**5,744,507**

**FOAMABLE ORGANOSILOXANE COMPOSITIONS CURABLE TO SILICONE FOAMS HAVING IMPROVED ADHESION**

**Gloria Lynne Angell, and Michael Andrew Lutz, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Division of Ser. No. 775,123, Dec. 30, 1996, Pat. No. 5,683,527. This application May 1, 1997, Ser. No. 846,446**

**Int. Cl.[6] F08J** *9/00*

**U.S. Cl. 521—86** **17 Claims**

1. A foamable, curable organosiloxane composition which yields, upon cure, a silicone foam having improved adhesion to a substrate, said foamable, curable composition comprising:

(A) 100 parts by weight of a polyorganosiloxane containing an average of at least two alkenyl radicals per molecule and having a viscosity within a range of about 0.03 Pa·s to 500 Pa·s at 25° C.;

(B) an organohydrogensiloxane having an average of at least two silicon-bonded hydrogen atoms per molecule;

(C) a blowing agent;

(D) a catalytically effective amount of a platinum group metal catalyst; and

(E) an adhesion promoter comprising:

i) an epoxy-functional compound;

ii) a hydroxyl-functional compound comprising at least one hydroxy group and in the same molecule at least one alkenyl group;

iii) a a tetraalkylorthosilicate;

iv) an organotitanate; and

v) a compound selected from a group consisting of compounds of aluminum and compounds of zirconium;

wherein the sum of the average number of silicon-bonded hydrogen atoms per molecule of component (B) and the average number of silicon-bonded alkenyl groups per molecule in component (A) is greater than 4.

**5,744,508**

**FOAMABLE SILICONE RUBBER COMPOSITION**

**Atsushi Yaginuma, Gunma-machi, and Yoshifumi Harada, Haruna-machi, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan**

**Filed May 19, 1997, Ser. No. 858,692**

**Claims priority, application Japan, May 20, 1996, 8-148568**

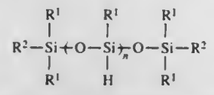
**Int. Cl.[6] C08G** *9/02*

**U.S. Cl. 521—99** **11 Claims**

1. A foamable silicone rubber composition comprising;

(A) a diorganopolysiloxane blocked with a vinyl group at the both terminals of its molecular chain and having a viscosity of from 25 cSt to 1,000,000 cSt at 25° C.;

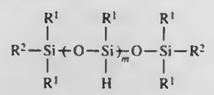
(B-1) an organohydrogenpolysiloxane represented by the general formula (2):



(2)

wherein $R^1$'s each represent a substituted or unsubstituted monovalent hydrocarbon group containing no aliphatic unsaturated bond; $R^2$'s each independently represent a monovalent group or atom selected from the group consisting of a substituted or unsubstituted monovalent hydrocarbon group, a hydrogen atom and a hydroxyl group; and n is an integer greater than 10;

(B-2) an organohydrogenpolysiloxane represented by the general formula (3):



(3)

wherein $R^1$'s and $R^2$'s are as defined above, and m is an integer that satisfies $3 \leqq m \leqq 10$;

(C) at least one hydroxyl-group source selected from the group consisting of water, an alcohol, a silanol group-containing organosilane and a silanol group-containing organosiloxane; and

(D) a platinum group metal compound;

the component (B-1) and the component (B-2) being present in a weight ratio (B-1)/(B-2) of from 20/80 to 90/10.

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**5,744,509**

**FOAMED POLYMER AND PROCESS FOR PRODUCTION THEREOF**

**Robert N. Wilson, Hixson, Tenn., and G. Ronald Blair, Richmond Hill, Canada, assignors to Woodbridge Foam Corporation, Canada**

**Filed Jul. 1, 1996, Ser. No. 674,190**

**Int. Cl.[6] C08J** *9/04;* **C08G** *18/02*

**U.S. Cl. 521—125** **33 Claims**

1. A foamed isocyanate-based polymer having a cellular structure and which includes a superabsorbent material, the polymer: (i) absorbing at least about 10 times its weight of a 0.9 wt./wt. % aqueous NaCl solution maintained at a temperature of from about 20° to about 25° C., and (ii) retaining at least about 10 times its weight of absorbed aqueous NaCl solution which is bound to the superabsorbent material, the cellular structure having a cell size of at least about 30 cells/inch when measured pursuant to ASTM D3576-77.



**5,744,510**

**ORGANIC CARBON AEROGELS FROM THE SOL-GEL POLYMERIZATION OF PHENOLIC-FURFURAL MIXTURES**

**Richard W. Pekala, Pleasant Hill, Calif., assignor to Regents of the University of California, Oakland, Calif.**

**Division of Ser. No. 429,276, Apr. 25, 1995, Pat. No. 5,556,892. This application Jun. 6, 1996, Ser. No. 659,377**

**Int. Cl.[6] C01B** *31/00;* **B29C** *65/00*

**U.S. Cl. 521—181** **31 Claims**

1. A composition of matter comprising a carbonized low density organic aerogel composed of phenolic-furfural having a pore/cell size of 1000A and having a density in the range of 0.1 to 1.0 g/cc.

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**5,744,511**

**VISIBLE RAY POLYMERIZATION INITIATOR AND VISIBLE RAY POLYMERIZABLE COMPOSITION**

**Hideki Kazama; Takeshi Satoh, and Makoto Oguri, all of Tokuyama, Japan, assignors to Tokuyama Corporation, Yamaguchi-ken, Japan**

**Filed Apr. 18, 1996, Ser. No. 634,259**

**Claims priority, application Japan, Apr. 19, 1995, 7-093924**

**Int. Cl.[6] C09J** *4/02;* **C08F** *2/50;* **C08K** *3/20;3/36*

**U.S. Cl. 522—25** **14 Claims**

1. A visible-ray polymerization initiator comprising:

(A) a coumarin dye;

(B) at least one photo acid generator selected from the group consisting of a halo-alkyl substituted -s-triazine derivative and a diphenyliodonium salt compound; and

(C) a tetraphenyl borate compound.

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**5,744,512**

**COREACTIVE PHOTOINITIATORS**

**Manfred Köhler, Darmstadt; Jörg Ohngemach, Reinheim; Eike Poetsch; Rudolf Eidenschink, both of Mühtal; Gerhard Greber, Bad Vöslau; Dieter Dorsch, Darmstadt; Jürgeo Gehlhaus, Lautertal; Konrad Dorfner, Darmstadt, and Hans Ludwig Hirsch, Reinhelm, all of Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.**

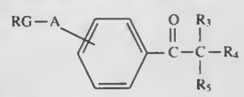
**Division of Ser. No. 252,729, Jun. 2, 1994, Pat. No. 5,532,112, which is a continuation of Ser. No. 951,299, Sep. 24, 1992, abandoned, which is a continuation of Ser. No. 720,141, Jun. 24, 1991, abandoned, which is a continuation of Ser. No. 167,060, Mar. 11, 1988, abandoned. This application Mar. 20, 1996, Ser. No. 618,701**

**Claims priority, application Germany, Mar. 12, 1987, 3707891.7; Nov. 13, 1987, 3738567.4**

**Int. Cl.[6] C08F** *2/50;* **G03C** *1/68;* **C09D** *3/727*

**U.S. Cl. 522—34** **2 Claims**

I. A photoinitiator of the formula II



(II)

in which

$R_3$, $R_4$ in each case independently of one another are H, $C_1$–$C_{12}$alkyl, $C_1$–$C_{12}$alkoxy, phenyl or together form $C_2$–$C_6$alkylene;

$R_5$ is $—OR_7$;

$R_7$ is H or $C_1$–$C_6$alkyl;

A is a spacer group $Z[(CH_2)_n Y]_n$-$[(CH_2)_m X]_l$, wherein

X is —O—;

Y is —O—, —NH— or —O—CO—;

Z is a single bond, —NH—, —NHCO— or —CONH—;

l is 1

m is an integer from 1 to 4;

o is an integer from 0 to 4;

n is 1, if Y is —O—CO— and

n is an integer from 0 to 4, if Y is —O— or —NH—;

RG is one of the functional reactive groups oxiranyl, $O{=}C{=}N—$, $S{=}C{=}N—$, $N_1—R_cR_bC{=}CR_a—$, $O{=}C{=}N—R_d—$ or $(R_e)_3Si—$;

$R_a$, $R_b$ and $R_c$ in each case independently of each other are H or $—CH_3$;

Rd is $C_1$–$C_6$alkylene or phenylene; and

$R_e$ is $C_1$–$C_{12}$alkoxy.

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**5,744,513**

**PHOTOLYTICALLY CROSSLINKABLE THERMALLY STABLE COMPOSITION**

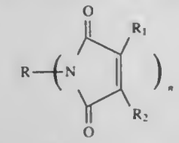
**Jerry E. White; Mary K. Dehnke, and Lu Ho Tung, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Continuation of Ser. No. 377,497, Jul. 10, 1989, abandoned, which is a division of Ser. No. 115,650, Oct. 26, 1987, Pat. No. 4,851,454, which is a continuation of Ser. No. 886,476, Jul. 17, 1986, abandoned. This application Oct. 29, 1991, Ser. No. 784,142**

**Int. Cl.[6] C08J** *3/28*

**U.S. Cl. 522—116** **6 Claims**

1. A photolytically crosslinkable but thermally stable composition comprising a homopolymer or interpolymer consisting of one or more diolefinic monomers containing residual unsaturation and a crosslinkable quantity of a multifunctional 3,4-disubstituted maleimide compound corresponding to the formula:



wherein R is a polyether moiety containing up to 36 carbons corresponding to the formula:

$$R'_{(4-n')}—C(CH_2(OCH_2CH)_m)_{n'}$$
$$\quad\quad\quad

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(2) from about 15 to about 70 percent by weight of one or more acrylate- or methacrylate-terminated urethane oligomers which is the reaction product of (i) a polyether polyol; (ii) a non-aromatic polyisocyanate; and (iii) an endcapping monomer capable of providing an acrylate or methacrylate terminus;

(3) from about 15 to about 70 percent by weight of one or more monomer diluents selected from the group consisting of

(i) alkyl acrylate and alkyl methacrylate monomers having 6 to 18 carbon atoms in the alkyl moiety;

(ii) monomers having (i) an aromatic moiety, (2) a moiety containing acrylic or methacrylic unsaturation, and (3) a hydrocarbon moiety; and

(iii) mixtures thereof;

(4) from about 0 to about 3.0 percent by weight of an acrylate-functional silane adhesion promoter which binds in with the primary coating composition during cure; and

(5) from about 0 to about 10.0 percent by weight of a triacylphosphine oxide photoinitiator,

all of said percentages being percentages by weight based on the weight of all ingredients.

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**5,744,515**

**METHOD AND IMPLANTABLE ARTICLE FOR PROMOTING ENDOTHELIALIZATION**

**David L. Clapper, Shorewood, Minn., assignor to BSI Corporation, Eden Prairie, Minn.**

**Continuation of Ser. No. 451,165, May 26, 1995, abandoned. This application Oct. 11, 1996, Ser. No. 729,537**

**Int. Cl.[6] A61L *27/00***

**U.S. Cl. 523—113** **44 Claims**

1. An article comprising an implantable medical device comprising a rigid, porous biomaterial selected from the group consisting of non-soluble synthetic polymers, metals and ceramics and providing a surface bearing immobilized adhesion molecules selected from the group consisting of fibronectin, laminin, collagen, and active peptide domains thereof, the adhesion molecules having been bound to each other or the surface of the biomaterial by the activation of one or more photoreactive groups covalently bound to the adhesion molecules, the photoreactive groups having been selected from the group consisting of photoreactive aryl ketones, azides, diazirines, ketenes and diazo compounds, the adhesion molecules being provided directly upon the surface in an amount suitable to promote capillary endothelialization of the device in vivo, wherein the adhesion molecule is capable of binding to the surface of a cell, and wherein the biomaterial is porous in that it provides channels or passages extending through the biomaterial and of sufficient dimensions to permit the growth of capillaries therethrough.

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**5,744,516**

**BIODEGRADABLE RESIN MOLDED ARTICLE**

**Takafumi Hashitani; Shozo Fujita; Makoto Iijima, and Koji Asano, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 402,568, Mar. 13, 1995, abandoned, which is a continuation of Ser. No. 250,437, May 27, 1994, abandoned. This application Sep. 11, 1996, Ser. No. 712,113**

**Claims priority, application Japan, Sep. 14, 1993, 5-229265; Dec. 27, 1993, 5-332493; Dec. 28, 1993, 5-336070**

**Int. Cl.[6] C12N *1/20***

**U.S. Cl. 523—124** **7 Claims**

1. A biodegradable molded article comprising a molded mixture of a biodegradable resin and thermophilic bacteria.

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**5,744,517**

**POLYCARBONATE COMPOSITIONS RESISTANT TO IONIZING RADIATION**

**James Y. J. Chung, Wexford, Pa., assignor to Bayer Corporation, Pittsburgh, Pa.**

**Continuation of Ser. No. 407,933, Mar. 21, 1995. This application Sep. 20, 1996, Ser. No. 717,388**

**Int. Cl.[6] C08L *69/00;* C08K *5/12***

**U.S. Cl. 523—136** **2 Claims**

1. A thermoplastic molding composition having improved resistance to yellowing caused by exposure to gamma radiation comprising

(i) a resinous component consisting of an aromatic polycarbonate resin and

(ii) about 0.1 to 3.0% relative to the weight of said polycarbonate, of dicyclohexyl phthalate.

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**5,744,518**

**BIPHENYL ADDITIVE FOR IMPROVEMENT IN URETHANE FOUNDRY BINDERS**

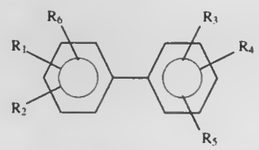
**Michael M. Geoffrey, Lombard, Ill., assignor to Borden Chemical, Inc., Columbus, Ohio**

**Division of Ser. No. 285,108, Aug. 3, 1994. This application Jul. 31, 1995, Ser. No. 509,602**

**Int. Cl.[6] C08K *5/01***

**U.S. Cl. 523—143** **5 Claims**

1. A mixture comprising: foundry aggregate, a polyhydroxy resin solution, and one or more additive compounds having the following formula



wherein $R_1$, $R_2$, $R_3$, $R_4$, $R_5$ and $R_6$ which may be the same or different are selected from the group consisting of H and $C_1$–$C_6$ branched and unbranched alkyl and alkenyl substituents, with the proviso that when one of said additive compounds is phenylbenzene ($R_1$–$R_6$ are each hydrogen) it is present in amounts of less than 1% by weight of the polyhydroxy resin solution and a second additive compound of the formula above is present wherein $R_1$–$R_6$ are not each hydrogen.

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**5,744,519**

**INK COMPOSITION FOR MARKING NONPOUROUS SUPPORTS**

**Alain Heraud, and Pierre De Saint-Romain, both of Valence, France, assignors to Imaje S.A., Bourg-Les-Valence, France**

**Filed Feb. 22, 1996, Ser. No. 603,899**

**Claims priority, application France, Mar. 8, 1995, 95 02701**

**Int. Cl.[6] C09D *11/10;* C08K *3/04***

**U.S. Cl. 523—160** **18 Claims**

1. Ink composition, liquid at room temperature, for ink jet printing, for the marking of objects, free from UV polymerization initiating agent and comprising at least one dye and/or a pigment, an organic solvent and a binder, characterized in that the binder comprises the combination of at least a:

a) polymeric resin having a hydroxyl or carboxyl functions

b) hydrophobic polymeric epoxy resin having a plasticizing effect, and

another resin different from resins a) and b).



**5,744,520**

**AGGREGATION PROCESSES**

**Grazyna E. Kmiecik-Lawrynowicz, Burlington; Richard P. N. Veregin, Mississauga; Raj D. Patel, Oakville; Michael A. Hopper, Toronto, and Maria V. McDougall, Burlington, all of Canada, assignors to Xerox Corporation, Stamford, Conn.**

**Division of Ser. No. 497,737, Jul. 3, 1995, Pat. No. 5,565,296. This application Jul. 19, 1996, Ser. No. 684,955**

**Int. Cl.[6] C08K *9/08;3/22;5/41;* C08L *1/26***

**U.S. Cl. 523—334** **25 Claims**

1. A process for the preparation of polymer compositions which comprises mixing a conductive component with an anionic polymeric latex containing a polymer; adding a cationic surfactant, or flocculant whereby the aggregation of the latex particles and the conductive component particles results; subsequently adding colloidal stabilizer, followed by the addition of a base to obtain a pH of from about 7 to about 12; heating above about the polymer glass transition temperature thereby enabling the severage, or breakage of the formed aggregated particles; further heating above about the polymer glass transition temperature enabling the coalescence of the polymer and conductive component particles; and optionally washing and drying the resulting coalesced product.

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**5,744,521**

**CATHODIC ELECTRODEPOSITION PAINT FORMING FILMS HAVING IMPROVED SURFACE SMOOTHNESS**

**Haruhiko Takasaki, Hirakata, and Mitsuo Yamada, Suita, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan**

**Filed Jan. 7, 1997, Ser. No. 779,846**

**Claims priority, application Japan, Jan. 8, 1996, 8-018428**

**Int. Cl.[6] C08L *63/02;63/04***

**U.S. Cl. 523—404** **17 Claims**

1. In a cathodic electrodeposition paint composition comprising a cationically modified epoxy resin and a crosslinker dispersed in an aqueous medium containing a neutralizing acid, the improvement wherein said paint composition comprises a cured film surface smoothness improving amount of the addition polymerization product of a t-alkyphenol novolac resin having an average number of nuclei from 3 to 8 with from 2 to 10 moles per phenolic hydroxyl group of ethylene oxide, propylene oxide or a mixture thereof, or a reaction product thereof with a half blocked diisocyanate.

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**5,744,522**

**LOW GLOSS COATING COMPOSITIONS**

**Paul J. Prucnal, Pittsburgh, Pa., and Szu-Ping Lu, Canton, Mich., assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan**

**Filed Sep. 13, 1996, Ser. No. 713,517**

**Int. Cl.[6] C08L *63/00;* C08F *20/00***

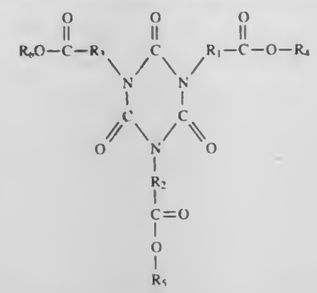
**U.S. Cl. 523—442** **30 Claims**

1. A coating composition that provides a 60° gloss of less than about 60 upon curing comprising:

a) a glycidyl group-containing acrylic copolymer prepared from at least one ethylenically unsaturated compound as a copolymerizable monomer;

b) an aromatic polyester which contains carboxyl groups; and

c) an isocyanurate curing agent having the formula:



wherein $R_1$–$R_3$ are independently selected from the group consisting of divalent alkylene groups of 1 to 18 carbon atoms and divalent groups of 3 to 21 carbon atoms and containing an ester linkage, and $R_4$–$R_6$ are independently selected from the group consisting of H, organic salt groups, alkyl groups of 1 to 20 carbon atoms and $C(O)R_7$ wherein $R_7$ is an alkyl group of 1 to 22 carbon atoms.

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**5,744,523**

**USE OF POLYACRYLATE ESTERS AS DISPERSANTS**

**Michael Barkowsky, Essen; Jürgen Fock, Düsseldorf, and Dietmar Schaefer, Hattingen, all of Germany, assignors to Th. Goldschmidt AG, Essen, Germany**

**Continuation of Ser. No. 137,875, Oct. 15, 1993, abandoned. This application Aug. 10, 1995, Ser. No. 513,314**

**Claims priority, application Germany, Oct. 28, 1992, 42 36 337.3**

**Int. Cl.[6] C08F *20/28;8/14;* B01F *17/52***

**U.S. Cl. 523—523** **6 Claims**

1. A method of dispersing finely divided particles in lacquer, binder, polymer blend, paraffin oil, thermoplastic or thermosetting material by adding a dispersing agent, wherein the dispersing agent is a polyacrylate ester of an average molecular weight of about 1,500 to 20,000 and is obtained by transesterification of alkyl polyacrylates containing 1 to 4 carbons atoms in the alkyl group, with saturated or unsaturated aliphatic alcohols having 12 to 22 carbon atoms in such a way so that 25 to 70% of the ester groups are transesterified.

6. A dispersion of finely divided particle in a medium of lacquer, binder, polymer blend, paraffin oil, thermoplastic or thermosetting material containing a dispersing agent, wherein the dispersing agent is a polyacrylate ester of an average molecular weight of about 1,500 to 20,000 and is obtained by transesterification of alkyl polyacrylates containing 1 to 4 carbon atoms in the alkyl group, with saturated or unsaturated aliphatic alcohols having 12 to 22 carbon atoms in such a way so that 25 to 70% of the ester groups are transesterified, in an amount sufficient to disperse the particle in the medium.

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**5,744,524**

**POLYMER MODIFIED ASPHALTIC COMPOSITIONS WITH IMPROVED DISPERSION AND PRODUCTS THEREFROM**

**Eraj D. Manandhar, West Haven, Conn., and Arthur M. Usmani, Indianapolis, Ind., assignors to Bridgestone/Firestone, Inc., Akron, Ohio**

**Continuation of Ser. No. 628,974, Apr. 8, 1996, abandoned, which is a continuation of Ser. No. 359,988, Dec. 20, 1994, abandoned. This application Mar. 13, 1997, Ser. No. 816,672**

**Int. Cl.[6] C08L *95/00***

**U.S. Cl. 524—70** **24 Claims**

1. A method of improving the dispersion of filler in a polymer modified asphaltic compound comprising:

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blending from about 15 to about 25 parts by weight of a filler with from about 0.1 to about 5 parts by weight of a dispersing agent;

allowing said filler and said dispersing agent to react to produce an oriented reaction product;

blending from about 70 to about 45 parts by weight of asphalt with from about 15 to about 25 parts by weight of a polymer modifier to form a polymer modified asphalt; and,

blending said oriented reaction product with said polymer modified asphalt to produce a filled, oriented asphaltic compound.

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**5,744,525**

**STABILIZED VINYL CHLORIDE COMPOSITION**

**Heather Blue Harvey, Hyde; Joseph William Burley, Warrington, both of United Kingdom, and Gerard Hub Frans Schmets, Horn, Netherlands, assignors to Akros Chemicals, Eccles, United Kingdom**

**PCT No. PCT/GB94/02691, § 371 Date Sep. 3, 1996, § 102(e) Date Sep. 3, 1996, PCT Pub. No. WO95/16739, PCT Pub. Date Jun. 22, 1995**

**PCT Filed Dec. 9, 1994, Ser. No. 663,179**

**Claims priority, application United Kingdom, Dec. 17, 1993, 9325849**

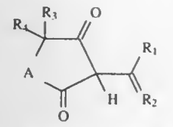
**Int. Cl.[6] C08K** *5/45;5/3472;5/15*

**U.S. Cl. 524—84** **13 Claims**

1. A composition based on homopolymers and/or copolymers of vinyl chloride comprising the following compounds, expressed by weight relative to the weight of the polymers:

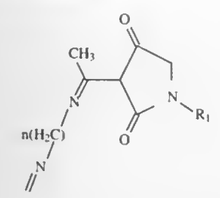
(a) from 0.1% to 5% of one or more organotin salts and/or one or more divalent metal salts of a carboxylic acid or phenol; and

(b) from 0.001% to 5% of one or more organic compounds of the general formula



Compound A

in which $R_1$ represents a linear or branched alkylene or alkenylene radical having up to 20 carbon atoms, an aralkylene radical having from 7 to 20 carbon atoms or an arylene or cycloalkylene radical having from 6 to 20 carbon atoms, the cycloalkylene radicals optionally containing carbon-carbon double bonds; these radicals optionally being unsubstituted or substituted, by one or more halogen atoms or hydroxyl groups or, for aryl or cycloalkylene radicals, by one or more methyl, ethyl, or methoxy radicals, the above mentioned radicals optionally also being modified by the presence in an aliphatic chain of one or more —O—, —CO— or —$CO_2$— chain members; $R_3$ and $R_4$ are defined as $R_1$ or H and can be the same or different; A is either O, S or $NR_7$, with $R_7$ defined as $R_1$ or H; with the exception that when $R_2$=O, A≠O; and $R_2$ represents O, $NR_5$ or $NNHR_5$ wherein $R_5$ is defined as $R_1$, H or C(S)$NHR_6$ wherein $R_6$ is defined as $R_1$ or H; or $R_2$ represents the following:



wherein n is an integer between 1 and 10.

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**5,744,526**

**COLOR AND HYDROLYTIC STABILIZATION OF AROMATIC POLYCARBONATE RESINS**

**Johanes M.D. Goossens, and Theodours L. Hoeks, both of Bergen Op Zoom, Netherlands, assignors to General Electric Company, Pittsfield, Mass.**

**Filed May 14, 1997, Ser. No. 855,913**

**Int. Cl.[6] C08K** *5/526;5/5393;5/50*

**U.S. Cl. 524—90** **18 Claims**

1. An aromatic polycarbonate composition having improved color and hydrolytic stability, while maintaining good processing properties, wherein the aromatic polycarbonate composition comprises an aromatic polycarbonate and a stabilizer composition comprising in a combination (a) at least one organic phosphorous containing additive selected from the group consisting of phosphite, phosphine and phosphonite and (b) hexamethylene tetra amine, said stabilizer being present in an amount sufficient to provide an aromatic polycarbonate composition having improved color and hydrolytic stability.

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**5,744,527**

**POLYACETAL RESIN COMPOSITION**

**Toru Katsumata, and Nobuyuki Matsunaga, both of Fuji, Japan, assignors to Polyplastics Co., Ltd., Japan**

**PCT No. PCT/JP94/01112, § 371 Date Sep. 22, 1994, § 102(e) Date Sep. 22, 1994, PCT Pub. No. WO95/02012, PCT Pub. Date Jan. 19, 1995**

**PCT Filed Jul. 7, 1994, Ser. No. 302,932**

**Claims priority, application Japan, Jul. 7, 1993, 5-167707; Jul. 7, 1993, 5-167708; Sep. 2, 1993, 5-218671**

**Int. Cl.[6] C08K** *5/35*

**U.S. Cl. 524—99** **17 Claims**

1. A polyacetal resin composition comprising a blend of:

(A) 100 parts by weight of a polyacetal resin, with

(C) 0.01 to 2.0 parts by weight of a UV absorber and,

(D) 0.01 to 1 part by weight of a low-molecular hindered amine series substance (D-1) having a molecular weight of less than 700 and 0.01 to 4 parts by weight of a high-molecular hindered amine series substance (D-2) having a molecular weight of 700 or more.

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**5,744,528**

**ALKOXYSILANE TERMINATED RESIN AND METHODS OF MAKING AND USING SAME**

**Andrew Callinan, Robbinsdale, and Matthew T. Scholz, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

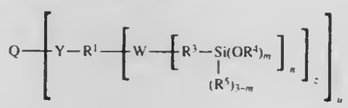
**Division of Ser. No. 48,656, Apr. 16, 1993, Pat. No. 5,423,735. This application May 15, 1995, Ser. No. 441,185**

**Int. Cl.[6] C08K** *5/24*

**U.S. Cl. 524—265** **19 Claims**

1. A water-curable resin composition containing less than about 1 wt-% of a solvent and having a viscosity of no greater than about 500 Pa-s under ambient conditions, said resin composition comprising:

(a) a water-reactive alkoxysilane terminated nitrogen-containing prepolymer of the formula:



wherein:

(i) Q is a polyol residue;

(ii) W is —NH—C(O)—X($R^2_{2-n-q}$)- or —X—C(O)—NH—;

(iii) X is —N—, —O—, or —S—;





(iv) Y is —N—, —O—, —S—, carbamylthio (—S—C(O)—NH—), carbamate (—O—C(O)—NH—), or unsubstituted or N-substituted ureido (—N(C(O)—NH—)-);

(v) $R^1$ is a substituted or unsubstituted divalent bridging $C_1$–$C_{200}$ hydrocarbon group, optionally interrupted in the backbone by 1–50 nonperoxide —O—, —C(O)—, —S—, —$SO_2$—, —$NR^6$—, amide (—C(O)—NH—), ureido (—NH—C(O)—NH—), carbamate (—O—C(O)—NH—), carbamylthio (—S—C(O)—NH—), unsubstituted or N-substituted allophonate (—NH—C(O)—N(C(O)—O—)-), unsubstituted or N-substituted biuret (—NH—C(O)—N(C(O)—NH—)-), and N-substituted isocyanurate groups;

(vi) $R^2$ can be present or absent, and is selected from the group consisting of a H and a substituted or unsubstituted $C_1$–$C_{20}$ hydrocarbon group, optionally interrupted in the backbone by 1–10 nonperoxide —O—, —C(O)—, —S—, —$SO_2$—, or —$NR^6$-groups;

(vii) $R^3$ is a substituted or unsubstituted divalent bridging $C_1$–$C_{20}$ hydrocarbon group, optionally interrupted in the backbone by 1–5 nonperoxide —O—, —C(O)—, —S—, —$SO_2$—, or —$NR^6$-groups;

(viii) $R^4$ is a $C_1$–$C_6$ hydrocarbon group or —N=$C(R^7)_2$;

(ix) each $R^5$ and $R^7$ is independently a $C_1$–$C_6$ hydrocarbon group;

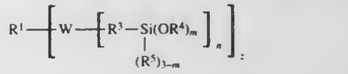
(x) $R^6$ is a H or a $C_1$–$C_6$ hydrocarbon group;

(xi) n=1–2 and q=0–1, with the proviso that when X is N, n+q=1, and when X is S or O, n+q=2;

(xii) m=2–3;

(xiii) z=1–3; and

(xiv) u=the functionality of the polyol residue =0–6, with the proviso that when u=0, the water-reactive alkoxysilane terminated prepolymer is of the formula



wherein $R^1$, W, $R^3$, $R^4$, $R^5$, m, n, and z are as defined above.

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**5,744,529**

**CURABLE COMPOSITIONS**

**Derek William Butler, Barry South Glamorgan; Thomas Easton, South Glamorgan, and Peter Cheshire Hupfield, Mid Glamorgan, all of Wales, assignors to Dow Corning Limited, Mid Glamorgan Wales, United Kingdom**

**Filed Dec. 18, 1995, Ser. No. 573,816**

**Claims priority, application United Kingdom, Dec. 29, 1994, 9426326**

**Int. Cl.[6] C08K** *5/54*

**U.S. Cl. 524—265** **9 Claims**

1. A curable composition comprising

(A) a polyacrylated polymer in combination with

(B) an friction reducing additive which is a polysiloxane comprising at least one unit of the general formula (i) $R_aSiO_{(4-a)/2}$ and at least one unit of the general formula (ii) $R_aR^1SiO_{(3-b)/2}$ wherein R is selected from the group consisting of monovalent hydrocarbon groups having from 1 to 12 carbon atoms and substituted monovalent hydrocarbon groups having from 1 to 12 carbon atoms, $R^1$ represents a group of the formula —$(CH_2)_a(OR^2)_mX$ wherein $R^2$is an alkylene unit having 2 or 3 carbon atoms, a is 0, 1, 2 or 3 and b is 0, 1 or 2, X is selected from the group consisting of a hydroxyl group and a group having the formula —OCO$CR^3$=$CH_2$ where $R^3$ is selected from the group consisting of hydrogen, methyl and ethyl, n has a value of 2 to 5 and m has a value of from 8 to 50, provided that where X is a hydroxyl group, n is 3 and m is 18.

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**5,744,530**

**GRANULAR CALCIUM CARBONATE FOR USE AS A DIRECT ADDITIVE FOR THERMOPLASTICS**

**David A. Skelhorn, Sandersville, Ga., assignor to ECC International Inc., Roswell, Ga.**

**Continuation of Ser. No. 171,534, Dec. 22, 1993, abandoned. This application Apr. 25, 1996, Ser. No. 639,309**

**Int. Cl.[6] C08K** *3/26*

**U.S. Cl. 524—427** **21 Claims**

1. A thermoplastic granule containing a high proportion of a particulate carbonate filler in a thermoplastic binder, for blending with an end product thermoplastic in which the carbonate filler is to be dispersed; comprising:

85% to 92% by weight of a particulate carbonate having a particle size distribution in accordance with the equation

$$\text{Cumulative Percent finer than } D = \frac{(D^n - D_s^n)}{D_L^n - D_s^n} \times 100\%$$

where

D=Particle size

$D_s$=Smallest particle size and is in the range of 10 to 0.1 μm;

$D_L$=Largest particle size and is in the range of 100 to 1.0 μm;

n=Distribution modulus and has a value appropriate for carbonate particles assumed to be approximately spherical;

which carbonate is coated with one or more fatty acids having a carbon chain length of from 12 to 20 carbon atoms; the balance of said granule by weight being a thermoplastic polymeric binder which is solid at ambient temperature and is compatible with said end product thermoplastic in which said carbonate filler is to be dispersed, said polymeric binder being selected from one or more members of the group consisting of amorphous polyolefins and highly branched polyethylene waxes.

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**5,744,531**

**ANIONIC ELECTROCOATING COMPOSITIONS CONTAINING HYDROXYALKYLAMIDE CURING AGENTS**

**Paul R. Kerr, Hampton Township, Allegheny County; Raphael O. Kollah, Shaler Township, Allegheny County; Steven R. Zawacky, Pittsburgh, and Patricia A. Alkens, Hockessin Township, New Castle County, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jun. 24, 1996, Ser. No. 670,829**

**Int. Cl.[6] C08F** *8/30*

**U.S. Cl. 524—432** **23 Claims**

1. A liquid, anionic electrocoating composition having an organic phase dispersed in an aqueous phase, wherein the organic phase comprises:

a. at least one electrodepositable β-hydroxyalkylamide curing agent comprising an organic radical, said organic radical:

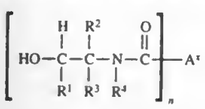
i. containing from about 8 to about 60 carbon atoms,

ii. being derived from a substituted or unsubstituted aliphatic, alicyclic or aromatic hydrocarbon radical, and

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iii. being bonded to n β-hydroxyalkylamide groups, wherein n is an integer from 1 to 4, to form the following structure:



where $R^1$ can be H or a substituted or unsubstituted aliphatic, alicyclic or aromatic group containing up to about 6 carbon atoms;

where $R^4$ and $R^3$ can be the same or different, and can be H, or a substituted or unsubstituted aliphatic, alicyclic, or aromatic group containing up to about 36 carbon atoms;

where $R^4$ is H or a substituted or unsubstituted aliphatic group containing up to about 8 carbon atoms when n is an integer form 2 to 4, and is a β-hydroxy substituted aliphatic group containing up to 6 carbon atoms when n is 1;

where A is an organic radical;

where x is the valency of the organic radical and an integer greater than or equal to n; and

where $R^1$, $R^2$, $R^3$, $R^4$ and A, either individually or in any combination, have a carbon chain length, or substituted groups, or both, if any, such that the resulting β-hydroxyalkylamide curing agent has a lipophilic nature such that the β-hydroxyalkylamide curing agent associates with the organic phase of the anionic electrocoating composition and deposits onto a conductive substrate immersed in the anionic electrocoating composition during an anionic electrocoating process, and

b. at least one water dispersible, electrodepositable polymer capable of crosslinking with said β-hydroxyalkylamide curing agent.

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**5,744,532**

**POWDER INJECTION MOLDING BINDER, POWDER INJECTION MOLDING COMPOSITION AND METHOD FOR PRODUCTION OF SINTERED MEMBER**

**Yoshimitsu Kankawa, Shiga, and Toshiki Nikaya, Osaka, both of Japan, assignors to Nippon Shokubai Co. Ltd., Osaka-fu, Japan**

**Filed Mar. 20, 1995, Ser. No. 406,557**

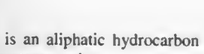
**Claims priority, application Japan, Mar. 23, 1994, 6-052014; Oct. 20, 1994, 6-255764**

**Int. Cl.[6] C08K** *3/08;3/10;* **C08L** *31/00*

**U.S. Cl. 524—440** **10 Claims**

1. A powder injection molding composition comprising (a) from 20 to 80% by volume of a powdery material capable of sintering, (b) from 10 to 70% by volume of an organic solvent soluble polymer (I) obtained by polymerizing a monomer component comprising from 50 to 100% by weight of at least one long side chain-containing monomer selected from the group consisting of

(i) long side chain-containing vinyl monomers represented by the formula (1)



(1)

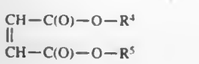
wherein

$R^1$ is H or $CH_3$, $R^2$ is an aliphatic hydrocarbon group having from 15–30 carbon atoms and

B is —C(O)—O—, —C(O)NH.$CH_2$.$CH_2$.O.C(O)—, —C(O)NH.CH(OH).$CH_2$.O.C(O)—, or —C(O)NH.$CH_2$.$CH_2$.O.C(O)NH.$R^3$.NH.C(O)O—

wherein $R^3$ is a divalent organic group or —O.C(O)—, and

(ii) long side chain-containing maleic monomers represented by the formula (2)



(2)

wherein $R^4$ is H or an aliphatic hydrocarbon group having from 15–30 carbon atoms and $R^5$ is an aliphatic hydrocarbon group having from 15–30 carbon atoms, and from 50 to 0% by weight of other polymerizable monomer, and (c) from 10 to 70% by volume of a binder auxiliary (II), providing the total of the powdery material, the polymer (I), and the binder auxiliary (II) accounts for 100% by volume, wherein after said composition is subjected to injection molding, said polymer (I) and said binder auxiliary (II) are removable from said injection molded product, whereby the residual molded product comprising said powdery material is sinterable to provide the desired sintered powdery material, free of said polymer (I) and said binder auxiliary (II).

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**5,744,533**

**ADHESIVE COMPOSITION FOR BONDING A SEMICONDUCTOR DEVICE**

**Nancy E. Iwamoto, Ramona; Jesse L. Pedigo, La Mesa; Shao Wei Li, and Alan Grieve, both of San Diego, all of Calif., assignors to Johnson Matthey, Inc., Valley Forge, Pa.**

**Filed Jun. 4, 1997, Ser. No. 868,508**

**Int. Cl.[6] C08K** *3/00*

**U.S. Cl. 524—440** **18 Claims**

1. An adhesive composition suitable for bonding a semiconductor device to a substrate comprising about 60 to 90 wt. % particulate silver;

about 10 to 40 wt. % of an adhesive material comprising at least one nonelectrically conductive organic compound; and

a filler comprising at least one electrically conductive organic compound, said filler forming a conductivity bridge between silver particles.

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**5,744,534**

**LIGHT SCATTERING MATERIAL**

**Minoru Ishiharada, Kodaira; Itsuo Tanuma, Sayama, and Kazuo Naito, Kawasaki, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan**

**Continuation of Ser. No. 103,714, Aug. 10, 1993, abandoned. This application Apr. 12, 1996, Ser. No. 631,130**

**Claims priority, application Japan, Aug. 10, 1992, 4-234203; Aug. 10, 1992, 4-234204**

**Int. Cl.[6] C08K** *3/34*

**U.S. Cl. 524—442** **3 Claims**

1. A light scattering material comprising a non-crosslinked transparent elastomer matrix having a glass transition temperature of room temperature or lower, and particles of a transparent material dispersed therein having a different index of refraction from the matrix, wherein the difference in index of refraction between the transparent elastomer matrix and the particles of the transparent material is at least 0.03, wherein the particles of the transparent material have a size greater than the wavelength of incident light by a factor of 2 to 10, the amount of the transparent material particles blended is 0.01 to 10 parts by weight per 100 parts by weight of the transparent elastomer matrix, and said transparent elastomer matrix is selected from the group consisting of an acrylate ester polymer and an acrylate ester copolymer;

wherein said acrylate ester copolymer comprises an acrylate ester monomer and a monomer selected from the group consisting of a methacrylate ester, styrene, α-methyl styrene, vinyl acetate, methyl vinyl ketone, phenyl vinyl ketone and vinyl benzoate monomer; and

wherein said acrylate ester polymer, said acrylate ester monomer and said methacrylate ester contain a substituent selected from the group consisting of a methyl, ethyl, butyl, propyl, stearyl, lauryl, 2-ethylhexyl, cyclohexyl, tetrahydrofurfuryl, aminoethyl, 2-hydroxyethyl, 3-hydroxypropyl, 3-chloro-2-hydroxypropyl, and trifluoroethyl radical.



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**5,744,535**

**POLYPROPYLENE RESIN COMPOSITION FOR EXTERIOR PARTS OF AUTOMOBILE**

**Tomohiko Akagawa; Ikunori Sakai, and Shigehiro Asano, all of Sakai, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan**

**Filed Oct. 8, 1996, Ser. No. 727,105**

**Claims priority, application Japan, Oct. 9, 1995, 7-261707; Sep. 11, 1996, 8-240101; Sep. 30, 1996, 8-258007**

**Int. Cl.[6] C08K** *3/34*

**U.S. Cl. 524—451** **4 Claims**

1. A polypropylene resin composition for the exterior parts of automobiles, comprising:

(A) 35 to 74% by weight of a crystalline ethylene-propylene block copolymer having a content of copolymerized ethylene of 0.5 to 15% by weight, an isotactic pentad fraction (mmmm) of copolymerized propylene of 96% or more, and a melt flow rate of 40 to 80 g/10 minutes determined at a temperature of 230° C. under a load of 2160 g;

(B) 21 to 40% by weight of an ethylene-α-olefin copolymer prepared by a catalytic polymerization in the presence of a single site catalyst, containing 70 molar % or less of copolymerized α-olefin, and having a molecular weight distribution ratio (Mw/Mn) of a weight-average molecular weight (Mw) to a number-average molecular weight (Mn) of 2.5 or less, and a melt flow index ratio ($MI_{10}/MI_{2.16}$) of a melt flow index ($MI_{10}$) determined at 190° C. under a load of 10 kg to a melt flow index ($MI_{2.16}$) determined at a temperature of 190° C. under a load of 2.16 kg of 6 to 15; and

(C) 5 to 25% by weight of talc particles having an average particle size of 3 to 7 μm, determined by a laser diffraction method.

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**5,744,536**

**RUBBER COMPOSITIONS**

**Hideki Matsui; Takashi Hamada, and Shigeo Kimura, all of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan**

**Filed Apr. 14, 1995, Ser. No. 421,905**

**Claims priority, application Japan, Apr. 26, 1994, 6-088335**

**Int. Cl.[6] C08K** *3/04*

**U.S. Cl. 524—492** **3 Claims**

1. A rubber composition comprising 10–100 parts by weight of carbon black having a specific surface area of nitrogen adsorption ($N_2SA$) of 70–90 $m^2/g$ and a dibutyl terephthalate absorption (DBP) of 170–200 ml/100 g and 10–100 parts by weight of silica, based on 100 parts by weight of diene rubber ingredient.

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**5,744,537**

**ANTIREFLECTIVE COATING FILMS**

**William R. Brunsvold, Poughkeepsie; George J. Hefferon, Fishkill; Christopher F. Lyons, LaGrangeville; Wayne M. Moreau, Wappingers Falls, and Robert L. Wood, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 516,117, Aug. 17, 1995, abandoned, which is a continuation of Ser. No. 240,289, May 9, 1994, abandoned, which is a continuation of Ser. No. 722,773, Jun. 28, 1991, abandoned. This application May 27, 1997, Ser. No. 863,678**

**Int. Cl.[6] C08L** *27/12*

**U.S. Cl. 524—520** **5 Claims**

1. An aqueous-soluble, antireflective coating for use on an aqueous developable photoresist composition comprising:

(a) a film-forming polymeric binder which is soluble in water or aqueous alkaline solutions, said polymeric binder selected from the group consisting of polyvinylalcohol, polyacrylic acid, polyvinylpyrrolidone, polyvinylsulfonic acid, polyvinylmethylether, polyethyleneglycol, polyalphatrifluoromethyl acrylic acid, polyvinyllmethylether-co-maleic anhydride, polyethyleneglycol-co-propyleneglycol, and polymethacrylic acid; and

(b) a fluorocarbon compound selected from the group consisting of ammonium salts of perfluoroorganic carboxylic acids having from about 6 to about 10 carbon atoms, ammonium salts of perfluoroorganic sulfonic acids having from about 6 to about 10 carbon atoms, and fluoroalkyl quaternary ammonium salts in admixture with said film-forming polymeric binder,

wherein the antireflective coating has a refractive index approximately equal to the square root of the refractive index of the aqueous developable photoresist composition, and wherein the antireflective coating is soluble in water or aqueous solutions, and wherein the antireflective coating is removable by dissolution in photoresist developer.

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**5,744,538**

**WATER DISPERSIBLE ADHESIVE COMPOSITIONS**

**Richard Anthony Miller, and Scott Ellery George, both of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.**

**Filed Aug. 28, 1995, Ser. No. 519,958**

**Int. Cl.[6] C08J** *3/00;* **C08K** *3/20;* **C08L** *51/00;67/00*

**U.S. Cl. 524—539** **19 Claims**

1. A water-dispersible adhesive composition comprising

(a) 20 to 80 weight percent of the copolyester comprising a branched water-dispersible polyester composition made of the reaction products;

(I) 1,4-cyclohexane dicarboxylic acid;

(II) about 2 to 40 mol percent, based on the total of all acid equivalence, of at least one difunctional sulfomonomer containing at least one sulfonate group bonded to an aromatic ring wherein the functional groups are carboxyl or esters thereof;

(III) at least one diol or a mixture of diols comprising:

(A) about 0.1 to 85 mol percent, based on the total mol percent of diol moieties having the formula $H(—OCH_2CH_2—)_nOH$ wherein n is 2 to about 20 provided that the mol percent of such moieties is inversely proportional to the value of n;

(B) about 0.1 to 15 mol percent, based on the total mol percent of diol moieties of a poly(ethylene glycol) having the formula $H(—OCH_2CH_2—)_nOH$ wherein n is 2 to about 500, provided that the mol percent of such moieties is inversely proportional to the value of n; and

(C) 0 to about 99 mol percent of the diol component being selected from the group consisting of glycols containing two $—C(R^1)_2—OH$ groups wherein $R^1$ in the reactant is a hydrogen atom, an alkyl of 1 to 5 carbon atoms, or an aryl group of 6 to 10 carbon atoms;

(IV) 0 to about 40 mol percent of a hydroxycarboxylic acid having one $—C(R—)_2—OH$ group, wherein R in the reactant is hydrogen or an alkyl group of 1 to 6 carbon atoms; and

(V) about 0.5 to 40 mol percent of a "multifunctional" or "branch-inducing" reactant containing at least three functional groups selected from hydroxyl, carboxyl, and mixtures thereof; the copolyester containing substantially equal mol proportions of acid equivalents (100 mol percent) and diol wherein the inherent viscosity is at least 0.1 dL/g measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of about 0.25 g of copolyester in 100 ml of the solvent, the glass transition temperature $T_g$ is no greater than 20° C., and the ring and ball softening point is at least 70° C.;

(b) about 2 to 60 weight percent of a tackifier selected from the group consisting of terpene resins, aromatic resins, aliphatic hydrocarbon, rosins, and polymers;

(c) about 0 to 30 weight percent of an extending oil selected from the group consisting of a paraffinic oils, naphthenic oils, liquid polyesters, liquid hydrocarbon resins, liquid rosins, low

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molecular weight polyethylene glycols, dibenzoates, isobutyrates, phthalate oils, animal oils, vegetable oils; and mineral oils; and

(d) about 0.1 to about 2 weight percent of an antioxidant stabilizer.

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**5,744,539**

**MANUFACTURING PROCEDURES FOR MAKING HIGH POLYTETRAFLUOROETHYLENE CONTENT DISPERSIONS IN OIL FOR LUBRICANT USE AND THE COMPOSITIONS SO PRODUCED**

**Frederic C. McCoy, 8 Herbert Hoover Dr., New Windsor, N.Y. 12553, and John P. Fay, Tower Ridge 4K, Peekskill, N.Y. 10566**

**Continuation of Ser. No. 508,833, Jul. 28, 1995, abandoned. This application Jan. 13, 1997, Ser. No. 782,082**

**Int. Cl.[6] C08J** *51/00*

**U.S. Cl. 524—546** **28 Claims**

1. A fluid polytetrafluoroethylene dispersion having excellent resistance to sedimentation, said polytetrafluoroethylene dispersion, in parts by weight of the dispersion, consisting essentially of:

(a) 15% to about 30% particulate polytetrafluoroethylene having a substantially uniform particle size distribution where at least about 80% of the particles have a size in the range from about 1.6 microns to about 35 microns and on a volume basis, the average is about 4–12 microns;

(b) about 5% to about 20% of an ethylene-propylene copolymer containing about 0.2% of nitrogen as a dispersing agent to disperse said polytetrafluoroethylene; and

(c) the balance substantially a lubricating carrier oil.

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**5,744,540**

**AQUEOUS POLYMER EMULSION**

**Roland Baumstark, Neustadt; Michael Portugall, Wachenheim; Rolf Dersch, Neustadt, and Enrique Schweigger, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Nov. 1, 1995, Ser. No. 551,489**

**Int. Cl.[6] C08L** *39/04*

**U.S. Cl. 524—558** **46 Claims**

1. An aqueous polymer emulsion obtained by polymerizing in a first polymerization stage monomers **1** having at least one ethylenically unsaturated group by free radical aqueous emulsion polymerization to a conversion of at least 90% by weight, based on the monomers **1** to be polymerized, and then polymerizing, in the presence of the product mixture of the first polymerization stage, monomers **2** having at least one ethylenically unsaturated group in a second free radical aqueous emulsion polymerization stage, with the proviso that

a) the monomers **1** are such that their random copolymerization alone would give a polymer **1** whose glass transition temperature tends to the limit $Tg^1$ with increasing molecular weight,

b) the monomers **2** are such that their random copolymerization alone would give a polymer **2** whose glass transition temperature tends to the limit $Tg^2$ with increasing molecular weight,

c) the difference between $Tg^1$ and $Tg^2$ is at least 20° C.,

d) in addition to the monomers of the monomers **1** and **2**, at least one adhesion-promoting monomer which differs from these monomers **1** and **2** and contains at least one ethylenically unsaturated group and at least one amino, ureido or N-heterocyclic group is polymerized in an amount of from 0.1 to 10% by weight, based on the total amount of the monomers to be polymerized,

e) from 20 to 100 mol % of the total amount of the adhesion-promoting monomers to be polymerized according to d) are polymerized in the first polymerization stage and

f) the amount of the monomers of the polymer having the lower limit $Tg^1$ is from 40 to 90% by weight, based on the total amount of the monomers **1** and **2**.

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**5,744,541**

**COPOLYMER OF POLYPROPYLENE AND ORGANOPOLYSILOXANE AND METHOD FOR PREPARATION THEREOF**

**Takashi Sawaguchi, Kanagawa; Manabu Seno, Tokyo, and Teruhito Maruyama, Kanagawa, all of Japan, assignors to Dow Corning Asia, Ltd., Tokyo, Japan**

**Filed Apr. 14, 1997, Ser. No. 837,197**

**Claims priority, application Japan, Apr. 15, 1996, 8-092463; Apr. 15, 1996, 8-092464**

**Int. Cl.[6] C08F** *283/00;8/00*

**U.S. Cl. 524—588** **20 Claims**

1. A method for preparing a copolymer of polypropylene and organopolysiloxane, said method comprising heating a solution of

(I) an α, ω-diene-propylene polymer and

(II) an organohydrido polysiloxane having an average at least two SiH groups in one molecule in

(III) a solvent having a boiling point (b.p.), said heating being carried out at a temperature below said boiling point (b.p.).

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**5,744,542**

**EMULSIFIERS AND THEIR USE IN WATER DISPERSIBLE POLYISOCYANATE COMPOSITIONS**

**Jonathan T. Martz, Shaler Township, Allegheny County; Joseph M. Carney, Reserve Township, Allegheny County; Robert E. Jennings, New Sewickley Township, Beaver County, and Karen D. Donnelly, Hampton Township, Allegheny County, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Continuation of Ser. No. 411,253, Mar. 27, 1995, abandoned. This application Nov. 6, 1996, Ser. No. 744,566**

**Int. Cl.[6] C08J** *3/00;* **C08K** *3/20;* **C08L** *75/00;* **C07C** *261/00*

**U.S. Cl. 524—590** **29 Claims**

1. An emulsifier having a number average molecular weight ranging from about 1000 to about 4000, said emulsifier comprising the reaction product of:

(a) an isocyanate component comprising an isocyanate oligomer having at least two free isocyanate groups, and

(b) a hydroxy functional polyalkyl ether component present in an amount sufficient to react with all of the isocyanate oligomer's free isocyanate groups, said hydroxy functional polyalkyl ether component comprising at least one mono-hydroxy functional polyalkyl ethers containing at least five ethylene oxide groups.

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**5,744,543**

**ONE-COMPONENT REACTIVE ADHESIVE**

**Thomas Huver; Herbert Fischer, both of Duesseldorf; Wolfgang Klauck, Meerbusch, and Gerd Bolte, Monheim, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany**

**PCT No. PCT/EP95/02047, § 371 Date Dec. 9, 1996, § 102(e) Date Dec. 9, 1996, PCT Pub. No. WO95/33800, PCT Pub. Date Dec. 14, 1995**

**PCT Filed May 30, 1995, Ser. No. 750,426**

**Claims priority, application Germany, Jun. 9, 1994, 44 20 151.6**

**Int. Cl.[6] C08K** *5/20*

**U.S. Cl. 524—728** **29 Claims**

1. A one-component reactive adhesive based on an air-activatable initiator wherein the air-activatable initiator is selected from the group consisting of hydrazones, dihydropyridines and mixtures thereof and radical-polymerizable olefinically unsaturated monomers, wherein the adhesive additionally contains groups selected from the group consisting of isocyanate, silanes and mixtures thereof.



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**5,744,544**

**HIGH SOLIDS COPOLYMER DISPERSION FROM A LATEX AND ITS USE IN SEALANTS**

**James H. Dunaway, Cuyahoga Falls; Pamela K. Hernandez, Brunswick; Gregory P. Bidinger, Copley, and Biing-Lin Lee, Broadview Heights, all of Ohio, assignors to The B.F.Goodrich Company, Akron, Ohio**

**Continuation-in-part of Ser. No. 321,288, Oct. 11, 1994, Pat. No. 5,541,253. This application Jul. 26, 1996, Ser. No. 690,288**

**Int. Cl.[6] C08L** *31/02*

**U.S. Cl. 524—832** **27 Claims**

1. A high solids polymer dispersion comprising:

at least 77 weight percent discrete polymer particles being comprised of the reaction product from polymerizing at least one unsaturated monomer in the presence of a latex, said discrete polymer particles having a particle size distribution having at least 2 modes with one mode having particle diameters of less than 1 μm and one mode greater than 1 μm and wherein at least 70 wt. % of the total polymers of said polymer dispersion have a Tg of 0° C. or less and are substantially noncrystalline.

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**5,744,545**

**BIOCOMPATIBLE ADHESIVE COMPOSITIONS**

**Woonza M. Rhee, Palo Alto; Prema R. Rao, Los Gatos; George H. Chu, Cupertino; Frank A. DeLustro, Belmont; Carol F. H. Harner, Redwood Shores; Naomi Sakai, San Mateo, and Jacqueline A. Schroeder, Redwood City, all of Calif., assignors to Collagen Corporation, Palo Alto, Calif.**

**Division of Ser. No. 573,801, Dec. 18, 1995, which is a continuation-in-part of Ser. No. 476,825, Jun. 7, 1995, Pat. No. 5,614,587, which is a continuation-in-part of Ser. No. 147,227, Nov. 3, 1993, Pat. No. 5,565,519, which is a continuation-in-part of Ser. No. 922,541, Jul. 30, 1992, Pat. No. 5,328,955, which is a continuation-in-part of Ser. No. 433,441, Nov. 14, 1989, Pat. No. 5,328,955, which is a continuation-in-part of Ser. No. 274,071, Nov. 21, 1988, abandoned. This application May 8, 1997, Ser. No. 853,496**

**Int. Cl.[6] A61F** *13/00;15/00*

**U.S. Cl. 525—54.1** **33 Claims**

1. A method for effecting the nonsurgical attachment of a first surface to a second surface, comprising the steps of:

providing collagen and a multifunctionally activated synthetic hydrophilic polymer;

mixing the collagen and synthetic polymer to initiate crosslinking between the collagen and the synthetic polymer;

applying the mixture of collagen and synthetic polymer to a first surface before substantial crosslinking has occurred between the collagen and the synthetic polymer; and

contacting the first surface with a second surface to effect adhesion between the first surface and the second surface.

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**5,744,546**

**MELT-PROCESSED BLENDS CONTAINING POLY(VINYL ALCOHOL)**

**Thierry Christian Claude Diaz, Roquefort Les Pins; Jean-Philippe Gaetan Meyer, Grasse Le Plan, both of France, and Carlos Alfonso Cruz, Holland, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Filed Feb. 7, 1997, Ser. No. 798,417**

**Int. Cl.[6] C08F** *16/06*

**U.S. Cl. 525—57** **1 Claim**

1. A melt-processed blend comprising:

a) from 80 to 98 parts, based on 100 parts of the blend, of at least one first polymer containing at least 80 mol % of units of the structure

$$-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-$$

and

(b) from 2 to 20 parts, based on 100 parts of the blend, of a block copolymer prepared by anionic polymerization of a mixture comprising from 20 to 35 weight percent of styrene and 65 to 80 percent butadiene or isoprene, the block copolymer having been hydrogenated, the block copolymer further containing from 1 to 5 weight percent grafted maleic anhydride.

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**5,744,547**

**PROCESSES FOR PRODUCING VINYL ACETATE POLYMER AND SAPONIFIED PRODUCT OF VINYL ACETATE POLYMER AND RESIN COMPOSITION**

**Takeshi Moritani; Kaoru Ikeda, both of Kurashiki; Akimasa Aoyama, deceased, late of Kurashiki, by Akiko Aoyama, heir; Takaharu Kawahara; Yukihiro Ohara, both of Okayama; Naoshi Nakagawa, and Toshinori Tsugaru, both of Osaka, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan**

**Filed Jun. 25, 1996, Ser. No. 668,466**

**Claims priority, application Japan, Jun. 26, 1995, 7-159515**

**Int. Cl.[6] C08F** *8/00*

**U.S. Cl. 525—62** **19 Claims**

1. A process for producing an ethylene-vinyl acetate copolymer, which comprises, after copolymerization of at least one monomer comprising vinyl acetate with ethylene to form ethylene-vinyl acetate copolymer, adding a conjugated polyene having a boiling point of at least 20° C. and removing unreacted vinyl acetate monomer after adding said polyene.

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**5,744,548**

**MELT-EXTRUDABLE THERMOPLASTIC POLYPROPYLENE COMPOSITION AND NONWOVEN WEB PREPARED THEREFROM**

**Ronald Sinclair Nohr, Roswell; John Gavin MacDonald, Decatur, and Peter Michelovich Kobylivker, Marietta, all of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.**

**Continuation of Ser. No. 448,067, May 23, 1995, abandoned, which is a division of Ser. No. 321,720, Oct. 12, 1994, abandoned. This application Oct. 30, 1996, Ser. No. 739,530**

**Int. Cl.[6] C08L** *83/04*

**U.S. Cl. 525—106** **11 Claims**

1. A composition comprising a melt-extrudable thermoplastic polypropylene composition having:

a melt flow rate in a range of from about 18 to about 30 g/10 minutes at a temperature of 190° C. and a load of 2.16 kg;

a polydispersity less than 4; and

a Z-average molecular weight greater than 300,000 as determined by differential refractometry.

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**5,744,549**

**FLOURINATED POLYURETHANE COATED GOLF BALLS**

**Mitchell E. Lutz, Fairhaven, Mass., assignor to Acushnet Company, Fairhaven, Mass.**

**Filed Jun. 3, 1996, Ser. No. 664,974**

**Int. Cl.[6] A63B** *37/12;* **C08L** *75/04*

**U.S. Cl. 525—129** **23 Claims**

1. A golf ball comprising a core, a cover and a coating composition layer deposited upon at least a portion of an outer surface of said cover, said coating composition layer comprising of a fluorinated polyurethane resin and a particulate material which comprises a plurality of poly(tetrafluoroethylene) particles.

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5,744,550

## CURABLE COATING COMPOSITIONS CONTAINING CARBAMATE ADDITIVES

Gregory G. Menovcik, Farmington Hills; Walter H. Ohrbom, Commerce, and John W. Rehfuss, West Bloomfield, all of Mich., assignors to BASF Corporation, Southfield, Mich.

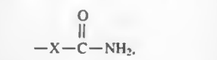
Filed Nov. 3, 1994, Ser. No. 333,917
Int. Cl.[6] C08L 29/02
U.S. Cl. 525—162 18 Claims

1. A curable coating composition comprising

(a) a polymer resin comprising active hydrogen-containing functional groups other than carbamate,

(b) a curing agent having groups that are reactive with said functional groups on (a), and

(c) a compound having a number average molecular weight of from 75 to 2000 comprising at least one group of the formula:



wherein X is O or NH and either (a), (b), or both (a) and (b) comprise groups that are reactive with said group on (c).

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5,744,551

## HIGH STRENGTH POLYETHYLENE FILM

Sandra Ann Kupperblatt, Flanders, N.J.; Michael William Tilston, St. Albans, W. Va., and George Edward Ealer, Whitehouse Station, N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Mar. 28, 1997, Ser. No. 828,408
Int. Cl.[6] C08L 23/08; C08F 255/02
U.S. Cl. 525—240 9 Claims

1. A blend comprising a mixture of two ethylene/alpha-olefin copolymers, said blend having a flow index in the range of about 5 to about 50 grams per 10 minutes; a melt flow ratio in the range of about 10 to about 50; a density in the range of 0.900 to 0.940 gram per cubic centimeter; a weight average molecular weight in the range of about 98,000 to about 190,000; and an Mw/Mn ratio in the range of about 2 to about 8, said blend having been prepared by mixing first and second copolymers having about equal molecular weights, each copolymer being a copolymer of ethylene and an alpha-olefin having 3 to 8 carbon atoms, the first copolymer having a flow index in the range of about 5 to about 75 grams per 10 minutes; a melt flow ratio in the range of about 10 to about 50; a density in the range of 0.860 to 0.930 gram per cubic centimeter; a weight average molecular weight in the range of about 87,000 to about 190,000; and an Mw/Mn ratio in the range of about 2 to about 4 and the second copolymer having a flow index in the range of about 5 to about 75 grams per 10 minutes; a melt flow ratio in the range of about 10 to about 50; a density in the range of 0.935 to 0.970 gram per cubic centimeter; a weight average molecular weight in the range of about 87,000 to about 190,000; and an Mw/Mn ratio in the range of about 2 to about 4, the weight ratio of the first copolymer to the second copolymer being in the range of about 70:30 to about 30:70.

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5,744,552

## SULFUR VULCANIZABLE RUBBER CONTINING SODIUM THIOSULFATE PENTAHYDRATE

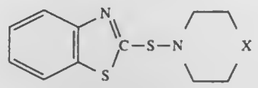
Richard Michael D'Sidocky, Ravenna, and Teddy Ben Cowling, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 526,394, Sep. 30, 1996, Pat. No. 5,594,052. This application Sep. 16, 1996, Ser. No. 714,477
Int. Cl.[6] C08F 8/34; C08L 7/00
U.S. Cl. 525—332.6 20 Claims

1. A method for increasing the rate of vulcanization of a sulfur vulcanizable rubber composition by heating a sulfur vulcanizable composition to a temperature ranging from 100° C. to 200° C., said rubber composition comprising

(a) a sulfur vulcanizable rubber

(b) from 0.5 phr to 5 phr of a sulfenamide compound of the general formula:



wherein X is O or $CH_2$; and

(c) from 0.05 to 10 phr of a hydrated thiosulfate.

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5,744,553

## METHOD AND DEVICE FOR THE PREPARATION OF A CROSSLINKED EXTRUDED POLYMERIC PRODUCT

Werner Kempter, St. Margrethen, Switzerland, assignor to Bernhard Rustige GmbH & Co. KG, Bremen, Germany

PCT No. PCT/EP94/01152, § 371 Date Dec. 12, 1995, § 102(e) Date Dec. 12, 1995, PCT Pub. No. WO94/25509, PCT Pub. Date Nov. 10, 1994
PCT Filed Apr. 14, 1994, Ser. No. 535,164
Claims priority, application Germany, Apr. 23, 1993, 43 13 290.1
Int. Cl.[6] C08F 8/00
U.S. Cl. 525—333.8 19 Claims

1. Process for the preparation of a crosslinked, extruded polymeric product, comprising the steps:

(a) selecting a solid, non-pelletized polymer granulate or a polymer powder having a fissured, porous surface;

(b) blending said polymer granulate or polymer powder in combination with a liquid additive which contains a crosslinker adjacent the inlet of an extruder to form a liquid-solid mixture; and

(c) immediately passing said liquid-solid mixture into said extruder to intimately mix the liquid and solid materials.

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5,744,554

## POLYESTER/POLYCARBONATE BLENDS HAVING ENHANCED PROPERTIES

Rudolf Pfaendner, Rimbach; Kurt Hoffmann, and Heinz Herbst, both of Lautertal, all of Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

PCT No. PCT/EP95/01872, § 371 Date Nov. 25, 1996, § 102(e) Date Nov. 25, 1996, PCT Pub. No. WO95/33003, PCT Pub. Date Dec. 7, 1995
PCT Filed May 17, 1995, Ser. No. 737,847
Claims priority, application Switzerland, May 27, 1994, 1645/94
Int. Cl.[6] C08G 64/00
U.S. Cl. 525—439 13 Claims

1. A polyester/polycarbonate blend (PES/PC blend), comprising

a) at least one phosphite,

b) at least one sterically hindered phenol,

c) at least one catalyst compound which is a Lewis base, and

d) at least one difunctional epoxy resin, with 0.01 to 10 parts of component c) being used per 100 parts of PES/PC blend.

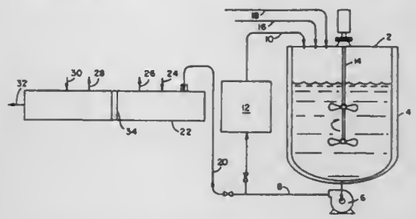


5,744,555

## PROCESS FOR THE SYNTHESIS OF ELASTOMERIC POLYPROPYLENE

William A. Ames; Robert E. Holliday, both of Longview; Timothy J. McKeon, White Oak; Luis A. Pagan; James H. Scott, both of Longview; Horst K. Seeger; Gregory T. Slemons, both of Longview; Max Statman, and Jeffrey J. Vanderbilt, both of Longview, all of Tex., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Nov. 25, 1994, Ser. No. 344,924
Int. Cl.[6] C08F 2/06
U.S. Cl. 526—67 20 Claims



1. A process for the production of elastomeric polypropylene comprising contacting propylene and 0 to 80 weight percent of an unreactive hydrocarbon solvent in the presence of a Group IV organometallic catalyst supported on $Al_2O_3$ at a temperature of about 60° to 80° C. in a recirculated, stirred reactor for a time to produce elastomeric polypropylene, said recirculated, stirred reactor is agitated such that the and continually removing a portion of the contents of said reactor containing propylene, solvent, and elastomeric polypropylene by the use of a high viscosity pump recovering said elastomeric polypropylene; wherein said recirculated, stirred reactor is agitated such that the reactor contents are well mixed, wherein said reactor contents are essentially free of catalyst poisons and wherein the elastomeric polypropylene in said reactor is in the combination slurry/solution phase.

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5,744,556

## GAS PHASE POLYMERIZATION EMPLOYING UNSUPPORTED CATALYSTS

George Ernest Keller, South Charleston; Keith Ernest Carmichael, Charleston; Jean Bowman Cropley, Scott Depot; Eldon Ronald Larsen, Charleston, all of W. Va.; Arakalud Venkatapathia Ramamurthy, East Windsor; Mark Wilton Smale, Glen Gardner, both of N.J.; Timothy Todd Wenzel, and Clark Curtis Williams, both of Charleston, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 13, 1996, Ser. No. 712,930
Int. Cl.[6] C08F 2/34
U.S. Cl. 526—135 15 Claims

1. A gas-phase polymerization of monomers comprising:

a) introducing a monomer or monomers into a gas-phase reactor,

b) introducing an unsupported polymerization catalyst system into the gas-phase reactor, wherein the unsupported polymerization catalyst system comprises:

(i) a non-volatile materials fraction containing a polymerization catalyst;

(ii) a solvent fraction which is at least partially miscible with the non-volatile materials fraction and which is sufficiently volatile to allow for the formation of polymerization catalyst particles when the mixture of the solvent fraction and the non-volatile materials fraction is sprayed into the reactor;

(iii) a compressed fluid having a critical temperature between 273K and 505K and in its supercritical condition; and

(iv) optionally a slowly vaporizing solvent; and

c) recovering the polymer product.

5,744,557

## ENERGY-CURABLE CYANATE/ETHYLENICALLY UNSATURATED COMPOSITIONS

Fred B. McCormick, Maplewood; David J. Drath, Woodbury; Ilya Gorodisher, Stillwater; Michael A. Kropp, Cottage Grove; Michael C. Palazzotto, St. Paul, and Melville R. V. Sahyun, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 16, 1993, Ser. No. 78,981
Int. Cl.[6] C08L 67/07; C08F 4/42
U.S. Cl. 526—171 23 Claims

1. A composition of matter comprising a curable mixture comprising 1 to 99 weight percent of a first monomer and an initiator therefor, the first monomer being one of 1) at least one ethylenically unsaturated monomer or 2) at least one cyanate ester monomer, and 99 to 1 weight percent of a second monomer and an initiator therefor, the second monomer being the member of 1) or 2) that is not selected as the first monomer, wherein a curative for the cyanate ester is a transition metal-containing organometallic compound curing agent and a curative for the ethylenically unsaturated monomer is a free-radical generating curing agent or a transition metal-containing organometallic compound, said composition when one or more of said monomers has at least commenced curing comprises one or both of an interpenetrating polymer network and a semi-interpenetrating polymer network, said networks comprising a semi-phase separated morphology which includes a continuum of phase compositions.

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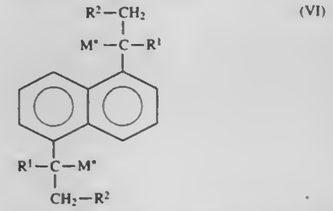
5,744,558

## 1,5-DIETHENYLNAPHTHALENE COMPOUNDS AND BIFUNCTIONAL PRIMERS FOR ANIONIC POLYMERIZATION PREPARED THEREFROM

Turgut Nugay, Cankaya-Ankara, Turkey, and Gérard Riess, Mulhouse, France, assignors to Elf Atochem S.A., Puteaux, France

Division of Ser. No. 409,989, Mar. 24, 1995, Pat. No. 5,674,799. This application Apr. 15, 1997, Ser. No. 843,338
Claims priority, application France, Mar. 24, 1994, 94 03487
Int. Cl.[6] C08F 4/56; B01J 23/04
U.S. Cl. 526—175 5 Claims

1. In a process for the anionic polymerization of at least one ethylenically unsaturated monomer in the presence of an alkali metal compound primer therefor, the improvement which comprises, as said primer therefor, a bifunctional primer naphthalene compound having the structural formula (VI):



(VI)

wherein each $R^1$ is a linear, branched or cyclic alkyl radical having from 1 to 12 carbon atoms, or a substituted or unsubstituted aryl radical; each $R^2$ is a $C_1$–$C_6$ alkyl radical, a $C_5$–$C_{12}$ cycloalkyl radical, or an aromatic radical; and each $M^+$ is an alkali metal.

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5,744,559
MACRO-AZO INITIATOR
Susumu Nagai, Suita; Hisato Takahashi, Fukuoka, and Akira Ueda, Takaishi, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan
Continuation of Ser. No. 678,785, Jul. 11, 1996, abandoned, which is a continuation of Ser. No. 434,368, May 3, 1995, abandoned. This application Sep. 8, 1997, Ser. No. 925,069
Claims priority, application Japan, Nov. 1, 1994, 6-292420
Int. Cl.[6] C08F 4/04
U.S. Cl. 526—219 8 Claims

1. A macro-azo initiator comprising a mixture of oligomers obtained in one reaction, each oligomer having at least two kinds of azo groups different in cleavability and obtained by reacting a compound (A) having an azo group in the molecule and having a reactive functional group selected from the group consisting of a —COOH group, a —COCl group, a —COBr group, a $—COOCH_3$ group, a $—COOC_2H_5$ group and an —NCO group at each end of the molecule with a compound (B) having an azo group in the molecule and having at each end of the molecule a functional group selected from the group consisting of an —OH group, an $—NH_2$ group and an —NH— group, reactive with the reactive functional group of compound (A).

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5,744,560
METAL ACCELERATED POLYMERIZATION PROCESSES
Daniel A. Foucher, Toronto; Paula J. MacLeod, Mississauga; Michael K. Georges, Guelph, and Timothy E. Burrow, Toronto, all of Canada, assignors to Xerox Corporation, Stamford, Conn.
Filed Jan. 21, 1997, Ser. No. 784,638
Int. Cl.[6] C08F 4/10;4/50;4/80;12/08
U.S. Cl. 526—221 22 Claims

1. A free radical polymerization process for the preparation of a polymer comprising heating a mixture of a free radical initiator, a stable free radical agent, a metal catalyst, or a metal stable free radical complex catalyst, and at least one polymerizable monomer; cooling said mixture; and optionally isolating said polymer, and wherein said metal catalyst is selected from the group consisting of zinc dichlorids, zinc hexafluoroacetylacatonate dihydrate, cobalt hexafluoroacetylacetonate monohydrate, magnesium hexafluoroacetylacetonate dioxane, yttrium tris(hexafluoroacetylacetonate), nickel hexafluoroacetylacetonate dihydrate, and scandium hexafluoroacetylacetonate.

20. A free radical polymerization process for the preparation of thermoplastic resin comprising heating a first mixture comprised of a free radical initiator, a stable free radical agent, a metal compound catalyst, and at least one polymerizable monomer compound to form a first intermediate product resin; optionally cooling said first mixture; adding to said first intermediate product resin a second mixture comprised of a free radical initiator, a stable free radical agent, a metal compound catalyst, and at least one polymerizable monomer compound, wherein said polymerizable monomer compound of said second mixture contains the same components as said polymerizable monomer compound of said first mixture, and said free radical initiator and said stable free radical agent of said second mixture are the same or different from said free radical initiator and said stable free radical agent of said first mixture; and wherein there is formed a combined mixture; heating said combined mixture to form a third mixture comprised of a mixture of thermoplastic resin comprised of a first product resin formed from said first intermediate product resin and added said second monomer and a second product resin formed from said second monomer; cooling said third mixture; optionally isolating said mixture of thermoplastic product resin from said third mixture; and optionally washing and drying said mixture of thermoplastic resins, and wherein said metal compound catalyst is a compound of the formula $M(RR')_n$ wherein M is a metal, and R and R' are hydrogen, a single or doubly bridging ligand complex containing either a Group III, Group IV or Group VI element, and n is a number of from 1 to about 6.

5,744,561
FLUORINATED POLYMER HAVING IMPROVED HEAT STABILITY
Patrick Kappler, Ecully, France, assignor to Elf Atochem S.A., Puteaux, France
Filed Oct. 11, 1995, Ser. No. 541,068
Claims priority, application France, Oct. 14, 1994, 94 12281
Int. Cl.[6] C08F 14/18
U.S. Cl. 526—255 10 Claims

1. A method of protecting a substrate, which comprises the step of coating said substrate with one or more heat stable fluorinated copolymers of trifluoroethylene and tetrafluoroethylene wherein said one or more heat stable fluorinated copolymers of trifluoroethylene and tetrafluoroethylene comprises
from 96 to 70 mol % of trifluoroethylene, and
from 4 to 30 mol % of tetrafluoroethylene.

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5,744,562
ACRYLIC COPOLYMER ELASTOMER, ITS BLEND RUBBER AND BLEND RUBBER COMPOSITION
Kuniyoshi Saito, Iwaki; Iwao Moriyama, Takahagi, and Jun Okabe, Kitaibaraki, all of Japan, assignors to Nippon Mektron, Limited, Tokyo, Japan
Filed Jul. 24, 1996, Ser. No. 686,078
Claims priority, application Japan, Jul. 25, 1995, 7-209179; Aug. 11, 1995, 7-227018; Jan. 24, 1996, 8-029841; Mar. 22, 1996, 8-093486; May 15, 1996, 8-144917
Int. Cl.[6] C08F 30/08
U.S. Cl. 526—279 2 Claims

1. An acrylic copolymer elastomer which comprises a copolymer of an alkyl acrylate having an alkyl group having 1 to 8 carbon atoms and an unsaturated ester compound represented by the following general formula:

(1) $CH_2$=CRCOO$(CH_2)$nPhOR',

(2) $CH_2$=CRCOO$(CH_2)$nOCO$(CH_2)$mPhOR',

(3) $CH_2$=CHOCO$(CH_2)$nOCO$(CH_2)$mPhOR' or

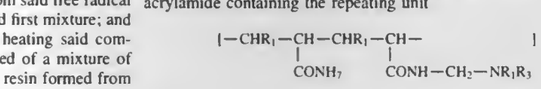
(4) $CH_2$=CHO$(CH_2)$nOCO$(CH_2)$mPhOR'

where R is a hydrogen atom or a methyl group; R' is a hydrogen atom, an acyl group or a trialkylsilyl group; Ph is a phenylene group; n is an integer of 1 to 6; and m is 0 or an integer of 1 to 3.

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5,744,563
MANNICH BASE COPOLYMER AND METHOD FOR MAKING IT
Tamara V. Vyshkina, 50 Quentin Rd., Brooklyn, N.Y. 11223
Continuation of Ser. No. 514,397, Aug. 11, 1995, abandoned. This application Feb. 18, 1997, Ser. No. 802,893
Int. Cl.[6] C08F 226/02;2/10
U.S. Cl. 526—307.3 5 Claims

1. A flocculant copolymer of acrylamide and Mannich base of acrylamide containing the repeating unit



wherein
$R_1$ is hydrogen or $C_{1-8}$ alkyl groups, $R_3$ and $R_4$ are $C_1$ to $C_8$ alkyl groups and may be the same or different, wherein said copolymer is prepared in two stages,
the first stage comprising forming a Mannich base of an acrylamide by reacting a secondary amine having the formula $NHR_2R_3$ wherein $R_2$ and $R_3$ are $C_1$ to $C_8$ alkyl groups with an acrylamide and a formaldehyde to form the Mannich base of the acrylamide and



the second stage comprising copolymerizing said Mannich base of an acrylamide with an acrylamide in a mole ratio of acrylamide to Mannich base of acrylamide of 1:(0.05–0.1) in aqueous solution in the presence of a redox polymerization initiator at about 5° C. to about 30° C. for at least 6 hours
and wherein said copolymer is recovered form said solution.

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5,744,564
WRINKLED ABSORBENT PARTICLES OF HIGH EFFECTIVE SURFACE AREA HAVING FAST ABSORPTION RATE
Frederick W. Stanley, Jr., deceased, late of Midland, by Caroline Stanley, legal representative; Jack C. Lamphere, Midland, and Larry R. Wilson, Beaverton, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.
PCT No. PCT/US92/07336, § 371 Date Nov. 4, 1993, § 102(e) Date Nov. 4, 1993, PCT Pub. No. WO93/19099, PCT Pub. Date Sep. 30, 1993
PCT Filed Aug. 28, 1992, Ser. No. 140,182
Claims priority, application Germany, Mar. 14, 1992, 921 04 434.3
Int. Cl.[6] C08F 2/32
U.S. Cl. 526—317.1 39 Claims

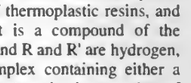


1. A fluid absorbent polymer having a fast rate of absorption, comprising:
individual non-agglomerated polymer particles, each said particle having a mean surface area greater than about 0.2 $m^2/g$, each said particle having a surface substantially continuous but including a plurality of wrinkles comprising folds, ridges, crevices and channels.

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5,744,565
PLASTISOLS
Peter Denkinger, Kendall Park, N.J., and Wilhelm Elser, Griesheim, Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany
Filed Nov. 18, 1996, Ser. No. 746,813
Claims priority, application Germany, Nov. 16, 1995, 195 42 746.7
Int. Cl.[6] C08F 20/10
U.S. Cl. 526—318.4 3 Claims

1. A method of preparing a bead polymerizate P, comprising:
suspension polymerizing a dispersion of monomers having a constituency comprising:
a-1) 50–100% by weight methyl methacrylate;
a-2) 0–50% by weight of at least one monomer, which is not methyl methacrylate, with the formula I



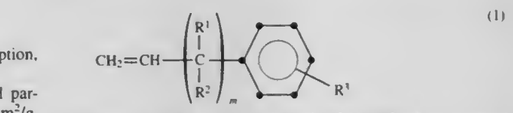
(1)

where
$R_1$ stands for hydrogen or methyl and
$R_2$ stands for $C_{1-14}$ alkyl branched or unbranched;
a-3) 0–20% by weight of another vinyl monomer VM, which excludes (a-1) and (a-2), and
a-4) 0–20% by weight of an adhesion-promoting monomer HM, in the presence of a dispersant or protective colloid in water containing a water soluble initiator;
separating the bead polymerizate P from the aqueous polymerization medium; and
comminuting the separated bead polymerizate.

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5,744,566
UNSATURATED COPOLYMER BASED ON OLEFIN AND PRODUCITON AND USE THEREOF
Toshiyuki Tsutsui, Ootake, and Masaaki Kawasaki, Ichihara, both of Japan, assignors to Mitsui Chemicals, Inc., Tokyo, Japan
Filed Dec. 27, 1996, Ser. No. 773,592
Claims priority, application Japan, Dec. 29, 1995, 7-353315
Int. Cl.[6] C08F 236/20;4/642
U.S. Cl. 526—336 15 Claims

1. An unsaturated copolymer based on olefin, which comprises a random copolymer of constituent comonomers of
(a-1) an α-olefin having 2–20 carbon atoms,
(a-2) a vinyl monomer having an aromatic ring, as represented by formula (1) given below and
(a-3) a chain-formed non-conjugated triene or tetraene having one vinyl group in the molecule,
said copolymer comprising constituent structural units of
(b-1) 30–99.8 mole % of a structural unit derived from said α-olefin (a-1),
(b-2) 0.1–60 mole % of a structural unit derived from said vinyl monomer (a-2) and
(b-3) 0.1–10 mole % of a structural unit derived from said non-conjugated triene or tetraene (a-3)
and having an intrinsic viscosity [η] determined in Decalin® (Decahydronaphthalene) at 135° C. in the range from 0.05 to 10 dl/g:



(1)

wherein m is an integer of 0–5 and $R^1$, $R^2$ and $R^3$ may be identical with or different from each other and denote each hydrogen atom or an alkyl group having 1–8 carbon atoms.

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5,744,567
RANDOM PROPYLENE COPOLYMERS
Stephan Hüffer, Ludwigshafen; Meinolf Kersting, Neustadt; Franz Langhauser; Rainer Alexander Werner, both of Bad Dürkheim; Patrik Müller, Kaiserslautern, and Jürgen Kerth, Carlsberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany
Filed Dec. 4, 1996, Ser. No. 763,839
Claims priority, application Germany, Dec. 6, 1995, 195 45 499.5
Int. Cl.[6] C08F 10/06;210/06
U.S. Cl. 526—348.6 4 Claims

1. A random propylene copolymer containing copolymerized $C_2$–$C_{10}$-alk-1-enes obtained by polymerization of propylene and $C_2$–$C_{10}$-alk-1-enes in the presence of a Ziegler-Natta, catalyst system comprising a titanium-containing solid component a) comprising a compound of magnesium, a halogen, silica gel as support and a carboxylic ester as electron donor compound, and also, as cocatalysts, an aluminum compound b) and a further electron donor compound c), where propylene and the $C_2$–$C_{10}$-alk-1-enes are polymerized with one another at from 50° to 100° C. at pressures in the range from 15 to 40 bar and mean residence times of from 0.5 to 5 hours and the support used in the titanium-

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containing solid component is a silica gel which has a mean particle diameter of from 5 to 200 μm, a mean particle diameter of the primary particles of from 1 to 10 μm and voids or channels having a mean diameter of from 1 to 10 μm, which voids or channels have a macroscopic proportion by volume based on the total particle in the range from 5 to 20%.

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**5,744,568**

## PROCESS FOR THE PRODUCTION OF POLYURETHANE LENS

**Masahisa Kosaka, and Yukio Kageyama, both of Tokyo, Japan, assignors to Hoya Corporation, Japan**

**Division of Ser. No. 559,632, Nov. 20, 1995, Pat. No. 5,635,580. This application Feb. 18, 1997, Ser. No. 802,800**

**Int. Cl.[6] C08G** *18/16*

**U.S. Cl. 528—58** **15 Claims**

1. A process for mass-producing a polyurethane lens comprising the steps of:

(A) selecting two polythiol compounds which have different reaction rates with a polyisocyanate compound by:

(i) mixing a first candidate polythiol compound with m-xylylene diisocyanate, as a standard polyisocyanate compound, in an —NCO group/—SH group mixing ratio of 1.0, measuring the viscosity of the resultant mixture at 20° C. immediately after mixing and again 2 hours after preparation of the mixture, and determining a change in viscosity between the first and second measurements,

(ii) mixing a second candidate polythiol compound with m-xylylene diisocyanate and measuring viscosity change in the same manner as in the above step (i),

(iii) repeating step (ii) for additional candidate polythiol compounds, and

(iv) comparing the amount of viscosity change for any two polythiol compounds so measured, and when a difference between the viscosity change is at least 100 cps, selecting these two candidate polythiol compounds which have different reaction rates with the standard polyisocyanate compound;

(B) adding two or more of the polythiol compounds selected in step (A) to a mixture of polyisocyanate compound and an alkyltin halide compound of the formula (I),

$$(R_1)_c—Sn—X_{4-c} \quad (I)$$

wherein $R_1$ is methyl, ethyl, propyl or butyl, X is a fluorine atom, a chlorine atom or a bromine atom and c is an integer of 1 to 3,

(C) pouring the resulting mixture of step (B) into a plurality of lens molds and allowing the mixture to react;

(D) heating the filled lens molds of step (C) in the same polymerization furnace; and thereafter

(E) obtaining a plurality of transparent polyurethane lenses.

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**5,744,569**

## ONE-COMPONENT AND TWO-COMPONENT POLYURETHANE COATING COMPOSITIONS

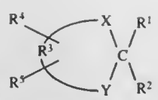
**Bernd Bruchmann, Ludwigshafen; Hans Renz, Meckenheim, and Günter Mohrhardt, Speyer, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Jun. 28, 1996, Ser. No. 672,332**

**Int. Cl.[6] C08G** *18/46*

**U.S. Cl. 528—73** **10 Claims**

1. A one-component or two-component polyurethane coating composition comprising at least one reactive component capable of reacting with polyisocyanates, wherein the reactive component is a compound A) containing an isocyanate group, a urethane, thiourethane or urea group and two capped isocyanate-reactive groups, wherein the compound (A) is the addition product of 1 mol of a compound having the general structural formula



(I)

and one mol of diisocyanate, where $R^1$ and $R^2$ are, independently of one another, hydrogen or $C_1$–$C_{10}$-alkyl, X and Y are, independently of one another, oxygen, sulfur or an N-$R^6$ group, $R^3$ is $C_1$–$C_5$-alkylene and the heterocyclic ring can be substituted by further radicals $R^4$ and $R^5$, where one of the radicals $R^4$, $R^5$ or $R^6$ must bear a group capable of reacting with isocyanate and is hydroxyl, mercapto, primary or secondary amino, or be such a group capable of reacting with isocyanate and the other radical $R^4$, $R^5$ or $R^6$, if present at all, must contain no group capable of reacting with isocyanate, with the proviso that X is not oxygen when Y is N-$R^6$, and Y is not oxygen when X is N-$R^6$.

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**5,744,570**

## COPOLYETHER AMIDE AND WATER VAPOUR PERMEABLE FILM MADE THEREFROM

**Bert Gebben, Velp, Netherlands, assignor to Akzo Nobel NV, Arnhem, Netherlands**

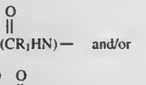
**Filed Aug. 16, 1996, Ser. No. 699,004**

**Claims priority, application Netherlands, Aug. 17, 1995, 1000996**

**Int. Cl.[6] C08G** *63/42;69/08;73/00*

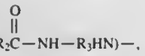
**U.S. Cl. 528—170** **17 Claims**

1. A copolyether amide composed of polyamide segments A and ethylene oxide groups-containing polyamide segments B, the polyamide segments A comprising monomer units of the following structure:



(I)

and/or



(II)

wherein $R_1$ has the meaning of an alkylene group with 3 to 11 carbon atoms which may be substituted or not, and $R_2$ and $R_3$ may be the same or different and represent a (cyclo)alkylene group with 4 to 11 carbon atoms which may be substituted or not or a difunctional aromatic group, and the polyamide segments B comprising monomer units of the following structure:



(III)

wherein G stands for a divalent group remaining after the removal of the amino terminated groups of a polyoxyalkylene diamine which is connected or not via one or more lactam units included among the polyamide segments A according to the former formula with a dicarboxylic acid unit wherein $R_4$ has the meaning of a (cyclo)alkylene group which may be substituted or not, a polyoxyalkylene group or a difunctional aromatic group, characterised in that the copolyether amide

a) is made up of at least 10 wt. % and not more than 30 wt. % of ethylene oxide groups,

b) is composed of 30 to 60 wt. % of polyamide segments A and 70 to 40 wt. % of polyamide segments B containing the monomer units according to formula (III), wherein G has the meaning of a polyoxyalkylene group having a molecular weight of 600 to 6000 and an atomic ratio of carbon to oxygen of 2.0 to 4.3, or when the group $R_4$ has the meaning of a divalent group obtained after the removal of the carboxyl groups, of a dimeric fatty acid or of a polyoxyalkylene group having a molecular weight of 600 to 6000 and an atomic ratio of carbon to oxygen of 2.0 to 4.3, as well as of a (cyclo)alkylene group with 2 to 12 carbon atoms which may be substituted or not or of a difunctional aromatic group, and



c) has a melting point in the range of 180° to 260° C.

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**5,744,571**

## PRODUCTION OF PARTICULAR POLYESTERS USING A NOVEL CATALYST SYSTEM

**Samuel D. Hilbert, Jonesborough, and Thomas G. Davis, Kingsport, both of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.**

**Continuation of Ser. No. 463,389, Jun. 5, 1995, which is a division of Ser. No. 362,387, Dec. 22, 1994. This application Oct. 15, 1996, Ser. No. 720,970**

**Int. Cl.[6] C08G** *63/02*

**U.S. Cl. 528—272** **17 Claims**

1. A process of producing a moldable polyethylene terephthalate or modified polyethylene terephthalate having an inherent viscosity greater than 0.65 dL/g comprising:

reacting a diacid component further comprising at least 65 mole % terephthalic acid or a diester component comprising at least 65 mole % $C_1$–$C_4$ dialkyl terephthalate and a diol component comprising at least 65 mole % ethylene glycol at temperatures to effect steps (A) and (B) as follows:

(A) esterification or transesterification, wherein said esterification is carried out,

optionally, in the presence of about 1 to about 50 parts of titanium present in the form of an alkyl titanate or optionally, in the presence of a catalyst system comprising from about 1 to about 50 parts of titanium present in the form of an alkyl titanate and from about 1 to about 100 parts of phosphorus in the form of a phosphate ester or phosphoric acid, and wherein said transesterification is carried out in the presence of from about 1 to about 50 parts of titanium in the form of an alkyl titanate; and

(B) polycondensation, wherein said polycondensation is carried out in the presence of a catalyst system comprising from about 1 to about 50 parts of titanium present in the form of an alkyl titanate, from about 1 to about 100 parts of phosphorus in the form of a phosphate ester or phosphoric acid and an inorganic toner;

each of the parts of the catalyst representing per million parts of polymer product, wherein the mole percentage for all of the diacid component totals 100 mole %, and wherein the mole percentage for all of the diol component totals 100 mole %.

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**5,744,572**

## PROCESS FOR THE ACCELERATION OF THE POLYCONDENSATION OF POLYESTER

**Heinz-Dieter Schumann, Maintal, and Ulrich Thiele, Bruchkoebel, both of Germany, assignors to Zimmer AG, Frankfurt, Germany**

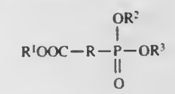
**Filed Feb. 6, 1997, Ser. No. 797,461**

**Claims priority, application Germany, Aug. 1, 1996, 196 31 068.7**

**Int. Cl.[6] C08G** *63/78*

**U.S. Cl. 528—286** **7 Claims**

1. In a process for the acceleration of the polycondensation of polyester made by the esterification of at least one dicarboxylic acid with at least one diol, precondensation, melt phase polycondensation, granulation, crystallization and solid phase polycondensation, the improvement comprising the addition, prior to the precondensation reaction, of from about 30 to less than 500 ppm phosphorus in relation to the polyester in the form of carboxy phosphonic acid of the formula:



wherein, R is selected from the group consisting of $C_{1-10}$-alkylene, $C_{1-10}$-cycloalkylene, and $C_{6-10}$ -arylene and $R^1$, $R^2$, and $R^3$ are independently selected from the group consisting of hydrogen, $C_{1-10}$ -alkyl, $C_{1-10}$-cycloalkyl, and $C_{6-10}$-aryl, provided that at least two of $R^1$, $R^2$, and $R^3$ are hydrogen.

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**5,744,573**

## ELECTROSTATIC DISSIPATIVE NYLONS

**Larry C. Brubaker, 449 Hartz Rd., Fleetwood, Pa. 19522**

**Filed Oct. 25, 1996, Ser. No. 736,999**

**Int. Cl.[6] C08G** *69/08;73/10*

**U.S. Cl. 528—310** **4 Claims**

1. A method for reducing the surface resistivity of polylactams by incorporating an antistatic agent which is miscible in lactam monomer at polymerization temperatures in a lactam and conducting an anionic polymerization of the lactam characterized in that the anti static agent is N,N-Bis(hydroxy ethyl) alkylamine or a chain extended low molecular weight polyoxirane and the moisture contained in the lactam monomer is at least 0.4 wt %.

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**5,744,574**

## ISOMALEIMIDES AND POLYMERS DERIVED THEREFROM

**Stephen A. Ezzell, Woodbury; Richard G. Hansen, St. Paul, and Gregory J. Anderson, Brooklyn Park, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**PCT No. PCT/US95/15885, § 371 Date Dec. 5, 1995, § 102(e) Date Dec. 5, 1995, PCT Pub. No. WO97/20832, PCT Pub. Date Jun. 12, 1997**

**PCT Filed Dec. 5, 1995, Ser. No. 557,086**

**Int. Cl.[6] C08G** *69/08;* **C07D** *307/02*

**U.S. Cl. 528—315** **23 Claims**

1. A method for preparing an isomaleimide or polyisomaleimide comprising the steps in sequence:

(a) admixing at least one of a maleamic acid and a polymaleamic acid with an acid halide,

(b) reacting the admixture with a tertiary amine at a temperature sufficiently low to suppress the formation of a maleimide, and

(c) isolating the resulting isomaleimide or polyisomaleimide.

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**5,744,575**

## AROMATIC POLYIMIDE AND GAS SEPARATION

**Shunsuke Nakanishi; Kenji Ito, and Yoshihiro Kusuki, all of Chiba, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan**

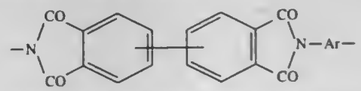
**Filed Jun. 6, 1996, Ser. No. 659,330**

**Claims priority, application Japan, Jun. 6, 1995, 7-139279; Jun. 6, 1995, 7-139280; Jun. 6, 1995, 7-139281**

**Int. Cl.[6] C08G** *73/10*

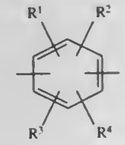
**U.S. Cl. 528—353** **17 Claims**

1. An aromatic polyimide consisting essentially of a recurring structural unit of the formula (I):



(I)

wherein Ar is a divalent aromatic group having the formula (II):



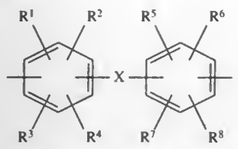
(II)

VOL 1209 ISS 4 AP 28 1998 UMI



in which at least one of $R^1$ through $R^4$ is a sulfonate group selected from the group consisting of $—SO_3H$, $—SO_3M$, and $—SO_3N(L)_4$, wherein M is an alkali metal and L is a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, and others of $R^1$ through $R^4$ are independently hydrogen atoms or alkyl groups having 1 to 3 carbon atoms;

or the formula (III):



(III)

in which at least one of $R^1$ through $R^8$ is a sulfonate group selected from the group consisting of $—SO_3H$, $—SO_3M$, and $—SO_3N(L)_4$, wherein M is an alkali metal and L is a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, and others of $R^1$ through $R^3$ are independently hydrogen atoms or alkyl groups having 1 to 3 carbon atoms, and X is a single bond, —O—, $—SO_2—$, —NH—, an alkylene group having 1 to 3 carbon atoms, or an alkenylene group having 1 to 3 carbon atoms.

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**5,744,576**

**PROCESS FOR PRODUCING POLY(PHENYLENE SULFIDE)**

**Michihisa Miyahara; Hiroyuki Sato, and Yoshikatsu Satake, all of Fukushima-ken, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan**

**Continuation of Ser. No. 576,358, Dec. 21, 1995, abandoned. This application Jul. 7, 1997, Ser. No. 888,599**

**Claims priority, application Japan, Dec. 28, 1994, 6-337557**

**Int. Cl.[6] C08G** *75/14*

**U.S. Cl. 528—388** **4 Claims**

1. A process for producing poly(phenylene sulfide), in which an alkali metal sulfide is reacted with a dihalo-aromatic compound in an organic amide solvent, which comprises conducting the following Steps 1 and 2:

Step 1:

reacting the alkali metal sulfide with the dihalo-aromatic compound within a temperature range of 180°–265° C. in the organic amide solvent containing water in a proportion of 0.5–2.0 moles per mole of the alkali metal sulfide charged while (i) raising the reaction temperature at an average heating rate of not higher than 1° C./min in a temperature range of from 180° C. to 220° C., so as to obtain a conversion of 0–45% of the halogen moiety of the dihalo-aromatic compound, then (ii) raising the reaction temperature at an average heating rate of 0.2–0.5° C./min in a temperature range of from 220° C. to 240° C. until conversion of the halogen moiety of the dihalo-aromatic compound reaches 60–90%, further (iii) raising the reaction temperature at an average heating rate of not higher than 1° C./min within a temperature range of from 240° C. to 260° C., so as to obtain a conversion of the dihalo-aromatic compound of 95–95 mol %, thereby forming a prepolymer of poly(phenylene sulfide); and

Step 2:

adding water to the reaction system at a temperature of at least 235° C. in such a manner that water is present in a proportion of 2.1–10 moles per mole of the alkali metal sulfide charged, and continuing the reaction for 1–5 hours within a temperature range of from 250° C. to 270° C., thereby converting the prepolymer to high-molecular weight poly(phenylene sulfide).

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**5,744,577**

**PROCESS FOR PRODUCING POLYKETONES**

**Andrew David Poole, North Humberside, England, assignor to BP Chemicals Limited, London, England**

**Filed Oct. 13, 1995, Ser. No. 542,673**

**Claims priority, application United Kingdom, Oct. 13, 1994, 9420667**

**Int. Cl.[6] C08G** *67/02*

**U.S. Cl. 528—392** **17 Claims**

1. A process for preparing polylketones by polymerising a mixture of carbon monoxide and one or more olefins in the presence of a group VIII metal catalyst which is prepared by reacting together:

(a) a source of group VIII metal, and

(b) an amine, phosphine, arsine, stibine, the polymerisation being carried out in the presence of a composition comprising hydrocarbyl aluminoxane and tertiary butyl aluminium.

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**5,744,578**

**PROCESS FOR THE CRYSTALLIZATION OF POLYETHYLENE NAPHTHALATE PREPOLYMERS AND THE SOLID STATING OF THOSE CRYSTALLIZED PREPOLYMERS**

**Ben Duh, Tallmadge, Ohio, assignor to Shell Oil Company, Houston, Tex.**

**Filed Apr. 2, 1997, Ser. No. 832,411**

**Int. Cl.[6] C08F** *6/10*

**U.S. Cl. 528—492** **33 Claims**

1. A process for the crystallization of an amorphous polyethylene naphthalate prepolymer containing volatile components which comprises heating said prepolymer at a temperature within the range of about 20° C. above the Tg and about 10° C. below the Tm of the prepolymer under agitation and, in the presence of a liquid, or mixture of liquids, sufficient to prevent the expansion of volatile components within said prepolymer, and to thereby produce a crystallized polyethylene naphthalate polymer.

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**5,744,579**

**RECOMBINANT DNA VECTORS CAPABLE OF EXPRESSING APOAEQUORIN**

**Milton J. Cormier, Sedona, Ariz., and Douglas Prasher, East Falmouth, Mass., assignors to University of Georgia Research Foundation, Athens, Ga.**

**Division of Ser. No. 960,195, Oct. 9, 1992, Pat. No. 5,422,266, which is a continuation of Ser. No. 569,362, Aug. 13, 1990, abandoned, which is a continuation of Ser. No. 165,422, Feb. 29, 1988, abandoned, which is a continuation of Ser. No. 942,273, Dec. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 687,903, Dec. 21, 1984, abandoned. This application Jun. 7, 1995, Ser. No. 476,609**

**Int. Cl.[6] C12P** *21/02*

**U.S. Cl. 530—324** **2 Claims**

1. A homogeneous peptide comprising, the amino acid sequence

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | MET | THR | SER | GLU | GLN | TYR | SER |
| 8 | VAL | LYS | LEU | THR<br>PRO | PRO<br>LYS | ASP<br>TRP | PHE<br>ILE | ASP<br>GLY | ASN<br>ARG |
| 23 | HIS | LYS | HIS | MET<br>VAL | PHE<br>ASN | ASN<br>HIS | PHE<br>ASN | LEU<br>GLY | ASP<br>ARG |
| 38 | ILE | SER | LEU | ASP<br>ALA | CLU<br>SER | MET<br>ASP | VAL<br>ILE | TYR<br>VAL | LYS<br>ILE |
| 53 | ASN | ASN | LEU | GLY<br>ALA | ALA<br>LYS | THR<br>ARG | PRO<br>HIS | GLU<br>LYS | GLN<br>ASP |
| 68 | ALA | VAL | GLU | ALA<br>GLY | PHE<br>MET | PHE<br>LYS | GLY<br>TYR | GLY<br>GLY | ALA<br>VAL |



-continued

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 83 | GLU | THR | GLU | TRP<br>GLY | PRO<br>TRP | GLU<br>LYS | TYR<br>ARG | ILE<br>LEU | GLU<br>ALA |
| 98 | SER | GLU | GLU | LEU<br>ASN | LYS<br>GLN | ARG<br>ILE | TYR<br>THR | SER<br>LEU | LYS<br>ILE |
| 113 | ARG | LEU | TRP | GLY<br>ILE | ASP<br>ILE | ALA<br>ASP | LEU<br>LYS | PHE<br>ASP | ASP<br>GLN |
| 128 | ASN | GLY | ALA | ILE<br>LYS | SER<br>ALA | LEU<br>TYR | ASP<br>THR | GLU<br>LYS | TRP<br>SER |
| 143 | ASP | GLY | ILE | ILE<br>CYS | GLN<br>GLU | SER<br>GLU | SER<br>THR | GLU<br>PHE | ASP<br>ARG |
| 158 | VAL | CYS | ASP | ILE<br>LEU | ASP<br>ASP | GLU<br>VAL | SER<br>ASP | GLY<br>GLU | GLN<br>MET |
| 173 | THR | ARG | GLN | HIS<br>THR | LEU<br>MET | GLY<br>ASP | PHE<br>PRO | TRP<br>ALA | TYR<br>CYS |
| 188 | GLU | LYS | LEU | TYR | GLY | GLY | ALA | VAL | PRO |

wherein said peptide is capable of producing light when combined with a luciferin and contacted with calcium ions.

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**5,744,580**

**IMMUNOTOXINS COMPRISING RIBOSOME-INACTIVATING PROTEINS**

**Marc D. Better, Los Angeles; Stephen F. Carroll, Walnut Creek, and Gary M. Studnicka, Santa Monica, all of Calif., assignors to Xoma Corporation, Berkeley, Calif.**

**Continuation of Ser. No. 425,336, Apr. 18, 1995, Pat. No. 5,621,083, which is a continuation of Ser. No. 64,691, May 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 988,430, Dec. 9, 1992, Pat. No. 5,416,202, which is a continuation-in-part of Ser. No. 901,707, Jun. 19, 1992, Pat. No. 5,376,546, which is a continuation-in-part of Ser. No. 787,567, Nov. 4, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 488,113**

**Int. Cl.[6] A23J** *1/14;* **A61K** *35/78;* **C07K** *16/00;* **C12P** *21/08*

**U.S. Cl. 530—377** **36 Claims**

1. A fusion protein comprising (a) a gelonin sequence that is SEQ ID NO. 2 or SEQ ID NO. 101 and (b) a targeting sequence that allows the internalization of said fusion protein, wherein said targeting sequence is an antibody, an antigen-binding portion of an antibody, a hormone, a lymphokine or a growth factor.

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**5,744,581**

**Patent Not Issued For This Number**

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**5,744,582**

**Patent Not Issued For This Number**

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**5,744,583**

**Patent Not Issued For This Number**

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**5,744,584**

**ANTITHROMBOSIS AGENTS**

**Robert M. Scarborough, Belmont, Calif., assignor to COR Therapeutics, Inc., South San Francisco, Calif.**

**Division of Ser. No. 294,859, Aug. 29, 1994, Pat. No. 5,679,542, which is a division of Ser. No. 614,443, Nov. 16, 1990, Pat. No. 5,342,830. This application Jun. 7, 1995, Ser. No. 481,676**

**Int. Cl.[6] C07K** *16/18;* **G01N** *33/53*

**U.S. Cl. 530—388.1** **20 Claims**

1. An isolated antibody immunospecific for a snake venom platelet antiadhesive peptide, said peptide inhibiting the binding of vWF to GPIb-IX receptors, but not binding of Fg to GPIIb-IIIa receptors in purified and isolated form, obtainable from a snake venom selected from the group consisting of: *Agkistrodon acutus, Agkistrodon halys blomhoffi, Agkistrodon contortrix mokasen, Bitis arietans, Bitis caudalis, Bitis gabonica, Bitis g. rhinoceros, Bothrops asper, Bothrops alternata, Bothrops atrox, Bothrops cotiara, Bothrops jararaca, Bothrops newiedi, Bothrops medusa, Bothrops schiegli, Cerastes cerastes, Cerastes vipera, Crotalus admanteus, C atrox, C basilicus, C. durissus totonatacus,* C. h. horridus, C. m. molossus, C ruber, C. scutalatus, C. v. cereberus, C. v. helleri, C. v. lutosus, C v. oreganus, Echis carinatus sochurecki, Eristicophis macmahoni, Pseudocerastes persicus, Sistrurus m. barbouri, Sistrurus c. tergeminus, Trimeresurus flavoviridis, Trimeresurus gramineus, Vipera lebetina, Vipera ammondytes, Vipera palastinae, and Vipera r. russelli.

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**5,744,585**

**HUMAN MONOCLONAL ANTIBODY AGAINST LUNG CARCINOMA**

**Rajko D. Medenica, Once Ocean Point, Port Royal Plantation, Hilton Head Island, S.C. 29928, and Sonjoy Mukerjee, 40 Bill Fries Dr., Apt. H5, Hilton Head Island, S.C. 29926**

**Filed Mar. 16, 1995, Ser. No. 405,034**

**Int. Cl.[6] C07K** *16/30;* **G01N** *33/574;33/577*

**U.S. Cl. 530—388.15** **11 Claims**

1. A monoclonal antibody designated TB2A36C3 isolated from an Epstein-Barr virus-transformed human B-cell line designated TB94 and deposited with the American Type Culture Collection and bearing Accession Number CRL-12142, wherein the monoclonal antibody is specifically reactive against lung tumor antigens.

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**5,744,586**

**MANUFACTURING PROCESS FOR THE PRODUCTION OF PURIFIED TRANSFERRIN**

**John M. Rolf, Los Angeles; Akimasa Obmizu, Arcadia; Shawn D. Latham, Sierra Madre, and Prabir Bhattacharya, Walnut, all of Calif., assignors to Alpha Therapeutic Corporation, Los Angeles, Calif.**

**Filed Jun. 26, 1996, Ser. No. 668,351**

**Int. Cl.[6] A61K** *38/00;* **C07K** *5/00;7/00;16/00*

**U.S. Cl. 530—394** **21 Claims**

1. A method of purifying transferrin comprising the steps of

a.) concentrating a partially purified transferrin preparation;

b.) decreasing ionic strength of the transferrin preparation sufficient for subsequent adsorption of transferrin onto an ion exchange chromatographic medium;

c.) treating the transferrin preparation prior to the following step (d) with an organic compound for inactivating enveloped viruses;

d.) subjecting the preparation to an ion exchange chromatography medium, with an ionic strength sufficient to ensure that transferrin is adsorbed;

e.) eluting transferrin from the ion exchange medium of step (d);

f.) concentrating the resultant eluate; and

g.) filtering the concentrated eluate for removing virus particles to obtain a sterile transferrin preparation substantially free of enveloped and non-enveloped viruses.

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**5,744,587**

## METHOD FOR PURIFYING THROMBOPOIETIN

**Andrew R. Alaska; Jin-Jyi Chang, both of Issaquah; William Downey, Seattle; John W. Forstrom, Seattle, and Linh Phan, Seattle, all of Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.**

**Filed Jun. 7, 1995, Ser. No. 484,246**

**Int. Cl.[6] A61K** *38/24;38/27;* **C04K** *1/00;14/00*

**U.S. Cl. 530—399** **19 Claims**

1. A method for purifying human thrombopoietin (TPO) from a biological fluid comprising:

reducing the volume of a human TPO-containing biological fluid by a method selected from the group consisting of ligand affinity chromatography, ion-exchange chromatography, hydrophobic interaction chromatography and ultrafiltration to provide a concentrated fraction;

adjusting the salt concentration of the concentrated fraction to provide an adjusted solution;

acidifying the adjusted solution to precipitate contaminant proteins and provide a cleared solution;

fractionating the cleared solution by anion-exchange chromatography to provide a TPO-enriched fraction;

exposing the TPO-enriched fraction to hydroxyapatite whereby protein contaminants are bound to the hydroxyapatite and TPO remains substantially unbound;

collecting the unbound TPO; and

concentrating the collected TPO by cation-exchange chromatography or ultrafiltration.

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**5,744,588**

## BLUE TYPE DISPERSE DYE MIXTURE AND PROCESS FOR ITS PREPARATION

**Kiyoshi Himeno; Toshio Hihara, and Yousuke Takahashi, all of Kitakyushu, Japan, assignors to DyStar Japan Ltd., Osaka, Japan**

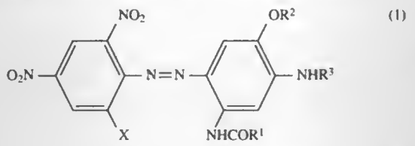
**Filed Oct. 9, 1996, Ser. No. 729,027**

**Claims priority, application Japan, Oct. 18, 1995, 7-293815**

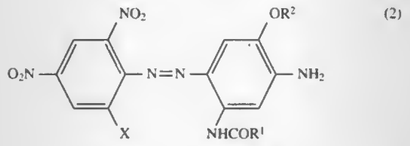
**Int. Cl.[6] C09B** *67/22;41/00*

**U.S. Cl. 534—581** **10 Claims**

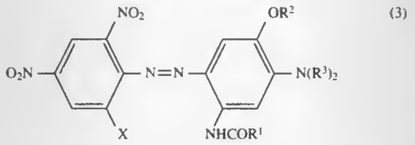
1. A blue type disperse dye mixture comprising 1.0 part by weight of at least one dye of the formula (1), from 0.05 to 0.2 part by weight of at least one dye of the formula (2), from 0.05 to 1.0 part by weight of at least one dye of the formula (3) and from 0.05 to 1.0 part by weight of at least one dye of the formula (4):



(1)

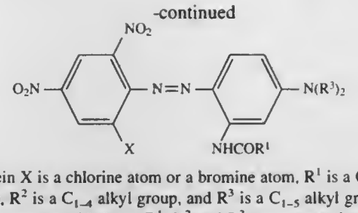


(2)



(3)

-continued



(4)

wherein X is a chlorine atom or a bromine atom, $R^1$ is a $C_{1-5}$ alkyl group, $R^2$ is a $C_{1-4}$ alkyl group, and $R^3$ is a $C_{1-5}$ alkyl group or an allyl group, provided that $R^1$, $R^2$ and $R^3$ may, respectively, be the same or different among the formulae (1) to (4).

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**5,744,589**

## DISAZO REACTIVE DYESTUFFS CONTAINING FIBER-REACTIVE RADICALS

**Horst Jäger, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Oct. 11, 1996, Ser. No. 728,925**

**Claims priority, application Germany, Oct. 20, 1995, 195 39 076.8**

**Int. Cl.[6] C09B** *62/09;62/03;* **D06P** *1/382;3/66*

**U.S. Cl. 534—634** **7 Claims**

1. An azo reactive dyestuff of the formula

$$X^1—B^1D^1—N=N—K^1—Y—K^2—N=N—D^2—B^2—X^2 \quad (1)$$

in which

$D^1$ and $D^2$ are identical or different and represent an unsubstituted or substituted benzene or naphthalene nucleus wherein the substituents are selected from the group consisting of $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, a sulfo group, or a carboxyl group;

$B^1$ and $B^2$ are identical or different and are a divalent bridge member selected from the group consisting of



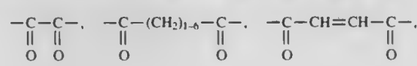


wherein

R is hydrogen, methyl or ethyl and the bond identified by the asterisk is the one linked to the $D^1$ or $D^2$ radical;

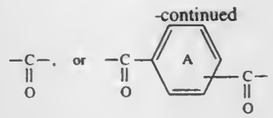
$X^1$ and $X^2$ are identical or different and represent a heterocyclic fiber-reactive radical which contains at least one reactive substituent wherein said fiber-reactive radical is selected from the group consisting of pyridine, pyrimidine, pyridazine, pyrazine, thiazine, oxazine, an asymmetric or symmetric triazine ring, quinoline, phthalazine, quinazoline, quinoxaline, acridine, phenazine and phenanthridine and the reactive substituents is selected from the group consisting of halogen, ammonium group, pyridinium group, picolinium group, carboxypyridinium group, sulfonium group, sulfonyl group, azido group, thiocynato group, thioether group, oxyether group, sulfinate group or sulfonate group;

Y represents a group selected from the group consisting of





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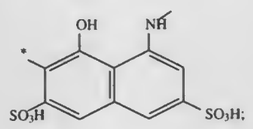


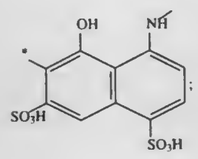
in which

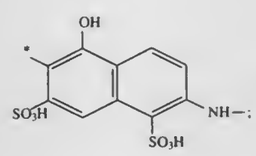
the two carbonyl groups of the benzene ring A are in the o-, m- or p-position relative to one another and the benzene ring A is unsubstituted or substituted by Cl, $CH_3$ or $OCH_3$; and

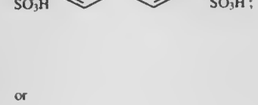
$K^1$ and $K^2$ are identical or different and

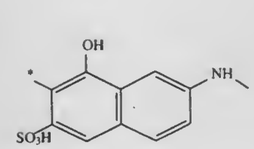
represent the following groups











or



wherein the bond identified with the asterisk is linked to the azo group.

**5,744,590**

## MONOAZO PIGMENTS

**Alan Patrick Chorlton, Stockport, and James Mason, Rochdale, both of United Kingdom, assignors to Zeneca Limited, London, England**

**PCT No. PCT/GB95/02833, § 371 Date Jul. 17, 1997, § 102(e) Date Jul. 17, 1997, PCT Pub. No. WO96/22334, PCT Pub. Date Jul. 25, 1996**

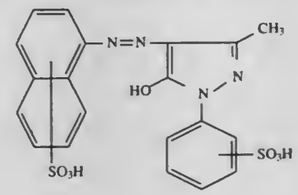
**PCT Filed Dec. 5, 1995, Ser. No. 875,071**

**Claims priority, application United Kingdom, Jan. 20, 1995, 9501089**

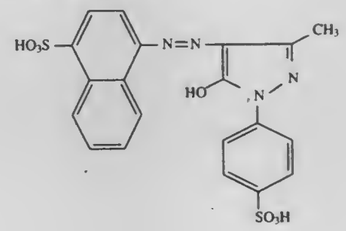
**Int. Cl.[6] C09B** *63/00;67/20*

**U.S. Cl. 534—780** **8 Claims**

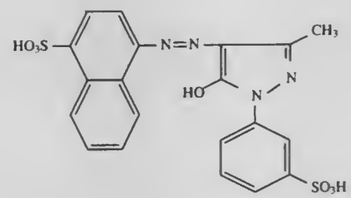
1. An azo pyrazolone compound of the formula:



in the form of a salt except for



and



in the form of their sodium and potassium salts.

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**5,744,591**

## RED DYESTUFFS

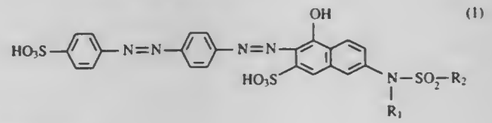
**Min-Mey Yei, Taoyuan, Talwan, assignor to Everlight USA, Inc., Pineville, N.C.**

**Filed May 27, 1997, Ser. No. 863,873**

**Int. Cl.[6] C09B** *31/08*

**U.S. Cl. 534—836** **14 Claims**

1. A dyestuff of the formula (1):



(1)

wherein:

$R_1$ is H or $C_1$–$C_4$ alkyl;

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$R_2$ is a phenyl or naphthyl group, which is unsubstituted or substituted by —Cl, —Br, —I, $—CH_3$, $—C_2H_5$, $—C_3H_7$, $—C_4H_9$—OH, $—OCH_3$, $—OC_2H_5$, $—NO_2$, $—NHCOCH_3$ or —COOH.

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**5,744,592**

## LIPID PRODRUGS FOR ORAL ADMINISTRATION

**Karl Y. Hostetler, Del Mar; Raj Kumar, San Diego, and Nagarajan C. Sridhar, Simi Valley, all of Calif., assignors to NeXstar Pharmaceuticals, Inc., Boulder, Colo.**

**Continuation of Ser. No. 355,510, Dec. 14, 1994, Pat. No. 5,484,809, which is a division of Ser. No. 991,166, Dec. 16, 1992, Pat. No. 5,411,947, which is a continuation-in-part of Ser. No. 373,088, Jun. 28, 1989, Pat. No. 5,223,263, Ser. No. 440,898, Nov. 22, 1989, Pat. No. 5,194,654, and Ser. No. 932,231, Aug. 19, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 482,431**

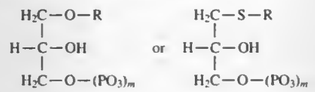
**Int. Cl.[6] C07H** *19/00;* **A01N** *13/04;* **A61K** *31/70*

**U.S. Cl. 536—22.1** **12 Claims**

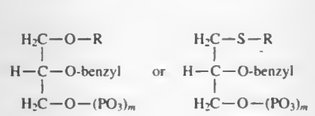
**1**. A method of improving the pharacokinetic properties of an orally administered drug, the improvement comprising:

providing an oral drug for which efficacy is limited by the metabolic clearance rate;

covalently linking a lipid of the formula



or



wherein

R is a straight or branched, saturated or unsaturated, or cyclic $C_1$ to $C_{24}$ alkyl group covalently linked to the glycerol moiety in an ester, thioester, ether, thioether or vinyl ether linkage,

to an available functional group of said drug either directly through a mono-, di- or triphosphate ester bond or indirectly through a bifunctional linker molecule, L, of the formula $X—(CH_2)_n—Y$, wherein X and Y are functional groups independently selected from the group consisting of hydroxyl, sulfhydryl, carboxyl and amine groups;

n=1 to 24; and

m=1 to 3.

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**5,744,593**

## PARASITIC HELMINTH LARVAL THIOL SPECIFIC ANTIOXIDANT PROTEINS AND NUCLEIC ACID MOLECULES

**Laura Klimowski, and Cynthia Ann Tripp, both of Ft. Collins, Colo., assignors to Heska Corporation, Ft. Collins, Colo.**

**Filed Feb. 15, 1996, Ser. No. 602,262**

**Int. Cl.[6] C07H** *21/04;* **C12N** *15/00;15/36;* **C12P** *21/02*

**U.S. Cl. 536—23.1** **15 Claims**

**1**. An isolated nucleic acid molecule comprising a nucleic acid sequence that encodes a parasitic helminth third specific antioxidant (TSA) protein, wherein said protein comprises an amino acid sequence that is at least about 80% identical to SEQ ID NO:2.

**5,744,594**

## DNA ENCODING ATP-SENSITIVE POTASSIUM CHANNEL GENES

**John P. Adelman; Michael J. Ashford, and Chris T. Bond, all of Portland, Oreg., assignors to Oregon Health Sciences University, Portland, Oreg.**

**Continuation-in-part of Ser. No. 288,510, Aug. 10, 1994, which is a continuation-in-part of Ser. No. 193,372, Feb. 8, 1994, abandoned. This application Feb. 7, 1995, Ser. No. 385,186**

**Int. Cl.[6] C07H** *21/02;21/04*

**U.S. Cl. 536—23.2** **9 Claims**

**1**. An isolated nucleic acid encoding an ATP-sensitive potassium channel protein comprising the amino acid sequence depicted by Seq. ID No. 2.

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**5,744,595**

## PROPARGYL MODIFIED NUCLEOSIDES AND NUCLEOTIDES

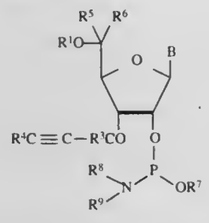
**Suresh C. Srivastava, Burlington, and Syed Kazim Raza, Waltham, both of Mass., assignors to ChemGenes Corporation, Waltham, Mass.**

**Continuation-in-part of Ser. No. 176,481, Dec. 30, 1993, abandoned. This application Jul. 25, 1995, Ser. No. 520,968**

**Int. Cl.[6] C07H** *19/67;19/10;19/167;19/20*

**U.S. Cl. 536—26.23** **8 Claims**

**1**. A compound having the formula



wherein B represents the DNA or RNA bases, Adenine, Guanine or Cytosine, each optionally protected with a protecting group, or Thymine or Uracil; $R^1$ represents H, monomethoxytrityl, dimethoxytrityl, trimethoxytrityl, tetrahydropyranyl, a chromophore, a ligand, monophosphate, diphosphate or triphosphate;

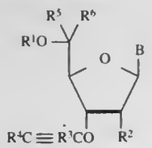
$R^2$ represents H; OH; OH-protected with silyl, tetrahydropyranyl, $—OCOCH_2CH_2COOH$, or another removable group capable of anchoring on solid supports and amenable to solid phase DNA or RNA synthesis; or OH-protected with $CH_3$, $C_2H_5$ or another unremovable group;

$R^3$, $R^4$, $R^5$ and $R^6$ each represent H; or alkyl, aryl or hydrocarbonyl radical, each with optional electron attracting or electron donating substituent groups;

$R^7$ represents alkyl, cyanoethyl, or another phosphate protecting group; and

$R^8$ and $R^9$ each represent alkyl or together form a cyclic structure.

**3**. A compound having the formula



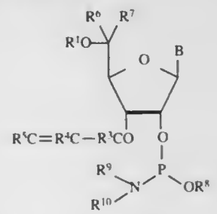
wherein B represents the DNA or RNA bases, Adenine, Guanine or Cytosine, each optionally protected with a protecting group, or Thymine or Uracil; $R^1$ represents H, monomethoxytrityl, dimethoxytrityl, trimethoxytrityl, tetrahydropyranyl, a chromophore, a ligand, monophosphate, diphosphate or triphosphate;



$R^2$ represents H; OH; OH-protected with silyl, tetrahydropyranyl, $—OCOCH_2CH_2COOH$, or another removable group capable of anchoring on solid supports and amenable to solid phase DNA or RNA synthesis; or OH-protected with $CH_3$, $C_2H_5$ or another unremovable group; and

$R^3$, $R^4$, $R^5$ and $R^6$ each represent H; or alkyl, aryl or hydrocarbonyl radical, each with optional electron attracting or electron donating substituent groups.

**5**. A compound having the formula



wherein B represents N-benzoyl adenine or N-isobutyryl guanine;

$R^1$ represents monomethoxytrityl, dimethoxytrityl, trimethoxytrityl, tetrahydropyranyl, a chromophore, a ligand, monophosphate, diphosphate or triphosphate;

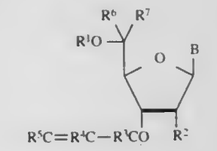
$R^2$ represents H, OH or OH-protected with silyl, tetrahydropyranyl or another removable group;

$R^3$, $R^4$, $R^5$, $R^6$ and $R^7$ each represent H; or alkyl, aryl, or hydrocarbonyl radicals, each with optional electron attracting or electron donating substituent groups;

$R^8$ represents alkyl, cyanoethyl, or another phosphate protecting group; and

$R^9$ and $R^{10}$ each represent alkyl or together form a cyclic system.

**7**. A compound having the formula



wherein B represents N-benzoyl adenine or N-isobubyryl guanine;

$R^1$ represents monomethoxytrityl, dimethoxytrityl, trimethoxytriiyl, tetrahydropyranyl, a chromophore, a ligand, monophosphate, diphosphate or triphosphate;

$R^2$ represents H, OH or OH-protected with silyl, tetrahydropyranyl or another removable group; and

$R^3$, $R^4$, $R^5$, $R^6$ and $R^7$ each represent H; or alkyl, aryl, or hydrocarbonyl radicals, each with optional electron attracting or electron donating substituent groups.

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**5,744,596**

## NUCLEOSIDE ANALOGUES AND SYNTHETIC INTERMEDIATES

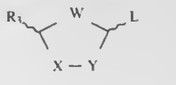
**Tarek Mansour, Montreal, and Allan H. L. Tse, St. Laurent, both of Canada, assignors to Biochem Pharma Inc., Laval, Canada**

**Division of Ser. No. 142,389, May 13, 1994, which is a continuation-in-part of Ser. No. 703,379, May 21, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 464,960**

**Int. Cl.[6] C07H** *19/00*

**U.S. Cl. 536—27.11** **5 Claims**

**1**. An intermediate of formula (II):



(II)

wherein W is O, S, S=O, $SO_2$, NZ, or $CH_2$;

X is O, S, S=O, $SO_2$, NZ, $CH_2$, CHF, CH, $CHN_3$, or CHOH;

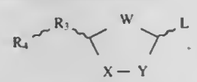
Y is O, S, $CH_2$, CH, CHF, or CHOH;

Z is hydrogen, hydroxyl, alkyl or acyl; provided that when Y is $CH_2$ and X is O, S, S=O, or $SO_2$, W is not O, S, S=O or $SO_2$;

$R_3$ is a substituted carbonyl or carbonyl derivative, wherein the carbonyl functionality is directly attached to the ring;

L is a leaving group; and provided that when W is oxygen, X is $CH_2$, Y is $CH_2$ and L is hydroxy, methoxy, ethoxy, propoxy or n-butoxy then $R_3$ is not ethoxycarbonyl; and provided that when W is $CH_2$, X is CH, Y is CH and $R_3$ is COOMe, then L is not —NHAc.

**2**. An intermediate of formula (VI)



(VI)

wherein W is O, S, S=O, $SO_2$, NZ, or $CH_2$;

X is O, S, S=O, $SO_2$, NZ, $CH_2$, CHF, CH, $CHN_3$, or CHOH;

Y is O, S, $CH_2$, CH, CHF, or CHOH; and

Z is hydrogen, hydroxyl, alkyl or acyl;

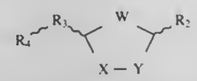
provided that when Y is $CH_2$ and X is O, S, S=O, or $SO_2$, W is not O, S, S=O or $SO_2$;

$R_3$ is a substituted carbonyl or carbonyl derivative, wherein the carbonyl functionality is directly attached to the ring;

$R_4$ is a chiral auxiliary; and

L is a leaving group.

**3**. An intermediate of formula (VII)



(VII)

wherein W is O, S, S=O, $SO_2$, NZ, or $CH_2$;

X is O, S, S=O, $SO_2$, NZ, $CH_2$, CHF, CH, $CHN_3$, or CHOH;

Y is O, S, $CH_2$, CH, CHF, or CHOH; and

Z is hydrogen, hydroxyl, alkyl or acyl;

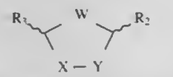
provided that when Y is $CH_2$ and X is O, S, S=O, or $SO_2$, W is not O, S, S=O or $SO_2$;

$R_2$ is a purine or pyrimidine base found in naturally occurring nucleosides or a derivative thereof, or an analogue of a purine or a pyrimidine base found in naturally occurring nucleosides or a derivative thereof;

$R_3$ is a substituted carbonyl or carbonyl derivative, wherein the carbonyl functionality is directly attached to the ring; and

$R_4$ is a chiral auxiliary.

**4**. An intermediate of formula (VIII)



(VIII)

wherein W is O, S, S=O, $SO_2$, NZ, or $CH_2$;

X is O, S, S=O, $SO_2$, NZ, $CH_2$, CHF, CH, $CHN_3$, or CHOH;

Y is O, S, $CH_2$, CH, CHF, or CHOH; and

Z is hydrogen, hydroxyl, alkyl or acyl; provided that when Y is $CH_2$ and X is O, S, S=O, or $SO_2$, W is not O, S, S=O or $SO_2$;

$R_2$ is a purine or pyrimidine base found in naturally occurring nucleosides or a derivative thereof, or an analogue of a purine or a pyrimidine base found in naturally occurring nucleosides or a derivative thereof; and

$R_3$ is a substituted carbonyl or carbonyl derivative, wherein the carbonyl functionality is directly attached to the ring; provided that when W is oxygen, X is $CHN_3$, Y is CHOH, and $R_2$ is 6-benzoylamino-9H-purin-9-yl, then $R_3$ is not COOH or COOMe.

**5**. An intermediate selected from the group consisting of:

cis and trans-2R-carboethoxy-5-hydroxytetrahydrofuran;

cis and trans-2S-carboethoxy-5-hydroxytetrahydrofuran;

cis and trans-2R-carboethoxy-5-acetoxytetrahydrofuran;

cis and trans-2S-carboethoxy-5-acetoxytetrahydrofuran;

1'S-(N-4-acetylcytosin-1-yl)-4'R-carbo-ethoxytetrahydrofuran;

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1'S-(cytosin-1-yl)-4'R-carboethoxytetrahydrofuran;
1'R-(5-fluorocytosin-1-yl)-4'S-carboethoxytetrahydrofuran and 1'S-(5-fluorocytosin-1-yl)-4'S-carboethoxytetrahydrofuran; and
1'S-(5-fluorocytosin-1-yl)-4'R-carboethoxytetrahydrofuran and 1'R-(5-fluorocytosin-1-yl)-4'R-carboethoxytetrahydrofuran.

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**5,744,597**

## STEREOSELECTIVE ANION GLYCOSYLATION PROCESS FOR PREPARING 2'-DEOXY-2',2'-DIFLUORONUCLEOSIDES AND 2'-DEOXY-2'-FLUORONUCLEOSIDES

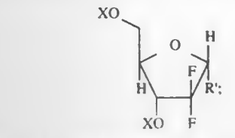
**Ta-Sen Chou; Cora S. Grossman; Larry Wayne Hertel; Richard E. Holmes; Charles D. Jones, and Thomas E. Mabry, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Division of Ser. No. 44,315, Apr. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 902,135, Jun. 22, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 459,573**

**Int. Cl.**[6] **C07H** *1/00;19/073;19/173*

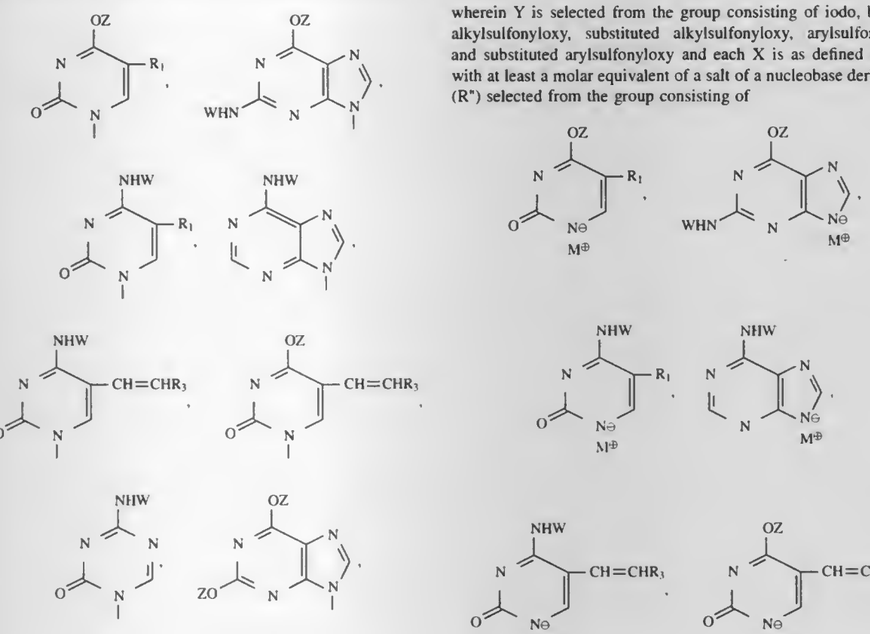
**U.S. Cl. 536—55.3** **14 Claims**

1. A stereoselective anion glycosylation process for preparing an alpha-anomer enriched nucleoside of the formula

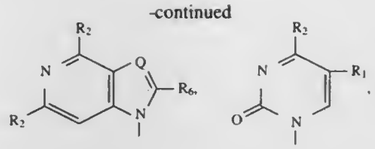


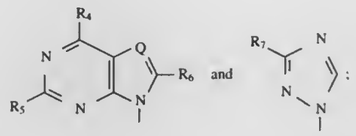
(IA)

wherein each X is independently selected from hydroxy protecting groups and R' is a nucleobase selected from the group consisting of



-continued





and



wherein $R_f$ is selected from the group consisting of hydrogen, alkyl, substituted alkyl and halo; $R_2$ is selected from the group consisting of hydroxy, halo, azido, primary amino and secondary amino; $R_3$ is selected from the group consisting of hydrogen, alkyl and halo; $R_4$, $R_5$ and $R_6$ are independently selected from the group consisting of hydrogen, —OZ, —NHW, N(alkyl)W, halo, alkoxy and thioalkyl; $R_7$ is selected from the group consisting of hydrogen, halo, cyano, alkyl, alkoxy, carboalkoxy, thioalkyl, thiocarboxamido and carboxamido; Q is selected from the group consisting of CH, $CR_8$ and N; wherein $R_8$ is selected from the group consisting of halo, carboxamido, thiocarboxamido, alkoxycarbonyl and nitrile; Z is a hydroxy protecting group and W is an amino protecting group; comprising reacting a beta-anomer enriched 2,2-difluorocarbohydrate of the formula



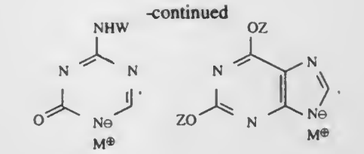
(IIB)

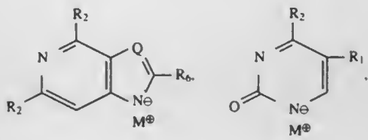
wherein Y is selected from the group consisting of iodo, bromo, alkylsulfonyloxy, substituted alkylsulfonyloxy, arylsulfonyloxy and substituted arylsulfonyloxy and each X is as defined above; with at least a molar equivalent of a salt of a nucleobase derivative (R") selected from the group consisting of





-continued





and



wherein $R_1$ through $R_7$, Q, Z and W are as defined above and $M^+$ is a cation; in an inert solvent.

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**5,744,598**

## IMINES OF PORPHYRINS, OF PORPHYRIN DERIVATIVES, AND OF RELATED COMPOUNDS, AND PHARMACEUTICAL COMPOSITIONS CONTAINING SUCH IMINES

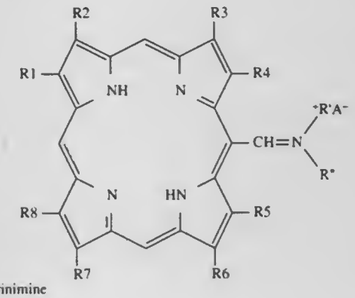
**Dimitris Skalkos, Loannilla, Greece; Steven H. Selman, Toledo; James A. Hampton, Waterville, both of Ohio, and Alan R. Morgan, Santa Barbara, Calif., assignors to University of Toledo, and Medical College of Ohio, both of Toledo, Ohio**

**Continuation-in-part of Ser. No. 375,629. Jan. 19, 1995, Pat. No. 5,512,559, and a continuation of Ser. No. 158,020, Nov. 24, 1993, Pat. No. 5,424,305, which is a continuation of Ser. No. 901,597, Jun. 19, 1992, abandoned. This application Apr. 29, 1996, Ser. No. 639,612**

**Int. Cl.**[6] **C07D** *487/22;* **A61K** *31/40*

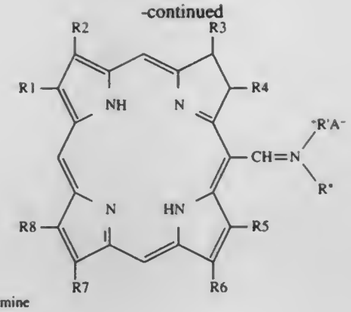
**U.S. Cl. 540—472** **36 Claims**

1. As a composition of matter, an imine of a porphyrin, a chlorin, a bacteriochlorin, a chlorophyll, a bacteriochlorophyll, a purpurin, a reduced purpurin, a verdin, a Diels Alder adduct, an isobacteriochlorin, a benzochlorin or a metal complex of one of the foregoing imines, said imine having been purified to the extent necessary to make it suitable for intravenous administration and having one of the structures set forth below, and identified by legend:

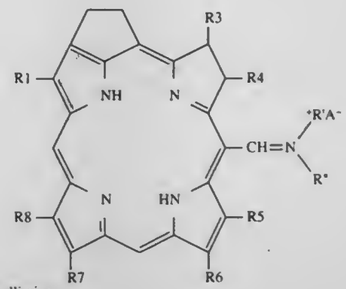


Porphyrinimine

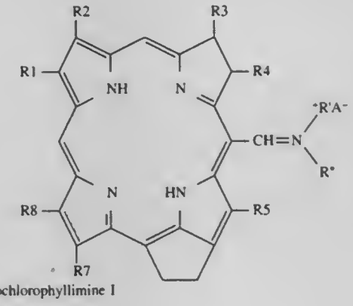
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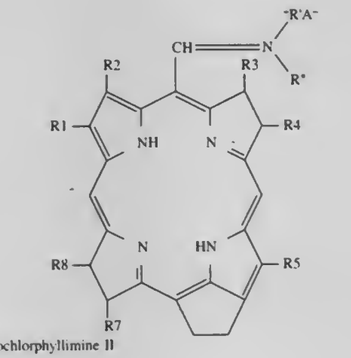
Chlorinimine



Chlorophyllimine



Bacteriochlorophyllimine I

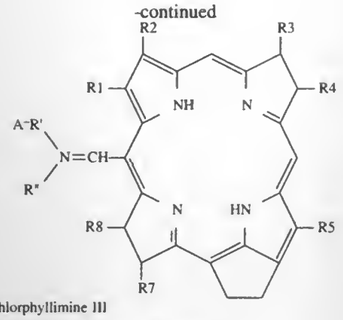


Bacteriochlorphyllimine II

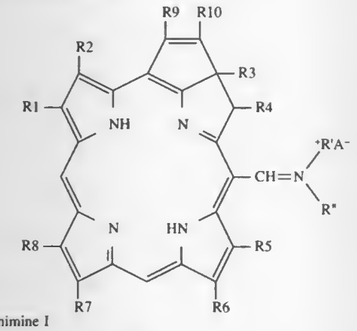
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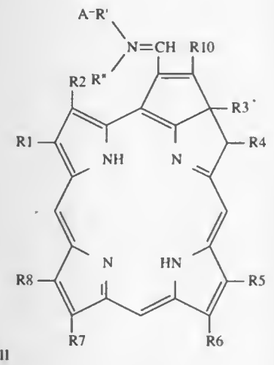
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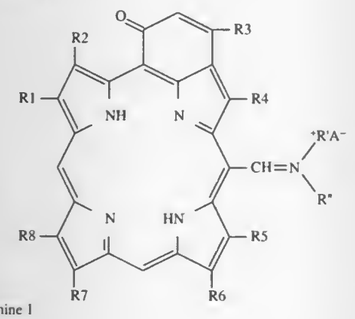
Bacteriochlorphyllimine III



Purpurinimine I

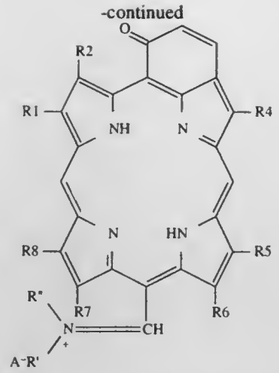


Purpurinimine II

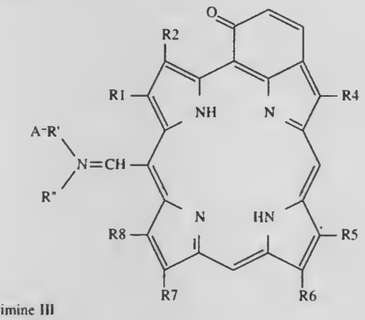


Verdinimine I

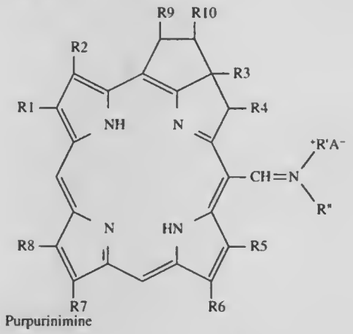
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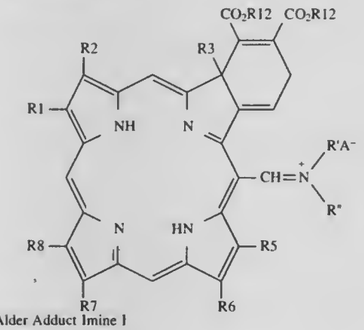
Verdinimine II



Verdinimine III



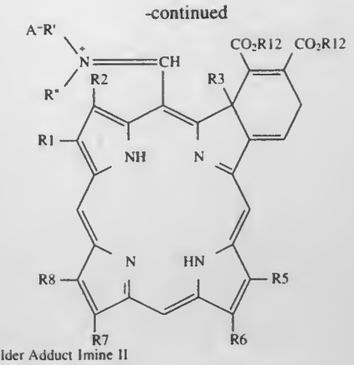
Reduced Purpurinimine



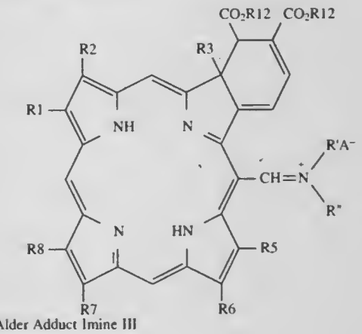
Diels Alder Adduct Imine I



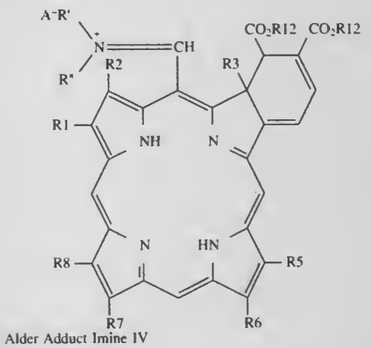
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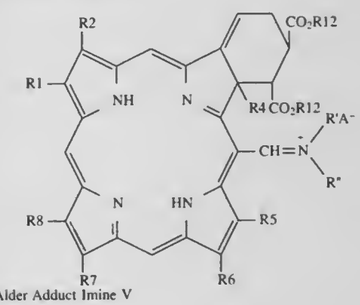
Diels Alder Adduct Imine II



Diels Alder Adduct Imine III

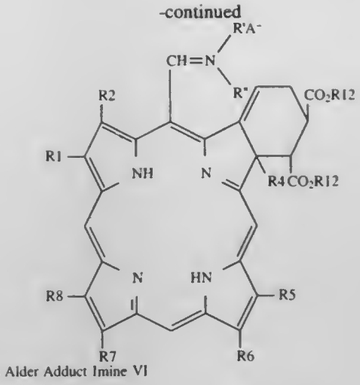


Diels Alder Adduct Imine IV

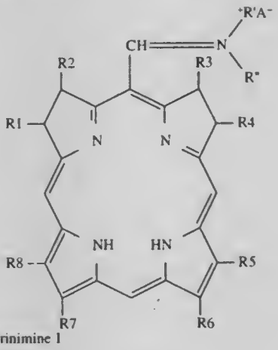


Diels Alder Adduct Imine V

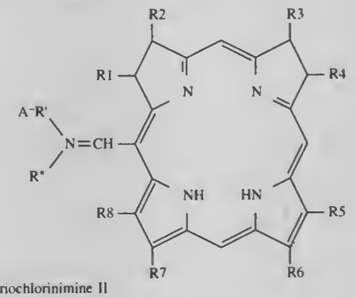
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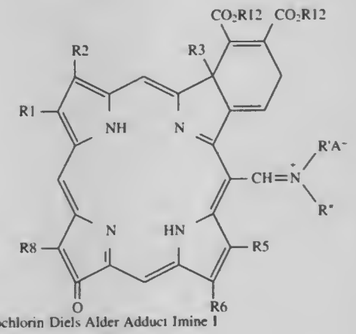
Diels Alder Adduct Imine VI



Isobacteriochlorinimine I



Isobacteriochlorinimine II

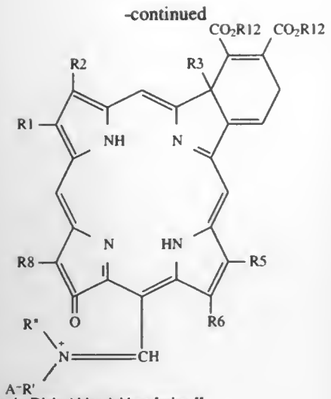


Bacteriochlorin Diels Alder Adduct Imine I

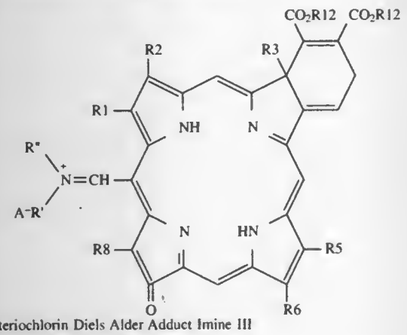
VOL 1209 ISS 4 AP 28 1998 UMI



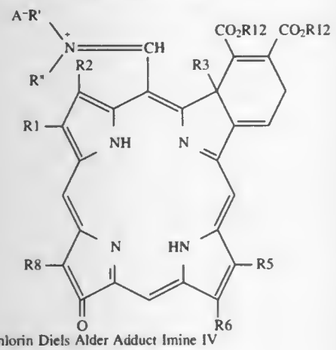
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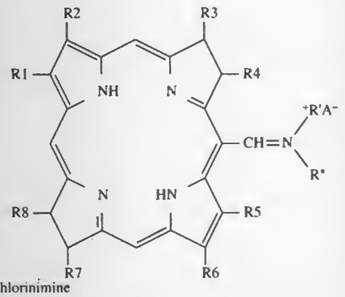
Bacteriochlorin Diels Alder Adduct Imine II



Bacteriochlorin Diels Alder Adduct Imine III

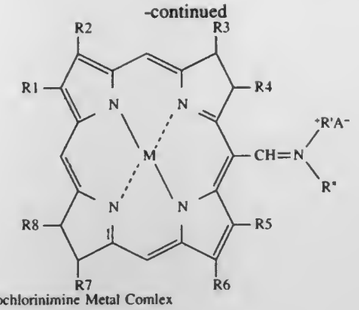


Bacteriochlorin Diels Alder Adduct Imine IV

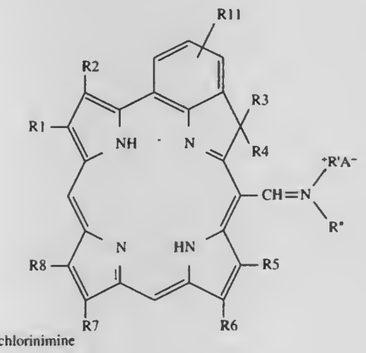


Bacteriochlorinimine

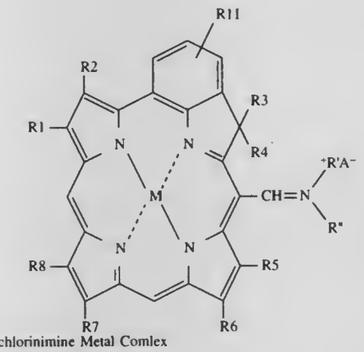
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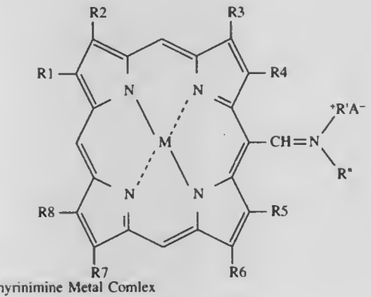
Bacteriochlorinimine Metal Comlex



Benzochlorinimine



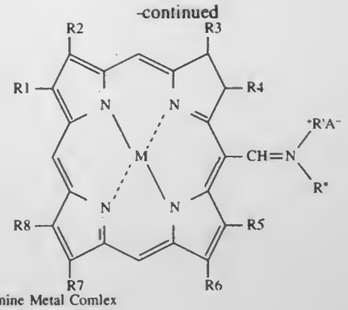
Benzochlorinimine Metal Comlex



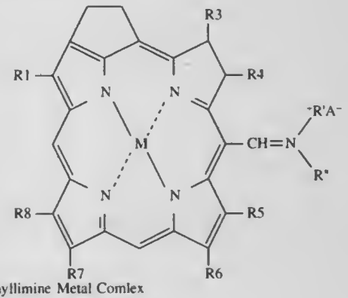
Porphyrinimine Metal Comlex



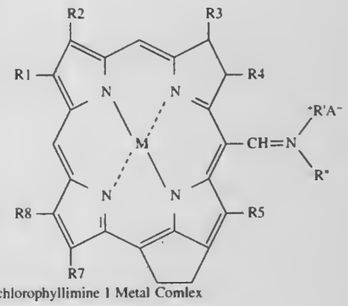
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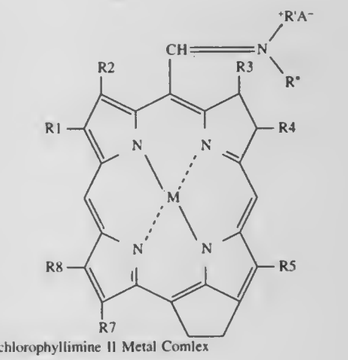
Chlorinimine Metal Comlex



Chlorophyllimine Metal Comlex

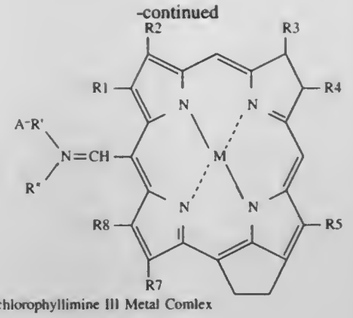


Bacteriochlorophyllimine I Metal Comlex

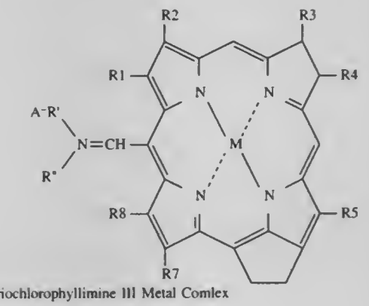


Bacteriochlorophyllimine II Metal Comlex

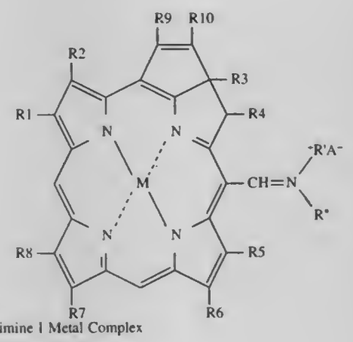
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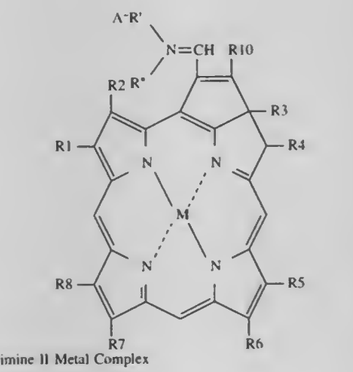
Bacteriochlorophyllimine III Metal Comlex



Bacteriochlorophyllimine III Metal Comlex



Purpurinimine I Metal Complex

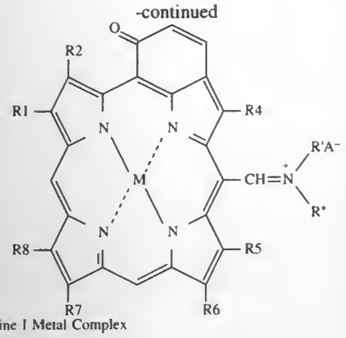


Purpurinimine II Metal Complex

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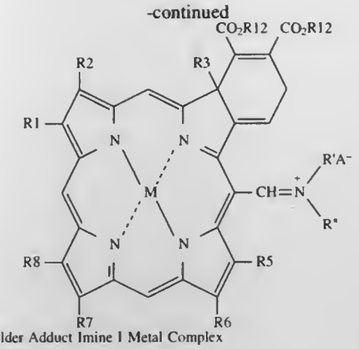


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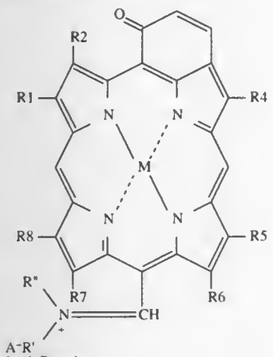


Verdinimine I Metal Complex

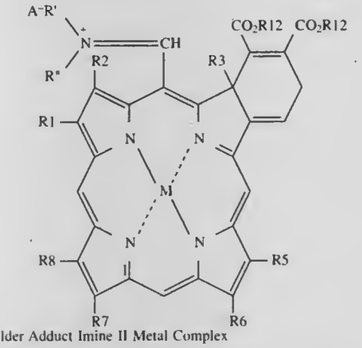
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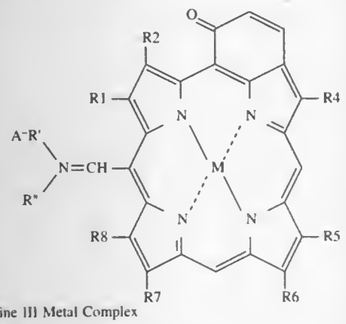
Diels Alder Adduct Imine I Metal Complex



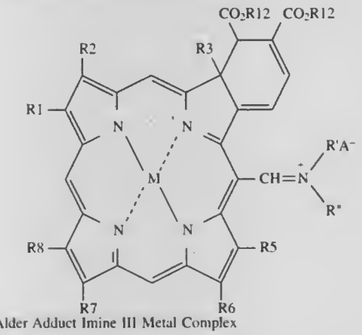
Verdinimine II Metal Complex



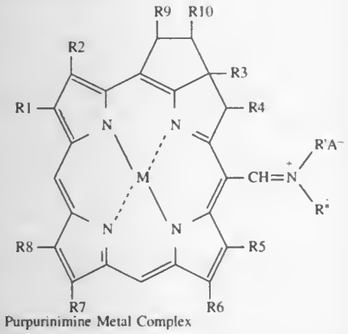
Diels Alder Adduct Imine II Metal Complex



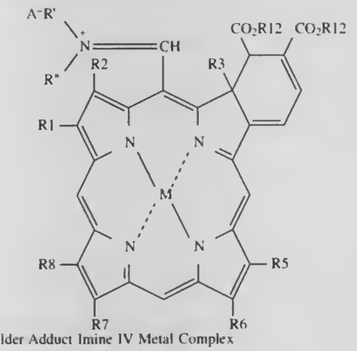
Verdinimine III Metal Complex



Diels Alder Adduct Imine III Metal Complex



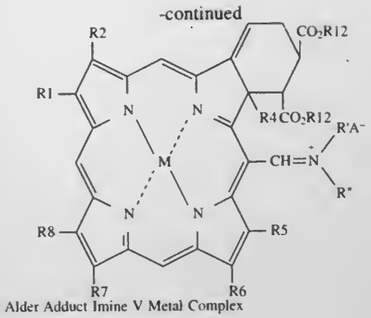
Reduced Purpurinimine Metal Complex



Diels Alder Adduct Imine IV Metal Complex

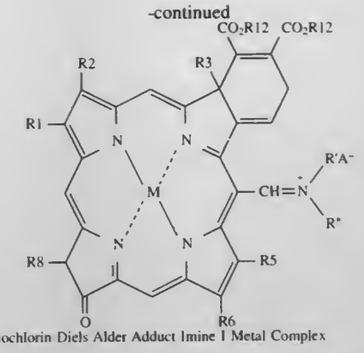


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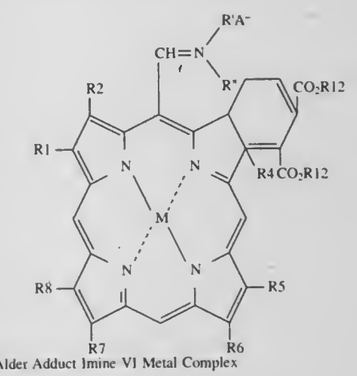


Diels Alder Adduct Imine V Metal Complex

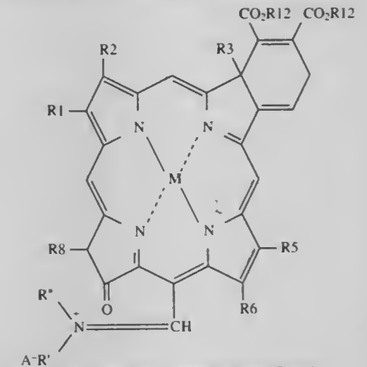
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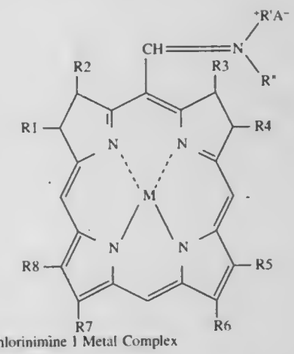
Bacteriochlorin Diels Alder Adduct Imine I Metal Complex



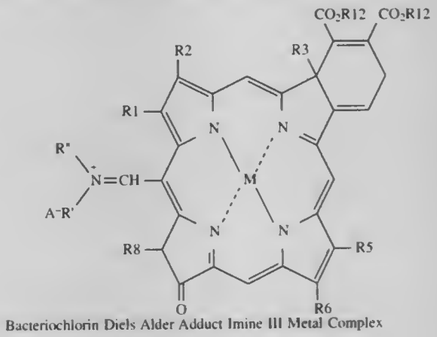
Diels Alder Adduct Imine VI Metal Complex



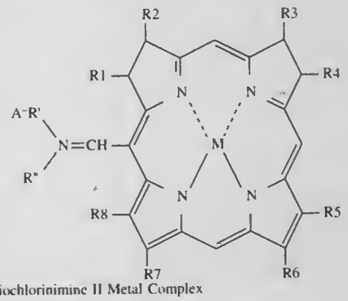
Bacteriochlorin Diels Alder Adduct Imine II Metal Complex



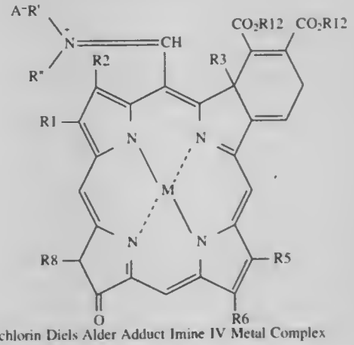
Isobacteriochlorinimine I Metal Complex



Bacteriochlorin Diels Alder Adduct Imine III Metal Complex



Isobacteriochlorinimine II Metal Complex



Bacteriochlorin Diels Alder Adduct Imine IV Metal Complex

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wherein

M comprises a metal cation that is complexed with two of the nitrogens of the benzochlorin and is Ag, Al, Ce, Co, Cr, Cu, Dy, Er, Eu, Fe, Ga, Gd, Hf, Ho, In, La, Lu, Mn, Mo, Nd, Ni, Pb, Pd, Pr, Pt, Rh, Sb, Sc, Sm, Sn, Tb, $^{99m}$Tc, Th, Ti, Tl, Tm, U, V, Y, Yb, Zn or Zr,

A is a physiologically acceptable anion,

R' and R" can be the same or different, and each is an alkyl group having from one to four carbon atoms, or each can be a CH2 group which is bonded to the nitrogen atom, and the two of which are a part of an aliphatic hydrocarbon chain having from 4 to 6 carbon atoms,

R12 is an alkyl group other than t-butyl having from 1 to 4 carbon atoms, and

each of R1 through R11 is H or CHO,

an alkyl group other than t-butyl having from 1 to 4 carbon atoms,

an alkylene group having from 2 to 4 carbon atoms,

a group having the formula $R_3N(R_4)_2$ where $R_3$ is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond; $R_4$ is hydrogen or an alkyl radical having from 1 to 2 carbon atoms and the two $R_4$ groups can be the same or different,

a group having the formula $R_3N(R_5)_3$ A where $R_3$ is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond; A is a physiologically acceptable anion and $R_5$ is an alkyl group having from 1 to 2 carbon atoms and the three $R_5$ groups can be the same or different,

a group having the formula $R_3OH$ where $R_3$ is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond, or

$CO_2R'$, $CH_2CO_2R'$ or $CH_2CH_2CO_2R'$ where R' is H, or an alkyl group other than t-butyl having from one to four carbon atoms,

with the provisos that R11 can be $SO_3H$ or a salt thereof,

that, in the foregoing chlorinimimes and metal complexes, either R3 or R4 can be a $CH_2$ group or O which, in either case, is bonded to the carbon of the pyrrole ring by a double bond,

that, in the foregoing families of compounds which are designated Isobacteriochlorinimine I and Isobacteriochlorinimine II and their metal complexes, either R1 or R2 can be a $CH_2$ group or O which, in either case, is bonded to the carbon of the pyrrole ring by a double bond and, when either R1 or R2 is a $CH_2$ group or O, either R3 or R4 is also a $CH_2$ group or O which is bonded to the carbon of the pyrrole ring by a double bond, and

that, in the foregoing families of compounds which are designated bacteriochlorinimines and metal complexes, either R3 or R4 can be a $CH_2$ group or O which, in either case, is bonded to the carbon of the pyrrole ring by a double bond and, when either R3 or R4 is a $CH_2$ group or O, either R7 or R8 is also a $CH_2$ group or O which is bonded to the carbon of the pyrrole ring by a double bond.

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**5,744,599**

## TRIAZINYLDIAMINOSTILBENE COMPOUNDS USEFUL AS ULTRAVIOLET ABSORBERS AND AS FLUORESCENT WHITENING AGENTS

**Dieter Reinehr, Kandern, Germany; Claude Eckhardt, Riedisheim, France; Robert Hochberg, Freiburg, Germany; Werner Kaufmann, Rheinfelden, Switzerland, and Georges Metzger, Moernach, France, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.**

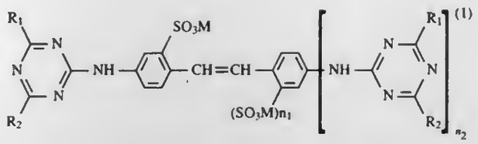
**Filed Feb. 21, 1996, Ser. No. 604,536**

**Claims priority, application United Kingdom, Feb. 22, 1995, 9503474**

**Int. Cl.$^6$ C07D** *251/00*

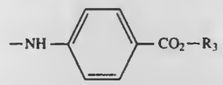
**U.S. Cl. 544—193.1** **19 Claims**

1. A compound having the formula:

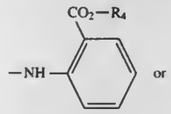


(1)

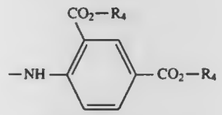
in which M is hydrogen, an alkali metal cation, ammonium or a cation formed from an amine; $R_1$ is a group having one of the formulae:



in which $R_3$ is unsubstituted alkyl or alkyl substituted by one or more halogen, $C_1$–$C_4$-alkoxy, phenyl, carboxyl, $C_1$–$C_4$-alkoxycarbonyl, mono- or di-$C_1$–$C_4$alkylated amino or —$SO_3M$ groups or unsubstituted aryl or aryl substituted by one or more $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, $C_2$–$C_5$-alkanoylamino, nitro, sulpho or di-$C_1$–$C_4$alkylated amino groups;



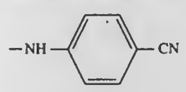
or



in which $R_4$ is M, unsubstituted alkyl or alkyl substituted by one or more halogen, $C_1$–$C_4$-alkoxy, phenyl, carboxyl, $C_1$–$C_4$-alkoxycarbonyl, mono- or di-$C_1$–$C_4$alkylated amino or —$SO_3M$ groups or unsubstituted aryl or aryl substituted by one or more $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, $C_2$–$C_5$-alkanoylamino, nitro, sulpho or di-$C_1$–$C_4$alkylated amino groups

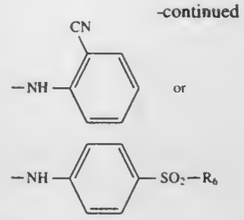


in which $R_5$ is hydrogen, unsubstituted alkyl or alkyl substituted by one or more halogen, $C_1$–$C_4$-alkoxy, phenyl, carboxyl, $C_1$–$C_4$-alkoxycarbonyl, mono- or di-$C_1$–$C_4$alkylated amino or —$SO_3M$ groups or unsubstituted aryl or aryl substituted by one or more $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, $C_2$–$C_5$-alkanoylamino, nitro, sulpho or di-$C_1$–$C_4$alkylated amino groups or —$NR_7R_8$ in which $R_7$ and $R_8$, independently, are hydrogen, unsubstituted alkyl or alkyl substituted by one or more halogen, $C_1$–$C_4$-alkoxy, phenyl, carboxyl, $C_1$–$C_4$-alkoxycarbonyl, mono- or di-$C_1$–$C_4$alkylated amino or —$SO_3M$ groups or unsubstituted aryl or aryl substituted by one or more $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, $C_2$–$C_5$-alkanoylamino, nitro, sulpho or di-$C_1$–$C_4$alkylated amino groups, or $R_7$ and $R_8$, together with the nitrogen atom to which they are attached, form a morpholine or piperidine ring;





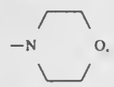
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or



in which $R_5$ is hydrogen, unsubstituted alkyl or alkyl substituted by one or more halogen, $C_1$–$C_4$-alkoxy, phenyl, carboxyl, $C_1$–$C_4$-alkoxycarbonyl, mono- or di-$C_1$–$C_4$alkylated amino or —$SO_3M$ groups or unsubstituted aryl or aryl substituted by one or more $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, $C_2$–$C_5$-alkanoylamino, nitro, sulpho or di-$C_1$–$C_4$alkylated amino groups, provided that $R_5$ is not carboxymethyl or hydroxymethyl; $R_2$ is hydrogen, unsubstituted alkyl or alkyl substituted by one or more halogen, $C_1$–$C_4$-alkoxy, phenyl, carboxyl, $C_1$–$C_4$-alkoxycarbonyl, mono- or di-$C_1$–$C_4$alkylated amino or —$SO_3M$ groups or unsubstituted aryl or aryl substituted by one or more $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, $C_2$–$C_5$-alkanoylamino, nitro, sulpho or di-$C_1$–$C_4$alkylated amino groups,



—OH,—$NH_2$,—$N(CH_2CH_2OH)_2$, —$N[CH_2CH(OH)CH_3]_2$,—NH—$R_4$,—$N(R_4)_2$ or —$OR_4$, in which $R_4$ has its previous significance; and $n_1$ and $n_2$, independently, are 0 or 1, provided that the compounds in which $n_1$ and $n_2$ are each 1, $R_1$ is



or



in which $R_3$ or $R_4$ is unsubstituted alkyl and $R_2$ is —$OR_4$ in which $R_4$ is naphthyl are excluded.

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**5,744,600**

## PHOSPHONOMETHOXY CARBOCYCLIC NUCLEOSIDES AND NUCLEOTIDES

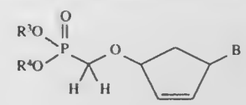
**Muzammil M. Mansuri, Cheshire, Conn.; John C. Martin, San Carlos, Calif.; Thomas W. Hudyma, Durham, Conn.; Joanne J. Bronson, Madison, Conn., and Louis M. Ferrara, Meriden, Conn., assignors to Institute of Organic Chemistry and Biochemistry of the Academy of Sciences of the Czech Republic, Czech Rep., and Rega Stichting v.z.w., Belgium**

**Continuation of Ser. No. 110,841, Aug. 24, 1993, abandoned, which is a continuation of Ser. No. 785,645, Oct. 31, 1991, abandoned, which is a continuation-in-part of Ser. No. 617,489, Nov. 23, 1990, abandoned, and a continuation of Ser. No. 270,331, Nov. 14, 1988, abandoned. This application Dec. 16, 1994, Ser. No. 357,561**

**Int. Cl.$^6$ A61K** *31/675;* **C07F** *9/6561;* **C07D** *473/18;473/34*

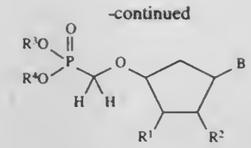
**U.S. Cl. 544—243** **14 Claims**

1. A compound of the Formula I or Formula II



I

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II

wherein

$R^1$ and $R^2$ are independently hydrogen, hydroxy, chlorine, fluorine, bromine, or an organic substituent having 1 to 5 carbon atoms and selected from acyloxy having a hydrocarbon stem of 1 to 4 carbon atoms, alkoxy, alkylthio, amino alkylamino and dialkylamino;

$R^3$ and $R^4$ are independently hydrogen, or organic phosphonic ester substituents having 1 to 12 carbon atoms and selected from alkyl, alkenyl, aryl, and aralkyl; and

B is a heterocyclic group selected from the group consisting of pyrimidine, purine, triazine, deazapurine, and triazole, attached through a ring nitrogen atom thereof optionally substituted with 1 to 3 substituents selected from the group consisting of hydroxy, mercapto, amino, hydrazino, fluoro, chloro, bromo, iodo, $C_1$ to $C_3$ alkyl, C2–C3 alkenyl, C2–C3 haloalkenyl, C1–C3 alkoxy, and C1–C3 alkylthio;

and the pharmaceutically acceptable acid addition, metal, and amine salts thereof.

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**5,744,601**

## N-(2-AMINO-4, 6-DICHLOPYRIMIDINE-5-YL) FORMANIDE, AND A PROCESS FOR ITS PREPARATION

**Gerhard Stucky, and René Imwinkelried, both of Brig-Glis, Switzerland, assignors to Lonza AG, Basel, Switzerland**

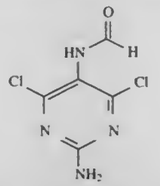
**Division of Ser. No. 693,520, Aug. 8, 1996, Pat. No. 5,663,340, which is a division of Ser. No. 428,916, Apr. 25, 1995, Pat. No. 5,583,226. This application May 12, 1997, Ser. No. 854,378**

**Claims priority, application Switzerland, Apr. 27, 1994, 01 299/94**

**Int. Cl.$^6$ C07D** *239/48*

**U.S. Cl. 544—330** **8 Claims**

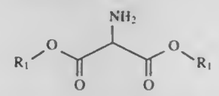
1. A process for making N-(2-amino-4,6-dichloropyrimidine-5-yl)formamide of the formula



I

the process comprising:

(a) in a volume comprising at least one aminomalonic ester of the formula

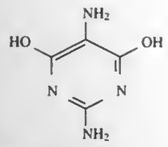


II

where $R_1$, is one of a $C_1$–$C_6$-alkyl group and its salt, cyclizing the aminomalonic ester with at least one of guanidine and its salt in the presence of a base, to produce an intermediate comprising at least one of 2,5-diamino-4,6-dihydroxypyrimidine of the formula

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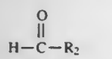




III

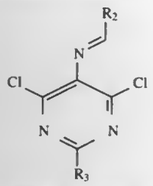
and its salt;

(b) in the intermediate, chlorinating the 2,5-diamino-4,6-dihydroxypyrimidine with a chlorinating agent in the presence of at least one amide of the general formula



IV

where $R_2$ is one of (i) a 5-membered heterocycloalkyl radical which is optionally substituted on the heteroatom, (ii) a 6-membered heterocycloalkyl radical which is optionally substituted on the heteroatom, (iii) $—NR_3R_3$, where $R_3$ is one of a $C_1$–$C_6$-alkyl group and a benzyl group, and (iv) $—NR_3R_4$, where $R_3$ and $R_4$ each are one of a $C_1$–$C_6$-alkyl group and a benzyl group, to produce a 4,6-dichloropyrimidine of the general formula



V

where $R_5$ is $—NH_2$; and

(c) reacting the 4,6-dichloropyrimidine with an aqueous solution comprising at least one carboxylic acid of the general formula

$R_6$—COOH VI

where $R_6$ is one of (i) a branched $C_1$–$C_6$-alkyl group, (ii) an unbranched $C_1$–$C_6$-alkyl group, and (iii) a $C_3$–$C_6$-cycloalkyl group, to produce the substance of the formula I.

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**5,744,602**

**CERTAIN IMIDAZOQUINOXALINES; A NEW CLASS OF GABA BRAIN RECEPTOR LIGANDS**

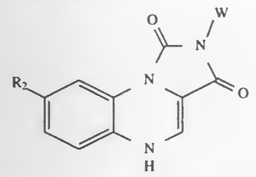
**Philip Whitcome, Bradford, and Kenneth Shaw, Weston, both of Conn., assignors to Neurogen Corporation, Branford, Conn.**

**Continuation of Ser. No. 50,068, Apr. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 606,769, Oct. 31, 1990, Pat. No. 5,130,430. This application May 15, 1995, Ser. No. 440,696**

**Int. Cl.**[6] **C07D** *487/04;401/04;233/72;* **A61K** *31/495*

**U.S. Cl. 544—346** **6 Claims**

1. A compound of the formula:



or the pharmaceutically acceptable non-toxic salts thereof wherein:

$R_2$ represents hydrogen or halogen; and

W is phenyl optionally substituted with straight or branched chain lower alkyl having 1–6 carbon atoms or straight or branched chain lower alkoxy having 1–6 carbon atoms.

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**5,744,603**

**CERTAIN ARYL SUBSTITUTED IMIDAZOPYRAZINONES: A NEW CLASS OF GABA BRAIN RECEPTOR LIGANDS**

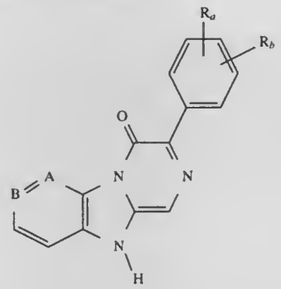
**Charles Blum, Guilford, and Alan Hutchison, Madison, both of Conn., assignors to Neurogen Corporation, Branford, Conn.**

**Continuation of Ser. No. 495,521, Dec. 21, 1995, Pat. No. 5,610,299, which is a continuation of Ser. No. 1,258, Jan. 6, 1993, abandoned. This application Jan. 24, 1997, Ser. No. 788,924**

**Int. Cl.**[6] **C07D** *471/04;471/14*

**U.S. Cl. 544—346** **4 Claims**

1. A compound of the formula:



or the pharmaceutically acceptable salts thereof wherein:

$R_a$ and $R_b$ are independently hydrogen, halogen, lower alkoxy, or lower alkyl;

A is nitrogen or CH; and

B is nitrogen or CH, with the proviso that not both A and B are nitrogen simultaneously.

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**5,744,604**

**PREPARATION OF 3-OXY-5-OXO-6-HEPTENOIC ACID DERIVATIVES**

**Katsumasa Harada; Akio Matsushita; Yasuhiro Kawachi, and Hiroshi Sasaki, all of Yamaguchi, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan**

**Continuation of Ser. No. 524,045, Sep. 6, 1995, Pat. No. 5,677,455. This application May 20, 1997, Ser. No. 858,937**

**Claims priority, application Japan, Sep. 6, 1994, 6-212959; Sep. 6, 1994, 6-212961**

**Int. Cl.**[6] **C07F** *7/02*

**U.S. Cl. 546—14** **4 Claims**

1. Methyl (3R,6E)-3-[(tert-butyldimethylsilyl)-oxy] -7-[2',6'-diisopropyl-4'-(4"-fluorophenyl)-5'-(methoxymethyl)pyridin-3'-yl]-5-oxo-6-heptenoate.



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**5,744,605**

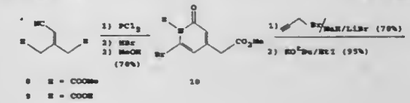
**INTERMEDIATES IN THE SYNTHESIS OF (+) CAMPTOTHECIN AND RELATED COMPOUNDS AND SYNTHESIS THEREOF**

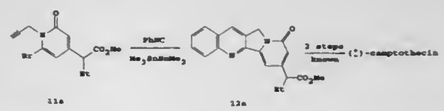
**Dennis P. Curran; Hui Liu, both of Pittsburgh, Pa., and Maree Patricia Collis, Prahran, Australia, assignors to University of Pittsburgh, Pittsburgh, Pa.**

**Continuation of Ser. No. 85,190, Jun. 30, 1993, abandoned. This application Mar. 4, 1996, Ser. No. 609,900**

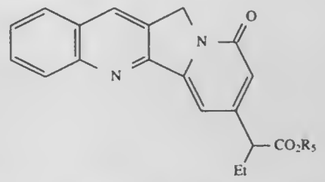
**Int. Cl.**[6] **C07D** *487/04;471/14;213/64;* **C07B** *37/10*

**U.S. Cl. 546—70** **6 Claims**

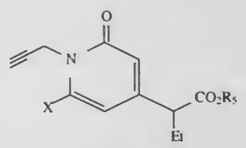




1. A method of synthesizing the following intermediate in the synthesis of camptothecin:



comprising the step of a 4+1 radical anuulation/cyclization wherein the precursor



is reacted with phenyl isonitrile wherein X is selected from the group consisting of Br, Cl and I and wherein R5 is selected from the group consisting of an alkyl group and a benzyl group.

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**5,744,606**

**PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE 3-QUINUCLIDINOL**

**Walter Brieden, Glis, Switzerland, assignor to Lonza AG, Gampel/Valais, Switzerland**

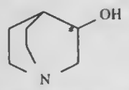
**Filed Jan. 16, 1997, Ser. No. 783,893**

**Claims priority, application Switzerland, Jan. 19, 1996, 0139/96**

**Int. Cl.**[6] **C07D** *453/00;453/02*

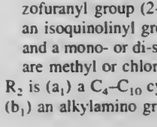
**U.S. Cl. 546—133** **9 Claims**

1. A process for the preparation of optically active 3-quinuclidinol of the formula:



I

comprising asymmetrically hydrogenating a quinuclidine derivative from the group consisting of 3-quinuclidinone tertiary and quaternary salts of the formula:



IIb

wherein $R^1$ is hydrogen, a monoarylmethyl, a diarylmethyl or a triarylmethyl and $A^-$ is the anion of an inorganic acid or an organic acid, in the presence of an optically active complex of rhodium, iridium or ruthenium with a chiral diphosphine as ligand, acting as a catalyst, in a suitable solvent, at a hydrogen pressure of 1 to 150 bar and at a temperature of 0° to 100° C., and cleaving the substituent $R^1$ if appropriate.

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**5,744,607**

**BASIC DERIVATIVES OF GLUTAMIC ACID AND ASPARTIC ACID AS GASTRIN OR CHOLECYSTOKININ ANTAGONISTS**

**Francesco Makovec; Lucio C. Rovati, and Luigi A. Rovati, all of Monza, Italy, assignors to Rotta Research Laboratorium S.p.A., Milan, Italy**

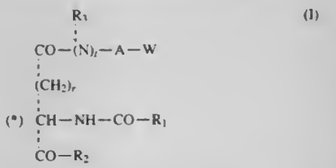
**Division of Ser. No. 318,651, Oct. 11, 1994, Pat. No. 5,587,479. This application Oct. 18, 1996, Ser. No. 733,568**

**Claims priority, application Italy, Apr. 9, 1992, TO92A0325**

**Int. Cl.**[6] **C07D** *221/20;401/06;209/54;* **A61K** *31/40*

**U.S. Cl. 546—146** **18 Claims**

1. A compound represented by the general formula



(I)

wherein r is 1 or 2;

$R_1$ is independently selected from the group consisting of an unsubstituted phenyl group; a mono- or di-substituted phenyl group in which the substituent is independently selected from the group consisting of a halogen atom, a linear or branched $C_1$–$C_4$ alkyl group, a nitro group, a cyano group, a methoxy group and a trifluoromethyl group; an unsubstituted phenylamino group; a mono- or di-substituted phenylamino group in which the substituent is independently selected from the group consisting of a halogen atom, a linear or branched $C_1$–$C_4$ alkyl group, a nitro group, a cyano group, a methoxy group and a trifluoromethyl group; a 2 (beta)naphthyl group; and a heterocyclic, monocyclic or bicyclic group selected from the group consisting of a furyl group (2- or 3-yl), an indolyl group (2- or 3-yl), an isoindolyl group (3-yl), a benzofuranyl group (2- or 3-yl), a quinolinyl group (2- or 3-yl), an isoquinolinyl group (3-yl), an unsubstituted pyridyl group and a mono- or di-substituted group in which the substitutents are methyl or chloro;

$R_2$ is ($a_1$) a $C_4$–$C_{10}$ cycloalkylamino group, or ($b_1$) an alkylamino group represented by:



wherein $R_5$ is a linear or branched chain alkyl group having from 4 to 10 carbon atoms, a $C_5$–$C_{10}$ cycloalkyl group, or a linear or branched alkoxyalkyl group having from 4 to 7 carbon atoms; and $R_6$ is selected from the group consisting of a hydrogen atom, an alkyl group, a linear or branched alkoxyalkyl group having from 4 to 7 carbon atoms and a $C_5$-$C_{10}$ cycloalkyl group;

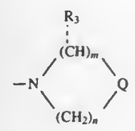
VOL 1209 ISS 4 AP 28 1998 UMI



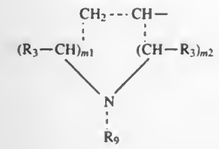
$R_3$ is a hydrogen atom, a $CH_3$ group or a $C_2H_5$ group;
A is a bond or a linear or branched alkylene group having from 1 to 4 carbon atoms;
W is
($a_2$) a tertiary amino group represented by:



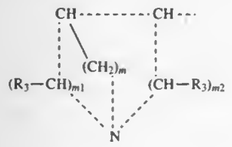
wherein $R_7$ and $R_8$ independently represent a hydrogen atom or a linear or branched alkyl group having from 1 to 5 carbon atoms, provided that $R_7$ and $R_8$ are not both hydrogen atoms; ($b_2$) a heterocyclic group represented by:



wherein $R_3$ is as defined above, m and n are independently selected integers having values between 1 and 3, provided that the ring formed consists of at least 5 atoms; Q is a bond, a $CH_2$ group, an oxygen atom, a sulphur atom, a nitrogen atom, or N—$R_9$; $R_9$ is a hydrogen atom, a linear or branched $C_1$–$C_4$ alkyl group, a phenyl group or a benzyl group, the aromatic groups of which may be unsubstituted or mono- or di-substituted as described above for the phenyl group in $R_1$;
($c_2$) a heterocyclic group represented by:



wherein m1 and m2 independently represent a value of between 0 and 3; and $R_3$ and $R_9$ have the above defined meanings;
or
($d_2$) a heterocyclic group represented by:



wherein m, m1, m2 and $R_3$ have the above defined meanings;
t is 1, except when Q is N—$R_9$ in ($b_2$), then t is 0 or 1; and
pharmaceutically acceptable salts thereof.

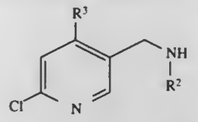
**5,744,608**

## METHOD FOR MANUFACTURING 3-(AMINOMETHYL)-6-CHLOROPYRIDINES

**Inoue Tsutomu, Odawara; Takahashi Jun; Imagawa Tsutomu, both of Takaoka, and Kazuhiro Hatanaka, Himi, all of Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan**

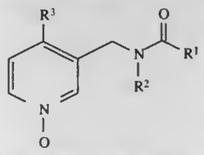
**PCT No. PCT/JP96/02535, § 371 Date May 1, 1997, § 102(e) Date May 1, 1997, PCT Pub. No. WO97/09312, PCT Pub. Date Mar. 13, 1997**
**PCT Filed Sep. 6, 1996, Ser. No. 836,658**
**Claims priority, application Japan, Sep. 8, 1995, 7-257116; Nov. 15, 1995, 7-321111**
**Int. Cl.[6] C07D** *213/38;213/26*
**U.S. Cl. 546—329** **10 Claims**

1. Method for manufacturing 3-(aminomethyl)-6-chloropyridines represented by a general formula [II];



[II]

wherein $R^2$ represents hydrogen or a lower alkyl and $R^3$ represents hydrogen, a lower alkyl or an halogen atom, characterized in that the compound represented by the general formula [II] is manufactured by allowing 3-(substituted-aminomethyl)pyridine 1-oxide represented by a general formula [I];



[I]

wherein $R^1$ represents alkyl, aryl, aralkyl or alkoxy, $R^2$ and $R^3$ are as described above, to react with a base represented by a general formula [a];

$$R'R''R'''N \qquad [a]$$

wherein R', R" and R'" may be the same or different one another and represent each independently a lower alkyl or an aromatic group, or R', R" , R'" and N may form together an optionally-substituted pyridine ring, in the presence of an electrophilic reagent having at least one chlorine atom, and subsequently treating the reaction product with hydrogen chloride and water.

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**5,744,609**

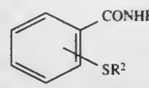
## METHOD FOR PRODUCING ALKYLSULFINYLBENZAMIDES AND 1-2 BENZISOTHIAZOL-3-ONES

**Hirokazu Kagano; Hiroshi Goda, and Shigeki Sakaue, all of Kako-gun, Japan, assignors to Sumitomo Seika Chemicals Co., Ltd., Hyogo, and Sumitomo Chemical Co., Ltd., Osaka, both of Japan**

**Division of Ser. No. 581,109, Dec. 29, 1995, Pat. No. 5,672,751, which is a division of Ser. No. 342,038, Nov. 17, 1994, Pat. No. 5,508,416. This application Apr. 7, 1997, Ser. No. 831,533**
**Claims priority, application Japan, Nov. 24, 1993, 5-319179; Dec. 29, 1993, 5-350932**
**Int. Cl.[6] C07D** *275/04;* **C07C** *323/04*
**U.S. Cl. 548—209** **5 Claims**

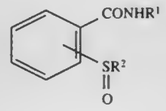
1. A method for producing an alkylsulfinylbenzamide represented by the general formula (IV), comprising reacting an alkylthiobenzamide represented by the following general formula (III):





(III)

wherein $R^1$ represents a hydrogen atom, or an alkyl group having 1 to 4 carbon atoms, an aryl group, or an aralkyl group, and wherein $R^2$ represents an alkyl group having 1 to 4 carbon atoms, with a halogen in a heterogeneous solvent, to give an alkylsulfinylbenzamide represented by the following general formula (IV):



(IV)

wherein $R^1$ and $R^2$ are defined as above.

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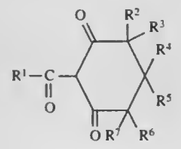
**5,744,610**

## HERBICIDAL COMPOUNDS

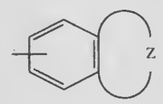
**John E. D. Barton; David Cartwright, both of Reading; John M. Cox, Wokingham; Glynn Mitchell, Iver, all of United Kingdom; Charles G. Carter, Silver Spring, Md.; David L. Lee, Martinez, Calif.; Francis H. Walker, Mill Valley, Calif., and Frank X. Woolard, Pt. Richmond, Calif., assignors to Zeneca Limited, London, England**

**Continuation of Ser. No. 453,916, May 30, 1995, Pat. No. 5,563,115, which is a division of Ser. No. 102,004, Aug. 4, 1993, Pat. No. 5,426,091, which is a division of Ser. No. 819,080, Jan. 10, 1992, Pat. No. 5,250,501, which is a division of Ser. No. 595,710, Oct. 9, 1990, Pat. No. 5,098,464, which is a continuation of Ser. No. 170,389, Mar. 18, 1988, abandoned.**
**This application Jul. 18, 1996, Ser. No. 683,727**
**Claims priority, application United Kingdom, Mar. 19, 1987, 8706557; May 21, 1987, 8712037; May 21, 1987, 8712038; Jun. 26, 1987, 8715044; Dec. 14, 1987, 8729108**
**Int. Cl.[6] C07D** *263/54*
**U.S. Cl. 548—217** **1 Claim**

1. A compound of the formula



wherein
$R^2$–$R^7$ are independently hydrogen or lower alkyl; and
$R^1$ is a bicyclic group of sub formula



wherein Z is a five or six membered fused ring containing up to three heteroatoms selected from the group consisting of sulphur and nitrogen.

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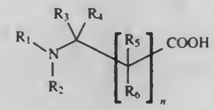
**5,744,611**

## PROCESS FOR THE REDUCTION OF AMINO ACIDS AND THE DERIVATIVES THEREOF

**Matthias Kottenhahn; Karlheinz Drauz, both of Freigericht, Germany, and Hans Hilpert, Reinach, Switzerland, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany and Hoppman-La Rouche AG, Basel, Switzerland**

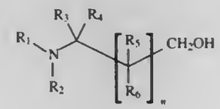
**PCT No. PCT/EP95/03281, § 371 Date Mar. 3, 1997, § 102(e) Date Mar. 3, 1997, PCT Pub. No. WO96/07634, PCT Pub. Date Mar. 14, 1996**
**PCT Filed Aug. 17, 1996, Ser. No. 793,702**
**Claims priority, application Germany, Aug. 17, 1995, 44 31 529.5**
**Int. Cl.[6] C07D** *263/24*
**U.S. Cl. 548—232** **7 Claims**

1. Process for the reduction of amino acids of the formula I



I

in which
n equals 0 or 1,
$R^1$, $R^2$, $R^3$, $R^4$, $R^5$, $R^6$ are mutually independently identical or different and are H, aryl, alkyl or arylalkyl, wherein in the latter two groups the carbon chain may be substituted and/or interrupted by heteroatoms
or
$R^1$ and $R^2$ are mutually independently identical or different and mean arylalkyloxycarbonyl, alkyloxycarbonyl or oxycarbonyl,
or
$R^1$, $R^4$, $R^5$ and $R^6$ are mutually independently identical or different and are acylaminoalkyl or hydroxyl,
and
wherein
$R^3$, $R^4$, $R^5$ or $R^6$ may form a ring with $R^1$ or $R^2$, to yield the corresponding amino alcohols of the formula II



II

in which $R^1$ to $R^6$ and n have the meaning stated for the formula I, in which process the compounds of the formula I are initially reacted in a first step in at least one linear or branched-chain alcohol having 1–5 C atoms with the addition of acid and with heating to yield an ester, wherein a reaction mixture containing the ester is obtained and the ester is reduced in a second step with alkali metal or alkaline earth metal borohydride to yield compounds of the formula II,
wherein
the second step is performed without isolating the ester from the reaction mixture and the alkali metal or alkaline earth metal borohydrides are used without the addition of a reducing agent activating substance to the reaction mixture produced in the first step.

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**5,744,612**

## PROCESS FOR PREPARATION OF 5- SUBSTITUTED TETRAZOLES

**Kiyoto Koguro; Toshikazu Oga; Norihito Tokunaga; Sunao Mitsui, and Ryozo Orita, all of Takasago, Japan, assignors to Toyo Kasei Kogyo Company Limited, Osaka, Japan**

**Filed Mar. 4, 1997, Ser. No. 805,917**

**Claims priority, application Japan, Mar. 21, 1996, 8-64900; Sep. 11, 1996, 8-240713**

**Int. Cl.[6] C07D** *257/04*

**U.S. Cl. 548—250** **4 Claims**

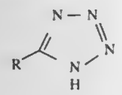
**1**. A process for preparing a 5-substituted tetrazole represented by the formula (3), the process comprising the step of reacting a nitrile represented by the formula (1) with an inorganic azide salt represented by the formula (2) in an aromatic hydrocarbon solvent in the presence of an amine salt:

RCN (1)

wherein R is an aliphatic group, an alicyclic group, an aromatic group, an aromatic aliphatic group, an aromatic alicyclic group, a heterocyclic group or a heterocyclic aliphatic group, each group having up to 30 carbon atoms and being unsubstituted or substituted with up to two substituents selected from chloro, bromo, hydroxy, methoxy, amino, carboxy, nitro, acetyl, methyl, alkoxycarbonyl and cyano,

$M(N_3)_n$ (2)

wherein M is an alkali metal or an alkaline earth metal, and n is 1 or 2, and


(3)

where R is as defined above.

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**5,744,613**

## PROCESS FOR THE PREPARATION OF ALKYLIMIDAZOLIDONE (METH)ACRYLATES

**Alain Riondel, Forbach, and Jean-Michel Paul, Metz, both of France, assignors to Elf Atochem S.A., Puteaux, France**

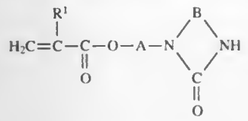
**Filed Oct. 17, 1996, Ser. No. 733,266**

**Claims priority, application France, Oct. 17, 1995, 95 12150**

**Int. Cl.[6] C07D** *233/70;233/80;233/32;233/04*

**U.S. Cl. 548—324.1** **21 Claims**

**1**. A process for the manufacture of a compound of formula:

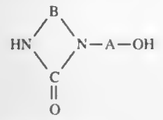

(I)

in which:

R1 represents hydrogen or methyl; and

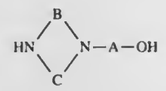
A and B each independently represent a straight- or branched-chain alkylene group having from 2 to 5 carbon atoms,

comprising reacting an excess of an anhydride of formula (II):

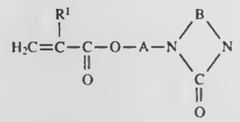

(II)

in which R1 is as defined above,

with a heterocyclic alcohol of formula (III):


(III)

**21**. A composition comprising (A) water. (B) (meth)acrylic acid and (C) a compound of the formula:



in which:

$R^1$ represent hydrogen or methyl; and

A and B each independently represent a straight- or branched-chain alkylene group having from 2 to 5 carbon atoms.

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**5,744,614**

## PREPARATION OF 3,5-DIARYLPYRAZOLES

**Hans Rupert Merkle, Ludwigshafen, and Erich Fretschner, Neckarsteinach, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**PCT No. PCT/EP96/00011, § 371 Date Jul. 3, 1997, § 102(e) Date Jul. 3, 1997, PCT Pub. No. WO96/21650, PCT Pub. Date Jul. 18, 1996**

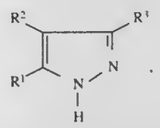
**PCT Filed Jan. 4, 1996, Ser. No. 860,026**

**Claims priority, application Germany, Jan. 13, 1995, 195 00 838.3**

**Int. Cl.[6] C07D** *231/12*

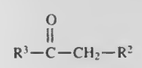
**U.S. Cl. 548—377.1** **5 Claims**

**1**. A process for preparing 3,5-diarylpyrazoles of the general formula I


I

where the substituents have the following meanings:

$R^1$ and $R^3$ are unsubstituted or substituted aryl radicals, $R^2$ is hydrogen, $C_1$–$C_8$-alkyl or unsubstituted or substituted aryl, which comprises reacting hydrazine hydrate with a carbonyl compound of the general formula III


III

and an arylaldehyde of the general formula IV

$R^1$—CHO IV.

where the substituents $R^1$, $R^2$ and $R^3$ have the abovementioned meanings, in sulfuric acid in the presence of iodine or an iodine compound.



**5,744,615**

## ULTRA WHITE N,N'-ETHYLENE-BIS(TETRABROMOPHTHALIMIDE) AND ITS PRODUCTION IN AQUEOUS ACETIC ACID

**Brian Tarbit, Ashington; Brian Adger, Hexham, and Paul Willett, Witton-le-Wear, all of England, assignors to Great Lakes Chemical, Frauenfeld, Switzerland**

**Division of Ser. No. 259,344, Jun. 14, 1995, Pat. No. 5,508,429. This application Jan. 19, 1996, Ser. No. 588,624**

**Int. Cl.[6] C07D** *403/04*

**U.S. Cl. 548—462** **7 Claims**

**1**. A polymer material comprising a flame retardant composition about 95° or more by weight comprised of N,N'-ethylene-bis(tetrabromophthalimide), said flame retardant composition having a yellowness index of about 5 or less and about 1% or less weight loss in thermogravimetric analysis to 400° C.

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**5,744,616**

## PROCESS FOR THE PRODUCTION OF 1,4,7,10-TETRAAZACYCLODODECANE AND ITS DERIVATIVES

**Orlin Petrov; Annette Prelle; Klaus Graske; Klaus Nickisch; Bernd Radüchel, and Johannes Platzek, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany**

**Filed Feb. 25, 1997, Ser. No. 805,585**

**Claims priority, application Germany, Feb. 26, 1996, 196 08 307.9**

**Int. Cl.[6] C07D** *229/02*

**U.S. Cl. 548—960** **14 Claims**

**1**. A process for the production of a cyclene derivative by cyclotetramerization of a benzylaziridine derivative, comprising producing the benzylaziridine derivative in situ, tetramerizing it without isolation into a tetrabenzylcyclene derivative in the presence of a strong acid, and removing the benzyl groups by hydrogenation.

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**5,744,617**

## PROCESS FOR THE PREPARATION OF SUBSTITUTED PHENOLS

**Jean-Erick Ancel; Hugues Bienayme, both of Lyons, and Pierre Meilland, Chaponost, all of France, assignors to Rhone-Poulenc Nutrition Animale, Antony Cedex, France**

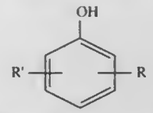
**Filed May 10, 1996, Ser. No. 644,863**

**Claims priority, application France, May 10, 1995, 95 05509**

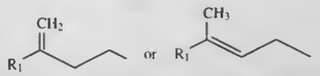
**Int. Cl.[6] C07D** *311/04;* **C07C** *39/04*

**U.S. Cl. 549—408** **20 Claims**

**1**. A process for preparing substituted phenols of formula (I)

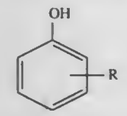

(I)

in which R represents one or more groups, which are identical or different and are selected from hydrogen, hydroxyl radicals and alkyl radicals having from 1 to 6 carbon atoms, and R' represents a radical selected from the radicals of formula (II)

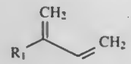

(II)

in which $R_1$ represents an unsubstituted or substituted alkylene or alkyl radical, wherein said radical of formula (II) contains at least 6 carbon atoms, which process comprises the step of:

condensing a phenol of formula (III)


(III)

in which R has the same meaning as in formula (I), in a single-phase medium with a butadiene derivative of formula (IV)


(IV)

in which $R_1$ has the same meaning as in formula (II), and wherein said butadiene derivative contains at least 6 carbon atoms in the presence of a base, a diphosphine soluble in an aprotic organic solvent, and a catalyst based on rhodium with the oxidation number (+1).

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**5,744,618**

## PROCESS FOR THE PREPARATION OF ASCORBIC ACID

**Ulrich Fechtel, Ober-Ramstadt, and Karlheinz Wembacher, Pfungstadt, both of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany**

**Filed Dec. 13, 1996, Ser. No. 766,276**

**Claims priority, application Germany, Dec. 16, 1995, 195 47 073.7**

**Int. Cl.[6] C07D** *307/62*

**U.S. Cl. 549—315** **7 Claims**

**1**. A process for the preparation of L-ascorbic acid by reacting 2 -keto-L-gulonic acid with aqueous mineral acid in a solvent mixture containing an inert organic solvent and an aliphatic ketone, characterized in that an acid chloride is added to said solvent mixture.

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**5,744,619**

## TITANOVANADOSILICALITES AS EPOXIDATION CATALYSTS FOR OLEFINS

**Laszlo T. Nemeth, Palatine; Gregory J. Lewis, Mount Prospect, and Richard R. Rosin, Arlington Heights, all of Ill., assignors to UOP LLC, Des Plaines, Ill.**

**Filed Mar. 17, 1997, Ser. No. 818,265**

**Int. Cl.[6] C07D** *301/03*

**U.S. Cl. 549—523** **17 Claims**

**1**. A process for the epoxidation of a carbon-carbon double bond in an olefinic compound comprising reacting under epoxide-forming conditions the olefinic compound in a feedstock with a hydroperoxide in the presence of a catalyst of a crystalline titanovanadosilicalite molecular sieve composition free of extraneous oxo-vanadium species, where the titanium and silicon are present as framework tetrahedral oxide units, said sieve having a unit empirical formula on an anhydrous basis of $(xSiyTizV)O_2$, where x has a value between about 0.96 and about 0.995, y has a value between about 0.005 and about 0.0267, and z has a value between about 0.0004 and about 0.01 and (x+y+z)=1.

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**5,744,620**

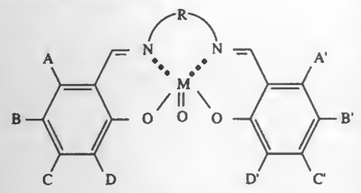
## CATALYTIC OXIDATION OF CYCLIC OLEFINS

**Yu-Ling Hsiao, Bridgeville, Pa.; Harry B. Gray, Pasadena, and Jay A. Labinger, Claremont, both of Calif., assignors to Bayer Corporation, Pittsburgh, Pa.**

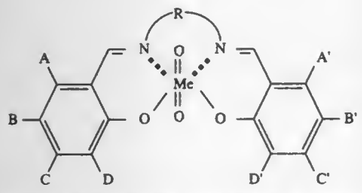
**Filed Jul. 10, 1997, Ser. No. 890,869**
**Int. Cl.[6] C07D *301/06***
**U.S. Cl. 549—533** **10 Claims**

1. A process for preparing an epoxide comprising reacting a cyclic olefin with a sole oxidizing agent selected from the group consisting of air and molecular oxygen, in the presence of a catalyst selected from the group consisting of metal salen complex the structure of which conforms to

(I)



(II)



wherein M denotes a member selected from the group consisting of Cr and V, and wherein Me denotes a member selected from the group consisting of Mo, Nb, W, Re, and Os,

wherein R is an aliphatic chain, straight or branched, cyclic or aromatic moiety containing 2 to 30 carbons, and wherein A, A', B, B', C, C', D and D' independently denote a member selected from the group consisting of hydrogen, F, Cl, Br, $—NO_2$, $—SO_3R$, or —CN.

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**5,744,621**

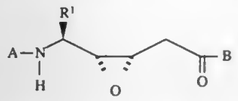
## IRREVERSIBLE HIV PROTEASE INHIBITORS, INTERMEDIATES, COMPOSITIONS AND PROCESSES FOR THE PREPARATION THEREOF

**Sung Chun Kim; Nakyen Choy; Chang Sun Lee; Young Chan Son; Ho Il Choi; Jong Sung Koh; Heungsik Yoon; Chi Hyo Park, and Sang Soo Kim, all of Daejeon, Rep. of Korea, assignors to Lucky Limited., Seoul, Rep. of Korea**

**Division of Ser. No. 159,382, Nov. 30, 1993, Pat. No. 5,587,388. This application Jun. 20, 1996, Ser. No. 667,888**
**Claims priority, application Rep. of Korea, Dec. 2, 1992, 92-23088; Dec. 2, 1992, 92-23089; Jun. 14, 1993, 93-10811; Oct. 14, 1993, 93-21298; Oct. 14, 1993, 93-21299; Oct. 14, 1993, 93-21300**
**Int. Cl.[6] C07D *303/08;215/38;265/30***
**U.S. Cl. 549—553** **1 Claim**

1. Cis-epoxide compounds of formula (I-1) and pharmaceutically acceptable salts, hydrates and solvates thereof:

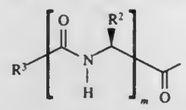
(I-1)



wherein:

$R^1$ is a cycloalkyl, or aryl-substituted lower alkyl group;

A is a functionalized acyl group of the formula



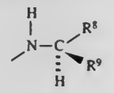
wherein $R^2$ is a $C_{1-4}$ alkyl, or amide-substituted $C_{1-2}$ alkyl group;

$R^3$ is a $C_{1-4}$ alkoxy, aryloxyalkyl or arylalkoxy, or a nitrogen-containing aromatic radical, or a lower alkoxy group substituted with a nitrogen-containing aromatic radical, or a radical having the formula of



wherein $R^4$ is a hydrogen or a methyl group and $R^5$ is an alkyl group substituted with a nitrogen-containing aromatic radical; and m is 0 or 1; and

B is a functionalized amino group of the formula



wherein $R^8$ and $R^9$ are independently a $C_{1-4}$ alkyl group optionally substituted with an aromatic radical, or an aromatic group.

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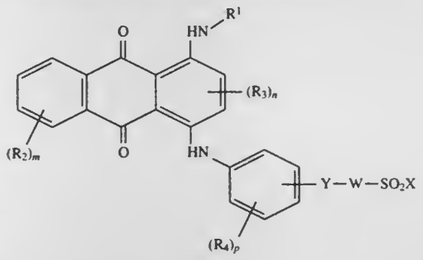
**5,744,622**

## WATER-SOLUBLE, FIBER-REACTIVE ANTHRAQUINONE COMPOUNDS

**Werner Hubert Russ, Flörsheim, and Christian Schumacher, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany**

**Filed Dec. 13, 1995, Ser. No. 571,573**
**Claims priority, application Germany, Dec. 15, 1994, 44 44 692.6**
**Int. Cl.[6] C09B *1/24;1/34***
**U.S. Cl. 552—232** **8 Claims**

1. An anthraquinone compound of the formula (1)



in which

$R^1$ is hydrogen, $C_1$–$C_6$-alkyl-carbonyl, $C_6$-aryl-carbonyl, $C_1$–$C_4$-alkylphenylcarbonyl, $C_1$–$C_6$-alkyl, $C_3$–$C_6$-cycloaklyl or phenyl, where $C_1$–$C_6$-alkyl, $C_3$–$C_6$-cycloalkyl and phenyl are optionally substituted by one or more radicals from the group consisting of hydroxyl, sulfo, carboxyl, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, cyano, amino and nitro;



$R^2$ is sulfo or carboxyl;

m is a number from 0 to 2;

$R^3$ is sulfo, carboxyl or halogen;

n is the number 0 or 1;

$R^4$ is sulfo, carboxyl, $C_1$–$C_4$-alkyl or $C_1$–$C_4$-alkoxy;

p is a number from 0 to 2;

W is a $C_1$–$C_6$-alkylene group;

X is vinyl or $—CH_2CH_2—L$, in which L is a group which can be split off under alkaline conditions and is selected from the group consisting of chlorine, bromine, $—OSO_3M$, $—SSO_3M$ or $—OP_3M_2$, in which M is hydrogen or an alkali metal;

Y is a bridge member of the formula —O— or —NH— with the proviso that W is a $C_3$– $C_6$-alkylene group if

X is vinyl and at the same time Y is —NH—.

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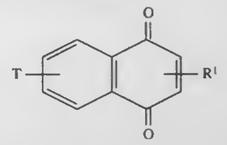
**5,744,623**

## TERPENE-QUINONES WITH ANTITUMOUR ACTIVITY

**M[a] Dolores Garcia Gravalos, Madrid; Marina Gordaliza Escobar; Santana Jose M[a] Miguel Del Corral, both of Salamanca; Ma del Mar Mahiques Bujanda, Alicante, and Arturo San Feliciano Martin, Salamanca, all of Spain, assignors to Pharma Mar, s.a., Madrid, Spain**

**PCT No. PCT/ES95/00096, § 371 Date Oct. 4, 1996, § 102(e) Date Oct. 4, 1996, PCT Pub. No. WO96/04230, PCT Pub. Date Feb. 15, 1996**
**PCT Filed Aug. 1, 1995, Ser. No. 624,593**
**Claims priority, application Spain, Aug. 1, 1994, 9401697; Apr. 27, 1995, 9500817**
**Int. Cl.[6] C07C *221/00***
**U.S. Cl. 552—297** **27 Claims**

1. A compound of the formula:



wherein $R^1$ is selected from the group consisting of hydrogen, alkyl, alkoxy, alkylamine and dialkylamine; and wherein and T is either an alkyl or a cycloalkyl group containing one or more isoprene units.

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**5,744,624**

## METHOD OF MAKING VITAMIN K1

**Manfred Dörner, Florence, S.C., assignor to Roche Vitamins Inc., Paramus, N.J.**

**Filed Dec. 12, 1996, Ser. No. 764,289**
**Claims priority, application Switzerland, Dec. 20, 1995, 3596/95**
**Int. Cl.[6] C07C *50/14***
**U.S. Cl. 552—299** **20 Claims**

1. A process for the manufacture of vitamin $K_1$, comprising oxidizing an alkali metal salt of dihydrovitamin $K_1$ with hydrogen peroxide in the presence of an iron(III) salt at a pH of about 13.7 to about 14.3.

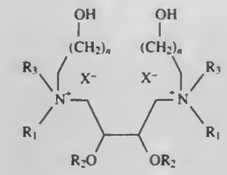
**5,744,625**

## CATIONIC TRANSPORT REAGENTS

**Michael H. Nantz; Michael J. Bennett, and Robert W. Malone, all of Davis, Calif., assignors to The Reagents of the University of California, Oakland, Calif.**

**Division of Ser. No. 316,719, Sep. 30, 1994, Pat. No. 5,527,928. This application May 16, 1996, Ser. No. 648,543**
**Int. Cl.[6] C07C *229/30***
**U.S. Cl. 554—105** **4 Claims**

1. A compound having the structure:



wherein

n=0–10;

$R_1$ is a hydrogen, an alkyl group, an alkenyl group, or a hydroxylated alkyl or alkenyl group;

$R_2$ is an alkyl group, an alkenyl group, or an alkyl or alkenyl containing acyl group;

$R_3$ is a hydrogen, an alkyl group, an alkenyl group, or a hydroxylated alkyl or alkenyl group; and

$X^-$ is an anion.

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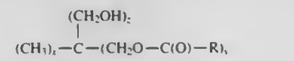
**5,744,626**

## COMPLEX GUERBET ACID ESTERS

**Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Lambent Technologies Inc, Norcross, Ga.**

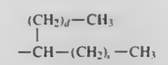
**Continuation-in-part of Ser. No. 548,737, Oct. 26, 1995, which is a continuation-in-part of Ser. No. 332,135, Oct. 31, 1994. This application Dec. 26, 1996, Ser. No. 807,909**
**Int. Cl.[6] C07C *53/00***
**U.S. Cl. 554—227** **9 Claims**

1. A compound which conforms to the following structure:



wherein:

R is:



x is and integer ranging from 0 to 1;

z is an integer ranging from 0 to 3;

y is and integer ranging from 1 to 4, with the proviso that $x+y+z=4$;

c and d are independently integers ranging from 3 to 17.

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5,744,627

## BORONIC COMPOUND COMPLEXING REAGENTS AND COMPLEXES

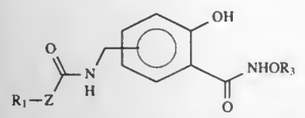
Mark L. Stowolitz, Woodinville; Robert J. Kaiser, Bothell; Kevin P. Lund, Lynnwood, all of Wash., and Steven M. Torkelson, San Mateo, Calif., assignors to Prolinx, Inc., Bothell, Wash., and Systemix, Palo Alto, Calif.

Continuation-in-part of Ser. No. 188,531, Jan. 28, 1994, Pat. No. 5,594,151. This application Aug. 5, 1996, Ser. No. 691,929

Int. Cl.[6] C07C *259/10*

U.S. Cl. 558—315 6 Claims

1. A reagent having the general formula of General Formula III:



General Formula III

wherein group Z comprises a spacer selected from a saturated or unsaturated chain up to about 6 carbon equivalents in length, an unbranched saturated or unsaturated chain of from about 6 to 18 carbon equivalents in length with at least one of intermediate amide or disulfide moieties, and a polyethylene glycol chain of from about 3 to 12 carbon equivalents in length;

wherein group $R_3$ is selected from one of an H, an alkyl, and a methylene or ethylene moiety with an electronegative substituent; and

wherein group $R_1$ is a electrophilic or nucleophilic moiety suitable for reaction of the reagent with a biologically active species.

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5,744,628

## PROCESS FOR THE PREPARATION OF ESTERS OF AROMATIC CARBOXYLIC ACIDS

Ralf Pfirmann, Griesheim, and Theodor Papenfuhs, Frankfurt, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Jul. 29, 1996, Ser. No. 681,635

Claims priority, application Germany, Jul. 31, 1995, 195 27 996.4; May 20, 1996, 196 20 191.8

Int. Cl.[6] C07C *229/00;69/76;67/72*

U.S. Cl. 560—19 30 Claims

1. A process for the preparation of compounds of the formula (1)

$$R^1R^2R^3R^4R^5ArCOOR \quad (1)$$

in which $R^1$, $R^2$, $R^3$, $R^4$ and $R^5$ are identical or different and are hydrogen, a halogen, an alkyl or alkoxy group having 1 to 6 carbon atoms, OR, NHR, $NR_2$, SR or COOR, R being an alkyl radical having 1 to 4 carbon atoms, Ar is an aryl radical having 6 to 12 carbon atoms and the radical R identified in formula (1) has the above meaning, which comprises reacting a compound of the formula (2)

$$R^1R^2R^3R^4R^5ArCOOH \quad (2)$$

in which $R^1$, $R^2$, $R^3$, $R^4$ and $R^5$ are identical or different and are hydrogen, a halogen, an alkyl or alkoxy group having 1 to 6 carbon atoms, OH, $NH_2$, NHR, SH or COOH and Ar has the same meaning as in formula (1), with a sulfate of the formula $(RO)_2SO_2$, in which R has the above meaning, at a pH from 5 to 12 in the presence of a water-insoluble tertiary amine and water at a temperature from 10° to 120° C. in the presence or absence of a water-insoluble solvent and with addition of a base.

5,744,629

## PROCESS FOR MANUFACTURING METHYLENE-BIS (DIBUTYL-DITHIOCARBAMATE) WITH ASTM COLOUR LESS THAN 2

Béla Jóvér, Budapest; János Forstner, Százhalombatta; József Petró , Százhalombatta; Szabolcs Szoboszlay, Százhalombatta; Imre Fekete, Százhalombatta; Károly Csergo, Százhalombatta; Gyula Sztrehárszki, Százhalombatta; Gyula Ráksi, Százhalombatta; János Kiss, Almásfúzitó ; Ferenc Mikó , Komárom; JenóBaladincz, Komárom, and József Tóth, Komárom, all of Hungary, assignors to MOL Magyar Olaj- es Gazipari Rt., Szazhalombatta, Hungary

Filed Feb. 2, 1996, Ser. No. 595,286

Claims priority, application Hungary, Feb. 20, 1995, P9500320

Int. Cl.[6] C07C *57/04*

U.S. Cl. 562—28 2 Claims

1. An improved process for manufacturing methylene-bis-(dibutyl-dithiocarbamate) with ASTM colour less than 2, by reacting aqueous solutions of dibutyl amine and sodium hydroxide with carbon disulfide, treating the obtained reaction product with methylene dichloride followed by vacuum stripping, phase separation and filtration of the precipitated sodium chloride, which comprises keeping the temperature of the mixture during the reaction with carbon disulfide at or below 15° C. and performing the vacuum stripping in two steps, first at a temperature between 45° C. and 100° C. and at a pressure of 5–50 kPa, then carrying out the phase separation between 35° C. and 50° C., and thereafter performing the second vacuum stripping of the separated organic phase also at a temperature between 45° C. and 100° C. and at a pressure of 5–50 kPa.

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5,744,630

## METHOD OF PRODUCING 3-AMINO-2-HYDROXY-1-PROPANOL DERIVATIVES

Kenji Inoue, Kakogawa; Hiroshi Awaji, Akashi, and Satomi Takahashi, Kobe, all of Japan, assignors to Kaneka Corporation, Osaka, Japan

PCT No. PCT/JP94/01540, § 371 Date Jul. 18, 1995, § 102(e) Date Jul. 18, 1995, PCT Pub. No. WO95/08530, PCT Pub. Date Mar. 30, 1995

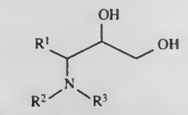
PCT Filed Sep. 20, 1994, Ser. No. 436,344

Claims priority, application Japan, Sep. 20, 1993, 5-233240

Int. Cl.[6] C07D *263/20*

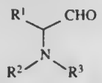
U.S. Cl. 560—29 6 Claims

1. A process for producing an 3-amino-2-hydroxy-1-propanol compound of the formula (2)



(2)

wherein $R^1$, $R^2$ and $R^3$ are as defined below characterized in that an aminoaldehyde compound of the formula (1)



(1)

wherein $R^1$ represents aralkyl; $R^2$ and $R^3$ independently represent hydrogen or an amino-protecting group; provided, however that at least one of $R^2$ and $R^3$ is an amino protecting group and a formaldehyde source are subjected to hetero-coupling reaction in the presence of a low valence titanium formed by reducing $TiCl_4$ or $TiCl_3$ with Zn, Zn—Cu, Mg or Al in the reaction system, wherein said hetero-coupling reaction is carried out at a temperature of from −50° to 40° C. at a concentration of said aminoaldehyde compound of the formula (1) of 1 to 20 w/v%: and said formaldehyde source being used in a proportion of 1 to 50 molar equivalents, said $TiCl_4$ or $TiCl_3$ being used in a proportion of 0.1 to 5 molar equivalents, and said Zn, Zn—Cu, Mg or Al being used in a proportion of 1 to 6 molar equivalents to said aminoaldehyde compound of the formula (1).



5,744,631

## FATTY ACID ANALOGS AND PRODRUGS

Sean T. Nugent, Grayslake, and Richard A. Mueller, Glencoe, both of Ill., assignors to G.D. Searle & Co., Skokie, Ill.

Continuation of Ser. No. 410,450, Mar. 24, 1995, Pat. No. 5,599,947, which is a continuation-in-part of Ser. No. 4,370, Jan. 14, 1993, abandoned. This application Nov. 4, 1996, Ser. No. 743,100

Int. Cl.[6] C07C *229/24;229/26;229/64*

U.S. Cl. 560—39 6 Claims

1. A compound of the formula $CH_3(CH_2)_9O(CH_2)_2$—X wherein X is selected from the group consisting of

$CONEt_2$,

$CONHCH_2Ph$,

$CO—NHCH_2CO_2C_2H_5$

$CO—D—C_6H_5CH_2CH(NH)CO_2C_2H_5$ and

$CO—L—C_6H_5CH_2CH(NH)CO_2C_2H_5$.

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5,744,632

## PROCESS FOR CRYSTALLIZING L-α-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Masayoshi Naruse, Yokohama; Haruo Kawasaki, Tokyo; Shinichi Kishimoto, Yokkaichi; Harutoshi Oura, Kawasaki; Masao Nakamura, Yokohama, and Hideo Takeda, Inagi, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Continuation of Ser. No. 176,673, Jan. 3, 1994, abandoned, which is a continuation of Ser. No. 845,806, Mar. 9, 1992, abandoned, which is a continuation of Ser. No. 723,727, Jun. 21, 1991, abandoned, which is a continuation of Ser. No. 500,525, Mar. 27, 1990, abandoned, which is a continuation of Ser. No. 293,565, Jan. 3, 1989, Pat. No. 5,041,607, which is a continuation of Ser. No. 54,494, May 27, 1987, abandoned, which is a division of Ser. No. 839,819, Mar. 12, 1986, abandoned, which is a continuation of Ser. No. 482,542, Apr. 6, 1983, abandoned. This application May 31, 1995, Ser. No. 455,707

Claims priority, application Japan, Apr. 12, 1982, 57-60671

Int. Cl.[6] C07C *224/00*

U.S. Cl. 560—41 9 Claims

1. A crystalline L-α-aspartyl-L-phenylalanine methyl ester product obtained by cooling an aqueous solution containing L-α-aspartyl-L-phenylalanine methyl ester said product being obtained from a process which comprises:

(i) adjusting the initial concentration of said ester n said solution so that the amount of precipitated solid phase formed upon cooling is about 10 grams or more of precipitate per liter of solvent, and

(ii) cooling said solution through conductive heat transfer without causing forced flow to obtain a sherbet-like pseudo solid phase; and

(iii) isolating the sherbet-like pseudo phase to obtain crystalline L-α-aspartyl-L-phenylalanine methyl ester.

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5,744,633

## PROCESS FOR THE PRODUCTION OF DIURETHANES AND THEIR USE FOR THE PRODUCTION OF DIISOCYANATES

Oswald Wilmes, Köln; Eberhard König, Leverkusen; Klaus Nachtkamp, Düsseldorf, and Ernst Kysela, Bergisch Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 2, 1994, Ser. No. 348,704

Claims priority, application Germany, Dec. 13, 1993, 43 42 426.0

Int. Cl.[6] C07C *261/00*

U.S. Cl. 560—115 6 Claims

1. A process for the production of a diurethane corresponding to the formula

$$R—O—CO—NH—R'—NH—CO—O—R \quad (I)$$

in which

R represents a residue obtained by removal of a hydroxyl group from a monohydric alcohol having a boiling point below 180° C. and

R' represents a difunctional (cyclo)aliphatic hydrocarbon radical containing from 2 to 18 carbon atoms, provided that at least two carbon atoms are present between the two nitrogen atoms comprising

a) reacting a urea with an alcohol corresponding to the formula ROH in amounts such that the molar ratio of alcohol to urea is at least 1:1 at a temperature of from about 150 to about 300° C.,

b) removing at least 10 mol %, based on the molar quantity of urea used in a), of ammonia generated during a).

c) introducing a diamine represented by the formula $H_2N—R'—NH_2$ into the reaction mixture remaining from b),

d) reacting the mixture of c) at a temperature of from about 150° to about 300° C.,

and

e) distilling the mixture remaining after d) to remove volatile substituents.

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5,744,634

## PROCESS FOR PRODUCING 2-KETO-L-GULONIC ACID ESTERS

Joachim Veits, Rheinfelden, Germany, assignor to Roche Vitamins Inc., Parsippany, N.J.

Continuation of Ser. No. 349,159, Dec. 2, 1994, abandoned. This application May 19, 1997, Ser. No. 858,639

Claims priority, application Switzerland, Jan. 18, 1994, 154/94

Int. Cl.[6] C07C *69/66*

U.S. Cl. 560—174 7 Claims

1. A process for the manufacture of methyl or ethyl 2-keto-L-gulonic acid ester comprising:

reacting 2-keto-L-gulonic acid with a lower alkanol selected from the group consisting of methanol and ethanol to form a reaction mass, and

exposing the reaction mass to an acidic ion exchanger to produce said ester, at a temperature from about room temperature to about 80° C. continuously for a time from about 10 minutes to about 120 minutes,

wherein said exposing is characterized by flowing the reaction mass over the ion exchanger to produce a flow having a superficial velocity from about 0.5 m/h to about 7.5 m/h.

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5,744,635

## PREPARATION PROCESS FOR BETA-ALKOXY ACRYLIC ACID

Jean-Louis Brayer, Nanteuil-Le-Haudouin, France; David Michael Hodgson, Reading, Great Britain; Ian Christopher Richards, Saffron Walden, Great Britain, and Jason Witherington, Reading, Great Britain, assignors to Roussel Uclaf, France

PCT No. PCT/FR94/00418, § 371 Date Oct. 3, 1995, § 102(e) Date Oct. 3, 1995, PCT Pub. No. WO94/24085, PCT Pub. Date Oct. 27, 1994

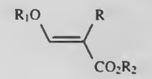
PCT Filed Apr. 14, 1994, Ser. No. 532,784

Claims priority, application France, Apr. 15, 1993, 93 04439; United Kingdom, Jan. 27, 1994, 9401541

Int. Cl.[6] C07C *69/73*

U.S. Cl. 560—183 24 Claims

1. A process for the preparation of a compound of the formula

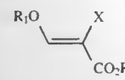


I

VOL 1209 ISS 4 AP 28 1998 UMI



wherein R is selected from the group consisting of optionally substituted alkenyl of 2 to 8 carbon atoms, optionally substituted alkynyl of 2 to 8 carbon atoms, optionally substituted phenyl and naphthyl and optionally substituted 5- and 6-membered heteroaryl having 1 or 2 heteroatoms and $R_1$ and $R_2$ are individually alkyl of 1 to 4 carbon atoms comprising reacting a compound of the formula

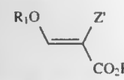


II

wherein X is halogen with an organometallic compound of the formula

RZ III

wherein Z is a metal or metal derivative or reacting a compound of the formula



II'

wherein $R_1$ and $R_2$ are individually alkyl of 1 to 4 carbon atoms and Z' is a metal or metal derivative with a compound of the formula

RX' III'

wherein R is defined as above and X' is a nucleophilic reaction leaving group to form a compound of Formula I.

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**5,744,636**

## PROCESS FOR THE PRODUCTION OF ETHYLIDENE DIACETATE FROM DIMETHYL ETHER USING A HETEROGENEOUS CATALYST

**Dorai Ramprasad, and Francis Joseph Waller, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**Filed May 21, 1996, Ser. No. 651,130**

**Int. Cl.[6] C07C** *67/00*

**U.S. Cl. 560—204** **19 Claims**

1. A process for producing ethylidene diacetate which comprises reacting dimethyl ether, hydrogen, carbon monoxide and acetic acid in the presence of an alkyl iodide and a bifunctional catalyst that is stable to hydrogenation and comprises an insoluble polymer having pendant quaternized heteroatoms, some of which heteroatoms are ionically bonded to anionic Group VIII metal complexes, the remainder of the heteroatoms being bonded to iodide, under conditions sufficient to form EDA and recovering the formed EDA.

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**5,744,637**

## CARBOXYLIC ACID ACCELERATED FORMATION OF DIESTERS

**Gerald Charles Tustin, and Todd Jay Dickson, both of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.**

**Filed Dec. 13, 1996, Ser. No. 766,247**

**Int. Cl.[6] C07C** *67/00;69/34*

**U.S. Cl. 560—238** **18 Claims**

1. A process for producing 1,1-dicarboxylic esters comprising the steps of:

1) contacting a carboxylic acid anhydride of the formula ($R^1CO)O(OCR^2$) or a ketene, a carboxylic acid promoter of the formula $R^3COOH$, and an aldehyde of the formula $R^4CHO$, wherein the molar ratio of aldehyde to carboxylic acid promoter is about 10 to 1, at a temperature of about 0° to about 80° C., in the presence of à non-iodide containing strong Bronsted acid catalyst in a contact zone that is substantially free of a hydrogenation catalyst or a carbonylation catalyst, wherein $R^1$ and $R^2$ are identical and are an alkyl having 1 to 10 carbon atoms, $R^3$ is an alkyl that is the same as or different from $R^1$ or $R^2$ and contains 1–10 carbon atoms, and $R^4$ is hydrogen or an alkyl of 0 to 10 carbon atoms; and

2) recovering a product comprising the 1,1-dicarboxylic ester.

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**5,744,638**

## PROCESS FOR THE PREPARATION OF HALOANTHRANILIC ACIDS

**Horst Schmand, Bad Nenndorf; Bernd Kellermeier, Lindhorst; Günter Bartels, Burgwedel, and Hans-Jürgen Schmidt, Seelze, all of Germany, assignors to Riedel-de Haen Aktiengesellschaft, Seelze, Germany**

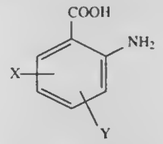
**Continuation of Ser. No. 158,048, Nov. 24, 1993, abandoned, which is a continuation of Ser. No. 997,547, Dec. 28, 1992, abandoned. This application Jan. 13, 1995, Ser. No. 372,865**

**Claims priority, application Germany, Jan. 11, 1992, 42 00 512.4**

**Int. Cl.[6] C07C** *229/00*

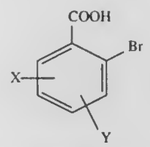
**U.S. Cl. 562—456** **22 Claims**

1. Process for the preparation of compounds of the general formula I



(I)

in which X and Y, independently of each other, represent hydrogen, fluorine, chlorine or bromine but cannot simultaneously represent hydrogen, comprising reacting compounds of the general formula II



(II)

in which X and Y are defined as above, with aqueous ammonia under copper catalysis at atmospheric pressure.

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**5,744,639**

## GRANULAR ALKALI METAL NITRILOTRIACETATE

**Sheldon P. Verrett, Olivette, Mo., assignor to Solutia Inc., St. Louis, Mo.**

**PCT No. PCT/US94/13652, § 371 Date Jul. 22, 1996, § 102(e) Date Jul. 22, 1996, PCT Pub. No. WO95/15370, PCT Pub. Date Jun. 8, 1995**

**PCT Filed Dec. 1, 1994, Ser. No. 647,959**

**Int. Cl.[6] C07C** *229/00*

**U.S. Cl. 562—572** **8 Claims**

1. A process for preparing granular alkali metal nitrilotriacetate (NTA) which comprises,

(1) contacting NTA powder with an aqueous alkali metal silicate solution,

(2) mixing the wetted NTA to form granules, and

(3) drying the granules whereby a majority of the granules, by weight, are in the −12 to +80 mesh size range and have a density of at least about 0.60 g/cc and an absorptivity in the absorptivity test greater than 7 ml/100 g.



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**5,744,640**

## FLUORINE RUBBER COMPOSITION

**Takashi Enokida; Akihiro Naraki; Eiichi Yamashita, all of Kitaibaraki, and Haruyoshi Tatsu, Hitachi, all of Japan, assignors to Nippon Mektron, Limited, Tokyo, Japan**

**Division of Ser. No. 583,642, Jan. 5, 1996, Pat. No. 5,587,413.**

**This application Sep. 16, 1996, Ser. No. 714,192**

**Claims priority, application Japan, Jan. 13, 1995, 7-021359**

**Int. Cl.[6] C07C** *271/60;275/30;275/08;275/14*

**U.S. Cl. 564—51** **1 Claim**

1. A polyfluoroalkyl group-containing block isocyanate compound represented by the following general formula:

$$Rf(CH_2)nNHCONHRNHCOON{=}CR^1R^2$$

where Rf is a polyfluoroalkyl group having 4 to 20 carbon atoms; R is a divalent organic group; $R^1$ is a lower alkyl group or a phenyl group; $R^2$ is a lower alkyl group and n is an integer of 1 to 4.

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**5,744,641**

## SULFONYL- OR SULFINYLBENZOYLGUANIDINE DERIVATIVES

**Rolf Gericke, Seeheim; Manfred Baumgarth, Darmstadt; Klaus-Otto Minck, Ober-Ramstadt, and Norbert Beier, Reinheim, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany**

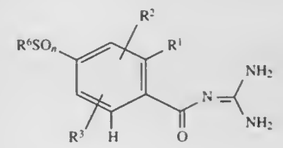
**Filed Aug. 9, 1996, Ser. No. 699,053**

**Claims priority, application Germany, Aug. 11, 1995, 195 29 612.5**

**Int. Cl.[6] C07C** *281/14;321/28*

**U.S. Cl. 564—228** **20 Claims**

1. A 4- sulfonyl- or 4-sulfinylbenzoylguanidine compound of formula I



I.

wherein

$R^1$ is A, $CF_3$, $CH_2F$, $CHF_2$, $C_2F_5$, CN, $NO_2$ or Hal,

$R^2$ is $—SO_n—R^6$, $—SO_2NR^4R^5$, $NO_2$ or $CF_3$,

$R^3$ is H, Hal, A, OH, OA, CN, $NO_2$, $CF_3$, $CH_2F$, $CHF_2$, $C_2F_5$ or $CH_2CF_3$,

$R^4$ and $R^5$ are each independently, H, A, $C_{5-7}$-cycloalkyl, $C_{4-8}$-cycloalkylmethyl, Ph or $—CH_2—Ph$, or

$R^4$ and $R^5$ together are $C_{4-6}$-alkylene wherein a $CH_2$ group is optionally

replaced by O, S, NH, N—A or $N—CH_2$-Ph,

$R^6$ is A, Ph, Het or $C_{3-7}$-cycloalkyl,

Het is a mono- or binuclear saturated, unsaturated or aromatic heterocycle having 1 to 4 N, O and/or S atoms, bonded via N or C, unsubstituted or mono-, di- or trisubstituted by Hal, SH, SA, $NH_2$, NHA, $NA_2$, $CF_3$, A, OH, OA, CN, $NO_2$, NHA, $NA_2$ and/or carbonyl oxygen,

A is $C_{1-6}$-alkyl,

Hal is F, Cl, Br or I,

Ph is phenyl, unsubstituted or mono-, di- or trisubstituted by A, OA, $NR^4R^5$, F, Cl, Br, I or $CF_3$ and

n is 1 or 2,

or a physiologically acceptable salt thereof.

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**5,744,642**

## PROCESS FOR THE PREPARATION OF ALIPHATIC IMINES

**Reinhard Lantzsch, Wuppertal, and Werner Lindner, Köln, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

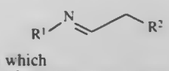
**Filed Feb. 24, 1995, Ser. No. 393,762**

**Claims priority, application Germany, Mar. 3, 1994, 44 06 949.9**

**Int. Cl.[6] C07C** *249/02*

**U.S. Cl. 564—278** **6 Claims**

1. A process for the preparation of an aliphatic imine of the formula



(I)

in which

$R^1$ is alkyl, alkenyl, alkinyl, cycloalkyl, cycloalkyl-alkyl, arylalkyl or heteroarylalkyl, each of which is optionally substituted, and

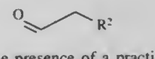
$R^2$ is methyl, ethyl, n-propyl or n-butyl, optionally substituted by fluorine, chlorine, methoxy or ethoxy,

which comprises reacting an

amine of the formula

$$R^1—NH_2 \quad (II)$$

with an approximately equimolar amount of an aldehyde of the formula



(III)

in the presence of a practically water-immiscible organic solvent, at a temperature between −30° C. and +15° C.

wherein the aldehyde is used in an amount of from 0.95 to 1.05 mol per mol of amine, the imine being isolated without further purification by distillation.

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**5,744,643**

## PROCESS FOR PREPARING AROMATIC AMINES

**Matthias Beller, Idstein; Ahmed Tafesh, Kelkheim, both of Germany; Christian Koblpaintner, Corpus Christi, Tex., and Christoph Naumann, Niedernhausen, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**

**Filed Feb. 21, 1996, Ser. No. 604,572**

**Claims priority, application Germany, Feb. 23, 1995, 195 06 278.7**

**Int. Cl.[6] C07C** *209/36*

**U.S. Cl. 564—417** **22 Claims**

1. A process for preparing aromatic amines, which comprises reacting an aromatic nitro compound with carbon monoxide in a solvent mixture comprising water and a water-insoluble organic solvent by means of a catalyst comprising palladium and a water-soluble phosphine under a pressure of from 5 to 300 bar and at a temperature of from 50 to 200° C., and separating the aqueous phase and the organic phase.

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**5,744,644**

## CONCENTRATED SOLUTIONS OF POLYHYDROXYALKYLAMINES AND THEIR USE

**Bernd Papenfuhs, Neuötting, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany**

**Filed May 23, 1996, Ser. No. 652,148**

**Claims priority, application Germany, May 30, 1995, 195 19 705.4**

**Int. Cl.[6] C07C** *211/03*

**U.S. Cl. 564—444** **4 Claims**

1. A solution which comprises at least one dialkylaminopropylglucamine of the formula 1 below

$$Z—NH—CH_2CH_2CH_2—NR^1R^2$$

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where $R^1$ and $R^2$ are identical or different and are $C_1$–$C_4$-alkyl or hydroxyalkyl having from 2 to 4 carbon atoms and Z is a linear polyhydroxyhydrocarbon radical having at least 3 OH groups optionally alkoxylated wherein the solvent is water, alcohol, or a water/alcohol mixture, and wherein said solution contains from 45–90% by weight of at least one compound of the formula I at a temperature of 15°–70° C.

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**5,744,645**

## TWO-STAGE PROCESS FOR PRODUCING DIISOPROPYL ETHER USING CATALYTIC DISTILLATION

**Terry L. Marker, Warrenville; Gregory A. Funk, Carol Stream; Paul T. Barger, Arlington Heights, and Harold U. Hammershaimb, Western Springs, all of Ill., assignors to UOP, Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 311,993, Sep. 26, 1994, Pat. No. 5,504,258. This application Apr. 1, 1996, Ser. No. 625,859**

**Int. Cl.[6] C07C** *41/00*

**U.S. Cl. 565—695** **18 Claims**

1. A process for producing diisopropyl ether comprising the steps of:

a. reacting in a hydration zone operating at a temperature from about 50° F. (10° C.) to about 400° F. (204° C.) and a pressure from about 500 to about 1600 psig the propylene in a feedstock with water in the presence of a first catalyst selected from the group consisting of acidic cation exchange resins and acidic zeolites, and an optional organic cosolvent, to effect hydration of the propylene to produce an effluent stream containing at least water, unreacted propylene, and isopropyl alcohol;

b. reacting in a catalytic distillation etherification zone operating at a temperature from about 250° F. (121° C.) to about 500° F. (260° C.) and a pressure from about 1 to about 600 psig at least a portion of the effluent stream and sufficient propylene to provide a propylene to isopropyl alcohol ratio of about 1:1 to about 2:1 in the presence of a second catalyst selected from the group consisting of acidic cation exchange resins and acidic zeolites to effect reaction of propylene and isopropyl alcohol to form diisopropyl ether and concurrently separating an organic portion containing the diisopropyl ether and an aqueous portion; and

c. collecting the organic portion containing the diisopropyl ether.

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**5,744,646**

## PREPARATION OF TRIS (PENTAFLUOROPHENYL) BORANE

**David R. Wilson, and Robert E. LaPointe, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Apr. 2, 1997, Ser. No. 832,150**

**Int. Cl.[6] C07F** *5/02*

**U.S. Cl. 568—1** **10 Claims**

1. A process for preparing tris(pentafluorophenyl)borane, the steps of the process comprising:

a) forming a pentafluorophenyl metal compound wherein the metal is selected from Group 11 or 12;

b) contacting the (pentafluorophenyl) metal compound from step a) with a boron halide compound to form tris(pentafluorophenyl)borane; and

c) recovering the resulting tris(pentafluorophenyl)borane.

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**5,744,647**

## PROCESS FOR THE PREPARATION OF 3-(METHYLTHIO) PROPANAL

**Yung C. Hsu, Chesterfield, and Dennis A. Ruest, Manchester, both of Mo., assignors to Novus International, Inc., St. Louis, Mo.**

**Continuation of Ser. No. 557,699, Nov. 13, 1995, which is a continuation of Ser. No. 273,216, Jul. 11, 1994, abandoned, which is a continuation-in-part of Ser. No. 73,763, Jun. 8, 1993, Pat. No. 5,352,837. This application Jul. 11, 1996, Ser. No. 679,701**

**Int. Cl.[6] C07C** *323/50*

**U.S. Cl. 568—41** **6 Claims**

1. A process for the continuous preparation of 3-(methylthio)propanal, comprising:

contacting a gaseous acrolein feed stream with a liquid reaction medium in a gas/liquid contact zone, said reaction medium containing 3-(methylthio)propanal and a catalyst for the reaction between methyl mercaptan and acrolein, said gaseous acrolein feed stream comprising acrolein vapor and non-condensable gas, whereby acrolein from said feed stream is transferred to said liquid medium;

introducing methyl mercaptan into said reaction medium in a proportion which is substantially stoichiometrically equivalent to the acrolein introduced into said medium, and reacting acrolein and methyl mercaptan in said liquid medium without substantial formation of the intermediate hemi(methylthio)acetal of 3-(methylthio)propanal to produce a liquid reaction product containing 3-(methylthio)propanal;

dividing said reaction product into a product fraction and a circulating fraction; and

recycling said circulating fraction to said gas/liquid contact zone.

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**5,744,648**

## PROCESS FOR THE MANUFACTURE OF 1, 3-CYCLOHEXANEDIONE

**Varadaraj Elango, Norwood, Mass., and Rajagopal Sakamuri, Warwick, R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.**

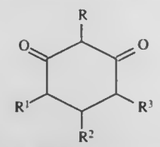
**Filed Aug. 1, 1996, Ser. No. 690,792**

**Int. Cl.[6] C07C** *45/29*

**U.S. Cl. 568—362** **17 Claims**

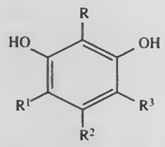
1. A method for making a compound of Formula I:

Formula I



wherein each of R, $R^1$, $R^2$ and $R^3$ are independently selected from the group consisting of hydrogen; $C_1$–$C_6$ alkyl; $C_3$–$C_6$ cyclic alkyl; $C_1$–$C_6$ alkoxy; fluoro; trifluoromethyl; $-(CH_2)_n-COOR^5$ (where n is 0 to 6 and $R^5$ is H or $C_1$–$C_6$ alkyl); and phenyl, optionally substituted by a substituent selected from the groups defined above for R, $R^1$, $R^2$ and $R_3$; wherein said method comprises a transfer hydrogenation process in which resorcinol or substituted resorcinol of Formula II:

Formula II



is reduced with a hydrogen donor in the presence of (a) a metal catalyst selected from the group consisting of platinum, palladium rhodium and ruthenium, and (b) a solvent to form a salt of a



corresponding 1,3-diketone which diketone is then converted to the compound of Formula I by neutralization with an acid.

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**5,744,649**

## HYDROFORMYLATION PROCESSES

**David Robert Bryant, South Charleston, and James Clair Nicholson, South Charleston, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.**

**Filed Nov. 26, 1996, Ser. No. 753,504**

**Int. Cl.[6] C07C** *45/50*

**U.S. Cl. 568—454** **20 Claims**

1. A process for separating one or more phosphorus acidic compounds from a hydroformylation reaction product fluid containing said one or more phosphorus acidic compounds, a metal-organophosphite ligand complex catalyst and optionally free organophosphite ligand which process comprises treating said hydroformylation reaction product fluid with water sufficient to remove at least some amount of said one or more phosphorus acidic compounds from said hydroformylation reaction product fluid, wherein said hydroformylation reaction product fluid comprises an organic phase and said water comprises a separate aqueous or water phase.

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**5,744,650**

## METAL-LIGAND COMPLEX CATALYZED PROCESSES

**James Clair Nicholson, Saint Albans; David Robert Bryant, South Charleston, and James Russell Nelson, Charleston, all of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.**

**Filed Nov. 26, 1996, Ser. No. 757,744**

**Int. Cl.[6] C07C** *45/50*

**U.S. Cl. 568—454** **20 Claims**

1. A process which comprises reacting one or more reactants in the presence of a metal-organopolyphosphite ligand complex catalyst and optionally free organopolyphosphite ligand to produce a reaction product fluid comprising one or more products, wherein said process is conducted at (a) a carbon monoxide partial pressure such that reaction rate increases as carbon monoxide partial pressure decreases and reaction rate decreases as carbon monoxide partial pressure increases and which is sufficient to prevent and/or lessen deactivation of the metal-organopolyphosphite ligand complex catalyst and (b) a temperature such that the temperature difference between reaction product fluid temperature and inlet coolant temperature is sufficient to prevent and/or lessen cycling of carbon monoxide partial pressure, hydrogen partial pressure, total reaction pressure, reaction rate and/or temperature during said process.

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**5,744,651**

## PROCESS FOR PREPARING PEROXIDIC PERFLUOROPOLYOXYALKYLENES

**Giuseppe Marchionni, Milan, and Pier Antonio Guarda, Nole, both of Italy, assignors to Ausimont S.p.A., Milan, Italy**

**Filed Feb. 13, 1997, Ser. No. 800,022**

**Claims priority, application Italy, Feb. 14, 1996, M196 A 000279**

**Int. Cl.[6] C07C** *409/20*

**U.S. Cl. 568—560** **15 Claims**

1. Tetrafluoroethylene oxidation process for preparing peroxidic perfluoropolyoxyalkylene polymers at temperatures between −100° C. and −40° C., in the absence of UV radiation and by operating in the presence of a chemical initiator containing at least one F—X bond, wherein X is oxygen or halogen, by operating with total pressures between 0 and 15 relative bar and in the presence of a solvent comprising an amount of $COF_2$ greater than 8% of total solvent by moles or in the presence of $COF_2$ alone.

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**5,744,652**

## METHOD FOR THE MANUFACTURE OF METHYL TERTIARY BUTYL ETHER FROM TERTIARY BUTYL ALCOHOL AND METHANOL

**Pei-Shing Eugene Dai; Laurence Darrel Neff; Kyle Lee Preston, all of Port Arthur, and Rei-Yu Judy Hwan, Sugar Land, all of Tex., assignors to Huntsman Specialty Chemicals Corp., Austin, Tex.**

**Filed Mar. 10, 1997, Ser. No. 815,984**

**Int. Cl.[6] C07C** *41/00*

**U.S. Cl. 568—671** **18 Claims**

1. A process for the preparation of methyl tertiary butyl ether from methanol and a tertiary butyl alcohol charge stock contaminated with oxygen-containing impurities including peroxides and formates which comprise the steps of:

a) feeding the tertiary butyl alcohol charge stock to a reactor containing a bed of a copper decomposition catalyst to decompose the oxygen-containing contaminants, to dehydrate a portion of the TBA to form isobutylene (IBTE) and water, and to provide a liquid TBA charge stock comprising tertiary butyl alcohol, isobutylene and water and a gaseous off-gas reaction product,

b) feeding the liquid TBA charge stock to an etherification reactor together with methanol to form an etherification reaction product comprising unreacted methanol, unreacted TBA, water, isobutylene and MTBE.

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**5,744,653**

## METHOD FOR PREPARING 1,3-DIHYDROXY-4,6-BIS(α-METHYL-α(4'-HYDROXYPHENYL)ETHYL)BENZENE

**Mizuo Ito, and Shigeru Iimuro, both of Aichi, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan**

**Continuation of Ser. No. 390,791, Feb. 17, 1995, abandoned. This application Aug. 19, 1996, Ser. No. 699,190**

**Claims priority, application Japan, Feb. 25, 1994, 6-027729; Sep. 13, 1994, 6-218751**

**Int. Cl.[6] C07C** *39/12*

**U.S. Cl. 568—720** **8 Claims**

1. A method for preparing 1,3-dihydroxy-4,6-bis[α-methyl-α(4'-hydroxyphenyl)ethyl]benzene comprising the step of initiating a homogeneous reaction of resorcin with 4-isopropenylphenol in a mixed solvent of a non-polar solvent selected from the group consisting of benzene, toluene and xylene and a polar solvent selected from the group consisting of methanol and ethanol in the presence of an inorganic acid selected from the group consisting of hydrochloric acid, hydrobromic acid and nitric acid.

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**5,744,654**

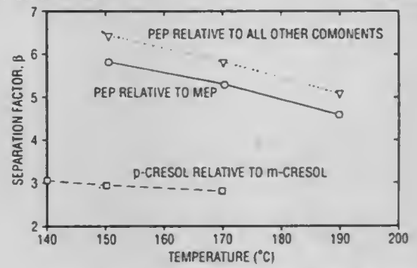
## RECOVERY OF PARA-ETHYLPHENOL

**John A. Waters, Houston, Tex., assignor to Merichem Company, Houston, Tex.**

**Filed Jun. 14, 1996, Ser. No. 663,649**

**Int. Cl.[6] C07C** *39/06*

**U.S. Cl. 568—750** **6 Claims**




1. A process for the separation and recovery of p-ethylphenol from a complex mixture comprising p-ethylphenol, m-ethylphenol,

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and other alkylphenols without significant formation of unwanted byproducts which comprises the steps of contacting the mixture at adsorption conditions with a type X-zeolite exchanged at ion exchangeable sites with barium ions, potassium ions or a mixture of barium and potassium ions to selectively adsorb p-ethylphenol, contacting said adsorbent and adsorbed p-ethylphenol with a desorbent material having a boiling point at least about 5° C. different from the boiling point of p-ethylphenol, at desorption conditions sufficient to maintain a liquid phase, whereby p-ethylphenol is recovered at a separation factor of about 4.5 or greater relative to the m-ethylphenol present in the feed and to all other alkylphenols present in the feed.

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**5,744,655**

## PROCESS TO MAKE 2,3-DIHALOPROPANOLS

**P. J. Thomas; R. Garth Pews; Paul C. Vosejpka, and George J. Frycek, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Jun. 19, 1996, Ser. No. 667,526**

**Int. Cl.[6] C07C *31/34***

**U.S. Cl. 568—841** **19 Claims**

1. A process to make 2,3-dihalopropanol comprising the step of reacting 2,3-dihalopropanal with molecular hydrogen in the presence of a transition metal-containing catalyst, under conditions such that 2,3-dihalopropanol is formed.

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**5,744,656**

## CONVERSION OF HEXAFLUOROBENZENE TO BROMOPENTAFLUOROBENZENE

**Fredric Askham, Loveland, Colo., assignor to Boulder Scientific Company, Mead, Colo.**

**Filed Oct. 25, 1996, Ser. No. 736,655**

**Int. Cl.[6] C07C *22/00***

**U.S. Cl. 570—147** **9 Claims**

1. A method which comprises reacting $C_6F_5MgBr$ with a halogenating agent to produce a halopentafluorobenzene which has the formula $C_6F_5X$ in which X is a chlorine bromine or iodine.

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**5,744,657**

## PROCESS FOR THE PREPARATION OF PERFLUOROCARBONS

**James Lang Webster, Parkersburg, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 540,352, Oct. 6, 1995, abandoned, which is a continuation-in-part of Ser. No. 362,321, Dec. 22, 1994, abandoned. This application Dec. 18, 1995, Ser. No. 573,828**

**Int. Cl.[6] C07C *19/08***

**U.S. Cl. 570—150** **36 Claims**

1. Process for the preparation of perfluorocarbon containing at least two carbon atoms, comprising

feeding fluorine-containing compound having a molecular weight greater than 20 and gaseous CO to a reaction zone wherein the fluorine-containing compound is split apart to liberate fluorine from said fluorine-containing compound and obtaining a gaseous reaction mixture which contains said fluorine and said CO,

reacting said reaction mixture with carbon at a temperature of at least 1500° C. to obtain a gaseous reaction product,

rapidly cooling said gaseous reaction product to obtain said perfluorocarbon as a result thereof, and

recovering said perfluorocarbon from said gaseous reaction product.

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**5,744,658**

## CHEMICAL PROCESS

**John David Scott, Cheshire, and Rachel Anne Steven, Manley, both of England, assignors to Imperial Chemical Industries PLC, London, England**

**Continuation of Ser. No. 83,691, Jun. 30, 1993, Pat. No. 5,382,722, and Ser. No. 11,537, Feb. 1, 1993, Pat. No. 5,395,996, said Ser. No. 83,691 is a continuation of Ser. No. 755,554, Sep. 5, 1991, Pat. No. 5,145,826, said Ser. No. 11,537 is a continuation of Ser. No. 804,550, Dec. 11, 1991, Pat. No. 5,243,105, which is a continuation of Ser. No. 676,703, Mar. 29, 1991, abandoned. This application Jul. 18, 1996, Ser. No. 683,402**

**Claims priority, application United Kingdom, Mar. 29, 1996, 9007029**

**Int. Cl.[6] C07C *17/08;17/00***

**U.S. Cl. 570—166** **2 Claims**

1. A method for the manufacture of 1,1,1,2-tetrafluoroethane which comprises the steps of:

(a) contacting a mixture of 1,1,1-trifluoro-2-chloroethane and hydrogen fluoride with a fluorination catalyst at superatmospheric pressure and a temperature in the range of about 280° to 450° C. in a first reaction zone to form a product containing 1,1,1,2-tetrafluoroethane and hydrogen chloride together with unreacted starting materials;

(b) passing the total product of step (a) together with trichloroethylene to a second reaction zone containing a fluorination catalyst at superatmospheric pressure and a temperature in the range of about 200°–400° C. but lower than the temperature in step (a) to form a product containing 1,1,1,2-tetrafluoroethane and 1,1,1-trifluoro-2-chloroethane;

(c) treating the product of step (b) to separate 1,1,1,2-tetrafluoroethane from 1,1,1-trifluoro-2-chloroethane;

(d) feeding the 1,1,1-trifluoro-2-chloroethane from step (c) together with hydrogen fluoride to said first reaction zone (step(a)); and

(e) collecting the 1,1,1,2-tetrafluoroethane separated out in step (c).

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**5,744,659**

## PROCESS FOR THE PREPARATION OF DIFLUOROMETHANE

**Takehide Tsuda; Yasufu Yamada, and Takashi Shibanuma, all of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan**

**PCT No. PCT/JP95/01122, § 371 Date Dec. 19, 1996, § 102(e) Date Dec. 19, 1996, PCT Pub. No. WO95/35271, PCT Pub. Date Dec. 28, 1995**

**PCT Filed Jun. 7, 1995, Ser. No. 750,836**

**Claims priority, application Japan, Jun. 20, 1994, 6-137275**

**Int. Cl.[6] C07C *17/20;19/08***

**U.S. Cl. 570—167** **9 Claims**

1. A process for preparing difluoromethane comprising reacting dichloromethane and hydrogen fluoride in a liquid phase in the presence of a fluorination catalyst, wherein the reaction pressure is between 1 and 10 kg/cm$^2$ab., and the reaction temperature is between 50° and 150° C., provided that the selected reaction temperature is a temperature at which hydrogen fluoride is not liquefied under the selected reaction pressure.



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**5,744,660**

## PRODUCTS OF TETRAFLUOROTHANES

**Lisa Bradley, Waterloo; Leslie Burgess, Runcorn; Richard Llewellwyn Powell, Tarporley; Geoffrey James Moore, Northwich; Paul Nicholas Ewing, Stockton Heath, and Kenneth Taylor, Great Sankey, all of England, assignors to Imperial Chemical Industries PLC, London, England**

**Continuation of Ser. No. 190,191, Jun. 6, 1994, abandoned. This application Dec. 21, 1995, Ser. No. 576,049**

**Claims priority, application United Kingdom, Jun. 10, 1992, 9212251; Jun. 10, 1992, 9212328; Jun. 10, 1992, 9212330; Aug. 24, 1992, 9217965; Aug. 24, 1992, 9217966**

**Int. Cl.[6] C07C *17/08***

**U.S. Cl. 570—169** **10 Claims**

1. A process for the production of 1,1,2,2-tetrafluoroethane which comprises contacting 1,1,2,2-tetrachloroethane with hydrogen fluoride in the vapour phase at a temperature in the range of about 200° C. to about 400° C. in the presence of a chromia based fluorination catalyst, the 1,1,2,2-tetrachloroethane being kept at a temperature below the reaction temperature before said contact and being vaporized for the reaction just prior to said contact in order to minimize the decomposition of 1,1,2,2-tetrachloroethane to trichloroethylene.

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**5,744,661**

## PURIFICATION OF 1, 1-DIFLUOROETHANE

**Matthew Hermes Luly, Lancaster; Addison Miles Smith, Amherst, and Kane David Cook, Eggertsville, all of N.Y., assignors to AlliedSignal Inc., Morristown, N.J.**

**Filed Oct. 7, 1996, Ser. No. 729,702**

**Int. Cl.[6] C07C *17/38***

**U.S. Cl. 570—177** **22 Claims**

1. A method of purifying 1,1-difluoroethane which comprises contacting a mixture comprising 1,1-difluoroethane and at least one unsaturated halocarbon having two carbon atoms with an effective amount of sulfuric acid under conditions sufficient to separate 1,1-difluoroethane from the at least one unsaturated halocarbon having two carbon atoms.

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**5,744,662**

## SEPARATION OF R-12 AND R-134A BY A LIQUID-LIQUID EXTRACTION TECHNIQUE

**Mohamad Karim Moallemi, 76-16 Grand Central Pkwy, π1A, Forest Hills, N.Y. 11375**

**Filed Apr. 17, 1996, Ser. No. 635,439**

**Int. Cl.[6] C07C *17/38***

**U.S. Cl. 570—180** **11 Claims**

1. A process for separating R-134a in a mixture with a refrigerant selected from the group consisting of R-12 and R-22 by extracting the R-12 or R-22 by a liquid-liquid extraction using a mineral oil.

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**5,744,663**

## PROCESS FOR PREPARING CYCLOPENTYL BROMIDE

**Heinz Landscheidt, Duisburg; Alexander Klausener, Köln; Matthias Stenger, Monheim, and Paul Wagner, Düsseldorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Jul. 5, 1996, Ser. No. 676,027**

**Claims priority, application Germany, Jul. 12, 1995, 195 25 356.6; Feb. 14, 1996, 196 05 402.8**

**Int. Cl.[6] C07C *21/00***

**U.S. Cl. 570—250** **8 Claims**

1. A substantially gaseous or gaseous process for the continuous preparation of cyclopentyl bromide from cyclopentene and hydrogen bromide, in which the reaction is carried out in the presence of a heterogeneous catalyst comprising passing the starting materials cyclopentene and hydrogen bromide in pure or diluted form in a substantially gaseous or gaseous state over the heterogeneous catalyst.

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**5,744,664**

## CYCLOOLEFIN COPOLYMERS (COCS) AS SUBSTRATE MATERIAL FOR LIQUID-CRYSTAL DISPLAYS

**Michael-Joachim Brekner, Frankfurt am Main, and Dietmar Jungbauer, Weiterstadt, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany**

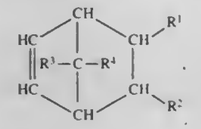
**Continuation of Ser. No. 140,737, Oct. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 87,024, Jul. 2, 1993, Pat. No. 5,371,158, which is a continuation of Ser. No. 791,566, Nov. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 548,083, Jul. 5, 1990, Pat. No. 5,087,677. This application Nov. 16, 1994, Ser. No. 341,306**

**Claims priority, application Germany, Oct. 24, 1992, 42 35 992.9**

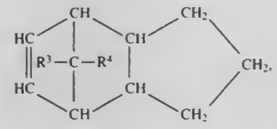
**Int. Cl.[6] C10L *1/16;* C08F *4/62;* C09K *19/38***

**U.S. Cl. 585—12** **8 Claims**

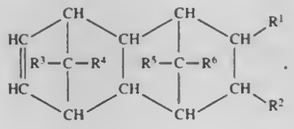
1. A substrate for liquid-crystal displays, which is formed from polymers of polycyclic olefins which are obtained by polymerization, without ring opening, of from 0.1 to 100% by weight, based on the total amount of monomers, of at least one monomer of the formula (I), (II), (III), (IV), (V) or (VI):



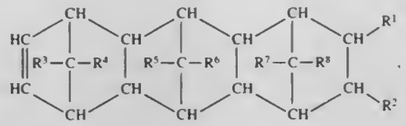
(I)



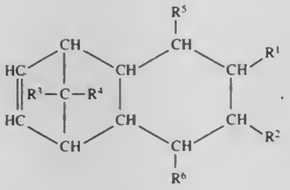
(II)



(III)



(IV)

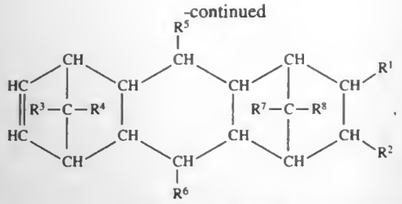


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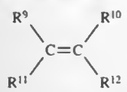
(VI)

in which $R^1$, $R^2$, $R^3$, $R^4$, $R^5$, $R^6$, $R^7$ and $R^8$ are identical or different and are a hydrogen atom or a $C_1$–$C_8$-alkyl radical, where identical radicals in the different formulae may have different meanings, from 0 to 99.0% by weight, based on the total amount of monomers, of a cycloolefin of the formula (VI)



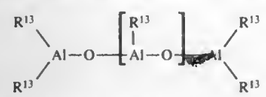
(VII)

in which n is a number from 2 to 10, and from 0 to 99.9% by weight, based on the total amount of monomers, of at least one acyclic 1-olefin of the formula (VIII)



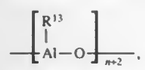
(VIII)

in which $R^9$, $R^{10}$, $R^{11}$ and $R^{12}$ are identical or different and are a hydrogen atom or a $C_1$–$C_8$-alkyl radical said polymerization being conducted prepared at a temperature of from 20° to 150° C. and at a pressure of from 0.01 to 64 bar, in the presence of a catalyst which comprises an aluminoxane of the formula (IX)



(IX)

for the linear type and/or of the formula (X)



(X)

for the cyclic type, where, in the formulae (IX) and (X), $R^{13}$ is a $C_1$–$C_8$-alkyl group, phenyl or benzyl, and n is an integer from 2 to 50, and a metallocene of the formula (XI)



(XI)

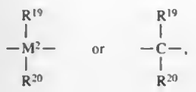
in which

$M^1$ is titanium, zirconium, hafnium, vanadium, niobium or tantalum,

$R^{14}$ and $R^{15}$ are identical or different and are a hydrogen atom, a halogen atom, a $C_1$–$C_{10}$-alkyl group, a $C_1$–$C_{10}$-alkoxy group, a $C_8$–$C_{10}$,-aryl group, a $C_8$–$C_{10}$-aryloxy group, a $C_2$–$C_{10}$-alkenyl group, a $C_7$–$C_{40}$-arylalkyl group, a $C_7$–$C_{40}$-alkylaryl group or a $C_8$–$C_{40}$-arylalkenyl group,

$R^{16}$ and $R^7$ are a monocyclic or polycyclic hydrocarbon radical which can form a sandwich structure with the central atom $M^1$,

$R^{18}$ is



or



$=BR^{19}$, $=AlR^{18}$, —Ge—, —Sn—, —O—, —S—, =SO, $=SO_2$, $=NR^{18}$, =CO, $=PR^{18}$ or $=P(Q)R^{19}$ where $R^{18}$ and $R^{20}$ are identical or different and are a halogen atom, a $C_1$–$C_{10}$-alkyl group, a $C_1$–$C_{10}$-fluoro-alkyl group, a $C_6$–$C_{10}$-fluoroaryl group, a $C_6$–$C_{10}$-aryl group, a $C_1$–$C_{10}$-alkoxy group, a $C_2$–$C_{10}$-alkenyl group, a $C_7$–$C_{40}$-arylalkyl group, a $C_8$–$C_{40}$-arylalkenyl group or a $C_7$–$C_{40}$-alkylaryl group, or $R^{19}$ and $R^{20}$ or $R^{19}$ and $R^{21}$, in each case with the atoms connecting them, form a ring, and $R^{19}$ or $R^{20}$ is a hydrogen atom and

$M^2$ is silicon, germanium or tin, wherein polymerization is carried out in the liquid cycloolefin monomer or cycloolefin monomer mixture or in an at least 95 percent by volume cycloolefin solution, the substituents $R^{16}$ and $R^{17}$ in the formula (XI) being different from one another, and wherein the yield stress of the polymer is from 40 to 66 MPa.

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**5,744,665**

**MALEIMIDE COPOLYMERS AND METHOD FOR INHIBITING HYDRATE FORMATION**

**Christine Ann Costello, Easton, Pa.; Enock Berluche, Phillipsburg, N.J.; Russell Harlan Oelfke, Houston, and Larry Dalton Talley, Friendswood, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.**

**Filed Jun. 6, 1996, Ser. No. 659,550**

**Int. Cl.[6] C07C** *9/00*

**U.S. Cl. 585—15** **32 Claims**

1. A method for inhibiting the formation of clathrate hydrates in a fluid having hydrate-forming constituents, comprising treating the fluid with an inhibitor comprising a substantially water soluble copolymer having at least two monomeric units, wherein one of the monomeric units is a maleimide unit and another of the monomeric units is a vinyl unit having a pendant group, the pendant group having two to twenty-one carbon atoms, at least one nitrogen atom and at least one oxygen atom; the copolymer having an average molecular weight between about 1,000 and about 6,000,000.

18. A method of inhibiting the formation of gas hydrates in petroleum fluids under conditions that would allow formation of gas hydrates in the petroleum fluids, wherein the method comprises:

introducing and dispersing into the petroleum fluids a sufficient amount of an inhibitor to inhibit the formation of gas hydrates; and

conveying the petroleum fluids;

wherein the inhibitor comprises a copolymer having at least two monomeric units, wherein one of the monomeric units is a maleimide unit and another of the monomeric units is a vinyl unit having a pendant group, the pendant group having two to twenty-one carbon atoms, at least one nitrogen atom and at least one oxygen atom; the copolymer having an average molecular weight between about 1,000 and about 6,000,000.

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**5,744,666**

**PROCESS FOR PREPARING AN ALKYNYL FULVENE GROUP CONTAINING COMPOUND AND SAID COMPOUND**

**M. Bruce Welch, Bartlesville, Okla.; Bernd Peifer, and Helmut G. Alt, both of Bayreuth, Germany, assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 434,807, May 4, 1995, Pat. No. 5,631,203. This application Dec. 6, 1996, Ser. No. 760,886**

**Int. Cl.[6] C07C** *13/00;45/00;15/12;13/465*

**U.S. Cl. 585—23** **12 Claims**

9. An alkynyl fulvene group containing compound represented by the formula

QR

wherein Q is a cyclopentadienyl-type group,

wherein R is a hydrocarbyl group containing from 3 to 20 carbon atoms



and is bonded to the cyclopentadienyl-type group by means of a carbon—carbon double bond, and

wherein Q or R contain a terminal alkynyl group;

wherein the cyclopentadienyl-type group is a cyclopentadienyl, substituted cyclopentadienyl, indenyl, substituted indenyl, tetrahydroindenyl, fluorenyl, substituted fluorenyl, or octahydrofluorenyl group, wherein the substituents are hydrocarbyl groups containing from 1 to 20 carbon atoms, alkoxy groups containing from 1 to 12 carbon atoms, silyl groups, alkyl halide groups where the alkyl contains from 1 to 12 carbon atoms, or halide.

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**5,744,667**

**PREPARATION OF TRIMETHYL PENTANES BY HYDROGEN TRANSFER**

**Regis J. Pellet, Croton-on-Hudson, N.Y., assignor to Texaco Inc., White Plains, N.Y.**

**Filed Dec. 31, 1996, Ser. No. 775,322**

**Int. Cl.[6] C07C** *5/02*

**U.S. Cl. 585—257** **4 Claims**

1. A method for producing a product paraffin having from 5 to 10 carbon atoms from a reaction mixture containing:

a) an acceptor olefin containing 5 to 10 carbon atoms and having the carbon backbone structure of said selected paraffin, and

b) a donor paraffin containing 3 to 10 carbon atoms and having a carbon backbone structure different from that of said selected paraffin; which process comprises contacting said reaction mixture with a heterogeneous catalyst comprising platinum supported on a lithium neutralized large pore boron beta zeolite containing from 0.1% up to 2 wt. % of platinum and 0.05 to 2 wt. % of boron under conditions effective to dehydrogenate at least a portion of said donor paraffin and to form said product paraffin.

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**5,744,668**

**PROCESS OF PRODUCING GASOLINE, DIESEL AND CARBON BLACK WITH WASTE RUBBERS AND/OR WASTE PLASTICS**

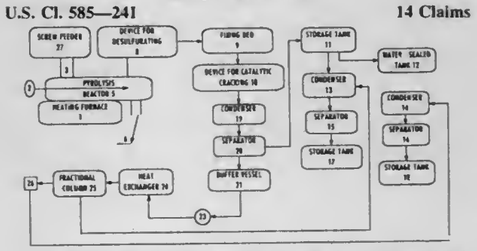
**Dinli Zhou, Beijing, and Li Xing, Zucun Chemical Plant, Fangshan District, Beijing 102403, both of China, assignors to Li Xing, Beijing, China**

**Filed May 15, 1996, Ser. No. 648,275**

**Claims priority, application China, Aug. 8, 1995, 95 1 07978.6**

**Int. Cl.[6] C07C** *1/00*

**U.S. Cl. 585—241** **14 Claims**




1. A process for producing gasoline, diesel and carbon black from a waste material comprising rubber and plastics waste, comprising the steps of:

(a) charging the waste material into a pyrolysis device and providing heat to the waste material to heat the same to a first temperature to obtain pyrolysis thereof;

(b) activating a stirrer mechanism in the pyrolysis device to discharge therefrom any carbon residue produced by the pyrolysis;

(c) passing gaseous products of the pyrolysis through a purification device to perform at least one of a first desulfurization, denitrogenation and dechlorination therein;

(d) passing the purified gaseous products into a first catalytic tracking device with a first catalyst to produce a catalytically cracked reaction product; and

(e) fractionating a portion of the catalytically cracked reaction product to separate gasoline and diesel therefrom.

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**5,744,669**

**PROCESS FOR THE CONVERSION OF A HALOGENATED ORGANIC STREAM CONTAINING TRACE QUANTITIES OF ORGANIC NITRATES**

**Tom N. Kalnes, La Grange; George R. Hibel, Schaumburg, and Chwu-Ching Jan, Elk Grove Village, all of Ill., assignors to UOP, Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 388,112, Feb. 13, 1995, Pat. No. 5,600,041, which is a continuation-in-part of Ser. No. 192,532, Feb. 7, 1994, abandoned, which is a continuation-in-part of Ser. No. 981,962, Nov. 25, 1992, abandoned. This application Jan. 30, 1997, Ser. No. 792,587**

**Int. Cl.[6] C07C** *4/00;17/38*

**U.S. Cl. 585—310** **9 Claims**

1. A process for the conversion of a stream comprising halogenated organic compounds and trace quantities of organic nitrates which process comprises:

(a) contacting said stream comprising halogenated organic compounds and said trace quantities of organic nitrates, and hydrogen with a selective hydrogenation catalyst comprising a refractory inorganic oxide and at least one metallic compound having hydrogenation activity and selected from the group consisting of Group VIB and VIII of the Periodic Table in a first hydrogenation zone at hydrogenation conditions including a pressure from about atmospheric to about 2000 psig, a temperature from about 60° F. to about 212° F., a liquid hourly space velocity from about 0.05 $hr^{-1}$ to about 20 $hr^{-1}$ and a hydrogen to feed ratio from about one to about 1,000 SCFB selected to produce at least one water-soluble nitrogen compound while minimizing the production of hydrogen halide compounds;

(b) contacting the resulting effluent from said first hydrogenation zone comprising hydrogen, halogenated organic compounds and water-soluble nitrogen compounds with an aqueous scrubbing solution to absorb at least a portion of said water-soluble nitrogen compounds to produce a first hydrogen-rich gaseous stream, an aqueous stream comprising water-soluble nitrogen compounds and a stream comprising halogenated organic compounds having less than about 20 ppm nitrogen;

(c) contacting said stream comprising halogenated organic compounds having less than about 20 ppm nitrogen with hydrogen in a second hydrogenation reaction zone operated at hydrogenation conditions selected to produce hydrogenated hydrocarbonaceous compounds and to generate at least one water-soluble hydrogen halide compound;

(d) contacting the resulting effluent from said second hydrogenation zone comprising hydrogenated hydrocarbonaceous compounds, a hydrogen-rich gas and at least one water-soluble hydrogen halide compound with a halide-lean absorber solution in an absorption zone;

(e) withdrawing a halide-rich absorber solution containing at least a portion of said water-soluble hydrogen halide compound from said absorption zone;

(f) withdrawing a stream comprising hydrogenated hydrocarbonaceous compounds and a hydrogen-rich gas from said absorption zone; and

(g) introducing said stream recovered in step (f) into a separation zone to produce a second hydrogen-rich gaseous stream and a hydrogenated hydrocarbonaceous stream.

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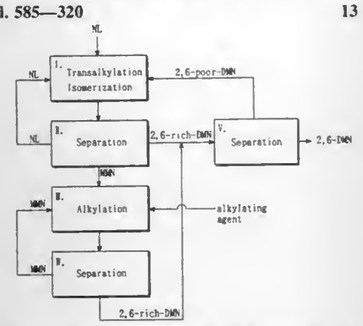


5,744,670

## PROCESS FOR PREPARING DIALKYLNAPHTHALENE

Masabiro Motoyuki; Koji Yamamoto, both of Kobe, Japan; John Paul McWilliams, Paulsboro, and Robert Glenn Bundens, Pennington, both of N.J., assignors to Kobe Steel, Ltd., Kobe, Japan, and Mobil Oil Corporation, Fairfax, Va.

Filed Jun. 10, 1996, Ser. No. 661,114
Int. Cl.[6] C07C *2/00;2/66;5/22*
U.S. Cl. 585—320 13 Claims




9. A process for producing 2,6-dialkylnaphthalene from a feedstock comprising isomers of dialkylnaphthalene and naphthalene comprising:

I) transalkylating isomers of dialkylnaphthalene and said naphthalene to produce monoalkylnaphthalene; and

isomerizing isomers of dialkylnaphthalene to produce a dialkylnaphthalene isomerizate;

II) separating the product of step I) into fractions of naphthalene, monoalkylnaphthalene and dialkylnaphthalene;

III) alkylating said fraction of monoalkylnaphthalene of step II) with an alkylating agent to produce dialkylnaphthalene;

IV) separating the product of step III) into fractions of monoalkylnaphthalene and dialkylnaphthalene; and

V) separating 2,6-dialkylnaphthalene from said fractions of dialkylnaphthalene of steps II) and IV),

wherein steps I) and III) are each conducted in the presence of a catalyst composition comprising a synthetic zeolite characterized by an X-ray diffraction pattern including interplanar d-spacing

12.36±0.4
11.03±0.2
8.83±0.14
6.18±0.12
6.00±0.10
4.06±0.07
3.91±0.07
3.42±0.06 Å

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5,744,671

## PROCESS FOR THE PREPARATION OF AN ALKYL BENZENE

Henri J. H. Beelen, Heerlen, Netherlands; Geert I. V. Bonte, Diepenbeek, Belgium; Michiel Cramwinckel, 's-Hertogenbosch; Henricus A. M. Duisters, Budel, both of Netherlands, and Johan G. D. Haenen, Hasselt, Belgium, assignors to DSM N.V., Heerlen, Netherlands

Filed May 5, 1995, Ser. No. 435,314
Claims priority, application Netherlands, Nov. 5, 1992, 9201932
Int. Cl.[6] C07C *5/367;5/42;5/41*
U.S. Cl. 585—430 6 Claims

1. A process for the preparation of an alkyl benzene comprising dehydrogenating a feed containing the corresponding alkenyl cyclohexene in the gas phase using a catalyst and in the presence of a diluent to obtain a reaction product comprising said alkylbenzene and an alkyl cyclohexane, wherein said feed contains alkenyl cyclohexene and alkyl cyclohexane in a molar ratio between 10:1 and 1:10 wherein at least a part of the alkyl cyclohexane in the reaction product is used as diluent.

5,744,672

## METHOD FOR INHIBITING THE POLYMERIZATION OF VINYL AROMATICS

Vladimir Anatolievich Kourbatov, Dorogomiloyskaya D. 5., Kv. 49, 112059 Moscow, Russian Federation; Nataljya Pavlovna Boreyko, Sohkolnii 6-34, 423550 Nischnekamsk, Russian Federation; Valerii Pavlovich Zouev, Chimikov 64, ap. 94, 423550 Nischnekamsk, Russian Federation, and Alexandr Grigorievich Llakumovich, Galee Str. 10, ap. 8, 420072 Kazan, Russian Federation

PCT No. PCT/IB94/00240, § 371 Date Jan. 23, 1996, § 102(e) Date Jan. 23, 1996, PCT Pub. No. WO95/03263, PCT Pub. Date Feb. 2, 1995
PCT Filed Jul. 18, 1994, Ser. No. 586,781
Claims priority, application Russian Federation, Jul. 23, 1993, RU-930-37814
Int. Cl.[6] C07C *5/333;7/20*
U.S. Cl. 585—440 10 Claims

1. A process for inhibiting the polymerization of a vinyl aromatic compound comprising adding to the vinyl aromatic compound an effective amount of an inhibitor system comprising:

a) 3,5-di-tert-butyl-4-hydroxy-N,N-dimethylbenzyl amine:

b) an acid component selected from the group consisting of carboxylic acids, synthetic fatty acids, anhydrides of an organic acid, and inorganic acids; and

c) air , wherein a), b) and c) are present in the weight ratio of 1:1 to 0.05:0.05 to 15.

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5,744,673

## ACTIVATED ZEOLITE BETA AND ITS USE FOR HYDROCARBON CONVERSION

Gary W. Skeels, Bethlehem, N.H., and Edith M. Flanigen, White Plains, N.Y., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 395,251, Feb. 28, 1995, Pat. No. 5,659,099, which is a continuation-in-part of Ser. No. 96,808, Jul. 26, 1993, Pat. No. 5,393,718, which is a division of Ser. No. 767,457, Sep. 30, 1991, Pat. No. 5,258,570, which is a continuation-in-part of Ser. No. 596,157, Oct. 11, 1990, Pat. No. 5,095,169, which is a continuation-in-part of Ser. No. 366,263, Jun. 12, 1989, abandoned, which is a division of Ser. No. 175,332, Mar. 30, 1988, abandoned. This application Dec. 20, 1996, Ser. No. 770,954
Int. Cl.[6] C07C *5/52*
U.S. Cl. 585—474 3 Claims

1. A process for the disproportionation of an alkylaromatic feedstock comprisiong one or both of toulene and trimethylbenzenes comprising contacting the feedstock at akylaromatic-disproportionation conditions with an activated zeolite beta catalyst having a concentration of hydroxoaluminum cations corresponding to at least 0.9 milliequivalents of NaOH per gram of zeolite beta and a concentration of hydronium cations correspondingto less than 0.1 milliequivalents of NaOH per gram of zeolite beta to obtain an disproportionated akylaromatic product containing a greater proportion of xylenes than in the feedstock.

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5,744,674

## CATALYST AND PROCESS FOR THE CONVERSION OF HEAVY AROMATICS TO LIGHT AROMATICS

Shouxi Gui; Yuzhi Hao; Yanqing Li; Zhenhua Jing; Haohui Gu; Zhanqiao Liang, and Baoyu Cheng, all of Beijing, China, assignors to China Petrochemical Corporation, and Research Institute of Petroleum Processing, both of Beijing, China

Filed Feb. 6, 1996, Ser. No. 597,157
Int. Cl.[6] C07C *4/12*
U.S. Cl. 585—489 12 Claims

1. A catalyst comprising from 30 to 70 wt % of zeolite ZSM-5 and from 70 to 30 wt % of γ- or η-$Al_2O_3$ as a carrier, and from 0.1 to 0.5 wt % of Re, from 0.1 to 0.5 wt % of Sn and from 0.05 to 0.3 wt % of Pt or from 0.2 to 0.8 wt % of Pd based on the weight of the carrier supported on the carrier.

4. A method for preparing the catalyst of claim 1, comprising the steps of:

(a) mixing a Na-ZSM-5 zeolite with $Al_2O_3$ or its precursor;

(b) adding a solution of nitric acid to the mixture, followed by mixing, kneading, extruding and calcining to provide a carrier;

(c) performing an ion exchange of the carrier with a solution of ammonium salt such that an exchanged sodium cation content in the ZSM-5 zeolite is above 90%; and

(d) impregnating the carrier with a solution of a mixture of precursors of the Re, Sn and Pt or Pd, followed by calcination.

10. A method for preparing benzene, toluene and xylene from $C_9^+$ heavy aromatics with the catalyst of claim 1, by contacting the $C_9^+$ heavy aromatics with the catalyst at a reaction temperature of 350° to 450° C., a pressure of from 0.5 to 3.5 MPa, a weight hourly space velocity of from 1 to 5 $h^{-1}$ and a hydrogen/hydrocarbon ratio (v/v) of from 500 to 1200.



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5,744,675

## PROCESS FOR PREPARING AN OLIGOMER MIXTURE FROM α,ω-DIOLEFINES AND MIXTURE PREPARD.

Emmanuel Fiolitakis, Duelmen; Hans Guenther Wey, Muelheim/Ruhr, and Jaroslaw Monkiewicz, Rheinfelden, all of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Dec. 13, 1995, Ser. No. 571,673
Claims priority, application Germany, Mar. 8, 1995, 195 08 088.2
Int. Cl.[6] C10M *107/10;* C07C *2/30*
U.S. Cl. 585—506 15 Claims

1. A process for preparing an oligomer mixture from α,ω-diolefins in the presence of an organoaluminum compound as a catalyst in the liquid phase, said process comprising:

a) reacting said α,ω-diolefins with at least two successive reaction passes;

b) separating reaction product of each pass into a first part which contains at least, based on the total content and the reaction product, more than 95% by weight of the monomeric α,ω-diolefins and their dimers and more than 60% by weight of their trimers, and into at least a second part which contains at least the tetramers and higher oligomer, at least a part of the separated monomeric α,ω-diolefins, dimers and trimers from the first part being a part of the starting materials for a subsequent pass such that the total of the terminal double bonds remains constant or almost constant in each pass; and

c) increasing the catalyst concentration from pass to pass by up to 20% by weight based on the weight of the catalyst in the preceding pass; and

wherein said reaction has a reaction characteristic value defined as (catalyst concentration reaction time) between about 0.10 kmol/$m^3$·h and 0.16 kmol/$m^3$·h for at least the first pass.

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5,744,676

## OLEFIN OLIGOMERIZATION PROCESS

Kevin J. Theriot, 7565 Sheringham Ave., Baton Rouge, La. 70808, and Robert G. Irwin, 15010 Ridgewood Ave., Prairieville, La. 70869

Filed Feb. 26, 1996, Ser. No. 606,669
Int. Cl.[6] C07C *2/08*
U.S. Cl. 585—510 22 Claims

1. A process of preparing alpha-olefin oligomer enriched in dimer which comprises contacting an oligomerizable predominantly linear alpha-olefin monomer with a catalyst system comprising boron trifluoride, a protic promoter, and a modifier which is (a) at least one 1,3-dioxolane, or (b) at least one 1,3-dioxane, or (c) a combination of (a) and (b), in an amount within the range of from about 0.1 to about 10 moles of modifier per mole of promoter, at a temperature in the range of 0° to 200° C. and a pressure in the range of atmospheric to 100° psig, to form an oligomerization product mixture containing at least about 50% of the dimer of the aforesaid linear alpha-olefin, and terminating the oligomerization.

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5,744,677

## ETHYLENE OLIGOMERIZATION

Feng-Jung Wu, Baton Rouge, La., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 777,137, Oct. 16, 1991, abandoned. This application Jul. 14, 1992, Ser. No. 914,489
Int. Cl.[6] C07C *2/36*
U.S. Cl. 585—512 16 Claims

1. A process for preparing α -olefins, said process comprising oligomerizing ethylene in the presence of a catalyst comprising (a) a preformed chromium complex containing a coordinating polydentate ligand which inhibits ethylene polymerization and, (b) an aluminoxane, in an organic solvent so as to provide a chain growth product of $C_4$ to $C_{30}$ α-olefins having a Schultz-Flory distribution, which product is enriched in 1-hexene said polydentate ligand being a cyclic polyamine ligand represented by A—NR—B, where R is a $C_1$ to $C_{10}$ alkyl or a $C_6$ to $C_{20}$ aryl group, A represents the number of atoms in the ring and is an integer from 9 to 18 and B represents the number of nitrogen atoms in the ring and is an integer from 3 to 6, or a poly(pyrazolyl)borate anion of the type $RB(P_z)_3$ where R is a $C_1$ to $C_{10}$ alkyl group and $P_z$ is a pyrazole or a substituted pyrazole.

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5,744,678

## OLIGOMERIZATION CATALYSTS AND PROCESS USING THE SAME FOR THE PRODUCTION OF OLEFINIC OLIGOMERS

Fuyuki Aida; Takashi Nakano; Yoshio Tajima, and Kazuo Matsuura, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

PCT No. PCT/JP96/00532, § 371 Date Nov. 1, 1996, § 102(e) Date Nov. 1, 1996, PCT Pub. No. WO96/27440, PCT Pub. Date Sep. 12, 1996
PCT Filed Mar. 6, 1996, Ser. No. 737,077
Claims priority, application Japan, Mar. 6, 1995, 7-083049; Apr. 5, 1995, 7-115344; Jul. 20, 1995, 7-206607; Jul. 20, 1995, 7-206608; Sep. 5, 1995, 7-251760; Sep. 5, 1995, 7-251761; Sep. 8, 1995, 7-230984; Sep. 8, 1995, 7-230985
Int. Cl.[6] C07C *2/18;2/22*
U.S. Cl. 585—513 18 Claims

1. An oligomerization catalyst for olefins which comprises a reaction product resulting from contacting the following components (A), (B), (C) and (D):

component (A) which is at least one nickel compound of the group consisting of a nickel salt of an organic acid, a nickel salt of an inorganic acid, and a nickel complex;

component (B) which is at least one organophosphoric compound of the formula

$$PX^1X^2X^3 \quad (I)$$

wherein $X^1$, $X^2$ and $X^3$ each are a halogen atom, a hydrogen atom or a $C_1$–$C_{12}$ hydrocarbon residual group;

component (C) which is at least one organoalumium compound; and

component (D) which is at least one compound selected from the group consisting of

(a) at least one carbon-halogen bond-containing compound of any of the formulae


(X)

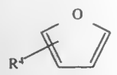
VOL 1209 ISS 4 AP 28 1998 UMI



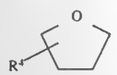
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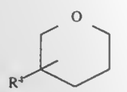
(XI)



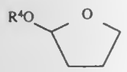
(XII)



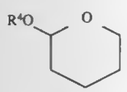
(XIII)



(XIV)



(XV)



(XVI)

$R^4-O-R^8$ (XVII)

$R^4-O-SiR^8_3$ (XVIII)

$R^4R^9C(OR^8)_2$ (XIX)

$R^4R^9C(OR^4)(OR^8)$ (XX)

$R^4C(OR^8)_3$ (XXI)

$R^8C(OR^4)(OR^8)_2$ (XXII)

$R^4-R^{10}$ (XXIII)

wherein $R^4$ is a $C_1$–$C_{30}$ halogenated hydrocarbon group, $R^8$ is $R^4$ or a $C_1$–$C_{30}$ hydrocarbon group, $R^9$ is the same as $R^8$ or a hydrogen atom and $R^{10}$ is a hydrogen or halogen atom;

(b) oxoacid and salts thereof; and

(c) compounds of any of the formulae

$QX^4_n$ (II)

$QR_n$ (III)

$QR'_n$ (IV)

$QX^4_iR_m$ (V)

$QX^4_iR'_m$ (VI)

$QR_iR'_m$ (VII)

$Q^1(BR_4)_p$ (VIII)

and

$R^*(BR_4)$ (IX)

wherein Q is an element of the group consisting of Mg, Ti, Zr, B, and Sn; $Q^1$ is an element of the group consisting of Li, Na, K, Ca, and Zn; $X^4$ is a halogen or hydrogen atom; R is a $C_1$–$C_{12}$ hydrocarbon group; R' is a $C_1$–$C_{12}$ oxygen-containing hydrocarbon group; $R^*$ is a $C_1$–$C_{20}$ hydrocarbon group or an ammonium group; n is a valence of Q; l and m are natural numbers that satisfy n=l+m; and p is a valence of $Q^1$.

**15**. A process of producing olefinic oligomers by reacting alpha-olefins in the presence of a catalyst containing a product of reaction between each of the components (A) through (D) defined in claim **1**.

**5,744,679**

**USING WATER CONCENTRATION TO CONTROL ETHYLENE OLIGOMERIZATION**

**Richard E. Marinangeli, Arlington Heights, and Timothy A. Brandvold, Buffalo Grove, both of Ill., assignors to UOP LLC, Des Plaines, Ill.**

**Filed Dec. 27, 1996, Ser. No. 775,051**

**Int. Cl.[6] C07C** *2/08;2/22;2/16;2/18*

**U.S. Cl. 585—526** **7 Claims**

**1**. In a process for continuous oligomerization of ethylene to form linear alpha-olefins by contacting, at conditions effective for linear alpha olefin formation, gaseous ethylene with a transition metal catalyst system dissolved in a polar organic liquid, where said transition metal catalyst system is the reaction product of a transition metal compound, a catalyst activator, and an organo-phosphorus sulfonate ligand, the improvement wherein said polar organic liquid contains from about 1 to about 6 weight percent water.

**5,744,680**

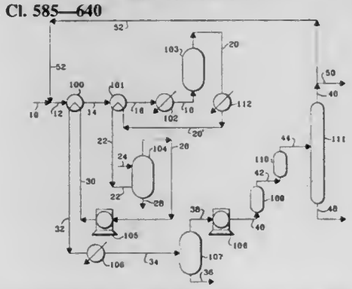
**PROCESS FOR PRODUCING LIGHT OLEFINS**

**Robert C. Mulvaney, III, Arlington Heights, and Terry L. Marker, Warrenville, both of Ill., assignors to UOP, Des Plaines, Ill.**

**Filed Aug. 10, 1995, Ser. No. 513,649**

**Int. Cl.[6] C07C** *1/20*

**U.S. Cl. 585—640** **22 Claims**



**1**. A process for the production of light olefins comprising olefins having from 2 to 4 carbon atoms per molecule from an oxygenated feedstock, having from about 1 to about 4 carbon atoms per molecule, said oxygenated feedstock comprising at least one of the group consisting of an alcohol, an ether, an aldehyde, a ketone, and mixtures thereof, said process comprising:

a) passing the feedstock to a reaction zone at reaction conditions effective to produce said light olefins and therein contacting said feedstock in the presence of a diluent with an ELAPO molecular sieve catalyst selective for the conversion of at least a portion of said feedstock into said light olefins and water to produce a reactor effluent comprising methane and said light olefins;

b) passing said reactor effluent to a separation zone to provide a light hydrocarbon fraction comprising methane and a product fraction comprising light olefins; and, c) recycling at least a portion of said light hydrocarbon fraction to said reaction zone as said diluent.

**5,744,681**

**PARAFFIN ALKYLATION PROCESS**

**Jean-François Joly, Lyon; Alain Forestiere, Vernaison; Jean-Luc Duplan, Irigny, and Eric Benazzi, Montesson, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France**

**Filed Mar. 22, 1996, Ser. No. 620,456**

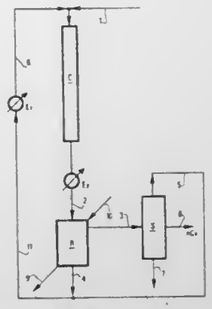
**Claims priority, application France, Mar. 24, 1995, 95 03590; Mar. 24, 1995, 95 03592**

**Int. Cl.[6] C07C** *2/56;2/58;2/60*

**U.S. Cl. 585—709** **24 Claims**

**1**. A process for the alkylation of at least one isoparaffin by at least one olefin in the presence of at least one solid acidic catalyst,





which comprises bringing a major portion of the olefin into contact with the catalyst in a complexing zone to form an olefin-catalyst complex, in the presence of the isoparaffin, before the complex is sent to at least one alkylation zone.

**5,744,682**

**ALKYLATION PROCESS USING A CATALYST WITH NON-UNIFORM METAL DISPERSION**

**Thomas K. McBride, Jr., Arlington Heights; Maureen L. Bricker, Buffalo Grove, and Karl Z. Steigleder, Glen Ellyn, all of Ill., assignors to UOP, Des Plaines, Ill.**

**Division of Ser. No. 270,291, Jul. 5, 1994, abandoned. This application May 30, 1995, Ser. No. 454,479**

**Int. Cl.[6] C07C** *2/58;2/56;* **B01J** *23/58*

**U.S. Cl. 585—728** **11 Claims**

**1**. A process for alkylating a $C_2$–$C_6$ alkene with a $C_4$–$C_6$ alkane to form an alkylate comprising reacting in the liquid phase the alkene with the alkane under alkylation conditions in the presence of a catalyst comprising a particulate refractory inorganic oxide support having dispersed thereon a first component which is at least one Group VIII metal, a second component which is a metal cation and a third component which is the reaction product of a metal halide and bound surface hydroxyl groups of said refractory inorganic oxide; the catalyst characterized in that at least 40 percent of the first component present on the catalyst is located within a band of about 100 to about 300 micrometers beginning at the surface and extending toward the center of the catalyst particle, the second component is uniformly distributed throughout the particle and present in an amount from about 0.1 to about 10 wt. %.

**5,744,683**

**PROCESS FOR CONTINUOUS REACTION AND DEPARATION USING REACTIVE CHROMATOGRAPHY**

**Hemant W. Dandekar, Roselle; Gregory A. Funk, Carol Stream; Simon H. Hobbs, Chicago; Masami Kojima, Mount Prospect; Ralph D. Gillespie, Gurnee; Herman A. Zinnen, Evanston, and Charles P. McGonegal, Addison, all of Ill., assignors to UOP, Des Plaines, Ill.**

**Filed Jun. 18, 1996, Ser. No. 666,713**

**Int. Cl.[6] C07C** *5/13;7/12*

**U.S. Cl. 585—736** **22 Claims**

**1**. A process for the gas phase isomerization of an alkane to an isomerized product, where

i) said alkane is n-butane and the isomerized product is 2-methylpropane, or

ii) said alkane is n-pentane and the isomerized product is 2-methylbutane or 2,2-dimethylpropane, or

iii) said alkane has from 6 up to about 8 carbon atoms with no more than one methyl branch and the isomerized product has at least two methyl branches,

said process comprising:

a. continuously introducing, under conditions effective to isomerize the alkane to the isomerized product, the alkane and a desorbent into a simulated moving bed of a mixture of solids where the mixture of solids contains a catalyst effective to isomerize the alkane and an adsorbent effective to selectively adsorb the alkane relative to the isomerized product;

b. isomerizing at least a portion of the alkane to form at least one isomerized product in a zone of the simulated moving bed with concurrent separation of the isomerized products formed;

c. desorbing a portion of the alkane from the adsorbent using the desorbent in a first subsequent zone of the simulated moving bed;

d. desorbing additional alkane from the adsorbent using a mixture of desorbent and isomerized products in a second subsequent zone of the simulated moving bed devoid of fluid flow, and continuing the isomerization of the desorbed alkane; and

e. removing and collecting the isomerized products from the simulated moving bed.

**5,744,684**

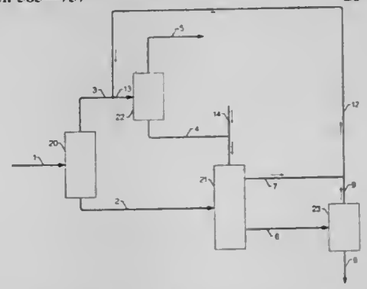
**PROCESS FOR ALKANE ISOMERIZATION USING REACTIVE CHROMATOGRAPHY AND REACTIVE DESORBENT**

**Herman A. Zinnen, Evanston; Charles P. McGonegal, Addison; Hemant W. Dandekar, Roselle; Gregory A. Funk, Carol Stream, and Ralph D. Gillespie, Gurnee, all of Ill., assignors to UOP, Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 333,683, Nov. 3, 1994, Pat. No. 5,530,173. This application Jun. 18, 1996, Ser. No. 666,699**

**Int. Cl.[6] C07C** *5/22*

**U.S. Cl. 585—737** **20 Claims**



**1**. A gas phase process of isomerizing a mixture of alkane reactants comprising pentanes and at least one alkane having from 6 to about 8 carbon atoms and no more than one methyl branch, said process comprising:

a. separating the mixture in a first separation zone to produce two streams, a stream enriched in alkanes having from 6 to about 8 carbon atoms and a stream enriched in pentanes;

b. separating the stream enriched in pentanes in a second separation zone to produce a stream predominately comprising n-pentane and a stream predominately comprising branched pentanes;

c. passing the stream enriched in alkanes having from 6 to about 8 carbon atoms and the stream enriched in n-pentane to an isomerization zone of a simulated moving bed of a mixture of solids wherein the mixture of solids contains a platinum on tungstated zirconia catalyst effective to isomerize the alkane and an adsorbent effective to selectively adsorb the alkane relative to the isomerized product, to produce a stream containing branched pentanes, n-pentane, and multi-methyl-branched alkanes having from 6 to about 8 carbon atoms, and a stream containing branched pentanes and n-pentane;

d. separating the stream containing branched pentanes, n-pentane, and multi-methyl-branched alkanes having from 6 to about 8 carbon atoms in a third separation zone to produce a stream enriched in multi-methyl-branched alkanes having from 6 to about 8 carbon atoms and a stream enriched in branched pentanes and n-pentane; and

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e. collecting the stream predominately comprising branched pentanes from the second separation zone and the stream enriched in multi-methyl-branched alkanes having from 6 to about 8 carbon atoms from the third separation zone.

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5,744,685

## UNSATURATED HYDROCARBON SEPARATION AND RECOVERY PROCESS

**Robert B. Wilson, Jr., Palo Alto, Calif.; Karen Meyer, Cincinnati, Ohio, and Marianna F. Asaro, Belmont, Calif., assignors to Amoco Corporation, Chicago, Ill.**

**Filed Oct. 15, 1996, Ser. No. 732,514**

**Int. Cl.[6] C07C** *7/00;7/10;7/152*

**U.S. Cl. 585—811** **17 Claims**

1. A process for the separation and recovery of at least one unsaturated hydrocarbon from a mixture thereof with at least one other component in a multi-component feed gas, comprising:

(a) contacting the feed gas and an acidic aqueous liquid solution of a single cubane-type cluster of the formula

$$[(H_2O)_xMo_3S_4Pd\ X]X_3$$

wherein X is a halide ion, and at least 2 molar in a hydrohalic acid as a complexation agent, under conditions such that the aforesaid complexation agent has a substantially greater affinity to form, and does selectively form, at least one water-soluble complex with the at least one unsaturated hydrocarbon than with the aforesaid at least one other component, such that a substantial portion of the aforesaid at least one unsaturated hydrocarbon thereby dissolves in the aqueous solution;

(b) separating the resulting aqueous solution from the feed gas;

(c) contacting the aqueous solution from step (b) with a gas phase under conditions such that the aforesaid at least one complex dissociates in the aqueous solution and the resulting at least one dissociated unsaturated hydrocarbon is stripped from the aqueous solution into the gas phase; and

(d) separating the resulting gas phase from the aqueous solution.

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5,744,686

## PROCESS FOR THE REMOVAL OF NITROGEN COMPOUNDS FROM AN AROMATIC HYDROCARBON STREAM

**Gregory J. Gajda, Mt. Prospect, Ill., assignor to UOP, Des Plaines, Ill.**

**Filed Sep. 20, 1995, Ser. No. 530,979**

**Int. Cl.[6] C07C** *7/12;7/00;* **C25D** *3/34*

**U.S. Cl. 585—823** **25 Claims**

1. A process for the removal of nitrogen compounds from an aromatic hydrocarbon stream comprising nitrogen compounds and mixtures thereof with water, said process comprising passing said stream to an adsorption zone containing an adsorbent selective for the adsorption of said nitrogen compounds, said adsorbent comprising a non-acidic molecular sieve having a silica to alumina ratio in excess of about 100 and an average pore size less than about 5.5 Angstroms and withdrawing a treated effluent being essentially free of said nitrogen compounds.

3. The process of claim 1 wherein said aromatic hydrocarbon stream comprises benzene.

5,744,687

## PROCESS FOR RECOVERING ALKENES FROM CRACKED HYDROCARBON STREAMS

**Ramakrishnan Ramachandran, Allendale, and Loc H. Dao, Bound Brook, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.**

**Continuation-in-part of Ser. No. 159,028, Nov. 29, 1993, abandoned. This application Apr. 22, 1994, Ser. No. 231,559**

**Int. Cl.[6] C07C** *7/13*

**U.S. Cl. 585—829** **24 Claims**

1. A process for the recovery of alkene selected from ethylene, propylene and mixtures of these from a cracked hydrocarbon stream comprising the steps:

(a) separating a gaseous stream from the cracked hydrocarbon stream;

(b) cooling the gaseous stream, thereby producing a condensed hydrocarbon stream and a gas stream comprised predominantly of hydrogen and methane and containing small amounts of alkene and alkane selected from ethane, propane and mixtures of these;

(c) subjecting said gas stream to adsorption at a temperature above about 50° C. in an adsorption vessel containing an adsorbent which selectively adsorbs alkenes, selected from the group consisting of 4A-zeolite, 5A zeolite, 13X-zeolite and mixtures of these, thereby producing a nonadsorbed hydrogen- and alkane-enriched component and an adsorbed alkene-enriched component; and

(d) desorbing said alkene-enriched component from said adsorbent by reducing the pressure in said adsorption vessel, by raising the temperature in said adsorption vessel or by reducing the pressure and raising the temperature in said adsorption vessel.

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5,744,688

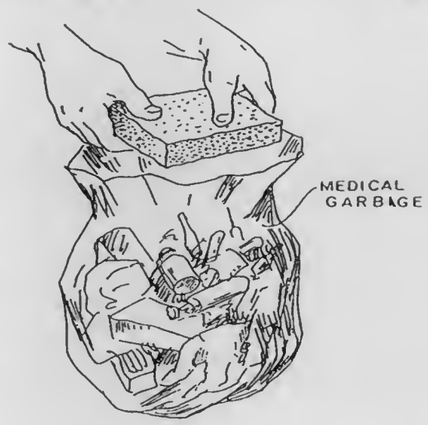
## QUALITY CONTROL FOR BIOLOGICAL DECONTAMINATION AND STERILIZATION

**Paula Vance, and Alice Weissfeld, both of Houston, Tex., assignors to Microbiology Specialists, Inc., Houston, Tex.**

**Filed Oct. 3, 1996, Ser. No. 725,612**

**Int. Cl.[6] C07B** *33/00*

**U.S. Cl. 588—205** **10 Claims**




1. A method for quality control of infectious waste decontamination processes, which involve a step of disrupting the waste in the treatment process, comprising the steps:

a) providing a destruction resistant medium seeded with indicator microorganisms at a given number per unit, said microorganisms being homogeneously seeded throughout the entirety of said medium, such that the number of microorganisms per given unit of medium is substantially constant throughout the entirety of the medium;

b) adding said medium to infectious waste to be treated;

c) treating said waste with at least one step of physically disrupting the waste;

d) during the treatment of said waste, physically severing said medium into at least two separate pieces;

e) recovering at least a portion of said medium from said treated waste; and

f) testing for the presence of viable indicator microorganisms on the treated medium.

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5,744,689

## TREATING MATERIAL FOR POLYCHLOROBIPHENYL-CONTAINING OILS

**Yoshio Taguchi, Tokyo, Japan, assignor to Hiromi Taguchi, Tokyo, Japan**

**Filed Oct. 28, 1996, Ser. No. 738,477**

**Int. Cl.[6] A62D** *3/00*

**U.S. Cl. 588—207** **13 Claims**

1. A process for treating a polychlorobiphenyl-containing oil comprising contacting the polychlorobiphenyl-containing oil with a composition having components as follows:

i) calcium oxide having deposited thereon an oil that renders the calcium oxide hydrophobic;

ii) a decomposing agent for dehalogenating the polychlorobiphenyl-containing oil;

iii) a porous material, containing at least silicon dioxide and magnesium, for absorbing the polychlorobiphenyl-containing oil, said porous material having ion exchange capability, said porous material containing water in an amount sufficient to initiate an exothermic reaction with the calcium oxide to elevate the temperature of a mixture resulting from contacting the polychlorobiphenyl-containing oil with the composition;

said components being present in the composition in respective amounts and said contacting being effected for a time sufficient to cause (a) dehalogenation of the polychlorobiphenyl-containing oil with the concomitant formation of carbon atoms and hydrogen atoms; (b) initiation of said exothermic reaction resulting in an exchange of ions; and (c) formation of the mixture into a powder sludge.

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5,744,690

## METHOD OF INCINERATING COMBUSTIBLE WASTES AND CHLORINE SCAVENGER

**Naruo Yokoyama; Satoru Saito, both of Hiroshima; Suminori Tanaka, Kagawa-ken; Masaharu Nishihara, Marugame, and Minoru Ohsugi, Hiroshima, all of Japan, assignors to Toda Kogyo Corporation, Japan**

**Continuation of Ser. No. 528,213, Sep. 13, 1995, abandoned. This application Jun. 25, 1997, Ser. No. 882,352**

**Claims priority, application Japan, Sep. 14, 1994, 6-219696; Mar. 29, 1995, 7-097931**

**Int. Cl.[6] B01D** *53/68*

**U.S. Cl. 588—209** **22 Claims**

8. A chlorine-scavenger comprising:

100 parts by weight of a calcium compound, and particles selected from the group consisting of

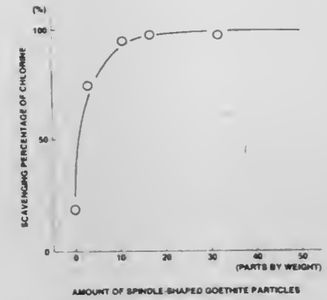
(a) iron oxide particles selected form the group consisting of hematite particles, magnetite particles, maghemite particles and mixed particles thereof,

(b) ferric oxide hydroxide particles selected from the group consisting of goethite particles, akaganeite particles, lepidocrocite particles and mixed particles thereof, and

(c) mixtures of (a) and (b),

the amount of the iron oxide particles, ferric oxide hydroxide particles or their mixture of being 2 to 100 parts by weight based on 100 parts by weight of the calcium compound,

wherein the average particle size of the iron oxide particles is 0.01 to 1.0 μm in the case of granular particles, the average major axial diameter of the iron oxide particles is 0.1 to 0.5 μm in the case of spindle-shaped particles, the average major axial diameter of the iron oxide particles is 0.1 to 0.5 μm in the case of acicular particles, and the average major axial diameter of the ferric oxide hydroxide particles is 0.08 to 0.5 μm.




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5,744,691

## METHOD FOR TREATING SOLIDS CONTAMINATED WITH HYDROCARBONS

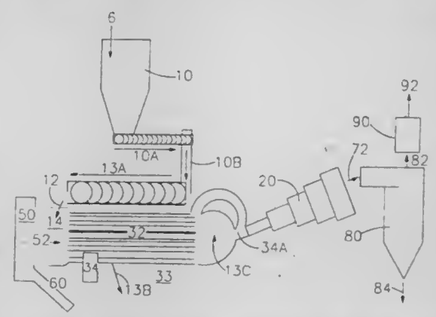
**Siegfried E. Tischler, Jakarta Selatan, Indonesia, assignor to Successful Venture Enterprises, Inc., Virgin Islands (Br.)**

**Continuation-in-part of Ser. No. 382,980, Feb. 3, 1995, Pat. No. 5,625,119, which is a continuation-in-part of Ser. No. 68,512, May 27, 1993, Pat. No. 5,414,205. This application Nov. 15, 1996, Ser. No. 751,175**

**Claims priority, application Indonesia, Jun. 22, 1992, P-003381**

**Int. Cl.[6] A63D** *3/00*

**U.S. Cl. 588—214** **13 Claims**




1. A method for treating solids contaminated with organic compounds comprising the steps of:

injecting the contaminated solids into a preheating chamber;

producing a stream of air into the preheating chamber, the air being preheated to a sufficient temperature to initiate spontaneous combustion of a portion of the organic compounds;

combining the contaminated solids and the preheated air at a first end of a cocurrent flow fluidized bed oxidizer;

spontaneously combusting a portion of the organic compounds while generating heat for oxidizing substantially all of the remaining organic compounds and producing a mixture of treated solids and process gas and while pneumatically conveying the solids and process gas in cocurrent flow at a substantially constant velocity through the fluidized bed oxidizer in a generally horizontal direction;

pneumatically removing the mixture of treated solids and process gas from a second end of said fluidized bed oxidizer; and

separating the treated solids from the process gas.

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5,744,692

**NUCLEOTIDE SEQUENCES CODING AN ENDOPOLYGALACTURONASE INHIBITOR**

**Felice Cervone; Giulia De Lorenzo; Giovanni Salvi, all of Rome, Italy; Peter Albersheim, Athens, Ga.; Alan Darvill, Athens, Ga., and Carl Bergmann, Athens, Ga., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.**

**PCT No. PCT/IT92/00158, § 371 Date Sep. 19, 1994, § 102(e) Date Sep. 19, 1994, PCT Pub. No. WO93/11241, PCT Pub. Date Jun. 10, 1993**

**PCT Filed Dec. 4, 1992, Ser. No. 244,646**

**Claims priority, application Italy, Dec. 6, 1991, RM91A0915**

**Int. Cl.[6] A01H** *5/00;* **C12N** *15/29;15/84;15/70;15/81*

**U.S. Cl. 800—205** **35 Claims**

1. An isolated DNA fragment, or the complement thereof, encoding a protein having an inhibiting activity for a fungal polygalacturonase enzyme derived from Phaseolus plants, parts thereof or cultured plant cells of a plant of the genus Phaseolus.

12. A plant transformed with a DNA fragment according to claim 1 to thereby produce a PGIP protein having an inhibiting activity for a fungal PG enzyme.

5,744,693

**PLANTS HAVING ALTERED FLORAL DEVELOPMENT**

**Elliot M. Meyerowitz, Pasadena; Martin F. Yanofsky, San Diego, both of Calif., and Hong Ma, Huntington, N.Y., assignors to California Institute of Technology, Pasadena, Calif.**

**Continuation of Ser. No. 293,278, Aug. 19, 1994, abandoned, which is a continuation of Ser. No. 956,694, Oct. 2, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 460,512**

**Int. Cl.[6] A01H** *4/00;* **C12N** *5/14;15/82*

**U.S. Cl. 800—205** **25 Claims**

1. A dicotyledonous plant comprising at least one cell transformed with a vector comprising a plant agamous nucleic acid wherein a portion of the coding region of said agamous nucleic acid contains at least 15 nucleotides encoding a portion of the DNA binding domain extending from amino acid residues 51 through 109 of SEQ ID NO. 2 herein and wherein said plant has an Ag or AP2 phenotype.



5,744,694

**GELLED COMPOSITIONS CONTAINING ORGANIC LIQUIDS**

**Ferruccio Berté, and Gianmarco Polotti, both of Bergamo, Italy, assignors to 3V Inc., Weehawken, N.J.**

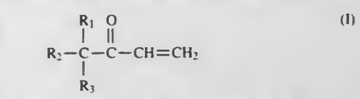
**Filed Mar. 18, 1997, Ser. No. 819,831**

**Claims priority, application Italy, Feb. 7, 1997, M197A0249**

**Int. Cl.[6] C10L** *7/02;7/04*

**U.S. Cl. 44—266** **18 Claims**

1. A thickened or gelled composition comprising 1) an organic liquid, 2) a crosslinked polymer of a) one or more olefinically unsaturated carboxylic acids, b) one or more vinyl esters of trialkylacetic acids with highly branched structure of formula (1)



(I)

wherein $R_1$, $R_2$ and $R_3$, which can be the same or different, are linear alkyl residues, at least one of which is always methyl, and wherein the sum of the carbon atoms of the acyl residue may reach ten, c) one or more polyunsaturated monomers as crosslinking agents, and 3) an organic or inorganic base, in an amount sufficient to partially or totally neutralize the acidity deriving from the copolymer, wherein said compositions may also comprise water.

5,744,695

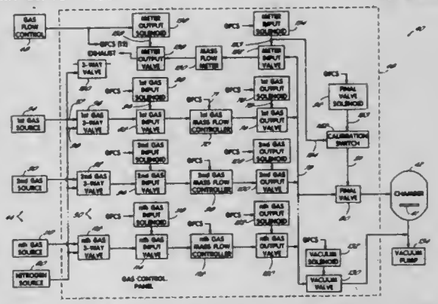
**APPARATUS TO CHECK CALIBRATION OF MASS FLOW CONTROLLERS**

**Gregory Russell Forbes, Boerne, Tex., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., Park Ridge, N.J.**

**Filed Jan. 10, 1997, Ser. No. 781,405**

**Int. Cl.[6] G01F** *25/00*

**U.S. Cl. 73—1.35** **15 Claims**



1. A calibration apparatus for a gas control system controlling the flow of different gases between remote gas sources and a processing chamber, a gas control panel including a final valve having an input in fluid communication with outputs of a plurality of mass flow controllers and an output connected to the processing chamber, the final valve being connected to a final valve solenoid having an input in electrical communication with a gas flow control and an output in communication with a control input of the final valve, the final valve solenoid causing the final valve to open and close in response to signals from the gas flow control, the calibration apparatus comprising:

a mass flow meter;

a meter input valve and having

an output connected to an input of the mass flow meter, and

an input connected to the input of the final valve;

a meter input solenoid having

an input in electrical communication with the gas flow control providing a signal to operate the meter input solenoid, and

an output in communication with a control input of the meter input valve for operating the meter input valve; and

a switch device and coupled between an output of the final valve solenoid and the control input of the final valve, the switch device having a control input coupled to the output of the meter input solenoid, whereby operation of the meter input solenoid by the gas flow control to open the meter input valve closes the switch device and prevents the final valve solenoid from operating the final valve, thereby inhibiting a flow of gas to the chamber and enabling a flow of gas from a selected mass flow controller, through the meter input valve and the mass flow meter to check calibration of the selected mass flow controller and whereby further, the operation of the meter input solenoid by the gas flow control to close the meter input valve causes the calibration switch to open to permit the final valve solenoid to operate the final valve, thereby inhibiting a flow of gas through the meter input valve and permitting a flow of gas to be directed through the final valve and into the chamber.

5,744,696

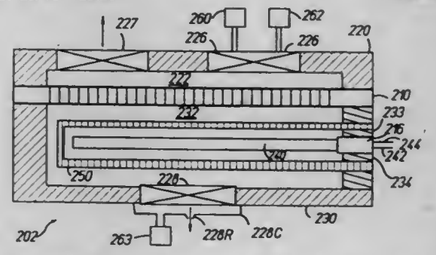
**THERMAL ISOLATION SYSTEM IN A CHROMATOGRAPH**

**Tak Kui Wang, Havertown, Pa.; James Ward Baker, Elkton, Md., and Terry A. Berger, Newark, Del., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 456,210, May 31, 1995. This application Mar. 10, 1997, Ser. No. 814,035**

**Int. Cl.[6] G01N** *31/08;* **F25D** *23/06*

**U.S. Cl. 73—23.25** **15 Claims**



15. A method for providing thermal isolation of a component system in a chromatograph, comprising the steps of:

providing a control system for supplying first and second control signals;

providing a housing defining a closed cavity and a cavity volume, said closed cavity being constructed to accommodate at least a portion of the component system, the closed cavity being subject to pressurization and thereby having a cavity pressure;

locating the component system and the housing in a spaced relationship wherein the portion of said component system is enclosed within said housing;

operatively connecting a thermal device to the component system and operating the thermal device in response to the first control signal for effecting a thermal zone in the portion of the component system; and

operatively connecting a pumping assembly to the housing and operating the pumping assembly in response to the second control signal for effecting a selective amount of cavity pressure in the closed cavity,

whereby the extent of gas phase heat conduction between the portion of the component system and the housing is selectably controlled.

VOL 1209 ISS 4 AP 28 1998 UMI

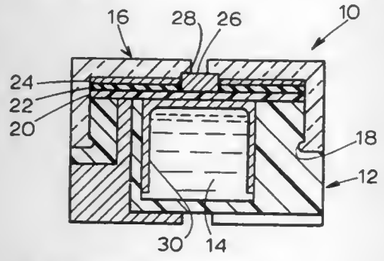


5,744,697

## GAS SENSOR WITH CONDUCTIVE HOUSING PORTIONS

Dennis Martell, Naperville, Ill.; Piers Richard Grove Warburton, Coraopolis, Pa.; Laura Ann Lindner, Oakdale, Pa., and Juergen Lindner, Bethel Park, Pa., assignors to J and N Associates, Inc., Valpariso, Ind., and National Draeger Incorporated, Pittsburgh, Pa.

Filed Aug. 16, 1995, Ser. No. 515,688
Int. Cl.[6] G01N *21/77*
U.S. Cl. 73—31.06 14 Claims




1. A gas sensor assembly comprising:
a housing having a receptacle formed therein;
a gas-sensing agent disposed in said receptacle; and
a plurality of electrodes disposed in fluid contact with said gas-sensing agent.
said housing having a plurality of conductive housing portions, each of said conductive housing portions being conductively coupled to a respective one of said electrodes, said housing having a non-conductive housing portion with a plurality of spaces formed therein, said conductive housing portions being disposed within said spaces, wherein said conductive housing portions are composed of a conductive plastic material.

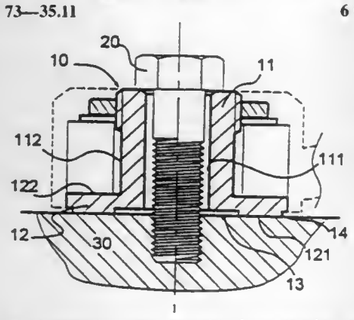
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5,744,698

## ACCELEROMETRIC SENSOR FOR MEASURING THE PISTON KNOCK OF AN INTERNAL COMBUSTION ENGINE

Bernard Pierre André Genot, Roquettes, France, assignor to Siemens Automotive, S.A., Toulouse Cedex, France

PCT No. PCT/EP95/00314, § 371 Date Aug. 1, 1996, § 102(e) Date Aug. 1, 1996, PCT Pub. No. WO95/21384, PCT Pub. Date Aug. 10, 1995
PCT Filed Jan. 30, 1995, Ser. No. 693,044
Claims priority, application France, Feb. 1, 1994, 94 01189
Int. Cl.[6] G01L *23/22*
U.S. Cl. 73—35.11 6 Claims




1. An accelerometric sensor assembly for measuring an acceleration of a component, comprising:
a base in the form of bushing with a flange formed thereon, said flange having an upper surface defining a shoulder and a lower surface defining a contact surface pressing against a component of which an acceleration is to be measured;
at least one piezoelectric washer, connecting disks, and a seismic mass stacked on said shoulder of said flange;
said lower surface of said flange being formed with a central recess such that a load generated by a pressure on said contact surface is substantially equally distributed on both sides of a circle having a diameter greater than or equal to an average diameter of said shoulder.

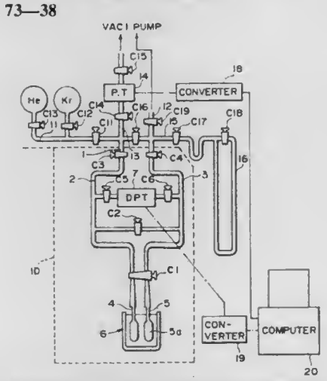
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5,744,699

## METHOD AND APPARATUS FOR ADSORPTION MEASUREMENT USING TEMPERATURE-COMPENSATED CONSTANT-VOLUME ADSORPTION APPARATUS

Isao Suzuki, 3233-9 Tsurutamachi, Utsunomiya-shi, Tochigi-ken, Japan, 320

Filed Feb. 28, 1996, Ser. No. 608,532
Claims priority, application Japan, Mar. 2, 1995, 7-066713
Int. Cl.[6] G01N *15/08*
U.S. Cl. 73—38 9 Claims




1. A method for adsorption measurement, comprising:
(a) providing a temperature-compensated constant-volume adsorption apparatus including:
a pair of a reference buret and a sample buret of almost equal shapes and volumes disposed in a lateral symmetry,
a pair of a reference adsorption cell and a sample adsorption cell of almost equal shapes and volumes disposed in a lateral symmetry and connected to the reference and sample burets, respectively, the sample cell containing a sample for adsorption measurement,
an adsorbate gas supply connected to the reference and sample burets so as to supply an adsorbate gas to the burets, and
a pressure gage capable of measuring pressures within the reference and sample burets,
(b) introducing an adsorbate gas into the burets,
(c) causing the adsorbate gas in the burets to expand into the respective adsorption cells, and
(d) determining an adsorbed amount of the adsorbate gas by the sample cell based on a pressure difference between the burets while compensating for an adsorbed amount by the reference adsorption cell, wherein the adsorbed amount of the adsorbate gas by the reference adsorption cell is determined according to the following equation (6):

$$(22414/RT)[V_A P_n(1)+V_B P_{n-1}-(V_A+V_B)P_n(2)]= A_R(P_n(2))-A_R(P_n(\phi),$$

wherein symbols signify the following:
R: gas constant, T: temperature,
$V_A$: volume of the reference buret,
$V_B$: volume of the reference adsorption cell,
$P_n(1)$: pressure in the burets after introducing the adsorbate gas into the burets prior to an n-th adsorption,
$P_{n-1}$: pressure in the adsorption cells after a previous (n−1)-th adsorption,



$P_n(2)$: pressure in the reference adsorption cell after the n-th adsorption.
$A_R(P_n(2))$: an isothermally adsorbed amount of the adsorbate gas onto the reference adsorption cell after the n-th adsorption.
n: an integer.
provided that $P_{n-1}$ and $A_R(P_{n-1})$ are 0 for n=1.

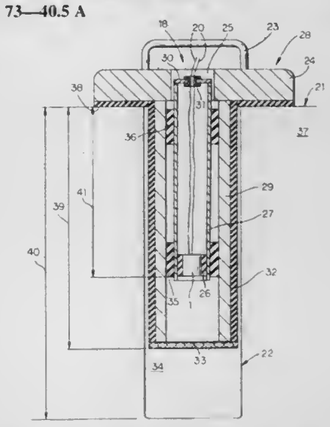
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5,744,700

## DEVICE FOR DETECTING AND LOCATING FLUID LEAKS

Christian Carme; Virginie Delemotte, both of Marseille; Jean René Ardouin, Sanary, and Alain Del Tatto, La Farlede, all of France, assignors to Technofirst, Aubagne Cedex, and Gaz de France, La Plaine Saint Denis, both of France

Filed Sep. 15, 1995, Ser. No. 529,171
Int. Cl.[6] G01M *3/24*
U.S. Cl. 73—40.5 A 12 Claims




1. A device for detecting and locating a leak of fluid from a pipe system buried in the ground, said device comprising:
pick-up sensor means not in contact with a pipe system buried in the ground for providing first signals in response to a leak of fluid from said pipe system;
signal-processing means for processing said first signals into processed signals; and
headphone means equipped with at least one speaker supplied with said processed signals for detecting and locating said leak,
wherein said headphone means further comprises microphone means for sending microphone signals to said signal-processing means, and said signal-processing means further comprises electronic noise-reducing means responsive to said microphone signals for reducing noise in said processed signals, and
wherein said pick-up sensor means is mounted on an end of support means for sliding inside a guide surrounded by an insulating sleeve.

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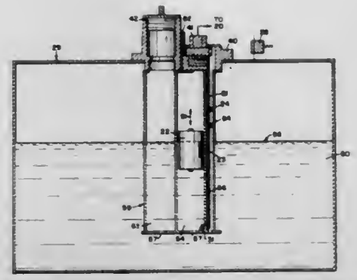
5,744,701

## ELECTRONIC LIQUID LEAK DETECTOR

Daniel E. Peterson, Northfield; Dana R. Lonn, Minneapolis, and Walter J. Petersen, Eden Prairie, all of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Jan. 20, 1995, Ser. No. 375,760
Int. Cl.[6] G01M *3/26*
U.S. Cl. 73—49.2 34 Claims

1. An apparatus for measuring the fluid volume in a reservoir having at least one wall, comprising:



a) a first column having a first end and a second end, wherein said first end extends through the reservoir and is in fluid communication with the external atmosphere, and wherein said second end extends beneath the surface of the fluid and is in fluid communication with the fluid;
b) measuring means for measuring the level of the fluid within said first column;
c) electrically controllable fluid communication means, located through a wall of the reservoir, for selectively venting the atmosphere within the reservoir to the external atmosphere; and
d) wherein the air pressure within the reservoir moves toward equilibrium with the external atmosphere when said controllable fluid communication means vent, whereby any elevated or decreased levels of fluid within said first column may be normalized and said column operates as a virtual column.

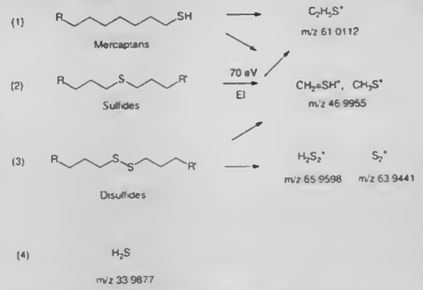
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5,744,702

## METHOD FOR ANALYZING TOTAL REACTIVE SULFUR

Stilianos G. Roussis, Brights Grove; James W. Fedora, and Andrew S. Cameron, both of Sarnia, all of Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 12, 1996, Ser. No. 711,622
Int. Cl.[6] G01N *11/00;* G01D *18/00*
U.S. Cl. 73—53.01 5 Claims




1. A method for determining total reactive sulfur in a crude oil or fraction thereof which comprises the steps of:
(1) introducing the crude oil or fraction thereof containing aromatic and non-aromatic sulfur compounds into a mass spectrometer;
(2) obtaining a series of mass spectra;
(3) selecting fragment ions which are characteristic of non-aromatic reactive sulfur species including hydrogen sulfide, mercaptans, hydrocarbyl sulfides, hydrocarbyl disulfides, elemental sulfur and polysulfides, said fragment ions being selected from at least one of $SH^+$, $CSH^+$; $CH_3S^+$, $C_2H_5S^+$, $H_2S_2^+$; and $S_2^+$;
(4) identifying peaks in the mass chromatograms which are characteristic of at least one of the fragment ions; and

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(5) quantifying the reactive sulfur species identified by their corresponding fragment ions, wherein the total reactive sulfur is the weighted sum of individual non-aromatic reactive sulfur species.

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**5,744,703**

**PROCESS TO MEASURE THE STRINGINESS OF ROOM TEMPERATURE VULCANIZABLE SILICONE SEALANT COMPOSITIONS**

**Mary A. Krenceski, Troy; Chiu-Sing Lin, Schenectady, and Gary M. Lucas, Scotia, all of N.Y., assignors to General Electric Company, Waterford, N.Y.**

**Filed Feb. 26, 1997, Ser. No. 805,517**
**Int. Cl.[6] G01N** *11/02*
**U.S. Cl. 73—54.01** **2 Claims**

1. A process for measuring the stringiness of uncured room temperature vulcanizable sealant compositions comprising:

(a) delivering said sealant onto a movable surface by means of a sealant delivery device whereby a bead of sealant is deposited onto said movable surface;

(b) stopping the delivery of said sealant onto said movable surface;

(c) moving said bead of sealant on said movable surface away from said sealant delivery device by moving said movable surface away from said sealant delivery device whereby a string of sealant is formed between said bead of sealant and said sealant delivery device until said string of sealant breaks off from said sealant delivery device;

(d) stopping said movable surface; and

(e) measuring the length of said string of sealant.

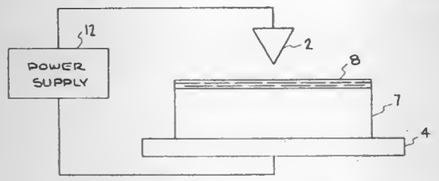
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**5,744,704**

**APPARATUS FOR IMAGING LIQUID AND DIELECTRIC MATERIALS WITH SCANNING POLARIZATION FORCE MICROSCOPY**

**Jun Hu, Berkeley; D. Frank Ogletree; Miguel Salmeron, both of El Cerrito, all of Calif., and Xudong Xiao, Kowloon, China, assignors to The Regents, University of California, Oakland, Calif.**

**Filed Jun. 7, 1995, Ser. No. 476,441**
**Int. Cl.[6] G01B** *7/34*
**U.S. Cl. 73—105** **6 Claims**




1. A scanning-force-microscope probe electrode assembly for imaging induced polarization forces comprising,

a) an electrically conducting scanning-force-microscope probe tip;

b) a counter electrode located more than the radius of the probe tip away from the probe tip;

c) a voltage supply connected to the probe tip and the counter electrode;

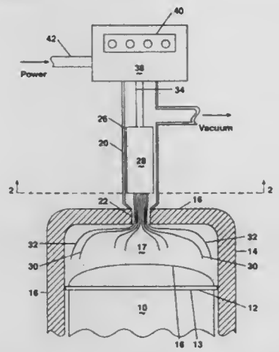
d) means to connect the probe tip to a scanning-force-microscope.

**5,744,705**

**METHOD AND APPARATUS FOR ENGINE TESTING**

**Edward J. Derouen, Port Sulfur, La., and Keith J. Franovich, Hattiesburg, Miss., assignors to Chevron U.S.A. Inc., San Francisco, Calif.**

**Filed Aug. 7, 1995, Ser. No. 512,353**
**Int. Cl.[6] G01M** *15/00*
**U.S. Cl. 73—116** **7 Claims**




1. A measuring device for determining clearances between a piston of a reciprocating engine and interconnected mechanical driver elements including wrist pins, a connecting rod, crank shaft bearings, piston rings, and the cylinder wall around said piston at any selected position of said piston over a full revolution of said crank shaft without disassembly of said engine which comprises:

(a) a collimated wave source for directly irradiating a selectable area on the piston head during reciprocation of said piston within the enclosed volume of the cylinder wall formed in an engine block;

(b) said collimated wave source being supported within an impervious chamber having one end threadably sealable to said engine block to form an auxiliary volume integral with the compression chamber formed by the head space between said piston head and said engine block;

(c) said chamber additionally including means for modifying pressure in said compression chamber sufficient to reciprocate said piston head relative to any initial position thereof in said cylinder;

(d) detection means for measuring and recording a distance of movement of a selected portion of a piston head relative to a reference marker on said engine block during movement of said piston and an interconnected wrist pin, interconnected to a said connecting rod, crank shaft, and crank shaft bearings;

(e) means for displaying the linear distances for movement of said piston head relative to said reference marker to indicate the displacement distances for movement of each element over any portion of a full cycle of said piston; and

(f) wherein said collimated wave source is a laser beam generating an optical frequency responding to the speed of rotation of said crank shaft, said detection means includes digital recording means, and said display means indicates the vertical movement of said selected portion of said piston head over a given time interval.

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**5,744,706**

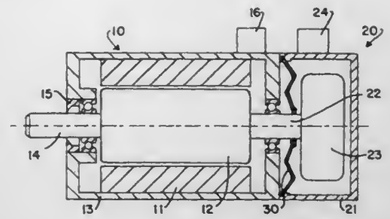
**DEVICE FOR MEASURING THE ANGLE OF TWIST**

**Josef Siraky, Donaueschingen, Germany, assignor to Max Stegmann GmbH Antriebstechnik-Elektronik, Donaueschingen, Germany**

**Filed Dec. 1, 1995, Ser. No. 565,913**
**Claims priority, application Germany, Dec. 23, 1994, 44 46 243.3**
**Int. Cl.[6] G01B** *3/00*
**U.S. Cl. 73—116** **14 Claims**

1. In a device for measuring the angle of twist of a motor to which the measuring device is coupled, the device including a






device housing, a device stator, and a device shaft and the motor including a motor housing and a motor shaft, the housing of the device being capable of being mounted on a housing of the motor, the improvement comprising a seal for sealing said device, said seal comprising:

a sealing element that is comprised of

a circular ring disc fastened on its outer circumference to the housing of the device or of the motor and resting its inner circumference in a sealing manner on the shaft of the device or the shaft of the motor and capable of being axially and radially deformed at least in a partial area of its surface; and

an outer ring area extending from said disc and connected to the device stator for coupling said device stator to the housing in an angularly rigid manner.

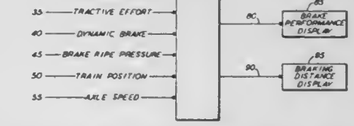
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**5,744,707**

**TRAIN BRAKE PERFORMANCE MONITOR**

**Robert C. Kull, Olney, Md., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.**

**Filed Feb. 15, 1996, Ser. No. 601,688**
**Int. Cl.[6] G01L** *5/28*
**U.S. Cl. 73—121** **18 Claims**




1. A method for providing improved control of brakes on railway vehicles disposed in a train drawn by at least one operating locomotive, said method comprising:

(a) communicating signals indicative of grade information to an onboard computer disposed on such train, said step of communicating signals indicative of grade information including the step of utilizing a track grade database and signals indicative of train position in relation to such track grade database from a rail navigation system;

(b) providing said onboard computer with signals indicative of axle speed from at least one of such vehicles of such train;

(c) providing said onboard computer with signals indicative of brakepipe pressure;

(d) providing said onboard computer with signals indicative of tractive effort from such at least one operating locomotive; and

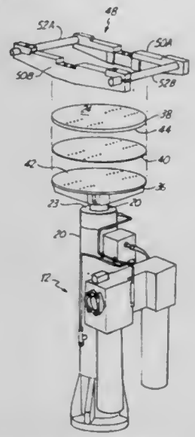
(e) providing said onboard computer with signals defining computer programs to utilize said signals obtained in steps (a) through (d) above to generate signals indicating at least one braking efficiency parameter of such train, thereby providing said improved control of such brakes.

**5,744,708**

**WHEELPAN WITH DAMPING STRUCTURES**

**Steven R. Haeg, Shorewood, and Thomas C. Owens, Chanhassen, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.**

**Filed Aug. 15, 1996, Ser. No. 698,364**
**Int. Cl.[6] E01C** *23/00*
**U.S. Cl. 73—146** **12 Claims**




1. A wheelpan assembly for supporting a vehicle on a vehicle test system, the wheelpan assembly comprising:

a base plate connectable to an actuator, the base plate having an upwardly facing surface;

a top plate engageable with the vehicle, the top plate having a downwardly facing surface facing the upwardly facing surface of the base plate; and

a visco-elastic damping layer disposed between the upwardly facing surface of the base plate and the downwardly facing surface of the top plate.

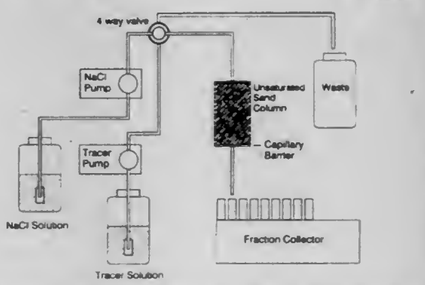
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**5,744,709**

**MEASUREMENT OF SPECIFIC INTERFACIAL AREAS OF IMMISCIBLE FLUID INTERFACES IN FLOW SYSTEMS**

**Kanaka Prasad Saripalli; P. S. C. Rao; Michael D. Annable, and Kirk Hatfield, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.**

**Filed Apr. 25, 1996, Ser. No. 641,141**
**Int. Cl.[6] B01D** *15/04*; **G01N** *15/08*; **C12Q** *01/02*
**U.S. Cl. 73—152.18** **15 Claims**




1. A method for measuring the surface area of immiscible fluid interfaces at a fluid-fluid interface in a flow system having a test volume containing at least two immiscible fluids therewithin either in the presence or absence of a solid phase, comprising the steps of:

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providing in a first of said fluids an interfacial tracer compound soluble in said first fluid which will form a monolayer at the fluid-fluid interface when flown past second of said immiscible fluids, but which will not partition into the second of said fluids;

allowing for the said tracer compound to accumulate as a monolayer at the said fluid-fluid interface;

measuring the response of said tracer compound in the first of said fluids;

calculating the area of said interface by interpreting the measured tracer response.

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**5,744,710**

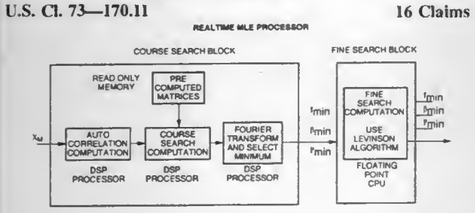
## FAST MAXIMUM LIKELIHOOD PROCESSOR FOR MEANS WIND VELOCITY ESTIMATION

**Theagenis John Abatzoglou, Cupertino; Chao Huang, Mountain View; Bruce Steakley, and Jung Kenneth, both of Cupertino, all of Calif., assignors to Lockheed Martin Corp., Sunnyvale, Calif.**

**Filed Jan. 17, 1997, Ser. No. 785,364**

**Int. Cl.[6] G01F *13/00***

**U.S. Cl. 73—170.11** **16 Claims**




1. A method of providing a fast maximum likelihood estimation of the power, the instantaneous wind radial velocity, and the velocity spread of a small wind patch in space, said method comprising,

transmitting a pulsed beam of radiation having a selected frequency to the small wind patch,

capturing a returned pulsed beam of radiation which is reflected back from aerosols present in the small wind patch,

said returned pulsed beam of radiation having a Gaussian power spectral density comprising,

(a) an amplitude which is related to the wind path return power,

(b) a frequency which is higher than the transmitted frequency by the amount of a Doppler frequency component and which Doppler frequency component can be used to estimate an average wind radial velocity over the wind patch, and

(c) a width which is a function of the velocity spread wind aerosols,

storing a pulsed sub-sample autocorrelation matrix in a table look-up,

said table look-up comprising fixed power and velocity spread values,

performing a coarse search of the received pulsed beam of radiation using the autocorrelation matrix in the table look-up to minimize a likelihood function of wind spread values and power values over the Doppler frequency component, and

then performing a fine search to find the absolute minimum of all of the power, wind radial velocity and velocity spread variables in the wind patch, and wherein the performing of the coarse search includes,

performing an autocorrelation computation of the returned pulsed beam,

performing a coarse search computation using the table look-up, and

performing a fast Fourier transform and select minimums computation.

**5,744,711**

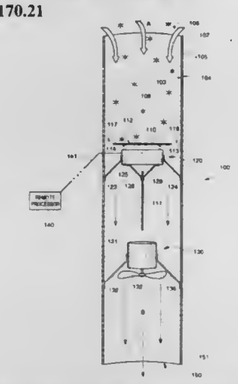
## WINTER PRECIPITATION MEASURING SYSTEM

**Roy Martin Rasmussen, Boulder, Colo., and John Hallett, Reno, Nev., assignors to University Corporation for Atmospheric Research, Boulder, Colo., and University and Community College System of Nevada, on behalf of Desert Research Institute, Reno, Nev.**

**Filed Nov. 1, 1996, Ser. No. 740,757**

**Int. Cl.[6] G01W *1/14***

**U.S. Cl. 73—170.21** **17 Claims**



1. A winter precipitation measuring system comprising:

an elongated tube;

a thermal plate within said elongated tube;

means for maintaining said thermal plate at a substantially constant temperature;

means for quantifying a power consumption curve for a particle of winter precipitation that is in contact with said thermal plate;

means for distinguishing a first particle of winter precipitation from a second particle of winter precipitation in view of said power consumption curve for each respective particle; and

means for determining a precipitation rate in response to said means for maintaining said thermal plate at said substantially constant temperature.

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**5,744,712**

**Patent Not Issued For This Number**

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**5,744,713**

## CONSTRUCTION FOR FASTENING AND CONTACTING RESISTOR ELEMENTS FOR A HOT FILM ANEMOMETER AND SENSOR ARRANGEMENT USING SUCH CONSTRUCTION

**Karlheinz Wienand, Aschaffenburg; Marc Klammer, Heidelberg; Stefan Dietmann, Haiterbach, and Christian Koch, Kleinostheim, all of Germany, assignors to Herheus Sensor-Nite GmbH, Hanau, Germany**

**Filed Aug. 7, 1996, Ser. No. 692,962**

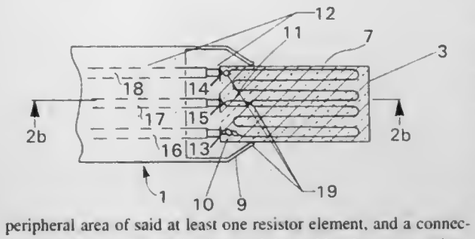
**Claims priority, application Germany, Aug. 18, 1995, 195 30 413.6**

**Int. Cl.[6] G01F *1/68***

**U.S. Cl. 73—204.26** **8 Claims**

1. A construction for fastening and contacting resistor elements into a flat sensor carrier of a hot film anemometer, comprising at least one resistor element having a resistance layer in the form of a hot film resistance line formed on an oblong substrate and having at least two connection contacts spaced from each other in a






peripheral area of said at least one resistor element, and a connection area in a sensor carrier for receiving said at least one resistor element, said connection area comprising a contact clamp provided with contact springs for bonding and holding said at least two connection contacts, the resistor element with its connection contacts being inserted into a drawer-like recess of the sensor carrier in such a manner that the underside of the resistor element has three contact points arranged in a triangle which rest on elevations of the drawer-like recess, the connection contacts being soldered with the contact springs, whereby the resistance element is pressed on the elevations by tension of the contact springs exerted on an upper side of the resistor element.

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**5,744,714**

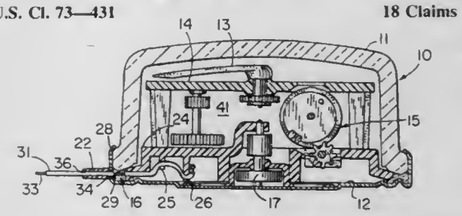
## INSTRUMENT HOUSING WITH ELECTRICAL DISCHARGE GAP

**H. Paul Walding, Jr., Slinger; Donald H. Strobel, Brookfield; Mark M. Lazar, and Kenneth R. Bloss, Jr., both of New Berlin, all of Wis., assignors to Badger Meter, Inc., Milwaukee, Wis.**

**Filed Oct. 29, 1996, Ser. No. 740,411**

**Int. Cl.[6] G01D *11/24***

**U.S. Cl. 73—431** **18 Claims**




1. In an instrument housing having a top and a base assembled together, an assembly for electrostatic discharge comprising:

a chassis inside the instrument housing with a support for holding at least a pair of wires;

said a pair of wires having insulated portions and having bare portions where the pair of wires is mounted to the support;

wherein the base is formed of a conductive material and wherein the base has at least one projection extending towards a corresponding one of the bare portions;

wherein the instrument contains a volume of a gas for conducting electrostatic charge;

such that an electrostatic discharge gap is provided between the projection and one of the bare portions of the wires through which said charge may be conducted to the base of conductive material for discharge from the interior of the instrument.

**5,744,715**

## TACTILE-ACOUSTIC INFORMATION DETECTING AND MEASURING APPARATUS AND METHOD

**Jean-Paul Gerome, Montchaboud, France, assignor to Apollon's Algebra (Gibraltar) Limited, Gibraltar**

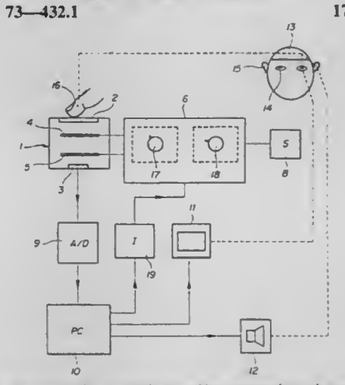
**PCT No. PCT/IB95/00615, § 371 Date Jan. 31, 1997, § 102(e) Date Jan. 31, 1997, PCT Pub. No. WO96/04574, PCT Pub. Date Feb. 15, 1996**

**PCT Filed Aug. 4, 1995, Ser. No. 776,657**

**Claims priority, application WIPO, Aug. 5, 1994, PCT/IB94/00237**

**Int. Cl.[6] G01V *1/00;9/00***

**U.S. Cl. 73—432.1** **17 Claims**




1. An apparatus for detecting and/or measuring phenomena or conditions represented by information appearing on at least one electrical conductor coupled to a source of said information, comprising a vibrator plate of solid material mounted on a frame so as to form a membrane capable of generating acoustic signals when being rubbed on its surface by an operating person's fingertip, microphone means arranged opposite said vibrator plate for receiving said acoustical signals and at least first and second substantially flat electrode members arranged between said vibrator plate and said microphone means in substantially parallel relationship with each other and with said vibrator plate, said electrode members being electrically connected to the output of a tuneable network comprising a plurality of control elements for tuning, the input of said tuneable network being coupled to said source and the output of said microphone means being connected over an analog-to-digital converter circuit to an input of computer means adapted for processing the information contained in said acoustic signals and for producing a detection or measuring signal derived therefrom.

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**5,744,716**

## FLUID DISPLACEMENT LEVEL, DENSITY AND CONCENTRATION MEASUREMENT SYSTEM

**Victor B. Mimken; Sergey A. Velichko, and Tom Krawzak, all of Boise, Id., assignors to SCP Global Technologies, a division of PRECO, Inc., Boise, Id.**

**Filed Jun. 7, 1996, Ser. No. 660,642**

**Int. Cl.[6] G01N *9/12***

**U.S. Cl. 73—453** **21 Claims**

1. An apparatus for measuring characteristics of a fluid contained in a vessel, said apparatus comprising:

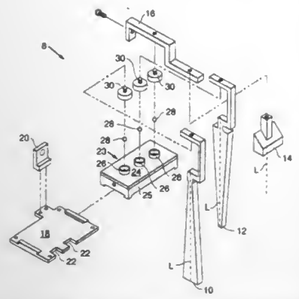
a first fluid displacer having cross-section which varies with depth in the vessel and having a shape such that when the first fluid displacer is positioned in the vessel, buoyant force exerted by the fluid on the first fluid displacer depends on the level of the fluid;

a second fluid displacer having cross-section which varies with depth in the vessel and having shape such that when the second fluid displacer is positioned in the vessel, buoyant force exerted by the fluid on the second fluid displacer depends on the level of the fluid;

a first force transducer coupled to the first fluid displacer;

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a second force transducer coupled to the second fluid displacer; and

processing means coupled to the first force transducer and to the second force transducer for receiving a first signal from the first force transducer and a second signal from the second force transducer, the first signal and the second signal being indicative of fluid forces acting on the first fluid displacer and the second fluid displacer, and for processing the first signal and the second signal to generate at least one signal indicative of at least one characteristic of the fluid.

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**5,744,717**

## CIRCUIT ARRANGEMENT FOR A CAPACITIVE ACCELERATION SENSOR

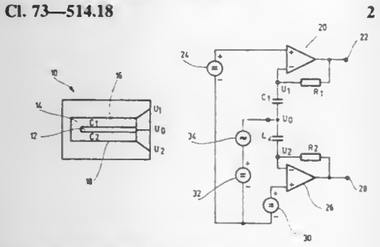
**Leo Tanten, Reutlingen; Ulrich Fleischer, Pliezhausen; Michael Barth, Kirchheim/Teck, and Bernd Mueller, Reutlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Jul. 8, 1996, Ser. No. 677,674**

**Claims priority, application Germany, Jul. 6, 1995, 195 24 604.7**

**Int. Cl.[6] G01P** *15/125*

**U.S. Cl. 73—514.18** **2 Claims**



1. A circuit arrangement, comprising:

a first capacitor and a second capacitor having a first capacitance value and a second capacitance value, respectively, having a first outer electrode and a second outer electrode, respectively, and having a common middle electrode, the common middle electrode being movably supported as a function of an acceleration;

a position-control circuit for applying a voltage to the first and second outer electrodes so as to keep the first and second capacitance values equal;

an a.c. circuit for applying an a.c. voltage to the common middle electrode;

a first operational amplifier having a first inverting input and a first output, the first inverting input coupled to the first outer electrode;

a first negative-feedback resistor coupled between the first output of the first operational amplifier and the first outer electrode;

a second operational amplifier having a second inverting input and a second output, the second inverting input coupled to the second outer electrode; and

a second negative-feedback resistor coupled between the second output of the second operational amplifier and the second outer electrode,

wherein an a.c. current through at least one of the first and second capacitors is evaluated for position control.

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**5,744,718**

## SENSOR USING A RESISTANCE ELEMENT

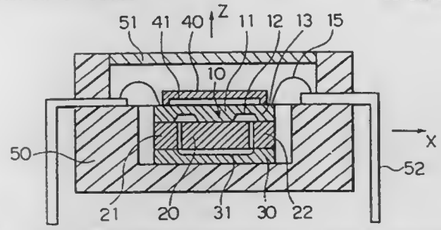
**Kazuhiro Okada, 73, Sugaya 4-Chome, Ageo-shi, Saitama 362, Japan**

**Division of Ser. No. 393,801, Feb. 24, 1995, Pat. No. 5,531,092, which is a division of Ser. No. 168,024, Dec. 15, 1993, abandoned, which is a division of Ser. No. 761,771, Aug. 14, 1991, Pat. No. 5,295,386. This application Apr. 26, 1996, Ser. No. 641,078**

**Claims priority, application Japan, Dec. 28, 1989, 1-343354; Mar. 27, 1990, 2-77397; Jul. 27, 1990, 2-200449**

**Int. Cl.[6] G01P** *15/08*

**U.S. Cl. 73—514.33** **12 Claims**



1. A sensor for detecting a physical quantity acting as an external force comprising:

a substrate having first and second opposite surfaces and including a working portion located at a center of said substrate, a flexible portion located around said working portion and a fixed portion located around said flexible portion, said flexible portion including a groove into said substrate from one of said surfaces of said substrate so that a thickness of said substrate at said groove of said flexible portion is less than that of said substrate in said working portion and said fixed portion;

a working body connected at one end to said second surface of said working portion for transmitting an external force to said working portion, whereby mechanical deformation of said flexible portion of said substrate is produced, the working body having an outside side surface;

a pedestal connected at one end to said second surface of said fixed portion of said substrate for supporting said fixed portion of said substrate fixedly relative to said flexible and working portions of said substrate, the pedestal having an inside side surface opposite said outside side surface of said working body at a space therefrom; and

detection elements on one of said surfaces of said flexible portion of said substrate each for providing an electric characteristic that changes on the basis of said mechanical deformation, whereby said external force is detected;

wherein said detection elements comprise a first detection element located on a first axis and a second detection element located on a second-axis, said first axis and said second axis being on said one of said surfaces of said flexible portion of said substrate with said detection elements and perpendicular to each other;

wherein a first component along said first axis of said external force is detected on the basis of said electric characteristic of said first detection element and a second component along said second axis of said external force is detected on the basis of said electric characteristic of said second detection element; and

wherein said space of said inside side surface of said pedestal from said outside side surface of said working body is set so that said outside side surface of said working body contacts



with said inside side surface of said pedestal when said components of said external force exceed a predetermined intensity.

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**5,744,719**

## INTEGRATED MICROMECHANICAL SENSOR DEVICE

**Wolfgang Werner, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

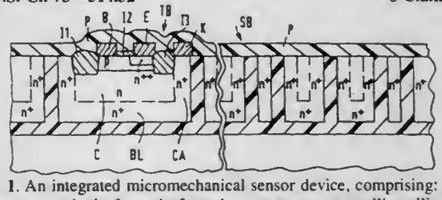
**PCT No. PCT/DE94/01092, § 371 Date Jun. 12, 1996, § 102(e) Date Jun. 12, 1996, PCT Pub. No. WO95/08775, PCT Pub. Date Mar. 30, 1995**

**PCT Filed Sep. 20, 1994, Ser. No. 619,735**

**Claims priority, application Germany, Sep. 21, 1993, 43 32 057.0**

**Int. Cl.[6] G01P** *15/00*

**U.S. Cl. 73—514.32** **6 Claims**



1. An integrated micromechanical sensor device, comprising:

a sensor body formed of a substrate, a monocrystalline silicon layer disposed on said substrate, and an insulating layer disposed in a predetermined region between said substrate and said silicon layer;

said silicon layer having trenches with side walls formed therein from an upper surface thereof to a lower boundary surface, and said silicon layer having a first region above said insulating layer and a second region at which said insulating layer is at least partly missing;

said side walls of said trenches and a side of said silicon layer carrying the lower boundary surface having a first predetermined doping type, and said silicon layer having a second predetermined doping type at least in a partial region thereof;

a transistor configuration disposed in said first region of said silicon layer; and

a sensor configuration disposed in said second region (SB) of said silicon layer.

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**5,744,720**

## ROLLING BEARING UNIT WITH ROTATING SPEED DETECTOR

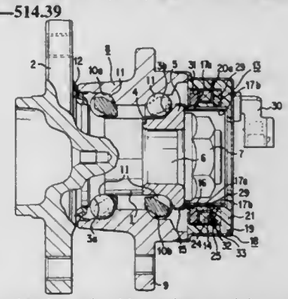
**Hideo Ouchi, Fujisawa, Japan, assignor to NSK Ltd., Tokyo, Japan**

**Filed Dec. 22, 1995, Ser. No. 577,934**

**Claims priority, application Japan, Dec. 27, 1994, 6-325517**

**Int. Cl.[6] G01P** *3/22;3/48;* **F16C** *32/00;* **G01B** *7/14*

**U.S. Cl. 73—514.39** **2 Claims**



1. A rolling bearing unit with rotating speed detector comprising a stationary ring having an end and a first peripheral face formed with a stationary raceway, a cover fixed to the end of the stationary ring, a rotating ring having an end and a second peripheral face being opposite to the first peripheral face and formed with a rotating raceway, a plurality of rolling elements rotatably provided between the stationary raceway and the rotating raceway, an annular tone wheel made of a magnetic material fixed to the end of the rotating ring, and having a cutout section where a plurality of cutouts are circumferentially formed with a first pitch and a sensor opposed to the tone wheel and supported inside the cover,

the tone wheel having a rotating cylindrical portion having a peripheral face and being concentric with the rotating and stationary rings,

the cutout section formed in the peripheral face of the rotating cylindrical portion,

the sensor comprising an annular first and second permanent magnets, an annular magnetic stator with ends, and an annular coil,

the coil provided circumferentially around the stator between the ends,

the first and second permanent magnets having a first end face in magnetic orientation provided with the south and north poles alternately arranged with a uniform pitch, and faced to the cutout section in the peripheral face of the rotating cylindrical portion with a small clearance therebetween,

the first and second permanent magnets having a second end face in magnetic orientation provided in contact with or close to the ends of the stator respectively,

the south and north poles in the first end face in magnetic orientation of the first and second permanent magnets having a second pitch which is set to n·p, where n is an integer, and p is the first pitch of the cutouts in the cutout section,

the first and second permanent magnets having a phase relationship with the cutout section, such that the phase of the south and north poles in the first end face in magnetic orientation of the first permanent magnet with reference to the cutout section is displaced from the phase of the south and north poles in the first end face in magnetic orientation of the second permanent magnet with reference at the cutout section by m·p/2, where m is an odd integer and p is the first pitch of the cutouts in the cutout section,

whereby, at the moment when all of the south poles in the first end face in magnetic orientation of the first permanent magnet are faced to the cutouts respectively, all of the north poles in the first end face of the second permanent magnet are faced to the cutouts.

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**5,744,721**

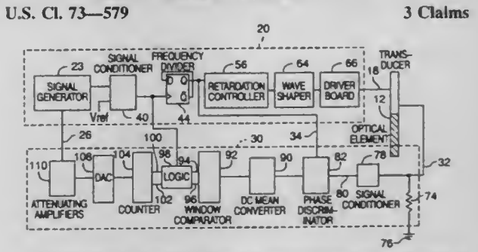
## ELECTRONIC CONTROL SYSTEM FOR AN OPTICAL ASSEMBLY

**Steven Scott Varnum, Tigard, Oreg., assignor to Hinds Instruments, Inc., Hillsboro, Oreg.**

**Filed Oct. 25, 1995, Ser. No. 548,502**

**Int. Cl.[6] H04B** *10/04;* **G02F** *1/33;1/11*

**U.S. Cl. 73—579** **3 Claims**




1. An electronic control system for maintaining the oscillation of an optical assembly at resonance, the electronic control system comprising:

a signal control circuit for delivering an input signal to the optical assembly;

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a resonance detector for detecting a difference in phase between the input signal and a feedback signal from the optical assembly and for providing a control signal based on the phase difference;

the signal control circuit being responsive to the control signal for modifying the frequency of the input signal to oscillate the optical assembly substantially at resonance; and

a second optical assembly and a temperature controller responsive to the resonance detector for modifying the temperature of the second optical assembly.

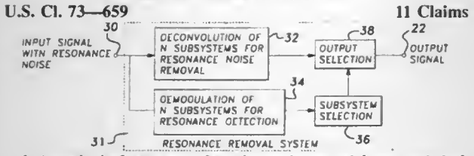
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5,744,722

## DECONVOLUTION METHOD OF RESONANCE DETECTION AND REMOVAL FROM CRANKSHAFT SPEED MEASUREMENTS

**Zhijian James Wu, Rochester Hills, and John Fiaschetti, Warren, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.**

**Filed Sep. 16, 1996, Ser. No. 719,304**
**Int. Cl.[6] G01H** *11/08;13/00*
**U.S. Cl. 73—659** **11 Claims**




1. A method of resonance detection and removal from crankshaft speed measurements comprising:

measuring a crankshaft speed;

converting said measured crankshaft speed into an input signal;

sending said input signal to an engine controller;

determining an impulse response of a resonance system from said input signal;

subjecting said input signal to a deconvolution operation utilizing said impulse response of said resonance system; and

obtaining an output signal representative of an engine performance characteristic from said deconvolution operation.

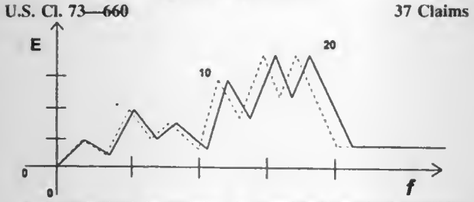
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5,744,723

## METHOD FOR DETERMINING ROTATIONAL SPEED FROM MACHINE VIBRATION DATA

**Kenneth R. Piety, Knoxville, Tenn., assignor to CSI Technology, Inc., Wilmington, Del.**

**Filed May 10, 1996, Ser. No. 644,176**
**Int. Cl.[6] G01N** *29/00*
**U.S. Cl. 73—660** **37 Claims**




1. A method of determining the rotational speed of a rotating shaft, comprising:

sensing vibration produced by the shaft to produce a test vibration signal at an unknown rotational speed of the shaft,

converting the test vibration signal to a test frequency spectrum,

compiling a table of peaks found in the test frequency spectrum,

providing a reference frequency spectrum corresponding to a known rotational speed of the shaft,

compiling a table of peaks found in the reference frequency spectrum, and

determining a stretch factor that provides optimum correlation between the table of test frequency spectrum peaks and the table of reference frequency spectrum peaks, and calculating the unknown rotational speed of the rotating shaft using the known rotational speed of the reference frequency spectrum and the stretch factor.

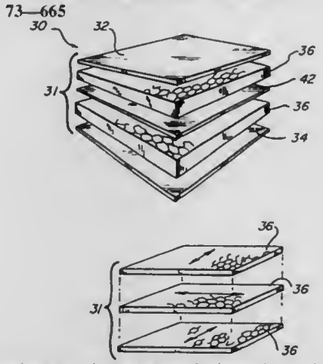
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5,744,724

## RANDOM VIBRATION GENERATING TABLE

**Gregg K. Hobbs, Westminister, Colo., assignor to QualMark Corporation, Denver, Colo.**

**Continuation of Ser. No. 484,564, Jun. 7, 1995, abandoned, which is a division of Ser. No. 344,544, Nov. 22, 1994, Pat. No. 5,589,637, which is a division of Ser. No. 950,631, Aug. 27, 1992, Pat. No. 5,365,788, which is a continuation-in-part of Ser. No. 487,757, Mar. 1, 1990, abandoned. This application May 13, 1997, Ser. No. 855,132**
**Int. Cl.[6] G01N** *29/12;* **G01M** *7/02*
**U.S. Cl. 73—665** **41 Claims**




1. Vibration screening apparatus for imparting multi-modal and multi-axial vibrations to a device to be screened, comprising:

mounting table means for supporting said device, for converting stress waves from impact forces into multi-modal and multi-axial vibrations, and for transmitting said multi-modal and multi-axial vibrations to said device, said mounting table means including a rigid core structure, said rigid core structure including a top surface sheet, a bottom surface sheet, and a honeycomb layer sandwiched between said top surface sheet and said bottom surface sheet;

impact actuator means connected directly to said bottom surface sheet of said mounting table means in a rigid manner that accommodates no relative movement between said impact actuator means and said bottom surface sheet for imparting undamped sequential impact forces to said rigid core structure; and

mounting means on said mounting table means for mounting said device securely on said top surface sheet of said mounting table means in a rigid manner that accommodates substantially no relative movement between said device and said top surface sheet for imparting undamped vibrations from said rigid core structure to said device.

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5,744,725

## CAPACITIVE PRESSURE SENSOR AND METHOD OF FABRICATING SAME

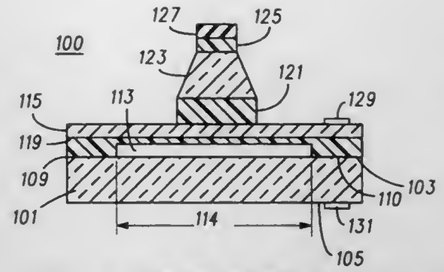
**Shiuh-Hui Steven Chen, Lake Zurich; Carl Ross, Mundelin, both of Ill., and Donald L. Hughes, Mesa, Ariz., assignors to Motorola Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 228,626, Apr. 18, 1994, abandoned. This application Jan. 8, 1997, Ser. No. 780,428**
**Int. Cl.[6] H01G** *7/00*
**U.S. Cl. 73—724** **29 Claims**

1. A method of fabricating a capacitive pressure sensor, the method comprising the steps of:

providing first and second silicon layers (**123**, **115**), wherein each of the first and second silicon layers (**123**, **115**) have an






insulating layer (**201**, **203**, **205**, **207**) respectively in contact with a first major surface (**202**, **204**) and on a surface (**206**, **208**) opposing the first major surface (**202**, **204**);

mechanically reducing a thickness (**210**) of the second silicon layer (**115**) to a predetermined thickness (**116**) wherein the step of mechanically reducing exposes a second major surface (**220**) on the second silicon layer (**115**);

disposing a third insulating layer (**211**) onto the second major surface (**220** of the second silicon layer (**115**);

providing a third silicon layer (**101**) having a fourth insulating layer (**109**) in contact with a portion (**110**) of a major surface (**214**) of the third silicon layer, wherein the fourth insulating layer (**109**) forms a perimeter structure (**215**) surrounding a predefined area (**114**) on the major surface (**214**) of the third silicon layer (**101**); and

bonding a top surface (**270**) of the perimeter structure (**215**) to the third insulating layer **211** oriented on the second silicon layer (**115**), wherein a chamber (**113**) is formed between the third insulating layer (**211**), the perimeter structure (**215**), and the predefined area (**114**).

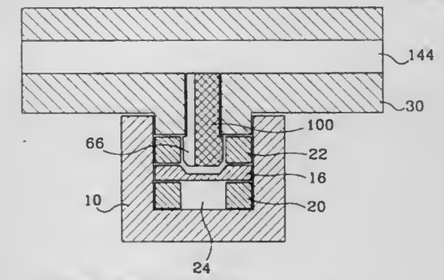
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5,744,726

## PRESSURE SENSOR WITH REDUCED DEAD SPACE ACHIEVED THROUGH AN INSERT MEMBER WITH A SURFACE GROOVE

**D. Joseph Maurer, Pearl City, Ill., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Feb. 25, 1997, Ser. No. 805,480**
**Int. Cl.[6] G01L** *9/06;9/00*
**U.S. Cl. 73—727** **14 Claims**




1. A pressure sensor, comprising:

a housing structure having a first cavity formed therein;

a pressure sensitive component disposed within said first cavity;

a second cavity containing a fluid;

a first conduit formed within said housing structure, said first conduit connecting said second cavity in fluid communication with said pressure sensitive component;

an insert member disposed within said first conduit; and

a channel formed within a longitudinal outer surface of said insert member, said channel being formed to connect said pressure sensitive component in fluid communication with said second cavity.

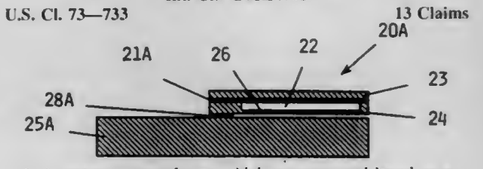
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5,744,727

## PRESSURE GAUGE

**Anders Hanneborg, Fetsund; Fin Serck-Hanssen, Hovik, and Per Ohlckers, Neshru, all of Norway, assignors to Sinvent A/S, Trondheim, Norway**

**PCT No. PCT/NO95/00048, § 371 Date Dec. 9, 1996, § 102(e) Date Dec. 9, 1996, PCT Pub. No. WO95/24624, PCT Pub. Date Sep. 14, 1995**
**PCT Filed Mar. 3, 1995, Ser. No. 716,143**
**Claims priority, application Norway, Mar. 7, 1994, 940785**
**Int. Cl.[6] G01L** *7/02*
**U.S. Cl. 73—733** **13 Claims**




1. A pressure gauge for very high pressures and based upon a principle similar to the bourdon tube, the pressure gauge comprising:

a substantially straight, beam-shaped measuring element having at least one elongate cavity lying eccentrically in the cross section of the measuring element;

a holder member at one end of the gauge, the measuring element being supportable by the holder member;

wherein the measuring element is composed of two substantially plate-shaped parts manufactured in planar technology and including material therein selected from the group consisting of silicium or quartz, the plate-shaped parts having cooperating surfaces, an elongate recess in the surface of one of the plate-shaped parts which faces the surface of the other plate-shaped part so as to form the eccentric cavity both plate-shaped parts being joined at said surfaces in such a manner that said cavity is sealingly closed, and the measuring element being deflected when subjected exteriorly to the very high pressures to be measured.

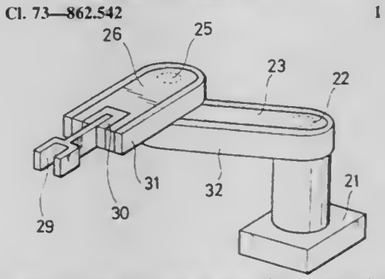
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5,744,728

## ROBOT COVERED WITH VISCO-ELASTIC MATERIAL

**Kazutsugu Suita, Toyota; Yoji Yamada, Nagoya; Nuio Tsuchida, Nagoya, and Koji Imai, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Continuation of Ser. No. 489,427, Jun. 12, 1995, abandoned. This application Nov. 12, 1996, Ser. No. 746,582**
**Claims priority, application Japan, Jun. 28, 1994, 6-146685**
**Int. Cl.[6] G05B** *19/42*
**U.S. Cl. 73—862.542** **1 Claim**




1. A robot having an arm and an arm driver to move the arm, a surface of the arm subject to collision with an object, the robot comprising a detector for detecting a magnitude of an external force applied to the arm and forcibly stopping the arm driver when the detected magnitude of the external force exceeds a predetermined level, wherein the surface of the arm is covered with a visco-elastic material, wherein the visco-elastic material has a viscosity coefficient and elasticity coefficient, such that the magnitude of the external force acting on the visco-elastic material is less

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than a permissible level at an instant after lapse of the sum of times t1and t2, where the permissible level does not cause damage to the arm and the object and time t1is measured from the instant when the visco-elastic material is brought into contact with the object until the instant the magnitude of the detected external force reaches the predetermined level acting on the visco-elastic material and time t2is measured from the instant of starting the stopping operation of the arm driver until the instant when the arm is stopped, and the external force acting on the object is $F(t)=(\eta V+GR)+GV(t-R/V)$, where F(t) is the external force, $\eta$ is the viscosity coefficient and G is the elasticity coefficient of the visco-elastic material, R is a radius of a half spherical end of the object, and V is a speed of the arm; and

wherein the predetermined level is at a force F(t) =5.0N and the permissible level is at a force F(t)=30.0N, further wherein at t=R/V, R=0.034 m and V=0.6 m/sec and the viscosity coefficient $\eta$ and the elasticity coefficient G satisfy the following conditions:

$5.0N \leqq V\eta+0.6\eta+0.034G$, and at $t=R/V+0.15$:

$30N \geqq V\eta+GR+GV\times 0.15$.

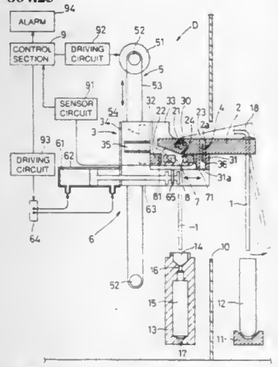
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**5,744,729**

**SAMPLE SUCKING DEVICE**

**Yosuke Tanaka, Kobe, Japan, assignor to Toa Medical Electronics Co., Ltd., Hyogo, Japan**

**Filed Dec. 18, 1996, Ser. No. 768,565**
**Claims priority, application Japan, Dec. 19, 1995, 7-350710**
**Int. Cl.[6] G01R** *1/16*
**U.S. Cl. 73—864.25** **18 Claims**




1. A sample sucking device comprising:

a pipette for sucking and collecting liquid samples;

a sample sucking mechanism connected to the pipette;

an arm, extending in a front direction and pivotally supported at a rear portion or an approximately intermediate portion thereof by a horizontal shaft, for holding the pipette substantially vertically at a front portion thereof;

an arm holder for supporting the arm substantially horizontally so that the arm is pivotable in an up-and-down direction;

an up-and-down moving mechanism for moving the arm holder in an up-and-down direction;

a back-and-forth moving mechanism for moving the arm holder back and forth;

at least two sensors, provided on the arm holder, in which a first sensor has a first preset value and a second sensor has a second preset value larger than the first preset value, for detecting an abnormal external force exceeding the respective preset value when exerted on the pipette or the arm; and

a control section capable of selectively receiving an abnormality detection signal from each sensor, for controlling actions of the sample sucking mechanism, the up-and-down moving mechanism, and the back-and-forth moving mechanism, and issuing a moving action stop command to the up-and-down moving mechanism or the back-and-forth moving mechanism when a sensor selectively detects the respective abnormal external force.

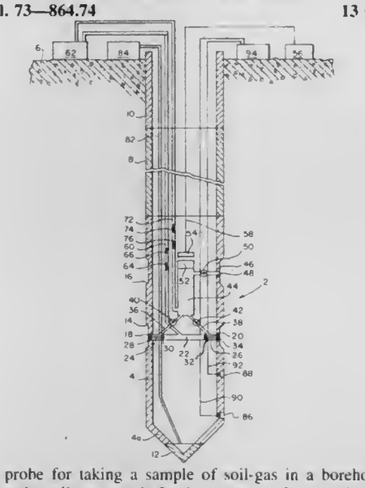
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**5,744,730**

**SUBSURFACE IN-SITU RADON GAS DETECTION/ PENETROMETER SYSTEM**

**John H. Ballard, 106 Pinehaven Cove, Clinton, Miss. 39056-3123, and John C. Morgan, 211 Bellbottom Rd., Redwood, Miss. 39058**

**Filed Feb. 14, 1997, Ser. No. 800,490**
**Int. Cl.[6] G01N** *1/26;* **E21B** *49/00*
**U.S. Cl. 73—864.74** **13 Claims**



1. A probe for taking a sample of soil-gas in a borehole and analyzing the soil-gas sample for the presence of a pre-selected gas while in the ground, comprising:

(a) an elongated body adapted to penetrate the ground, said body having an outer surface containing at least one inlet port and at least one outlet port, said body further containing a sampling chamber in fluid communication with said ports;

(b) detecting means connected with said sampling chamber for detecting the pre-selected gas; and

(c) regulating means for selectively allowing the soil-gas sample to flow from said inlet port to said sampling chamber.

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**5,744,731**

**LIQUID SAMPLING APPARATUS CAPABLE OF ASSEMBLY IN DIFFERENT SAMPLING CONFIGURATIONS**

**Lynn A. Dudley, Chino, Calif., assignor to Vortex Company, Claremont, Calif.**

**Filed Jan. 22, 1996, Ser. No. 589,719**
**Int. Cl.[6] G01N** *1/12*
**U.S. Cl. 73—864.63** **20 Claims**

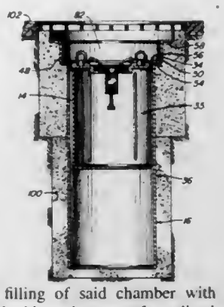
**14**. A liquid sampling device comprising:

a receptacle having upper and lower ends and containing a sample collection chamber, an upwardly opening basin at the upper end of said receptacle for receiving a liquid to be sampled, and liquid inlet means at the upper end of said receptacle including a passage opening to said chamber and having an upper inlet opening to said basin through which liquid may flow from said basin to said chamber, and wherein

said sampling device is adapted to be placed in a sampling position wherein said basin is disposed to receive liquid to be sampled, and

said inlet means includes float valve means responsive to the liquid level in said chamber for closing said passage in





response to filling of said chamber with a predetermined volume of liquid, and means for adjusting the maximum liquid inflow rate into said chamber through said passage.

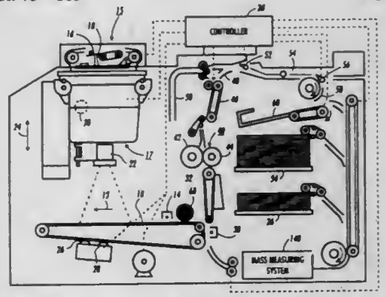
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**5,744,732**

**SHEET MATERIALS TRANSPORT SYSTEM**

**Joel A. Kubby, Rochester, N.Y.; Eric Peeters, Mountain View, Calif.; R. Enrique Viturro; Fred F. Hubble, III, both of Rochester, N.Y.; Stanley J. Wallace, Victor, N.Y.; Alan J. Werner, Jr., Rochester, N.Y.; Warren B. Jackson, San Francisco, Calif.; David K. Biegelsen, Portola Valley, Calif.; Lars-Erik Swartz, Sunnyvale, Calif.; Raj B. Apte, Palo Alto, Calif.; Robert A. Sprague, Saratoga, Calif., and James G. Chase, Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Division of Ser. No. 666,940, Jun. 19, 1996. This application Mar. 5, 1997, Ser. No. 811,987**
**Int. Cl.[6] G01G** *9/00*
**U.S. Cl. 73—865** **9 Claims**




1. A system for transporting a sheet of material, the system comprising:

a) a nip having a first surface and a second surface separated by a first distance, the sheet of material passing between the first surface and the second surface;

b) a conveyor coupled to the nip for conveying the sheet of material, the conveyor having a first speed;

c) a mass measuring system for measuring a mass of the sheet of material and modifying a one of the first distance and the first speed, the mass measuring system including:

1) an actuator for imparting a force of a known magnitude to the sheet of material;

2) a position sensing system adjacent to the actuator for generating a first electrical signal representative of an acceleration of the sheet of material;

3) a tactile sensor system adjacent to the first sensor system for generating a second electrical signal representative of a coefficient of friction of the sheet of material;

4) a processor for generating a third electrical signal representative of a mass of the sheet of material in response to the first electrical signal, the second electrical signal, and the known magnitude of the force imparted to the sheet of material.

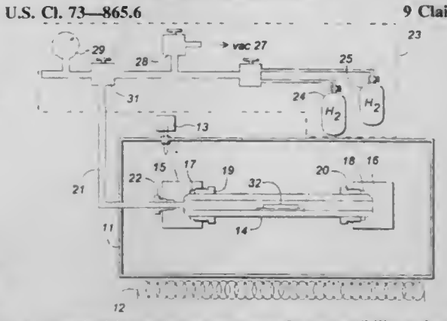
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**5,744,733**

**METHOD FOR TESTING AND SCREENING ELECTRONIC AND PHOTONIC PACKAGES FOR HYDROGEN DAMAGE SUSCEPTIBILITY**

**Paul Michael Bridenbaugh, 22 Iroquois Trail, Somerville, N.J. 08876; Gustav Edward Derkits, Jr., 55 Holmes Oval, New Providence, N.J. 07974, and Franklin Richard Nash, 1069 Canal Rd., Princeton, N.J. 08540**

**Filed Apr. 9, 1997, Ser. No. 831,583**
**Int. Cl.[6] G01N** *17/00*
**U.S. Cl. 73—865.6** **9 Claims**




1. A method for testing a component for susceptibility to hydrogen degradation comprising the steps of:

(a) placing the component to be tested in a temperature controlled pressure vessel,

(b) evacuating the pressure vessel,

(c) backfilling the pressure vessel with a test gas mixture containing a critical gas selected from the group consisting of hydrogen, deuterium, and tritium and a diluent gas, thereby providing a partial pressure of said critical gas,

(d) raising the ambient temperature of said pressure vessel to a predetermined test temperature T, thereby raising the partial pressure of said critical gas to a partial test pressure P,

(e) allowing the component to remain in the pressure vessel at the test pressure P and predetermined test temperature T for a predetermined period,

(f) cooling said pressure vessel,

(g) releasing the pressure in the pressure vessel, and

(h) examining the component to determine the extent of damage to the component caused by the hydrogen susceptibility test.

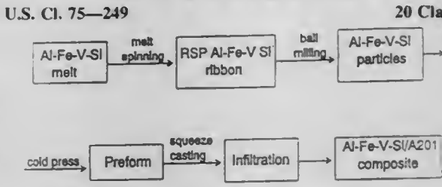
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**5,744,734**

**FABRICATION PROCESS FOR HIGH TEMPERATURE ALUMINUM ALLOYS BY SQUEEZE CASTING**

**Chih-Chao Yang, and Edward Chang, both of Tainan, Taiwan, assignors to Industrial Technology Research Institute, Hsin-chu, Taiwan**

**Filed Oct. 31, 1995, Ser. No. 551,110**
**Int. Cl.[6] B22F** *9/08;* **C22C** *21/00*
**U.S. Cl. 75—249** **20 Claims**




11. An article of high-temperature aluminum alloy having a predetermined shape and dimension and a compressional strength of at least 20 kg/mm$^2$ at temperatures of 300° C. or greater, said article of high-temperature aluminum alloy being fabricated from a process comprising the steps of:

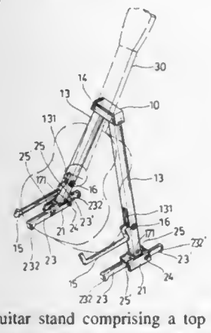
VOL 1209 ISS 4 AP 28 1998 UMI



(a) forming a porous preform from particles of a first aluminum alloy, said preform having the shape and dimension of said aluminum alloy article being fabricated;
(b) squeeze-casting a molten second aluminum alloy into void spaces of said porous preform to form an aluminum composite containing said first aluminum alloy, which provides as a reinforcement phase, dispersed in said second aluminum alloy, which provides as a matrix phase;
(c) wherein said molten second aluminum alloy is cast at such temperatures so as to cause a surface of said first aluminum alloy particles to melt and thereby form a strong bonding with said second aluminum alloy after cooling.

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**5,744,735**
**FOLDING GUITAR STAND**
**Tsun-Chi Liao, Taichung, Taiwan, assignor to Hwa Shin Musical Instrument Co., Ltd., Taichung, Taiwan**
**Filed Dec. 12, 1995, Ser. No. 570,928**
**Int. Cl.[6] G10D** *3/00*
**U.S. Cl. 84—327** **4 Claims**

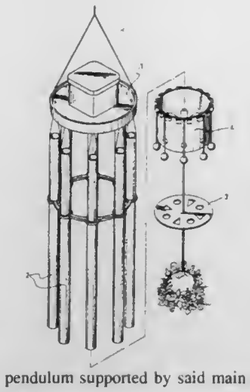


1. A folding guitar stand comprising a top member, two legs pivotally connected to said top member for pivotable movement between an extended position and a closed position, two supporting rods pivotally connected to said legs at a front side of each said leg and pivotable between an extended position perpendicular to said legs and a closed position in close attachment to said legs, a foot member fastened to each said leg at one and thereof remote from said top member, each said foot member including a base, a coupling block on the base, the block being fixedly secured to said leg, a pivot pin, a first balance rod and a second balance rod pivotally mounted to the base for pivotal movement about the pivot pin through a fixed angle in opposite directions between an outward position of use and an inward position of storage.

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**5,744,736**
**WINDCHIMES**
**Ching-Ho Chang, 2F, No. 5, Alley 8, Lane Szu Wei, Chung Cheng Rd., Hsin-Tien Taipei Hsien, Taiwan**
**Filed Sep. 9, 1996, Ser. No. 711,234**
**Int. Cl.[6] G10D** *13/08*
**U.S. Cl. 84—402** **6 Claims**

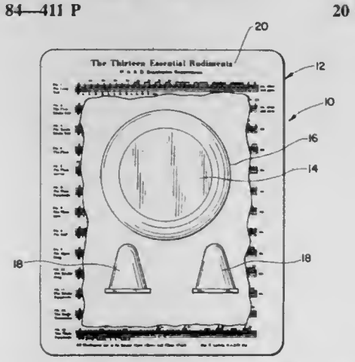
1. A windchime, comprising:
a supporting bracket,
a plurality of chimes supported by said supporting bracket;
an electrical powered main pendulum being supported by said supporting bracket at a center portion thereof to strike said chimes for playing a melody or song; and



an auxiliary pendulum supported by said main pendulum to be blown by wind.
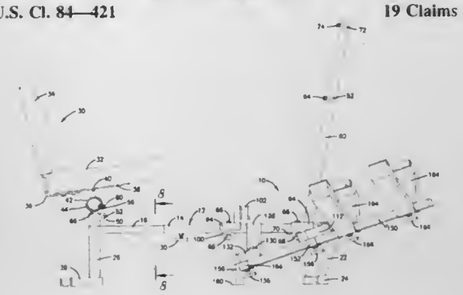
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**5,744,737**
**MUSCLE CONTROL DEVELOPMENT SYSTEM AND KIT THEREFOR**
**Darryl Carter, 1459 W. 47th St., Chicago, Ill. 60609**
**Filed Oct. 24, 1996, Ser. No. 736,384**
**Int. Cl.[6] G10D** *13/02*
**U.S. Cl. 84—411 P** **20 Claims**




1. A drum practice pad system for development of a user's arm, hand and finger muscles for development of drum stick control, comprising:
a plurality of homogenous, rimless pads formed of a resilient, elastically deformable material, at least one of said pads being a pancake pad having a relatively thin profile in a thickness direction, and configured to absorb a relatively small amount of force exerted thereon by a drumstick and to exhibit a relatively large rebound therefrom, at least another of said pads being a biscuit pad having a larger thickness profile than said pancake pad, said biscuit pad being configured to absorb a relatively larger amount of force exerted thereon than said pancake pad and to exhibit a lesser rebound therefrom, and at least another of said pads being a pea pad configured for placement between at least one of the user's forefinger tip and thumb tip and the user's forefinger base and thumb base, at about the juncture thereof, and being configured to be compressed therebetween for exercising selected muscles of the user.



**5,744,738**
**FRAME STRUCTURE FOR MUSICAL DRUMS**
**Robert A. Gatzen, 157 Pheasant Run, Newington, Conn. 06111**
**Filed Sep. 11, 1995, Ser. No. 526,154**
**Int. Cl.[6] G10D** *13/02*
**U.S. Cl. 84—421** **19 Claims**



1. A musical assembly comprising:
a rigid frame;
a seat mounted on said frame in a manner to receive vibration transmitted to the frame;
a pair of spaced apart arms extending to one side of said frame;
a bar connected rigidly with both of said arms;
at least one rebounding playing surface comprising a bass drum having a shell;
cradle means carried on said bar for holding said bass drum, said cradle means engaging said shell at spaced locations thereon;
a pedal connected with said arms at a location accessible to the foot of a drummer seated on said seat; and
a beater stick actuated by said pedal for striking said bass drum.

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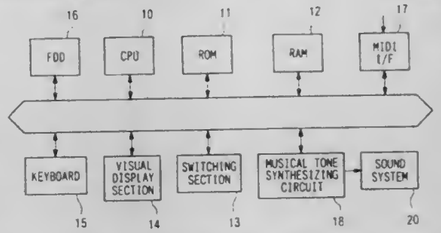
**5,744,739**
**WAVETABLE SYNTHESIZER AND OPERATING METHOD USING A VARIABLE SAMPLING RATE APPROXIMATION**
**Michael V. Jenkins, Austin, Tex., assignor to Crystal Semiconductor, Austin, Tex.**
**Filed Sep. 13, 1996, Ser. No. 713,341**
**Int. Cl.[6] G10H** *7/00*
**U.S. Cl. 84—603** **25 Claims**



1. A method of coding musical signals for recreation by a wavetable synthesizer comprising the steps of:
filtering a musical signal into a plurality of mutually disjoint frequency bands including a higher frequency band and a lower frequency band;
sampling the higher frequency band at a first sampling rate for a first sample duration;
sampling the lower frequency band at a second sampling rate for a second sample duration, the second sampling rate being lower than the first sampling rate and the second sample duration being longer than the first sample duration; and
storing the sampled higher frequency band and an associated recreation parameter in a first storage and storing the sampled lower frequency band and an associated recreation parameter in a second storage.

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**5,744,740**
**ELECTRONIC MUSICAL INSTRUMENT**
**Kotaro Mizuno, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan**
**Filed Feb. 21, 1996, Ser. No. 604,348**
**Claims priority, application Japan, Feb. 24, 1995, 7-036427**
**Int. Cl.[6] G10H** *1/18*
**U.S. Cl. 84—615** **13 Claims**




1. An electronic musical instrument comprising:
performance information receiving means for receiving performance information, including tone pitch information, which is transmitted thereto from an external device;
memory means for storing a function to be executed in in a designated correspondence with the tone pitch information;
function executing means for executing the function corresponding to the tone pitch information included in the performance information which is received by the performance information receiving means; and
editing means for selectively editing the designated correspondence between the function and the tone pitch information stored by the memory means.

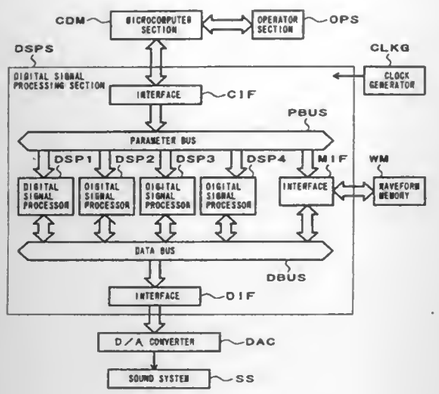
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**5,744,741**
**DIGITAL SIGNAL PROCESSING DEVICE FOR SOUND SIGNAL PROCESSING**
**Yasuyoshi Nakajima, and Masahiro Koyama, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan**
**Filed Jan. 11, 1996, Ser. No. 583,985**
**Claims priority, application Japan, Jan. 13, 1995, 7-004121; Feb. 28, 1995, 7-067110; Apr. 20, 1995, 7-117672**
**Int. Cl.[6] G10H** *1/02;1/057;1/06*
**U.S. Cl. 84—622** **21 Claims**

19. A voice and tone synthesis device comprising:
a plurality of waveform generation sections receiving a sound generation start signal instructing a start of sound generation and pitch information so as to form a sound waveform on the basis of the pitch information in response to the sound generation start signal;
a control section for supplying the sound generation start signal and pitch information to specific one of the plurality of said waveform generation sections, and
a transfer section for transferring the sound generation start signal and pitch information from said specific waveform

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generation section to predetermined other one of said waveform generation sections, wherein said specific waveform generation section and the predetermined other one of said waveform generation sections generate tones of harmonized pitches at synchronized generating timings.

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**5,744,742**

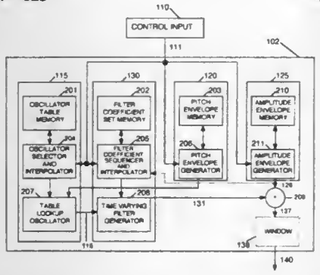
## PARAMETRIC SIGNAL MODELING MUSICAL SYNTHESIZER

**Eric Lindemann, and Jeffrey Barish, both of Boulder, Colo., assignors to EuPhonics, Incorporated, Boulder, Colo.**

**Continuation of Ser. No. 551,840, Nov. 7, 1995, abandoned. This application Feb. 28, 1997, Ser. No. 808,676**

**Int. Cl.[6] G10H** *1/00;1/12*

**U.S. Cl. 84—623** **48 Claims**




**10**. A method for generating a musical tone in response to an input control signal, comprising the steps of:

interpolating between data stored in an oscillator data table memory based upon the input control signal to generate an excitation signal;

interpolating between sets of filter coefficients stored in a filter coefficient table memory based upon the input control signal to generate an intermediate filter coefficient set;

interpolating within the intermediate filter coefficient set to generate a formant filter; and

filtering the excitation signal with the formant filter to generate a tone.

**5,744,743**

## PEDAL RESONANCE EFFECT SIMULATION DEVICE FOR DIGITAL PIANOS

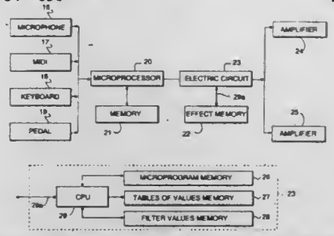
**Giovanni De Poli, Padua; Francesco Campetella, Pesaro, and Giampaolo Borin, Schio, all of Italy, assignors to Generalmusic S.P.A., Giovanni in Mariqnano, Italy**

**Filed Mar. 19, 1996, Ser. No. 618,379**

**Claims priority, application Italy, Apr. 28, 1995, B095A0192**

**Int. Cl.[6] G10H** *1/02;7/00*

**U.S. Cl. 84—630** **21 Claims**




**8**. A device for simulating in a digital piano the effect of a resonance pedal of a mechanical piano, said device comprising:

signal generation means, including a keyboard, for inputting signals corresponding to sounds of a plurality of simulated piano strings;

a resonance pedal operable in response to pressure of varying degrees of intensity;

generation control means for controlling the signal generation means in accordance with the operation of the resonance pedal via messages of a note-ON/note-OFF type;

an electric circuit device connected to said signal generation means, to said resonance effect pedal and to the generation control means, for controlling resonance of the generated signals based upon the pressure applied to the resonance pedal, said resonance being controlled in accordance with a physical reference model of the behavior of mechanical piano strings where the resonance contribution is provided by individual real strings of a mechanical piano.

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**5,744,744**

## ELECTRIC STRINGED INSTRUMENT HAVING AUTOMATED ACCOMPANIMENT SYSTEM

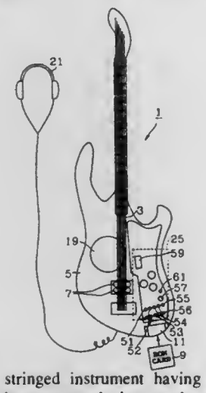
**Sadamoto Wakuda, Shizuoka-ken, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka-Ken, Japan**

**Filed Oct. 24, 1994, Ser. No. 327,629**

**Claims priority, application Japan, Oct. 28, 1993, 5-270939; Oct. 28, 1993, 5-270940**

**Int. Cl.[6] G10H** *1/36;1/46*

**U.S. Cl. 84—650** **8 Claims**



**1**. An electric stringed instrument having at least a normal electric stringed instrument playing mode and an automated accompaniment mode for outputting accompaniment sound to said instrument, said electric stringed instrument comprising:

a plurality of metallic strings supported by said instrument;

pickup means located adjacent said plurality of strings for detecting vibrations of said plurality of strings on said instrument and for generating a corresponding analog play signal;

accompaniment provision means for providing, in said automated accompaniment mode, separate prerecorded information as a digital accompaniment signal for accompanying said play signal;

digital to analog conversion means, coupled to said accompaniment provision means, for converting said digital accompaniment signal into an analog accompaniment signal;

mixing means, coupled to said pickup means and said accompaniment provision means; for mixing said play signal and said analog accompaniment signal;

amplifier means, coupled to said mixing means, for amplifying said play signal and said analog accompaniment signal after said play signal and said analog accompaniment signal are mixed;

a speaker, coupled to said amplifier means, for emitting sound according to said mixed and amplified signals;

volume proportion determination means, coupled to said pickup means, for determining whether the volume level of said play signal and said digital accompaniment signal are at the same volume level;

volume adjustment means, coupled said volume proportion determination and said pickup means, for adjusting the volume levels of at least one of said play signal and said digital accompaniment signal, prior to mixing them with said mixing means, when it is determined by said volume proportion determination means that the volume levels of said play signal and said digital accompaniment signal are at different volume levels, to adjust said volume levels of said play signal and said analog accompaniment signal to the same volume level; and

request responding means for effecting the volume level adjustment by said volume adjustment means only when there is a balance adjustment request and such that the balance adjustment is not repeated once the balance adjustment is completed.

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**5,744,745**

## MISSILE DETENT AND RELEASE APPARATUS

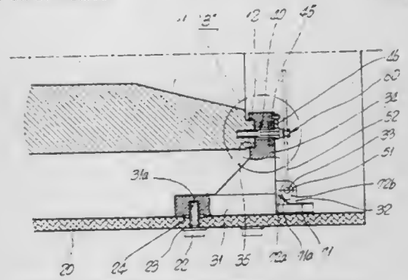
**Woo-Jeon Shim; Boo-Soon Koo; Beom-Soo Lim, and Kil-Ho Hong, all of Daejon, Rep. of Korea, assignors to Agency for Defense Development, Rep. of Korea**

**Filed Dec. 12, 1996, Ser. No. 764,523**

**Claims priority, application Rep. of Korea, Dec. 15, 1995, 50631/1995**

**Int. Cl.[6] F41F** *3/04*

**U.S. Cl. 89—1.806** **11 Claims**



**1**. A missile detent and release apparatus, comprising:

a pair of detaining protrusions protruding from one end portion of a missile;

a pair of fixing members fixed on an inner surface of a missile launch tube and each having a detaining groove into which respectively one of the detaining protrusions is inserted, with the fixing members each having hinge portions and being formed to extend in a direction coaxial with the longitudinal axis of the missile:

a detaining screw passing through a detaining groove of each one of said fixing members in the direction of the longitudinal axis the missile and engaged into a detaining screw hole formed at the center portion of the detaining screw hole formed at the center portion of the detaining protrusion for detaining the missile coaxially with the longitudinal axis of the missile;

a releasing rotation member rotatably engaged with each of said fixing members, and extending coaxially with the longitudinal axis of a missile nozzle, with the releasing rotation member being backwardly moved by a rocketing force of the missile; and

a detaining pin for detaining the movement of the detaining screw, with the end portion thereof being fixed to the rotation member.

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**5,744,746**

## TANDEM WARHEAD FOR COMBATTING ACTIVE TARGETS

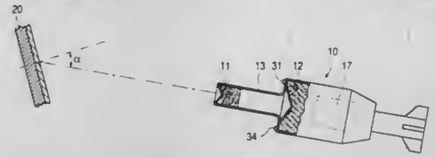
**Peter Tripptrap, Langenfeld; Jörg Peters, Düsseldorf; Torsten Niemeyer, Hilden, and Herbert Scholles, Hermannsburg, all of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany**

**Filed Jul. 12, 1990, Ser. No. 566,819**

**Claims priority, application Germany, Jul. 20, 1989, 39 24 087.8**

**Int. Cl.[6] F42B** *12/18;* **F42C** *13/02*

**U.S. Cl. 102—476** **10 Claims**



**1**. In a tandem warhead for combatting active armored targets, said warhead including a first shaped or projectile forming leader charge disposed in said warhead in a front portion of said warhead, a second shaped or projectile forming main charge disposed in said warhead behind said first charge when seen in the direction of flight of said warhead, and ignition means for causing said first charge to be ignited and thereafter said second charge to be ignited with a time delay $\Delta t$; the improvement wherein said tandem warhead further includes means for determining the actual momentary attack angle $\alpha$ of the warhead relative to the target and a said time delay $\Delta t$ associated with the respectively determined said momentary angle, and for sopplying the said determined time delay $\Delta t$ to said ignition means, with said means for determining including a plurality of distance measuring means, disposed on said warhead, for providing measured respective distance coordinates between said tandem warhead and a target in the flight direction of said warhead; means for using said measured respective distance coordinates to determine the momentary angle $\alpha$; and means for providing a value corresponding to said time delay $\Delta t$ determined with the aid of a characteristic curve $\Delta t=f(\alpha)$ specific for said warhead.

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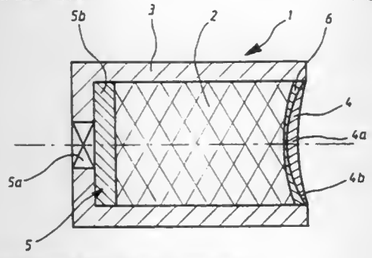


5,744,747

## SLUG GENERATING CHARGE

Jean-Luc Renaud-Bezot, Bourges; Laurent Chauveau, Sennercay, and Bernard Ceyrat, Bourges, all of France, assignors to Giat Industries, Versailles, France

Continuation of Ser. No. 719,421, Sep. 24, 1996, abandoned.
This application Aug. 26, 1997, Ser. No. 917,542
Claims priority, application France, Oct. 20, 1995, 95 12337
Int. Cl.[6] F42B *12/10*
U.S. Cl. 102—476 7 Claims




1. A slug generating charge comprising:
an explosive charge arranged in an envelope;
having only two layers that comprise
a metal liner set into motion by the detonation of the explosive, the metal liner having a circularly uniform thickness that decreases between a central part and its periphery and which is in contact with the envelope; and
a metal plate placed between the explosive charge and the metal liner, the metal plate having a diameter equal to an inner diameter of the envelope, the metal plate being in contact with at least a thinned peripheral part of the metal liner, the constitutive material and geometric characteristics of the metal plate being selected such that it reduces the velocity transmitted to the peripheral part of the metal liner relative to the central part of the metal liner by the explosive charge upon its ignition;
wherein upon detonation, the metal plate becomes detached from the metal liner.

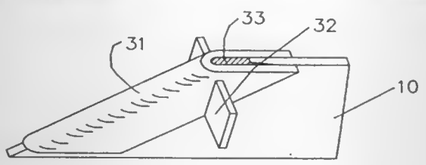
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5,744,748

## KINETIC ENERGY PROJECTILE WITH FIN LEADING EDGE PROTECTION MECHANISMS

Ameer G. Mikhail, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 716,678, Sep. 13, 1996, Pat. No. 5,668,347.
This application Apr. 14, 1997, Ser. No. 840,120
Int. Cl.[6] F42B *14/00;10/00;* B64C *1/10*
U.S. Cl. 102—523 5 Claims




1. A device to protect the fins of a projectile comprising:
a moveable shield on the leading edge of said fin;
means to restrain movement of said shield;
means to eject said shield after said projectile exits from a gun tube after launch; and,
further comprising padding material between said shield and said fin.

5,744,749

Patent Not Issued For This Number

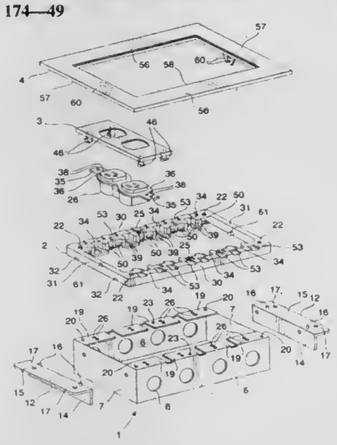
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5,744,750

## MODULAR ELECTRICAL CONNECTOR BOX

Gordon S. Almond, Kelowna, Canada, assignor to R123 Enterprises Ltd., Kelowna, Canada

Filed Nov. 30, 1994, Ser. No. 348,279
Int. Cl.[6] H02G *3/10*
U.S. Cl. 174—49 6 Claims



1. An assembly for housing electrical outlets comprising
junction box means for mounting in a recess in a wall, said box means having an open outer side;
ring means for mounting on said open outer side of the box means, said ring means having two ends and permitting access to the interior of the box means when mounted thereon;
at least one pair of opposed recesses in said ring means for receiving an electrical outlet;
cover plate means having two ends for mounting on said ring means and extending between opposed sides of said ring means to cover the area of the ring means around the electrical outlet and in the area of said opposed recesses while permitting access to said electrical outlet;
first lock means for releasably locking the cover plate means on said ring means;
face plate means for mounting on said ring means in surrounding relationship to said cover plate means and forming a substantially continuous outer surface therewith when in an assembled condition, said face plate means having two ends and limiting access to said cover plate means, whereby said cover plate means cannot be removed from said ring means until said face plate means has been removed therefrom; and
second lock means for releasably locking said face plate means to said ring means.

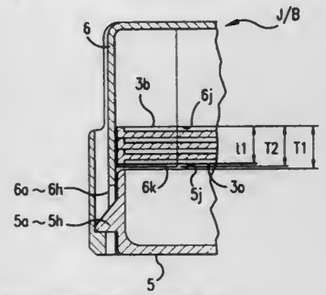


5,744,751

## ELECTRIC JUNCTION BOX AND METHOD FOR ASSEMBLING SAME WITH BUS BAR

Koji Kasai, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Feb. 3, 1997, Ser. No. 794,539
Claims priority, application Japan, Jun. 27, 1996, 8-167956
Int. Cl.[6] H02G *5/02*
U.S. Cl. 174—52.1 14 Claims




1. An electric junction box comprising:
an upper case;
a lower case attachable to the upper case;
a bus bar laminate interfitting between the upper case and the lower case; and
at least one seating protruding from at least one of the upper and lower cases, wherein a distance from a first holding surface of one of the upper and lower cases to said at least one seating is set to be slightly larger than a thickness of the bus bar laminate and is substantially equal to a dimension between the first holding surface and a second holding surface opposite the first holding surface, and wherein said at least one seating is made to contact one of the first and second holding surfaces and is restricted so that the upper and lower cases are not forced to move in a pressing direction against the bus bar laminate.

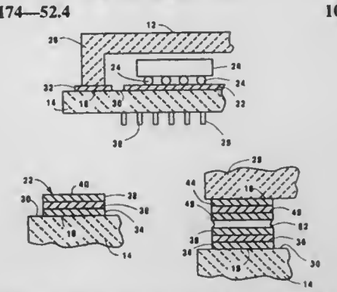
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5,744,752

## HERMETIC THIN FILM METALLIZED SEALBAND FOR SCM AND MCM-D MODULES

Dale C. McHerron, Modena, and Hilton T. Toy, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1995, Ser. No. 464,230
Int. Cl.[6] H01L *23/02*
U.S. Cl. 174—52.4 10 Claims



1. A reworkable hermetic module for encapsulating at least one microelectronic device having a thin film wiring layer comprising:
a cap for said module having a mating surface extending uninterruptedly around the periphery of said cap;
a substrate for said module, said substrate having a polished planar upper surface upon which is deposited a thin film wiring layer for said mircroelectronic device comprising at least one polymeric dielectric material and at least one wiring path of metallic material, said substrate having a mating surface on said polished surface extending uninterruptedly around the periphery of said substrate;
at least one thin film sealing layer on the mating surface of said substrate, said sealing layer having a thickness of less than about 0.001 in. and comprising a metal capable of wetting molten solder which has a melting point no greater than about 400° C. and adhering to said solder after solidification; and
a layer of said solder on said substrate forming a hermetic seal for said module.

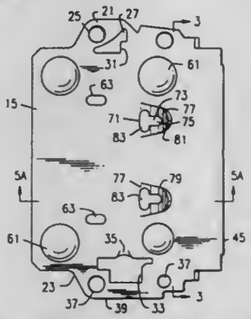
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5,744,753

## ELECTRICAL OUTLET BOX

William Nattel, Montreal, Canada, assignor to Thomas & Betts Corporation, Memphis, Tenn.

Filed Jun. 15, 1995, Ser. No. 490,802
Int. Cl.[6] H02G *3/08*
U.S. Cl. 174—58 29 Claims




1. A side plate, for forming a side of a metallic knock down, electrical outlet box, the side plate comprising: a generally rectangular planar main body; first and second extensions at first and second ends respectively of the main body; respective attachment means for releasably attaching the first and second extensions to top and bottom walls of said box; and at least one outwardly embossed portion on one side of the main body and an aperture in the embossed portion through the one side of the main body for receiving a fastening element, for securing said side plate against a mounting surface.

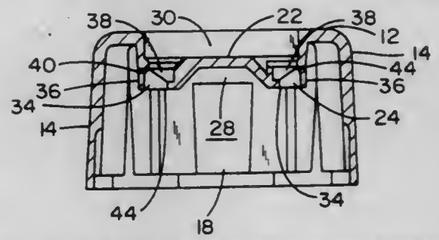
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5,744,754

## ELECTRICAL RECEPTACLE INCORPORATING INTEGRAL ELECTRICAL WIRE STRAIN RELIEF ARRANGEMENT

Ward E. Strang, Fairfield, and Carol Z. Howard, Oxford, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Filed Mar. 5, 1997, Ser. No. 811,632
Int. Cl.[6] H02G *3/18*
U.S. Cl. 174—65 SS 8 Claims




1. An electrical receptacle incorporating an integral electrical wire strain relief arrangement, said receptacle comprising:

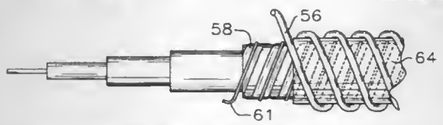
VOL 1209 ISS 4 AP 28 1998 UMI



(a) a housing having a rear wall, sidewalls and end walls forming a generally box-shaped structure;
(b) and structure formed unitarily with at least one of said housing walls including at least one through hole for the passage therethrough of at least one electrical wire or cable, said at least one through hole having first and second laterally offset hole portions along an axial extent thereof, a juncture between said first and second hole portions extending at an angle to the axial extent of said hole portions so as to form a strain relief-forming wall structure for said electrical wire or cable which is passed through one of said at least one through hole upon being tensioned and straightened to frictionally contact a wall surface of said at least one through hole in at least a region of the junture between said hole portions; and
(c) a well being formed in an outer surface of said at least one of said housing walls about said at least one through hole, said well being fillable with a potting compound so as to form a water-tight seal about said electrical wire or cable extending from said at least one through hole externally of the housing.

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**5,744,755**
**LIGHTNING RETARDANT CABLE**
**Samuel N. Gasque, Jr., Hendersonville, N.C., assignor to Marilyn A. Gasque, Hendersonville, N.C.**
**Filed Oct. 31, 1996, Ser. No. 741,536**
**Int. Cl.[6] H01B** *7/18*
**U.S. Cl. 174—108** **22 Claims**

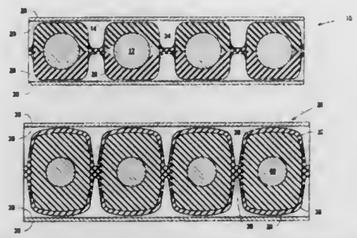



1. A lightning retardant cable comprising:
at least one internal conductor;
a choke conductor; said choke conductor wound about said internal conductor in the shape of a spiral; said choke conductor not being in direct contact with said internal conductor; said choke conductor presenting a high impedance to electrical current caused by lightning when lightning strikes near said cable;
a spiraled shield adjacent to said choke conductor; said spiraled shield being wound about said internal conductor; said spiraled shield not in direct contact with said internal conductor;
said spiraled shield being in the form of a flat conductor; at least one side of said flat conductor having electrical insulation attached thereto;
said choke conductor is in contact with an uninsulated side of said flat conductor of said spiraled shield.

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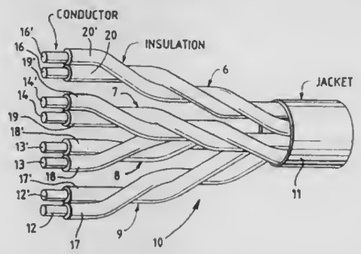
**5,744,756**
**BLOWN MICROFIBER INSULATED CABLE**
**Denis Dean Springer; Harry Alan Loder, and Robert Sam Dodsworth, all of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Filed Jul. 29, 1996, Ser. No. 681,725**
**Int. Cl.[6] H01B** *7/34*
**U.S. Cl. 174—110 N** **5 Claims**

1. A ribbon cable for transmitting electrical signals comprising:
a number of spaced, parallel conductors;
a microfiber insulation layer comprising a non-woven, blown microfiber web surrounding said conductors, said microfiber web including a plurality of elongated, entangled polymeric fibers fused each to a number of proximate one of said fibers at points along the length of said fibers, said insulation layer being compressed and more frequently fused to itself between said conductors, and
an outer layer of microporous, heat sealable insulation formed from a thermoplastic polymer selected from the group consisting of polypropylene, polystyrene, poly(ethylene terephthalate) polyamides, polyvinylidene fluoride and blends thereof surrounding said microfiber insulation layer, said ribbon cable being substantially free of air gaps around said conductors.



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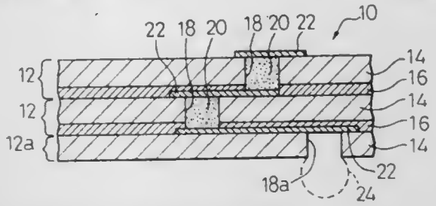
**5,744,757**
**PLENUM CABLE**
**Robert D. Kenny, Oxford, Ohio, and Douglas O'Brien, Richmond, Ind., assignors to Belden Wire & Cable Company, Richmond, Ind.**
**Continuation-in-part of Ser. No. 412,052, Mar. 28, 1995, Pat. No. 5,514,837. This application May 3, 1996, Ser. No. 642,489**
**Int. Cl.[6] H01B** *11/02*
**U.S. Cl. 174—113 R** **7 Claims**




1. A plenum cable having a jacket enclosing a plurality of twisted pair conductors comprising:
at least one twisted pair conductor has an insulation dielectric layer selected from the group consisting of flame retardant polyethylene and flame retardant polypropylene and
at least two twisted pair conductors having insulation dielectric layers selected from the group consisting of fluorinated ethylene propylene, tetrafluoroethylene, and ethylenechlorotrifluoroethylene and copolymers of tetrafluoroethylene with a perfluoroalkoxy, and
at least one of the twisted pair conductors being joined together along the length thereof and having a center-to-center distance at any point along the twisted pair conductor that does not vary by more than ±0.03 of an average center-to-center distance, said average center-to-center distance being an average of at least 20 center-to-center distance measurements on each of at least three randomly selected 1000 ft. twisted pair conductors of the same size taken from at least three separate successive runs with each run being on a separate day.



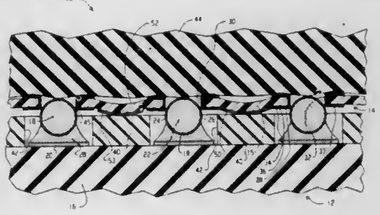
**5,744,758**
**MULTILAYER CIRCUIT BOARD AND PROCESS OF PRODUCTION THEREOF**
**Toshikazu Takenouchi, and Mikiko Wakabayashi, both of Nagano, Japan, assignors to Shinko Electric Industries Co., Ltd., Nagano, Japan**
**Filed Aug. 9, 1996, Ser. No. 695,387**
**Claims priority, application Japan, Aug. 11, 1995, 7-205623; Jun. 24, 1996, 8-162688**
**Int. Cl.[6] H05K** *1/00*; **B32B** *3/00;15/08*
**U.S. Cl. 174—255** **7 Claims**




1. A multilayer circuit board comprising:
a plurality of substrates;
each of said substrates comprising: a thermosetting resin film having first and second surfaces, a metal layer formed on said first surface and a thermoplastic polyimide film formed on said second surface;
each of said substrates having at least one via hole, extending through said substrates, except for said metal layer, in such a manner that one end of said at least one via hole is closed by said metal layer;
a layer of metallic plating, of predetermined thickness, laminated with a thermoplastic polyimide resin containing electrically conductive material, to form an electrically conductive via; and
said metal layer being defined as a predetermined circuit pattern electrically connected to said via; and
said plurality of substrates being laminated in such a manner that each substrate is adhered to an adjacent substrate by said thermoplastic polyimide film, and said electrically conductive via extending through said thermoplastic polyimide film is adhered to and electrically connected to said circuit pattern of said adjacent substrate.

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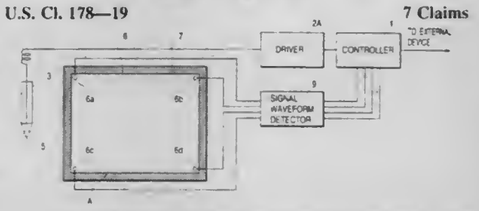
**5,744,759**
**CIRCUIT BOARDS THAT CAN ACCEPT A PLUGGABLE TAB MODULE THAT CAN BE ATTACHED OR REMOVED WITHOUT SOLDER**
**Joseph George Ameen, Newark, Del.; Joseph Funari, Vestal, and Michael John Funari, Apalachin, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**
**Filed May 29, 1996, Ser. No. 655,363**
**Int. Cl.[6] H05K** *1/16*
**U.S. Cl. 174—260** **11 Claims**



1. A circuit package comprising:
a. a substrate having:
a circuit pattern;
at least one pad disposed on the circuit board;
at least one gold plated metal ball disposed atop said pad;
b. a removable flexible module electrically connected to the substrate, having:
a flexible dielectric member having wrinkles therein;
at least one nondeformable gold plated via disposed through the flexible dielectric member, wherein said at least one gold plated via is disposed over the gold plated metal ball and electrically and structurally connected to the gold plated metal ball; and
c. an elastomeric stop disposed on the substrate.

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**5,744,760**
**COORDINATES INPUT APPARATUS**
**Katsuyuki Kobayashi, Yokohama; Atsushi Tanaka, Yamato; Yuichiro Yoshimura, Kamakura; Ryozo Yanagisawa, Inzai; Masaki Tokioka, Fujisawa, and Hajime Sato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**
**Filed Sep. 4, 1996, Ser. No. 707,721**
**Claims priority, application Japan, Sep. 7, 1995, 7-230023**
**Int. Cl.[6] G08C** *21/00*
**U.S. Cl. 178—19** **7 Claims**




1. A coordinates input apparatus for inputting coordinates by an input pen, comprising:
a vibration propagating plate which has a piezoelectric performance and has a first surface including a coordinate input area and a second surface that faces said first surface;
applying means for applying a voltage to said vibration propagating plate by making said input pen come into contact with a desired position in said coordinate input area; and
detecting means for detecting a vibration which ms generated by said voltage as an electric signal at a position of an electrode arranged out of said coordinate input area,
wherein said coordinate input area has a mesh-like electrode.

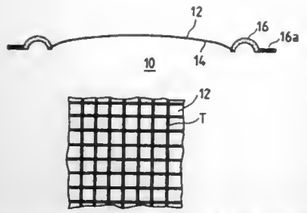
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**5,744,761**
**DIAPHRAGM-EDGE INTEGRAL MOLDINGS FOR SPEAKERS AND ACOUSTIC TRANSDUCERS COMPRISING SAME**
**Takashi Ogura, Osaka, and Kousaku Murata, Kobe, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**
**Filed Jun. 28, 1994, Ser. No. 266,924**
**Claims priority, application Japan, Jun. 28, 1993, 5-156676; Jun. 27, 1994, 6-143716**
**Int. Cl.[6] G10K** *13/00*
**U.S. Cl. 181—167** **31 Claims**

1. A diaphragm for speakers which comprises a self-supporting, shaped body including a tightly woven synthetic polymer fiber cloth substrate which has, at least, a diaphragm portion and an edge portion shaped integrally with and extending from said diaphragm portion wherein said diaphragm portion of said cloth substrate has a polymer resin at least partially impregnated thereto in order to impart stiffness to said diaphragm portion and said edge

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portion has a flexible polymer material at least partially impregnated therein so that said edge portion is lower in stiffness than said diaphragm portion,

wherein said cloth substrate has a weave structure which consists of fine fibers and thick fibers, said thick fibers being woven in said cloth substrate at intervals in vertical and horizontal directions to impart appropriate stiffness to said cloth substrate.

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**5,744,762**

**MUFFLER CONTROLLER FOR USE IN CONTROLLABLE EXHAUST SYSTEM OF INTERNAL COMBUSTION ENGINE**

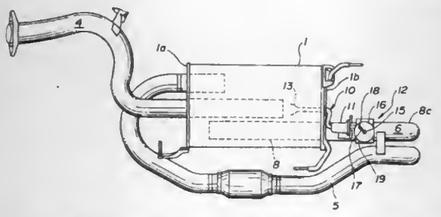
**Koji Seki, Yokohama; Yukio Nakanishi, and Tanomo Norikawa, both of Yokosuka, all of Japan, assignors to Calsonic Corporation, Tokyo, Japan**

**Filed Dec. 13, 1995, Ser. No. 571,768**

**Claims priority, application Japan, Feb. 24, 1995, 7-036518**

**Int. Cl.[6] F01N** *1/00*

**U.S. Cl. 181—254** **8 Claims**



1. A muffler assembly installed in an exhaust system of an internal combustion engine, comprising:

a muffler;

a conduit operatively connected to said muffler and defining an exhaust gas flow passage through which the exhaust gas in said muffler flows before discharging to the open air;

an actuator operatively connected to said conduit and having a piston rod moving straightly and reciprocatively in accordance with an exhaust pressure in said muffler; and

a valve assembly operatively connected to said conduit and including:

a valve plate pivotally installed in said exhaust gas flow passage by a pivot shaft;

an operation disc coaxially connected to said pivot shaft to rotate together with said pivot shaft and said valve plate;

a radially extending elongate slot defined in said operation disc; and

a roller rotatably connected to said piston rod and slidably received in said elongate slot.

**5,744,763**

**SOUNDPROOFING INSULATOR**

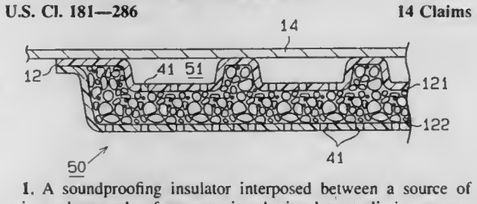
**Tadanobu Iwasa, Ichinomiya; Fujio Ninomiya, Aichi-ken; Zenichi Yasuda, Gifu; Yutaka Ogasawara, Ogaki; Masasumi Kokawa, Aichi-ken, and Kazuya Watanabe, Inazawa, all of Japan, assignors to Toyoda Gosei Co., Ltd., Aichi-ken, Japan**

**Filed Oct. 31, 1995, Ser. No. 551,034**

**Claims priority, application Japan, Nov. 1, 1994, 6-269059; Nov. 1, 1994, 6-269061; Mar. 14, 1995, 7-054679; Mar. 31, 1995, 7-075546; May 10, 1995, 7-112109; May 15, 1995, 7-116190; May 15, 1995, 7-116191; May 15, 1995, 7-116193**

**Int. Cl.[6] E04B** *1/82*

**U.S. Cl. 181—286** **14 Claims**



1. A soundproofing insulator interposed between a source of noise and a member for supporting the insulator to limit propagation of noise from the source to the support member, the soundproofing insulator comprising:

a multiplicity of elastic grains for absorbing the noise transmitted from the noise source;

a housing enclosing the elastic grains, the housing having a first layer wall contacting the support member and a second layer wall facing the noise source,

the second layer wall including a plurality of through holes having a diameter smaller than a minimum dimension of each elastic grain whose passage is to be prevented; and

a plurality of air pockets defined between the first layer and the support member.

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**5,744,764**

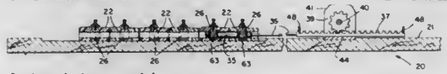
**MODULAR DE-ENERGIZED SWITCH FOR TRANSFORMER TAP CHANGING**

**William R. Aschenbrenner, Waukesha; Thomas M. Golner, Pewaukee, and Shirsh Mehta, Waukesha, all of Wis., assignors to General Signal Corporation, Stamford, Conn.**

**Filed Sep. 26, 1996, Ser. No. 720,293**

**Int. Cl.[6] H01H** *15/06*

**U.S. Cl. 200—1 R** **27 Claims**



1. A switch comprising:

(a) an insulating base;

(b) a plurality of fixed contact units mounted in aligned position on the base, each contact unit comprising an insulating body with a hollow bore therethrough and an electrical contact embedded in the insulating body and having a bore aligning with the bore of the body and having a contact post portion extending out of the insulating body, the fixed contact units mounted to the base so that the bores of the insulating bodies and electrical contacts of the fixed contact units are linearly aligned;

(c) a movable contactor mounted to move within the bores of the insulating bodies and the electrical contacts of the fixed contact units, the movable contactor having a cylindrical conductive body with two contact bands at spaced positions on the cylindrical body with the cylindrical body providing electrical conduction between the contact bands, the movable contactor sized to slide within the fixed contact units with the contact bands sized to engage the electrical contacts within the fixed contact units; and

(d) a drive shaft attached to the movable contactor so that the movable contactor can be driven through the bores of the fixed contact units by moving the drive shaft whereby the movable contactor can be moved from a position in which one of the contact bands of the movable contactor engages the electrical contact in a first of the fixed contact units to a position wherein the one contact band engages the electrical contact within another of the fixed contact units.



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**5,744,765**

**LEVER SWITCH WITH SUPPORT WALLS FOR SUPPORTING MOVABLE CONTACT POINTS AND METHOD OF DETECTING AN OPERATING DIRECTION OF A LEVER SWITCH**

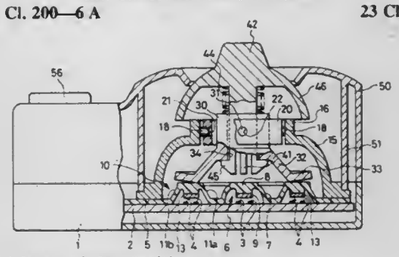
**Tetsuo Yamamoto, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan**

**Filed Jun. 11, 1996, Ser. No. 661,377**

**Claims priority, application Japan, Jun. 19, 1995, 7-176825; Oct. 3, 1995, 7-282484**

**Int. Cl.[6] H01H** *25/04;13/70;9/00*

**U.S. Cl. 200—6 A** **23 Claims**



1. A lever switch comprising:

a circuit board;

a plurality of stationary contact points generally arranged in a circle on the circuit board;

a plurality of movable contact points arranged in a circle and selectively coupleable with corresponding ones of the plurality of stationary contact points;

a tiltable operating lever arranged substantially at a center of the circle in which the plurality of stationary contact points are arranged, wherein at least one of the plurality of movable contact points comes into contact with at least one of the plurality of stationary contact points when the operating lever is tilted; and

inner and outer elastically flexible support walls respectively forming an inner circumference and an outer circumference of the circle formed by the plurality of movable contact points, wherein the plurality of movable contact points are supported by the inner and outer elastically flexible support walls.

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**5,744,766**

**SLIDE OR RECIPROCATING SWITCH WITH S-SHAPED BRIDGING-OR SPANNER CONTACT**

**Homer S. Sambar, Shorewood; Frank J. Graninger, and Roger E. Karweik, both of Norway, all of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.**

**Filed Jul. 24, 1996, Ser. No. 685,736**

**Int. Cl.[6] H01H** *15/06;1/20*

**U.S. Cl. 200—16 A** **20 Claims**

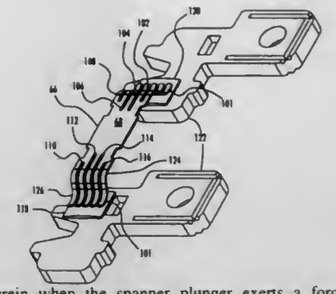
1. In a switch circuit having a pair of contacts and a spanner guide assembly, the spanner guide assembly including a spanner plunger and a spanner extending between the contacts, the spanner comprising:

a central region disposed in a spanner plane, the central region being in mechanical communication with the spanner plunger;

a pair of end regions extending from the central region, each of the end regions including:

a bent portion extending between the spanner plane and a contact plane, the contact plane being below and substantially parallel to the spanner plane; and

a contact region coupled to the bent portion, the contact region being disposed in the contact plane,



wherein when the spanner plunger exerts a force on the central region, the bent portion flexes such that the contact region contacts one of the pair of contacts with a sweeping movement.

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**5,744,767**

**RADIUS ACTUATOR WITH ADJUSTABLE SLANTED DISPOSITION OF AN OPERATING KEY FOR OPERATION OF A SAFETY SWITCH**

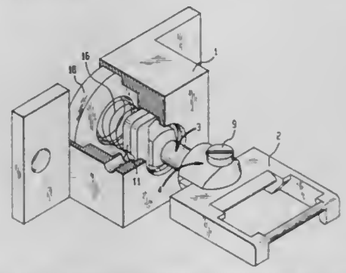
**Rolf Wecke, Bückeburg, and Roland Mönnings, Porta Westfalica, both of Germany, assignors to Hans Bernstein Spezialfabrik Für Schaltkontakte GmbH & Co., Porta Westfalica, Germany**

**Filed Oct. 11, 1996, Ser. No. 730,676**

**Claims priority, application Germany, Oct. 13, 1995, 295 16 230 U**

**Int. Cl.[6] H01H** *3/00*

**U.S. Cl. 200—17 R** **6 Claims**



1. A radius actuator for operating a safety switch; comprising:

a holder,

a spring-biased operating key; and

mounting means securing the operating key to the holder for movement of the operating key between a slanted initiation position and a switch-actuating position, said mounting means including a carrier member defining a longitudinal axis and having one end connected to the operating key and another end received in the holder such that the operating key is tiltable about a first pivot axis with regard to the carrier member and lockable in place, a base plate attached to the other end of the carrier member such that the carrier member is tiltable about a second pivot axis and lockable in place, with the second pivot axis being in offset disposition to the first pivot axis by 90°, and a spring received in the holder and loading the base plate, said base plate being displaceable in the holder in opposition to the action of the spring in direction of the longitudinal axis of the carrier member and tiltable relative to the longitudinal axis.

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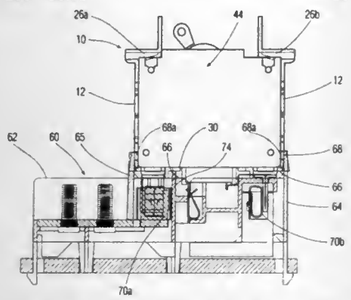


5,744,768

## LOCKING PLATE FOR STAB TERMINAL FOR FRONT ACCESS CIRCUIT BREAKER

**Howard Bishop, Salisbury, and Keith Singer, Cambridge, both of Md., assignors to Philips Electronics North America Corporation, New York, N.Y.**

**Filed Sep. 13, 1996, Ser. No. 713,376**
**Int. Cl.[6] H01H** *9/08;* **H02B** *1/04*
**U.S. Cl. 200—50.01** **10 Claims**




1. A locking plate for releasably securing a circuit breaker to a module, said locking plate comprising:
a back portion for supporting said circuit breaker;
means for releasably securing said locking plate to said module;
securing means, connected to said back portion, for releasably engaging a terminal of said circuit breaker, wherein said securing means is at least essentially orthogonal to said back portion and includes a first leg and a second leg spaced apart from and in facing relation to said first leg, said first and second legs being releasably engagable with said terminal of said circuit breaker, whereby said terminal of said circuit breaker is intermediate said first and second legs when said locking plate is secured to said circuit breaker.

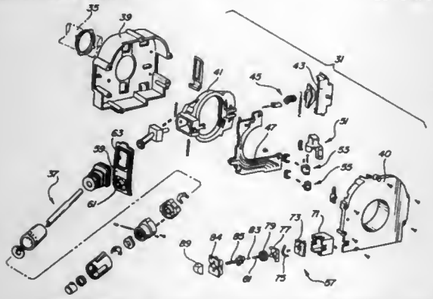
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5,744,769

## ELECTRICAL SWITCH FOR USE IN AN AUTOMOTIVE VEHICLE

**Thomas H. Proctor, Sterling Heights; James B. Wright, Warren; LeRoy A. Poleschuk, White Lake, and Ernest Peter Valade, Woodhaven, all of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.**

**Continuation-in-part of Ser. No. 380,090, Jan. 30, 1995, Pat. No. 5,575,177, which is a continuation-in-part of Ser. No. 120,676, Sep. 13, 1993, Pat. No. 5,385,067. This application May 1, 1995, Ser. No. 431,899**
**Int. Cl.[6] H01H** *9/00*
**U.S. Cl. 200—61.54** **15 Claims**




1. In combination, an electrical switch and a steering column, said combination comprising:
first conductive means for conducting electric current;
second conductive means for conducting electric current;
a carrier linearly movable relative to said first and second conductive means;
contactor means riding upon said carrier operable for conducting electric current between said first and second conducting means, wherein a back and forth movement of said contactor means along a first direction causes telescoping movement of the steering column and a back and forth movement of said contactor means along a second direction causes tilting movement of the steering column;
a nonpivoting post oriented substantially normal to a plane defined by surfaces of said first and second conductive means;
a receptacle having at least one groove for engaging with a distal end of said post; and
said post and said receptacle assisting to align said carrier during movement.

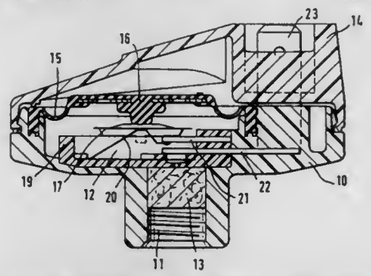
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5,744,770

## INDICATING APPARATUS FOR INDICATING A VACUUM

**Klaus Moessinger, Obersulm, and Stefan Kochert, Weinstadt, both of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany**

**Filed Feb. 7, 1996, Ser. No. 598,215**
**Claims priority, application Germany, Feb. 24, 1995, 195 06 453.4**
**Int. Cl.[6] H01H** *35/40*
**U.S. Cl. 200—83 A** **12 Claims**




1. An indicating apparatus for indicating a vacuum comprising a housing, a membrane which seals off a vacuum area on one side thereof with respect to an ambient pressure area on the other side thereof, a piston associated with said membrane and movably arranged in the housing, and a snap element acted upon by the piston in response to a pressure difference between the vacuum area and the ambient pressure area, said snap element actuating an electric contact when moved by said piston in response to a sufficient pressure difference, wherein said electric contact comprises a contact spring arranged immediately underneath said snap element and a conductive contact plate into contact with which the snap element, when it snaps through, pushes the contact spring.

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5,744,771

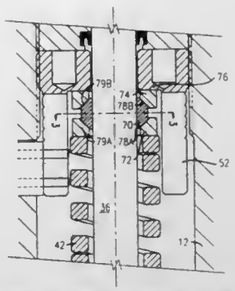
## PRESSURE SWITCH WITH INCREASED DEADBAND

**James Richard Ellett, Edmonton, Canada, assignor to Argus Machine Co. Ltd., Edmonton, Canada**

**Filed Nov. 5, 1996, Ser. No. 743,245**
**Int. Cl.[6] H01H** *35/38*
**U.S. Cl. 200—83 J** **8 Claims**

1. A pressure switch comprising:
a housing with an interior bore;
a rod slidable over a limited range within the bore under external fluid pressure;
a mechanically operated electrical switch operatively connected to the rod;
a spring disposed within the housing and oriented to resist movement of the rod within the bore;
adjustment means encapsulated within the housing to adjust resistance of the rod to movement under the external fluid pressure; and






means, responsive to spring pressure, to increase frictional forces on the rod tending to oppose longitudinal movement of the rod within the bore.

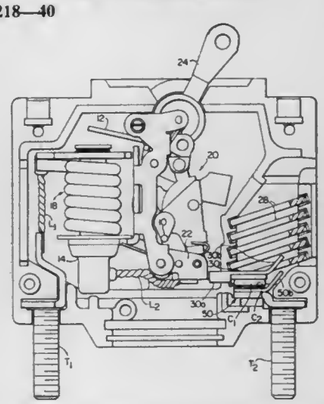
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5,744,772

## MOLDED CASE CIRCUIT BREAKER WITH ARC SUPPRESSANT FEATURES INCLUDING MAGNETICALLY PERMEABLE ARC HORN MOUNTED ON THE CONTACT ARM

**Michael A. Fasano, Watertown, Conn., assignor to Carlingswitch, Inc., Plainville, Conn.**

**Filed Aug. 1, 1996, Ser. No. 695,176**
**Int. Cl.[6] H01H** *9/44;9/30*
**U.S. Cl. 218—40** **3 Claims**




1. A circuit breaker having a housing defining an internal chamber, a circuit breaker mechanism provided in said chamber and including a pivotable movable contact arm which moves from a closed to an open position in response to an overcurrent condition that is detected by said circuit breaker mechanism, a movable contact provided on the underside of said movable contact arm, a copper plated magnetically permeable arc horn on the upper side of said contact arm, said arc horn having a generally U-shaped configuration with the legs of the "U" defining ears for mounting said arc horn on said movable contact arm, said U-shaped arc horn further including an upstanding base portion that extends beyond the free end of the movable contact arm and beyond said movable contact, said base defining a target area for locating the electric arc generated during a short circuit condition, a fixed contact provided for engagement by said movable contact when the movable contact arm is moved downwardly to a closed position, an arc shoe associated with said fixed contact and including portions alongside the fixed contact, said arc shoe further including a portion projecting upwardly and outwardly of said fixed contact to enhance the migration of an arc created between said fixed and movable contacts as a result of upward opening movement of the movable contact arm, which arc is driven in a direction away from the end of the movable contact as a result of said upwardly extending portion of said arc horn in conjunction with the upwardly and outwardly projecting portion of said arc shoe.

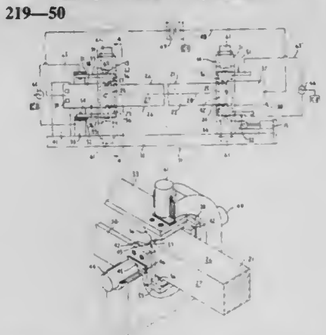
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5,744,773

## RESISTANCE HEATING PROCESS AND APPARATUS

**Robert G. Van Otteren, Bay City; Frank Scott Mellen, Midland, both of Mich.; Alfred R. Leger, North Grafton, and Charles H. Gage, Westborough, both of Mass., assignors to Newcor, Inc., Bloomfield Hills, Mich.**

**Filed Sep. 19, 1995, Ser. No. 531,106**
**Int. Cl.[6] C21D** *9/62;* **H05B** *3/02*
**U.S. Cl. 219—50** **21 Claims**



1. An apparatus for electrical resistance heating of a longitudinally elongate metal workpiece having peripheral side surfaces, the workpiece having a longitudinally elongate center portion joined between opposite first and second end portions each terminating in a transversely-extending end face which defines a free end of the workpiece, said apparatus comprising:
a frame;
first and second collet assemblies mounted on said frame in generally opposed but spaced relation from one another for respectively supportingly engaging respective first and second end portions of the workpiece;
first electrical resistance heating means for applying direct-current electrical energy longitudinally along said workpiece for effecting resistance heating thereof, said first heating means including first and second jaw assemblies respectively provided on said first and second collet assemblies, for engaging a surface of the respective end portion of the workpiece in the vicinity of the respective end face, said first and second jaw assemblies respectively including first and second jaws each comprising an electrode for transmitting electrical current therethrough;
said first heating means also including a first direct-current electrical power source connected to said first and second jaw assemblies so as to define a conductive path longitudinally along said workpiece to effect resistance heating thereof due to passage of direct-current electrical energy longitudinally therethrough;
second electrical resistance heating means for transmitting electrical energy transversely across said first end portion of said workpiece in close proximity to the respective end face for effecting electrical resistance heating thereof, said second resistance heating means including third and fourth jaw assemblies both associated with said first collet assembly for clampingly engaging opposite peripheral side surfaces of said first end portion of said workpiece in directly adjacent relation to the respective end face, said third and fourth jaw assemblies respectively defining third and fourth jaws which are disposed in generally opposed relationship and cooperate as a pair for clampingly engaging opposed peripheral side surfaces of said first end portion of said workpiece therebetween, each of said third and fourth jaws comprising an electrode for transmitting electrical energy therethrough; and
said second resistance heating means also including a second electrical power source connected to said third and fourth

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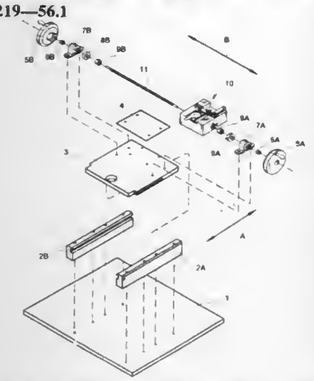
jaws for permitting electrical energy to be transmitted directly between said third and fourth jaws so as to be transmitted transversely across said first end portion of said workpiece in close relation with the respective end face to effect electrical resistance heating of said first end portion.

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**5,744,774**
**METHOD AND APPARATUS FOR AFFIXING A DEVICE TO A MULTICONDUCTOR CABLE**

**Jack Levinson, Boulder; Kirk L. Weimer, Superior, and Todd G. Wieseler, Boulder, all of Colo., assignors to Ohmeda Inc., Liberty Corner, N.J.**

**Filed Mar. 29, 1996, Ser. No. 624,069**
**Int. Cl.[6] B23K** *11/26*
**U.S. Cl. 219—56.1** **10 Claims**



1. Apparatus for interconnecting a plurality of conductors to a like plurality of electrical contacts comprising:
a weld circuit comprising a first terminal and a second terminal and a power source for applying a current to said first terminal and said second terminal;
means for precisely positioning said plurality of electrical contacts against said first terminal in a spaced apart predetermined orientation;
means for securing each of said plurality of conductors against a mating one of said plurality of electrical contacts which are secured against said first terminal; and
means for placing said second terminal in contact with at least one of said plurality of conductors to thereby enable an electrical current, caused by said current, to flow between said first and said second terminals through the at least one conductor and a corresponding one of said electrical contacts to weld said at least one conductor to said mating one of said electrical contacts.

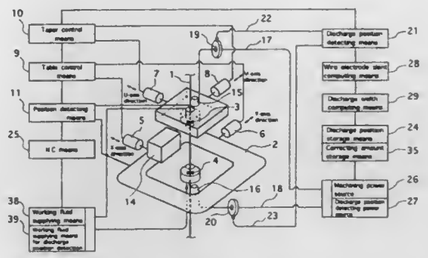
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**5,744,775**
**WIRE ELECTRODE DISCHARGE MACHINE AND METHOD**

**Osamu Yasuda, and Yoshiro Nakayama, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 6, 1996, Ser. No. 611,810**
**Claims priority, application Japan, Mar. 6, 1995, 7-045429**
**Int. Cl.[6] B23H** *7/06*
**U.S. Cl. 219—69.12** **21 Claims**

1. A wire electrode discharge machine, comprising:
working fluid supplying means for supplying working fluid between a wire electrode and a workpiece;
a machining power source for applying a voltage to generate a discharge between said wire electrode and said workpiece through said working fluid supplied from said working fluid supplying means;



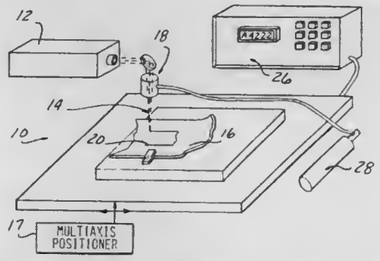
a table on which said workpiece is fixed;
table control means for controlling a movement of said table in X-axis and Y-axis directions;
a pair of wire electrode guides respectively located at a top and a bottom of said workpiece;
taper control means for controlling a slant of said wire electrode relative to said workpiece by moving one of said wire electrode guides in U-axis and V-axis directions;
discharge position detecting means for detecting the discharge position between said wire electrode and said workpiece based on a current supplied through an upper power supplying line and a lower power supplying line from said machining power source to said wire electrode;
wire electrode slant determining means for determining a slant direction of said wire electrode relative to said workpiece based on a shift of said discharge position detected by said discharge position detecting means while approaching said wire electrode relative to said workpiece; and
a wire electrode slant correcting means for correcting the slant of said wire electrode relative to said workpiece based on the slant direction of said wire electrode determined by said wire electrode slant determining means.

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**5,744,776**
**APPARATUS AND FOR LASER PREWEAKENING AN AUTOMOTIVE TRIM COVER FOR AN AIR BAG DEPLOYMENT OPENING**

**David J. Bauer, West Bloomfield, Mich., assignor to Tip Engineering Group, Inc., Farmington Hills, Mich.**

**Continuation-in-part of Ser. No. 132,299, Oct. 5, 1993, Pat. No. 5,375,875, and a continuation-in-part of Ser. No. 151,175, Mar. 1, 1994, abandoned, which is a division of Ser. No. 934,886, Aug. 24, 1992, Pat. No. 5,217,244, which is a continuation of Ser. No. 471,922, Jan. 23, 1990, abandoned, which is a continuation of Ser. No. 380,156, Jul. 14, 1989, abandoned. This application Oct. 31, 1994, Ser. No. 332,565**
**Int. Cl.[6] B23K** *26/00*
**U.S. Cl. 219—121.7** **22 Claims**




17. Apparatus for prescoring an inside of an automotive interior trim piece having a substrate and an overlying cover piece, comprising:
a $CO_2$ laser beam generator of sufficient power to partially penetrate said interior trim piece;



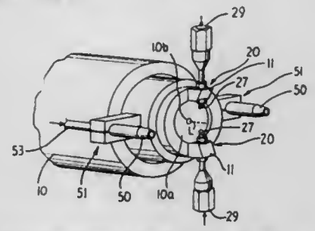
means for supporting said trim piece and relatively moving said supported trim piece and laser beam generator to trace a scoring pattern on said interior trim piece with a laser beam to form an air bag deployment door therein; and,
control means monitoring said scoring of said trim piece during the tracing of the scoring pattern on said interior trim piece, and varying the scoring effect of said laser beam to produce only a predetermined partial penetration of said interior trim piece by said laser beam at points along the tracing of said scoring pattern.

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**5,744,777**
**SMALL PARTICLE PLASMA SPRAY APPARATUS, METHOD AND COATED ARTICLE**

**Thomas F. Bernecki, Grayslake, and Daniel R. Marron, Burbank, both of Ill., assignors to Northwestern University, Evanston, Ill.**

**Continuation-in-part of Ser. No. 461,434, Jun. 5, 1995, abandoned, which is a division of Ser. No. 352,959, Dec. 9, 1994, abandoned. This application May 31, 1996, Ser. No. 656,070**
**Int. Cl.[6] B23K** *10/00*
**U.S. Cl. 219—121.47** **13 Claims**



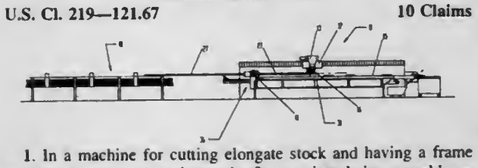
1. Apparatus for coating a surface, comprising:
a) a plasma torch having a discharge end from which a plasma plume is directed toward said surface, and
b) a powder injector having a powder supply passage and a powder discharge passage having a generally elliptical cross sectional shape with a major and minor passage dimension and with a reduced cross-sectional area as compared to that of said powder supply passage proximate a particle injection region of said plume, said powder discharge passage being oriented at an angle between about 30 and 60 degrees relative to an axis perpendicular to a longitudinal axis of said torch for introducing powder particles in the size range less than about 20 microns diameter into an outer mantle of the plasma plume.

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**5,744,778**
**TUBE HANDLING METHOD AND APPARATUS FOR CUTTING MACHINE**

**Edward C. Kasb, Sugar Land, Tex., and Jeffrey S. Schmidt, Lebanon, Ind., assignors to G&H Diversified Manufacturing, Inc., Indianapolis, Ind.**

**Filed Apr. 2, 1996, Ser. No. 626,500**
**Int. Cl.[6] B23K** *26/00*
**U.S. Cl. 219—121.67** **10 Claims**



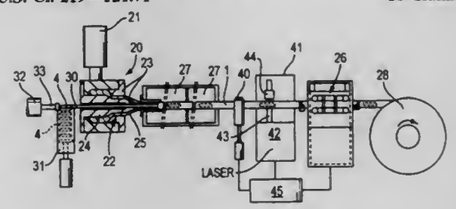
1. In a machine for cutting elongate stock and having a frame and first and second carriages, the first carriage being movable on the frame along one linear axis and the second carriage being movable along the first carriage in directions transverse to the first axis, and a cutting head secured to the second carriage and including a cutting tool, the improvement combination comprising:
a first stock support in a fixed location relative to the cutting head;
a second stock support in a fixed location relative to the frame;
both stock supports permitting the stock to rotate about a processing axis parallel to the linear axis;
a first stock gripper on the cutting head;
a second stock gripper adjacent the second stock support; and
a stock rotator adjacent the second stock support to rotate the stock on the processing axis;
the first stock gripper, the stock rotator and the cutting tool being disposed on a substantially straight line; and
the first stock gripper being located between the first stock support and the stock rotator.

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**5,744,779**
**METHOD FOR MANUFACTURING DRIP IRRIGATION TUBES**

**Bruno Buluschek, Echandens, Switzerland, assignor to E. Kertscher S.A., Yvonand, Switzerland**

**Filed Dec. 6, 1995, Ser. No. 568,135**
**Claims priority, application France, Dec. 7, 1994, 94 14712**
**Int. Cl.[6] B23K** *26/00*
**U.S. Cl. 219—121.71** **10 Claims**




1. A method for manufacturing drip irrigation tubes, comprising the following steps of:
providing a continuous tube by extrusion, said tube having an interior space delimited by a wall having an internal face,
welding onto said internal face of said wall of the tube a flow regulator comprising a watertight wall which defines with said internal face a collecting chamber connected to said interior space of the tube by a regulated discharge conduit, and
perforating said wall of the tube so that said collecting chamber communicates with the exterior,
wherein in order to perforate the wall of the tube, a contactless detector is used, able to detect the beginning of a flow regulator passing in front of it when the tube moves longitudinally in relation to said detector, and
a laser is used for perforating the wall of the tube at a location facing the collecting chamber.

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**5,744,780**
**APPARATUS FOR PRECISION MICROMACHINING WITH LASERS**

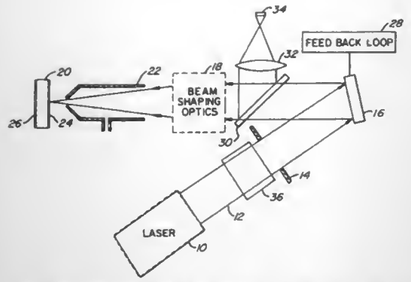
**Jim J. Chang, Dublin; Ernest P. Dragon, Danville, and Bruce E. Warner, Pleasanton, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Sep. 5, 1995, Ser. No. 523,321**
**Int. Cl.[6] B23K** *26/18*
**U.S. Cl. 219—121.73** **13 Claims**

1. An apparatus for precision micromachining a part, comprising:
a laser beam produced by a laser, wherein said laser beam has a beam quality better than 2 times the diffraction limit, a pulse length less than 1 microsecond, a repetition rate greater than 2 kHz and a wavelength that is in the visible range;

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a cover plate attached to a front surface of said pars., said cover plate collecting vapor deposits during said precision micromachining, wherein said cover plate is comprised of a foil;

an x-y tilt mirror to direct and scan said laser beam onto said covered part, wherein said x-y tilt mirror comprises voltage controlled x and y axis drives that are capable of microradian tilt control at 1 to 1000 Hz; and

beam shaping optics to reduce the size of said laser beam to the micron scale, wherein said beam shaping optics are diffraction limited over their aperture.

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**5,744,781**

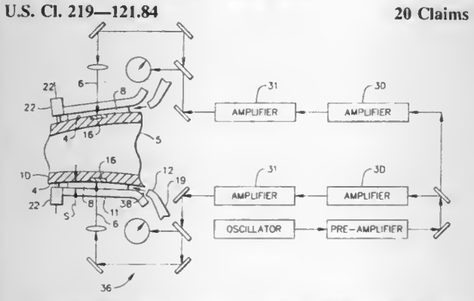
**METHOD AND APPARATUS FOR LASER SHOCK PEENING**

**Robert L. Yeaton, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio**

**Filed Aug. 7, 1995, Ser. No. 511,771**

**Int. Cl.[6] B23K** *26/14*

**U.S. Cl. 219—121.84** **20 Claims**




1. An apparatus for laser shock peening a surface portion on a workpiece through a curtain of water, said apparatus comprising:

a laser unit having at least one laser beam source for generating at least one laser beam and means for directing said beam through to the surface portion on the workpiece,

a water supply means for flowing the curtain of water over the surface portion,

a confining means for confining the water curtain on the surface portion essentially without any air gaps between the surface portion and a transparent wall of said confining means, said transparent wall being positionable a spaced apart distance from and over the surface portion, and said laser unit being of sufficient power to produce a region having deep compressive residual stresses imparted by laser shock peening extending into workpiece from the surface portion.

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**5,744,782**

**ADVANCED CONSUMABLE ELECTRODES FOR GAS METAL ARC (GMA) WELDING OF HIGH STRENGTH LOW ALLOY (HSLA) STEELS**

**Krishnaswamy Sampath, Johnstown, Pa., and Richard Samuel Green, Westerville, Ohio, assignors to Concurrent Technologies Corporation, Johnstown, Pa.**

**Filed Mar. 7, 1996, Ser. No. 610,586**

**Int. Cl.[6] B23K** *35/22*

**U.S. Cl. 219—146.1** **23 Claims**

1. A bare, solid, consumable, ferrous welding electrode for gas metal arc welding of HSLA-80 and HSLA-100 steels consisting essentially of iron, carbon, manganese, nickel, molybdenum, silicon, copper, and boron, wherein the amounts, in weight percent, of carbon (C), manganese (Mn), nickel (Ni), molybdenum (Mo), silicon (Si), copper (Cu), and boron (B) satisfy the following equations:

$$B_{50}(°C.)=770-(270\times C)-(90\times Mn)-(37\times Ni)-(70\times Cr)-(83\times Mo)$$

where the calculated $B_{50}$ is about 400° C. to 500° C.;

$$M_S(°C.)=561-(474\times C)-(33\times Mn)-(17\times Ni)-(17\times (Cr)-(21\times Mo)$$

where the calculated $M_S$ is about 400° C. to 450° C.;

$$CEN=C+A(C)\times[Si/24+Mn/6+Cu/15+Ni/20+(Cr+Mo+V+Nb)/5+5B]$$

where $A(C)=0.75+0.25\tanh[20\times(C-0.12)]$; and

where the calculated CEN is about 0.28 to 0.41.

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**5,744,783**

**AUTOMATIC TEMPERATURE CONTROLLING METHOD IN ELECTRIC RICE COOKER**

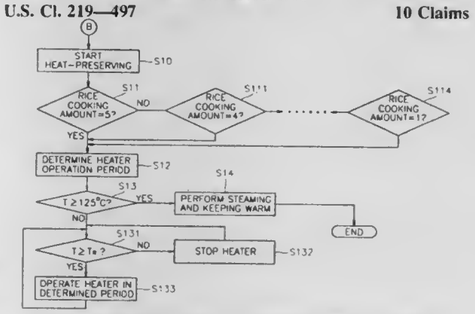
**Sang-Uk You, Kyeongki-Do, Rep. of Korea, assignor to Daewoo Electronics, Ltd., Seoul, Rep. of Korea**

**Filed Nov. 22, 1996, Ser. No. 755,312**

**Claims priority, application Rep. of Korea, Nov. 24, 1995, 1995-43438; Nov. 24, 1995, 1995-43439; Nov. 30, 1995, 1995-45136**

**Int. Cl.[6] H05B** *1/02*

**U.S. Cl. 219—497** **10 Claims**




1. An automatic temperature controlling method of an electric rice cooker, said method comprising the steps of:

a) storing reference temperature data of an internal pot including rice according to a time passage, and storing heater operation state data and heater on/off operation period data according to a temperature change of the internal pot during a second heating process and a heat-preserving process;

b) heating the internal pot to a first temperature for completing a first heating process after a soaking process, calculating a time interval from a second temperature for beginning the first heating process to the first temperature for completing a first heating process, storing the calculated time interval, and storing an amount of the rice corresponding to the calculated time interval;



c) starting the second heating process and judging how many rice cooking amount is the rice amount stored in step b);

d) reading a heater operation period data corresponding to the judged rice cooking amount from the stored heater operation period data in step a), and determining a heater on/off operation period of the second heating process based on the read heater operation period data;

e) judging whether a current temperature of the internal pot is equal to or greater than a third temperature for starting a heat-preserving process, and when the current temperature of the internal pot is less than the third temperature, comparing the current temperature of the internal pot with the reference temperature data stored in step a);

f) controlling an operation of the heater according to a comparison result of step e);

g) starting the heat-preserving process and judging which rice cooking amount is the rice amount stored in step b), when the current temperature of the internal pot is equal to or greater than the third temperature in step e);

h) reading a heater operation period data corresponding to the judged rice amount from the stored heater operation period data in step a), and determining the heater operation period of the heat-preserving process based on the read heater operation period data;

i) judging whether the current temperature of the internal pot is equal to or greater than a fourth temperature for starting a steaming process, and when the current temperature of the internal pot is less than the fourth temperature, comparing the current temperature of the internal pot with the reference temperature data stored in step a); and

j) controlling an operation of the heater according to a comparison result of step j).

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**5,744,784**

**LOW-LOSS INDUCTION COIL FOR HEATING AND/OR MELTING METALLIC MATERIALS**

**Dieter Schluckebier, Simmerath, Germany, assignor to Otto Junker GmbH, Germany**

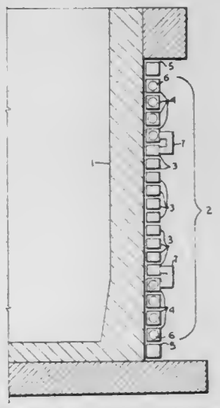
**PCT No. PCT/DE95/00622, § 371 Date Feb. 27, 1997, § 102(e) Date Feb. 27, 1997, PCT Pub. No. WO95/35014, PCT Pub. Date Dec. 21, 1995**

**PCT Filed May 11, 1995, Ser. No. 750,589**

**Claims priority, application Germany, Jun. 13, 1994, 44 20 463.9**

**Int. Cl.[6] H05B** *6/42*

**U.S. Cl. 219—674** **20 Claims**



1. A low-loss induction coil structure for heating an induction furnace, said coil structure including windings comprising:

a length of hollow electrical conductor having an internal conduit extending therethrough arranged for carrying a fluid coolant;

a current-carrying element formed from a plurality of braided, insulated, individual conductors, said element and said length of hollow electrical conductor being electrically interconnected for conducting an induction current; and

a length of hollow tubing having an internal passageway extending therethrough arranged for carrying a fluid coolant, said current-carrying element being located within said passageway of the hollow tubing and not within said conduit of the hollow electrical conductor.

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**5,744,785**

**METHOD FOR AUTOMATICALLY CONTROLLING COOKING BY USING A VAPOR SENSOR IN A MICROWAVE OVEN**

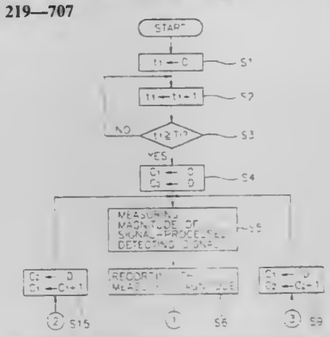
**Charng-Gwon Lee, Bupyeon-ku, Rep. of Korea, assignor to Daewoo Electronics Co. Ltd., Seoul, Rep. of Korea**

**Filed May 23, 1996, Ser. No. 652,136**

**Claims priority, application Rep. of Korea, Sep. 29, 1995, 95-33037**

**Int. Cl.[6] H05B** *6/68*

**U.S. Cl. 219—707** **13 Claims**




1. A method for automatically controlling cooking by using a vapor sensor in a microwave oven, said method comprising the steps of:

(i) operating a blowing means for a first operation time by a control means so as to remove water vapors, which remains in a cavity, thereby air-cooling the cavity while food is being cooked by using a microwave oven equipped with a vapor sensor therein;

(ii) initializing to zero both a value of a first counter and a value of a second counter in order to measure a magnitude of a signal-processed detecting signal supplied from a detecting signal processing circuit section, which inputs and signal-processes a detecting signal supplied from the vapor sensor;

(iii) recording the measured magnitude of the signal-processed detecting signal supplied from the detecting signal processing circuit section in response to the wind, which is produced by the operation of the blowing means and which passes sequentially through exhaust holes formed in the central portion of a ceiling portion of the cavity, through a wind path and through second discharge holes;

(iv) comparing the value of the first counter or the value of the second counter with values of reference phases in accordance with the measured magnitude of the signal-processed detecting signal;

(v) calculating a second air cooling time corresponding to an additional air cooling time in accordance with the value of the first counter or the value of the second counter;

(vi) operating by means of the control means the blowing means for the second air cooling time calculated in step (v) in order to additionally air-cool the cavity; and

(vii) heating in succession food placed in the cavity, wherein the step (iv) comprises the substeps of:

(a) judging whether or not the magnitude, measured in step (iii), of the signal-processed detecting signal is equal to or smaller than a magnitude of a reference detecting signal;

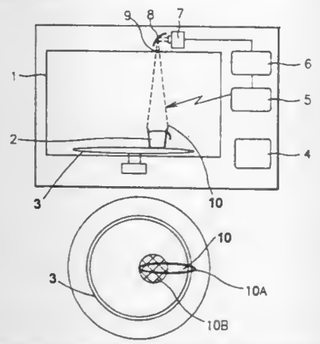
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(b) judging whether or not the value of the second counter is zero when it is judged in substep (a) that the magnitude of the signal-processed detecting signal is greater than the magnitude of the reference detecting signal;
(c) initializing to zero the value of the first counter, increasing by one the value of the second counter, and returning to step (iii) in order to repeat the succeeding steps when it is judged in substep (b) that the value of the second counter is not zero;
(d) judging whether or not the value of the first counter is smaller than a value of a third reference phase when it is judged in substep (b) that the value of the second counter is zero;
(e) initializing to zero the value of the first counter, increasing by one the value of the second counter, and returning to step (iii) in order to repeat the succeeding steps when it is judged in substep (d) that the value of the first counter is smaller than the value of the third reference phase;
(f) performing step (v) when it is judged in substep (d) that the value of the first counter is greater than or equal to the value of the third reference phase;
(g) judging whether or not the value of the first counter is zero when it is judged in substep (a) that the magnitude of the signal-processed detecting signal is equal to or smaller than the magnitude of the reference detecting signal;
(h) increasing by one the value of the first counter, initializing to zero the value of the second counter, and returning to step (iii) in order to repeat the succeeding steps when it is judged in substep (g) that the value of the first counter is not zero;
(i) judging whether or not the value of the second counter is smaller than a value of a fifth reference phase when it is judged in substep (g) that the value of the first counter is zero;
(j) increasing by one the value of the first counter, initializing to zero the value of the second counter, and returning to step (iii) in order to repeat the succeeding steps when it is judged in substep (i) that the value of the second counter is smaller than the value of the fifth reference phase; and
(k) performing step (v) when it is judged in substep (i) that the value of the second counter is greater than or equal to the value of the fifth reference phase.

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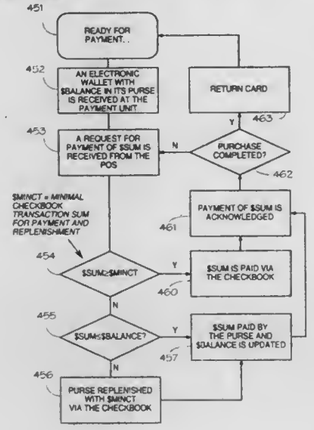
**5,744,786**
**AUTOMATIC COOKING APPARATUS HAVING TURNTABLE AND INFRARED TEMPERATURE SENSOR**
**Tae Yoon Kim, Kyungki-do, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea**
**Filed Apr. 25, 1996, Ser. No. 637,406**
**Claims priority, application Rep. of Korea, May 16, 1995, 12104/1995**
**Int. Cl.[6] H05B** *6/68;6/78*
**U.S. Cl. 219—711** **8 Claims**




1. An automatic cooking apparatus having a cooking chamber and a turntable, the automatic cooking apparatus comprising:
infrared radiation extracting means having an angle of view of a predetermined form toward one side of the turntable for extracting an infrared radiation radiated from a surface of a cooking object; and,
temperature detecting means having a window with an elliptical angle of view for reception of the infrared radiation for detection of a temperature of the surface of the cooking object;
wherein the angle of view of the infrared radiation extracting means includes the center and a part of the rim of the turntable; and
wherein the infrared radiation extracting means includes a reflector having an elliptical angle of view for collecting and reflecting infrared radiations from the cooking object, and a filter for transmission of infrared radiation waves from the cooking object toward the reflector.

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**5,744,787**
**SYSTEM AND METHOD FOR RETAIL**
**Mordechai Teicher, Kfar Saba, Israel, assignor to Advanced Retail Systems Ltd., Kiriat Ono, Israel**
**Filed Sep. 25, 1995, Ser. No. 533,599**
**Claims priority, application Israel, Sep. 25, 1994, 111055; Jun. 1, 1995, 113980; Sep. 4, 1995, 115164**
**Int. Cl.[6] G06K** *5/00;* **G06F** *17/60*
**U.S. Cl. 235—380** **6 Claims**

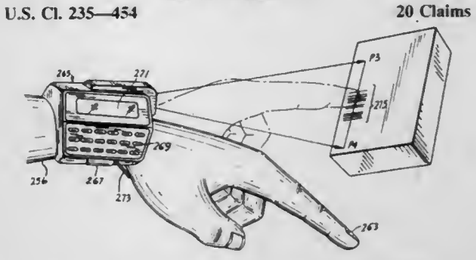



1. A retail unit serving a customer on a purchase, the customer having an electronic wallet for paying for a purchase via its electronic checkbook sums equal to or larger than a predetermined minimal checkbook payment sum, for paying from its electronic purse sums equal to or smaller than the value stored therein, and for paying for replenishing the electronic purse via the electronic checkbook sums equal to or larger than a predetermined minimal purse replenishment sum, the retail unit comprising:
a point of sale for determining a purchase price; and
a payment unit including an electronic cash drawer, communicating with said point of sale for retrieving said purchase price therefrom and interfacing with said electronic wallet for automatically selecting, according to said purchase price, said value stored in said electronic purse, said minimal checkbook payment sum and said minimal purse replenishment sum, whether
to receive said purchase price via said electronic checkbook, or
to receive said purchase price from said electronic purse and deposit it in said electronic cash drawer, or
to receive via said electronic checkbook a calculated purse replenishment sum which is at least the larger of said minimal purse replenishment sum and the difference between said purchase price and said value stored in said electronic purse, and to transfer from said electronic cash drawer to said electronic purse the difference between said calculated purse replenishment sum and said purchase price.



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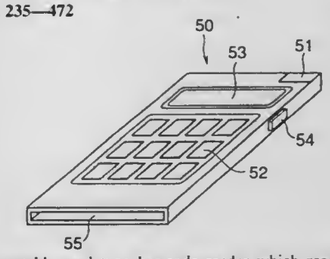
**5,744,788**
**VOICE-ACTIVATED OPTICAL SCANNING SYSTEM**
**Boris Metlitsky, Stony Brook; Mark Krichever, Hauppauge; Edward Barkan, Miller Place; Howard M. Shepard, River, and Jerome Swartz, Old Field, all of N.Y., assignors to Symbol Technologies, Inc., Holysville, N.Y.**
**Continuation of Ser. No. 460,729, Jun. 2, 1995, which is a division of Ser. No. 366,383, Dec. 29, 1994, Pat. No. 5,479,002, which is a continuation of Ser. No. 79,761, Jun. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 881,280, May 11, 1992, Pat. No. 5,306,900, which is a division of Ser. No. 699,417, May 13, 1991, Pat. No. 5,191,197, which is a continuation-in-part of Ser. No. 193,265, May 11, 1988, Pat. No. 5,144,120. This application Feb. 27, 1997, Ser. No. 807,286**
**Int. Cl.[6] G06K** *7/10*
**U.S. Cl. 235—454** **20 Claims**




1. An optical scanning system for reading indicia having parts of differing light reflectivity, comprising:
an optical scanner including a light emitter for emitting light directed at said indicia, and a light detector for detecting light reflected from said indicia and for generating therefrom a first signal;
means for receiving an audio command from a user and for generating therefrom a second signal; and
control circuitry for controlling the optical scanner in dependence upon said second signal.

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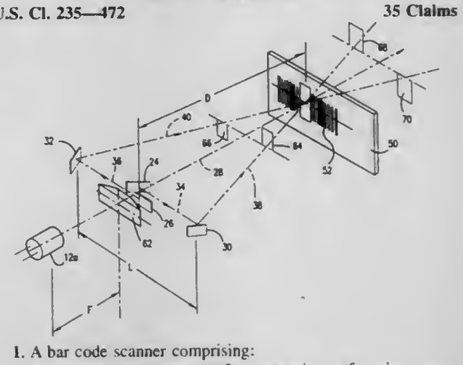
**5,744,789**
**BAR-CODE READER**
**Motofumi Kashi, Chofu, Japan, assignor to Tohken Co., Ltd., Tokyo, Japan**
**Filed Jan. 22, 1996, Ser. No. 589,611**
**Claims priority, application Japan, Feb. 3, 1995, 7-037821**
**Int. Cl.[6] G06K** *7/10*
**U.S. Cl. 235—472** **5 Claims**




1. A portable card type bar-code reader which reads out data expressed in a bar-code and has the functions of a PC card, said portable card type bar-code reader comprising:
a housing having the shape and size of a PC card;
a reading section for reading data expressed in a bar code;
a memory disposed in said housing and operatively connected to said reading section for storing information read by said reading section;
a display section formed in an outer wall of said housing for displaying data; and
a key pad located on an upper planar surface of said housing for inputting instructions to register, delete or display data stored in said memory.

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**5,744,790**
**SPLIT OPTICS FOCUSING APPARATUS FOR CCD-BASED BAR CODE SCANNER**
**Yajun Li, Oakdale, N.Y., assignor to Symbol Technologies, Inc., Holtsville, N.Y.**
**Filed Jan. 25, 1996, Ser. No. 591,099**
**Int. Cl.[6] G06K** *7/10*
**U.S. Cl. 235—472** **35 Claims**




1. A bar code scanner comprising:
a) a focusing energy source for generating a focusing energy beam of a given configuration;
b) a radiant energy source for generating a radiant energy for illuminating a bar code to be scanned,
c) a detector for generating output electrical signals indicative of said radiant energy incident thereon;
d) an optical system having
1) a focus portion for transmitting segments of said focusing energy beam in separate optical paths extending from said scanner to said bar code and
2) a scan portion for collecting said radiant energy incident on said bar code and applying said collected radiant energy to said detector; and
e) a decoder for decoding said output electrical signals of said detector to provide indication of information contained in said bar code.

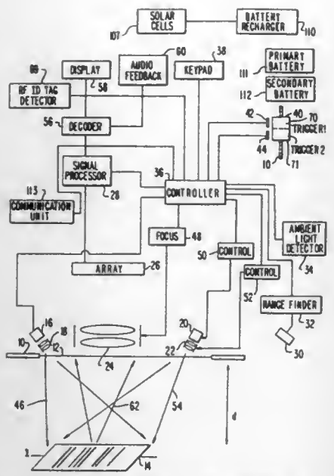
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**5,744,791**
**SOLAR ENERGY-POWERED OPTICAL READER**
**Richard Isaac, East Northport; Reuven Shapira, Plainview, and Simon Bard, Setauket, all of N.Y., assignors to Symbol Technologies, Inc., Holtsville, N.Y.**
**Division of Ser. No. 686,157, Jul. 24, 1996, which is a division of Ser. No. 407,577, Mar. 30, 1995, Pat. No. 5,600,121. This application Mar. 18, 1997, Ser. No. 820,048**
**Int. Cl.[6] G06K** *7/10*
**U.S. Cl. 235—472** **10 Claims**

1. A system for electro-optically reading indicia having parts of different light reflectivity, comprising:
a housing;
a scanner supported by the housing, for scanning at least one of a light beam directed at an indicium to be read, and a field of view extending over the indicium, said scanner having a component energizable by DC voltage; and

VOL 1209 ISS 4 AP 28 1998 UMI






an energy collector supported by the housing, for collecting energy radiated from a radiant energy source for supplying the DC voltage to power said scanner component.

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**5,744,792**

**HYBRID INFORMATION RECORDING MEDIUM**

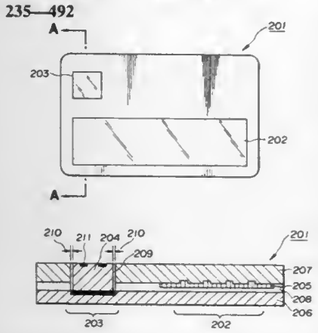
**Hiroyuki Imataki, Yokohama, and Mizuho Hiraoka, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 313,583, Sep. 29, 1994, abandoned. This application Oct. 25, 1996, Ser. No. 736,965**

**Claims priority, application Japan, Oct. 5, 1993, 5-271138**

**Int. Cl.[6] G06K** *19/06;19/00*

**U.S. Cl. 235—492** **46 Claims**




1. A hybrid information recording medium provided with an IC module and an optical recording layer, each as information storage means, said recording medium comprising:

a first substrate which retains the IC module; and

a second substrate which retains the optical recording layer,

wherein the optical recording layer is disposed at a surface of said second substrate which faces said first substrate, and

wherein the optical recording layer is disposed so as to be out of direct contact with said first substrate to avoid influence of heat from the IC module on the optical recording layer.

**5,744,793**

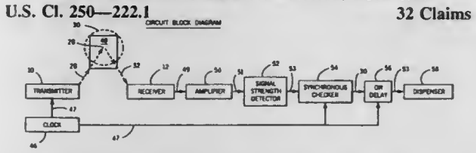
**TRIANGULATION POSITION-DETECTION AND INTEGRATED DISPENSING VALVE**

**Daniel G. Skell, Cedarburg, and Eric D. Skell, Hubortus, both of Wis., assignors to Electro-Pro, Inc., Cedarburg, Wis.**

**Continuation-in-part of Ser. No. 202,792, Feb. 28, 1994, Pat. No. 5,550,369. This application Jan. 5, 1996, Ser. No. 583,801**

**Int. Cl.[6] G01V** *8/20;* **G01S** *17/481;17/02;* **B67D** *3/00*

**U.S. Cl. 250—222.1** **32 Claims**




1. An automatic dispenser control which detects when a container is in a desired position and activates a dispenser comprising:

a clock producing constant periodic clock pulses;

a transmitter having an input and an output, said input receiving the periodic clock pulses and the output emitting pulses of energy responsive thereto along an axis of projection;

a receiver having an energy sensing input receiving the energy pulses along an axis of reflection, said receiver having an output providing an energy indicative signal;

the transmitter and receiver being orientated in a common plane and having said axes of projection and reflection extending out of said common plane and converging to a target intercept point associated with the desired position;

a synchronous checker producing a signal only when an energy indicative signal resulting from a given emitted energy pulse occurs substantially synchronously with the periodic clock pulse causing the given emitted energy pulse from the transmitter; and

wherein the production of the signal indicates the container is in position and activates the dispenser, and the absence of the signal indicates the container is no longer in position and deactivates the dispenser.

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**5,744,794**

**APPARATUS FOR DETECTING AQUEOUS ENVIRONMENTS**

**Walter Craig Michie; Neil Bette Graham, both of Glasgow; Brian Culshaw; Peter Thomas Gardiner, both of Kilmacolm, and Christopher Raymond Moran, Glasgow, all of United Kingdom, assignors to University of Strathclyde, Glasgow, United Kingdom**

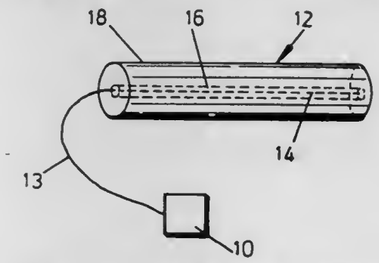
**PCT No. PCT/GB94/00292, § 371 Date Dec. 13, 1995, § 102(e) Date Dec. 13, 1995, PCT Pub. No. WO94/18536, PCT Pub. Date Aug. 18, 1994**

**PCT Filed Feb. 14, 1994, Ser. No. 495,566**

**Claims priority, application United Kingdom, Feb. 13, 1993, 9302903**

**Int. Cl.[6] G01M** *3/04;* **G02B** *6/44*

**U.S. Cl. 250—227.16** **10 Claims**




1. A detecting system for use in detecting the presence of a target measurand, said system comprising:



a fibre-optic probe assembly (**12**) incorporating an optical fibre (**14**) which is subject to micro bending at intervals along its length, the probe assembly (**12**) comprising a rigid containment structure (**18**) which is filled with the length of optical fibre (**14**) and a body of material (**16**) which is subject to a volumetric change in the presence of said target measurand, said body of material comprising a hydrogel based polymer formed from an organic solvent soluble hydrogel and wherein said body of material is in the form of a thin film having a dry thickness of less than 50 microns; and

a sensor assembly (**10**) coupled to the probe assembly, the sensor assembly (**10**) having optical signal transmitting and receiving means arranged to identify optical fibre microbend changes arising, in use, from forces imposed locally on the fibre (**14**) by the interaction of the rigid containment structure (**18**) and volumetric changes in the body of material (**16**).

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**5,744,795**

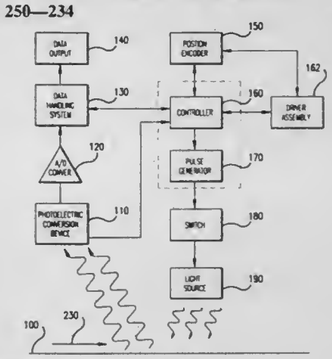
**ILLUMINATION STROBING IN A SCANNER TO IMPROVE IMAGE SHARPNESS AND POWER CONSUMPTION**

**Mark J. Bianchi; Richard L. Kochis, both of Fort Collins; Ronald K. Kerschner, Loveland, and Dan L. Dalton, Greeley, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jul. 31, 1995, Ser. No. 509,468**

**Int. Cl.[6] G06K** *7/10;* **H04N** *1/04*

**U.S. Cl. 250—234** **9 Claims**




1. An optical scanner comprising:

a) a light source for generating light directed at an object to be scanned;

b) a switch for switching said light source on and off;

c) an optical sensor having a predetermined sampling rate, said optical sensor generating a data signal representative of a scanned object;

d) a driver assembly for enabling displacement of said optical scanner across a scanned object in a predetermined scan direction;

e) a position encoder for sensing the displacement of said optical scanner and generating a displacement signal representative thereof; and

f) a controller for actuating said driver assembly during a scanning operation, said controller strobing said switch to said light source on and off synchronized to the sampling rate of said optical sensor and the displacement signal from said position encoder.

**5,744,796**

**MASS SPECTROMETER AND RADICAL MEASURING METHOD**

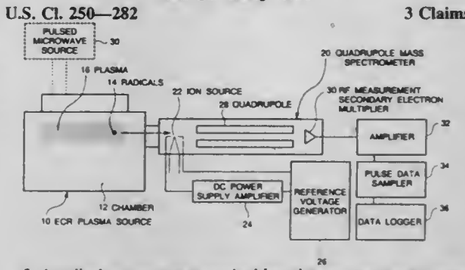
**Keizo Kinoshita; Seiji Samukawa, both of Tokyo, and Tetsu Mieno, Shizuoka, all of Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Nov. 7, 1996, Ser. No. 744,366**

**Claims priority, application Japan, Nov. 8, 1995, 7-289723**

**Int. Cl.[6] H01J** *49/26*

**U.S. Cl. 250—282** **3 Claims**




2. A radical measurement method based on an appearance mass spectrometry of picking up a signal indicative of only radicals in plasma, by bringing an ionizing electron beam accelerating voltage of a mass spectrometer to a potential between the "potential for ionization of radicals" and the "potential for dissociative ionization of parent gas or dissociative ionization of parent radicals", wherein the improvement is that a signal outputted from said mass spectrometer is picked up while repeatedly changing said ionizing electron beam accelerating voltage, in the form of a pulse, between a first voltage not lower than said "potential for ionization of radicals" and a second voltage higher than said first voltage but lower than said "potential for dissociative ionization of parent gas or dissociative ionization of parent radicals", and the density of said radicals is determined from the difference in said signal outputted from said mass spectrometer between when said first voltage is applied and when said second voltage is applied.

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**5,744,797**

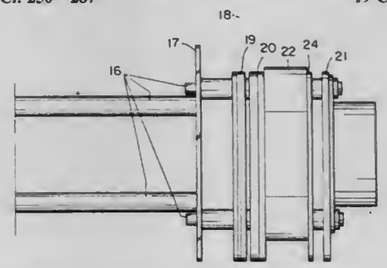
**SPLIT-FIELD INTERFACE**

**Melvin Park, Nashua, N.H., assignor to Bruker Analytical Instruments, Inc., Billerica, Mass.**

**Filed Nov. 22, 1995, Ser. No. 561,634**

**Int. Cl.[6] B01D** *59/44;* **H01J** *49/00*

**U.S. Cl. 250—287** **19 Claims**




1. A split-field ion interface for a time of flight mass spectrometer comprising:

a multideflector;

a first electrode energized to a first potential;

a second electrode energized to a second potential;

a third electrode energized to a third potential, wherein said multideflector and said first, second and third electrodes form said interface between an ion source and said mass spectrometer; and

at least one electrode gap, defined as the region between two of said first, second and third electrodes, wherein ions are propelled through said gap;

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wherein said interface is situated such that ions are accelerated in a direction parallel to the flight tube of said mass spectrometer.

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**5,744,798**

## MASS SPECTROMETRY AND MASS SPECTROMETER

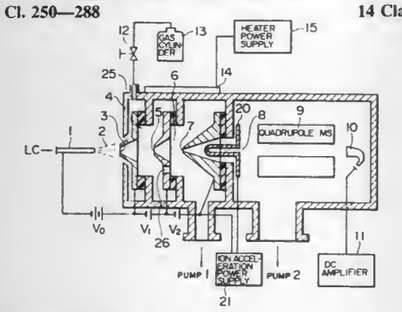
**Yoshiaki Kato, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 440,120, May 12, 1995, abandoned, which is a continuation of Ser. No. 167,363, Dec. 16, 1993, abandoned, which is a continuation of Ser. No. 942,992, Sep. 10, 1992, Pat. No. 5,298,743. This application Apr. 18, 1997, Ser. No. 841,002**

**Claims priority, application Japan, Sep. 12, 1991, 03/232956**

**Int. Cl.[6] B01D** *59/44;* **H01J** *49/00*

**U.S. Cl. 250—288** **14 Claims**




1. A mass spectrometer comprising:

means for generating ions in an ion generating region under an atmospheric pressure; a first vacuum chamber disposed adjacent to the ion generating region to pass the ions therethrough; a second vacuum chamber disposed to pass therethrough the ions which have passed through said first vacuum chamber; means for mass-analyzing the ions which have passed through said second vacuum chamber; means for evacuating said first and second vacuum chambers so that a vacuum of said first and second vacuum chambers are different and said first vacuum chamber is maintained under a pressure not higher than $10^2$ Pa; and means for accelerating the ions by a first accelerating voltage in said first vacuum chamber and by an accelerating voltage lower than said first accelerating voltage in said second vacuum chamber.

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**5,744,799**

## APPARATUS FOR AND METHOD OF REAL-TIME NANOMETER-SCALE POSITION MEASUREMENT OF THE SENSOR OF A SCANNING TUNNELING MICROSCOPE OR OTHER SENSOR SCANNING ATOMIC OR OTHER UNDULATING SURFACES

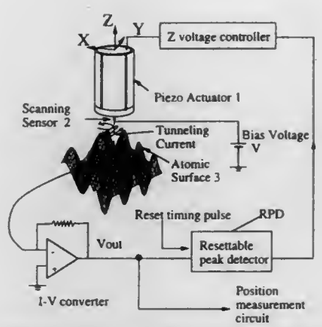
**Tetsuo Ohara, 12 Lindall Place, #4, Boston, Mass. 02114**

**Filed May 20, 1996, Ser. No. 650,168**

**Int. Cl.[6] H01J** *37/26*

**U.S. Cl. 250—306** **48 Claims**

1. A method of real-time nanometer scale position location measurement of a probe scanning a periodically undulating surface as the surface and probe are relatively moved, that comprises the steps of setting up a sensing field between the probe and the surface; oscillating the probe during said scanning about a reference origin point of the probe by a controlling sinusoidal voltage; measuring the sinusoidal voltage generated by the sensing field during said oscillation and after passing to the surface; comparing the phase and amplitude of the controlling and generated voltages by multiplying said generated sinusoidal voltage by said controlling sinusoidal voltage; developing from such comparing, positional signals, on a continual basis, indicative of the direction and distance of the probe off the apex of the nearest undulation of the




surface, and thus the position of the probe along the surface and eliminating any phase delay between the controlling sinusoidal voltage and the actual probe oscillation.

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**5,744,800**

## DEFECT OBSERVING ELECTRON MICROSCOPE

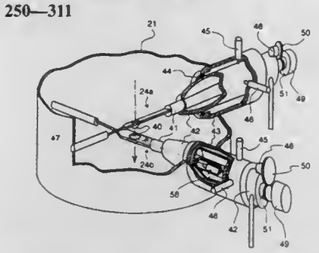
**Hiroshi Kakibayashi, Nagareyama; Hisaya Murakoshi, Tokyo; Hidekazu Okuhira, Asaka; Takashi Irie, Musashimurayama; Jiro Tokita, Kawagoe; Keiichi Kanehori, Sayama, and Yasuhiro Mitsui, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 7, 1995, Ser. No. 477,654**

**Claims priority, application Japan, Jun. 10, 1994, 6-128471**

**Int. Cl.[6] H01J** *37/26*

**U.S. Cl. 250—311** **22 Claims**



1. A transmission electron microscope for detecting defects in one specimen relative to a reference specimen, comprising:

an electron gun for electron beam emission;

a first electron lens system for illuminating an electron beam emitted by said electron gun to a specimen illuminating position;

a second electron lens system for focusing the electron beam passing through the specimen onto a predetermined image plane;

a pair of detachable specimen holders adjacently arranged at upper and lower stages separated by a small distance respectively along an electron beam axis for positioning respectively held specimens along the electron beam axis at a same time; and

means for positioning specimens held by said specimen holders into the electron beam illuminating position independently of each holder.



**5,744,801**

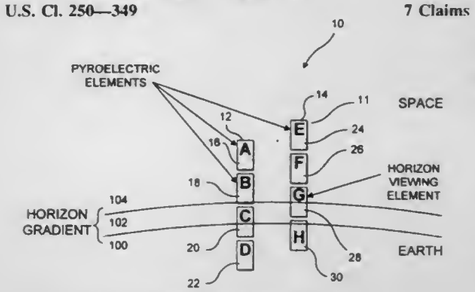
## EARTH HORIZON SENSOR WITH STAGGERED ARRAY OF SENSORS

**Neil Diedrickson, Stratford, Conn., assignor to Servo Corporation of America, Hicksville, N.Y.**

**Filed Nov. 3, 1995, Ser. No. 552,612**

**Int. Cl.[6] G01J** *5/10*

**U.S. Cl. 250—349** **7 Claims**




1. An earth horizon sensor apparatus including:

at least a first linear array and a second linear array of sensor elements wherein said sensor elements of said first linear array are staggered with respect to said sensor elements of said second linear array; and

processing means for determining an attitude of the earth horizon sensor apparatus by determining which of said sensor elements subtends an image of Space and a diffuse horizon gradient between Earth and Space.

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**5,744,802**

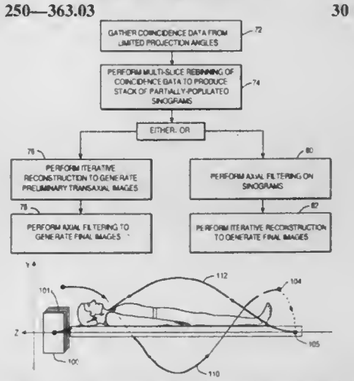
## IMAGE GENERATION FROM LIMITED PROJECTIONS IN POSITRON EMISSION TOMOGRAPHY USING MULTI-SLICE REBINNING

**Gerd Muehllehner, Wayne, Pa.; Peter Countryman, Oakland, and William K. Braymer, Pleasanton, both of Calif., assignors to ADAC Laboratories, Milpitas, Calif.**

**Filed Oct. 25, 1995, Ser. No. 547,951**

**Int. Cl.[6] G01T** *1/166*

**U.S. Cl. 250—363.03** **30 Claims**




1. A method of reconstructing an image in a medical imaging system, the medical imaging system including a plurality of detectors capable of detecting a plurality of rays occurring within a range of projection angles, the rays including transverse rays and oblique rays, the method comprising the steps of:

detecting the plurality of rays using the detectors;

generating a collection of data representative of the detected rays;

rebinning the data to create a stack of two-dimensional data sets corresponding to individual transverse slice images, wherein the slice images signify in the aggregate a three-dimensional image, wherein for each data set, the data included in said data set corresponds to less than all possible projection angles for the corresponding slice image;

applying a two-dimensional iterative reconstruction algorithm to each of the data sets to reconstruct a three-dimensional image slice-by-slice from the data sets; and

axially filtering the rebinned data.

29. In a medical imaging system having a detector for detecting radiation emitted from an object, the detector being rotatable relative to the object about an axis of rotation, a method of performing emission computed tomography, the method comprising the steps of:

detecting radiation emitted from the object using a first scan pass characterized by a helical path of relative motion between the detector and the object;

following completion of the first scan pass, rotating the detector approximately 90° relative to the object to a starting position; and

detecting radiation emitted from the object using a second scan pass starting from the starting position, wherein the second scan pass is opposite in direction from the first scan pass and is characterized by a helical path of relative motion between the detector and the object, such that the first scan pass and the second scan pass together result in the acquisition of orthogonal sets of data.

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**5,744,803**

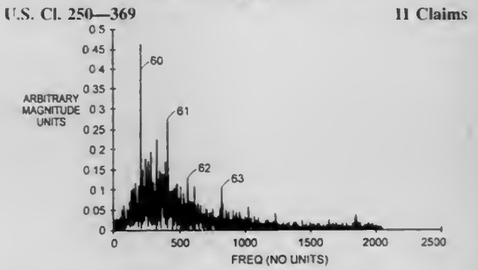
## RADIATION DETECTOR ASSEMBLY AND METHOD WITH DISCRIMINATION BETWEEN VIBRATION AND RADIATION INDUCED EVENTS

**Carlos M. Grodsinsky, Strongsville, and Kevin D. Kimmich, Kirtland, both of Ohio, assignors to Saint-Gobain Industrial Ceramics, Inc., Worcester, Mass.**

**Filed Sep. 19, 1996, Ser. No. 710,698**

**Int. Cl.[6] G01T** *1/20*

**U.S. Cl. 250—369** **11 Claims**




1. A method for making radiation-based measurements in a high vibration environment, comprising the steps of:

positioning a scintillation crystal package in the high vibration environment for interaction with incident radiation,

using a light sensing device to convert photons received from the scintillation crystal package into an electrical signal which over time is composed of radiation induced events that are non-periodic and vibration induced events that are periodic,

distinguishing the periodic events using a time history of the electrical signal, and

using the distinguished periodic events to provide corrected data from which vibration induced components have been discriminated.

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**5,744,804**

## SYSTEM FOR DETERMINING A COMPOSITON OF RADIONUCLIDES

**Robert Johan Meijer, Roden, and Cornelis Stapel, Groningen, both of Netherlands, assignors to Rijksuniversiteit Te Groningen, Netherlands**

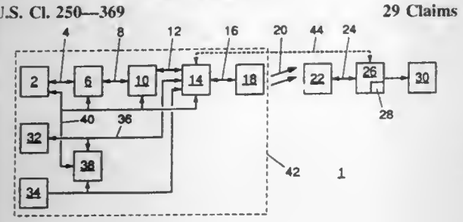
**PCT No. PCT/NL95/00125, § 371 Date Dec. 2, 1996, § 102(e) Date Dec. 2, 1996, PCT Pub. No. WO95/27223, PCT Pub. Date Oct. 12, 1995**

**PCT Filed Apr. 4, 1995, Ser. No. 722,264**

**Claims priority, application Netherlands, Apr. 5, 1994, 9400534**

**Int. Cl.[6] G01T *1/16***

**U.S. Cl. 250—369** **29 Claims**




1. A system for determining a composition of a mineral-containing material by detecting gamma and/or x-ray radiation emitted by radionuclides in the material, comprising a detector unit which supplies an electrical signal containing information about the intensity and energy of the emitted radiation and a signal processing system by which these electrical signals are further processed for determining said composition of radionuclides, wherein the signal processing system comprises an A/D converter to which said electrical signals are applied and a first computer unit which further processes signals supplied by the A/D converter for the purpose of determining said composition of radionuclides; the first computer unit composes an energy spectrum of the detected radiation from the signals supplied by the A/D converter; and wherein the first computer unit determines the concentrations C(U), C(Th) and C(K) of the radionuclides uranium, thorium and potassium respectively according to the first algorithm and the relative masses $m_j$ ($_j$=a, b, c or d) of respective mineral groups which are designated a, b, c and d according to the second algorithm said second algorithm $m_j$ ($_j$=a, b, c or d) is determined from the equation:

$$C_p m = C$$

wherein

$$C_p = \begin{pmatrix} C_a(Bi) & C_b(Bi) & C_c(Bi) & C_d(Bi) \\ C_a(Th) & C_b(Th) & C_c(Th) & C_d(Th) \\ C_a(K) & C_b(K) & C_c(K) & C_d(K) \\ 1 & 1 & 1 & 1 \end{pmatrix},$$

$$m = \begin{pmatrix} m_a \\ m_b \\ m_c \\ m_d \end{pmatrix} \text{ and } C = \begin{pmatrix} C(Bi) \\ C(Th) \\ C(K) \\ 1 \end{pmatrix},$$

and wherein every mineral group a, b, c or d is characterized by its three known concentrations $C_j$(U), $C_j$(Th) and $C_j$(K) with $_j$=a, b, c or d.

**5,744,805**

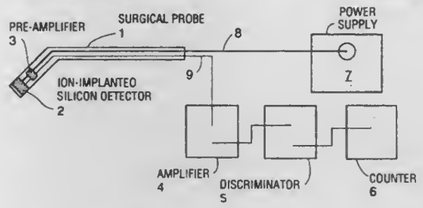
## SOLID STATE BETA-SENSITIVE SURGICAL PROBE

**Raymond R. Raylman, Morgantown, W. Va., and Richard L. Wahl, Ann Arbor, Mich., assignors to University of Michigan, Ann Arbor, Mich.**

**Filed May 7, 1996, Ser. No. 643,913**

**Int. Cl.[6] G01T *1/161***

**U.S. Cl. 250—370.01** **18 Claims**




5. A probe system comprising a probe having an ion-implanted silicon detector, whereby beta particles emitted from a radiopharmaceutical within diseased tissue are detected.

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**5,744,806**

## METHOD FOR MULTISENSOR ARRANGEMENTS

**Christer Fröjd, Sundsvall, Sweden, assignor to AFP Imaging Corporation, Elmsford, N.Y.**

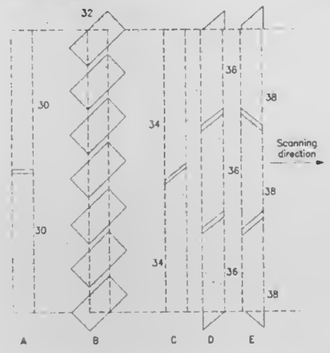
**PCT No. PCT/SE95/01011, § 371 Date Mar. 5, 1997, § 102(e) Date Mar. 5, 1997, PCT Pub. No. WO94/07354, PCT Pub. Date Mar. 14, 1996**

**PCT Filed Sep. 8, 1995, Ser. No. 793,277**

**Claims priority, application Sweden, Sep. 8, 1994, 9402997**

**Int. Cl.[6] H05G *1/64*; H01L *25/00***

**U.S. Cl. 250—370.09** **12 Claims**




1. A method for extending the physical length of a rectangular x-ray detector for a scanning digital radiographic system device comprising a number of individual sensor element dies, characterized by arranging the border line between two adjacent individual sensor elements (**34**, **36**, **38**) with a predefined angle in relation to the scanning direction of said radiographic system thereby in the scanning direction creating an overlapping detector sensor element area enabling a continuous data acquisition along the entire length of the multiple sensor element arrangement.



**5,744,807**

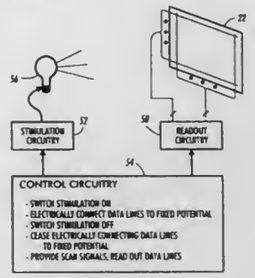
## SENSOR ARRAY DATA LINE READOUT WITH REDUCED CROSSTALK

**Richard L. Weisfield, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 20, 1996, Ser. No. 667,202**

**Int. Cl.[6] H01L *27/14*; *31/00*; G01T *1/24***

**U.S. Cl. 250—370.09** **11 Claims**




1. In a system including:

a sensor array; the sensor array having array circuitry that includes data lines, scan lines, and for each data line/scan line pair, cell circuitry; the cell circuitry of each data line/scan line pair including:

a sensing element for receiving a stimulus and for providing an electric signal indicating a measure of the received stimulus; the sensing element including a charge collection electrode; and

a switching element for responding to a scan signal on the scan line by electrically connecting the data line and the charge collection electrode to provide the electric signal from the sensing element to the data line;

a method comprising:

during a first interval, stimulating the sensing elements and electrically connecting a set of the data lines to a fixed potential; and

during a second interval after the first interval, providing, on each of a set of the scan lines, a scan signal that includes a duty interval and, after the duty interval of the scan signal on a scan line in the set, reading out signals from at least one of the set of data lines.

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**5,744,808**

**Patent Not Issued For This Number**

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**5,744,809**

## CHROMATICITY TESTING DEVICE OF CRT PHOSPHOR SCREEN

**Kouji Imada, Shiga, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Dec. 9, 1996, Ser. No. 761,834**

**Claims priority, application Japan, Dec. 8, 1995, 7-320402**

**Int. Cl.[6] G01J *3/46***

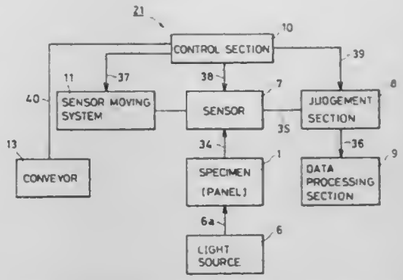
**U.S. Cl. 250—461.1** **5 Claims**

1. A chromaticity testing device of a phosphor screen of a color CRT, said device comprising:

a supporting member for supporting a face panel of a color CRT having a phosphor screen therein;

a UV light source for emitting UV light toward said phosphor screen placed on said member;

a movable sensor unit for sensing visible light emitted from a position on said phosphor screen due to illumination by said UV light and outputting chromaticity signals for the red, green and blue components of said emitted visible light;




a judgment section for receiving said chromaticity signals output from said sensor unit to determine chromaticity values corresponding to said chromaticity signals, and for comparing said chromaticity values with corresponding preset values to thereby judge whether said chromaticity values are acceptable or not; and

a control section for controlling said sensor unit and said judgment section;

wherein said sensor unit is located to be contacted with the surface of said face panel on sensing to avoid the effect of external light under the control of said control section.

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**5,744,810**

## METHOD AND SYSTEM FOR EXPOSING PATTERN ON OBJECT BY CHARGED PARTICLE BEAM

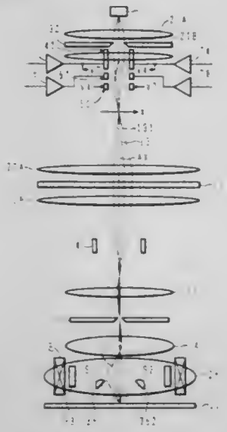
**Takamasa Satoh, Kawasaki, Japan, assignor to Fujitsu Ltd., Kawasaki, Japan**

**Filed Sep. 10, 1996, Ser. No. 709,815**

**Claims priority, application Japan, Mar. 19, 1996, 8-063511**

**Int. Cl.[6] H01J *37/302***

**U.S. Cl. 250—492.23** **11 Claims**



1. A system for charged particle beam exposure, comprising:

a charged particle gun for emitting said charged particle beam;

a mask having an aperture for shaping a cross section of said charged particle beam;

said system further comprising:

a first electrostatic deflector having n number of deflecting electrodes around an optical axis between said charged particle gun and said mask for deflecting said charged particle beam;

a second electrostatic deflector having n number of deflecting electrodes around said optical axis between said first electrostatic deflector and said mask for deflecting said charged particle beam;

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a cyclic wave generating circuit for outputting a cyclic wave with a cycle of T/m, where T is one exposure period and m is a natural number;

a delay circuit for essentially delaying said cyclic wave by a time of iT/(mn) for each i=1 to (n−1); and

an amplifier circuit for amplifying said cyclic wave from said cyclic wave generating circuit and (n−1) delayed cyclic waves from said delay circuit to get 1st to nth drive voltages, said 1st to nth drive voltages being supplied to said n number of deflecting electrodes of said first electrostatic deflector respectively and to said n number of deflecting electrodes of said second electrostatic deflector respectively in such a way that an electric field formed at said first electrostatic deflector and an electric field formed at said second electrostatic deflector have opposite phases from each other.

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**5,744,811**

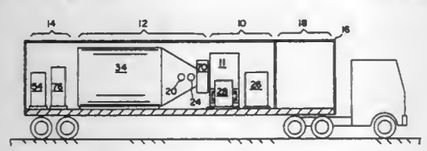
**TRANSPORTABLE ELECTRON BEAM SYSTEM AND METHOD**

**Peter R. Schonberg, Scotts Valley; George G. Hoberg, Atherton; Russell George Schonberg, Los Altos Hills; David Richard Fadness, San Jose, all of Calif., and Guy E. Materi, Manchester, Tenn., assignors to Zapit Technology, Inc., Santa Clara, Calif.**

**Continuation of Ser. No. 992,614, Dec. 18, 1992, Pat. No. 5,357,291, which is a continuation-in-part of Ser. No. 941,788, Sep. 8, 1992, Pat. No. 5,319,211. This application Oct. 17, 1994, Ser. No. 323,636**

**Int. Cl.[6] H01J** *37/00*

**U.S. Cl. 250—492.3** **18 Claims**



1. A treatment system for the transformation of organic compounds in liquid into environmentally more acceptable chemicals comprising an atomizer, means to flow organic compounds in liquid for treatment into said atomizer for atomization therein, means to feed the output from said atomizer into a treatment chamber, an electron generator to output electrons into said treatment chamber to interact with said atomized output and cause chemical transformations of organic compounds therein, and means to release the treated chemicals from said chamber.

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**5,744,812**

**FARADAY CUP ASSEMBLY FOR A SEMICONDUCTOR ION-IMPLANTING APPARATUS**

**Sang-guen Oh, and Jeong-kon Kim, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Dec. 26, 1996, Ser. No. 773,336**

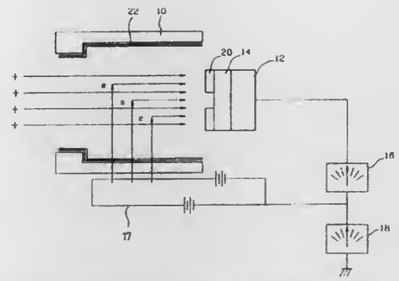
**Claims priority, application Rep. of Korea, May 20, 1996, 96-17070**

**Int. Cl.[6] H01J** *37/317*

**U.S. Cl. 250—492.21** **13 Claims**

1. A Faraday cup assembly of a semiconductor ion-implanting apparatus for performing an ion implantation is installed adjacent to a disc upon which a wafer can be mounted,

wherein an inner wall of said Faraday cup assembly is covered by a conductive thin film to reduce or prevent the formation



of an insulating layer, caused by an impurity produced during said ion implantation, on said inner wall.

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**5,744,813**

**METHOD AND DEVICE FOR CONTROLLING BEAMS OF NEUTRAL AND CHARGED PARTICLES**

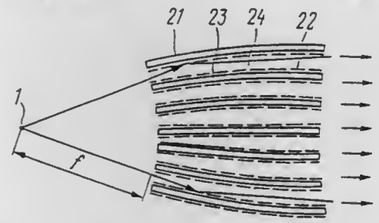
**Muradin Abubekirovich Kumakhov, 5/2, 34 nab.Novikova-Priboya, Moscow, Russian Federation, 123103**

**PCT No. PCT/RU94/00146, § 371 Date Feb. 26, 1996, § 102(e) Date Feb. 26, 1996, PCT Pub. No. WO96/02058, PCT Pub. Date Jan. 25, 1996**

**PCT Filed Jul. 8, 1994, Ser. No. 602,844**

**Int. Cl.[6] G02B** *5/124*

**U.S. Cl. 250—505.1** **65 Claims**



6. A device for controlling beams of neutral and charged particles, comprising: a source of neutral and charged particles; and an optical system in the form of alternating different-density media that establish radiation transfer channels to cause multiple scattering of the particles interacted with the media, wherein said alternating media provide a three-dimensional multilayer structure having periods varying both along a longitudinal axis on a surface of the structure and along cross-section of the structure in a direction perpendicular to said longitudinal axis.

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**5,744,814**

**METHOD AND APPARATUS FOR SCANNING EXPOSURE HAVING THICKNESS MEASUREMENTS OF A FILM SURFACE**

**Takayuki Uchiyama, Tokyo, Japan, assignor to NEC Corporation, Japan**

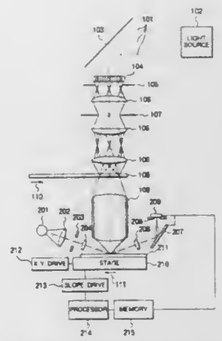
**Filed Mar. 24, 1997, Ser. No. 828,838**

**Int. Cl.[6] G01N** *21/86*

**U.S. Cl. 250—559.27** **6 Claims**

1. A method for step-and-scan exposure of a film on a semiconductor wafer, comprising the steps of measuring a film thickness at each focusing position of a film surface, retrieving an optimum offset amount of a focal position from the film surface based on a photoresist characteristic and the measured film thickness at the





each focusing position, and exposing the film for patterning with an exposure light having a focal point defined by the optimum offset amount.

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**5,744,815**

**BEAM SPLITTING OPTICS IN BAR CODE READERS**

**Vladimir Gurevich, Ronkonkoma; Mark Krichever, Hauppauge; Boris Metlitsky, and Paul Dvorkis, both of Stony Brook, all of N.Y., assignors to Symbol Technologies, Inc., Holtsville, N.Y.**

**Filed Oct. 5, 1995, Ser. No. 538,971**

**Int. Cl.[6] G06K** *7/10*

**U.S. Cl. 250—566** **26 Claims**



1. A scanner for electro-optically reading indicia, comprising:

a first light source for generating and directing a first light beam along a first direction;

a second light source for generating and directing a second light beam along a second direction generally orthogonal to the first direction;

a light reflector spaced apart from the first light source; and

a combining element located between the first light source and the light reflector, for transmitting the first light beam entering the combining element through the combining element to the light reflector for reflection therefrom along a common path to an indicium to be read, said combining element also being located adjacent the second light source for reflecting the second light beam entering the combining element to the light reflector for reflection therefrom along said common path to the indicium.

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**5,744,816**

**LOW PRESSURE SHEET MOLDING COMPOUNDS**

**Kurt Ira Butler, Kingsville, Ohio, assignor to Premix, Inc., North Kingsville, Ohio**

**Filed Sep. 4, 1996, Ser. No. 707,752**

**Int. Cl.[6] C09K** *3/00;* **C08F** *8/00;8/30*

**U.S. Cl. 252—182.18** **21 Claims**

1. A composition that is moldable at pressures below about 100 psi, said composition being made by combining:

(A) a vinyl ester resin;

(B) a styrene monomer;

(C) a hydroxy-terminated polyester having a molecular weight in the range of about 500 to about 3000;

(D) a diphenylmethane diisocyanate; and

(E) a polymerization initiator containing an azo group; said composition being characterized by a mole ratio of NCO groups from (D) to OH groups from (C) in the range of about 0.1 to about 10.

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**5,744,817**

**HOT CARRIER TRANSISTORS AND THEIR MANUFACTURE**

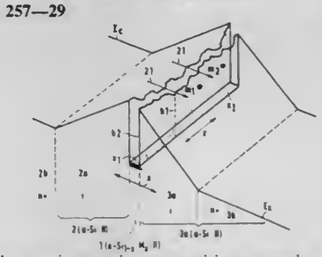
**John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 11, 1996, Ser. No. 762,688**

**Claims priority, application United Kingdom, Dec. 16, 1995, 9525784**

**Int. Cl.[6] H01L** *29/06*

**U.S. Cl. 257—29** **14 Claims**



1. A hot carrier transistor comprising a metal-semiconductor alloy base region located between semiconductor emitter and collector regions and forming Schottky barriers with the emitter and collector regions, characterised in that the emitter and collector regions comprise hydrogenated amorphous semiconductor material adjoining an intermediate semiconductor-rich amorphous metal-semiconductor alloy layer which provides the base region.

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**5,744,818**

**INSULATED GATE FIELD EFFECT SEMICONDUCTOR DEVICE**

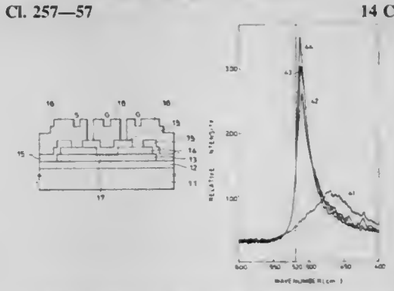
**Shunpei Yamazaki, 21-21, Kitakarasuyama, 7-chome, Setagaya-ku, Tokyo 157, and Hongyong Zhang, Paresu Miyagami 302, 1-10-15, Fukamidai, Yamato-shi, Kangawa-ken 242, both of Japan**

**Continuation of Ser. No. 235,228, Apr. 29, 1994, abandoned, which is a continuation of Ser. No. 1,544, Jan. 6, 1993, abandoned, which is a division of Ser. No. 774,852, Oct. 11, 1991, Pat. No. 5,210,050. This application Apr. 25, 1995, Ser. No. 428,842**

**Claims priority, application Japan, Oct. 15, 1990, 2-277134; Oct. 15, 1990, 2-277135**

**Int. Cl.[6] H01L** *29/04;29/76*

**U.S. Cl. 257—57** **14 Claims**



1. An insulated gate field effect semiconductor device comprising:

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at least a semiconductor island formed on a glass substrate with a buffer layer interposed between the glass substrate and the semiconductor island, said semiconductor island comprising an active region of said device and a gate electrode provided adjacent to said semiconductor island with an insulating film therebetween,

wherein said semiconductor island comprises silicon having source, drain and channel regions and having a grain structure with crystal grains at an average diameter of 30 Å to 4 μm as calculated from a half band width of one of a Raman Spectrum and an X-ray diffraction of said film, an electron mobility of from 5 to 300 $cm^2/V \cdot sec$ and contains an oxygen concentration not higher than $7 \times 10^{19}$ atoms $cm^3$ within said semiconductor film,

wherein a Raman spectrum of at least the channel region of said semiconductor film shows a peak shifted to a lower wavenumber side with respect to 520 $cm^{-1}$, and

wherein said insulating film extends beyond side edges of said semiconductor island.

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**5,744,819**

**LIQUID CRYSTAL DISPLAY AND HEATER CONTROL CIRCUIT FOR USE WITH SAID DISPLAY**

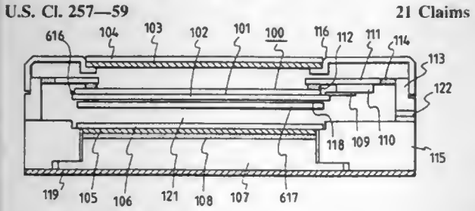
**Takashi Yamamoto, Yamato; Shigeru Noda, Kawasaki; Hiroyuki Yokomizo, Atsugi; Hiroshi Takabayashi, Kawasaki; Makoto Uehara, Yokohama, and Mitsuo Iwayama, Odawara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 16, 1992, Ser. No. 945,625**

**Claims priority, application Japan, Sep. 20, 1991, 3-268790; Oct. 3, 1991, 3-281892; Jan. 27, 1992, 4-034028**

**Int. Cl.[6] H01L** *29/04;31/036*

**U.S. Cl. 257—59** **21 Claims**




1. A liquid crystal display comprising:

a liquid crystal panel having a pair of boards, a pair of electrodes, and a liquid crystal disposed between said boards, said panel having a service state in which an image is displayed on said panel and a non-service state in which no image is displayed on said panel;

a heater provided near or adjacent said panel;

means for detecting a temperature of said panel; and

a control circuit for controlling an amount of heat generated by said heater in accordance with a comparison result between an output of said detecting means and either a first set temperature for use when said liquid crystal panel is in said service state, or a second set temperature, lower than said first set temperature, for use when said liquid crystal panel is in said non-service state,

wherein said first set temperature is lower than a minimum temperature necessary for re-aligning said liquid crystal panel.

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**5,744,820**

**LIQUID CRYSTAL DISPLAY DEVICE WITH A DISCONNECTED WIRING PATTERN ATTACHED BY INDEPENDENT METAL WIRING**

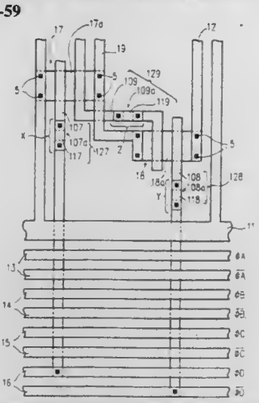
**Yasuhiro Matsushima, Kashihara; Toshihiro Yamashita, Nara, and Takayuki Shimada, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed May 15, 1995, Ser. No. 446,084**

**Claims priority, application Japan, Aug. 24, 1994, 6-199634; Jan. 23, 1995, 7-008466; Mar. 13, 1995, 7-053076**

**Int. Cl.[6] H01L** *29/04; G02F 1/343*

**U.S. Cl. 257—59** **18 Claims**



1. A driver monolithic liquid crystal display device comprising:

a plurality of top-gate type thin-film transistors formed on an insulative substrate; and

a plurality of signal wirings for providing a signal to a gate electrode of each of the thin-film transistors,

wherein at least one signal wiring which is selected among the plurality of the signal wirings comprises:

a main portion formed of the same material as that of the gate electrode by patterning a first wiring layer, the main portion having two subportions which are separated in the first wiring layer by a disconnection; and

a connecting subportion for interconnecting the two subportions which are separated in the first layer by the disconnection, the connecting subportion being formed by patterning a second wiring layer.

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**5,744,821**

**THIN FILM TRANSISTOR-LIQUID CRYSTAL DISPLAY HAVING A PLURALITY OF BLACK MATRICES PER SINGLE PIXEL**

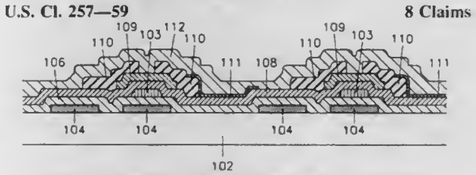
**Jun-Ho Song, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea**

**Filed Mar. 11, 1996, Ser. No. 614,932**

**Claims priority, application Rep. of Korea, Mar. 10, 1995, 95-4974; Jun. 12, 1995, 95-15438**

**Int. Cl.[6] H01L** *29/04;31/036*

**U.S. Cl. 257—59** **8 Claims**




1. A thin film transistor-liquid crystal display comprising:

a plurality of black matrices electrically isolated from each other and arranged in rows and columns on a substrate, each of said plurality of black matrices forming a portion of a pixel unit;

an insulating layer disposed over said plurality of black matrices;



a plurality of gate electrodes formed on said insulating layer, each gate electrode overlapping one of said black matrices;

a gate insulating layer disposed over said gate electrodes;

a plurality of amorphous silicon layers formed on said gate insulating layer, each amorphous silicon layer disposed above one of said gate electrodes;

a plurality of source electrodes formed so that each source electrode is connected to one of said amorphous silicon layers at one end of said amorphous silicon layer and overlaps one of said black matrices;

a plurality of drain electrodes formed so that each drain electrode is connected to one of said amorphous silicon layers at an end opposite said one end and overlaps one of said black matrices; and

a plurality of pixel electrodes, each pixel electrode formed within one of said pixel units and electrically connected to one of said drain electrodes.

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**5,744,822**

**SEMICONDUCTOR DEVICE/CIRCUIT HAVING AT LEAST PARTIALLY CRYSTALLIZED SEMICONDUCTOR LAYER**

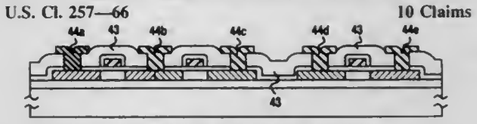
**Toru Takayama, and Yasuhiko Takemura, both of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan**

**Continuation of Ser. No. 483,048, Jun. 7, 1995, abandoned, which is a division of Ser. No. 216,107, Mar. 21, 1994, Pat. No. 5,501,989. This application Jan. 24, 1997, Ser. No. 788,562**

**Claims priority, application Japan, Mar. 22, 1993, 5-86744; Mar. 22, 1993, 5-86745; Mar. 22, 1993, 5-86746; Mar. 22, 1993, 5-86747**

**Int. Cl.[6] H01L** *21/20;29/76;29/04;27/108*

**U.S. Cl. 257—66** **10 Claims**




1. A p-channel type thin film transistor comprising:

source and drain semiconductor regions having a p-type conductivity, said source and drain semiconductor regions doped with a p-type impurity and formed in a crystalline semiconductor film comprising silicon; and

a channel semiconductor region formed in said crystalline semiconductor film and extending between said source and drain regions,

wherein at least said source and drain semiconductor regions of the semiconductor film contain a catalyst metal which is capable of promoting crystallization of said semiconductor film and said source and drain regions of the crystalline semiconductor film are selectively doped with phosphorus.

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**5,744,823**

**ELECTRONIC DEVICES COMPRISING THIN-FILM CIRCUITRY**

**Gerard F. Harkin, London, and Nigel D. Young, Red Hill, both of England, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Oct. 9, 1996, Ser. No. 728,119**

**Claims priority, application United Kingdom, Oct. 12, 1995, 9520888**

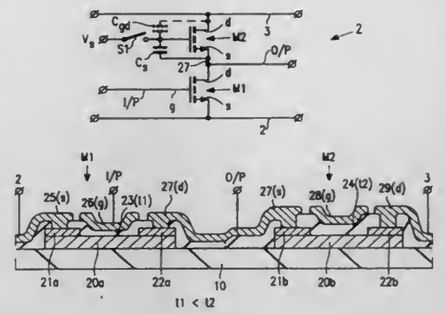
**Int. Cl.[6] H01L** *27/108;29/04;29/76*

**U.S. Cl. 257—68** **15 Claims**

1. An electronic device comprising thin-film circuitry, in which a driver transistor and a load transistor are coupled together as an inverter, both the driver and load transistors are thin-film field-effect transistors each having a respective gate electrode coupled capacitively to a respective channel region, a boot strapping capacitor is coupled between the gate electrode of the load transistor and a node at which a drain electrode of the driver transistor and a source electrode of the load transistor are coupled together, and the load transistor has a lower transconductance than that of the driver transistor, a factor μ.C in the transconductance of the load transistor being lower than that in the transconductance of the driver transistor, wherein for the load and driver transistors:

μ=charge-carrier mobility in the channel region of the respective transistor, and

C=capacitance between the gate electrode and the channel region of the respective transistor.




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**5,744,824**

**SEMICONDUCTOR DEVICE METHOD FOR PRODUCING THE SAME AND LIQUID CRYSTAL DISPLAY INCLUDING THE SAME**

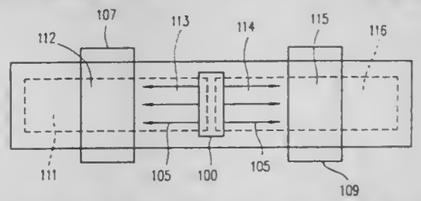
**Takamasa Kousai, Tenri; Naoki Makita, Nara, and Toru Takayama, Yokohama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 460,203, Jun. 2, 1995, abandoned. This application May 27, 1997, Ser. No. 863,272**

**Claims priority, application Japan, Jun. 15, 1994, 6-132973**

**Int. Cl.[6] H01L** *29/04;31/036;29/12*

**U.S. Cl. 257—74** **11 Claims**




1. A semiconductor device including a first thin film transistor having a first channel layer formed of a first crystalline silicon layer and a second thin film transistor having a second channel layer formed of a second crystalline silicon layer, wherein:

the first crystalline silicon layer and the second crystalline silicon layer are located on a single substrate,

wherein a promotion of crystallization in the first crystalline silicon layer is achieved without any catalyst, and

the second crystalline silicon layer includes a catalytic element for promoting crystallization, the second crystalline silicon layer having a higher mobility than the mobility of the first crystalline silicon layer and being formed of a lateral growth area obtained as a result of crystal growth in a direction substantially parallel to a surface of the substrate from an area of an amorphous silicon layer including the catalytic element introduced thereto.

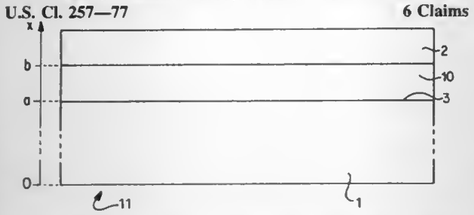
VOL 1209 ISS 4 AP 28 1998 UMI



### 5,744,825
### COMPOSITE STRUCTURE FOR AN ELECTRONIC COMPONENT COMPRISING A GROWTH SUBSTRATE, A DIAMOND LAYER, AND AN INTERMEDIATE LAYER THEREBETWEEN

**Reinhard Zachai, Guenzburg; Hans-Juergen Fuesser, Gerstetten-Dettingen, and Tim Gutheit, Ulm, all of Germany, assignors to Daimler-Benz AG, Stuttgart, Germany**

**Division of Ser. No. 432,853, May 2, 1995, Pat. No. 5,525,537.**
**This application Jan. 30, 1996, Ser. No. 594,038**
**Claims priority, application Germany, May 4, 1994, 44 15 601.4**
**Int. Cl.[6] H01L** *31/0312;31/0328;31/0336;31/072*
**U.S. Cl. 257—77** **6 Claims**




1. A composite structure for an electronic component comprising a growth substrate, an intermediate layer arranged on the growth substrate, and a diamond layer applied over the intermediate layer, wherein:

said substrate, intermediate layer and diamond layer each have a crystal lattice exhibiting a lattice constant;

said intermediate layer has substantially a crystallographic lattice structure selected from the group consisting of a zinc blende structure, a diamond structure and a $CaF_2$ structure;

the crystal lattice of the intermediate layer has a fixed orientation relative to the crystal lattice of the growth substrate;

the lattice constants of the growth substrate and of the intermediate layer adjacent the growth substrate exhibit a difference amounting to less than 20% of the lattice constant of the intermediate layer adjacent the growth substrate;

the lattice constants of the diamond layer and of the intermediate layer adjacent the diamond layer satisfy the expression:

$$|(n*a_{ZS}-m*a_D)|/\ n*a_{ZS}<0.2$$

where n and m are positive integers less than 10,

$a_D$ is the lattice constant of the diamond layer, and

$a_{ZS}$ is the lattice constant of the intermediate layer adjacent the diamond layer, and

individual crystallites of the diamond layer with dimensions between 0.1 μm to 200 μm are oriented between 20% and 100% on the crystal lattice of the intermediate layer.

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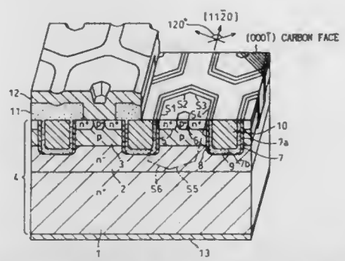
### 5,744,826
### SILICON CARBIDE SEMICONDUCTOR DEVICE AND PROCESS FOR ITS PRODUCTION

**Yuichi Takeuchi, Chita-gun; Takeshi Miyajima, Kariya; Norihito Tokura, Okazaki; Hiroo Fuma, Ichinomiya, and Toshio Murata, Seto, all of Japan, assignors to Denso Corporation, Kariya, Japan**

**Filed Jan. 22, 1997, Ser. No. 785,952**
**Claims priority, application Japan, Jan. 23, 1996, 8-009625**
**Int. Cl.[6] H01L** *31/0312*
**U.S. Cl. 257—77** **4 Claims**

1. A silicon carbide semiconductor device, comprising:

a single crystal hexagonal silicon carbide semiconductor substrate comprising a stack of a first semiconductor layer of a first conductivity-type, a second semiconductor layer of the first conductivity-type having an electric resistance higher than that of said first semiconductor layer, and a third semiconductor layer of a second conductivity-type in this order, said third semiconductor layer having a main surface of a carbon face with a face orientation of about $(000\bar{1})$;




a semiconductor region of the first conductivity-type formed in a predetermined region of said third semiconductor layer in a layer adjacent to said main surface of said third semiconductor layer;

a trench extending from said main surface through said semiconductor region and said third semiconductor layer and reaching said second semiconductor layer, said trench having side walls extending in the direction of [11$\bar{2}$0];

a fourth semiconductor layer of silicon carbide extending on said side walls of said semiconductor region, said third semiconductor layer and said second semiconductor layer in said trench, said fourth semiconductor layer having a surface;

a gate insulating film formed at least on said surface of said fourth semiconductor layer;

a gate electrode layer formed inside said gate insulating film in said trench;

a first electrode layer formed on at least a portion of said semiconductor region; and

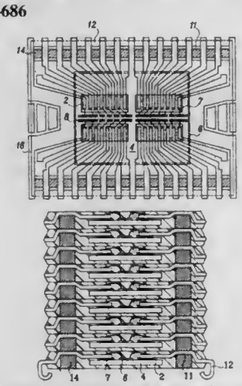
a second electrode layer formed on a surface of said first semiconductor layer.

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### 5,744,827
### THREE DIMENSIONAL STACK PACKAGE DEVICE HAVING EXPOSED COUPLING LEAD PORTIONS AND VERTICAL INTERCONNECTION ELEMENTS

**Do Soo Jeong; Min Cheol An; Seung Ho Ahn, all of Suwon; Hyeon Jo Jeong, Pyungteck, and Ki Won Choi, Suwon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Nov. 26, 1996, Ser. No. 753,532**
**Claims priority, application Rep. of Korea, Nov. 28, 1995, 95-44249**
**Int. Cl.[6] H01L** *23/48;25/04;23/02;23/495*
**U.S. Cl. 257—686** **28 Claims**




1. A three dimensional stack package device comprising a plurality of individual semiconductor devices, each of said plurality of individual semiconductor devices comprising:

a semiconductor chip;

a protective body for encapsulating said semiconductor chip;

a lead frame comprising



inner lead portions which are electrically interconnected to the semiconductor chip and included within the protective body,

outer lead portions formed as a single body with the inner lead portions, and

coupling lead portions located between the inner and the outer lead portions and having a top surface exposed upward from the protective body; and

a plurality of vertical interconnection means attached to a back surface of the coupling lead portions and exposed from the protective body in a direction opposing the exposed top surface of the coupling lead portions,

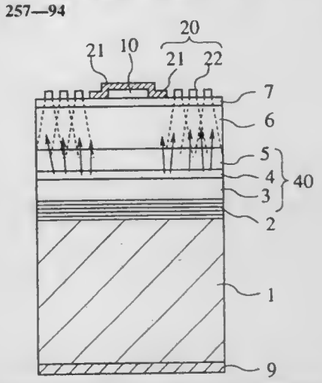
wherein, an electrical interconnection of the plurality of individual semiconductor devices is accomplished by the coupling lead portions and the vertical interconnections means, and an electrical interconnection of the three dimensional stack package device to an external circuit device is accomplished by the outer lead portions of a lowermost semiconductor device.

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### 5,744,828
### SEMICONDUCTOR LIGHT EMITTING DEVICE WITH BLOCKING LAYER

**Hideki Nozaki, Kawasaki; Kazumi Unno, Yokohama; Yasuo Idei, Tama, and Katsuhiko Nishitani, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan**

**Filed Jul. 10, 1996, Ser. No. 678,626**
**Claims priority, application Japan, Jul. 13, 1995, 7-199324**
**Int. Cl.[6] H01L** *33/00*
**U.S. Cl. 257—94** **15 Claims**




1. A semiconductor light emitting device comprising:

a semiconductor substrate;

an emission layer formed on a first principal plane of said semiconductor substrate and having a plurality of semiconductor films;

a current blocking layer formed in a predetermined region on said emission layer;

an excitation electrode formed on said emission layer and current blocking layer; and

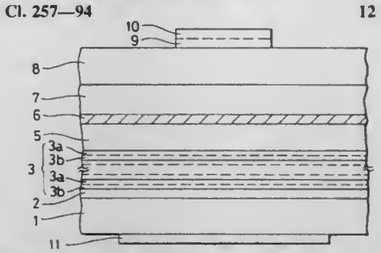
a substrate electrode formed on a second principal plane of said semiconductor substrate, said excitation electrode having a bonding pad for connection to a bonding wire that passes an external current, and a current supply electrode, said current blocking layer being under the bonding pad,

wherein said current supply electrode extends along the periphery of said semiconductor substrate and said bonding pad is located inside of said current supply electrode with a light emission surface between said current supply electrode and said bonding pad through which light is passed.

### 5,744,829
### AlGaInP LIGHT EMITTING DIODE

**Shigetaka Murasato, and Yasuyuki Sakaguchi, both of Chichibu, Japan, assignors to Showa Denko K. K., Tokyo, Japan**

**Filed Dec. 26, 1996, Ser. No. 773,348**
**Int. Cl.[6] H01L** *33/00*
**U.S. Cl. 257—94** **12 Claims**




1. An AlGaInP light-emitting diode, comprising:

a GaAs substrate having an ohmic electrode on its rear surface,

a reflection layer comprised of a lamination of multiple layers provided on the GaAs substrate,

a double hetero-junction light-emitting structure of $(Al_xGa_{1-x})_yIn_{1-y}P$ provided on the reflection layer, said light-emitting structure being comprised of an active layer between upper and lower cladding layers, with each of the layers being lattice matched to the GaAs substrate at an epitaxial growth temperature,

a current diffusion layer formed of GaP provided on the double hetero-junction light-emitting structure, and

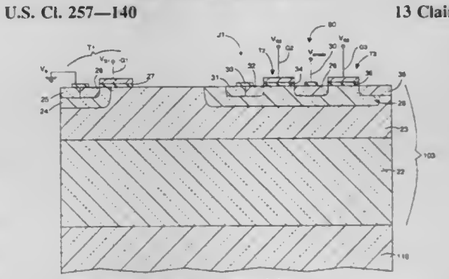
an ohmic electrode provided on the current diffusion layer.

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### 5,744,830
### SEMICONDUCTOR DEVICE

**Sankaranarayanan Ekkanath-Madathil, Leicester, England; Qin Huang, Blacksburg, Va.; Gehan Anil Joseph Amaratunga, Cambridge, England, and Naoki Kumagai, Matsumoto, Japan, assignors to Fuji Electric Co., Ltd., Tokyo, Japan**

**Filed Nov. 13, 1995, Ser. No. 556,621**
**Claims priority, application United Kingdom, Nov. 14, 1994, 9423424**
**Int. Cl.[6] H01L** *29/74;29/76*
**U.S. Cl. 257—140** **13 Claims**



1. A semi-conductor device comprising:

a first lightly doped region of a first conductivity type;

a first well of a second conductivity type, formed in said first lightly doped region;

said first well extending to a first portion of a first surface of said first lightly doped region;

a first heavily doped region of said first conductivity type, formed in a surface of said first well;

said first heavily doped region having an electrode fixed thereto;

a second heavily doped region of said first conductivity type in said surface of said first well;

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a third heavily doped region of said first conductivity type in said surface of said first well, adjoining said first lightly doped region of said first conductivity type;

said first and second heavily doped regions of said first conductivity type spaced from one another so that a first portion of said first well extends to said surface of said first well of said second conductivity type therebetween;

a first gate electrode fixed via a first insulating layer to said first portion of said first well;

said first and third heavily doped regions of said first conductivity type spaced from one another so that a second portion of said first well extends therebetween;

a second gate electrode fixed via a second insulating layer to said second portion of said first well;

a heavily doped region of said second conductivity type, in said surface of said first well; and

said heavily doped region of said second conductivity type electrically connected by a floating electrode only to said second heavily doped region of said first conductivity type, effective to cause injection of a plurality of carriers from said heavily doped region of said second conductivity type, into said first lightly doped region of said first conductivity type, when a voltage is applied to said first gate electrode.

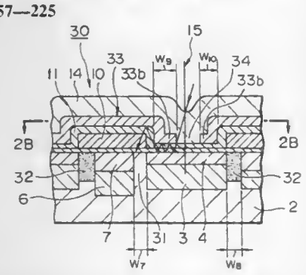
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**5,744,831**

## SOLID-STATE IMAGE PICK-UP DEVICE

**Hiroaki Tanaka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Aug. 28, 1996, Ser. No. 704,105**
**Claims priority, application Japan, Sep. 1, 1995, 7-224858**
**Int. Cl.[6] H01L** *27/148;29/768*
**U.S. Cl. 257—225** **7 Claims**




1. A solid-state image pick-up device comprising:

a photoreceiving section for performing photoelectric conversion, disposed on a substrate;

a first shift register provided on a side of said photoreceiving section via a readout gate having a first width;

a second shift register provided on the opposite side of said photoreceiving section via a channel stop region having a second width different from said first width; and

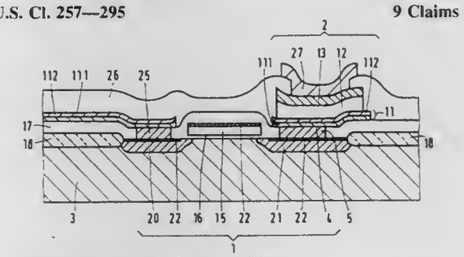
a light shielding film formed over said first and second shift registers and having an opening above said photoreceiving section, said opening located off center from a center line of said photoreceiving section in a direction extending between said opening and said first and second shift registers and substantially equidistant between said first and second shift registers.

**5,744,832**

## SEMICONDUCTOR DEVICE HAVING A FERROELECTRIC MEMORY ELEMENT WITH A LOWER ELECTRODE PROVIDED WITH AN OXYGEN BARRIER

**Robertus A.M. Wolters, and Johanna H.H.M. Kemperman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Oct. 3, 1995, Ser. No. 538,515**
**Claims priority, application European Pat. Off., Nov. 25, 1994, 94202867**
**Int. Cl.[6] H01L** *25/76;29/94;31/119;31/62;31/113*
**U.S. Cl. 257—295** **9 Claims**




1. A semiconductor device comprising:

a semiconductor body with a an electrically conducting region and a capacitor forming a memory element,

said capacitor comprising a lower electrode, an oxidic ferroelectric dielectric, and an upper electrode,

said lower electrode being in electrical contact with the conducting region and comprising a layer with a conductive metal oxide and a layer comprising platinum,

the layer comprising platinum containing more than 15 atom % of a metal other than platinum capable of forming a conductive metal oxide,

the layer comprising the conductive metal oxide being present between the layer comprising the platinum and the ferroelectric dielectric, and

said lower electrode including two oxygen barriers, a first oxygen barrier comprising an alloy of said platinum and said metal other than platinum capable of forming said conductive metal oxide and a second oxygen barrier comprised by said first layer of a conductive metal oxide.

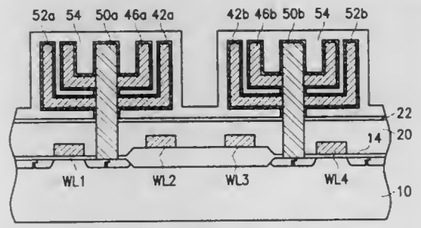
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**5,744,833**

## SEMICONDUCTOR MEMORY DEVICE HAVING TREE-TYPE CAPACITOR

**Fang-Ching Chao, Hsinchu, Taiwan, assignor to United Microelectronics Corporation, Taiwan**

**Filed Sep. 6, 1996, Ser. No. 706,704**
**Claims priority, application Taiwan, Aug. 16, 1996, 85109989**
**Int. Cl.[6] H01L** *27/108;29/76*
**U.S. Cl. 257—308** **19 Claims**




1. A semiconductor memory device, comprising:

(a) a substrate;

(b) a transfer transistor formed on said substrate, said transfer transistor having source/drain regions; and

(c) a tree-type capacitor coupled to one of said source/drain regions, said tree-type capacitor including:



a trunk conductive layer having a bottom end electrically coupled to said one of said source/drain regions, said trunk conductive layer extending substantially upright from said bottom end;

a pair of substantially parallel arranged branch conductive layers, each being substantially L-shaped in cross section and having one end connected to said trunk conductive layer, the one end of one of said pair of branch conductive layers being connected to said trunk conductive layer at a first location on said trunk conductive layer, the one end of the other of said pair of branch conductive layers being connected to said trunk conductive layer at a second location on said trunk conductive layer spaced above said first location, and said branch conductive layer in combination forming a storage electrode for said tree-type capacitor,

a dielectric layer formed over exposed surfaces of said trunk conductive layer and said branch conductive layer, and

an overlaying conductive layer overlaying said dielectric layer, said overlaying conductive layer serving as an opposing electrode of said tree-type capacitor.

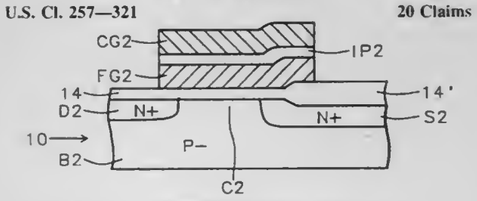
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**5,744,834**

## FLASH MEMORY CELL WITH TUNNEL OXIDE LAYER PROTECTED FROM THERMAL CYCLING

**Hsiao-Lun Lee, Singapore, Singapore, assignor to Chartered Semiconductor Manufacturing Ltd., Singapore, Singapore**

**Division of Ser. No. 654,517, May 28, 1996, Pat. No. 5,620,913. This application Jan. 24, 1997, Ser. No. 789,213**
**Int. Cl.[6] H01L** *29/76*
**U.S. Cl. 257—321** **20 Claims**




1. A flash memory EEPROM transistor comprising:

a semiconductor substrate,

a doped source region in the surface of said substrate,

said doped source region had been doped with arsenic at about 1E14 atoms/cm$^2$ to about 9E15 atoms/cm$^2$,

plus said doped source region had been additionally doped with from about 1E15 atoms/cm$^2$ to about 1E16 atoms/cm$^2$ of phosphorus,

a thick gate oxide layer formed over the portion of said surface of said substrate over said doped source region, said gate oxide lays: having been formed over said doped source region,

a tunnel dielectric layer thinner then said gate oxide layer formed on the surface of laid semiconductor substrate aside from the portion of said surface over said doped source region,

a stacked-gate structure for said transistor including a floating gate layer, an interelectrode dielectric layer, and a control gate layer formed over said tunnel dielectric layer and said stacked-gate structure overlapping said source region on one side of said stacked gate structure;

a doped drain region formed in the surface of said substrate beneath said tunnel dielectric layer at another side of said stacked gate structure opposite from said one side of said stacked gate structure with one edge of said doped drain region overlapping said gate structure,

said drain region had been doped with from about 1E15 atoms/cm$^2$ to about 1E16 atoms/cm$^2$ of phosphorus, and

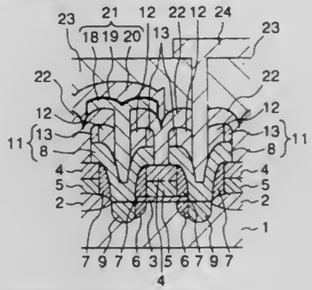
said doped drain region being shallower than said doped source region.

**5,744,835**

## MOS SEMICONDUCTOR DEVICE WITH MASK LAYERS

**Hiroyuki Inoue, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan**

**Filed Nov. 12, 1996, Ser. No. 747,928**
**Claims priority, application Japan, Nov. 14, 1995, 7-319482**
**Int. Cl.[6] H01L** *27/088*
**U.S. Cl. 257—336** **11 Claims**




1. A semiconductor device comprising:

a semiconductor substrate having a source and a drain of a MOS transistor formed therein;

a first insulating film formed on a predetermined region of said semiconductor substrate;

a first conductive film as a gate electrode and a second insulating film formed on a predetermined region of said first insulating film;

a third insulating film, as a side wall insulating film, formed on each of both side faces of said first conductive film and said second insulating film;

a second conductive film connected to one of said source and said drain of said MOS transistor and extending over said gate electrode of said MOS transistor, said second conductive film having a pattern in which said second conductive film is separated into both side portions as to said second insulating film;

a first mask layer formed on a first region of said second conductive film; and

a second mask layer formed on a second region of said second conductive film along each of side faces of said first mask layer.

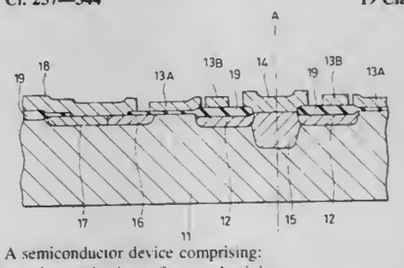
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**5,744,836**

## INSULATING GATE TYPE FIELD EFFECT TRANSISTOR

**Kenichiro Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Feb. 28, 1997, Ser. No. 808,170**
**Int. Cl.[6] H01L** *29/76;29/94;31/062*
**U.S. Cl. 257—344** **19 Claims**




1. A semiconductor device comprising:

(a) a substrate having a first conductivity;

(b) a source region formed at a surface of said substrate, said source region having a second conductivity;

(c) a drain region formed at a surface of said substrate, said drain region having a second conductivity and including a

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lightly doped region and a heavily doped region, said drain region having a length on an order of one of microns and tens of microns;

(d) an insulating film covering said substrate;

(e) a first gate electrode formed on said insulating film between said source region and said drain region; and

(f) a second gate electrode formed on said insulating film above said lightly doped region of said drain region for controlling the number of carriers in said lightly doped region of said drain region, said second gate electrode for receiving a voltage for varying carrier concentration in said lightly doped region.

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**5,744,837**

**SEMICONDUCTOR DEVICE COMPRISING A MATRIX ARRAY, AND THIN-FILM TRANSISTOR LIQUID-CRYSTAL DISPLAY DEVICE**

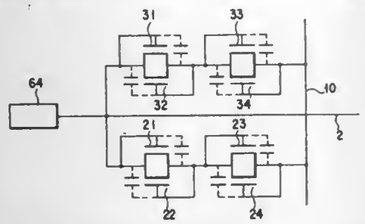
**Norihiko Kamiura, Yokohama, and Hisaaki Hayashi, Himeji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Nov. 16, 1995, Ser. No. 558,895**

**Claims priority, application Japan, Nov. 17, 1994, 6-283466**

**Int. Cl.[6] H01L** *23/62*

**U.S. Cl. 257—355** **50 Claims**




1. The semiconductor device comprising:

a matrix array having a plurality of address lines, a plurality of data lines and switching elements provided at intersections of said address lines and said data lines;

a first auxiliary line surrounding said matrix array; and

a first static electricity discharging means connected between said first auxiliary line and said address and/or data lines, said first static electricity discharging means comprising a first transistor discharge circuit and a second transistor discharge circuit connected in parallel to the first transistor discharge circuit, each of said transistor discharge circuits having a plurality of thin-film transistors (TFTs) connected in series.

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**5,744,838**

**SEMICONDUCTOR DEVICE HAVING INTERNAL CIRCUIT OTHER THAN INITIAL INPUT STAGE CIRCUIT**

**Ryuichi Matsuo, and Kenji Anami, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed May 31, 1995, Ser. No. 455,243**

**Claims priority, application Japan, Sep. 27, 1994, 6-231045**

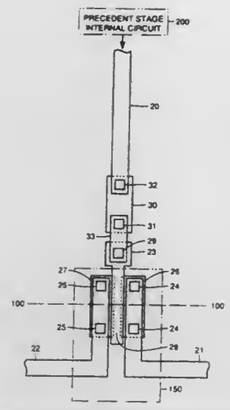
**Int. Cl.[6] H01L** *23/62*

**U.S. Cl. 257—356** **14 Claims**

1. A semiconductor device including an internal circuit other than an initial input stage circuit having a field-effect transistor, said semiconductor device comprising:

a gate electrode layer forming said field-effect transistor of said internal circuit other than said initial input stage circuit;

a first wiring layer being electrically connected with said gate electrode layer for transmitting a circuit signal to said gate electrode layer; and




an impurity diffusion layer, being interposed between said gate electrode layer and said first wiring layer, forming a resistor and a diode.

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**5,744,839**

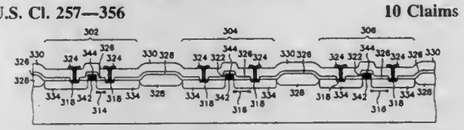
**ESD PROTECTION USING SELECTIVE SILICIDING TECHNIQUES**

**Manny K. F. Ma, and Aaron Schoenfeld, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**

**Filed Jun. 11, 1996, Ser. No. 661,447**

**Int. Cl.[6] H01L** *23/62*

**U.S. Cl. 257—356** **10 Claims**




1. An integrated circuit on a single semiconductor die, comprising:

at least one buffer transistor, having a silicided gate and silicided source/drain regions, wherein the silicided source/drain regions are not self-aligned with the gate; and,

an ESD protection device having a silicided gate and silicided source/drain regions not self aligned with the gate and placed at a shorter length from the gate than such regions in the buffer transistor.

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**5,744,840**

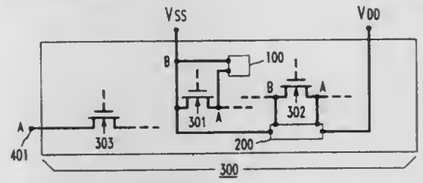
**ELECTROSTATIC PROTECTION DEVICES FOR PROTECTING SEMICONDUCTOR INTEGRATED CIRCUITRY**

**Kwok Kwok Ng, 275 Garfield St., Berkeley Heights, N.J. 07922**

**Filed Nov. 20, 1995, Ser. No. 560,671**

**Int. Cl.[6] H01L** *23/62*

**U.S. Cl. 257—360** **34 Claims**




1. An integrated circuit comprising:

(a) a protecting device structure for protecting first and second nodes of the integrated circuit, at least one of the nodes being



conductively coupled to a terminal of a protected MOS transistor having localized source and drain regions,

the protecting device structure comprising a semiconductor diode structure having localized source and localized drain regions of a first conductivity type, and having first and second localized auxiliary regions of a second conductivity type opposite the first conductivity type, the first and second localized auxiliary regions being located contiguous with and between the localized source region and the localized drain region, respectively, of the protecting device structure; and

(b) first wiring electrically connecting the localized source region of the protecting device structure to the first node of the integrated circuit;

(c) a first power supply terminal of the integrated circuit;

(d) a second power supply terminal of the integrated circuit; and

(e) an input-output terminal of the integrated circuit.

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**5,744,841**

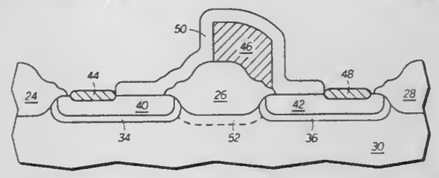
**SEMICONDUCTOR DEVICE WITH ESD PROTECTION**

**Percy Veryon Gilbert; Paul G. Y. Tsui; Shih-Wei Sun, all of Austin, and Stephen G. Jamison, Buda, all of Tex., assignors to Motorola Inc., Schaumburg, Ill.**

**Division of Ser. No. 384,177, Feb. 6, 1995. This application Feb. 18, 1997, Ser. No. 802,459**

**Int. Cl.[6] H01L** *23/62*

**U.S. Cl. 257—360** **23 Claims**




1. A semiconductor device having a field-dielectric electrostatic discharge (ESD) protection transistor comprising:

a source region having a first conductivity type;

a drain region having the first conductivity type;

a base region lying between the source and drain regions;

a first halo region having a second conductivity type that is opposite the first conductivity type, wherein the first halo region:

lies adjacent to a region selected from a group consisting of the source region and the drain region; and

extends into at least a portion of the base region;

a gate dielectric layer having a thickness greater than 1000 angstroms overlying the base region; and

a gate electrode overlying the gate dielectric layer.

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**5,744,842**

**AREA-EFFICIENT VDD-TO-VSS ESD PROTECTION CIRCUIT**

**Ming-Dou Ker, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan**

**Filed Aug. 15, 1996, Ser. No. 698,241**

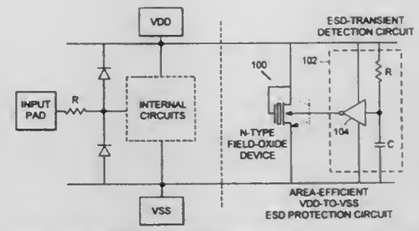
**Int. Cl.[6] H01L** *23/62*

**U.S. Cl. 257—362** **25 Claims**

1. An electrostatic discharge (ESD) protection circuit which forms part of an integrated circuit having a VDD line and a VSS line, said protection circuit comprising:

an ESD transient detection circuit connected between the VDD and VSS lines; and

an electrostatic discharge circuit driven by said transient detection circuit and connected between said VDD and VSS lines, wherein said discharge circuit comprises a lateral bipolar transistor having an emitter and a collector, one of which is electrically connected to the VDD line and the other of which is electrically connected to the VSS line, wherein said lateral




bipolar transistor is implemented by a field oxide device, and wherein said bipolar transistor has a base that is electrically coupled to the transient detection circuit.

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**5,744,843**

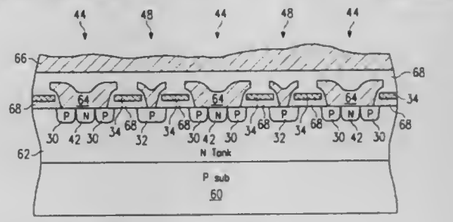
**CMOS POWER DEVICE AND METHOD OF CONSTRUCTION AND LAYOUT**

**Taylor R. Efland, Richardson, and Dale J. Skelton, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Aug. 28, 1996, Ser. No. 697,693**

**Int. Cl.[6] H01L** *29/76;21/265*

**U.S. Cl. 257—369** **25 Claims**




1. A CMOS power device, comprising:

a semiconductor substrate;

a tank region formed in the semiconductor substrate;

a polysilicon gate layer disposed above the tank region, the polysilicon gate layer defining a plurality of source diffusion openings and a plurality of drain diffusion openings all having rounded inner corners;

a plurality of source regions formed by diffusion through the plurality of source diffusion openings;

a plurality of drain regions formed by diffusion through the plurality of drain diffusion openings;

a plurality of backgate contact regions formed in vacancies in the plurality of source regions, the plurality of backgate contact regions being segmented and each operable to provide contact to the tank region;

multi-level metallization layers disposed above an active device region of the semiconductor substrate, the multi-level metallization layers comprising:

source contacts and vias alternating along a center line, the source contacts located above and extending over the backgate contact regions;

drain contacts and vias alternating along a center line;

sets of gate contacts and vias alternating and offset where the sets are offset with respect to adjacent sets;

source, drain and gate bussing; and

a center gate bus located on a center line of the power device, the center gate bus coupled to the gate bussing;

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a plurality of source bond pads formed on a first edge of the power device, the source bond pads coupled to the source bussing;

a plurality of drain bond pads formed along a second edge of the power device, the drain bond pads coupled to the drain bussing; and

thick upper level metallization disposed above the source bussing, the drain bussing and extending between associated bond pads.

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**5,744,844**

**CMOS SRAM CELL**

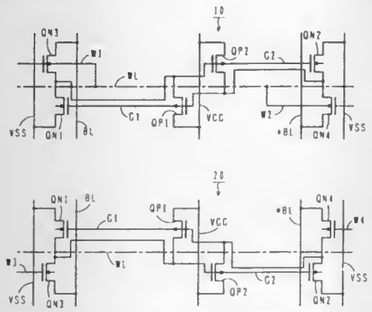
**Tsuyoshi Higuchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Nov. 19, 1996, Ser. No. 752,631**

**Claims priority, application Japan, Mar. 29, 1996, 8-077459**

**Int. Cl.[6] H01L** *29/76;27/11*

**U.S. Cl. 257—369** **14 Claims**




1. A semiconductor device having an SRAM cell therein, said SRAM cell comprising:

a first nMOS region of a semiconductor substrate, said first nMOS region including first and third nMOS transistors therein;

a second nMOS region of the semiconductor substrate having second and fourth nMOS transistors therein;

a pMOS region disposed between said first and second nMOS regions, said pMOS region having first and second pMOS transistors therein, said first to fourth nMOS transistors and said first and second pMOS transistors being formed on the semiconductor substrate;

isolation regions between said first nMOS region and said pMOS region and between said second nMOS region and said pMOS region;

first and second bit lines extending in a direction substantially perpendicular to a longitudinal region extending from said first nMOS region to said second nMOS region; said SRAM cell further comprising

a word line extending in a direction parallel to said longitudinal region,

wherein said first and second nMOS transistors and said first and second pMOS transistors comprise a flip-flop for storing data, wherein said third nMOS transistor forms a first transfer gate connected between the first bit line and the flip-flop, with a gate thereof connected with said word line, and wherein said fourth nMOS transistor forms a second transfer gate connected between said second bit line and said flip-flop with a gate thereof connected with said word line.

**5,744,845**

**COMPLEMENTARY MOS FIELD EFFECT TRANSISTOR WITH TUNNEL EFFECT MEANS**

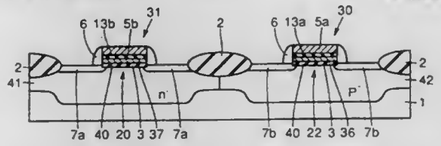
**Hirokazu Sayama, and Takashi Kuroi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 605,936, Feb. 23, 1996, abandoned. This application Feb. 13, 1997, Ser. No. 800,147**

**Claims priority, application Japan, Sep. 21, 1995, 7-242955**

**Int. Cl.[6] H01L** *29/76;29/94*

**U.S. Cl. 257—371** **4 Claims**




1. A complementary MOS field effect transistor having a dual gate structure, comprising:

a semiconductor substrate;

an n well and a p well formed in said semiconductor substrate;

an n channel MOSFET formed in said p well and having a first gate electrode; and

a p channel MOSFET formed in said n well and having a second gate electrode, wherein

said first gate electrode includes a first silicon film which is formed on said p well with a gate insulating film therebetween and to which impurities of a first conductivity type have been implanted, a first silicon oxide film formed on said first silicon film, and a first conductive film of metal or metal silicide formed on said first silicon oxide film,

said second gate electrode includes a second silicon film which is formed on said n well with a gate insulating film therebetween and to which impurities of a second conductivity type have been implanted, a second silicon oxide film formed on said second silicon film, and a second conductive film of metal or metal silicide formed on said second silicon oxide film,

said first silicon oxide film has a sufficiently small thickness so that a potential can be transmitted from said first conductive film to said first silicon film by means of a tunnel effect, and

said second silicon oxide film has a sufficiently small thickness so that a potential can be transmitted from said second conductive film to said second silicon film by means of a tunnel effect, wherein

each of said first and second silicon oxide films has a thickness of at most 30 Å.

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**5,744,846**

**SRAM CELL EMPLOYING SUBSTANTIALLY VERTICALLY ELONGATED PULL-UP RESISTORS AND METHODS OF MAKING, AND RESISTOR CONSTRUCTIONS AND METHODS OF MAKING**

**Shubneesh Batra, Boise, and Monte Manning, Kuna, both of Id., assignors to Micron Technology, Inc., Boise, Id.**

**Division of Ser. No. 568,173, Dec. 6, 1995, Pat. No. 5,683,930. This application Jan. 3, 1997, Ser. No. 775,356**

**Int. Cl.[6] H01L** *29/76;29/94*

**U.S. Cl. 257—380** **25 Claims**

1. An SRAM cell comprising:

at least one pull-down gate, a ground line, a Vcc line, and at least one pull-up resistor; the pull-down gate having associated transistor diffusion regions operatively adjacent thereto;

the Vcc line being elevationally outward relative to the transistor diffusion regions, an electrical insulating layer being intermediate the Vcc line and transistor diffusion regions; and





the pull-up resistor being substantially vertically elongated between Vcc and a selected of the transistor diffusion regions adjacent the pull-down gate through a substantially vertically elongated passageway formed through the insulating layer, the passageway comprising a combination of a previously formed contact opening through the insulating layer and an electrically insulating annulus spacer received laterally inward therewithin.

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**5,744,847**

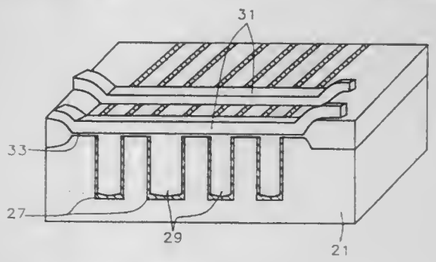
**POLYSILICON TRENCH AND BURIED WALL DEVICE STRUCTURES**

**Jemmy Wen, Hsinchu, Taiwan, assignor to United Microelectronics Corporation, Taiwan**

**Continuation of Ser. No. 667,615, Jun. 21, 1996, abandoned, which is a division of Ser. No. 365,047, Dec. 27, 1994, Pat. No. 5,554,568. This application Sep. 2, 1997, Ser. No. 923,547**

**Int. Cl.[6] H01L** *27/108;29/788;29/76;29/94*

**U.S. Cl. 257—397** **20 Claims**




1. A trench device, comprising:

a semiconductor substrate having a surface;

vertical trenches formed in said semiconductor substrate, said vertical trenches extending below the surface of said semiconductor substrate, with each of said vertical trenches having a bottom and sidewalls, the vertical trenches separated by horizontal portions of said surface of said semiconductor substrate;

conducting layers formed within said vertical trenches and extending from said bottom to said surface of said semiconductor substrate along said sidewalls of said vertical trenches;

a gate dielectric layer covering said horizontal surface of said semiconductor substrate and upper edges of said conducting layers; and

a gate electrode formed on said gate dielectric layer.

**5,744,848**

**PACKAGE FOR HOUSING A PHOTOSEMICONDUCTOR DEVICE**

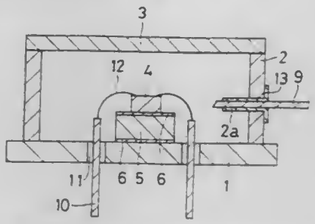
**Masaaki Harazono, Kokubu, Japan, assignor to Kyocera Corporation, Kyoto, Japan**

**Filed Aug. 2, 1996, Ser. No. 691,624**

**Claims priority, application Japan, Aug. 9, 1995, 7-203100**

**Int. Cl.[6] H01L** *23/06*

**U.S. Cl. 257—433** **4 Claims**




1. A package for housing a photosemiconductor device comprising:

a metal substrate; an insulating support member on the top surface of which a photosemiconductor device is mounted; a metal frame member attached onto the metal substrate so as to surround the insulating support member and having a fixing region through a side face thereof which fixes an optical fiber therein; outer lead terminals fixed in the metal substrate or the metal frame member via insulants; and a metal lid member attached to the top surface of the metal frame member to hermetically seal the photosemiconductor device,

wherein the insulating support member comprises an aluminum nitride-based sinter, the top surface of the insulating support member is coated with a thin-film brazing material, and the photosemiconductor device is fixed onto the insulating support member via the brazing material.

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**5,744,849**

**PHOTOELECTRIC CONVERTING DEVICE AND IMAGE PROCESSING APPARATUS USING THE SAME**

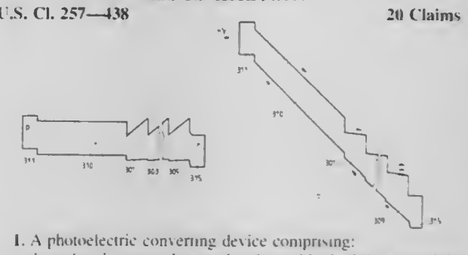
**Shigetoshi Sugawa, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 818,887, Jan. 10, 1992, abandoned. This application Jul. 26, 1994, Ser. No. 279,870**

**Claims priority, application Japan, Jan. 11, 1991, 3-012593; Jan. 14, 1991, 3-016008**

**Int. Cl.[6] H01L** *31/107*

**U.S. Cl. 257—438** **20 Claims**



1. A photoelectric converting device comprising:

a photoelectric converting portion formed by building up a light absorbing layer with a predetermined bandgap Eg1 and a carrier multiplying layer between charge injection blocking layers, the carrier multiplying layer being composed of a plurality of layers each having a bandgap changing continuously from a minimum bandgap Eg2 to a maximum bandgap Eg3 in a layer thickness direction from one interface to the other interface and the minimum bandgap Eg2 being adjacent to the maximum bandgap Eg3 between the adjacent layers of the carrier multiplying layer, wherein the charge injection blocking layers, the light absorbing layer and the carrier multiplying layer are composed of non-monocrystalline semi-

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conductors, and wherein at least one of all end portions having either one of the minimum bandgap Eg2 and the maximum bandgap Eg3 which are adjacent to each other has a microcrystalline structure including crystal grains of a size of several ten Å to several hundred Å, wherein said photoelectric converting portion is arranged in a matrix configuration,

a shift register for scanning drive of each photoelectric converting portion is arranged in periphery of the matrix arrangement of the photoelectric converting portion.

a signal output section for receiving a signal from said photoelectric converting portion is provided, wherein said signal output section comprises means for storing a signal from said photoelectric converting portion, means for scanning said means for storing, and means for reading the signal from said photoelectric converting portion; and

a controller for controlling said signal output section.

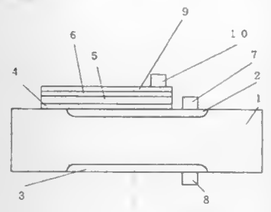
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**5,744,850**

**PHOTOELECTRIC CONVERSION SEMICONDUCTOR DEVICE**

**Keiji Sato; Yutaka Saitoh, and Tadao Akamine, all of Chiba, Japan, assignors to Seiko Instruments R&D Center Inc., Japan**

**Filed Oct. 18, 1996, Ser. No. 733,967**
**Claims priority, application Japan, Oct. 20, 1995, 7-273133**
**Int. Cl.[6] H01L** *31/107;31/075;31/105;31/117*
**U.S. Cl. 257—438** **6 Claims**




a

1. A photoelectric conversion semiconductor device, comprising:

first conductive impurity domain having an impurity concentration higher than that of a first conductive semiconductor substrate and formed on one surface of said first conductive semiconductor substrate;

a second conductive impurity domain formed on the other surface of said first conductive semiconductor substrate on the side opposite from the surface having said first conductive impurity domain;

a first electrode formed on said first condoctive impurity domain and a second electrode formed thereon via a dielectric layer; and

a third electrode formed on said second conductive impurity domain;

said dielectric layer extending to the domain of said first conductive semiconductor substrate.

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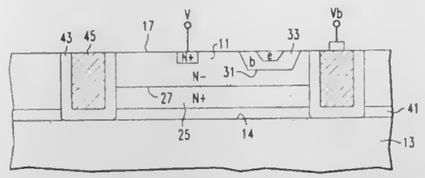
**5,744,851**

**BIASING OF ISLAND-SURROUNDING MATERIAL TO SUPPRESS REDUCTION OF BREAKDOWN VOLTAGE DUE TO FIELD PLATE ACTING ON BURIED LAYER/ISLAND JUNCTION BETWEEN HIGH AND LOW IMPURITY CONCENTRATION REGIONS**

**James D. Beasom, Melbourne Village, Fla., assignor to Harris Corporation, Melbourne, Fla.**

**Continuation of Ser. No. 827,095, Jan. 27, 1992, abandoned. This application May 24, 1993, Ser. No. 66,697**
**Int. Cl.[6] H01L** *23/58*
**U.S. Cl. 257—487** **9 Claims**

1. A semiconductor device comprising:




a semiconductor substrate containing a semiconductor island region of a first conductivity type having sidewalls which abut a first side of dielectric material that prescribes said island region, a second side of said dielectric material being contiguous with material capable of distributing a voltage applied thereto;

a first semiconductor region of said first conductivity type, and having an impurity concentration different from that of said island region, disposed in said island region, so as to define a relatively high-to-low impurity concentration junction between said first semiconductor region and said island region, said relatively high-to-low impurity concentration junction corresponding to a readily measurable transition of doping concentration within said island region, as opposed to a graded profile from high-to-low doping such as a Gaussian distribution from a top surface of said island region toward the bottom of said island region or a low-to-high retrograde profile measured from said top surface of said island region, said relatively high-to-low impurity concentration junction intersecting said dielectric material at a sidewall of said semiconductor island region;

a second semiconductor region of a second conductivity type disposed in said island region so as to define a PN junction between said second semiconductor region and said island region, said island region and said second semiconductor region being coupled to receive respective bias voltages which reverse bias said PN junction; and

wherein said PN junction is spaced apart from said sidewalls of said semiconductor island region, and said material capable of distributing a voltage applied thereto is coupled to receive a prescribed bias voltage that is insufficient to cause the avalanche-generation of electron-hole pairs in the vicinity of said relatively high-to-low impurity concentration junction; and

wherein said prescribed bias voltage differs from the island bias voltage by a value no more than half the total voltage applied to said semiconductor device.

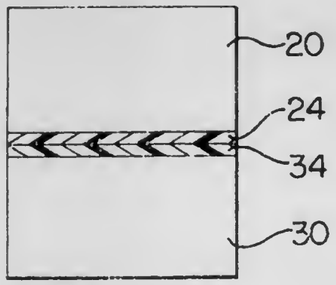
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**5,744,852**

**BONDED WAFER**

**Jack H. Linn; George Bajor, both of Melbourne, and George V. Rouse, Indialantic, all of Fla., assignors to Harris Corporation, Melbourne, Fla.**

**Division of Ser. No. 443,242, May 17, 1995, Pat. No. 5,603,779. This application Sep. 19, 1996, Ser. No. 710,694**
**Int. Cl.[6] H01L** *29/06*
**U.S. Cl. 257—506** **8 Claims**






1. An improved bonded wafer, comprising:

a first wafer;

a second wafer;

a polymer seal on at least a portion of said first wafer;

a polymer seal on at least a portion of said second wafer;

a bond junction formed between said first wafer and said second wafer by annealing said polymer seal on said first wafer to said polymer seal on said second wafer at a temperature sufficient to cause destructive distillation of said polymer seals, wherein said bond junction has semiconductor to semiconductor and semiconductor to carbon bonds.

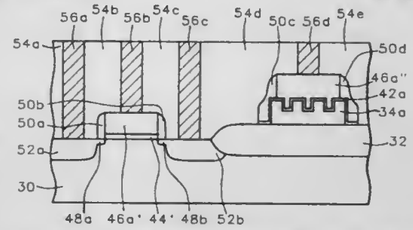
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**5,744,853**

**THREE DIMENSIONAL POLYSILICON CAPACITOR FOR HIGH DENSITY INTEGRATED CIRCUIT APPLICATIONS**

**Elgin Kiok Boone Quek, and Yang Pan, both of Singapore, Singapore, assignors to Chartered Semiconductor Manufacturing PTE LTD, Singapore, Singapore**

**Continuation of Ser. No. 529,023, Sep. 15, 1995, abandoned. This application Mar. 5, 1997, Ser. No. 810,794**
**Int. Cl.[6] H01L** *29/68;27/04;27/108;29/78*
**U.S. Cl. 257—532** **20 Claims**




1. A method for forming a three-dimensional polysilicon capacitor for use in integrated circuits comprising:

providing a semiconductor substrate;

forming over the semiconductor substrate a first insulator layer;

forming upon the first insulator layer without contacting the semiconductor substrate a first polysilicon layer, the first polysilicon layer having a first series of apertures formed at least partially through the first polysilicon layer;

forming upon the first polysilicon layer and into the first series of apertures within the first polysilicon layer a conformal insulator layer, the conformal insulator layer having a second series of apertures formed therein corresponding to locations where the conformal insulator layer is formed into the first series of apertures within the first polysilicon layer; and

forming upon the conformal insulator layer and completely filing the second series of apertures within the conformal insulator layer a second polysilicon layer, where the areal dimensions of the second polysilicon layer are contained within the areal dimensions of the first polysilicon layer.

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**5,744,854**

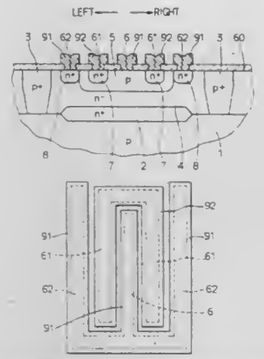
**SURGE PROTECTIVE DEVICE HAVING A SURFACE COLLECTOR REGION DIRECTLY SHORTED TO A BASE REGION**

**Hiroshi Okada, Nukata-gun, and Toshitaka Yamada, Okazaki, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Aug. 9, 1996, Ser. No. 694,828**
**Claims priority, application Japan, Aug. 10, 1995, 7-204836**
**Int. Cl.[6] H01L** *23/62*
**U.S. Cl. 257—565** **11 Claims**

1. A surge protective device, comprising:

a collector region of a first conductivity type provided on a semiconductor substrate;




a base region of a second conductivity type disposed at a surface portion of said collector region;

an emitter region of a first conductivity type disposed within said base region, said base region and said emitter region collectively forming a voltage-regulation diode in which said emitter region makes up a cathode and said base region makes up an anode; and

a surface collector region of said first conductivity type disposed at said surface portion of said collector region, said surface collector region being directly shorted to said base region by a wire.

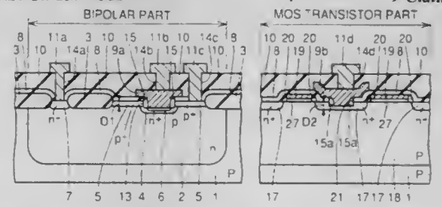
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**5,744,855**

**SINGLE-POLY-TYPE BIPOLAR TRANSISTOR**

**Yukio Maki, and Hiroki Honda, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 5, 1995, Ser. No. 460,940**
**Claims priority, application Japan, Dec. 2, 1994, 6-299361**
**Int. Cl.[6] H01L** *27/082;27/102;29/70;31/11*
**U.S. Cl. 257—588** **9 Claims**




8. A semiconductor device with a bipolar transistor comprising:

a semiconductor substrate of a first conductivity type having a main surface;

an MOS transistor having a pair of source/drain regions of the second conductivity type formed at the main surface of said semiconductor substrate;

an impurity diffusion layer of the second conductivity type formed at the main surface of said semiconductor substrate and spaced from said MOS transistor;

a base region of the first conductivity type formed at a surface of said impurity diffusion layer;

an external base region formed at the surface of said impurity diffusion layer and surrounding said base region;

a first groove formed to a depth in one of the source/drain regions;

an emitter region formed at a surface of said base region;

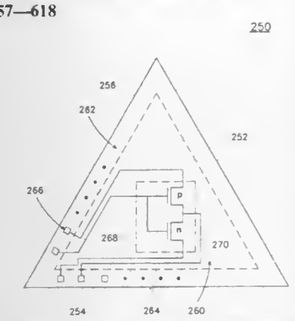
a second groove, having a death equal to the depth of the first groove, formed in the external base region such that the base region and the emitter region are directly beneath the second groove in the external base region; wherein

a diffusion depth of said source/drain regions is larger than that of said external base region.

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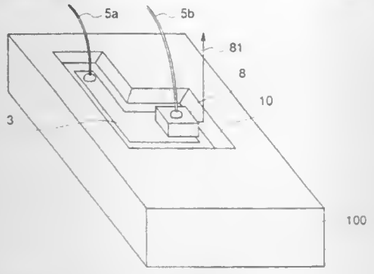
**5,744,856**
**NON-SQUARE DIE FOR INTEGRATED CIRCUITS AND SYSTEMS CONTAINING THE SAME**
**Michael D. Rostoker, Boulder Creek, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.**
**Continuation-in-part of Ser. No. 270,123, Jul. 1, 1994, abandoned, which is a division of Ser. No. 933,430, Aug. 21, 1992, Pat. No. 5,329,157, which is a continuation-in-part of Ser. No. 916,328, Jul. 17, 1992, Pat. No. 5,340,772. This application Jun. 7, 1995, Ser. No. 476,431**
**Int. Cl.[6] H01L** *29/06;23/495;23/48*
**U.S. Cl. 257—618** **14 Claims**




1. An electronic system having at least one semiconductor integrated circuit package containing a non-square semiconductor die, said system comprising:
a non-square semiconductor die having a plurality of bond pads thereon;
a patterned layer of conductive lines having inner and outer ends, the inner ends of the conductive lines defining a non-square die-receiving area for mounting the non-square semiconductor die;
the plurality of bond pads connected to the inner ends of the conductive lines with bond wires
an integrated circuit package formed about the non-square semiconductor die, the inner ends of the conductive lines and the non-square die-receiving area, the non-square die-receiving area having a triangular shape defined by angles alpha, beta and phi, wherein one of the angles is substantially equal to 90°; and
the outer ends of the conductive lines connected to an electronic system.

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**5,744,857**
**SEMICONDUCTOR DEVICE**
**Yousuke Yamamoto, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Aug. 9, 1996, Ser. No. 694,625**
**Claims priority, application Japan, Jan. 30, 1996, 8-014080**
**Int. Cl.[6] H01L** *29/06;27/15;31/12;33/00*
**U.S. Cl. 257—622** **10 Claims**




1. A semiconductor device comprising:
a silicon substrate having a surface and a recess 20~150 μm deep at the surface, the recess having a bottom and a plurality of side walls;
an electrode disposed on a region at the bottom of the recess, the region including an element region where a semiconductor element is mounted and a wire bonding region where a wire is bonded;
a semiconductor element mounted on a portion of the electrode within the element region; and
a wire bonded to a portion of the electrode within the wire bonding region.

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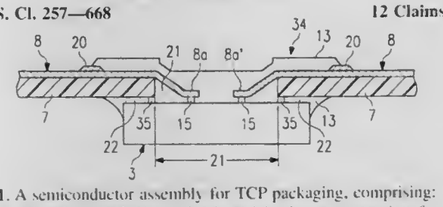
**5,744,858**
**SEMICONDUCTOR PACKAGING TECHNIQUE YIELDING INCREASED INNER LEAD COUNT FOR A GIVEN DIE-RECEIVING AREA**
**Michael D. Rostoker, Boulder Creek, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.**
**Continuation of Ser. No. 270,123, Jul. 1, 1994, abandoned, which is a division of Ser. No. 933,430, Aug. 21, 1992, Pat. No. 5,239,157, which is a continuation-in-part of Ser. No. 916,328, Jul. 17, 1992, Pat. No. 5,340,772. This application Sep. 26, 1996, Ser. No. 720,219**
**Int. Cl.[6] H01L** *23/02*
**U.S. Cl. 257—666** **7 Claims**




1. A semiconductor device assembly, comprising:
a semiconductor die having bond pads;
a patterned layer of conductive lines, inner ends of the conductive lines defining an area for receiving the die; and
a body formed about the die and inner ends of the conductive lines, the body having a triangular shape defined by angles alpha, beta and phi, wherein one of the angles is substantially equal to 90°.

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**5,744,859**
**SEMICONDUCTOR DEVICE**
**Takayuki Ouchida, Beppu, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.**
**Filed Feb. 7, 1996, Ser. No. 597,759**
**Int. Cl.[6] H01L** *23/495*
**U.S. Cl. 257—668** **12 Claims**



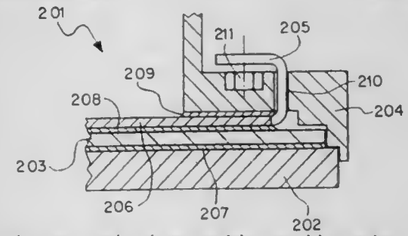

1. A semiconductor assembly for TCP packaging, comprising:
an IC chip containing a circuit and having a connection face provided with a plurality of bump electrodes coupled to the circuit;



a flexible base film (i) having a device hole smaller than the IC chip's connection face and facing it at a predetermined sealing gap distance and (ii) attached to a plurality of conducting leads having unattached inner lead portions extendible through the device hole for bonding to corresponding bump electrodes of the IC chip; and
a plurality of spacer projections, of a height equal to the sealing gap distance, disposed around the device hole between the base film and the chip's connection face for maintaining the gap distance when the inner lead portions are bonded to the bump electrodes and a sealant is poured in the device hole.

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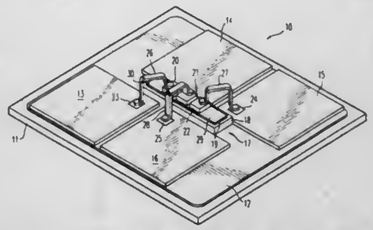
**5,744,860**
**POWER SEMICONDUCTOR MODULE**
**Reinhold Bayerer, Reichelsheim, Germany, assignor to Asea Brown Boveri AG, Baden, Switzerland**
**Filed Feb. 6, 1996, Ser. No. 595,920**
**Int. Cl.[6] H01L** *23/12*
**U.S. Cl. 257—683** **20 Claims**




1. A power semiconductor module comprising at least one semiconductor chip which is arranged on a baseplate and is surrounded by a housing arranged above the baseplate, characterized in that the power semiconductor module is designed for relief of an excess pressure which has formed in the region of the at least one semiconductor chip, and further characterized in that the at least one semiconductor chip is externally connected by connecting lugs which are electrically connected to the at least one semiconductor chip and are routed to the outside through corresponding through-passage openings in the housing, and further characterized in that the connecting lugs are constructed as parts of connection laminates which are arranged inside the housing and parallel to the baseplate and are mechanically connected to the latter over a large area.

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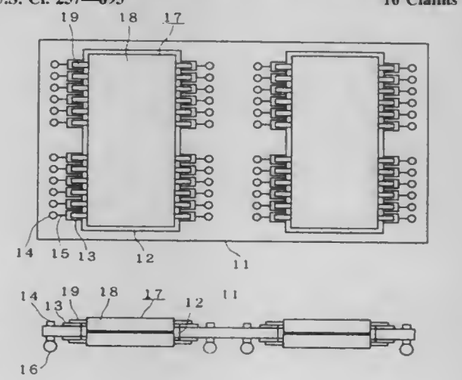
**5,744,861**
**POWER SEMICONDUCTOR MODULE**
**Reinhold Bayerer, Reichelsheim, Germany, assignor to Asea Brown Boveri AG, Baden, Switzerland**
**Filed Nov. 13, 1995, Ser. No. 558,021**
**Int. Cl.[6] H01L** *23/52*
**U.S. Cl. 257—691** **8 Claims**



1. A power semiconductor module, in which a plurality of individual controllable power semiconductors in the form of semiconductor chips are arranged alongside one another and electrically connected on a common module substrate, wherein the control connections of a plurality of the controllable power semiconductors are brought together on a second plane which is vertically offset with respect to the plane of the module substrate;
wherein the second plane is provided by the top side of a connecting rail which is placed onto the substrate and is arranged next to the semiconductor chips, wherein the electrical connection between the semiconductor chips and the connecting rail is effected via connecting wires which run from the respective semiconductor chip to the connecting rail, and wherein series resistors are respectively inserted between the semiconductor chips and the connecting rail.

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**5,744,862**
**REDUCED THICKNESS SEMICONDUCTOR DEVICE WITH IC PACKAGES MOUNTED IN OPENINGS ON SUBSTRATE**
**Hideki Ishii, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Nov. 20, 1996, Ser. No. 753,094**
**Claims priority, application Japan, Mar. 29, 1996, 8-076947**
**Int. Cl.[6] H01L** *23/36;25/04;23/02;23/12*
**U.S. Cl. 257—693** **10 Claims**




1. A semiconductor device comprising:
a substrate having an upper surface, a lower surface, and an opening; and
first and second integrated circuit packages, each integrated circuit package having a package body facing the opening, and straight leads protruding from said package body and supported on said substrate at a periphery of the opening, said first and second integrated circuit packages being disposed on the upper surface and the lower surface of said substrate, respectively, half of at least one of the package bodies of said first and second integrated circuit packages being disposed within the opening.

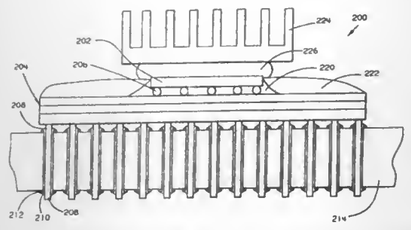
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**5,744,863**
**CHIP CARRIER MODULES WITH HEAT SINKS ATTACHED BY FLEXIBLE-EPOXY**
**Thomas Moran Culnane, Lanesboro, Pa.; Michael Anthony Gaynes, Vestal, N.Y.; Ping Kwong Seto, Endicott, N.Y., and Hussain Shaukatullah, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**
**Division of Ser. No. 273,253, Jul. 11, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 474,341**
**Int. Cl.[6] H01L** *23/34;* **H05K** *7/20*
**U.S. Cl. 257—712** **34 Claims**

1. A chip carrier module, comprising:
a first organic substrate;
a semiconductor chip connected to the first substrate;

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a layer of flexible-epoxy having a Young's modulus of less than 100,000 psi at 25° C. on a first surface of the chip;

a heat spreader with a surface bonded to the first surface of the chip by the flexible-epoxy;

means for mechanically holding the heat spreader and chip in a fixed position relative to the first substrate; and

means for connecting the first substrate to another substrate.

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**5,744,864**

**SEMICONDUCTOR DEVICE HAVING A TRANSPARENT SWITCHING ELEMENT**

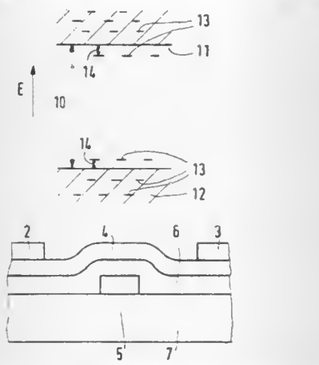
**Johannes F. M. Cillessen; Paulus W. M. Blom, both of Eindhoven, Netherlands; Ronald M. Wolf, Katonah, N.Y., and Jacobus B. Giesbers, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 1, 1996, Ser. No. 692,295**

**Claims priority, application European Pat. Off., Aug. 3, 1995, 95202117**

**Int. Cl.[6] H01L** *29/04;29/76;23/48*

**U.S. Cl. 257—749** **10 Claims**




1. A semiconductor device with a transparent switching element with two connection electrodes of transparent material and an interposed transparent channel region of a semiconductor material provided with a transparent gate electrode of conductive material separated from the channel region by a transparent insulating layer, characterized in that the semiconductor material comprises a degenerate semiconductor material with a basic material having a bandgap between the conduction and the valence bands of electrons greater than 2.5 eV and a mobility of charge carriers greater than 10 $cm^2/Vs$ provided with dopant atoms which form a fixed impurity energy level adjacent or in the valence or conduction band of the basic material.

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**5,744,865**

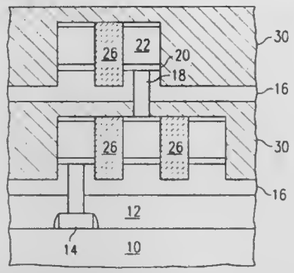
**HIGHLY THERMALLY CONDUCTIVE INTERCONNECT STRUCTURE FOR INTERGRATED CIRCUITS**

**Shin-Puu Jeng, and Mi-Chang Chang, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Oct. 22, 1996, Ser. No. 735,356**

**Int. Cl.[6] H01L** *23/48;23/52*

**U.S. Cl. 257—750** **20 Claims**




1. A microelectronic structure comprising:

(a) a semiconductor substrate;

(b) a high thermal conductivity material on a said semiconductor substrate;

(c) a plurality of interconnects on said high thermal conductivity material on said semiconductor substrate wherein the thickness of said high thermal conductivity material not directly below said interconnects is thinner than in areas directly below said interconnects;

(d) a dielectric material between at least two of said interconnects and between said high thermal conductivity material in said thinner areas; and

(e) an interlevel dielectric layer on said high thermal conductivity material, said interconnects and said dielectric material.

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**5,744,866**

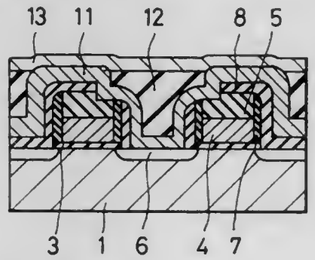
**LOW RESISTANCE GROUND WIRING IN A SEMICONDUCTOR DEVICE**

**Shinichi Horiba, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Mar. 11, 1997, Ser. No. 816,040**

**Int. Cl.[6] H01L** *23/48*

**U.S. Cl. 257—752** **12 Claims**




1. A semiconductor device comprising:

(a) a semiconductor substrate;

(b) a first insulating film formed partially on said semiconductor substrate;

(c) gate electrodes formed on said first insulating film, said gate electrodes having a two-layered structure including a first conductive film and a second insulating film lying over said first conductive film;

(d) a diffusion layer formed at a surface of said semiconductor substrate around said gate electrodes;

(e) an insulating sidewall film formed around a sidewall of said gate electrodes;



(f) a third insulating film partially covering said semiconductor substrate, said insulating sidewall film and said gate electrodes so that said diffusion layer, a part of said gate electrodes and a top edge of said insulating sidewall film are in exposure;

(g) a second conductive film covering said third insulating film, exposed part of said gate electrodes, exposed top edge of said insulating sidewall film and said semiconductor substrate;

(h) a fourth insulating film having a planarized top surface at such a level that a top surface of said second conductive film is in exposure; and

(i) a third conductive film bridging over said top surface of said second conductive film,

said third conductive film, said fourth insulating film and said second conductive film cooperating with one another to form a ground wiring layer.

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**5,744,867**

**Patent Not Issued For This Number**

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**5,744,868**

**ENCAPSULATED ELECTRONIC COMPONENT HAVING A PLURALITY OF CONNECTION LEADS OF MARTENSITIC STRUCTURAL-HARDENING CONDUCTIVE ALLOY**

**Ricardo Cozar, La Fermete, and Jean-Pierre Reyal, Eragny, both of France, assignors to Imphy S.A. (Societe Anonyme), Puteaux, France**

**Filed Apr. 25, 1996, Ser. No. 639,275**

**Claims priority, application France, Apr. 27, 1995, 95 05015**

**Int. Cl.[6] H01L** *23/48;23/52;29/40*

**U.S. Cl. 257—767** **8 Claims**

1. An encapsulated electronic component comprising a plurality of connection leads and an outer case, wherein the connection leads extend external to said outer case and comprise martensitic structural-hardening conductive alloy, the chemical composition of which comprises, by weight based on total weights:

$0\% \leqq Co \leqq 30\%$

$9\% \leqq Ni \leqq 21\%$

$5\% \leqq Mo \leqq 12\%$

$0.1\% \leqq Al+Ti \leqq 9\%$

$0\% \leqq Nb \leqq 1\%$

$0\% \leqq C \leqq 0.15\%$

$0\% \leqq Mn \leqq 5\%$

$0\% \leqq Cr \leqq 13\%$

optionally, at least one element taken from W, V or Be each in amounts of less than 0.1% and, optionally, copper in an amount of less than 0.3%, the balance being iron and impurities resulting from smelting.

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**5,744,869**

**APPARATUS FOR MOUNTING A FLIP-CHIP SEMICONDUCTOR DEVICE**

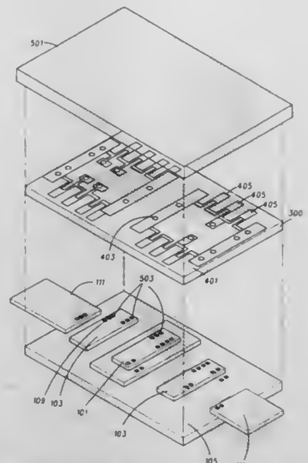
**Loren Francis Root, Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Dec. 5, 1995, Ser. No. 567,518**

**Int. Cl.[6] H01L** *23/48;23/52*

**U.S. Cl. 257—778** **11 Claims**

1. An apparatus for mounting a flip-chip semiconductor device, comprising:




a first substrate having a first substrate side and a second substrate side, a first substrate metalization pattern existing on the first substrate side, a second substrate metalization pattern existing on the second substrate side, the second substrate metalization pattern comprising bonding pads making electrical contact to the first substrate metalization pattern wherein the electrical contact between the second substrate metalization pattern and the first substrate metalization pattern is made through a plurality of via holes existing within the first substrate;

a plurality of tuning structures existing on the first substrate side, making electrical contact to the first and the second substrate metalization patterns; and

a plurality of flip-chip semiconductor devices, wherein a first side of the flip-chip semiconductor devices is electrically connected to the first and the second substrate metalization via solder bumps mated with the bonding pads.

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**5,744,870**

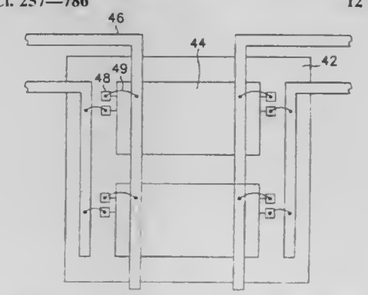
**MEMORY DEVICE WITH MULTIPLE INPUT/OUTPUT CONNECTIONS**

**Stephen L. Casper, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.**

**Filed Jun. 7, 1996, Ser. No. 660,109**

**Int. Cl.[6] H01L** *27/10;23/48;23/52*

**U.S. Cl. 257—786** **12 Claims**




1. An integrated circuit memory device comprising:

an integrated memory die;

a plurality of external conductive leads;

multiple data communication bond attachment pads connected to a single conductive lead;

multiple bi-directional data buffer circuits corresponding to the multiple data communication bond attachment pads; and

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an array of memory cells coupled to the multiple data communication bond attachment pads via the multiple data buffer circuits.

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**5,744,871**

**WIND SYSTEM FOR ELECTRIC POWER GENERATION**

**Miguel Angel Robles Akesolo, 09511 Mijala de Losa, Burgos, Spain**

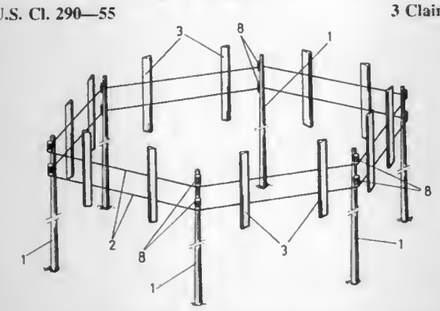
**PCT No. PCT/ES95/00093, § 371 Date Apr. 4, 1996, § 102(e) Date Apr. 4, 1996, PCT Pub. No. WO96/04479, PCT Pub. Date Feb. 15, 1996**

**PCT Filed Jul. 28, 1995, Ser. No. 624,455**

**Claims priority, application Spain, Aug. 5, 1994, 9401773**

**Int. Cl.[6] F03D** *5/02*

**U.S. Cl. 290—55** **3 Claims**




1. A WIND SYSTEM FOR ELECTRIC POWER GENERATION, designed to convert wind energy into electric power, and capable of being mounted in any area or location, is essentially characterised by comprising a number of blades (**3**) transversely connected through their inner face, by means of spacer elements (**4**), to the outside of a flexible transmission line (**2**) running horizontally, guided in wheels or pulleys (**6**), forming a closed belt, the blades (**3**) being longer than the distance separating the cables making up the flexible line (**2**), each pulley (**6**) being provided to be mounted on the shaft (**7**) of an alternator (**8**) tied to a tower or column (**1**) in order for the alternator (**8**) and pulley (**6**) assembly to lie between the relevant tower (**1**) and the flexible transmission line (**2**) driving the blades (**3**).

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**5,744,872**

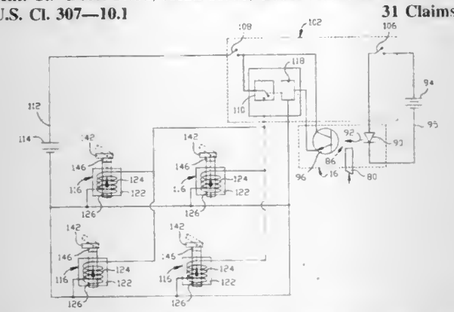
**INERTIA RESPONSIVE APPARATUS**

**Gasper Cario, Novi, Mich., and Roger F. Wells, Yorba Linda, Calif., assignors to TRW Inc., Lyndhurst, Ohio**

**Filed Jul. 14, 1995, Ser. No. 502,541**

**Int. Cl.[6] B60R** *21/32;* **A62B** *35/00;* **B65H** *75/48;* **H01H** *35/14*

**U.S. Cl. 307—10.1** **31 Claims**




2. An apparatus for helping to protect a vehicle occupant, said apparatus comprising:

an inertia assembly for reacting to a vehicle inertia change, said inertia assembly including a movable ball for moving from a rest position under the influence of a predetermined change in vehicle inertia, a displaceable member engaging said ball, and means for mounting said displaceable member for movement relative to said ball when said ball moves from its rest position;

a sensor assembly for detecting movement of said displaceable member, said sensor assembly including means for directing a beam of radiation and means for receiving the beam of radiation, said displaceable member including a portion for interrupting the beam of radiation when said ball moves from its rest position;

a plurality of vehicle occupant restraints;

a plurality of activator means for activating said plurality of vehicle occupant restraints; and

a single control means for controlling said plurality of activator means in response to a signal from said sensor assembly which is indicative or said ball rolling from its rest position.

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**5,744,873**

**POWER SWITCH DEVICE FOR ELECTRIC VEHICLE INCLUDING URGING ELEMENT TO ROTATE AN ELECTRIC CONTACT INTO AN OPEN POSITION**

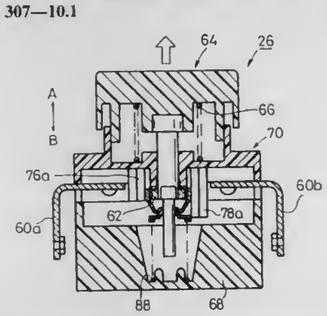
**Osamu Hasegawa; Satoshi Watanabe; Shigeru Suzuki, and Katsuhiro Shinmen, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 27, 1996, Ser. No. 622,413**

**Claims priority, application Japan, Apr. 5, 1995, 7-080508**

**Int. Cl.[6] H01H** *9/00*

**U.S. Cl. 307—10.1** **9 Claims**




1. A power switch on an electric vehicle which can be propelled by an electric motor energizable by a plurality of batteries connected to power supply lines, comprising:

a manual switch associated with a battery box which houses the batteries;

said manual switch comprising:

a housing including a case member;

first and second conductors, at least one of the first and second conductors being electrically connected to the batteries;

an electric contact disposed for movement inside said housing into and out of simultaneous contact with the first and second conductors;

an angularly movable operating member rotatably mounted on said case member, said electric contact being fixedly mounted on said angularly movable operating member, said angularly movable operating member being angularly movable to bring said electric contact selectively into a closed position in simultaneous contact with the first and second conductors;

a plurality of stationary teeth disposed in said case member for engagement with said electric contact; and

torsional urging means disposed in said housing for applying a torque to said operating member to rotate said electric contact into an open position to open the power supply lines connected to the batteries when a pressing force is applied to said operating member with said electric contact in said closed position.



**5,744,874**

**CAR ELECTRONIC CONTROL SYSTEM & METHOD FOR CONTROLLING THE SAME**

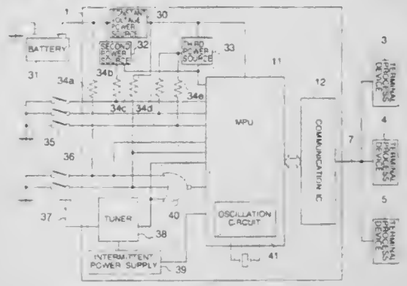
**Tatsuya Yoshida, Ibaraki-ken, and Mitsuru Kon'i, Hitachinaka, both of Japan, assignors to Hitachi, Ltd., and Hitachi Car Engineering Co., Ltd., both of Japan**

**Filed May 22, 1996, Ser. No. 651,559**

**Claims priority, application Japan, May 24, 1995, 7-124707**

**Int. Cl.[6] H04Q** *7/00*

**U.S. Cl. 307—10.1** **3 Claims**




1. A car electronic control system comprising:

a microcomputer having a function of switching between a sleep mode in which oscillation is stopped and an operational mode to be shifted from the sleep mode to the operational mode by at least one external input signal;

at least one first power supply circuit for supplying power continuously; and

at least one second power supply circuit for enabling to stop power supply on the basis of a signal received from the microcomputer,

wherein said second power supply circuit is stopped when the microcomputer shifts to the sleep mode, the microcomputer is shifted to the operational mode when the input signal varies in the sleep mode to judge whether the input signal is normal or abnormal prior to starting usual operation, the microcomputer outputs a signal for starting the power supply of said second power supply circuit to start the usual operation when judging that the input signal is normal while the microcomputer stops the power supply of the second power supply circuit and shifts to the sleep mode when judging that the input signal is abnormal.

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**5,744,875**

**CONTROL SYSTEM FOR A VEHICLE HAVING A MULTIFUNCTIONAL BUTTON FOR A REMOTE CONTROLLER**

**Frank Kleefeldt, Heiligenhaus; Wilfried Ostermann, Essen, and Fred Welskopf, Herne, all of Germany, assignors to Kiekert AG, Heiligenhaus, Germany**

**Filed Jun. 24, 1996, Ser. No. 668,944**

**Claims priority, application Germany, Aug. 18, 1995, 195 30 724.0**

**Int. Cl.[6] B60R** *25/10*

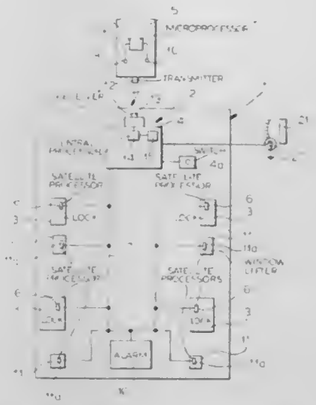
**U.S. Cl. 307—10.2** **12 Claims**

1. An electrical control system for an automotive vehicle having electrically operated door locks each with a locked mode, an unlocked mode and an antitheft mode, said system comprising:

a control unit on said vehicle connected to said door locks for operating same;

a remote controller for said system in wireless communication cation with said control unit and having at least one multifunction button issuing different control signals for switching said door locks into both said locked mode and said antitheft mode in response to different actuation sequences of said multifunction button;

circuitry including a timing element in at least one of said control unit and said remote controller




for switching all of said door locks upon an initial actuation of said pushbutton with said door locks in said unlocked mode into said locked mode and simultaneously establishing a time window $t_1$ with said timing element, and

upon a subsequent actuation of said pushbutton within said time window switching all of said door locks into said antitheft mode;

at least one electrically operated window additional unit in the form of a window or a sliding sunroof on the vehicle connected to said control unit and activated by an actuation of said multifunction pushbutton within said time window $t_1$ to close said additional unit; and

at least one electrically operated indicator on the vehicle connected to said control unit and activated by an actuation of said multifunction pushbutton within said time window $t_1$.

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**5,744,876**

**CAPACITIVE BACKUP POWER SOURCE FOR ELECTROMECHANICAL ACTUATOR**

**William Newton Fangio, Carlsbad, N. Mex., assignor to WNF-I, Carlsbad, N. Mex.**

**Filed Sep. 30, 1994, Ser. No. 316,832**

**Int. Cl.[6] H02J** *7/00*

**U.S. Cl. 307—66** **16 Claims**



1. A backup power system for supplying, during a power failure condition, power to an electromechanical actuator that is operable to positionally control a mechanical device, which electromechanical actuator in a non-power failure condition operates in response to a primary control signal to positionally control the mechanical device and with the mechanical device having a range of movement with one position being a fail-safe position, comprising:

a primary power source;

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a control system for generating the primary control signal for controlling the electromechanical actuator during the non-power failure condition and powered by said primary power source;

a primary backup capacitor for storing at least a powering level of energy, said primary backup capacitor being charged with said powering level of energy from said primary power source;

a power failure sensor for detecting a power failure condition of said primary power source; and

a backup power device for powering the electromechanical actuator with said primary backup capacitor in response to detection of the power failure condition of said primary power source by said power failure sensor, the mechanical device positioned to the fail-safe position in response to the electromechanical actuator being powered from said primary backup capacitor, which said backup power device and said primary backup capacitor with said powering level of energy are able to power the electromechanical actuator to position the mechanical device from any position in its range of motion to the fail-safe position, at which time powering of the electromechanical actuator from the primary backup capacitor is terminated.

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**5,744,877**

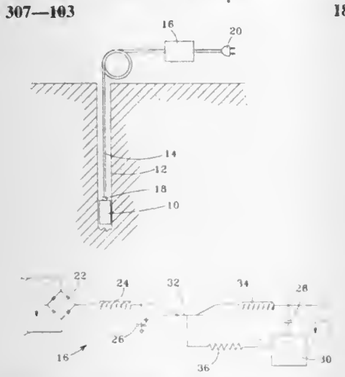
**DOWNHOLE POWER TRANSMISSION SYSTEM**

**Steve Owens, Woodlands, Tex., assignor to PES, Inc., Woodlands, Tex.**

**Filed Jan. 13, 1997, Ser. No. 782,326**

**Int. Cl.[6] G01V** *3/04*

**U.S. Cl. 307—103** **18 Claims**




1. A system for transmitting electric power between a power source and a downhole tool, comprising:

a regulator for engagement with the power source and for modifying the power transmitted through said regulator;

a conductor for transmitting electric power from said regulator to the downhole tool; and

a transmitter for detecting the downhole conductor voltage proximate to the downhole tool and for transmitting to said regulator a voltage signal representative of said downhole conductor voltage, wherein said regulator is responsive to said voltage signal for modifying the power transmitted from the power source into said conductor to maintain said downhole conductor voltage at a selected level.

**5,744,878**

**CIRCUIT CONFIGURATION FOR TRIGGERING A FIELD EFFECT TRANSISTOR WITH A SOURCE-SIDE LOAD**

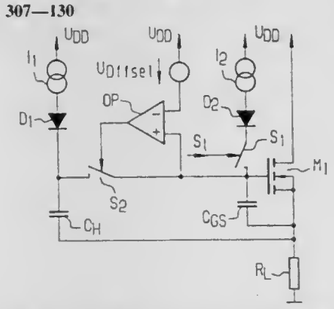
**Franz Wachter, Villach; Heinz Zitta, Drobollach, and Johann Massoner, Villach, all of Australia, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Mar. 10, 1997, Ser. No. 814,634**

**Claims priority, application Germany, Mar. 8, 1996, 196 09 121.7**

**Int. Cl.[6] H03K** *17/687*

**U.S. Cl. 307—130** **7 Claims**




1. In a circuit configuration for triggering a field effect transistor having a gate terminal, a gate-to-source capacitor, a source side load and a load path through which the load is acted upon by a supply voltage, the improvement comprising:

a first charging device;

a capacitor connected to said first charging device, said capacitor having terminals;

a first controllable switching device connected between one terminal of said capacitor and the gate terminal of the field effect transistor;

a second charging device;

a second controllable switching device through which said second charging device charges the gate-to-source capacitor of the field effect transistor; and

a comparator monitoring a voltage at the gate terminal of the field effect transistor and conductively triggering said first switching device when a predetermined value is attained.

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**5,744,879**

**SYNCHRONOUS LINEAR MOTOR**

**Dietmar Stoiber, Grünwald, Germany, assignor to Krauss-Maffei AG, Munich, Germany**

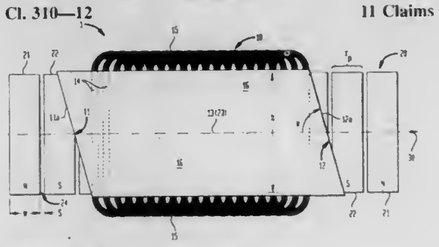
**PCT No. PCT/EP96/02684, § 371 Date Mar. 27, 1997, § 102(e) Date Mar. 27, 1997, PCT Pub. No. WO97/05688, PCT Pub. Date Feb. 13, 1997**

**PCT Filed Jul. 20, 1996, Ser. No. 809,737**

**Claims priority, application Germany, Jul. 31, 1995, 195 28 043.1**

**Int. Cl.[6] H02K** *41/03*

**U.S. Cl. 310—12** **11 Claims**



1. A synchronous linear motor comprising:

a primary section having a width and a length, said primary section being formed with rotor grooves for receiving a rotor winding; and



a secondary section defining with the primary section a longitudinal axis and having a length which in a moving direction exceeds the length of the primary section, said secondary section including a sequence of permanent magnets, each of the magnets having two pole pairs acting as north and south poles and spaced from one another at formation of a pole gap,

said primary section having front and rear end faces which are free of grooves and free of a winding and exhibit areas extending perpendicular to an air gap zone between the primary section and the secondary part and being beveled such as to define an angle of inclination which is selected with respect to the longitudinal axis in accordance with the following relationship:

$$\beta=\arctan(b/\tau_p),$$

wherein

β is the angle of inclination of the beveled areas at the front and rear end faces of the primary section,

b is the electrically active width of the primary section, and

$\tau_p$ is the pitch of the poles of the secondary section.

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**5,744,880**

**ROTATING MOTOR AND MOTOR-DRIVEN VEHICLE**

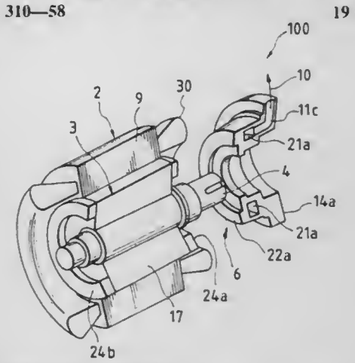
**Mitsuo Kudoh; Toshihiko Fukushima, both of Tsuchiura; Suetato Shibukawa, Hitachinaka; Osamu Koizumi; Fumio Tajima, both of Ibaraki-ken; Syouichi Kawamata, Hitachi, and Rumi Minakata, Shizuoka-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 20, 1996, Ser. No. 668,266**

**Claims priority, application Japan, Jun. 20, 1995, 7-153352**

**Int. Cl.[6] H02K** *9/00; 1/32*

**U.S. Cl. 310—58** **19 Claims**




1. A rotating motor comprising:

a rotating shaft having an outer surface and capable of rotating about an axis of rotation;

a rotor fixedly mounted on the outer surface of said rotating shaft and having an outer surface and a winding, said rotor having opposite ends extending in a direction of the axis of rotation;

a stator disposed around said rotor and having a winding;

a frame to which the outer surface of said stator is mounted;

end brackets mounted on said frame to form a case in which said rotor and said stator are housed and by which both ends of said rotating shafts are rotatably held via bearings;

stator-cooling mechanisms provided with coolant passages for cooling said stator; and

rotor-cooling mechanisms disposed close to at least one of said opposite ends of said rotor and provided with coolant passages for cooling said motor,

wherein on at least one of said opposite ends of said rotor taken in the direction of the axis of rotation there are provided substantially annular rotor disks to be cooled, wherein said rotor-cooling mechanisms are equipped with substantially annular cooling disks spaced apart from and disposed opposite to said rotor disks in the direction of the axis of rotation, and wherein said coolant passages are provided in said cooling disks.

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**5,744,881**

**SPINDLE MOTOR, AND ITS ROTOR YOKE MANUFACTURING METHOD**

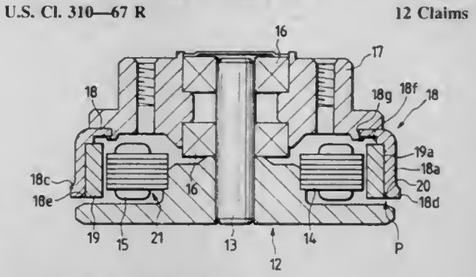
**Yutaka Ishizuka, and Koichi Katakura, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan**

**Filed Oct. 17, 1995, Ser. No. 544,030**

**Claims priority, application Japan, Oct. 17, 1994, 6-250730**

**Int. Cl.[6] H02K** *7/00*

**U.S. Cl. 310—67 R** **12 Claims**




1. A spindle motor comprising:

a rotor frame adapted to rotate a disk mounted thereon;

a rotor yoke of magnetic material which is secured to said rotor frame;

a drive magnet unit fixedly mounted on an inner cylindrical surface of said rotor yoke; and

a stator arranged confronted with said drive magnet unit,

wherein said rotor yoke includes:

a cylindrical portion on the inner cylindrical surface of which said drive magnet unit is fixedly mounted;

an annular portion which is radially outwardly extended from an edge of an open end of said cylindrical portion, wherein a thickness of said annular portion is greater than a thickness of said cylindrical portion;

a shear plane which is formed in an axial direction on an outer peripheral surface of said annular portion; and

a curved portion formed along an inner peripheral edge of the open end of said cylindrical portion.

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**5,744,882**

**SPINDLE MOTOR**

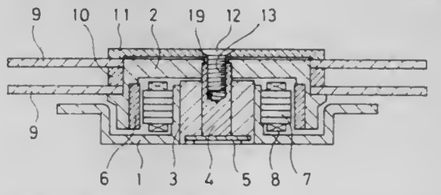
**Hiroyoshi Teshima, Sumiyoshi, and Akihide Matsuo, Yonago, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan**

**Filed May 30, 1996, Ser. No. 655,383**

**Claims priority, application Japan, Jun. 7, 1995, 7-139778**

**Int. Cl.[6] H02K** *7/14*

**U.S. Cl. 310—67 R** **4 Claims**




1. A spindle motor, comprising:

a housing having a stator;

a rotor hub, on which a disk is clamped, rotatably supported relative to said housing, and having a magnet rotatably driven

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by magnetic repulsion action between said stator and said magnet, said rotor hub having (i) a large-diameter hole at the center of rotation thereof through which a shaft having a tapped hole at one end thereof is press fitted, and (ii) a projection positioned at an end of said large-diameter hole abutting said end of said shaft; and

a clamping member, mounted on said rotor hub by a clamp screw threaded in said tapped hole, for pressing said disk against a disk holding surface of said rotor hub, said clamping member and said rotor hub defining a gap therebetween.

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**5,744,883**

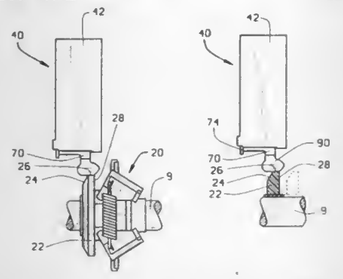
**CONTOURED SWITCH LEVER FOR CENTRIFUGAL SWITCH**

**William Lewis, Hazelwood, and Thomas Ottersbach, Normandy, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.**

**Filed Jan. 22, 1997, Ser. No. 786,263**

**Int. Cl.[6] H02P** *5/30;* **H02K** *11/00*

**U.S. Cl. 310—68 E** **22 Claims**




1. A switch lever for use in a switch of an electric motor, wherein the motor includes a motor shaft having an axis of rotation and a centrifugal actuator mounted on the shaft, the centrifugal actuator having an actuator collar which is axially moveable along the motor shaft between a first position and a second position, the actuator collar having a generally conical cam surface facing away from the direction of movement of the actuator collar as it moves from the first position to the second position, an outer cylindrical cam surface generally coaxial with the axis of rotation of the motor shaft, and a rear surface, the switch having a housing adapted to be secured in a fixed position relative to the actuator collar, the switch lever comprising:

(a) a body having a first end and a second end, the first end of said body being pivotally connected to the switch housing; and

(b) a cam follower at the second end of said body, said cam follower being cammingly engageable with the actuator collar as the actuator collar moves between the first and second positions along the motor shaft, said cam follower comprising:

(i) an inclined cam face configured for cammingly engaging the conical cam surface of the actuator collar as the actuator collar moves along the motor shaft from the second position to the first position;

(ii) a bottom cam face configured for cammingly engaging the outer cylindrical cam surface of the actuator collar when the actuator collar is substantially in the first position; and

(iii) a contoured rear cam face opposite the inclined cam face configured for camming engagement with at least an outer edge of the rear surface of the actuator collar.

**5,744,884**

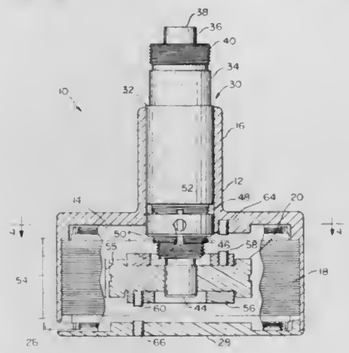
**LINER MOTION MICROPOSITIONING APPARATUS AND METHOD**

**Gregory J. Gerhard, Seattle, Wash., assignor to Applied Precision, Inc., Issaquah, Wash.**

**Filed Oct. 17, 1995, Ser. No. 544,309**

**Int. Cl.[6] H02K** *7/06*

**U.S. Cl. 310—80** **10 Claims**




1. An electronically controllable, linear motion micropositioning device, comprising:

a housing having a plurality of magnetic field generating stators longitudinally and rotationally fixed to housing defining a longitudinal rotation axis and cylindrical rotor cavity having a predetermined longitudinal depth;

a precision lead screw having an outer member fixed to the housing against longitudinal and rotational motion, and an inner member threadably engaged with the outer member for rotational and protruding reciprocal axial motion with respect to the housing; and,

a rotor having a plurality of magnetic element for torque inducing magnetic interaction with the stators under electronic control, the element being arranged in a circular pattern defining a longitudinal rotor depth less than the predetermined longitudinal depth of the rotor cavity, the rotor being fixed to the inner member against longitudinal and rotational motion, whereby relative rotation of the rotor with respect to the stators causes controlled relative longitudinal motion over a working distance between the rotor and stators, and between the inner member and the housing with minimal lost motion.

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**5,744,885**

**MODULAR GENERATOR FRAME CONSTRUCTION**

**Richard J. Keck, Clifton Park; Frank Zwack, Sr., Stephentown; Theodore S. Kralovic, Scotia, and Thomas E. Van Schaick, Burnt Hills, all of N.Y., assignors to General Electric Co., Schenectady, N.Y.**

**Continuation of Ser. No. 357,485, Dec. 16, 1994, abandoned. This application Feb. 4, 1997, Ser. No. 794,937**

**Int. Cl.[6] H02K** *5/00;5/04*

**U.S. Cl. 310—89** **4 Claims**

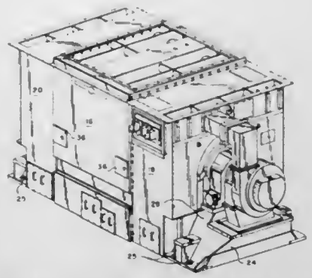
1. A modular generator frame construction for fabricating a generator having a rotor comprising:

a stand-alone inner frame module having a central opening defining a generator frame axis;

a stand-alone drive end cap module and a stand-alone exciter end cap module for securement to said inner frame module at opposite ends thereof, each of said drive and exciter end cap modules comprising an end cap frame having an opening and a pedestal support integrally formed with and mounted on said end cap frame for mounting and supporting a pedestal bearing;

means for securing said end cap modules to the opposite ends of said inner frame module, respectively;






said inner frame module being formed generally of structural support plates disposed generally perpendicular to said axis and spaced axially one from the other; and

said structural support plates of said inner frame module including a support plate at each of the opposite ends thereof each having an opening defining part of said central opening through said inner frame module, said openings through said end cap frames being smaller in diameter than the central opening through the inner frame and said openings through said structural support plates thereof, said openings through said end cap frames being of a size sufficient to permit the rotor to be inserted through said end cap openings after the end cap modules are secured to the inner frame.

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**5,744,886**

**CAPSTAN MOTOR ASSEMBLY AND ASSEMBLING METHOD THEREOF**

**Hyung-jin An, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**

**Filed Dec. 4, 1996, Ser. No. 760,273**

**Claims priority, application Rep. of Korea, Jan. 29, 1996, 96-314**

**Int. Cl.[6] H02K** *5/00*

**U.S. Cl. 310—91** **4 Claims**



1. A capstan motor comprising:

a printed circuit board (PCB) substrate on which are mounted a stator coil, a hall device for controlling a rotational position of the capstan motor, and a magnetic resistance device for controlling a speed of the capstan motor and which has a toothed portion at one end;

a motor portion including a capstan motor shaft and a rotor assembled so as to rotate with respect to said stator coil and having a magnet;

a bracket including a holder having a bore through which said capstan motor shaft passes to be supported;

a base deck to which said bracket is connected to be supported; and

an adjusting rod having a gear portion meshed with said toothed portion of said magnetic resistance device and rotatably disposed on said PCB substrate in order to adjust a gap between said magnetic resistance device and said rotor.

**5,744,887**

**PERMANENT MAGNET ROTOR AND MANUFACTURING METHOD THEREOF**

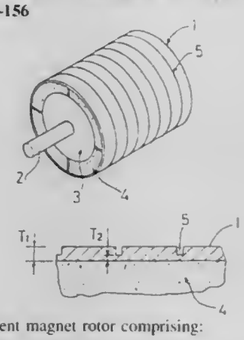
**Hiroshi Itoh, Takefu, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan**

**Filed Apr. 12, 1996, Ser. No. 631,055**

**Claims priority, application Japan, Apr. 14, 1995, 7-089733**

**Int. Cl.[6] H02K** *5/04;5/15;21/12*

**U.S. Cl. 310—156** **6 Claims**




1. A permanent magnet rotor comprising:

a rotor shaft;

a yoke mounted on said rotor shaft to form a magnetic path;

a plurality of permanent magnets secured to an outer surface of said yoke;

a non-magnetic metallic cylindrical cover mounted on said permanent magnets and having at least one groove defined in an outer surface thereof so as to extend generally circumferentially thereof; and

wherein said at least one groove opens in a radially outward direction and is closed at a radially inner part thereof so as to block any broken pieces of said permanent magnets from escaping radially outwardly through said annular cover.

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**5,744,888**

**MULTIPHASE AND MULTIPOLE ELECTRICAL MACHINE**

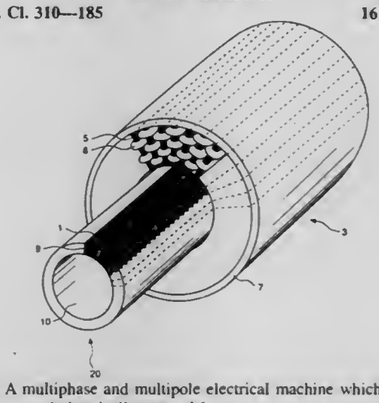
**Franc Zajc, and Ivica Zajc, both of Ljubljana, Slovenia, assignors to Tiedtke-Buhling-Kinne & Partner, Munich, Germany**

**Filed Feb. 5, 1996, Ser. No. 596,829**

**Claims priority, application Germany, Feb. 3, 1995, 195 03 610.7; Feb. 3, 1995, 295 01 741 U**

**Int. Cl.[6] H02K** *3/00*

**U.S. Cl. 310—185** **16 Claims**




1. A multiphase and multipole electrical machine which can be commutated electrically, comprising:

a rotor;

a stator having multiple poles divided into zones, each zone corresponding to a respective phase; and

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a winding conductor associated with each phase, said conductor being passed in alternating directions around successive stator poles of the corresponding zone:

wherein adjacent stator poles are spaced by a slot width substantially corresponding to the width of one winding conductor and wherein the winding conductor is wound around adjacent stator poles in such a manner that portions of the winding conductor of windings of adjacent stator poles are arranged one above the other within one slot.

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**5,744,889**

**ROTATING ELECTRIC MACHINE AND A STARTER HAVING THE SAME**

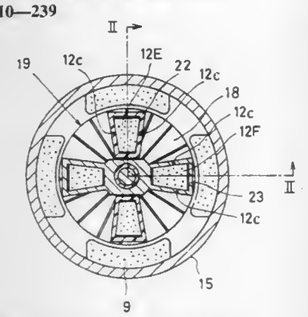
**Masami Niimi, Handa, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Jun. 26, 1996, Ser. No. 670,666**

**Claims priority, application Japan, Jun. 27, 1995, 7-160272; Mar. 18, 1996, 8-060783**

**Int. Cl.[6] H02K** *13/00;1/00*

**U.S. Cl. 310—239** **27 Claims**




1. A rotating electric machine comprising:

an armature which includes a rotation shaft that extends along an axial direction thereof;

a commutator which includes a sliding surface that is substantially perpendicular to said rotation shaft;

a brush having a front end surface for sliding on said sliding surface of said commutator and a back end surface, said brush having a substantially trapezoidal radial cross-section such that a width of said brush gets narrower towards a center axis of said commutator;

a brush holder having thermal conductivity and which includes a recess for accommodating said brush and which is in thermal communication with side walls of said brush to dissipate heat from said brush, and

single biasing means coupled to said back end surface of said brush, said biasing means being coupled with said back end surface to bias said brush towards said sliding surface of said commutator and to bias said brush towards said rotation shaft.

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**5,744,890**

**BRUSH STRUCTURE FOR MOTOR IN WHICH WEAR-RELATED PARAMETERS OF THE BRUSHES ARE VARIED TO EQUALIZE BRUSH WEAR**

**Mineo Yamaguchi, Kosai, and Takayuki Kitagawa, Toyohashi, both of Japan, assignors to ASMO Co., Ltd., Kosai, Japan**

**Filed Apr. 18, 1996, Ser. No. 634,230**

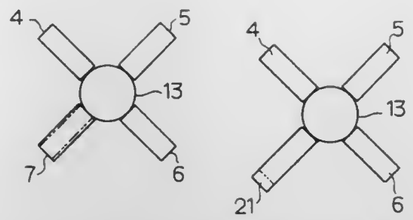
**Claims priority, application Japan, Jul. 5, 1995, 7-170005**

**Int. Cl.[6] H02K** *13/00;* **H02P** *7/06*

**U.S. Cl. 310—248** **20 Claims**

1. A brush structure for a motor driven by a power source to operate at a plurality of predetermined motor rotational speeds, comprising:

a first brush for connection with the power source at a time of motor rotation;




a plurality of second brushes for connection with the power source selectively at the time of said motor rotation; and

an armature circuit formed by a parallel circuit for varying an armature resistance thereof to control the motor rotational speed of the motor;

said parallel circuit being formed by a plurality of armature coils between said first brush and said second brushes selectively connected to said power source by way of changing the number of said second brushes connected to said power source, said first brush being connected to the power source during operation of the motor at all of said predetermined motor rotational speeds, the connection of the first brush and selective second brushes to the power source being unchanged during operation of the motor at each predetermined rotational speed;

said first brush having a sliding contact area that is larger than the sliding contact area of one of said second brushes which is to be connected to said power source only at a time when all of said second brushes are connected to said power source so that uneven wear of the first brush as compared to the second brushes during operation of the motor results in substantially equalized wear of the first brush and the second brushes at the end of each brush life.

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**5,744,891**

**DC MOTOR BRUSH ASSEMBLY, METHOD OF PRODUCING THE SAME AND BRUSH MATERIAL SHEET USED THEREIN**

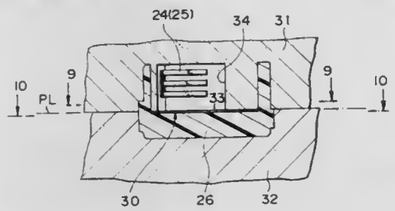
**Toshihide Okuyama; Kenji Tabata; Masahiro Kaneko, and Morimasa Tsuzuki, all of Sayama, Japan, assignors to Sayama Precision Industries, Co., Ltd., Sayama, Japan**

**Continuation of Ser. No. 395,302, Feb. 28, 1995, abandoned. This application May 27, 1997, Ser. No. 863,633**

**Claims priority, application Japan, Feb. 28, 1994, 6-030600**

**Int. Cl.[6] H02K** *13/00*

**U.S. Cl. 310—248** **9 Claims**




1. A brush material sheet having a shield sheet portion molded into one surface of a plastic brush holder with an oppositely facing plastic surface forming one end of a housing of a DC motor, said brush material sheet further comprising:

an electrically conductive brush forming portion associated with the shield sheet portion, said electrically conductive brush forming portion used to form a pair of brushes contacting a commutator piece connected to a coil of the motor, said brushes being formed by bending said electrically conductive brush forming portion away from said brush material sheet;

an outer peripheral connection portion connected to the shield sheet portion for holding the shield sheet portion during a molding process to cover a non-molding chamber formed as a concavity in a portion of a mold, said non-molding chamber being of a size to contain said brushes formed by bending; and

a separation slit formed in the brush material sheet for splitting the brush material sheet into segments corresponding to the brushes and an associated shield sheet portion when the outer peripheral connection portion is cut away from the brush material sheet.



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**5,744,892**

**BRUSH AND SLIP RING ARRANGEMENT OF AN AC GENERATOR**

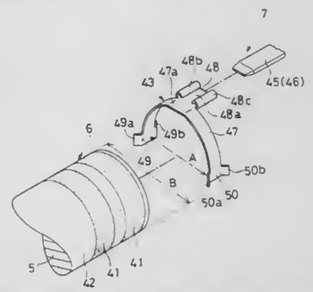
**Takuzou Mukai, Handa, and Kenzo Mitani, Obu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Aug. 20, 1996, Ser. No. 699,782**

**Claims priority, application Japan, Sep. 6, 1995, 7-228936**

**Int. Cl.[6] H01R** *39/24;39/18;39/36;39/08*

**U.S. Cl. 310—251** **9 Claims**




1. A brush and slip ring arrangement of an AC generator which includes a housing, a stator having a stator coil, a rotor having a field coil and a shaft and a voltage regulator, wherein

said arrangement comprises:

a slip ring unit carried by said shaft and having a cylindrical insulating member and a pair of carbonaceous slip rings around said cylindrical insulating member;

a pair of brush members made of springy copper alloy, each of said brush members having a semicircular brush body disposed to at least partially surround one of said slip rings, two contact portions disposed at opposite ends of said brush body in contact with one of said slip rings and a clamp portion; and

a brush holder fixed to said housing, said brush holder having a pair of connecting terminals each of which engages said clamp portion of one of said brush members and an insulating member insulating said connecting terminals from each other;

whereby portions of said slip rings in contact with said contact portions of said brush member always change so that said slip rings are cooled sufficiently.

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**5,744,893**

**BRUSHLESS MOTOR STATOR DESIGN**

**Chi Mou Zhao, Taipei Hsien; Chin Po Liao, Yun Lin Hsien; Shyh-Jier Wang, Hsinchu; Huang Der-Ray, Hsinchu, and Ying Tai-Fa, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan**

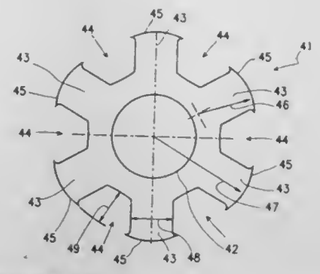
**Filed Mar. 12, 1997, Ser. No. 815,585**

**Claims priority, application Taiwan, Nov. 25, 1996, 85218157**

**Int. Cl.[6] H02K** *1/12;1/00*

**U.S. Cl. 310—259** **10 Claims**

1. A brushless motor stator for an axially wound, single-phase brushless motor with a diametrical air-gap having a plate structure with at least one plate, the profile of said plate comprising:




a central circular hole;

a plurality of salient poles surrounding said central circular hole, wherein an outer rim of each said salient pole is in the form of an arc; and

a slot opening between every two adjacent said salient poles, wherein the radius of said arc satisfies the following inequality relation:

$$\pi/P \times R_M < R_S < 0.95 R_M;$$

where $R_M$ represents the radius from the center to the outer rim of the brushless motor stator; $R_S$ represents the radius of said arc; and P represents the number of poles of permanent magnets used in said motor.

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**5,744,894**

**BRUSHLESS MOTOR HAVING A FIELD MAGNET, A PORTION OF WHICH IS USED FOR DETECTING THE ROTOR'S POSITION**

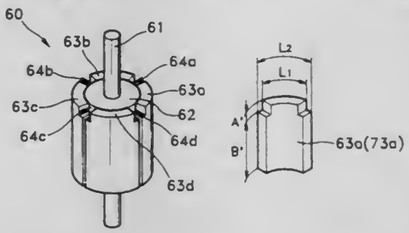
**Jae-sung Cho, and In-jae Lee, both of Incheon, Rep. of Korea, assignors to Dongyang Mechatronics Corporation, Incheon, Rep. of Korea**

**Filed Oct. 21, 1996, Ser. No. 733,946**

**Claims priority, application Rep. of Korea, Oct. 26, 1995, 95-37309**

**Int. Cl.[6] H02K** *21/22*

**U.S. Cl. 310—261** **2 Claims**




1. A brushless motor comprising:

a shaft;

a rotor, having a plurality of field magnets attached thereto, fixed to said shaft;

a stator for forming a magnetic field to enable rotation of said rotor; and

a housing in which said rotor and stator are installed,

wherein each of the field magnets having two end portions, wherein one end portion, used for detecting a position of said rotor, being configured with a notched section in each upper corner to form an arc length that is different from the other arc length of the remaining end portion thereof.

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5,744,895

## SYSTEM FOR DRIVING ELECTRIC VEHICLES

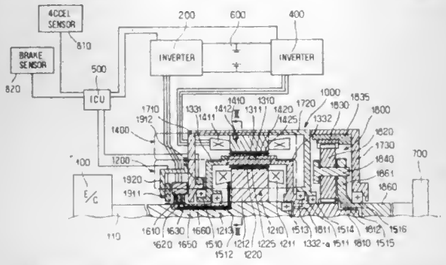
Masahiro Seguchi, Obu; Keiichiro Banzai, Toyota; Hiroaki Kajiura, Nagoya, and Akio Yasuda, Kosai, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 594,413, Jan. 31, 1996, abandoned. This application Jul. 3, 1996, Ser. No. 675,129

Claims priority, application Japan, Jan. 31, 1995, 07-13699; Jan. 31, 1995, 07-13700; Feb. 1, 1995, 7-314508; Jun. 8, 1995, 07-141744; Jun. 9, 1995, 07-142991; Jun. 9, 1995, 7-142993; Jul. 5, 1995, 7-169605; Oct. 25, 1995, 7-277654; Oct. 31, 1995, 7-283775; Dec. 22, 1995, 7-334605; Mar. 7, 1996, 8-050585

Int. Cl.[6] H02K *1/22;7/20;47/04;16/00*

U.S. Cl. 310—266 27 Claims




1. A system for driving a vehicle which converts electric power of a battery and mechanical power of an engine into driving power of an output shaft at a prescribed rotating torque rotational speed, said system comprising:

a housing;

a bearing;

a first rotor having a first control coil supported by said bearing for generating a rotating magnetic field;

a stator having a second control coil for generating a rotating magnetic field; and

a second rotor disposed between said first rotor and said stator and having a first plurality of permanent magnets for providing magnetic field interlinking said first control coil and a second plurality of permanent magnets for providing magnetic field interlinking said second control coil, said second rotor disposed coaxially with said first rotor to rotatably support said first rotor through said bearing;

wherein said first rotor and said second rotor form a first electric synchronous machine, and said stator and said second rotor form a second electric synchronous machine.

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5,744,896

## INTERLOCKING SEGMENTED COIL ARRAY

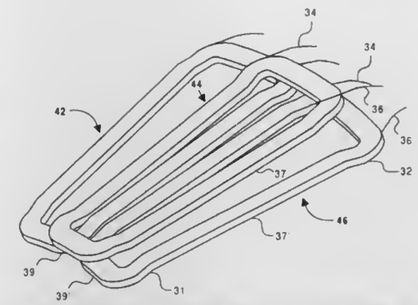
Roy Lee Kessinger, Jr., Greenville; Paul Anthony Stahura, South Bend; Paul Eric Receveur, New Albany, all of Ind., and Karl David Dockstader, Prospect, Ky., assignors to Visual Computing Systems Corp., Greenville, Ind.

Filed May 21, 1996, Ser. No. 651,973

Int. Cl.[6] H02K *1/22*

U.S. Cl. 310—268 20 Claims

1. A segmented coil array for use in rotary electromotive devices with one or two magnet rotors, such as motors and generators, of the type which employ an axial gap magnetic structure, composed of an even multiple of individual wire-wound coils, each coil having substantially the same structure and size and comprising circumferentially extending base portions and radially extending side portions, the radially extending side portions and circumferentially extending base portions joined at their respective ends to define a generally trapezoidal shape: the coil array formed into a



ring of partially overlapped alternating coils such that the radially extending side portions of each coil are coplanar.

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5,744,897

## DRIVING CONTROL DEVICE FOR VIBRATION WAVE MOTOR

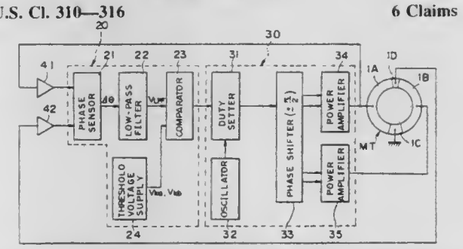
Tadao Takagi; Ryoichi Suganuma, both of Yokohama, and Daisuke Saya, Urayasu, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 563,751, Nov. 29, 1995, abandoned, which is a continuation of Ser. No. 190,570, Feb. 2, 1994, abandoned, which is a continuation of Ser. No. 645,329, Jan. 24, 1991, abandoned, which is a continuation of Ser. No. 423,331, Oct. 17, 1989, abandoned. This application Dec. 16, 1996, Ser. No. 767,320

Claims priority, application Japan, Oct. 19, 1988, 63-264726; Dec. 23, 1988, 63-326919

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—316 6 Claims




1. A control device for controlling a vibration motor having an elastic member and an electromechanical transducer coupled to said elastic member, said vibration motor normally operating only within an alternating voltage operating frequency zone higher than a resonance frequency of said vibration motor on a first frequency characteristic curve of said vibration motor and abnormally operating on a second frequency characteristic curve, the frequencies of which overlap the frequencies of the first frequency characteristic curve so that operation of said motor is subject to hysteresis, said motor tending to stop when operating on said second frequency characteristic curve, said control device comprising:

a power supply circuit connected to said electromechanical transducer and applying, to a pair of electrodes of said electromechanical transducer, alternating voltages having a predetermined phase difference to each other; and

means including a starting circuit connected to said power supply circuit and setting said alternating voltages from said power supply circuit to a critical voltage magnitude higher than a predetermined operating voltage magnitude and having a fundamental frequency higher than said resonance frequency, for starting said vibration motor from a stopped condition and for preventing said motor from stopping when said motor is operating on said second frequency characteristic curve, thereby to overcome an effect of said hysteresis, wherein said critical voltage magnitude is at least the minimum voltage magnitude needed for starting said vibration motor in any environment in which the vibration motor is used.



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5,744,898

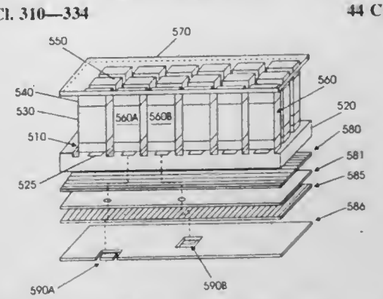
## ULTRASOUND TRANSDUCER ARRAY WITH TRANSMITTER/RECEIVER INTEGRATED CIRCUITRY

Stephen W. Smith, Durham; Gregg E. Trahey, Hillsborough, and Richard L. Goldberg, Durham, all of N.C., assignors to Duke University, Durham, N.C.

Continuation of Ser. No. 227,047, Apr. 13, 1994, abandoned, and a continuation-in-part of Ser. No. 962,455, Oct. 16, 1992, Pat. No. 5,329,496, and Ser. No. 883,006, May 14, 1992, Pat. No. 5,311,095. This application Nov. 19, 1996, Ser. No. 752,433

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—334 44 Claims




1. An ultrasonic transducer assembly comprising:

a connector having an upper surface, a lower surface and an array of connector pads formed in said connector for electrically connecting said upper surface to said lower surface;

an ultrasonic transducer chip mounted on said upper surface of said connector, said ultrasonic transducer chip being divided into a plurality of transducer elements, said plurality of transducer elements being comprised of a set of low impedance multilayer transmit transducer elements and a set of receive transducer elements and wherein said ultrasonic transducer chip is mounted on said connector such that a plurality of transducer elements from said transmit set of transducer elements are electrically connected to said lower surface of said connector and a plurality of said receive set of transducer elements are electrically connected to said lower surface of said connector;

a low voltage transmitter integral with said transducer assembly and operably associated with said transmit set of transducer elements for selectively providing an electrical signal to at least a preselected one of said transmit set of transducer elements to thereby generate an ultrasonic pulse from said preselected transducer element, wherein said low voltage transmitter transmits voltages of about 15 V or less to said transmit elements; and

receive circuitry means integral with said transducer assembly and operably associated with said receive set of transducer elements for selecting an electrical signal corresponding to an ultrasonic signal from a target received by a selected one of said receive set of transducer elements.

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5,744,899

## ILLUMINATING LAMP WITH ENHANCED FAR INFRARED RADIATION

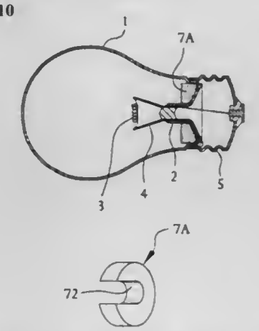
Haengwoo Lee, Karam 15-402, 986 Samcheon Dong, Seoku, Daejeon, and Sookhee Kim, Lucky 910-103, Hoo Gok Village 1058, Ilsan Dong, Goyang, Kyoungki, both of Rep. of Korea

Filed Apr. 5, 1995, Ser. No. 417,336

Claims priority, application Rep. of Korea, Jun. 9, 1994, 1994/13179

Int. Cl.[6] H01J *5/16*

U.S. Cl. 313—110 11 Claims




1. An illumination lamp emanating far infrared rays together with visible rays when an electric current is supplied to the lamp, the lamp comprising:

a glass enclosure;

a light-emitting element located in the glass enclosure for producing light when the electric current is supplied to the element;

a support stem for hermetically sealing the glass enclosure and holding the light-emitting element in a spaced apart relationship with respect to the glass enclosure;

at least one base attached to the glass enclosure which is adapted to engage with a light socket and which permits the transmission of the electric energy to the light-emitting element; and

a far infrared ray emanating body mounted on the support stem for emitting far infrared rays, the far infrared ray emanating body being positioned between the light-emitting element and the base so as not to interfere with the passage of light through the glass enclosure, and wherein the far infrared ray emanating body comprises a mixture of far infrared ray emission substance and a heat resistant binder.

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5,744,900

## PINK LAMP AND COATING THEREFOR

Cynthia J. Labant, St. Marys, Pa., assignor to Osram Sylvania Inc., Danvers, Mass.

Filed Oct. 4, 1996, Ser. No. 733,412

Int. Cl.[6] H01J *5/16;61/40*

U.S. Cl. 313—112 7 Claims

1. An electric lamp which exhibits a pink color when energized and which comprises a light transmissive envelope enclosing an electric light source and having a pink coating on a surface of said envelope, said coating containing a chrome tin pink inorganic pigment and a red iron oxide pigment, said coating being free of cadmium and selenium.

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5,744,901

## ELECTRIC REFLECTOR LAMP

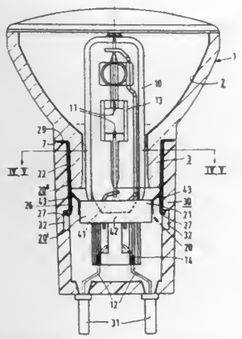
Winand H.A.M. Friederichs, Bath, N.Y., and Hubertus J. Muller, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1996, Ser. No. 705,571

Claims priority, application European Pat. Off., Aug. 30, 1995, 95202341.4

Int. Cl.[6] H01K *1/48;* H01J *5/48*

U.S. Cl. 313—113 18 Claims



1. An electric reflector lamp comprising:

a glass reflector body with a concave reflecting portion, a neck, and an optical axis;

a light-transmitting lamp vessel accommodating an electric element and fixed in the reflector body, the electric element being arranged in the reflecting portion;

a metal mounting member with a retaining portion which securely holds the lamp vessel;

a lamp cap with electric contacts which is fixed around the neck;

current conductors extending from the electric element to the contacts of the lamp cap,

wherein the retaining portion of the mounting member comprises a circumferential wall which surrounds the neck and has a relief which cooperates with a relief of the neck such that the circumferential wall and the neck are mutually coupled, and the lamp cap surrounds the mounting member closely so as to lock a coupling between the circumferential wall and the neck, while the lamp cap is coupled to the circumferential wall.

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5,744,902

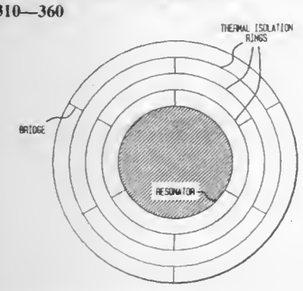
## CHEMICAL AND BIOLOGICAL SENSOR BASED ON MICRORESONATORS

John R. Vig, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 16, 1995, Ser. No. 441,909

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—360 2 Claims




1. A material sensor comprising:

a dual mode microresonator having an orientation and cut such that the microresonator has a frequency versus temperature characteristic which has a steep slope and is monotonic;

means to electrically excite the microresonator to produce an output frequency such that changes in absorbed energy vary the output frequency;

a reactant coating on the microresonator; and

means to thermally isolate the microresonator wherein the means to thermally isolate the microresonator includes a plurality of concentric low thermal conductance rings which are disposed around the microresonator and a plurality of sets of bridges each set of bridges connecting and supporting a selected pair of concentric rings.

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5,744,903

## COLOR CATHODE RAY TUBE WITH SUBELECTRODES

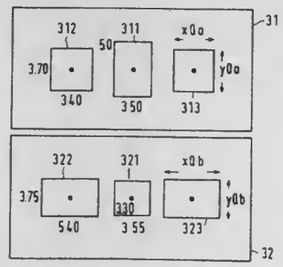
Willibrordus A.J.A. Van Der Poel, and Antonius W.F. Van De Heijden, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1996, Ser. No. 635,339

Claims priority, application European Pat. Off., May 2, 1995, 95201135

Int. Cl.[6] H01J *29/62*

U.S. Cl. 313—414 9 Claims




1. Color cathode ray tube device having an electron gun of the in-line type for generating three electron beams, a display screen and deflection means for scanning the electron beams over the display screen, wherein the electron gun comprises a main lens part for focusing the electron beams on the display screen, said main lens part comprising main lens electrodes having apertures for passing of the electron beams, at least one of said main lens electrodes comprising at least two sub-electrodes adjacent to each other, each of the sub-electrodes having a central and two outer apertures, whereby in operation between the adjacent sub-electrodes a quadrupole field is generated, characterized in that for the central apertures of the sub-electrodes it holds:

$$xQa \leq xQb$$

and for the two outer apertures of the sub-electrodes it holds:

$$yQa \leq yQb$$

and additionally at least one of the following relationships (a) and (b) holds: (a) for the sub-electrode remote from the main lens, yQa for the outer apertures is less than yQa for the central aperture, and (b) for the sub-electrode adjacent to the main lens, xQb for the central aperture is less than xQb for the outer apertures,

wherein:

xQa is the width of the aperture in the horizontal direction in the sub-electrode remote from the main lens,

xQb is the width of the aperture in the horizontal direction in the sub-electrode adjacent to the main lens

yQa is the height of the aperture in the vertical direction in the sub-electrode remote from the main lens and

yQb is the height of the aperture in the vertical direction in the sub-electrode adjacent to the main lens.



5,744,904

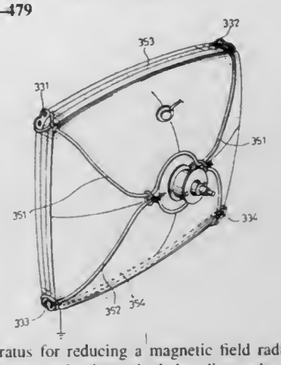
## APPARATUS FOR REDUCING MAGNETIC FIELD RADIATED FROM DEFLECTION YOKE

Hsich Chang-Fa, Taoyuan, Taiwan, assignor to Acer Peripherals, Inc., Taiwan

Filed Sep. 16, 1996, Ser. No. 715,280

Int. Cl.[6] H01J *31/00*

U.S. Cl. 313—479 2 Claims




1. An apparatus for reducing a magnetic field radiated from a deflection yoke, the deflection yoke being disposed around a neck portion of a cathode ray tube which is in the form of a funnel shape and which includes a lip portion, the funnel shape defining an upper portion and a lower portion with reference to the neck portion, the deflection yoke generating an upper magnetic field and a lower magnetic field, a first and a second lug being provided on the upper portion, a third and a fourth lug being provided on the lower portion, comprising:

a tension band surrounding the lip portion of the cathode ray tube, the first, second, third and fourth lugs respectively electrically contacting the tension band, the tension band being electrically grounded;

a first circuit path structure having first and second ends respectively connected to the first and second lugs, the first circuit path structure and the portion of the tension band between the first and second lugs providing a first circuit loop defining a first loop space, the upper magnetic field generating a first eddy current in the first circuit path structure by passing through the first loop space, the first eddy current resulting in dissipated heat;

a second circuit path structure having first and second ends respectively connected to the third and fourth lugs, the second circuit path structure and the portion of the tension band between the third and fourth lugs providing a second circuit loop defining a second loop space, the lower magnetic field generating a second eddy current in the second circuit path structure by passing through the second loop space, the second eddy current resulting in dissipated heat.

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5,744,905

## EMISSION MATERIALS FOR DISCHARGE LAMPS AND METHOD FOR MANUFACTURING ELECTRODE STRUCTURES WITH SUCH MATERIALS

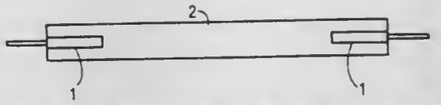
Vivek Mehrotra, Rye Brook, N.Y.; Hemant S. Betrabet, Veldhoven, Netherlands; David Robert Woodward, Morgantown; Thomas O. Leyh, Bridgeport, both of W. Va., and Susan McGee, Peekskill, N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.

Continuation of Ser. No. 759,509, Dec. 4, 1996, abandoned, which is a continuation of Ser. No. 363,182, Dec. 23, 1994. This application Aug. 19, 1997, Ser. No. 916,747

Int. Cl.[6] H01J *1/62;63/04;17/20;61/12*

U.S. Cl. 313—491 4 Claims

1. An electrode structure for fluorescent lamps comprising a sintered composite structure including a sintered material of tungsten and at least one of barium zirconate and barium strontium zirconate.




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5,744,906

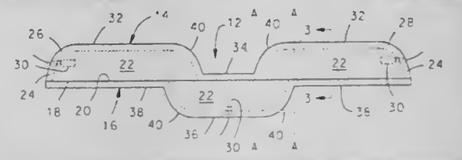
## GAS DISCHARGE ILLUMINATION DEVICE

Warren L. Alford, 2110 Stapp Dr., NE., Huntsville, Ala. 35801, and Danny Ray Massey, 5956 Brookline La., Montgomery, Ala. 36116

Filed Dec. 22, 1995, Ser. No. 577,134

Int. Cl.[6] H01J *61/30*

U.S. Cl. 313—493 10 Claims




1. A gas-discharge illumination device comprising: a translucent longitudinally extending housing forming a gas chamber, said housing having a first section and a second section, each said first and second sections having a mating facial surface, each said mating facial surface hermetically attached to the other, said first and second sections having a plurality of longitudinally extending raised portions each having a predetermined cross-section, a plurality of longitudinally extending flattened portions each having a predetermined cross-section and a plurality of longitudinally extending transition segments, the longitudinally extending cross section of each said transition segment transitioning from the cross-sectional configuration of each said raised portion to the cross-sectional configuration of each said flattened portion, said raised portions of said first section being coincident to said flattened portions of said second section, said raised portions of said second section being coincident to said flattened portions of said first section, said transition segments of said first section being coincident to the transition segments of said second section so as to form said gas chamber between said first and second sections as a longitudinally extending conduit having a generally constant cross-sectional area; and illumination means for illuminating said gas chamber and said housing.

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5,744,907

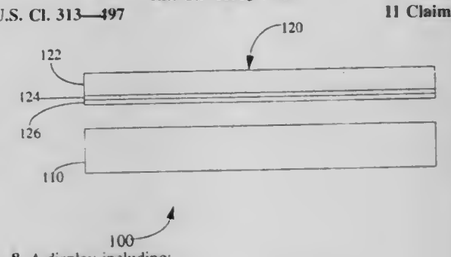
## BINDERS FOR FIELD EMISSION DISPLAYS

Surjit S. Chadha, and Charles M. Watkins, both of Meridian, Id., assignors to Micron Display Technology, Inc., Boise, Id.

Filed Jan. 19, 1996, Ser. No. 587,722

Int. Cl.[6] H01J *19/24*

U.S. Cl. 313—497 11 Claims




8. A display including:

a faceplate comprising:

a transparent screen having at least one side;

a transparent conductor disposed on said side of said screen;

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a layer of phosphor and binder material disposed on said transparent conductor, said binder material holding said phosphor to said transparent conductor, said binder material comprising a conductive material; and

a baseplate disposed proximal said side of said screen and being spaced apart from said faceplate, the space between said baseplate and said faceplate being substantially evacuated to provide a vacuum gap between said faceplate and said baseplate, said baseplate comprising:

a base electrode;

a plurality of conical field emission cathodes having a base and a tip, the bases of said field emission cathodes being disposed on said base electrode; and

a grid electrode disposed proximal the tips of said field emission cathodes, the tips of said field emission cathodes emitting electrons in response to voltages applied to said base and grid electrodes, said electrons traveling towards said faceplate.

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**5,744,908**

## ELECTRON TUBE

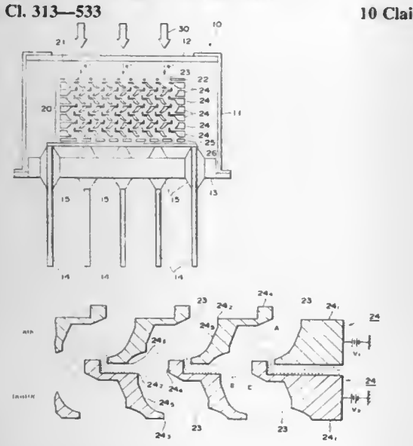
**Hiroyuki Kyushima, Hamamatsu, Japan, assignor to Hamamatsu Photonics K.K., Hamamatsu, Japan**

**Continuation of Ser. No. 398,153, Mar. 3, 1995, abandoned. This application Mar. 10, 1997, Ser. No. 813,312**

**Claims priority, application Japan, Jun. 28, 1994, 6-146639**

**Int. Cl.[6] H01J** *43/00*

**U.S. Cl. 313—533** **10 Claims**



1. An electron tube, comprising:

a first dynode plate for multiplying incident electrons having a first through hole, said first through hole having an incident opening for receiving the incident electrons and an emission opening for emitting multiplied electrons; and

a second dynode plate for multiplying incident electrons positioned adjacent the first dynode plate and having a second through hole, said second through hole having an incident opening for receiving electrons emitted by the first dynode plate and an emission opening for emitting multiplied electrons;

wherein said second dynode plate has a protruding acceleration electrode unit disposed on a surface facing said first dynode plate, said protruding acceleration electrode unit being located close to the incident opening of the through hole of said second dynode plate and protruding towards said emission opening of said first dynode plate.

**5,744,909**

## DISCHARGE DISPLAY APPARATUS WITH MEMORY SHEETS AND WITH A COMMON DISPLAY ELECTRODE

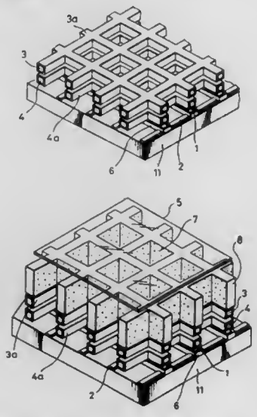
**Yoshifumi Amano, Kamakura, Japan, assignor to Technology Trade and Transfer Corporation, Kanagawa, Japan**

**Filed Jun. 9, 1995, Ser. No. 489,035**

**Claims priority, application Japan, Jul. 7, 1994, 6-156024**

**Int. Cl.[6] H01J** *17/49*

**U.S. Cl. 313—585** **11 Claims**



11. A discharge display apparatus, comprising:

plural pairs of first memory electrodes and second memory electrodes which are disposed adjacent to each other and covered by an insulating layer, said second memory electrodes serving as second address electrodes;

a plurality of first address electrodes which cross said plurality of second address electrodes through said insulating layer and apartition;

a spacer which has a plurality of apertures respectively corresponding to a plurality of apertures formed by said plurality of first and second electrodes and in which a fluorescent layer is deposited on inner walls of said plurality of apertures;

a display electrode common to all of said apertures of said memory electrode and said spacer, and

a tube body formed of a front glass plate and a rear glass plate, peripheries of said front glass plate and said rear glass plate being sealed by a frit glass to form a discharge space which is vacuumed and then into which a discharge gas sealed; said plural pairs of first and second memory electrodes both of which are disposed adjacent to each other and deposited on said insulating layer, said plurality of first address electrodes, said spacer and said display electrode being successively laminated and sealed into said tube body in this order, said fluorescent layer being activated by ultraviolet rays generated by gas discharge in said discharge space.

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**5,744,910**

## PERIODIC PERMANENT MAGNET FOCUSING SYSTEM FOR ELECTRON BEAM

**Robert Spencer Symons, Los Altos, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.**

**Filed Apr. 2, 1993, Ser. No. 41,765**

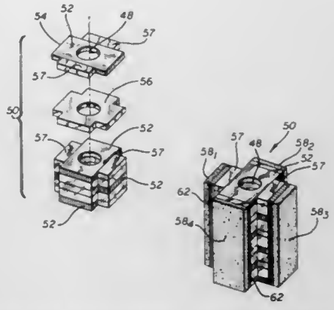
**Int. Cl.[6] H01J** *23/087*

**U.S. Cl. 315—5.35** **20 Claims**

16. A periodic permanent magnetic focusing system for use in a traveling wave tube (TWT), comprising:

polepiece means having an aperture extending therethrough, said polepiece means conducting magnetic flux to said aperture in a first direction and conducting said magnetic flux from said





aperture in a second direction oriented perpendicular to said first direction, said aperture providing an axial drift tube of said TWT:

means for magnetically insulating between said first direction of magnetic flux and said second direction of magnetic flux and for sealing said axial drift tube; and

magnet means for supplying said magnetic flux, said magnet means comprising permanent magnets disposed at outer portions of said polepiece means, said magnets being magnetized in a radial direction relative to said axial drift tube;

wherein an electron beam travels in said drift tube and said magnetic flux is provided for focusing of said electron beam.

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**5,744,911**

## DEVICE FOR DRIVING DIRECTLY HEATED CATHODE OF CATHODE RAY TUBE

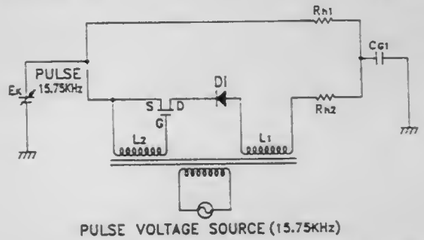
**Sang-kyun Kim, Seoul; Chang-seob Kim, and Hak-cheol Yang, both of Suwon, all of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea**

**Filed Dec. 21, 1995, Ser. No. 576,589**

**Claims priority, application Rep. of Korea, Dec. 28, 1994, 94-38308**

**Int. Cl.[6] H01J** *29/98*

**U.S. Cl. 315—94** **2 Claims**




PULSE VOLTAGE SOURCE (15.75KHz)

1. A device for driving a directly heated cathode of a cathode ray tube having a cathode, a heater for heating the cathode, image signal supplying means, and heater-heating signal voltage supplying means, the device for driving the directly heated cathode of the cathode ray tube comprising:

a transformer having primary and secondary coils for receiving a heater-heating signal voltage of a heater-heating signal voltage supplying means at said primary coil, for transforming the received voltage, for transmitting a transformed voltage from said secondary coil to a heater, said secondary coil including first and second coils;

a diode for producing a unidirectional component of a voltage induced in said first coil of said secondary coil; and

means for switching connected to said second coil and switching in synchronization with the voltage induced in said first coil so that a current from said first coil flows through said diode to the heater.

**5,744,912**

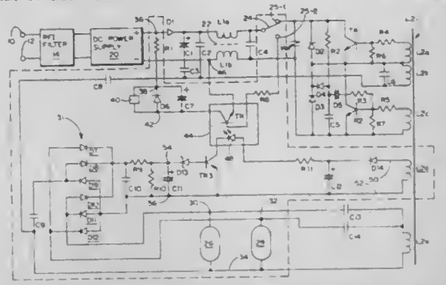
## ELECTRONIC BALLAST HAVING AN OSCILLATOR SHUTDOWN CIRCUIT FOR SINGLE OR MULTIPLE FLUORESCENT TUBES FOR LAMPS

**Gin Pang So, 2, Macrill Rd., Markham, Ontario, Canada, L6C 1R3**

**Filed Jun. 26, 1996, Ser. No. 669,784**

**Int. Cl.[6] H05B** *37/00*

**U.S. Cl. 315—127** **18 Claims**



1 An electronic ballast to power at least one fluorescent tube or lamp, said ballast including a source of power, a DC power supply having an input connected to said source of power, an oscillator connected to an output of said DC power supply so as to be driven therefrom, and a shutdown circuit to disable said oscillator and shutdown said electronic ballast in the event that the at least one fluorescent tube or lamp operates abnormally, said shutdown circuit comprising means responsive to the operating voltage of the at least one fluorescent tube or lamp, and photoresponsive switch means being controlled by said operating voltage responsive means to disconnect said oscillator from said DC power supply and thereby disable said oscillator when the operating voltage of the at least one fluorescent tube or lamp exceeds a particular threshold level.

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**5,744,913**

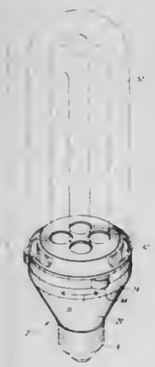
## FLUORESCENT LAMP APPARATUS WITH INTEGRAL DIMMING CONTROL

**Mark E. Martich, Hanover; Thomas E. Beling, Framingham, and John M. Ossenmacher, Scituate, all of Mass., assignors to Pacific Scientific Company, Weymouth, Mass.**

**Continuation-in-part of Ser. No. 217,936, Mar. 25, 1994, abandoned. This application May 3, 1994, Ser. No. 237,850**

**Int. Cl.[6] H05B** *37/02*

**U.S. Cl. 315—158** **12 Claims**



1. Dimmable fluorescent lamp apparatus comprising

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an electrical socket base for threading into an electrical lamp socket and having electrical conductors arranged for electrical connection with corresponding conductors of the electrical lamp socket,

an electrically insulative housing having a top end axially spaced from a bottom end and mounting said base at said bottom end, said housing having lamp supporting means at said top end for mountingly receiving a fluorescent illumination element having electrical contacts and having a tubular portion extending between said base at said bottom end and said supporting means at said top end, said housing having one or more apertures to permit light resulting from ambient conditions and from illumination of said fluorescent lamp element and from other illumination sources to enter said housing through said apertures,

controllable electrical circuit means disposed within said housing and connected with the electrical conductors of said base for receiving electrical power and having output conductors for electrical connection to the contacts of a fluorescent illumination element mountingly received in said supporting means and applying an adjustable variable operating electrical excitation to a fluorescent illumination element in response to a controllable electrical signal,

light sensing means disposed within said housing and in electrical connection with said controllable electrical circuit means, and

optical adjustment means for controlling the entry of said light through said apertures, thereby controlling impingement of said light onto said light sensing means for producing said controllable signal in response to adjustable positioning of said optical adjustment means, said optical adjustment means being manually accessible externally of said housing tubular portion.

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**5,744,914**

## FLAT DISPLAY DEVICE AND METHOD OF DRIVING SAME

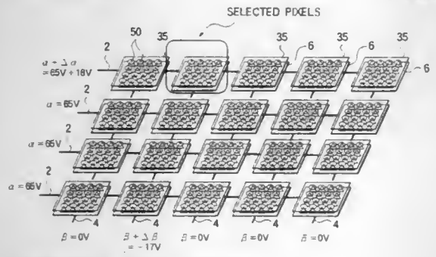
**Morikazu Konishi, Kanagawa, Japan, assignor to Sony Corporation, Japan**

**Filed Apr. 25, 1996, Ser. No. 637,370**

**Claims priority, application Japan, May 2, 1995, 7-108561**

**Int. Cl.[6] G09G** *3/10*

**U.S. Cl. 315—169.1** **3 Claims**




1. A flat display device comprising:

microcathodes arranged in the form of a matrix;

gate electrodes controlled so that electrons are selectively discharged from said microcathodes;

emitter electrodes for supplying a negative voltage to said gate electrodes of one or more selected microcathodes;

a DC voltage supplying means for supplying a DC bias voltage giving an emission current of a predetermined value or less between said emitter electrodes and gate electrodes irrespective of selection and non-selection; and

a selective voltage supplying means for supplying a voltage of an extent where electrons are emitted from said microcathodes between said emitter electrode and said gate electrode of the selected microcathodes while being superimposed on the DC bias voltage wherein the DC bias voltage giving the emission current of the predetermined value or less is supplied between said emitter electrodes and said gate electrodes by said DC voltage supplying means irrespective of selection and non-selection so that the emission current of the selected microcathodes becomes **10** times or more of the emission current of the non-selected microcathodes.

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**5,744,915**

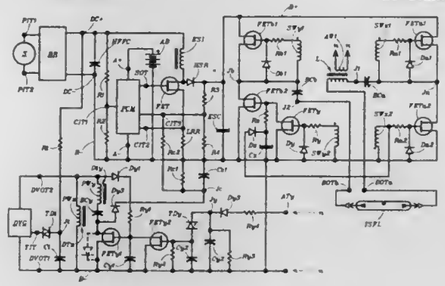
## ELECTRONIC BALLAST FOR INSTANT-START LAMPS

**Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010**

**Continuation-in-part of Ser. No. 734,188, Jul. 22, 1991, Pat. No. 5,428,266, which is a continuation-in-part of Ser. No. 643,023, Jan. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 787,692, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 644,155, Aug. 27, 1984, abandoned, which is a continuation of Ser. No. 555,426, Nov. 23, 1983, abandoned, which is a continuation of Ser. No. 178,107, Aug. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 973,741, Dec. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 890,586, Mar. 20, 1978, Pat. No. 4,184,128. This application Mar. 23, 1992, Ser. No. 856,392**

**Int. Cl.[6] H05B** *41/36*

**U.S. Cl. 315—209 R** **28 Claims**



1. An arrangement comprising:

a source operative to provide a DC supply voltage;

circuit assembly connected with the DC supply voltage and operative to provide a squarewave output voltage at a pair of output terminals; the circuit assembly having a first control input and being operative, on receipt of a first control signal at the first control input, to control the peak magnitude of the squarewave output voltage; the circuit assembly being further characterized by including an inverter circuit and a control circuit in interconnected combination; the circuit assembly being further characterized by not including a relay with a relay coil; and

gas discharge lamp disconnectably connected in circuit with the output terminals.

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**5,744,916**

## DISCHARGE TUBE LIGHTING APPARATUS

**Kenji Kawabata, Ome; Shuzo Matsumoto, Fujisawa; Ryuichi Ikeda, Yokohama; Mntohiro Sugino, Fujisawa; Takashi Okada, Ome, and Yoshiteru Watanabe, Sagamihara, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 16, 1995, Ser. No. 543,725**

**Claims priority, application Japan, Oct. 14, 1994, 6-249051**

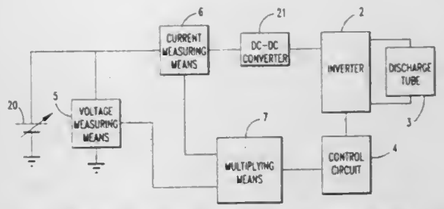
**Int. Cl.[6] H05B** *37/02*

**U.S. Cl. 315—308** **4 Claims**

3. A discharge tube lighting apparatus comprising:

a circuit for powering a discharge tube, the circuit including a DC-DC converter responsive to a DC power source for supplying a DC voltage and an inverter for converting the DC voltage supplied by the DC-DC converter into a high-frequency voltage that powers the discharge tube;






voltage measuring means for measuring an input voltage to the DC-DC converter;

current measuring means for measuring an input current to the DC-DC converter; and

multiply means responsive to the voltage measuring means and the current measuring means for computing the product of the measured input voltage and the measured input current; and

means responsive to said multiply means for reducing said DC voltage supplied by said DC-DC converter when the product computed by said multiply means reaches and remains at or above a predetermined value for a predetermined period, said predetermined value corresponding to an input power used by said circuit which is above a range of input power used by said circuit when said discharge tube is normally operating.

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**5,744,917**

## ELECTRON GUN ASSEMBLY FOR A COLOR CATHODE RAY TUBE APPARATUS

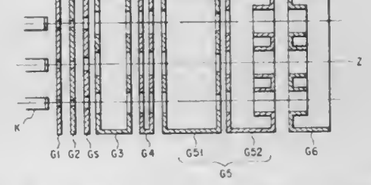
**Takahiro Kawaharada, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Dec. 6, 1996, Ser. No. 759,734**

**Claims priority, application Japan, Dec. 8, 1995, 7-320654; Sep. 18, 1996, 8-246477; Oct. 8, 1996, 8-266443**

**Int. Cl.[6] H01J** *29/58*

**U.S. Cl. 315—382.1** **14 Claims**




1. An electron gun assembly of a color cathode ray tube apparatus, for emitting electron beams which are deflected in horizontal and vertical directions by a deflection yoke provided on the tube apparatus to scan a phosphor screen in the tube apparatus, comprising:

means for emitting three electron beams;

means for forming cross-over points of the emitted electron beams, respectively, which includes control and screen grids arranged between the emitting means and the phosphor screen;

means for forming a main lens system for focusing the electron beams diverged from the cross-over points to the phosphor screen, which includes first, second, third, fourth, and fifth grids arranged between the forming means and the screen and an additional grid arranged between the screen grid and the first grid; and

means for applying a constant focus voltage to the first and third grids, for applying a dynamic voltage to the fourth grid and the additional grid, the dynamic voltage being varied depending on the deflection of the electron beams, and for applying a grid voltage to the second grid and one of the control and screen grids, whereby a plurality of first quadruple electron lenses corresponding to the three electron beams are formed between the third and fourth grids, each of which has a first lens power which is changed depending on the deflection of the electron beams, whereby a plurality of second quadruple electron lenses corresponding to the three electron beams are formed between the additional grid and the first grid, each of which has a second lens power which is changed depending on the deflection of the electron beams, and whereby a plurality of sub-lenses corresponding to the three electron beams are formed between the first grid and the fourth grid, each of which has a convergent lens power for converging the corresponding electron beam in the vertical and horizontal directions.

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**5,744,918**

## DISPLAY MONITOR

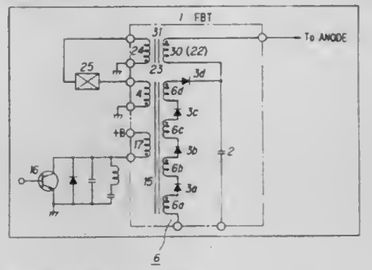
**Yoshihiko Sugawara; Hideyuki Mochida, and Kazuyoshi Takizawa, all of Kanagawa, Japan, assignors to Hitachi Media Electronics Co., Ltd., Iwate, Japan**

**Filed Dec. 6, 1996, Ser. No. 761,785**

**Claims priority, application Japan, Jan. 18, 1996, 8-006747**

**Int. Cl.[6] H01J** *29/70*

**U.S. Cl. 315—411** **4 Claims**




1. A display monitor comprising:

a flyback transformer for supplying a high voltage to a display, said flyback transformer including a core, a primary-side low-voltage coil wound on said core, a secondary-side high-voltage coil wound on said core and divided into high-voltage coil pieces, high-voltage rectifier diodes connected in series with respective output sides of said high-voltage coil pieces of said secondary-side high-voltage coil so as to form a series circuit, and a high-voltage capacitor connected to a cathode of one of said high-voltage rectifier diodes in a final stage of said series circuit;

an opposite-phase pulse inducing transformer constituted by a core different from said core of said flyback transformer, an opposite-phase pulse inducing coil wound on said different core for inducing a pulse which is opposite in phase to a deflecting yoke driving horizontal pulse, and a different-core high-voltage output line connected to an output side of said secondary-side high-voltage coil and arranged on said different core, said opposite phase pulse inducing transformer being arranged so that said pulse opposite in phase to said deflecting yoke driving horizontal pulse is superimposed on said different-core high-voltage output line and an output terminal of said different-core high-voltage output line is connected to said display; and

an opposite-phase pulse control circuit for adjusting the peak value and phase of said pulse opposite in phase to said deflecting yoke driving horizontal pulse, said opposite-phase pulse control circuit being connected to said opposite-phase pulse inducing transformer.

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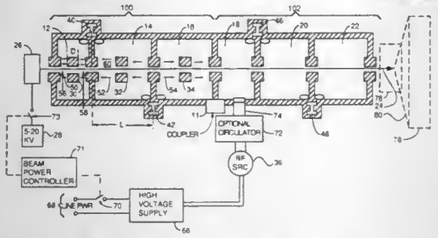


5,744,919

## CW PARTICLE ACCELERATOR WITH LOW PARTICLE INJECTION VELOCITY

Andrey V. Mishin, 6559 Leyland Park Dr., San Jose, Calif. 95120, and Russell G. Schonberg, 12386 Melody La., Los Altos Hills, Calif. 94022

Filed Dec. 12, 1996, Ser. No. 764,535
Int. Cl.[6] H05H *9/00;7/00*
U.S. Cl. 315—505 26 Claims




1. An RF linear accelerator comprising:

a charged particle source supplying charged particles having velocities substantially lower than the minimum particle injection velocity needed for efficient acceleration in a conventional RF linear accelerator which does not use drift tubes;

a first RF linear accelerator having one or more resonator cavities each with a drift tube therein coupled to receive charged particles from said charged particle source and structured to accelerate them from whatever velocity they arrived to a minimum velocity needed for efficient acceleration in an RF linear accelerator that does not use drift tubes;

a second RF linear accelerator which has one or more resonator cavities which do not employ drift tubes, said second RF accelerator coupled to receive charged particles output from said first RF linear accelerator said second RF linear accelerator structured for accelerating said charged particles arriving from said first RF linear accelerator up to a relativistic velocity;

an RF source of microwave energy coupled to said first and second RF linear accelerators so as to excite therein the $TM_{010}$ mode; and

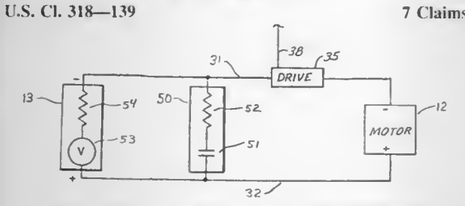
a coupling structure coupling said $TM_{010}$ RF energy in said first linear accelerator to said second linear accelerator in such a way as to cause a phase change such that charged particles arriving from said first RF linear accelerator arrive at a first resonator cavity of said second RF linear accelerator at a time when the electric field of said $TM_{010}$ mode in said first resonator cavity of said second RF linear accelerator is oriented in such a way as to accelerate said charged particles.

5,744,920

## SPEED CONTROLLER WITH IMPROVED BATTERY POWER TRANSFER

Kevin R. Orton, Tekin Electronics, Inc., 940 Calle Negocio, San Clemente, Calif. 92673

Filed Feb. 12, 1997, Ser. No. 797,984
Int. Cl.[6] H02P *1/00*
U.S. Cl. 318—139 7 Claims




1. A method for reducing the amount of power dissipated in the internal resistance of a nickel cadmium battery supplying current to a motor of a radio controlled model through a speed controller circuit that switches the battery on and off at a known switching rate and duty ratio to result in ON periods during which the battery is coupled to the load and OFF periods during which the battery is not coupled to the load, the method comprising:

providing a bank of capacitors connected across the battery, the bank of capacitors having at least one capacitor, a combined equivalent series resistance that is less than the internal resistance of the battery, and a combined capacitance such that the product of the combined capacitance expressed in microfarads and the switching rate expressed in Hertz is at least $4\times10^6$;

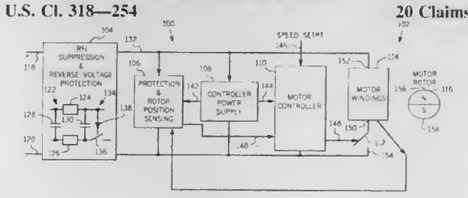
storing energy from the battery in the bank of capacitors during the OFF periods for contribution to the load during the ON periods.

5,744,921

## CONTROL CIRCUIT FOR FIVE-PHASE BRUSHLESS DC MOTOR

John E. Makaran, London, Canada, assignor to Siemens Electric Limited, Mississagua, Canada

Filed May 2, 1996, Ser. No. 643,160
Int. Cl.[6] H02K *23/00*
U.S. Cl. 318—254 20 Claims




1. A control system for electronically commutating a five-phase brushless DC motor adapted to be energized from a source of voltage, the motor including a stator having five windings adapted to be electronically commutated and a rotor mounted for rotation relative to the windings, the control system comprising:

a sensing circuit configured to generate signals corresponding to a rotary position of the rotor, said sensing circuit adapted to sense the rotary position by comparing back electromotive force voltages in the windings to each other;

an electronic commutation circuit including switches coupled to the windings; and

a control circuit coupled to the sensing circuit and the commutation circuit, the control circuit configured to generate control signals in response to the rotary position of the rotor and to apply the control signals to the commutation circuit, wherein the commutation circuit controls current flow through the windings in response to the control signals.

5,744,922

## CURRENT REGULATOR

Michael B. Neary, Manhattan Beach, and Michael J. Rainey, Lakewood, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 16, 1996, Ser. No. 714,711
Int. Cl.[6] H02P *1/00*
U.S. Cl. 318—293 6 Claims

1. A current regulator comprising:

a first MOSFET transistor having a drain, a gate and a source;

a second MOSFET transistor having a drain, a gate and a source;

a third MOSFET transistor having a drain, a gate and a source;

a fourth MOSFET transistor having a drain, a gate and a source;

a power supply;

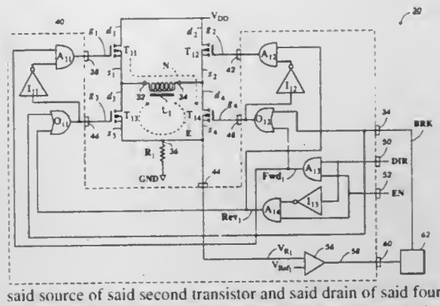
said drain of said first transistor and said drain of said second transistor being electrically connected to said power supply;

a first node;

a second node;

said source of said first transistor and said drain of said third transistor being electrically connected to said first node;





said source of said second transistor and said drain of said fourth transistor being electrically connected to said second node;

a load being electrically connected to said first node and said second node to provide an electrical path between said first node and said second node;

a third node

said source of said third transistor and said source of said fourth transistor being electrically connected to said third node;

a ground;

a resistor having a first terminal and a second terminal;

said third node being electrically connected to said first terminal of said resistor and said ground being electrically connected to said second terminal of said resistor;

a driver chip;

said gate of said first transistor, said gate of said second transistor, said gate of said third transistor, and said gate of said fourth transistor all being operably connected to said driver chip;

said driver chip having a brake input signal;

means for generating said brake signal;

selecting means;

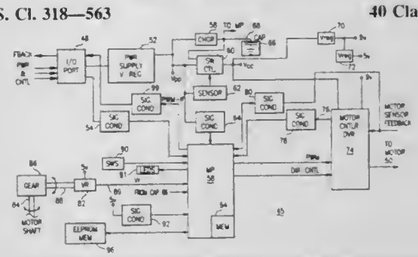
said driver chip and said selecting means being so constructed and arranged that when said brake signal is not generated said selecting means selectively activates said first transistor and said fourth transistor or said second transistor and said third transistor and when said brake signal is generated said third transistor and said fourth transistor are active whereby a low resistance current path is created when said brake signal is generated.

5,744,923

## MICROPROCESSOR-BASED CONTROLLER FOR ACTUATOR MOTORS WITH CAPACITIVE POWER BACKUP AND METHOD THEREFOR

Jason Strauss; Michael Ginzburg, both of Fort Lauderdale, Fla.; Zev Kopel, Dollard des Ormeaux, PQ, Canada, and Shu Yong Shao, Boca Raton, Fla., assignors to National Environmental Products, Ltd., Inc., Pompano Beach, Fla.

Filed Nov. 22, 1996, Ser. No. 755,088
Int. Cl.[6] G05B *9/02*
U.S. Cl. 318—563 40 Claims




1. A microprocessor-based controller for a fractional horsepower motor used as an actuator and adapted to be coupled to an air damper or a valve, said controller receiving power and control input signals and comprising:

a microprocessor coupled to and operating in conjunction with a memory;

a power and control input signal converter for regulating said power and converting said control input signals;

a capacitive energy storage unit coupled to said converter and receiving power therefrom, said capacitive energy storage unit storing sufficient power to drive said fractional horsepower motor and move said coupled air damper or valve to a predetermined fail safe position upon a loss of said power;

means for sensing a presence and said loss of said power and generating a fail safe control signal upon said loss of said power;

a switch receiving said fail safe control signal and passing power from one of said converter and said capacitive energy storage unit based upon the absence or presence of said fail safe control signal, respectively;

a driver controlled by and coupled to said microprocessor, said driver receiving said power from said switch and driving said fractional horsepower motor based thereon;

means, coupled to said microprocessor, for continually monitoring a position of said coupled air damper or said valve and for generating a position indicative signal;

said microprocessor having means for driving said air damper or valve via said driver to said fail safe position in the presence of said fail safe control signal and including means for reducing said power applied to said fractional horsepower motor via said driver when said position indicative signal falls within a predetermined position band near said predetermined fail safe position and in the presence of said fail safe control signal; and,

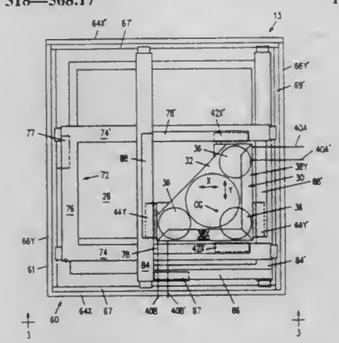
said microprocessor having means for generating position control signals based upon said control input signals from said converter, said microprocessor applying said position control signals to said driver and thereby affecting said position of said coupled air damper or valve.

5,744,924

## GUIDELESS STAGE WITH ISOLATED REACTION FRAME

Martin E. Lee, Saratoga, Calif., assignor to Nikon Corporation, Japan

Continuation of Ser. No. 627,824, Apr. 2, 1996, which is a continuation of Ser. No. 221,375, Apr. 1, 1994, Pat. No. 5,528,118. This application Jun. 20, 1996, Ser. No. 668,584
Int. Cl.[6] G03B *41/16*
U.S. Cl. 318—568.17 15 Claims



1. An exposure apparatus for exposing a pattern of a mask onto a substrate located on a stage member which is movable in a predetermined X-Y plane, the apparatus comprising:

a base member having a surface on which the stage member is suspended to move in the X-Y plane;

a column structure to support the mask and the base member;

an isolation supporting assembly to support the column structure on a foundation;

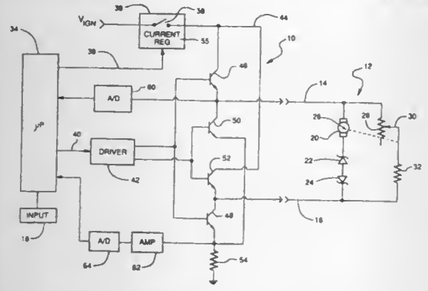
VOL 1209 ISS 4 AP 28 1998 UMI



a reaction frame structure disposed around the base member and supported on the foundation independently from the isolation supporting assembly;
a first drive system mounted on the reaction frame structure movably in the X and Y directions, for driving the stage member in the X and Y direction on the base member; and
a second drive system for driving the first drive system in the X and Y directions on the reaction frame structure to follow a motion of the stage member.

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**5,744,925**
**CONTROL METHOD AND APPARATUS FOR TWO-WIRE MOTOR ACTUATOR**
**Wayne Alan Madsen, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.**
**Filed Sep. 16, 1996, Ser. No. 715,282**
**Int. Cl.[6] G05B *1/03*; B60H *1/24***
**U.S. Cl. 318—590** **10 Claims**

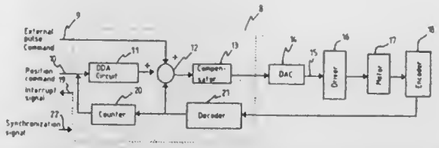



1. An apparatus comprising:
an actuator including a DC motor for positioning an output element, the actuator having only two wires;
a variable resistance in the actuator connected across the two wires and controlled by the output element over a resistance range to produce a resistance value dependent on the position of the output element;
a motor controller remote from the actuator and connected to the two wires for supplying current to the actuator and reading voltage developed across the actuator;
control means in the actuator responsive to the actuator voltage for applying driving current to the motor only for voltage above a threshold value to position the actuator, and for blocking current through the motor for voltage below the threshold value;
the controller having a current source for alternatively producing current in a first mode which yields actuator voltage above the threshold value over the variable resistance range, and producing current in a second mode which yields actuator voltage below the threshold value over the variable resistance range whereby in the second mode the voltage across the wires is dependent on the position of the output element;
and means in the controller responsive to the voltage across the wires during the second mode to determine the position of the output element.

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**5,744,926**
**SERVO MOTOR POSITIONING CONTROL AND POSITION RECORDING CHIP DEVICE**
**Chen-Kuo Lai, Taichung; Chang-Yu Ho, Kaoshiung, and Jia-Cheng Ke, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan**
**Filed Nov. 4, 1996, Ser. No. 743,285**
**Int. Cl.[6] G05B *11/26***
**U.S. Cl. 318—590** **16 Claims**

1. A servo motor positioning control and position recording chip device which comprising:



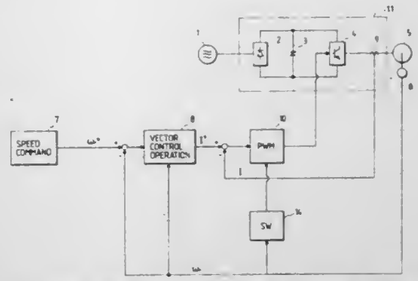

a position encoder, coupled to the servo motor, for detecting the position of the shaft of the servo motor and thereby generating a feedback signal;
a filter, coupled to said position encoder, for filtering out noises in the feedback signal;
a multiplication circuit, coupled to said filter, for multiplying the output of the filter by a preselected multiplier selected from 0, 1, 2, and 4;
a DDA circuit, responsive to an input programmed position command signal, for generating a simulated linear output;
a summation circuit, coupled to said DDA circuit and said multiplication circuit, for selectively summing up the negative of the output of said multiplication circuit to the output of said DDA circuit or to an external input position command signal;
a first programmable counter, coupled to said summation circuit, for counting the number of pulses in the output of said summation circuit and thereby generating a serial output;
an up/down counter, coupled to said first programmable counter, for converting the serial output of said first programmable counter into a parallel output;
a saturation adjustment circuit, coupled to said up/down counter, for performing saturation adjustment to the parallel output of said up/down counter;
a digital-to-analog converter, coupled to said saturation adjustment circuit, for converting the output of said saturation adjustment circuit into an analog signal;
a driver, coupled to said digital-to-analog converter, for driving the servo motor to rotate by a specific displacement in responsive to the analog signal;
an overflow detection circuit, coupled to said up/down counter, for detecting whether an overflow occurs to said up/down counter, said overflow detection circuit generating an interrupt signal to a CPU governing the operation of said chip device to handle the overflow condition;
a counter, coupled to said multiplication circuit, for counting the number of pulses from said multiplication circuit during a predetermined period, said counter generating an actuating signal to the CPU to actuate the CPU to generate another input programmed position command signal to said chip device; and
a second programmable counter, coupled to a clock signal, for generating a base frequency signal to drive said DDA circuit.

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**5,744,927**
**INVERTER CONTROL METHOD AND APPARATUS**
**Takahiro Hayashida, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Jan. 19, 1995, Ser. No. 374,873**
**Claims priority, application Japan, Jan. 28, 1994, 6-008872**
**Int. Cl.[6] H02P *7/63***
**U.S. Cl. 318—599** **15 Claims**

1. An inverter control apparatus comprising a current detector for detecting the primary current of a motor driven by an inverter circuit, a speed detector for detecting the speed of said motor, and a pulse width modulation circuit for pulse-width-modulating said inverter circuit in accordance with the primary current detection value of said current detector and a primary current command value, said inverter control apparatus comprising constant torque-constant output PWM switching means for judging whether the motor speed detected by said speed detector is in a constant torque region or in a constant output region to switch the PWM frequency

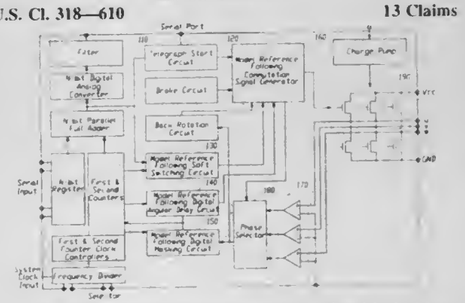





of said pulse width modulation circuit and to set the PWM frequency with the function of the motor speed in said constant output region.

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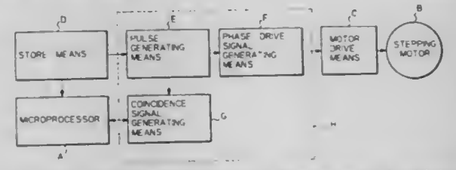
**5,744,928**
**DIGITAL LOCKED LOOP**
**Shi-ming Tang, and Sang-yong Lee, both of Kyonggi-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Rep. of Korea**
**Filed Apr. 29, 1996, Ser. No. 638,745**
**Claims priority, application Rep. of Korea, Oct. 19, 1995, 95-36269**
**Int. Cl.[6] H02P *7/00***
**U.S. Cl. 318—610** **13 Claims**




1. A hard disc spindle motor drive using a digital locked loop, comprising:
a digital locked loop which can lock an input digital signal according to a reference digital signal by using a digital counter, a register and an arithmetic logic circuit;
a telegraph start circuit designed for driving a motor by producing a high starting torque at an initial time of motor starting to overcome disadvantages of dead point, head-friction and insufficient initial starting torque;
a model reference following soft switching circuit which reduces variation ratio of switching current, prevents current ripple generated by switching, and eliminates the use of a snubber circuit by controlling ON/OFF time of a switching element in a driving output stage of the motor;
a model reference following digital angular delay circuit for finding an optimum switching point by delaying a digital angle after detecting a zero-cross point;
a model reference following digital masking circuit for masking noise signals produced by power switching and other energy sources;
a model reference following commutation signal generator including a 6-bit shift register and for generating commutation sequential signals with six states to be supplied to the driving output stage of the motor;
a comparator for detecting back-emf (electromotive force) zero-cross by comparing each motor phase's back-emf, and change the voltage of back-emf to a logic level;
a phase selector for receiving a commutation signal produced from the model reference commutation signal generator, selecting the phase of the input signal, and cooperating with the model reference following digital masking circuit; and
a motor driving circuit for receiving the commutation signal produced from the model reference commutation signal generator, and driving the motor according to the ON/OFF operation of an internal switching element in response to the input commutation signal.

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**5,744,929**
**STEPPING MOTOR DRIVE CONTROL DEVICE FOR AN ELECTRONIC APPARATUS**
**Hideto Miyazaki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**
**Filed Jan. 3, 1996, Ser. No. 582,421**
**Claims priority, application Japan, Jan. 11, 1995, 7-002466; Jan. 26, 1995, 7-010894; Dec. 13, 1995, 7-324731**
**Int. Cl.[6] H02P *8/00*; H04N *1/04*; B41J *29/38***
**U.S. Cl. 318—696** **9 Claims**




1. A device for controlling drive of a stepping motor for driving a movable section of an electronic apparatus, said device comprising:
motor drive means for driving the stepping motor;
a microprocessor for controlling said motor drive means;
store means for storing control data to be used during acceleration, constant-speed drive and deceleration of the stepping motor; and
motor control means for loading said control data stored in said store means to said motor drive means without the intermediary of said microprocessor, and controlling the stepping motor via said motor drive means with said control data.

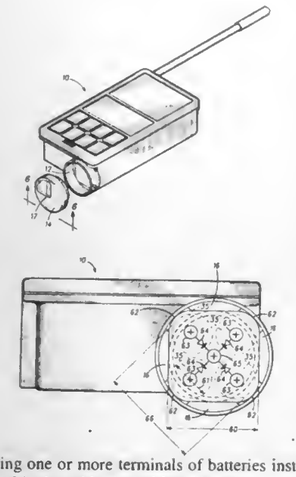
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**5,744,930**
**UNIVERSAL BATTERY COMPARTMENT**
**James Harvey Fleming, Phoenix; Theodore Woolley Keller, Scottsdale; David Moon Yee, Scottsdale, and Bennett Charles Beaudry, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**
**Filed Feb. 6, 1997, Ser. No. 795,747**
**Int. Cl.[6] H02J *7/00*; H01M *2/10***
**U.S. Cl. 320—2** **20 Claims**

**20.** In a radio, a battery compartment including in combination:
an elongated body having a length, a height and a width and including contacts disposed at one end thereof, wherein said length is chosen to be equal to three "C" cells stacked end to end and wherein said height and width of said elongated body are equal to twenty-nine and a half millimeters and corners of said elongated body are curved to accommodate cylinders having a diameter of fourteen millimeters; and
a cap adapted to couple to said elongated body at an end remote from said one end, wherein said cap couples to said compartment via a series of flanges disposed at outer edges of said cap, said flanges configured to engage and lock to grooves in said compartment with less than a quarter revolution of said cap, further including a contact disposed at an edge of said cap and adapted to make electrical contact to a contact disposed on said compartment when said cap is coupled to said compartment, wherein said contact disposed at an edge of said cap is also electrically coupled to a battery contact disposed on a face of said cap that is directed toward said elongated body when said cap is coupled thereto, said battery contact for

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contacting one or more terminals of batteries installed in said elongated body, said one end including:

a first contact, said first contact being centrally disposed on said cap and connected to a contact disposed on an edge of said cap; and

four second contacts, wherein said second contacts are disposed symmetrically about said first contact and separated therefrom by a center-to-center distance of about nine and nine-tenths millimeters; and

four diodes comprising diodes chosen from a group consisting of silicon Schottky barrier diodes, germanium diodes and silicon rectifiers, each said second contact connected to a diode anode wherein each diode has a cathode connected to said first contact.

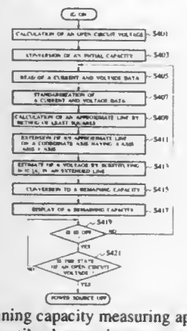
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**5,744,931**

## BATTERY REMAINING CAPACITY MEASURING APPARATUS

**Youichi Arai, and Hiroshi Ichikawa, both of Susono, Japan, assignors to Yazaki Corporation, Tokyo, Japan**

**Filed Aug. 30, 1996, Ser. No. 705,677**
**Claims priority, application Japan, Sep. 1, 1995, 7-225312**
**Int. Cl.[6] H01M** *10/46*
**U.S. Cl. 320—43** **2 Claims**



1. A battery remaining capacity measuring apparatus for measuring an open circuit until a battery is connected to a load together with a start of an operation, measuring a plurality of a closed circuit voltage and a current for every predetermined time after a state of said closed circuit, and obtaining an approximate linear function which shows a voltage-current characteristic according to said voltage and current, said apparatus comprising:

a remaining capacity operation portion for obtaining a voltage value whereby a reference value (I<0 ) is substituted in said approximate linear function whenever said approximate linear function, and displaying said voltage value as a remaining capacity operation portion.

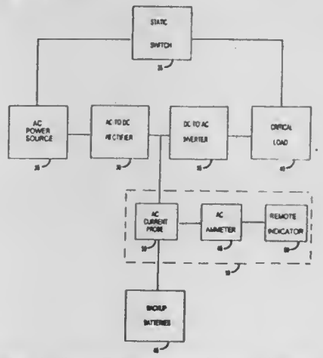
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**5,744,932**

## APPARATUS AND METHOD FOR MONITORING BACKUP BATTERY FLOW CHARGE

**William G. Kissel, 524 El Doro, Arlington, Tex. 76006**

**Filed Dec. 22, 1995, Ser. No. 577,477**
**Int. Cl.[6] H01M** *10/44;10/48;* **G01N** *27/416*
**U.S. Cl. 320—48** **3 Claims**



1. A method for determining a condition of a battery connected to an electrical system comprising:

a. monitoring an AC ripple current originating in said electrical system and flowing through said battery;

b. determining said condition of said battery from said AC ripple current;

c. comparing said AC ripple current to pre-selected limits; and

d. indicating when said AC ripple current is not within said pre-selected limits.

2. An apparatus for determining a condition of a battery connected to an electrical system comprising an AC current measurement device, connected between said battery and said electrical system, for measuring an AC ripple current flowing through said battery comprising:

a. a current comparator device coupled to said AC current measurement device for comparing said AC ripple current to pre-selected limits; and

b. an alarm condition indicator coupled to said current comparator device for communicating when said AC ripple current is not within said pre-selected limits.

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**5,744,933**

## VENDING MACHINE FOR CHARGING A SECONDARY BATTERY OF A MOBILE PHONE

**Katsuhiro Inoue, and Katsuya Numa, both of Tokyo, Japan, assignors to KN Technos Co., Ltd., Tokyo, Japan**

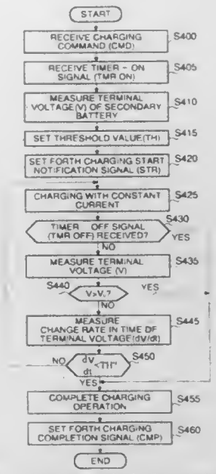
**Filed Nov. 13, 1996, Ser. No. 746,568**
**Claims priority, application Japan, Nov. 13, 1995, 7-317044; Nov. 6, 1996, 8-294079; Nov. 6, 1996, 8-294080; Nov. 6, 1996, 8-294081**
**Int. Cl.[6] H02J** *7/04*
**U.S. Cl. 320—110** **31 Claims**

1. A vending machine for charging a secondary battery of a mobile phone, comprising:

a plurality of charging means, each conforming to a specification of a mobile phone and a secondary battery of the mobile phone, for charging plural kinds of secondary batteries used in plural kinds of mobile phones;

instruction means for instructing a charging time corresponding to each of said plurality of charging means;





lock/unlock means for locking/unlocking a key on a door provided in each of said plurality of charging means;

reception means for receiving at least one coin and/or at least one banknote;

calculation means for calculating an amount of money of said coin and/or bill which have been received in said reception means; and

charging control means for controlling each of said plurality of charging means to charge a secondary battery of a mobile phone attached in one of said plurality of charging means, in accordance with the amount of money calculated by said calculation means and the charging time instructed by said instruction means.

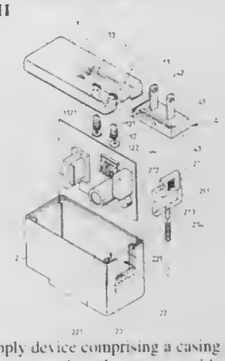
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**5,744,934**

## POWER SUPPLY DEVICE

**Michael Wu, Taipei Hsien, Taiwan, assignor to Formosa Electronic Industries Inc., Taipei Hsien, Taiwan**

**Filed Jun. 11, 1997, Ser. No. 873,237**
**Int. Cl.[6] H02M** *1/00*
**U.S. Cl. 320—111** **1 Claim**



1. A power supply device comprising a casing having a top open side, a cover plate covered on the top open side of said casing, an electronic exchanging type power circuit assembly mounted in said casing and adapted for dropping DC power supply to a predetermined voltage level and converting AC power supply into DC power supply, a DC power plug adapted for mounting on said top cover for connecting DC power supply from a DC power source to said electronic exchanging type power circuit assembly, and an AC power plug adapted for mounting on said top cover for connecting city power supply from an AC power supply outlet to said electronic exchanging type power circuit assembly, wherein:

said cover plate comprises a rectangular top chamber having an entrance at one end, two bevel tongues bilaterally and longitudinally disposed inside said rectangular top chamber, two vertical oblong holes longitudinally spaced inside said rectangular top chamber in the middle, two spring holders respectively disposed below said rectangular holes, two first spring elements respectively mounted in said spring holders, two AC terminals respectively supported on said first spring elements and connected to said electronic type power circuit assembly and having a respective contact tip projecting through said vertical oblong holes into said rectangular top chamber, two horizontal holes disposed at an inner side of said rectangular top chamber and spaced between said bevel tongues, two second spring elements respectively mounted in said horizontal holes, and two DC terminals respectively mounted in said horizontal holes and supported on said second spring elements and connected to said electronic exchanging type power circuit assembly;

said AC power plug comprises a rectangular base adapted to be inserted through said entrance into said rectangular top chamber of said cover plate and having a longitudinal bottom groove at a bottom side thereof and two longitudinal coupling grooves at two opposite lateral sides thereof for coupling to the bevel tongues of said cover plate, and two metal blades perpendicularly fastened to the rectangular base of said AC power plug and adapted for connecting to an AC power supply outlet and having a respective bottom end projecting into the longitudinal bottom groove of the rectangular base of said AC power plug, the bottom ends of said metal blades being respectively forced into contact with the AC terminals of said top cover when the rectangular base of said AC power plug is inserted into the rectangular top chamber of said cover plate;

said DC power plug comprise a rectangular base adapted to be inserted through said entrance into said rectangular top chamber of said cover plate and having a longitudinal bottom groove at a bottom side thereof and two longitudinal coupling grooves at two opposite lateral sides thereof for coupling to the bevel tongues of said top cover, two metal contacts spaced at a front side thereof which are respectively forced into contact with the DC terminals of said top cover when the rectangular base of said DC power plug is inserted into the rectangular top chamber of said cover plate, and a plug body perpendicularly raised from the rectangular base of said DC power plug and connected to said DC terminals and adapted for receiving DC power supply from a socket for cigarette lighter of a motor vehicle;

said casing comprises a side opening at one short side thereof, two vertical tracks behind said side opening, a receptacle on the inside between said vertical tracks, a spring mounted in said receptacle, a guide block moved in between said vertical tracks and having a bottom rod supported on the spring in said receptacle, and a stop plate fixedly fastened to said guide block at an outer side and defining with the topmost edge of said guide block a shoulder, the spring in said receptacle imparting an upward pressure to said guide block, causing said stop plate to block said entrance of said rectangular top chamber of said cover plate.

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**5,744,935**

## PROCESS AND APPARATUS FOR NICKEL-CADMIUM BATTERY REVIVAL

**Omar Fuad Khoury, P.O. Box 7203, Amman-11118, Jordan**

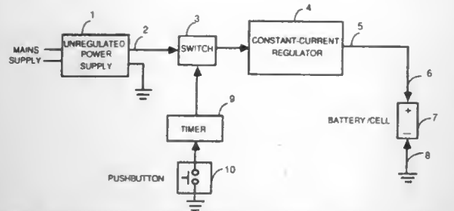
**Filed Aug. 6, 1996, Ser. No. 692,700**
**Int. Cl.[6] H01M** *10/44;* **H02J** *7/00*
**U.S. Cl. 320—2** **9 Claims**

1. A process to revive nickel-cadmium batteries or cells comprising:

providing a battery or cell suffering from unrechargeability and low, zero, or negative terminal voltage;

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the injection of a short-duration high-magnitude constant-amplitude current pulse through the battery or cell from the positive to the negative terminal;

and thereby raising the terminal voltage and allowing the battery or cell to be rechargeable and usable again.

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**5,744,936**

**ELECTRIC POWER ACCUMULATING APPARATUS AND ELECTRIC POWER SYSTEM**

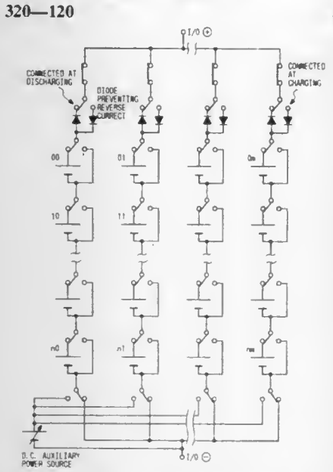
**Soichiro Kawakami, Nara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 187,014, Jan. 27, 1994, abandoned. This application Jan. 24, 1997, Ser. No. 789,601**

**Claims priority, application Japan, Jan. 29, 1993, 5-013722**

**Int. Cl.[6] H02J** *7/00*

**U.S. Cl. 320—120** **49 Claims**




1. An electric power accumulating apparatus provided with a parallel arrangement of plural groups each of which includes at least one secondary battery, comprising:

means for detecting an abnormality in each secondary battery of said plural groups;

means for electrically disconnecting one of at least three terminals connecting a secondary battery showing abnormality to the group from the secondary battery showing abnormality, and for connecting the other two terminals to shunt said secondary battery showing abnormality; and

one of an auxiliary power source and DC/DC converter for compensating the voltage corresponding to said detached battery,

wherein at least one diode is provided at least at one end of each group to prevent reverse current flow.

**5,744,937**

**DUAL BATTERY CHARGING DEVICE FOR CHARGING NICKEL METAL-HYDRIDE AND LITHIUM-ION BATTERIES**

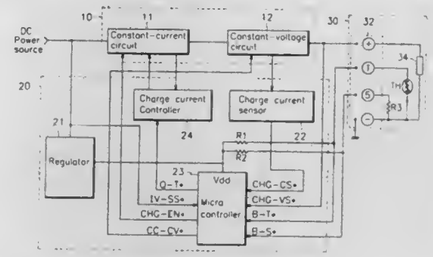
**Kyung-Yong Cheon, Suwon-si, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Oct. 10, 1996, Ser. No. 728,683**

**Claims priority, application Rep. of Korea, Oct. 12, 1995, 35207/1995**

**Int. Cl.[6] H02J** *7/00*

**U.S. Cl. 320—125** **25 Claims**




1. A dual battery charging device, comprising:

battery connector means having a plurality of terminals disposed thereon, for accommodating an insertion of a rechargeable battery selected from the group comprised of nickel metal-hydride batteries and lithium-ion batteries for a battery charging operation;

charging means comprising constant-current means and constant-voltage means electrically coupled to a power source for respectively supplying a charge current and a charge voltage to said battery connector means, during said battery charging operation to charge said rechargeable battery; and

controller means operatively connected to said battery connector means and said charging means, for determining a temperature and a type of the rechargeable battery and controlling the charge current and the charge voltage output from said charging means to said battery connector means to charge said rechargeable battery in dependence upon the temperature and the type of the rechargeable battery determined.

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**5,744,938**

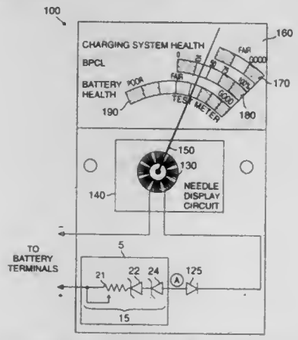
**METHOD AND APPARATUS FOR TESTING A VEHICLE CHARGE STORAGE SYSTEM**

**Wesley A. Rogers, Grosse Pointe Park, Mich., assignor to Electronic Development, Inc., Grosse Pointe Park, Mich.**

**Filed Jul. 16, 1996, Ser. No. 680,771**

**Int. Cl.[6] H01M** *10/48*

**U.S. Cl. 320—134** **25 Claims**




1. An apparatus for testing a charge storage system in a vehicle, said apparatus comprising:



a measurement circuit for measuring a terminal voltage of a battery in the vehicle, said circuit providing an output which varies in linear relation to the terminal voltage of the battery within an expected range of voltages, wherein said output is provided only when the terminal voltage of the battery exceeds a threshold level;

a display circuit for indicating at least one charge storage system operating condition based on the terminal voltage of the battery, said display circuit being electrically connected to the output of the measurement circuit; and

means for electrically connecting said measurement circuit to the battery.

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**5,744,939**

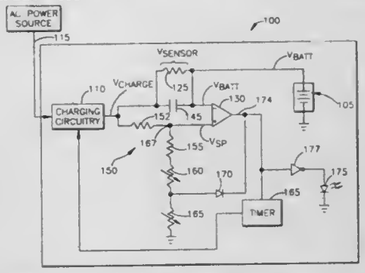
**TEMPERATURE COMPENSATION MONITORING CIRCUIT FOR A BATTERY PACK CHARGING APPARATUS**

**Lee E. Leppo, Tallmadge, Ohio, assignor to Telxon Corp., Akron, Ohio**

**Filed Sep. 5, 1996, Ser. No. 708,468**

**Int. Cl.[6] H01M** *10/46*

**U.S. Cl. 320—153** **14 Claims**




1. A monitoring circuit for a battery pack charging apparatus comprising:

a) a sensor resistor coupled between charging circuitry of the battery pack charging apparatus and a battery pack being charged by the charging circuitry, a voltage drop across the sensor resistor being proportional to a charging current through the battery pack;

b) a voltage divider circuit coupled to the charging circuitry, the voltage divider circuit including a first resistor and a first thermistor coupled in series, a set point voltage being taken off a node of the voltage divider circuit between the first resistor and the first thermistor, the voltage divider circuit set point voltage varying as a function of battery pack temperature such that when a voltage across the battery pack exceeds the voltage divider circuit set point voltage, the battery pack has been charged to a charge condition of between 90 and 95 percent of a fully charged condition;

c) a comparator, wherein the voltage across the battery pack is coupled to a first input of the comparator and the voltage divider circuit set point voltage is coupled to a second input of the comparator and an output state of the comparator changes when the voltage across the battery pack exceeds the voltage divider circuit set point voltage; and

d) a second thermistor coupled in series between the first thermistor and ground and a diode coupled between an output of the comparator and a node between the first and second thermistors, an anode end of the diode being coupled to the node between the first and second thermistors and a cathode end of the diode being coupled to the output of the comparator.

**5,744,940**

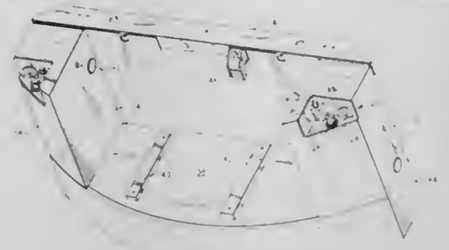
**FUEL TANK HAVING PASS THROUGH CONDUITS**

**Mark W. Colton, Clay; Vincent P. Fecteau, and Vincent D. Green, both of East Syracuse, all of N.Y., assignors to Carrier Corporatinn, Syracuse, N.Y.**

**Filed Dec. 26, 1995, Ser. No. 578,263**

**Int. Cl.[6] H02K** *5/00*

**U.S. Cl. 322—1** **9 Claims**



1. A fluid storage tank comprising:

wall means defining an enclosed volume for the storage of a fluid therein;

a first opening in said wall means;

a second opening in said wall means spaced from said first opening; and

an open conduit disposed within said enclosed volume, said conduit having a first portion thereof circumferentially engaging and sealingly attached to said first opening, said conduit having a second portion there of circumferentially engaging and sealingly attached to said second opening.

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**5,744,941**

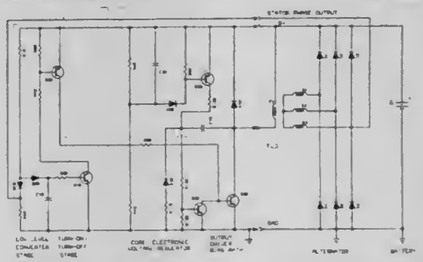
**SINGLE-WIRE-CONNECTED HIGH-SENSITIVITY DUAL-MODE A.C./D.C. TURN-ON/TURN-OFF STAGE FOR AN ELECTRONIC VOLTAGE REGULATOR**

**Luis E. Bartol, and German Holguin, both of c/o Industrias Condor, S.A. de C.V., Blvd M. Cervantes Saavedra no. 17, Col Granada 11520, Mexico**

**Filed May 14, 1996, Ser. No. 645,611**

**Int. Cl.[6] H02P** *9/00*

**U.S. Cl. 322—28** **14 Claims**



1. A turn-on/turn-off stage for an "A" type electronic voltage regulator which stage operates (i) between a battery voltage and a ground, and (ii) responsively to a control signal received from an alternator or from any suitable a.c. or d.c. voltage source, in order to (1) turn on the voltage regulator, enabling regulation of the alternator, and also to (2) turn off the voltage regulator, presenting a high impedance to a battery, the electronic voltage regulator turn-on/turn-off stage comprising:

a first resistor; connected in electrical series between the battery positive and the battery negative with

a two legged circuit including

a first leg including a first diode forward-biased to the battery voltage in electrical series with a second resistor, connected in electrical parallel with

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a second leg including a second diode forward-biased to the battery voltage and a capacitor,

where the electrical control signal from the alternator or from any other suitable a.c. or d.c. voltage source is received by the two-legged circuit between its first diode and its second resistor; and

a third resistor, connected in electrical series between a node formed by the second diode and

an amplifier for amplifying a voltage stored upon the capacitor to turn on an output driver of the voltage regulator, enabling regulation of the alternator, and to turn off this voltage regulator output driver, presenting a high impedance to a battery.

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**5,744,942**

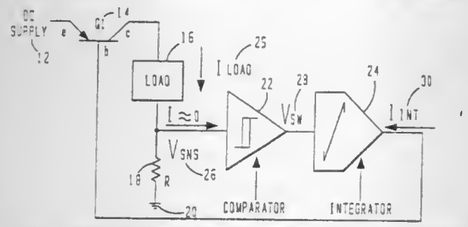
**LINEAR SLEWING REGULATOR**

**Gene Lee Armstrong, II, Garland, and David Louis Freeman, Plano, both of Tex., assignors to Benchmarq Microelectronics, Inc., Dallas, Tex.**

**Continuation of Ser. No. 323,035, Oct. 14, 1994, Pat. No. 5,548,204. This application Aug. 20, 1996, Ser. No. 700,295**

**Int. Cl.[6] G05F** *1/573*

**U.S. Cl. 323—277** **4 Claims**




1. An inductorless linear slewing regulator integrated circuit, comprising:

an output terminal;

a sense terminal for sensing the parameters of an external load that are to be regulated;

an external linear pass element having an input and an output and a control input, said linear pass element for being connected between a DC power supply and said external load;

a switching device for generating pulses that vary between first and second voltage levels at a repetitive rate that varies as a function of said sensed regulation parameters; and

a converter for converting said pulses to a control signal to drive the control input of said linear pass element in a feedback mode to provide regulation to said external load.

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**5,744,943**

**CIRCUITRY FOR SUPPLYING DC POWER TO A SMALL-SIZE ELECTRONIC APPARATUS**

**Yoichi Tokai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Sep. 26, 1996, Ser. No. 721,056**

**Claims priority, application Japan, Sep. 27, 1995, 7-249657; Sep. 29, 1995, 7-253262**

**Int. Cl.[6] G05F** *1/40*

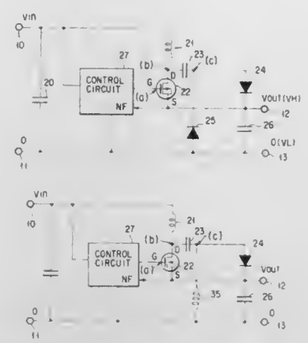
**U.S. Cl. 323—282** **17 Claims**

1. A chopper-type switching power-supply circuit having a DC high-potential input terminal, a DC low-potential input terminal, a DC high-potential output terminal and a DC low-potential output terminal, said circuit comprising:

an inductor connected at one end to the DC high-potential input terminal;

a capacitor connected at one end to the other terminal of the inductor;

an output circuit which comprises said DC high-potential output terminal and said DC low-potential output terminal and which has a first input terminal coupled to the other end of said capacitor and a second input terminal coupled to the DC low-potential input terminal;




an N-channel MOSFET having a drain electrode connected to the other end of said inductor and a source electrode connected to the high-potential output terminal; and

a control circuit, including at least a differential amplifier and a PWM control amplifier, for supplying a pulse-width control signal to the gate electrode of said N-channel MOSFET in accordance with the potential at the output terminals of said output circuit, thereby to perform negative feedback chopper control on said N-channel MOSFET.

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**5,744,944**

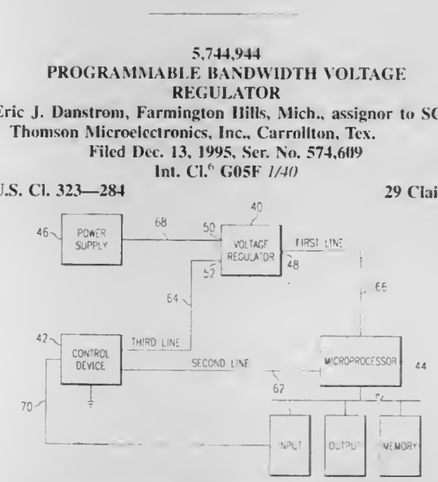
**PROGRAMMABLE BANDWIDTH VOLTAGE REGULATOR**

**Eric J. Danstrom, Farmington Hills, Mich., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.**

**Filed Dec. 13, 1995, Ser. No. 574,609**

**Int. Cl.[6] G05F** *1/40*

**U.S. Cl. 323—284** **29 Claims**




1. The electronic system comprising:

at least one component capable of operating at either of at least two power consumption levels, having a power supply input, and a control input;

a control device for detecting that the component is to start and stop being accessed prior to the component being accessed based on an access signal, the control device having an access signal input, a first control output coupled to the control input of the component for signaling the component to switch from one power consumption level to another power consumption level, and a second control output for producing a control signal responsive to the access signal;

a power supply including:

a voltage regulator capable of operating with two or more bandwidths comprising:

a first input coupled to a power source;

a second input coupled to the second control output for receiving the control signal the voltage regulator switches from one bandwidth to another bandwidth responsive to the control signal received at the second input; and,



an output coupled to the power supply input of the component.

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**5,744,945**

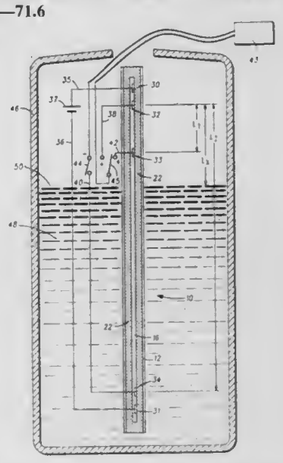
**CRYOGENIC FLUID-LEVEL SENSOR**

**James D. Hodge; Lori J. Klemptner, both of Lincolnwood, Ill., and Justin Whitney, Sandy, Utah, assignors to Illinois Superconductor Corporation, Mt. Prospect, Ill.**

**Division of Ser. No. 984,060, Nov. 30, 1992, Pat. No. 5,393,736. This application Nov. 8, 1994, Ser. No. 336,275**

**Int. Cl.[6] G01N** *27/00;* **H01L** *39/16;* **G01F** *23/24*

**U.S. Cl. 324—71.6** **7 Claims**



1. A method of using a cryogenic fluid level sensor assembly, comprising the steps of:

placing a length of high temperature ceramic superconductor material in contact with a cryogenic fluid;

operating said ceramic superconductor material above its level of critical current density;

providing an input voltage between a first location and a second location along said length of ceramic superconductor material; and

measuring a voltage drop between a third location on said length of ceramic superconductor material and said second location, said voltage drop varying with the length of a cryogenic fluid column in contact with said ceramic superconductor material thereby providing an indication of a level of cryogenic fluid.

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**5,744,946**

**PRINTED CIRCUIT BOARD FAULT INJECTION CIRCUIT**

**Brian Keith Lucas, Avon, England, assignor to Proteus Corporation, Denver, Colo.**

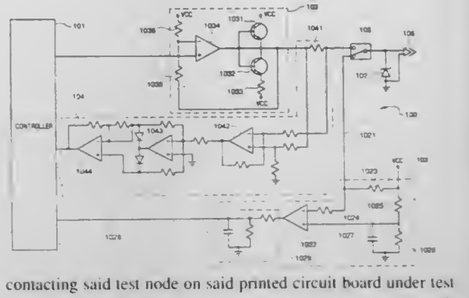
**Division of Ser. No. 187,783, Jan. 25, 1994, Pat. No. 5,550,844, which is a continuation of Ser. No. 978,752, Nov. 19, 1992, abandoned. This application Aug. 19, 1996, Ser. No. 699,468**

**Int. Cl.[6] G01R** *31/28*

**U.S. Cl. 324—73.1** **6 Claims**

1. A method for driving a test node on a printed circuit board under test to a logical zero, said method comprising the steps of:

placing said printed circuit board under test in a power-on operational condition wherein said test node on said printed circuit board can operate under power-on test conditions between first and second predetermined voltages representative of logic one and logic zero states, respectively, said first predetermined voltage being greater in magnitude than said second predetermined voltage;




contacting said test node on said printed circuit board under test with a circuit testing device external to said printed circuit board under test;

generating from said circuit testing device a drive signal voltage of a predetermined fixed magnitude having a value less than said second predetermined voltage representative of logic zero; and

applying said drive signal voltage of fixed magnitude to said test node on said printed circuit board under test via a probe lead connecting said printed circuit board under test with said circuit testing device to drive a voltage at said test node to a value representative of a stuck at zero state while said printed circuit board is powered to operate between said first and second predetermined voltages.

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**5,744,947**

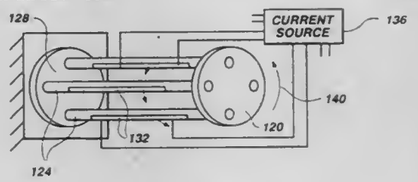
**MOVEMENT ACTUATOR/SENSOR SYSTEMS**

**Stephen L. Jacobsen, and David L. Wells, both of Salt Lake City, Utah, assignors to Sarcos Group, Salt Lake City, Utah**

**Division of Ser. No. 480,018, Jun. 7, 1995, Pat. No. 5,594,330, which is a division of Ser. No. 898,216, Jun. 12, 1992, Pat. No. 5,481,184, which is a continuation-in-part of Ser. No. 816,628, Dec. 31, 1991, Pat. No. 5,269,882, which is a continuation-in-part of Ser. No. 647,659, Jan. 28, 1991, Pat. No. 5,106,455. This application Nov. 7, 1996, Ser. No. 744,380**

**Int. Cl.[6] G01R** *5/22;* **H02M** *7/00*

**U.S. Cl. 324—106** **1 Claim**




1. A rotational movement actuator comprising

a base,

a plurality of elongate, flexible bars having fixed ends attached to the base at circumferentially spaced-apart locations to extend outward, generally in parallel, from the base,

cap means coupling the free ends of the bars in fixed relationship,

a plurality of actuable means, each disposed on a respective rod on a side in line with the circumferential spacing of the rods and responsive to actuation signals for causing the bending of the respective rod in a direction in line with the circumferential spacing, and

means for applying actuation signals to the actuable means to cause bending of the rods and thus rotation of the cap means.

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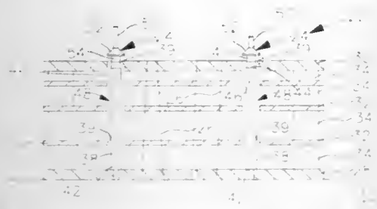


**5,744,948**

## PRINTED CIRCUIT BOARD HANDLING DEVICE

**Mark A. Swart, Upland, Calif., assignor to Everett Charles Technologies, Inc., Pomona, Calif.**

**Filed Aug. 15, 1995, Ser. No. 515,455**
**Int. Cl.[6] G01R** *31/02*
**U.S. Cl. 324—158.1** **10 Claims**



1. A test fixture assembly for releasably retaining a printed circuit board on a test fixture and for facilitating transfer of the board to and removal of the board from the fixture during a sequential test operation in which circuit boards under test are held in a test position, tested by a printed circuit board test apparatus, removed from the test position, and unloaded from the fixture, the test fixture assembly comprising:

a plurality of substantially parallel pin-supporting fixturing plate members;

a plurality of conductive test pins disposed in the test fixture for alignment with circuits on the board under test, the test pins supported in the test position within the fixture by the fixturing plate members; and

at least one board retaining assembly mounted to the fixture, the board retaining assembly including a board retaining device positioned adjacent a surface of the test fixture, and an elongated support member disposed perpendicularly through the fixture and rigidly connected at one end to one of the plate members of the fixture, the board retaining device affixed to a free end of the support member spaced from its rigid connection to the plate member, the support member being attached to the fixture so that its free end moves angularly relative to the fixturing plate members in response to a lateral force applied to the board retaining device in a direction away from the board under test, the support member having a normal position for mounting the board retaining device in a first position for releasably engaging an edge of the printed circuit board to firmly hold the board on the surface of the test fixture, the support member having a board release position in which said lateral force applied to the board retaining device moves the free end of the support member away from the board to move the board retaining device to a second position released from engagement with the edge of the board to thereby facilitate removal of the board from the test fixture.

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**5,744,949**

## ANALOG TEST CELL CIRCUIT

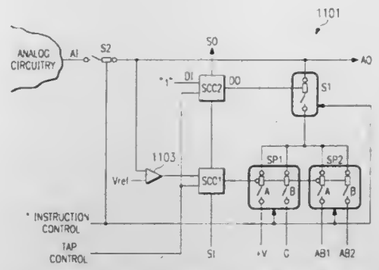
**Lee D. Whetsel, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 679,024, Jul. 12, 1996, abandoned, which is a continuation of Ser. No. 383,537, Feb. 2, 1995, abandoned, which is a continuation of Ser. No. 108,091, Aug. 17, 1993, abandoned. This application Mar. 14, 1997, Ser. No. 818,372**
**Int. Cl.[6] G01R** *31/28*
**U.S. Cl. 324—158.1** **7 Claims**

1. An electrical circuit with test capability, comprising:

functional circuitry for performing normal operating functions of the electrical circuit, said functional circuitry including an analog signal path for carrying an analog signal during performance of said normal operating functions;

first and second nodes for use in testing said analog signal path;




a first switching element connected to said first node and a second switching element connected to said second node, said first and second switching elements connected to one another to provide a signal path between said first and second nodes via said first and second switching elements; and

a third switching element connected between said analog signal path and said first and second switching elements, said first and third switching elements cooperable to provide a first test signal path from said first node through said first and third switching elements to said analog signal path for carrying a test signal between said first node and said analog signal path, and said second and third switching elements cooperable to provide a second test signal path from said second node through said second and third switching elements to said analog signal path.

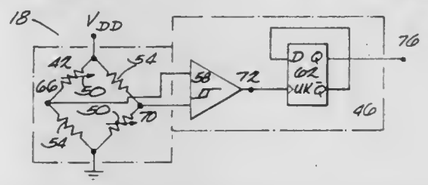
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**5,744,950**

## APPARATUS FOR DETECTING THE SPEED OF A ROTATING ELEMENT INCLUDING SIGNAL CONDITIONING TO PROVIDE A FIFTY PERCENT DUTY CYCLE

**James D. Seefeldt, DeForest, Wis., assignor to SSI Technologies, Inc., Janesville, Wis.**

**Filed May 9, 1996, Ser. No. 647,308**
**Int. Cl.[6] G01P** *3/481;3/489;33/09;* **H03K** *3/017*
**U.S. Cl. 324—166** **19 Claims**




1. A sensor for determining the rotational speed of a rotating element, said sensor comprising:

a tone wheel mounted on the rotating element, said tone wheel having a predetermined number of teeth,

a giant magnetoresistive ratio sensing device magnetically coupled to said tone wheel and including an output terminal, said sensing device generating an output signal at said output terminal having a frequency corresponding to at least twice the rotational speed of the rotating element multiplied by the number of teeth;

a wave-shaping circuit connected to said output terminal for receiving said output signal and for generating a digital switching signal having a frequency equal to the frequency of said output signal; and

a frequency divider having an input connected to said wave shaping circuit for receiving said digital switching signal, said frequency divider generating, in response to said digital switching signal, a square wave output signal indicative of the rotational speed of the rotating element, having a 50% duty cycle and a frequency equal to the frequency of said digital switching signal divided by a predetermined divisor, wherein said predetermined divisor is greater than or equal to two.

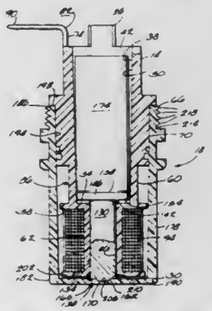


**5,744,951**

## HOUSING FOR A WHEEL SPEED SENSOR HAVING COIL BOBBIN SUSPENDED WITHIN THE HOUSING

**Brian G. Babin, Clinton Township, Mich., and Daniel D. Jarodsky, St. Charles, Ill., assignors to SSI Technologies, Inc., Janesville, Wis.**

**Division of Ser. No. 363,900, Dec. 27, 1994, Pat. No. 5,629,618. This application Sep. 12, 1996, Ser. No. 712,792**
**Int. Cl.[6] G01P** *3/488;1/02;* **H01F** *27/02*
**U.S. Cl. 324—173** **16 Claims**



1. A sensor for detecting the angular velocity of a rotating member, said sensor comprising:

a bobbin having a shoulder portion and an end portion spaced from said shoulder portion, said shoulder portion facing toward said end portion and said end portion defining an annular recess;

a coil mounted on said bobbin and within said recess; and

a housing for receiving said end portion of said bobbin to enclose said coil within said housing, said housing having an end wall including an inner surface and said housing also having an annular rim facing away from said end wall and engaging said shoulder portion of said bobbin so that said end portion of said bobbin is completely suspended within said housing and is spaced from said inner surface of said end wall.

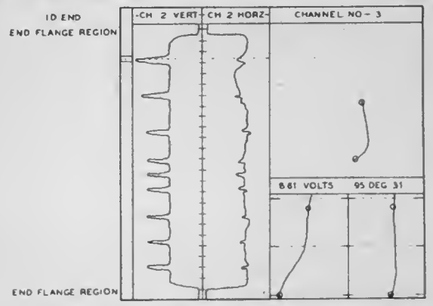
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**5,744,952**

## EDDY CURRENT MEASUREMENT OF TUBE ELEMENT SPACING

**Wayne Meredith Latham, Forest; Jimmy Wade Hancock, Lynchburg, and Jayne Marie Grut, Madison Heights, all of Va., assignors to McDermott Technology, Inc., New Orleans, La.**

**Filed Feb. 25, 1997, Ser. No. 805,956**
**Int. Cl.[6] G01B** *7/14;7/06;* **G01N** *27/72*
**U.S. Cl. 324—207.16** **4 Claims**




1. A method for measuring the spacing between tubes in a heat exchanger, comprising:

a. inserting a ferrite slug into a first tube of the heat exchanger;

b. inserting an eddy current coil operated in the absolute mode to a location corresponding to the ferrite slug into a second tube and scanning the second tube with the coil whereby the coil generates signals in response to the presence and distance of the ferrite slug; and

c. comparing signals received from the eddy current coil during the scan to calibrated signals representative of known spacing between tubes to determine the spacing between the first and second tubes.

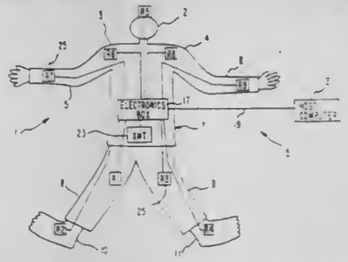
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**5,744,953**

## MAGNETIC MOTION TRACKER WITH TRANSMITTER PLACED ON TRACKED OBJECT

**Per Krogh Hansen, Burlington, Vt., assignor to Ascension Technology Corporation, Burlington, Vt.**

**Filed Aug. 29, 1996, Ser. No. 705,305**
**Int. Cl.[6] G01B** *7/14;7/30;* **G01R** *33/00;* **A61B** *5/103*
**U.S. Cl. 324—207.17** **30 Claims**




1. A motion tracking system for tracking motions of an object, comprising:

a) a transmitter mounted on an object, said transmitter including three orthogonal magnetic coils including a one-axis long range transmitter and a two-axis short range transmitter;

b) at least one sensor mounted on said object spaced from said transmitter;

c) a computer including control means for controlling operation of said transmitter; and

d) said computer receiving signals from said sensor and, therefrom, calculating position and orientation of said sensor with respect to said transmitter.

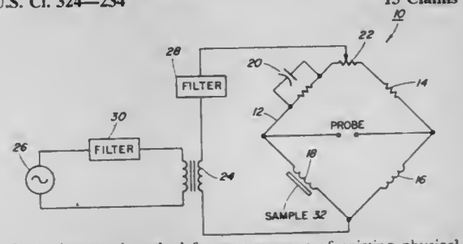
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**5,744,954**

## MAGNETIC FIELD GENERATION IN FERROMAGNETIC METAL OBJECTS

**Jack Arbuthnott Soules, Shaker Heights, Ohio, assignor to Cleveland State University, Cleveland, Ohio**

**Filed Nov. 25, 1996, Ser. No. 755,785**
**Int. Cl.[6] G01N** *27/72;* **G01R** *33/12*
**U.S. Cl. 324—234** **13 Claims**




1. An improved method for measurement of existing physical properties in a ferromagnetic metal object which comprises:

(a) contacting a surface of said ferromagnetic metal object with a probe device having spaced apart identical test and comparison induction coils,

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(b) both induction coils in said probe device further being limited in construction so that electrical output from said test induction coil generates a magnetic field in said ferromagnetic metal object tested below that causing any substantial domain shift in said metal, wherein said maximum allowable magnetic field may be as large as $10^{-1}$ Tesla in some hard ferromagnetic metal objects and as small as $10^{-5}$ Tesla in very soft ferromagnetic metal objects and wherein limiting said magnitude of said alternating magnetic field prevents the excitation of domain movement and eliminates Barkhausen noise,

(c) said test and comparison induction coils of said probe device providing bridge arms in an alternating current bridge circuit formed in combination with resistor elements, said resistor elements exhibiting the same resistance characteristics,

(d) energizing said bridge circuit at an operating frequency suitable for the particular ferromagnetic metal object being tested causing self-inductance eddy current flow in both induction coils of said probe device while said test induction coil in said probe device remains in physical contact with said surface of said ferromagnetic metal object being tested,

(e) balancing said bridge circuit during said probe operation,

(f) repeating steps (a) through (e) with said prove device at the same operating conditions while employing a ferromagnetic metal object having the same metallurgical characteristics, and

(g) comparing electrical conductivity values detected for said respective ferromagnetic metal objects to determine any differences found therebetween.

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**5,744,955**

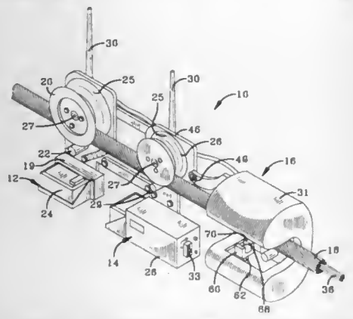
**APPARATUS AND METHOD OF DETECTING LOSS OF CROSS-SECTIONAL AREA OF MAGNETIC METALLIC STRENGTH MEMBERS USED IN CONDUCTORS SUCH AS ALUMINUM CONDUCTOR STEEL REINFORCED (ACSR) CONDUCTORS**

**James R. Booker, 11718 Walnut Hill Dr., Baltimore, Ohio 43105**

**Continuation-in-part of Ser. No. 510,198, Aug. 2, 1995. This application Oct. 18, 1995, Ser. No. 544,598**

**Int. Cl.[6] G01N *27/82;27/90***

**U.S. Cl. 324—240** **14 Claims**



1. An apparatus for detecting a loss of structural strength in a generally cylindrical conductor having a length and at least one metallic reinforcing member extending along the length of said conductor capable of exhibiting magnetic properties, comprising:

a rotatable source of magnetic energy configured to emanate a rotating magnetic field;

a coil winding mounted in a predetermined spaced relationship opposite from the source of magnetic energy defining a receiving space therebetween, wherein the receiving space is configured to receive said conductor having at least one metallic reinforcing member in spaced relationship between the source of magnetic energy and said coil winding to enable the rotating magnetic field emanating therefrom to induce a measurable voltage within the coil winding;

a rotatable member operatively mounted on said detector apparatus for biased, force-transmitting engagement on said conductor to movably support said detector apparatus for longitudinal movement along the length of said conductor and align said receiving space in a predetermined position relative to the longitudinal axis of said conductor.

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**5,744,956**

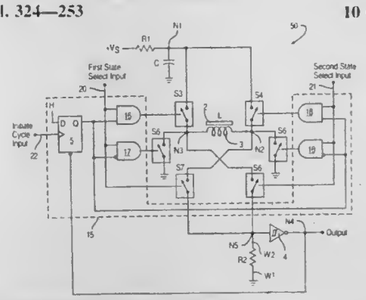
**LOW POWER MAGNETOMETER CIRCUITS HAVING ZERO OFFSET COMPENSATION**

**Timothy J. Hawks, 542 Forest Ave., Apt. B, Palo Alto, Calif. 94301-2618**

**Division of Ser. No. 255,651, Jun. 8, 1994, Pat. No. 5,642,046. This application Apr. 15, 1997, Ser. No. 838,095**

**Int. Cl.[6] G01R *33/04***

**U.S. Cl. 324—253** **10 Claims**



1. A magnetometer circuit comprising:

first (GND) and second ($V_S$) power terminals for application of a potential;

a sensor coil (3) including a saturable core, said sensor coil having first (N3) and second (N2) terminals;

a voltage sensor (4) having an input terminal (N5) and an output terminal (N4);

an impedance (R2, R3, or R5) having first and second terminals, with a first link (W1, S9, or S13) connecting said first impedance terminal to said first power terminal (GND) and a second link (W2, S11, or S12) connecting said second impedance terminal to said input terminal (N5) of said voltage sensor (4); and

circuitry (15 or 27) for providing bidirectional current flow through said sensor coil (3) in first and second operational states, such that in the first operational state said second terminal (N2) of said sensor coil (3) is connected to said input terminal (N5) of said voltage sensor (4) and said first terminal (N3) of said sensor coil (3) is sequentially and alternately coupled to receive first a first voltage from said second power terminal ($V_S$) and secondly a second voltage from said first power terminal (GND), and in the second operational state said first terminal (N3) of said sensor coil (3) is connected to said input terminal (N5) of said voltage sensor (4) and said second terminal (N2) of said sensor coil (3) is sequentially and alternately coupled to receive first said first voltage from said second power terminal ($V_S$) and secondly said second voltage from said first power terminal (GND).

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**5,744,957**

**CAVITY RESONATOR FOR NMR SYSTEMS**

**John Thomas Vaughan, Jr., Lynnfield, Mass., assignor to UAB Research Foundation, Birmingham, Ala.**

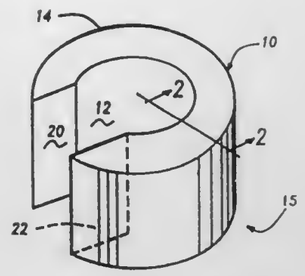
**Filed Aug. 15, 1995, Ser. No. 515,268**

**Int. Cl.[6] G01R *33/20***

**U.S. Cl. 324—318** **22 Claims**

1. A resonant cavity device for use in a nuclear magnetic resonance (NMR) system comprising:





a layer of electrically conductive material defining an electromagnetic resonant cavity, said cavity filled with a dielectric material, said cavity exhibiting a distributed impedance load,

means for energizing said cavity at a radio frequency useful for NMR systems,

wherein said cavity is dimensioned to resonate at said radio frequency to thereby generate an alternating magnetic field of a contour through said cavity; and

wherein said cavity includes an electromagnetic field aperture adapted to be positioned adjacent a target object to be analyzed, said aperture being dimensioned to conduct said alternating magnetic field across said aperture.

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**5,744,958**

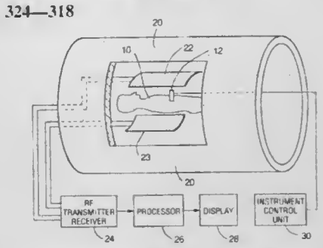
**INSTRUMENT HAVING ULTRA-THIN CONDUCTIVE COATING AND METHOD FOR MAGNETIC RESONANCE IMAGING OF SUCH INSTRUMENT**

**Roger W. Wernie, San Ramon, Calif., assignor to ITI Medical Technologies, Inc., Livermore, Calif.**

**Filed Nov. 7, 1995, Ser. No. 554,446**

**Int. Cl.[6] G01V *3/00***

**U.S. Cl. 324—318** **17 Claims**




1. A magnetic resonance imaging system, including:

an imaging region and a means for generating a magnetic resonance image of a target object in the imaging region, said magnetic resonance image including an image of the target object, wherein the means for generating the magnetic resonance image includes means for producing an RF field having an RF frequency in the imaging region; and

an instrument for use with the target object in the imaging region, said instrument including:

an electrically non-conductive body, sized for use with the target object in the imaging region; and

an electrically conductive, ultra-thin coating on at least part of the body, the coating being sufficiently thick to cause the instrument to be positively shown in the magnetic resonance image in response to presence of the instrument in the imaging region with the target object during generation of the magnetic resonance image, wherein the coating consists of material having a skin depth with respect to said RF frequency and the coating has a thickness less than the skin depth.

**5,744,959**

**NMR MEASUREMENT APPARATUS WITH PULSE TUBE COOLER**

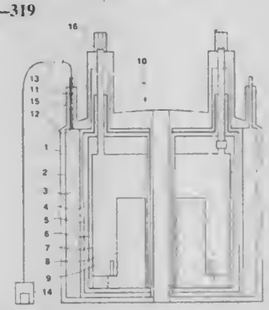
**René Jeker, Hombrechtikon; Silvio Di Nardo, Zürich, and Beat Mraz, Hombrechtikon, all of Switzerland, assignors to Spectrospin AG, Fällanden, Switzerland**

**Filed Dec. 3, 1996, Ser. No. 757,696**

**Claims priority, application Germany, Dec. 22, 1995, 195 48 273.5**

**Int. Cl.[6] G01V *3/00***

**U.S. Cl. 324—319** **11 Claims**



1. A high resolution nuclear magnetic resonance (NMR) measurement apparatus comprising:

a low loss cryostat;

a first tank disposed inside said cryostat, said first tank for containing cryogenic liquid;

a superconducting magnetic coil system disposed in said first tank for cooling by said cryogenic liquid, said superconducting magnet coil producing an extremely homogeneous magnet field for high resolution NMR spectroscopy;

a second tank disposed inside said cryostat and surrounding said first tank, said second tank mechanically mounted in said cryostat to vibrationally and cryogenically decouple said second tank from said first tank and from said superconducting magnet coil system, said second tank containing at least one of liquid nitrogen, said nitrogen, liquid air, solid air, liquid oxygen, solid oxygen, liquid neon and liquid argon; and

a pulse tube cooler having a cold end cryogenically thermally coupled to said second tank.

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**5,744,960**

**PLANAR OPEN MAGNET MRI SYSTEM**

**Yuly M. Pulyer, Revere, Mass., assignor to Brigham and Women's Hospital, Boston, Mass.**

**Filed Aug. 8, 1996, Ser. No. 695,174**

**Int. Cl.[6] G01V *3/00***

**U.S. Cl. 324—320** **18 Claims**

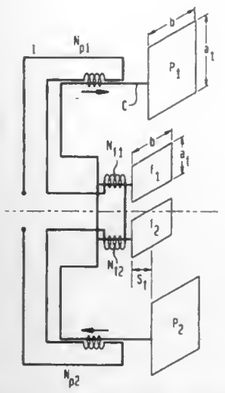
1. A magnetic resonance imaging system comprising an open magnet structure that provides a remote region of background field homogeneity for imaging, spatial encoding gradient coils and an rf coil, wherein the open magnet comprises:

a primary magnet having two primary pole pieces connected by a primary ferromagnetic core for internal flux, each primary pole piece having a surface facing away from the primary magnet, and

a bias magnet having two bias pole pieces located between the two primary pole pieces and connected by a bias ferromagnetic flux pathway for internal flux, the bias magnet being structured and arranged to have polarity opposite to the primary magnet, each bias pole piece having a surface facing away from the bias magnet and in a direction the same as the surfaces of the primary pole pieces.

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superposition of the magnetic fields of the primary magnet and bias magnet providing a region of substantial background field homogeneity remote from the magnets in said direction.

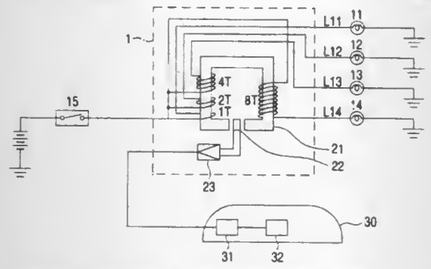
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**5,744,961**

**LAMP DISCONNECTION DETECTING DEVICE FOR IDENTIFYING A SPECIFIC LAMP WHICH HAS BECOME DISCONNECTED**

**Michihiro Otaka, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan**

**Filed Oct. 30, 1996, Ser. No. 741,118**
**Claims priority, application Japan, Nov. 1, 1995, 7-285134**
**Int. Cl.[6] G01R *31/02*; G08B *21/00***
**U.S. Cl. 324—403** **5 Claims**



1. A lamp disconnection detecting device comprising:
a magnetic core with a gap;
a plurality of detecting coils for detecting disconnection wound around said magnetic core, the number of turns of said plurality of detecting coils being different from one another and proportional to $2^n$, where n=0 or positive integers; and
a magnetic response section provided in said gap of said magnetic core for sensing a magnetic flux produced by current flowing through said detecting coils.

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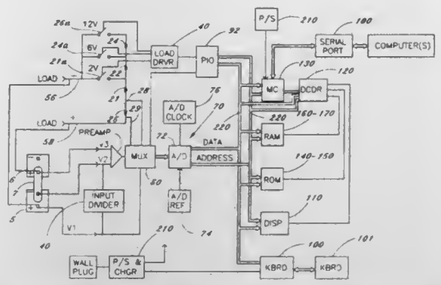
**5,744,962**

**AUTOMATED DATA STORING BATTERY TESTER AND MULTIMETER**

**Glenn Alber, and Edward W. Deveau, both of 990 S. Rogers Cir. Suite 11, Boca Raton, Fla. 33487**

**Filed Mar. 14, 1995, Ser. No. 404,031**
**Int. Cl.[6] G01R *27/26***
**U.S. Cl. 324—426** **15 Claims**

1. A data storing battery tester and multimeter for testing at least one battery in a plurality of batteries to predict whether said battery can provide a predetermined power level by determining at least the battery internal cell resistance, said battery being electrically connected in series by at least one conductive intercell link, said battery and batteries being connected to and used to supply power in electrical systems, said tester comprising:
an adjustable direct current (DC) resistance load;
resistance loading means, in electrical communication with said adjustable load, for selectively and automatically applying and removing said adjustable load across said battery while said battery remains connected to the electrical system to facilitate a load voltage and a float voltage, respectively, and to draw current;
processor means, in electrical communication with said resistance loading means, for reading said load voltage, said float voltage and said current draw and for calculating resistance of the intercell link and said internal cell resistance using said voltages and said current draw; wherein said load voltage, float voltage, current draw, intercell link resistance and internal cell resistance comprise data, said processor means including a prediction means for determining whether the battery can provide the predetermined power level based on said data;
memory means, in electrical communication with said processor means, for storing an algorithm used by said processor means to read and calculate said data and for storing said data
computer interface means, in electrical communication with said processor means, for communicating and interfacing with at least one computer peripheral to facilitate transferring said data to said computer; and
signal control means, in electrical communication with said resistance loading means and said processor means, for receiving input command signals and electrically providing output control signals to said processor means to facilitate the applying and removing of said adjustable load from said battery and processing of said data.



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**5,744,963**

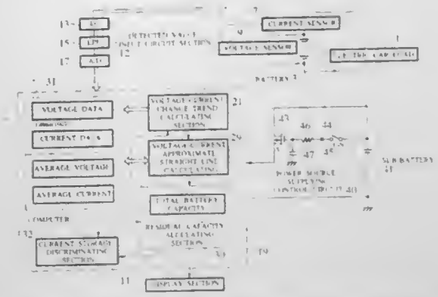
**BATTERY RESIDUAL CAPACITY MEASURING APPARATUS AND METHOD FOR MEASURING OPEN-CIRCUIT VOLTAGES AS THE BATTERY STARTS AND STOPS SUPPLYING POWER**

**Youichi Arai; Kenichi Shimoyama; Tsutomu Saigo, and Yoshihide Takada, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan**

**Filed Feb. 29, 1996, Ser. No. 609,128**
**Claims priority, application Japan, Mar. 3, 1995, 7-044152**
**Int. Cl.[6] G01N *27/416***
**U.S. Cl. 324—427** **6 Claims**

1. A battery residual capacity measuring apparatus, comprising:
a voltage-current change trend calculating section for while a battery is supplying power, collecting currents from the battery and terminal voltages of the battery;
a voltage-current approximate straight line calculating section for while the battery is supplying power, calculating an approximately linear function based upon the collected currents and the terminal voltages;
a battery residual capacity calculating section for measuring open-circuit voltages of the battery when the battery starts or stops supplying power so as to calculate and display a residual capacity according to a residual capacity voltage based upon the approximate linear function, and according to a total current capacity of the battery while the battery is supplying power; and
a current storage stop discriminating section for, only while the residual capacity voltage is lower than a previous residual capacity voltage, integrating the currents so as to obtain and store the total current capacity according to the open-circuit voltage measured when the battery stops supplying power, and according to the open-circuit voltage due to the integrated currents and due to the start of supplying the power when the supply of power is stopped.





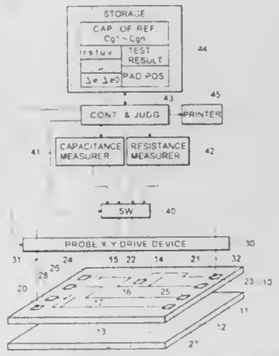
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**5,744,964**

**METHOD AND APPARATUS FOR ELECTRICAL TEST OF WIRING PATTERNS FORMED ON A PRINTED CIRCUIT BOARD**

**Morishiro Sudo; Masaru Ishijima, and Kazuo Yamazaki, all of Kawasaki, Japan, assignors to Fujitsu Automation Limited, Kawasaki, Japan**

**Filed Jul. 25, 1996, Ser. No. 686,391**
**Claims priority, application Japan, Mar. 11, 1995, 7-312444**
**Int. Cl.[6] G01R *31/02***
**U.S. Cl. 324—537** **8 Claims**



5. An electrical test apparatus for wiring patterns formed on a print-circuit board, comprising:
probes;
a probe drive device for moving said probes and placing said probes in contact with a conductive pattern formed on said print-circuit board;
a capacitance measuring device for measuring a capacitance between two of said probes;
a storage device; and
a control & judging device for controlling said probe drive device and said capacitance measuring device so as to measure, for each i=1 to n, a capacitance Cgi between a wiring pattern i of a print-circuit board of reference and a conductive plane arranged parallel thereto and so as to measure, for each i=1 to n, a capacitance Ci between a wiring pattern i of a print-circuit board to be tested and a conductive plane arranged parallel thereto, for calculating a ratio μ=an average value of some of said capacitances Ci, where i=1 to n/an average value of some, which correspond to said some of capacitances Ci, wherein i=1 to n, of capacitances Cgi, where j=1 to n,) essentially and for judging, for $1 \leq j \leq n$, that a wiring j has a defect if essentially $Cj < \mu Cgj(1-\Delta e)$ or $Cj > \mu Cgj(1+\Delta e)$ with Δe being a positive tolerance rate.

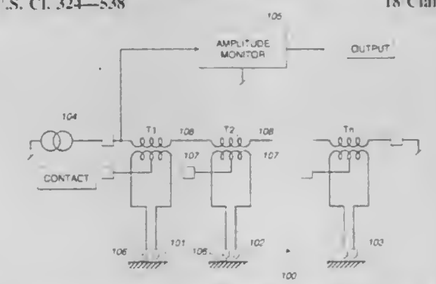
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**5,744,965**

**SYSTEM FOR CONTINUOUSLY MONITORING THE INTEGRITY OF AN ELECTRICAL CONTACT CONNECTION**

**Gabriel Lorimer Miller, Westfield, and Eric Richard Wagner, South Plainfield, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Sep. 17, 1996, Ser. No. 714,908**
**Int. Cl.[6] G01R *31/04***
**U.S. Cl. 324—538** **18 Claims**



1. A monitoring system for continuously monitoring the integrity of an electrical connection comprising:
a set of dual contact split pins having a first split pin and a second split pin, said set of dual contact split pins providing said electrical connection;
a transformer having a primary winding and secondary winding, said primary winding having an intermediate tap, a first primary end, and a second primary end, said secondary winding having a first secondary end and a second secondary end, said first split pin being electrically coupled to said first primary end of said primary winding, said second split pin being electrically coupled to said second primary end of said primary winding, said intermediate tap being electrically coupled to an unmonitored circuit connection;
an energy source electrically coupled to said first secondary end of said secondary winding, said second secondary end of said secondary winding electrically coupled to complete a circuit path from said energy source; and
a monitoring device electrically coupled to said first secondary end of said secondary winding, said monitoring device developing a first output value if impedance at said electrical connection is less than a threshold value, said monitoring device developing a second output value if impedance at said electrical connection is greater than said threshold value.

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**5,744,966**

**INSPECTION APPARATUS FOR SCREENING CONNECTORS WITH ACCESSORIES**

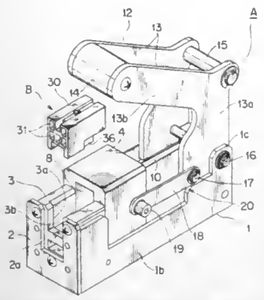
**Takayuki Sato, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan**

**Filed Oct. 10, 1996, Ser. No. 729,069**
**Claims priority, application Japan, Oct. 12, 1995, 7-264427**
**Int. Cl.[6] H01H *31/04***
**U.S. Cl. 324—538** **2 Claims**

1. An inspection apparatus for screening electric connectors, each having a housing, terminal chambers arranged in said connec-

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tor housing for containing and holding respective metal terminals and accessories including a clip and a terminal holder and fitted to the housing, said inspection apparatus comprising:

a connector support; and

an inspection apparatus main body releasably connectable to said connector support, wherein said inspection apparatus main body is provided with a test pin urged forward by a spring for electric connection with an electric test circuit, and wherein said inspection apparatus main body has a striker relief hole arranged on a side facing a side thereof facing said connector support;

said connector support being provided with an accessory detection mechanism designed to allow said connector support to approach said inspection apparatus main body when an accessory to be detected is present and to prevent said connector support from approaching said inspection apparatus main body when said accessory to be detected is not present, wherein said accessory detection mechanism comprises a striker holding chamber arranged under a connector containing chamber of said connector support and separated therefrom by means of a partition, an accessory detection pin retractable protecting through said partition, a striker arranged in the striker holding chamber and having a first end pivoted towards said striker holding chamber and a second opposed end freely disposed to project into said inspection apparatus main body through a front end of said connector support and a coil spring for urging said striker toward said connector containing chamber, said accessory detection mechanism being constantly supported by said striker at a base portion thereof.

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**5,744,967**

**APPARATUS FOR DETECTING INTERMITTENT AND CONTINUOUS FAULTS IN MULTIPLE CONDUCTOR WIRING AND TERMINATIONS FOR ELECTRONIC SYSTEMS**

**Brent A. Sorensen, 1801 W. 2100 South, West Haven, Utah 84401**

**Filed Aug. 24, 1995, Ser. No. 518,749**

**Int. Cl.[6] G01R** *31/02*

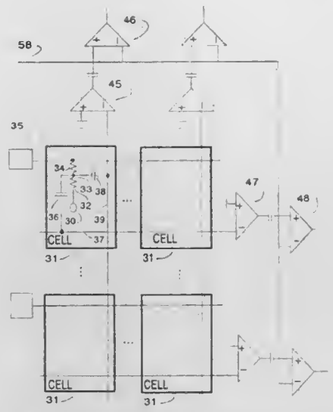
**U.S. Cl. 324—540** **19 Claims**

1. A tester for testing a system, wherein the system has a plurality of wires, wherein the tester has a plurality of pins each adapted for connection to a wire of the plurality of wires of the system, the tester comprising:

at least one row sense line and at least one column sense line;

an array of pin electronics cells, wherein each pin electronics cell couples a signal to one of the at least one row sense line and one of the at least one column sense line when a change in current flow through a tester pin connected to said pin electronics cell occurs;

apparatus for detecting the signal coupled to the at least one row sense line; and



apparatus for detecting the signal coupled to the at least one column sense line.

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**5,744,968**

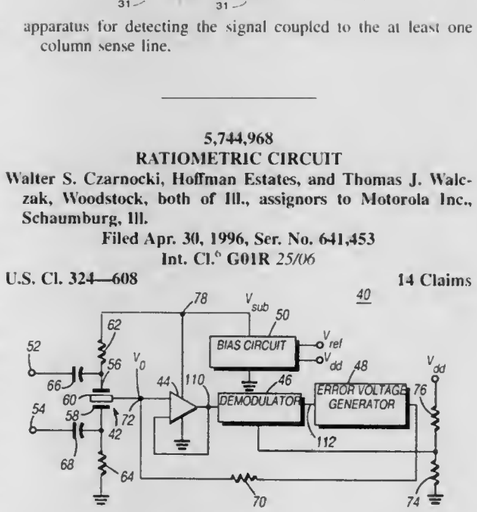
**RATIOMETRIC CIRCUIT**

**Walter S. Czarnocki, Hoffman Estates, and Thomas J. Walczak, Woodstock, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Apr. 30, 1996, Ser. No. 641,453**

**Int. Cl.[6] G01R** *25/06*

**U.S. Cl. 324—608** **14 Claims**



1. A ratiometric circuit comprising:

a differential capacitive sensor for sensing a change in capacitance;

a differential capacitive detector operatively connected to the differential capacitive sensor for detecting a change in the capacitance of the differential capacitve sensor;

an error voltage generator operatively connected to the differential capacitve detector for generating a corrective voltage in response to the detected change in capacitance; and

a bias circuit operatively connected to the differential capacitive sensor for generating a bias voltage inversely proportional to a supply voltage for maintaining a ratiometricity between an output voltage of the differential capacitive sensor and the supply voltage.

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**5,744,969**

**ANALOG AND MIXED SIGNAL DEVICE TESTER**

**Andrew Grochowski, and Shwu-Liang Luke Hsieh, both of Allentown, Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Dec. 29, 1995, Ser. No. 581,283**

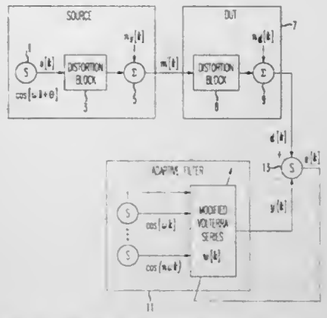
**Int. Cl.[6] G01R** *20/26*

**U.S. Cl. 324—614** **3 Claims**

1. A method of testing an integrated circuit comprising;

providing a signal input to said integrated circuit;





comparing the output of said integrated circuit to a Volterra series provided by an adaptive filter, thereby generating an error signal;

providing said error signal to said adaptive filter, thereby modifying said Volterra series;

using said modified Volterra series to determine the SNR of said integrated circuit.

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**5,744,970**

**MEASURING APPARATUS AND METHOD OF A PERMITTIVITY OF A DIELECTRIC MATERIAL**

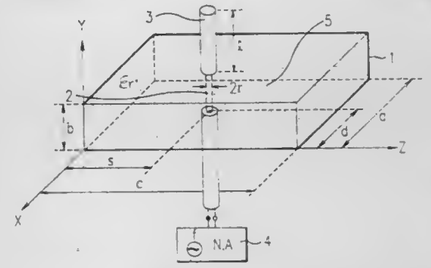
**Ki Chai Kim, Kyungsanbuk-do, and Se Yong Ro, Kyungki-do, both of Rep. of Korea, assignors to LG Electronics Inc., Seoul, Rep. of Korea**

**Continuation of Ser. No. 500,512, Jul. 11, 1995, abandoned. This application Mar. 7, 1997, Ser. No. 813,108**

**Claims priority, application Rep. of Korea, Nov. 15, 1994, 29888/1994**

**Int. Cl.[6] G01R** *27/04*

**U.S. Cl. 324—636** **7 Claims**



1. A measuring apparatus of a permittivity of a dielectric material comprising:

a power-feeding conductor installed within a cavity for supplying fixed frequency power;

a variable reactance attached to a surface of said cavity at the end of said power-feeding conductor for forcibly resonating said cavity by adjusting the length in accordance with the frequency of the supplied fixed frequency power; and

a network analyzer connected to said power-feeding conductor to identify resonance of the cavity,

wherein said cavity is an electrically small cavity at a non-resonating state when said dielectric material to be measured does not fill up said cavity.

**5,744,971**

**DEVICE AND APPARATUS FOR MEASURING DIELECTRIC PROPERTIES OF MATERIALS**

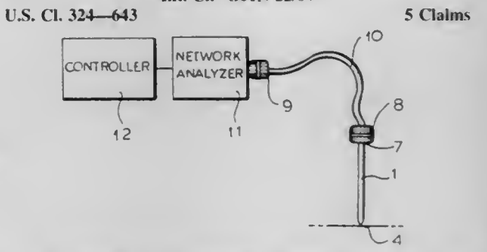
**Tsing Yee Amy Chan, and Marianne Odlyha, both of Birkbeck College, University of London, 29 Gordon Square, London, Great Britain, WC1H 0PP**

**Filed Sep. 7, 1995, Ser. No. 524,759**

**Claims priority, application United Kingdom, Sep. 9, 1994, 9418183**

**Int. Cl.[6] G01N** *22/04*

**U.S. Cl. 324—643** **5 Claims**



1. An apparatus for measuring the dielectric properties of rigid and semi-rigid materials, the apparatus comprising a probe having an inner conductor, and an outer conductor coaxial with the inner conductor, the probe having a first open end for contacting with the material without penetrating the surface thereof and a second end coupled to means for providing electromagnetic radiation having a frequency in the microwave range of the electromagnetic spectrum between 50 MHz and 20 GHz to the inner conductor for transmission thereby to the material through the first open end, and to means for analyzing the electromagnetic radiation transmitted to the material, reflected therefrom and transmitted back to the analyzing means via the outer conductor to provide a measurement of the dielectric properties of the material therefrom and to determine the moisture content of the material from the following formula:

$$(Y/2\pi\rho)\int_a^b E_\rho''(\rho)d\rho=(j\epsilon/2\pi)\int_a^b\int_0^{2\pi}E_\rho''(\rho)\cos(\Phi'-\Phi)\exp(-jk_2R_1)/R_1 d\Phi' d\rho'-\Sigma B_n\Phi_n^-(\rho),$$

wherein the primed coordinates correspond to simulated source points to predict the magnetic field in the sample region, R is the distance from the source point to a corresponding field point at $z=0$ and $R^2=\rho^2+\rho'^2-2\rho\rho'\cos(\Phi'-\Phi)$, $E_{\rho w}(\rho)$ is the electric field at the open end of the probe, Y the admittance, $\Phi_n'(\rho)$ is the derivative of the potential function $\Phi_n(\rho)$, with respect to $\rho$ where n is the order of the $Tm_{nm}$ mode, B is the relative amplitude of the corresponding order mode propagating in the $-z$ direction, $k_2$ is the wave number in the sample, and w is the angular frequency.

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**5,744,972**

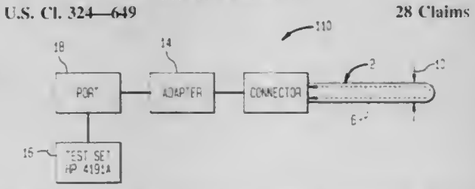
**DEVICE AND METHOD TO MEASURE THE COMPLEX PERMEABILITY OF THIN FILMS AT ULTRA-HIGH FREQUENCIES**

**Vladislav Korenivski, Westfield; Zhengxiang Ma, New Providence; Paul Matthew Mankiewich, Glen Gardner; Paul Anthony Polakos, Marlboro, and Robert Bruce van Dover, Maplewood, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Apr. 5, 1996, Ser. No. 627,638**

**Int. Cl.[6] G01N** *27/72*

**U.S. Cl. 324—649** **28 Claims**



1. A method for measuring the complex permeability of thin films at ultra-high frequencies comprising the steps of:

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providing a conductive strip having a first end and an opposite second end, said conductive strip being formed into a loop by turning said first end toward said second end;

measuring a first inductance and a first resistance for the loop at one or more of said ultra-high frequencies when empty;

loading the loop with a sample thin film to form a loaded loop;

measuring a second inductance and a second resistance of the loaded loop at said one or more of said ultra-high frequencies;

determining a resistance change by subtracting said first resistance from said second resistance;

determining an inductance change by subtracting said first inductance from said second inductance; and

calculating the permeability of the thin film from said resistance change and said inductance change.

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**5,744,973**

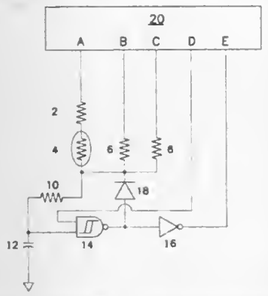
## RESISTANCE TO FREQUENCY CIRCUIT FOR MEASURING AMBIENT TEMPERATURE ON A THERMOSTAT

**Douglas D. Bird, Dayton, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Jul. 21, 1995, Ser. No. 505,831**

**Int. Cl.[6] G01R** *27/08; G05D 23/00; G01K 7/00*

**U.S. Cl. 324—707** **4 Claims**




1. A resistance to frequency converter for determining a resistance value of a resistance means, said resistance to frequency converter having active calibration, said resistance to frequency converter comprising:

a microprocessor having a first tri-state buffer, a second tri-state buffer, a third tri-state buffer, an output node and an input node, said first tri-state buffer, said second tri-state buffer, and said third tri-state buffer having a high state, a low state, and a high impedance state;

resistance means having a first node and a second node, said second node of said resistance means electrically connected to said first tri-state buffer wherein said resistance means comprises a thermistor;

a NAND gate with hysteresis, having a first input, a second input and an output, said second input of said nand gate electrically connected to said input node of said microprocessor, said input node of said microprocessor providing an on/off signal to said nand gate;

an inverter, having an input and an output, said output of said inverter providing said output frequency to said microprocessor input node, said input of said inverter connected to the output node of said NAND gate;

a capacitor with an anode and a cathode, said anode of said capacitor electrically connected to ground, said cathode of said capacitor electrically connected to said input of said nand gate;

a rectifier having an anode and a cathode, said anode of said rectifier electrically connected to said output of said nand gate, said cathode of said rectifier electrically connected to said first node of said resistance means;

a first resistor having a first node and a second node, said first node of said first resistor electrically connected to said input of said nand gate, said second node of said first resistor electrically connected to said cathode of said rectifier;

a first precision resistor having a first node and a second node, said first node of said first precision resistor electrically connected to said cathode of said rectifier, said second node of said first precision resistor electrically connected to a second tri-state buffer; and

a second precision resistor having a first node and a second node, said first node of said second precision resistor electrically connected to said cathode of said rectifier, said second node of said precision resistor electrically connected to a third tri-state buffer.

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**5,744,974**

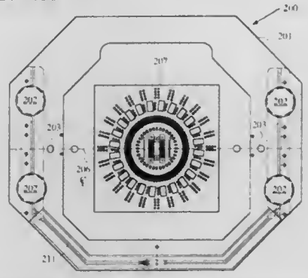
## TEST HEAD INTERFACE WITH VACUUM-ACTIVATED INTERCONNECTION COMPONENTS

**W. Scott Bogden, San Martin, Calif., assignor to Xilinx, Inc., San Jose, Calif.**

**Continuation of Ser. No. 123,415, Sep. 17, 1993, abandoned. This application May 14, 1996, Ser. No. 645,782**

**Int. Cl.[6] G01R** *31/02*

**U.S. Cl. 324—758** **4 Claims**




1. A structure for facilitating electrical contact between a test head and a handler, said handler including a plurality of compressible pins extending from the handler toward the test head, said structure comprising:

a test head plate for placement on said test head, said test head plate including a plurality of vacuum-activated components and a plurality of alignment pins; and

a handler plate for placement on said handler, said handler plate including a surface for achieving a vacuum with said vacuum-activated components and a plurality of stacking blocks for receiving said plurality of alignment pins,

wherein said vacuum-activated components amply identical vacuum conditions on said surface of said handler plate such that said plurality of compressible pins are compressed equally.

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**5,744,975**

## ENHANCED DEFECT ELIMINATION PROCESS FOR ELECTRONIC ASSEMBLIES VIA APPLICATION OF SEQUENTIALLY COMBINED MULTIPLE STRESS PROCESSES

**Budy Darmono Notohardjono, Poughkeepsie, and Vincent Cozzolino, New Paltz, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 6, 1996, Ser. No. 660,621**

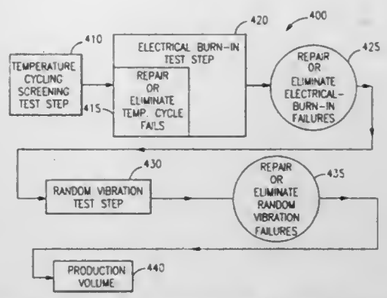
**Int. Cl.[6] G01R** *31/02*

**U.S. Cl. 324—760** **28 Claims**

1. A method for detecting defects in an electronic assembly including at least one electronic component, coupled via at least one connection point to a printed circuit board, said method comprising the sequentially ordered steps of:

first performing and completing a temperature cycling test upon the electronic assembly and then;






second performing and completing an electrical burn-in test upon the electronic assembly; and then

third performing and completing a random vibration test upon the electronic assembly;

wherein each of the sequential test steps are performed and completed separately from the other test steps.

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**5,744,976**

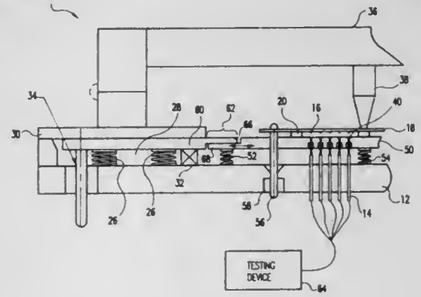
## FLOATING GUIDE PLATE TEST FIXTURE

**Raymond J. Caggiano, Mecklenburg County, and Jeffrey A. Hatley, Cabarrus County, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 24, 1996, Ser. No. 653,189**

**Int. Cl.[6] G01R** *31/02*

**U.S. Cl. 324—761** **15 Claims**




1. A circuit board test fixture, comprising:

a probe plate for holding a plurality of test probes in a fixed position;

a floating guide plate having a plurality of apertures therethrough corresponding to said plurality of test probes, said floating guide plate having a perimeter lip;

mounting means for fixing a circuit board under test above said guide plate, the circuit board having a plurality of test points to be contacted by said plurality of test probes; and

spring means, between said probe plate and said floating guide plate, for permitting said guide plate to float laterally with respect to said perimeter lip such that said plurality of apertures align with said plurality of test probes when said floating guide plate is pulled down through said plurality of test probes.

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**5,744,977**

## HIGH-FORCE SPRING PROBE WITH IMPROVED AXIAL ALIGNMENT

**Larry A. Cuautla, Rancho Cucamonga, Calif., assignor to Delaware Capital Formation, Inc., Wilmington, Del.**

**Continuation of Ser. No. 360,273, Dec. 21, 1994, abandoned. This application Oct. 16, 1996, Ser. No. 732,976**

**Int. Cl.[6] G01R** *31/02*

**U.S. Cl. 324—761** **22 Claims**




1. A high-force spring probe comprising:

a tubular barrel having a hollow interior, a plunger end at one end of the barrel, and a terminal end at an opposite end of the barrel;

a plunger disposed within the barrel interior, the plunger including:

a bearing section disposed immediately inside the plunger end of the barrel and having an outside diameter approximately matching an inside diameter of the barrel; and

an elongated spring control section disposed within the barrel, the elongated spring control section extending axially away from the bearing section to a free end of the plunger;

a plunger control spring disposed within a major length of the barrel interior and positioned between the plunger bearing section and the terminal end of the barrel;

wherein the elongated spring control section is disposed within the spring and has an axial length that is approximately one-half of the total spring length when the plunger is in a non-retracted state within the barrel to align and guide the plunger during its axial displacement within the barrel.

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**5,744,978**

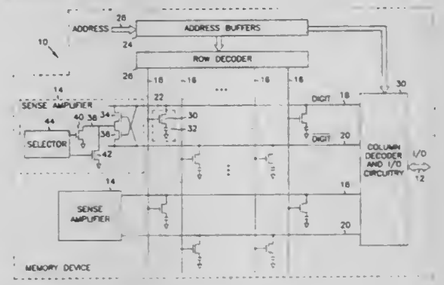
## VARIABLE LOAD DEVICE RESPONSIVE TO A CIRCUIT PARAMETER

**Gary R. Gilliam; Steve G. Renfro; Kacey Cutler; Roland Ochoa, and Craig E. Schneider, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**

**Continuation of Ser. No. 619,808, Mar. 15, 1996, Pat. No. 5,627,785. This application Jan. 15, 1997, Ser. No. 783,573**

**Int. Cl.[6] H03K** *17/14*

**U.S. Cl. 326—31** **7 Claims**




1. A variable load device comprising:

a number of load elements; and

a selector circuit, including a Schmitt trigger, coupled to the number of load elements that selectively enables one or more of the load elements based on a parameter of the circuit.

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**5,744,979**

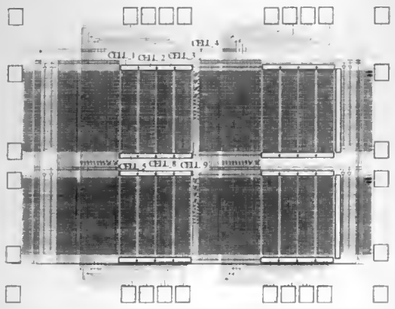
## FPGA HAVING LOGIC CELLS CONFIGURED BY SRAM MEMORY CELLS AND INTERCONNECT CONFIGURED BY ANTIFUSES

**F. Erich Goetting, Cupertino, Calif., assignor to Xilinx, Inc., San Jose, Calif.**

**Division of Ser. No. 548,654, Oct. 26, 1995, Pat. No. 5,646,547, which is a continuation of Ser. No. 234,764, Apr. 28, 1994, abandoned, which is a division of Ser. No. 919,491, Jul. 23, 1992, Pat. No. 5,319,254. This application Jun. 3, 1996, Ser. No. 656,753**

**Int. Cl.**[6] **H03K** *19/177*

**U.S. Cl. 326—39** **3 Claims**



1. A programmable integrated circuit comprising:

a plurality of logic elements, each logic element having a plurality of input leads and at least one output lead;

a group of interconnect lines;

a plurality of antifuses for programmably connecting said input and output leads of said logic elements to each other through said interconnect lines;

a plurality of static memory cells for causing said logic elements to perform a selected logic function; and

antifuse programming means programming said antifuses.

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**5,744,980**

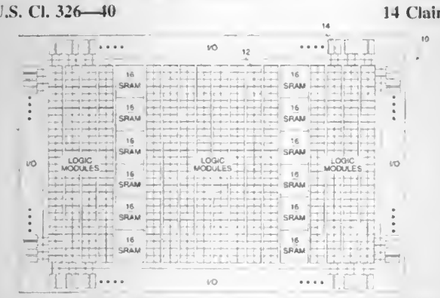
## FLEXIBLE, HIGH-PERFORMANCE STATIC RAM ARCHITECTURE FOR FIELD-PROGRAMMABLE GATE ARRAYS

**John E. McGowan, Sunnyvale; William C. Plants, Santa Clara, both of Calif.; Joel D. Landry, Colorado Springs, Colo.; Sinan Kaptanoglu, San Carlos, and Warren K. Miller, Palo Alto, both of Calif., assignors to Actel Corporation, Sunnyvale, Calif.**

**Filed Feb. 16, 1996, Ser. No. 603,597**

**Int. Cl.**[6] **H03K** *19/177*

**U.S. Cl. 326—40** **14 Claims**



1. A field programmable gate array architecture comprising:

a plurality of horizontal routing channels each including a plurality of interconnect conductors, some of said interconnect conductors segmented by user-programmable interconnect elements;

a plurality of vertical routing channels each including a plurality of interconnect conductors forming intersections with interconnect conductors in said horizontal routing channels, some of said interconnect conductors segmented by user-programmable interconnect elements;

user-programmable interconnect elements connected between selected ones of said horizontal and vertical interconnect conductors at selected ones of said intersections;

an array comprising a plurality of rows and columns of logic function modules superimposed on said horizontal and vertical routing channels, each of said logic function modules having at least one input and at least one output, said at least one input and at least one output of said logic function modules connectable to ones of said interconnect conductors in either or both of said horizontal and vertical routing channels;

at least a portion of one column of said array including random access memory blocks disposed in said array in place of logic function modules, said at least a portion of a column adjacent to at least one column of said logic function modules, each of said random access memory blocks spanning a distance of more than one row of said array such that at least one interconnect conductor in more than one horizontal routing channel passes therethrough and is connectable to adjacent logic function modules on either side thereof; each of said random access memory blocks having address inputs, control inputs, data inputs, and data outputs;

user-programmable interconnect elements connected between said address inputs, control inputs, data inputs, and data outputs of said random access memory blocks and selected ones of said interconnect conductors in said more than one horizontal routing channel passing therethrough; and

means for programming selected ones of said user-programmable interconnect conductors to connect the at least one input and at least one output of ones of said logic function modules to one another and to the address inputs, control inputs, data inputs, and data outputs of said random access memory blocks.

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**5,744,981**

## PROGRAMMABLE LOGIC CELL WITH INPUT POLARITY CONTROL

**Paul T. Sasaki; Suresh M. Menon, both of Sunnyvale, and Tsung C. Whang, Cupertino, all of Calif., assignors to Dyna Logic Corporation, Sunnyvale, Calif.**

**Division of Ser. No. 465,595, Jun. 5, 1995, Pat. No. 5,614,844, which is a continuation-in-part of Ser. No. 188,499, Jan. 27, 1994, Pat. No. 5,504,440. This application Jan. 16, 1997, Ser. No. 784,225**

**Int. Cl.**[6] **H03K** *19/177;19/086*

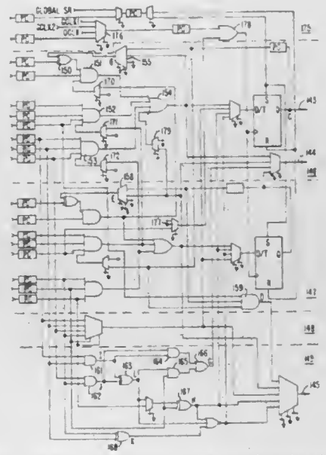
**U.S. Cl. 326—48** **8 Claims**

1. In a programmable logic device, a logic cell having input and output terminal for performing a logic function on the signals supplied to its input terminals and supplying the resulting output signals on its output terminals comprising:

polarity control circuits coupled to the input terminals for selecting the true or complement version of the signals supplied to the input terminals or a third voltage as output signals of the polarity control circuits;

a first combinational logic section coupled to the polarity control circuits;





an output register coupled to the first combinational logic section and to the output terminals.

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**5,744,982**

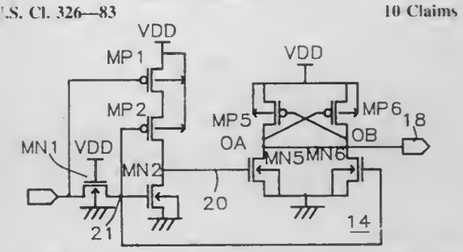
## INPUT BUFFER CIRCUIT

**Ke-Cheng Chu, Hsin-chu Hsien, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-chu, Taiwan**

**Filed Apr. 22, 1996, Ser. No. 636,087**

**Int. Cl.**[6] **H03K** *19/0175*

**U.S. Cl. 326—83** **10 Claims**




1. A buffer circuit for connection between an input pad (**17**) of a semiconductor chip and a buffer circuit output node (**18**) where other circuits of the chip are connected, the chip having components adapted to operate with a power supply having a ground connection and a predetermined voltage connection and subject to damage when subjected to a voltage higher than said predetermined voltage, the input pad being connectable to receive binary input voltages with an up level higher than said predetermined voltage, whereby some components of the buffer circuit are exposed to higher voltages than they are adapted to operate with, the buffer circuit comprising

a first stage comprising an n-channel FET (MN2) connected to conduct between a first node (**20**) and a circuit ground (**15**) and a upper p-channel FET (MP1) and a lower p-channel FET (MP2) connected to conduct in series between said first node (**20**) and a power supply point ($V_{DD}$), whereby the first node forms a first stage output node, the upper p-channel FET (MP1) being connected to the power supply point and the lower p-channel FET (MP2) being connected to the first output node (**20**),

wherein the gate oxide of the upper FET (MP1) undergoes a voltage stress according to the voltage at its gate and a layer of charge carriers in the underlying semiconductor area,

a series n-channel FET (MN1) connected between a circuit input pad (**17**) and a common connection point (**21**) of the gates of the n-channel FET (MN2) and the lower p-channel FET (MP2), the gate of the series FET being connected to a reference potential point ($V_{DD}$) to turn on when the input voltage is in the range of normal signal voltages but to turn off when the input voltages rises above the range of normal signal voltages,

the gate of the upper FET being connected to the input pad and the upper FET turning off completely in response to an up level signal voltage at the input pad and thereby blocking a leakage current that would otherwise flow in the circuit of the lower p-channel FET and the n-channel FET when the n-channel FET is turned on and the voltage drop across the series FET leaves the lower p-channel FET only partly turned off,

the lower p-channel FET conducting sufficiently to protect the upper p-channel FET when a signal higher than said predetermined voltage appears at the input pad and at the gate of the upper p-channel FET

and a second stage circuit comprising two n-channel FETs (MN5 and MN6) and two p-channel FETs (MP5 and MP6) connected to form a level shifting circuit, the second stage being connecting to said first node (**20**) to restore a voltage shift at the first node caused by the voltage drop across one of said FETs.

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**5,744,983**

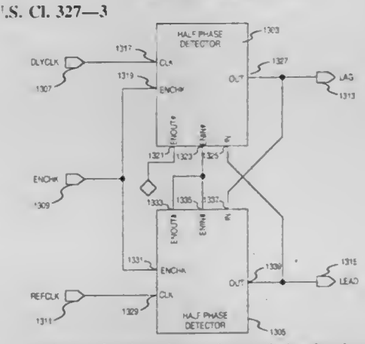
## PHASE DETECTOR WITH EDGE-SENSITIVE ENABLE AND DISABLE

**Mel Bazes, Haifa, Israel, assignor to Intel Corporation, Santa Clara, Calif.**

**Continuation-in-part of Ser. No. 433,810, May 3, 1995, Pat. No. 5,583,458. This application Aug. 23, 1996, Ser. No. 702,287**

**Int. Cl.**[6] **H03D** *13/00*

**U.S. Cl. 327—3** **12 Claims**




1. A device for detecting a phase relationship between a reference clock signal and a delayed clock signal, comprising:

two half phase detector circuits, each half phase detector circuit being substantially similar to one another, each half phase detector circuit having a clock input, an enable check input, an enable input signal input, an auxiliary input signal input, an enable output signal output and an output signal output; and

an enable check signal coupled to the enable check input of each half phase detector circuit, the reference clock signal coupled to the clock input of one of the half phase detector circuits, the delayed clock signal coupled to the clock input of another one of the half phase detector circuits, the auxiliary input signal input of each respective half phase detector circuit coupled to the output signal output of another respective half phase detector circuit, the enable output signal output of said one of the half phase detector circuits coupled to the enable input signal input of each half phase detector circuit.

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**5,744,984**

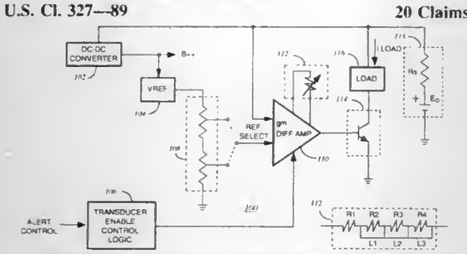
## DRIVER CIRCUIT PROVIDING CONTROLLABLE BATTERY OVERLOAD PROTECTION

**George A. Drapac, Boca Raton; Keith E. Jackoski, Wellington; Paul J. Godfrey, Melbourne, and Gary L. Pace, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation-in-part of Ser. No. 363,785, Dec. 27, 1994, Pat. No. 5,585,749. This application Nov. 13, 1996, Ser. No. 748,641**

**Int. Cl.[6] H03K** *5/153*

**U.S. Cl. 327—89** **20 Claims**




1. A driver circuit for driving a high current load in an electronic device powered by a battery having a terminal voltage which varies substantially in relation to a level of energy being consumed from the battery, said driver circuit comprising:

a differential amplifier responsive to a predetermined reference voltage and further responsive to the terminal voltage for generating a drive control signal which proportionally reduces a current supplied to the high current load when the terminal voltage is substantially equal to and lower than the predetermined reference voltage;

a slope control element, coupled to said differential amplifier for controlling a rate at which the drive control signal reduces proportionally the current supplied to the high current load; and

a load control element which provides a supply of current to the high current load, the supply of current being proportionally reduced in response to the drive control signal.

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**5,744,985**

## DIFFERENTIAL SAMPLE-HOLD CIRCUIT

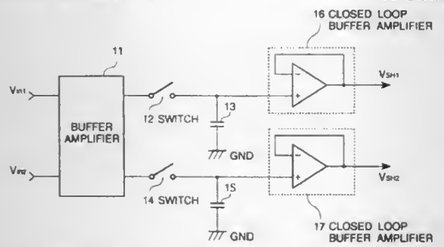
**Yoshio Nishida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Continuation of Ser. No. 509,460, Jul. 31, 1995, abandoned. This application Jun. 3, 1997, Ser. No. 867,760**

**Claims priority, application Japan, Jul. 29, 1994, 6-178973**

**Int. Cl.[6] G11C** *27/02*

**U.S. Cl. 327—94** **18 Claims**




1. A differential sample-hold circuit comprising:

a buffer amplifier having first and second input terminals for receiving a pair of analog input voltages, and first and second output terminals;

a first switch having an input terminal connected to said first output terminal of said buffer amplifier;

a second switch having an input terminal connected to said second output terminal of said buffer amplifier;

a first voltage holding capacitor having one end connected to an output terminal of said first switch and an other end connected to ground;

a second voltage holding capacitor having one end connected to an output terminal of said second switch and an other end connected to the ground;

a first closed-loop buffer amplifier having an input terminal connected to said one end of said first voltage holding capacitor, and an output terminal constituting a first output terminal for a first sampled-and-held value; and

a second closed-loop buffer amplifier having an input terminal connected to said one end of said second voltage holding capacitor, and an output terminal constituting a second output terminal for a second sampled-and-held value;

wherein said first and second closed-loop buffer amplifiers simultaneously operate to drive a load connected to said first and second output terminals.

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**5,744,986**

## SOURCE DRIVER CIRCUIT DEVICE HAVING IMPROVED LEVEL CORRECTION CIRCUIT FOR DRIVING LIQUID CRYSTAL DISPLAY

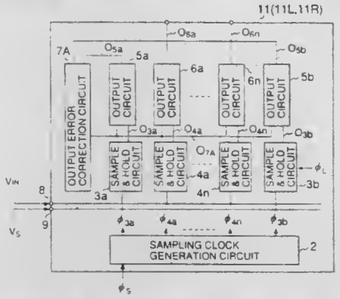
**Shigeru Yamada, Yokohama, and Tetsuro Itakura, Fujisawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Apr. 28, 1994, Ser. No. 233,930**

**Claims priority, application Japan, Apr. 28, 1993, 5-103092**

**Int. Cl.[6] G11C** *27/02*

**U.S. Cl. 327—95** **9 Claims**




1. A source driver circuit device for driving source lines of a plural number of thin film transistors (TFT) arranged in a matrix shape and constituting a liquid crystal display device, comprising

a plurality of sample-and-hold circuits arranged in an order for sequentially sampling an input video signal to obtain sampling values;

a plurality of signal output circuits for respectively generating voltage outputs corresponding to holding values of said plurality of sample-and-hold circuits;

a plurality of reference value sample-and-hold circuits each of which is provided with a predetermined number of said sample-and-hold circuits, and for sampling a reference potential;

a plurality of sample value output circuits for respectively generating voltage outputs corresponding to holding levels of said plurality of reference value sample-and-hold circuits; and

an output error correction circuit for performing an output level correction in each of said plurality of signal output circuits as a function of a value difference between said reference potential and an average value of a plurality of outputs issued from said plurality of sample value output circuits wherein said reference value sample-and-hold circuits include first and second value sample-and-hold circuits in parallel with said plurality of signal sample-and-hold circuits in one integrated circuit (IC) chip; and

wherein said output error correction circuit comprises a first transistor of a P-channel type having a gate receiving a detection level of said first value sample-and-hold circuit and



a source connected to a first constant current source, a second transistor of a P-channel type having a source connected to said source of the first transistor to thereby connect said second transistor with said first current source at a junction point of the first and second transistors and a gate receiving said reference potential, a third transistor of a P-channel type having a gate connected to the gate of the second transistor and a source connected to a second constant current source, a fourth transistor of a P-channel type having a gate receiving a detection level of said second level sample-and-hold circuit and a source connected to the source of the third transistor and receiving said second current source through a junction point of the third and fourth transistors, a fifth transistor of an N-channel type having a drain and a gate connected to a junction point of drains of said second and third transistors, a sixth transistor of an N-channel type having a gate connected to said gate of said fifth transistor and a drain connected to a junction point of drains of said first and fourth transistors, a seventh transistor of an N-channel type having a gate connected to the junction point of said drains of said first and fourth transistors, and an eighth transistor of a P-channel type having a drain and a gate connected to a source of said seventh transistor and outputting a correction output to each of said plurality of sample value output circuits and to said plurality of signal output circuits.

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**5,744,987**

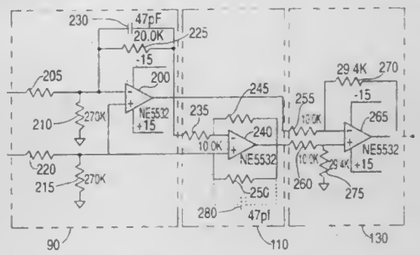
## SIGNAL CONVERTER FOR REPRODUCING AUDIO SIGNALS RECORDED ON A FILM MEDIUM

**Paul M. Embree, Irvine, Calif., and Milton L. Embree, Reading, Pa., assignors to Sony Corporation, Tokyo, Japan; Sony Pictures Entertainment, Park Ridge, and Lucent Technologies, Inc., Murray Hill, both of N.J.**

**Filed Nov. 8, 1994, Ser. No. 555,055**

**Int. Cl.[6] H01J** *40/16*

**U.S. Cl. 327—103** **26 Claims**




1. An electronic circuit for providing a voltage signal in response to a current generated by a photoelectric cell having at least a first and second terminal, comprising:

current to voltage converter means for receiving said current from said first terminal of said photoelectric cell and providing a first output voltage; and,

current return means connected to said current to voltage converter means for receiving said first output voltage and for providing a return current to said second terminal of said photoelectric cell.

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**5,744,988**

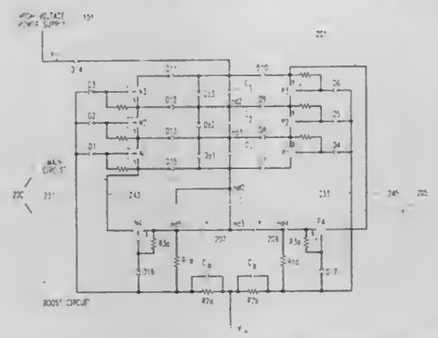
## AMPLIFIER CIRCUITS FOR DRIVING LARGE CAPACITIVE LOADS

**Joseph Henry Condon, 190 Kent Place Blvd., Summit, N.J. 07901, and Joseph Peter Savicki, 6 Haver Farm Rd., Clinton, N.J. 08809**

**Filed Sep. 5, 1996, Ser. No. 708,434**

**Int. Cl.[6] H03K** *17/00*

**U.S. Cl. 327—111** **20 Claims**




1. A boost circuit for use in an amplifier for driving a capacitive load, said amplifier comprising a plurality of capacitors arranged in series-connected stack relation, said boost circuit comprising:

at least one voltage source connected to said capacitive load; and

means for selecting one or more of the stack capacitors to provide charge to said capacitive load during a charging phase, at least a portion of the charge received by said capacitive load being returned to each of the selected stack capacitors during a discharging phase, said voltage source delivering said charge therethrough in at least one of the charging and discharging phases.

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**5,744,989**

**Patent Not Issued For This Number**

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**5,744,990**

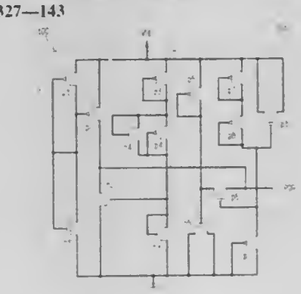
## ENHANCED POWER-ON-RESET/LOW VOLTAGE DETECTION CIRCUIT

**Steven Burstein, Smithtown, and Sharif M. Ibrahim, Kings Park, both of N.Y., assignors to Standard Microsystems Corporation, Hauppauge, N.Y.**

**Filed Nov. 8, 1995, Ser. No. 555,369**

**Int. Cl.[6] H03K** *17/22*

**U.S. Cl. 327—143** **10 Claims**



1. A power-on-reset circuit comprising:

a power voltage supply level detection circuit comprising:

a first current mirror circuit having a first linear operation threshold level and comprising:

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a first inverter circuit and a source circuit connected to said first inverter circuit;

a second current mirror circuit having a second linear operation threshold level and comprising

a second inverter circuit having its input connected to its output and a sink circuit connected to said second inverter circuit,

said first current mirror circuit and said second current mirror circuit being commonly connected between a power supply voltage to be monitored and a reference voltage,

said first current mirror circuit and said second current mirror circuit having a common output connected to generate a power-on-reset output signal only when said power supply voltage to be monitored is between said first linear operation threshold level and said second linear operation threshold level, and

an enhanced retriggering circuit integrated with said power supply level detection circuit and comprising:

a charge storing circuit having an input connected to said power supply voltage to be monitored,

a pass circuit having an input connected to said charge storing circuit and an output connected to said common output of said first and second current mirror circuits, and

a bias and voltage drop detection circuit connected to said power supply voltage to be monitored and connected to said pass circuit, said bias and voltage drop detection circuit output for biasing said pass circuit and for causing said pass circuit to output a trigger signal whenever said power supply voltage decreases beyond a predetermined amount.

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**5,744,991**

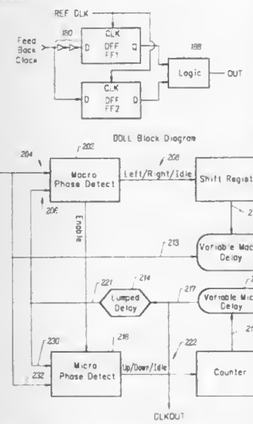
**SYSTEM FOR DISTRIBUTING CLOCKS USING A DELAY LOCK LOOP IN A PROGRAMMABLE LOGIC CIRCUIT**

**David E. Jefferson, San Jose, Calif.; L. Todd Cope, Penang, Malaysia; Srinivas Reddy, Santa Clara, and Richard G. Cliff, Milpitas, both of Calif., assignors to Altera Corporation, San Jose, Calif.**

**Filed Oct. 16, 1995, Ser. No. 543,420**

**Int. Cl.[6] H03L** *7/08;7/087*

**U.S. Cl. 327—158** **6 Claims**




**1**. A digital delay lock loop circuit for outputting a synchronized clock locked to a reference clock signal, the digital delay lock loop circuit comprising:

a reference clock input for receiving the reference clock signal;

a feedback clock signal derived from the reference clock signal;

a first digital phase detector coupled to the reference clock signal and the feedback clock signal, wherein the first digital phase detector determines a first phase difference between the reference clock signal and the feedback clock signal and outputs a first phase error signal at a first phase error signal output;

a second digital phase detector coupled to the reference clock signal and the feedback clock signal, wherein the second digital phase detector determines a second phase difference between the reference clock signal and the feedback clock signal and outputs a second phase error signal at a second phase error signal output, wherein the second phase error signal is coupled to delay the feedback clock signal in response to the second phase error signal;

a delay selector coupled to the first phase error signal and the reference clock signal for applying a delay to the reference clock signal in response to the first phase error signal, wherein the delay selector outputs a delayed reference clock signal as the feedback clock signal; and

wherein the synchronized clock output is coupled to the feedback clock signal.

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**5,744,992**

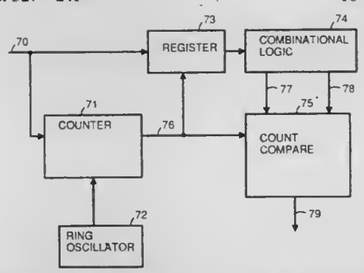
**DIGITAL PHASE SHIFTER**

**Douglas D. Baumann, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.**

**Division of Ser. No. 575,766, Dec. 20, 1995. This application Mar. 25, 1997, Ser. No. 823,591**

**Int. Cl.[6] H03K** *5/135*

**U.S. Cl. 327—241** **10 Claims**




**1**. A digital phase shifter which phase shifts an input signal by a predetermined phase angle, the digital phase shifter comprising:

a cycle length detection means, coupled to the input signal, for determining a length of a cycle of the input signal, the cycle length detection means including a counter which initializes a count at a beginning of each cycle of the input signal; and,

an output signal generation means, coupled to the cycle length detection means, for generating an output signal which is phase delayed from the input signal by a phase amount, the phase amount being approximately equal to the length of the cycle of the input signal multiplied by the predetermined phase angle, wherein the output signal generation means comprises:

combinational logic, coupled to the cycle length detection means having a first output and a second output, the combinational logic generating a leading edge count on the first output and a falling edge count on the second output the leading edge count and the falling edge count being based on the predetermined phase angle and the length of the cycle detected by the cycle length detection means, and

count compare logic, coupled to the cycle length detection means and the combinational logic for generating a rising edge of the output signal when a current count of the counter equals the leading edge count and for generating a falling edge of the output signal when the current count of the counter equals the falling edge count.



**5,744,993**

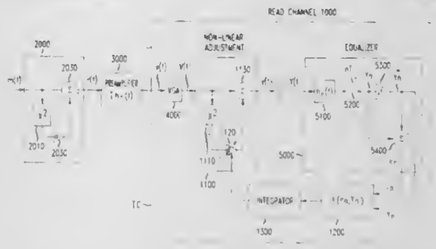
**READ CHANNEL FOR AT LEAST PARTIALLY OFFSETTING NONLINEAR SIGNAL EFFECTS ASSOCIATED WITH THE USE OF MAGNETO-RESISTIVE HEADS**

**Jeffrey Lee Sonntag, Rockland Township, Berks County, Pa., assignor to Lucent Technologies, Inc., Murray Hill, N.J.**

**Filed Sep. 27, 1995, Ser. No. 534,524**

**Int. Cl.[6] H03L** *5/00*

**U.S. Cl. 327—307** **7 Claims**




**1**. An integrated circuit for use in a magnetic recording read channel signal path that includes a magneto-resistive (MR) read head, said integrated circuit comprising a variable gain amplifier (VGA) followed by a nonlinear adjustment for introducing a controllable amount of second-order nonlinearity into the magnetic recording read channel signal path;

wherein said integrated circuit further includes an equalizer coupled in the magnetic recording read channel signal path after said nonlinear adjustment, and wherein said equalizer provides an error signal ($e_n$) and a slicer output signal ($Y_n$), whereby said nonlinear adjustment adjusts the amount of second-order nonlinearity in response to a control signal based at least in part on the error signal and the slicer output signal produced by said equalizer.

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**5,744,994**

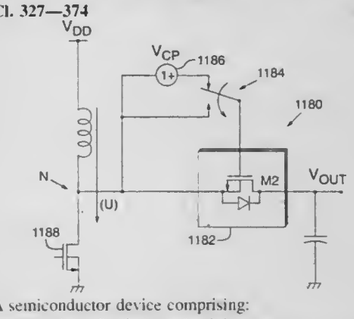
**THREE-TERMINAL POWER MOSFET SWITCH FOR USE AS SYNCHRONOUS RECTIFIER OR VOLTAGE CLAMP**

**Richard K. Williams, Cupertino, Calif., assignor to Siliconix incorporated, Santa Clara, Calif.**

**Filed May 15, 1996, Ser. No. 648,266**

**Int. Cl.[6] H03K** *17/687*

**U.S. Cl. 327—374** **8 Claims**




**1**. A semiconductor device comprising:

a source region of a first conductivity type;

a body region of a second conductivity type opposite to said first conductivity type adjacent said source region;

a drain region of said first conductivity type adjacent said body region, wherein said source region and said body region are connected together and biased at a first voltage and said drain region is biased at a second voltage, said first and second voltages being established such that a junction between said body region and said drain region is forward-biased;

a gate separated by an insulating layer from a channel region of said body region; and

a first switch for alternately connecting said gate to said source region or to a third voltage, said third voltage being sufficient to turn said semiconductor device fully on.

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**5,744,995**

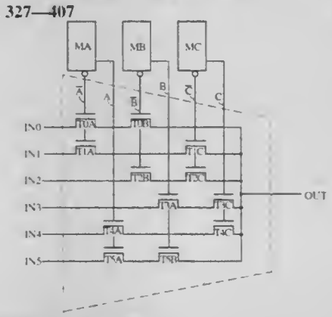
**SIX-INPUT MULTIPLEXER WITH TWO GATE LEVELS AND THREE MEMORY CELLS**

**Steven P. Young, San Jose, Calif., assignor to Xilinx, Inc., San Jose, Calif.**

**Filed Apr. 17, 1996, Ser. No. 635,096**

**Int. Cl.[6] H03K** *17/693*

**U.S. Cl. 327—407** **6 Claims**




**1**. A multiplexer comprising:

an output port;

a plurality of input ports;

a plurality of paths, each path connecting one input port to the output port;

an odd number of signal sources, each signal source providing a control signal on a control line for controlling the multiplexer;

for each path, a number of pass devices placed in series such that all pass devices must be turned on to connect the corresponding input port to the output port, the number of pass devices on each path being equal to (n+1)/2 where n is the number of signal sources; said plurality of paths comprising at least twice the number of said signal sources;

each pass device being controlled by a selected one of the signal sources such that when the control lines carry a selected number of logical 0 or logical 1 values, a unique input port is connected to the output port.

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**5,744,996**

**CMOS INTEGRATED SEMICONDUCTOR CIRCUIT**

**Gunther Kötzle, Nagold-Vollmaringen; Volker Kreuter, Korschenbroich; Thomas Ludwig, Sindelfingen, and Helmut Schettler, Dettenhausen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.**

**PCT No. PCT/DE93/00443, § 371 Date Jul. 17, 1995, § 102(e) Date Jul. 17, 1995, PCT Pub. No. WO94/01890, PCT Pub. Date Jan. 20, 1994**

**PCT Filed May 21, 1993, Ser. No. 387,705**

**Claims priority, application Germany, Jul. 1, 1992, 42 21 575.7**

**Int. Cl.[6] H03K** *3/01*

**U.S. Cl. 327—534** **9 Claims**

**1**. A data processing system, comprising:

an integrated semiconductor circuit including a CMOS pair of transistors, each transistor of said pair having an adjustable threshold voltage;

a variable frequency clock connected to said integrated semiconductor circuit;

both a higher and a lower absolute supply voltage level available for connection to said integrated semiconductor circuit,

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wherein one of said higher and said lower supply voltage levels is connected to said circuit at a time;

detecting means coupled to the supply voltage level that is connected to said circuit to generate a signal representing the supply voltage level that is connected to said circuit;

means to automatically adjust threshold voltages of said transistors in response to said signal to provide a higher absolute threshold voltage to each transistor of said CMOS pair at said higher level and a lower absolute threshold voltage to each transistor of said CMOS pair at said lower level; and

wherein said integrated semiconductor circuit has stable operation at a higher clock frequency at said higher absolute supply voltage and has stable operation at a lower clock frequency at said lower absolute supply voltage, wherein one of said higher clock frequency and said lower clock frequency is connected to said circuit at a time.

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**5,744,997**

**SUBSTRATE BIAS VOLTAGE CONTROLLING CIRCUIT IN SEMICONDUCTOR MEMORY DEVICE**

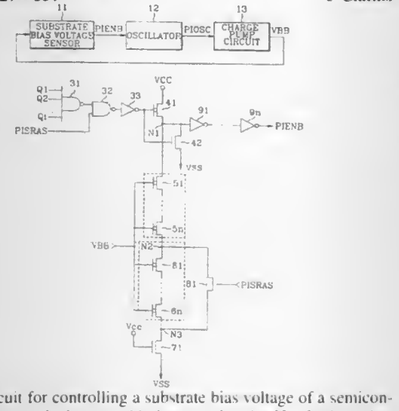
**Bok-Moon Kang, and Seung-Moon Yoo, both of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics, Co., Ltd., Kyungki-do, Rep. of Korea**

**Filed Apr. 26, 1996, Ser. No. 638,484**

**Claims priority, application Rep. of Korea, Apr. 26, 1995, 9967/1995**

**Int. Cl.**[6] **G05F** *1/10*

**U.S. Cl. 327—537** **3 Claims**




1. A circuit for controlling a substrate bias voltage of a semiconductor memory device operable in normal and self-refresh modes, said circuit being responsive to sensing of the substrate bias voltage and comprising:

mode signal generating means operative when said memory is in the self-refresh mode, and interval signal generating means operative during a portion of the self-refresh mode;

a sensing controller responsive to said mode and interval signals, said controller generating a first logic signal when said mode and interval signals are applied to the controller, and when no mode signal is applied to the controller, and generating a second logic signal when only a mode signal is applied to said controller;

a first switch connected between a power terminal and an output node, said first switch additionally being joined to said controller whereby when the first logic signal is applied to the switch, the switch is operative to couple a voltage level at the power terminal to said output node;

a second switch including at least one switching component, said second switch being connected between said output node and a first connecting node, said switching component having a control terminal to which said substrate bias voltage is applied;

a third switch including at least one switching component, said third switch being connected between said first connecting node and a second connecting node, said switching component of the third switch having a control terminal to which said substrate bias voltage also is applied;

a fourth switch connected between said second connecting node and a reference terminal and having a control terminal connected to said power terminal;

a fifth switch connected between said first and second connecting nodes and having a control terminal to which said mode signal generating means is applied, said fifth switch being operative in response to said mode signal;

a sixth switch connected between said output node and said reference terminal and having a control terminal connected to an output of said sensing controller, said sixth switch being operative in response to said second logic signal to cause voltage at said output node to discharge to a voltage level different from the voltage level at the power terminal; and

a sensing signal output circuit connected to said output node for producing a sensing signal for generating said substrate bias voltage, said sensing signal output circuit being disabled when said sixth switch is operative;

said substrate bias voltage controlling circuit being operative whereby in the absence of a mode signal said first, second, third and fourth switches establish a first potential level for adjusting the substrate voltage bias, and when said mode signal is applied to the substrate bias voltage controlling circuit said first, second, fourth and fifth switches establish a second potential level for adjusting the substrate voltage bias.

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**5,744,998**

**INTERNAL VOLTAGE DETECTING CIRCUIT HAVING SUPERIOR RESPONSIBILITY**

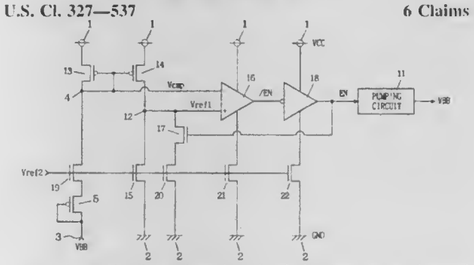
**Takashi Ito; Tadaaki Yamauchi, and Takaharu Tsuji, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 3, 1996, Ser. No. 760,010**

**Claims priority, application Japan, Jun. 7, 1996, 8-145715**

**Int. Cl.**[6] **H03K** *3/01*

**U.S. Cl. 327—537** **6 Claims**




1. An internal voltage detecting circuit for detecting an internal voltage and activating, when the detected internal voltage does not attain a prescribed level, an internal voltage generating circuit for generating said internal voltage, comprising:

a detection node receiving said internal voltage;

a reference node where a prescribed reference voltage is generated;

a comparison node where a comparison voltage is generated;

changing means responsive to said internal voltage for changing said comparison voltage;

comparing means for comparing said comparison voltage with said reference voltage and outputting, when said comparison voltage exceeds said reference voltage, an activation signal for activating said internal voltage generating circuit; and

enlarging means responsive to said activation signal for enlarging a difference between said comparison voltage and said reference voltage.



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**5,744,999**

**CMOS CURRENT SOURCE CIRCUIT**

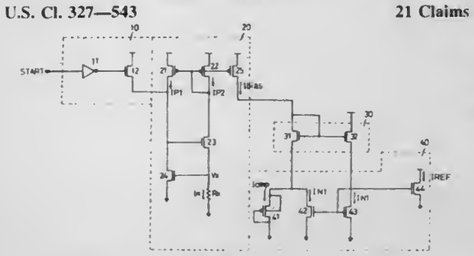
**Daejeong Kim, Seoul, and Sung Ho Cho, Kyungki-Do, both of Rep. of Korea, assignors to LG Semicon Co., Ltd., Cheongju, Rep. of Korea**

**Filed Jan. 22, 1996, Ser. No. 589,677**

**Claims priority, application Rep. of Korea, Sep. 27, 1995, 1995-32103**

**Int. Cl.**[6] **G05F** *1/10*

**U.S. Cl. 327—543** **21 Claims**




1. A current source circuit comprising:

a bias current generating circuit having a first current mirror to generate a bias current in response to a first signal;

a current compensation unit coupled to receive said bias current and having first, second and third transistors, said first transistor generating an offset current such that a first current flowing through said second transistor remains substantially constant, wherein said third transistor is coupled to said second transistor, and a reference current, which is substantially constant, flows through said third transistor; and

a current input unit to provide the bias current to said current compensation unit.

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**5,745,000**

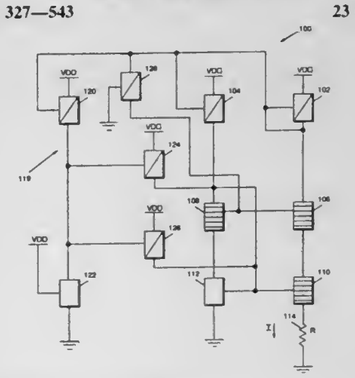
**CMOS LOW VOLTAGE CURRENT REFERENCE**

**David William Boerstler, Round Rock, and Daniel Mark Dreps, Georgetown, both of Tex., assignors to International Business Machines Incorporated, Armonk, N.Y.**

**Filed Aug. 19, 1996, Ser. No. 697,099**

**Int. Cl.**[6] **G05F** *1/10*

**U.S. Cl. 327—543** **23 Claims**




1. A current reference comprising:

circuitry coupled to a voltage supply for generating a substantially steady current despite variations in the voltage level of the voltage supply when a load is coupled to the circuitry, the circuitry comprising a first zero threshold voltage N-channel FET;

a first circuit coupled between the circuitry and the voltage supply for reducing sensitivity of the generated current to variations in the voltage supply, the first circuit comprising a second zero threshold voltage N-channel FET.

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**5,745,001**

**ACTIVE FILTER CIRCUIT APPARATUS**

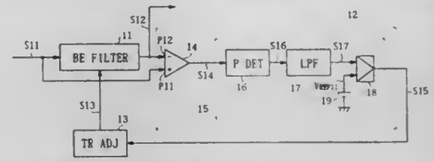
**Jun Ueshima, Tokyo; Katsunori Sato, Kanagawa; Yoshiyuki Takayanagi, Kanagawa, and Hideki Hirose, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 584,882, Jan. 11, 1996, abandoned, which is a continuation of Ser. No. 202,370, Feb. 25, 1994, abandoned. This application Feb. 26, 1997, Ser. No. 807,000**

**Claims priority, application Japan, Feb. 26, 1993, 5-039030; Feb. 26, 1993, 5-039031; Feb. 26, 1993, 5-062635**

**Int. Cl.**[6] **H03K** *5/00;* **H03B** *1/00*

**U.S. Cl. 327—553** **3 Claims**




1. A filter adjusting circuit, comprising:

an input signal connected to a first adjustable filter;

a trap frequency detector further comprising,

a subtractor having a noninverting input connected to the input signal and an inverting input connected to an output from the first adjustable filter;

an output from the subtractor connected to a peak detector input;

an output from the peak detector connected to an input of a low-pass filter, said low-pass filter having an output connected to a first input of a comparator; and

an output of the comparator connected to a trap frequency adjusting circuit for adjusting the first adjustable filter.

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**5,745,002**

**LOW VOLTAGE, SWITCHED CAPACITANCE CIRCUIT EMPLOYING SWITCHED OPERATIONAL AMPLIFIERS WITH MAXIMIZED VOLTAGE SWING**

**Andrea Baschirotto, Tortona; Rinaldo Castello, Arcore; Federico Montecchi, Pavia, and Angelo Nagari, Cilavegna, all of Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy**

**Filed Oct. 19, 1994, Ser. No. 326,107**

**Claims priority, application European Pat. Off., Jun. 24, 1994, 94830318**

**Int. Cl.**[6] **H03K** *11/00;5/00*

**U.S. Cl. 327—554** **48 Claims**

1. An integrated circuit switched capacitance stage, connected to be powered from a supply voltage and a ground, comprising:

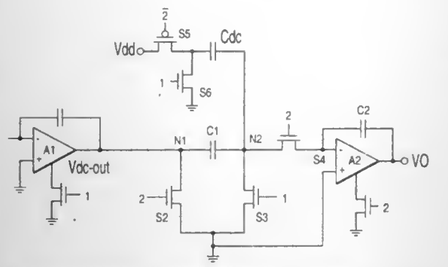
a first operational amplifier connected to receive an input signal, and to intermittently drive a first terminal of a switched capacitor in dependence on said input signal, during at least a first clock phase but not during a second clock phase;

a bias capacitor having one terminal thereof connected to a second terminal of said switched capacitor and the other terminal thereof switchably connected both to the supply voltage and to the ground;

a first switch connecting the output of said first operational amplifier to a first constant voltage during at least said second clock phase but not during said first clock phase;

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an additional switch connected to switch said second terminal of the switched capacitor to a second constant voltage during at least said first clock phase but not during said second clock phase; and

a second operational amplifier operatively connected to receive a voltage on said second terminal of said switched capacitor, and to provide an output signal on an output of said second operational amplifier accordingly during at least said second clock phase but not during said first clock phase;

whereby said bias capacitor biases an output voltage of said first operational amplifier toward a value intermediate between the supply voltage and the ground for providing a maximum voltage swing.

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**5,745,003**

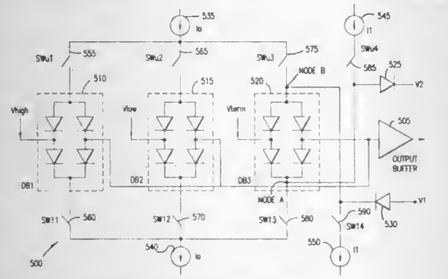
**DRIVER CIRCUITS FOR IC TESTER**

**Tsutomu Wakimoto, Kanagawa, Japan, and Toshihiro Nomura, Santa Clara, Calif., assignors to Schlumberger Technologies Inc., San Jose, Calif.**

**Filed Sep. 11, 1996, Ser. No. 710,032**

**Int. Cl.[6] H03K** *17/16*

**U.S. Cl. 327—382** **13 Claims**




1. A three-level driver circuit, comprising:

a. an output buffer

b. a first switch for applying a first analog level to the output buffer when in a closed state;

c. a second switch for applying a second analog level to the output buffer when in a closed state;

d. a third switch for applying a third analog level to the output buffer when in a closed state, wherein the third switch applies to the output buffer a capacitance which is dependent upon the third analog level when the third switch is in an open state and is unclamped; and

e. a clamping circuit for clamping the third switch such that the third switch applies to the output buffer a capacitance which is substantially independent of the third analog level when the third switch is in an open state and is clamped by the clamping circuit.

**5,745,004**

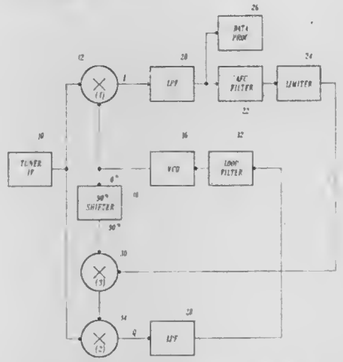
**FPLL WITH THIRD MULTIPLIER IN AN AC PATH IN THE FPLL**

**Victor Mycynek, Des Plaines, and Gary Sgrignoli, Mt. Prospect, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.**

**Filed Jul. 12, 1996, Ser. No. 678,902**

**Int. Cl.[6] H03L** *7/087*; **H04L** *27/227*

**U.S. Cl. 329—308** **7 Claims**




5. In an FPLL of the type including first, second and third multipliers, VCO means for supplying a pair of 90° phase displaced signals for demodulating an input signal, an AFC filter and limiter coupled between the first multiplier and the third multiplier, with the third multiplier being in a DC path in the FPLL and subject to offsets due to signal and noise, the improvement comprising:

relocating the third multiplier to an AC path in the FPLL.

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**5,745,005**

**DEMODULATING SYSTEM FOR CARRIER-WAVE AND SINGLE PULSE MODULATED SIGNALS**

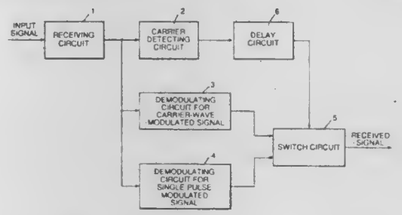
**Masayuki Natsumi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 14, 1996, Ser. No. 664,113**

**Claims priority, application Japan, Jul. 4, 1995, 7-168924; Dec. 26, 1995, 7-338525**

**Int. Cl.[6] H03D** *3/00*; **H04L** *27/22*

**U.S. Cl. 329—311** **3 Claims**




1. A communication device comprising

a demodulating circuit for demodulating a signal transmitted as a carrier-wave-modulated signal,

a demodulating circuit for demodulating a signal transmitted as a single-pulse-modulated signal, and

a switch circuit for selecting either one of the two demodulating circuits,

wherein a carrier detecting circuit is further provided for detecting presence or absence of a carrier-frequency component of the carrier-wave-modulated signal and

the switch circuit is designed to select an output of the demodulating circuit for the carrier-wave-modulated signal instead of an output of the demodulating circuit for the single-pulse-modulated signal when the carrier of the carrier-wave-modulated signal is detected by the carrier detecting circuit.



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**5,745,006**

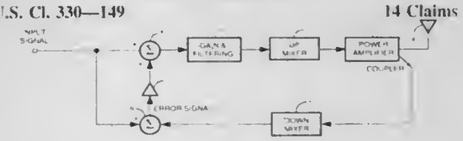
**METHOD OF COMPENSATING FOR DISTORTION IN AN AMPLIFIER**

**Brian Joseph Budnik, Watauga, Tex., and George Francis Opas, Park Ridge, Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Nov. 12, 1996, Ser. No. 747,497**

**Int. Cl.[6] H03F** *1/32*

**U.S. Cl. 330—149** **14 Claims**




1. For use with an amplifier that generates an output signal having distortion, a method of compensating for the distortion, comprising:

(a) in a first signal path, receiving an input signal to be applied to the amplifier;

(b) adding predistortion to the input signal, the predistortion also adding delay to the input signal and being selected to compensate for at least some of the distortion provided by the amplifier, thus providing a predistorted input signal;

(c) applying the predistorted input signal to the amplifier, thereby to generate a compensated output signal;

(d) in a second signal path, receiving the input signal and applying a selected amount of delay to the input signal, thereby to provide a delayed input signal;

(e) comparing the delayed input signal to the compensated output signal to generate an error signal representative of a level of uncompensated distortion; and

(f) combining the error signal with the predistorted input signal such that the error signal tends to minimize the level of uncompensated distortion.

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**5,745,007**

**CMOS DIFFERENTIAL AMPLIFIER HAVING CONSTANT TRANSCONDUCTANCE AND SLEW RATE**

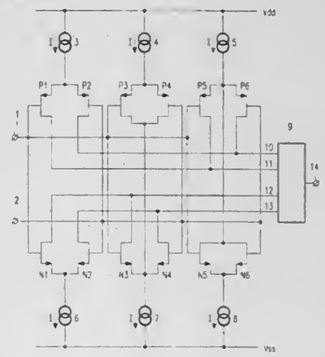
**William Redman-White, West Wellow, England, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 2, 1996, Ser. No. 691,775**

**Claims priority, application United Kingdom, Aug. 4, 1995, 9516025**

**Int. Cl.[6] H03F** *3/45*

**U.S. Cl. 330—253** **6 Claims**




1. A high voltage operational amplifier comprising:

first and second input terminals for receiving a low voltage differential input signal;

an output terminal for providing a high voltage output signal corresponding to the low voltage differential input signal;

a low voltage transconductance stage having first and second inputs coupled to the first and second input terminals, respectively, and a differential current output;

a voltage source having a high voltage supply input and a pair of differential outputs providing a low differential voltage at a high voltage level;

an intermediate stage comprising a low voltage current differential amplifier supplied by said pair of differential outputs of said voltage source and having a differential current input coupled to a differential current output of a buffer stage and a voltage output at a high voltage level but with low voltage swings providing a voltage representing the low voltage differential input signal;

the buffer stage being coupled between the differential current input of the intermediate stage and the differential current output of the transconductance stage;

an interface stage coupled to receive the voltage output of the intermediate stage and comprising a voltage follower stage providing a voltage output representing the voltage output of

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**5,745,008**

**HIGH VOLTAGE OPERATIONAL AMPLIFIER**

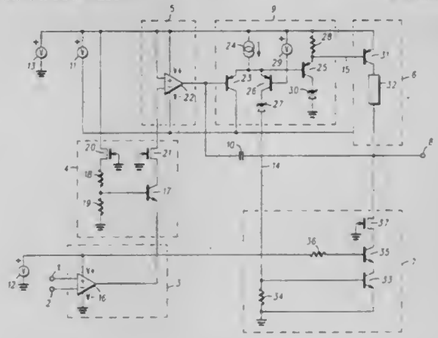
**Thien Huynh Luong, Vaud, and Heinz Lehning, Nyon, both of Switzerland, assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Jun. 13, 1996, Ser. No. 662,541**

**Claims priority, application United Kingdom, Jun. 24, 1995, 9512948**

**Int. Cl.[6] H03F** *3/45*; *1/14*

**U.S. Cl. 330—255** **8 Claims**



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the intermediate stage and a voltage to current converter stage providing a current output representing the voltage output of the intermediate stage;

an output sourcing stage having an input coupled to the voltage output of the interface stage and an output coupled to the output terminal and producing a high current representative of the low voltage differential input signal; and

an output sinking stage having an input coupled to the current output of the interface stage and an output coupled to the output terminal and producing a high current representative of the low voltage differential input signal;

whereby the combination of the high current outputs of the output sourcing and sinking stages produces the high voltage output signal at the output terminal.

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**5,745,009**

## SEMICONDUCTOR DEVICE INCLUDING A POWER AMPLIFIER AND A MOBILE TELECOMMUNICATION TERMINAL INCLUDING SUCH A SEMICONDUCTOR DEVICE

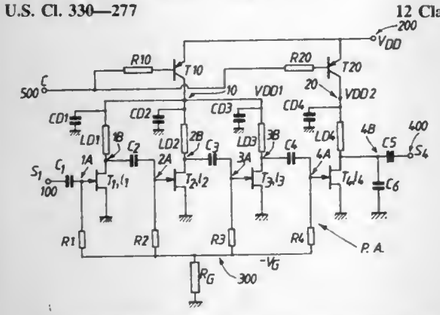
**Bruno Leroux, Sucy-en-Brie; Didier Meignant, Emerainville, and Eric Puechberty, Paris, all of France, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jul. 22, 1996, Ser. No. 681,106**

**Claims priority, application France, Jul. 21, 1995, 95 08894**

**Int. Cl.[6] H03F** *3/193*

**U.S. Cl. 330—277** **12 Claims**




11. A power amplifier circuit for use in a semiconductor device, said power amplifier circuit comprising:

a plurality of series-arranged depletion-layer field effect transistor stages, each of said stages including at least one transistor;

means for biasing each of said transistors in said plurality of series-arranged stages;

means for each of said stages to receive a high or very high frequency a.c. signal and means for each of said stages to output a high or very high frequency a.c. signal;

means for producing, on the drain of a transistor in a stage immediately preceding a transistor in a subsequent stage in said series, a voltage amplified a.c. signal of which the amplitude of its positive component is higher than the conduction threshold of the intrinsic diode of the transistor in the subsequent stage; and wherein

the transistor in the subsequent stage is isolated from the transistor in the preceding stage by a d.c. isolation capacitor which forms, together with the resistor of the intrinsic diode of the transistor in the subsequent stage, a series-arranged R-C rectifier circuit which imposes on the terminal of said isolation capacitor common to the gate of the transistor in the subsequent stage a shift of the mean level of the a.c. signal relative to the value of this mean level on the other terminal of said capacitor, said shift being used as a negative voltage which is available on the terminals of a resistor inserted between the gate of said transistor in said subsequent stage and ground for biasing the gate of said transistor of said subsequent stage.

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**5,745,010**

## OPERATIONAL AMPLIFIER

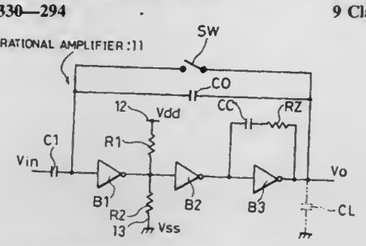
**Masayuki Miyamoto, Nabari, and Kunihiko Iizuka, Sakai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Apr. 30, 1996, Ser. No. 641,288**

**Claims priority, application Japan, May 30, 1995, 7-132256**

**Int. Cl.[6] H03F** *1/34*

**U.S. Cl. 330—294** **9 Claims**




1. An operational amplifier including:

reverse amplifiers interconnected in series in an odd number of stages not less than three;

means for feeding back an output from a reverse amplifier in a last stage to an input of a reverse amplifier in a first stage;

a feed back capacitance element provided across input and output ends of at least one of said reverse amplifiers.

wherein each reverse amplifier is connected to a first operating power source line and a second operating power source line, said first and second operating power source lines having respective levels; and

an input end of at least one of said reverse amplifiers in a second stage or beyond, whose preceding reverse amplifier in immediately one stage ahead is not provided with said capacitance element, being connected to said first and second power source lines respectively through a first resistor and second resistor having an equal resistance value, said first and second resistors serving as a gain adjustor.

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**5,745,011**

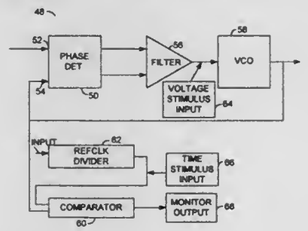
## DATA RECOVERY PHASE LOCKED LOOP

**Paul H. Scott, San Jose, Calif., assignor to Cypress Semiconductor Corporation, San Jose, Calif.**

**Filed Jun. 5, 1996, Ser. No. 658,760**

**Int. Cl.[6] H03L** *7/085;7/093*

**U.S. Cl. 331—44** **13 Claims**




1. A phase locked loop system having a detector, a filter and an oscillator along with a reference divider and a comparator having an input and an output comprising:

means for applying a test voltage at a first access node, located between the filter and the oscillator;

means for applying a digital input at an external pin between the reference divider and said comparator including means for applying a series of digital pulses;

means for providing a second input at said external pin comprising a multiplexer; and



means for providing a measurable output connected to said comparator.

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**5,745,012**

## VOLTAGE-CONTROLLED OSCILLATOR HAVING A SEMICONDUCTOR INTEGRATED CIRCUIT, A PIEZOELECTRICS RESONATOR AND A DIODE AND VARIABLE-CAPACITANCE DIODE

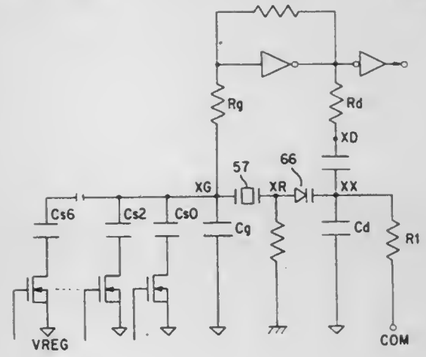
**Manabu Oka; Yukari Nakajima; Masayuki Kikushima, and Kazuhiko Shimodaira, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan**

**Continuation of Ser. No. 601,087, Feb. 14, 1996, Pat. No. 5,631,609. This application Jan. 21, 1997, Ser. No. 785,299**

**Claims priority, application Japan, Feb. 15, 1995, 7-27170; Oct. 3, 1995, 7-256623; Jan. 10, 1996, 8-2693**

**Int. Cl.[6] H03B** *5/36;* **H01L** *41/053*

**U.S. Cl. 331—68** **16 Claims**




1. A voltage-controlled oscillator comprising:

a semiconductor integrated circuit including at least an inverter;

a piezoelectric resonator; and

a variable-capacitance diode, wherein said piezoelectric resonator and said variable capacitance diode are connected in series between input and output terminals of said inverter, wherein a DC-cutting capacitor is disposed between said variable-capacitance diode and said inverter, a first node located between said piezoelectric resonator and said variable-capacitance diode is connected to ground by a bias resistor, and a signal is applied to a second node located between said variable-capacitance diode and said DC-cutting capacitor.

9. A voltage-controlled oscillator comprising:

a semiconductor integrated circuit mounted on an island of a lead frame and being electrically connected to an inner lead of said lead frame by a wire-bonded wire;

a piezoelectric resonator being disposed adjacent to said semiconductor integrated circuit;

a lead of said piezoelectric resonator being electrically connected to said lead frame; and

an electronic component mounted on a land of said lead frame and being electrically connected to said lead frame, wherein said piezoelectric resonator, said electronic component and said lead frame are resin molded into a single unit, an outer part of said inner lead being exposed to an outside, wherein a first connecting portion of said lead frame and said lead of said piezoelectric resonator is located on a same straight line as a second connecting portion of said lead frame and said electronic component.

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**5,745,013**

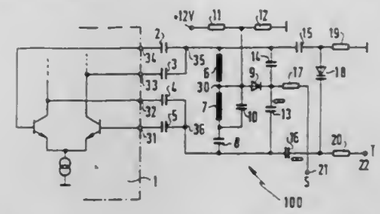
## VARIABLE-FREQUENCY OSCILLATOR CONFIGURATION

**Henning Hohmann, München, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Nov. 26, 1996, Ser. No. 756,347**

**Int. Cl.[6] H03B** *5/08*

**U.S. Cl. 331—179** **7 Claims**




1. A variable-frequency oscillator configuration, comprising:

an amplifier network including signal terminals; and

a feedback network including:

first and second terminals connected to said signal terminals of said amplifier network;

a first series circuit connected between said first and second terminals, said first series circuit having first and second resonant circuit inductors and a first resonant circuit capacitor, said first resonant circuit capacitor connected to said second terminal, and said first and second resonant circuit inductors having a coupling node therebetween;

a second series circuit connected between said first and second terminals, said second series circuit having a variable resonant circuit capacitor and a second resonant circuit capacitor; and

a switching device connected to said coupling node, for connecting said coupling node to said second terminal with regard to high-frequency signals, as a function of a switching signal.

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**5,745,014**

## NONRECIPROCAL CIRCUIT ELEMENT

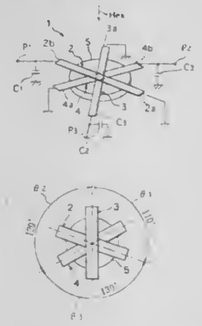
**Takekazu Okada, Ishikawa-ken; Takashi Hasegawa, and Hiromu Tokudera, both of Nagaokakyo, all of Japan, assignors to Murata Manufacturing Company, Ltd., Japan**

**Filed Jul. 29, 1996, Ser. No. 681,849**

**Claims priority, application Japan, Jul. 31, 1995, 7-195030; Dec. 27, 1995, 7-341374**

**Int. Cl.[6] H01P** *1/383*

**U.S. Cl. 333—1.1** **15 Claims**



1. A nonreciprocal circuit element comprising a ferrite body and three central conductors which are disposed such that they intersect each other at predetermined angles in an electrically isolated condition and a DC magnetic field is applied to the intersection and

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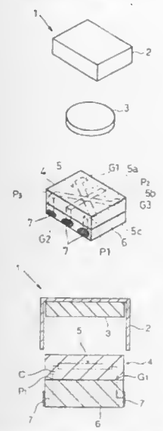
to the ferrite body, wherein all three of the intersection angles formed by the intersection of said three central conductors have differennt values.

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**5,745,015**
**NON-RECIPROCAL CIRCUIT ELEMENT HAVING A MAGNETIC MEMBER INTEGRAL WITH THE FERRITE MEMBER**

**Hiromu Tokudera, and Katsuyuki Ohira, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co. Ltd., Japan**

**Filed Nov. 26, 1996, Ser. No. 756,727**
**Claims priority, application Japan, Nov. 27, 1995, 7-307120; Nov. 25, 1996, 8-313806**
**Int. Cl.[6] H01P** *1/383*
**U.S. Cl. 333—1.1** **15 Claims**



1. A non-reciprocal circuit element comprising:
a ferrite member having a center electrode section in which a plurality of electrode lines which function as inductance components are disposed so as to intersect each other at an intersecting portion by forming a predetermined angle between pairs of said electrode lines and being maintained in an electrical non-contacting state, said ferrite member also having matching capacitance electrodes connected to input/output ports of said electrode lines functioning as capacitance components;
a permanent magnet for applying a magnetic field to the intersection portion of said center electrode section of said ferrite member; and
a magnetic member formed integrally with at least one of lower and upper surfaces of said ferrite member, said magnetic member being made of a magnetic material having a permeability higher than that of said ferrite member.

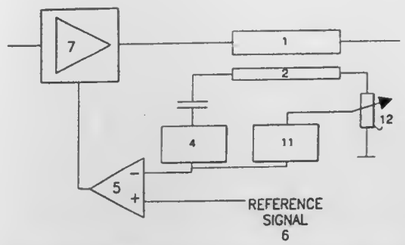
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**5,745,016**
**METHOD FOR IMPROVING POWER MEASUREMENT IMPLEMENTED WITH A DIRECTIONAL COUPLER AT LOW POWER LEVELS**

**Ari Salminen, Salo, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland**

**Filed May 9, 1996, Ser. No. 644,037**
**Claims priority, application Finland, May 10, 1995, 952268**
**Int. Cl.[6] H03H** *7/00*
**U.S. Cl. 333—17.1** **15 Claims**

1. A directional coupler arrangement for measuring radio frequency power, which directional coupler arrangement comprises
a directional coupler comprising a first conductor element (1) and a second conductor element (2), both of which comprise a first end and a second end,



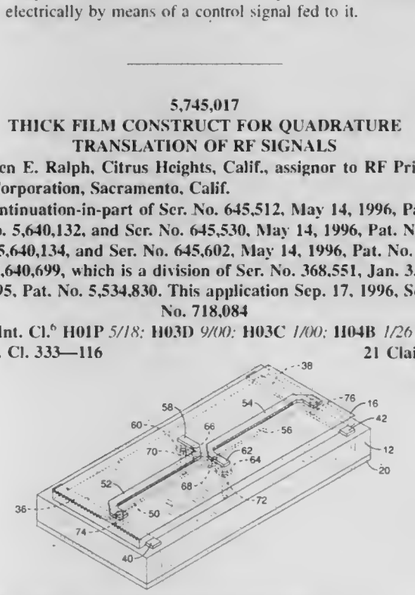

a detector element (4) for detecting a level of power coupled from the first conductor element (1) to the second conductor element (2) and for providing an output signal as a response to said power level, which detector element comprises an input port and an output port and whose input port is connected to the first end of the second element (2), and
a terminal impedance (12), which is connected between the second end of the second conductor element (2) and an earth potential,
characterized in that
the impedance value of said terminal impedance (12) is altered electrically by means of a control signal fed to it.

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**5,745,017**
**THICK FILM CONSTRUCT FOR QUADRATURE TRANSLATION OF RF SIGNALS**

**Loren E. Ralph, Citrus Heights, Calif., assignor to RF Prime Corporation, Sacramento, Calif.**

**Continuation-in-part of Ser. No. 645,512, May 14, 1996, Pat. No. 5,640,132, and Ser. No. 645,530, May 14, 1996, Pat. No. 5,640,134, and Ser. No. 645,602, May 14, 1996, Pat. No. 5,640,699, which is a division of Ser. No. 368,551, Jan. 3, 1995, Pat. No. 5,534,830. This application Sep. 17, 1996, Ser. No. 718,084**
**Int. Cl.[6] H01P** *5/18;* **H03D** *9/00;* **H03C** *1/00;* **H04B** *1/26*
**U.S. Cl. 333—116** **21 Claims**



10. A thick film quadrature coupler, comprising:
(a) a plurality of balanced transmission line cells, each said cell including
(i) a dielectric substrate base, said substrate base having first and second sides,
(ii) a metal backplane adjacent to said first side of said substrate base,
(iii) a first metal trace deposited on said second side of said substrate base, said first metal trace having first and second ends,
(iv) a dielectric layer deposited over and around said first metal trace,
(v) a second metal trace deposited on said dielectric layer, said second metal trace having first and second ends,
(vi) said second metal trace aligned with and generally parallel to said first metal trace, said first ends of said first and second metal traces having a common orientation, and said second ends of said first and second metal traces having a common orientation;



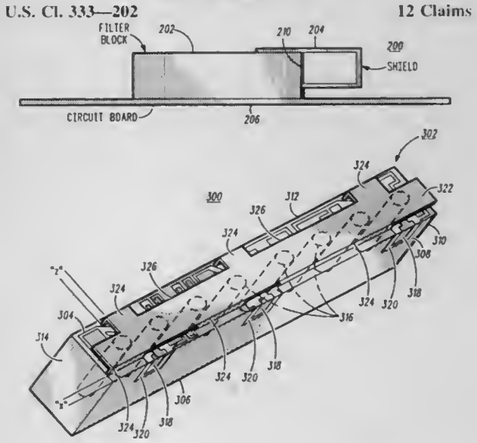
(b) a first one of said transmission line cells having an input at said first end of said first trace and an in-phase output at said first end said second trace;
(c) a second one of said transmission line cells having a resistive termination at said first end of said of said first trace and a quadrature phase output at said first end of said second trace, said second end of said first trace of said second cell electrically connected to said second end of said second trace of said first cell, said second end of said second trace of said second cell electrically connected to said second end of said first trace of said first cell;
(d) a third one of said transmission line cells having a first end of said second trace electrically connected to said second end of said second trace of said first cell and said second end of said first trace of said second cell, said first trace of said third cell electrically connected to ground; and
(e) a fourth one of said transmission line cells having a first end of said second trace electrically connected to said second end of said first trace of said first cell and said second end of said second trace of said second cell, said first trace of said fourth cell electrically connected to ground.

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**5,745,018**
**CERAMIC FILTER WITH A COPLANAR SHIELD**

**Reddy R. Vangala, Albuquerque, N. Mex., assignor to Motorola Inc., Schaumburg, Ill.**

**Filed Jul. 9, 1996, Ser. No. 677,154**
**Int. Cl.[6] H01P** *1/202*
**U.S. Cl. 333—202** **12 Claims**



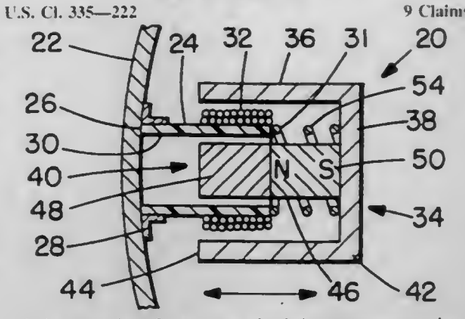

1. A ceramic filter with a coplanar shield, comprising:
a filter body comprising a block of dielectric material having top, bottom and side surfaces, and having a plurality of metallized through holes extending from the top to the bottom surfaces defining resonators in the filter body;
a metallization layer substantially coating the bottom and the side surfaces, and the top surface having a metallized pattern thereon defining a top pattern;
at least a first and a second input-output pad comprising an area of conductive material on one of the side surfaces and substantially surrounded by an unmetallized area of the metallization layer on the one side surface of the metallization layer; and
a conductive shield having a plurality of standoff legs which maintain the conductive shield at a predetermined height above the top pattern of the filter body, the standoff legs are connected to a portion of the top pattern on the top surface of the filter at a predetermined distance from the one side surface having the at least first and second input-output pads.

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**5,745,019**
**MAGNETIC ANNUNCIATOR**

**Herman Lee Renger, Calabasa, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.**

**Filed May 16, 1996, Ser. No. 648,748**
**Int. Cl.[6] H01F** *7/08*
**U.S. Cl. 335—222** **9 Claims**




1. An annunciator for an organ stimulating system encapsulated within a casing and implantable in the body of a patient comprising:
an elongated support member mounted at one end on the casing for the organ stimulating system, said support member being tubular and having an inner peripheral surface and extending to a free end;
an electrically conductive coil encircling said support member;
an elongated oscillating member including:
a field return member of magnetically permeable material, spaced from and generally encircling said support member, said field return member being tubular and extending between a proximal end generally proximate said free end of said support member and a distal end generally proximate the casing;
a head member integral with said field return member and overlying said proximal end thereof; and
a stack member mounted on said head member and extending away therefrom toward the casing for the organ stimulating system, said stack member having an outer peripheral surface which is spaced from said inner peripheral surface of said support member;
said stack member including a magnetically permeable pole piece and a permanent magnet member, said pole piece and said magnet member being in stacked relationship which together produce a radial magnetic field which extends through said coil and to said field return member; and
resilient means intermediate, and bearing against, respectively, said head member and said free end of said support member, said resilient means biasing said oscillating member to an initial position;
whereby cyclic energization of said coil interacts with said radial magnetic field to cause said oscillating member to oscillate relative to said initial position.

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**5,745,020**
**FLYBACK TRANSFORMER WITH A BUILT-IN PIN FOR GENERATING FLYBACK PULSE SIGNAL**

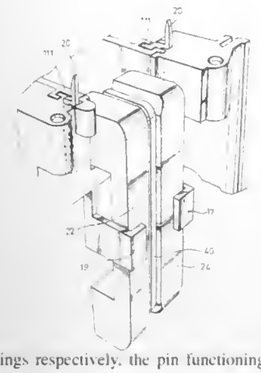
**Chiang Shen-Long, and Kuan Meng-Tsan, both of Kweishan, Taiwan, assignors to Acer Peripherals Inc., Kweishan, Taiwan**

**Filed Feb. 26, 1996, Ser. No. 606,578**
**Int. Cl.[6] H01F** *27/02*
**U.S. Cl. 336—92** **5 Claims**

1. A flyback transformer for a display device circuitry, the flyback transformer having a low voltage bobbin, a high voltage bobbin, a core and a casing, the casing including a slot which has two end openings, characterizing in:
the flyback transformer comprising a pin inserted within the slot of the casing with two ends of pin sticking out from said two

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end openings respectively, the pin functioning to generate a positive flyback pulse signal and a negative flyback pulse signal at said two ends respectively during a flyback operation of the circuitry, an insulating portion being provided between the pin and the core.

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**5,745,021**

**LINE FILTER**

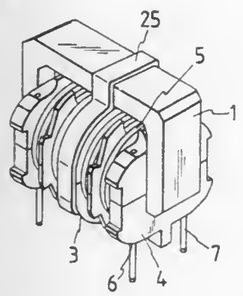
**Hisayo Miyoshi; Toshinori Oda; Tatsuya Mori; Shunya Inoue, and Yutaka Tsutsumi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Division of Ser. No. 711,709, Aug. 30, 1996, Pat. No. 5,635,891, which is a continuation of Ser. No. 400,701, Mar. 8, 1995, abandoned, which is a division of Ser. No. 208,780, Mar. 11, 1994, abandoned. This application Mar. 17, 1997, Ser. No. 819,180**

**Claims priority, application Japan, Mar. 12, 1993, 5-51890; Apr. 6, 1993, 5-79309; Sep. 27, 1993, 5-239639; Sep. 27, 1993, 5-239640; Sep. 27, 1993, 5-239641; Oct. 4, 1993, 5-247929; Jan. 20, 1994, 6-4468**

**Int. Cl.[6] H01F** *27/30*

**U.S. Cl. 336—196** **1 Claim**



1. A line filter comprising:
a magnetic core having a leg;
a bobbin placed around the leg of the magnetic core and having a gear;
a pair of windings provided on the bobbin; and
a band engaging the gear and the magnetic core to fix the gear and the magnetic core to each other.

**5,745,022**

**BIMETALLIC TEMPERATURE CONTROLLER HAVING A RESISTOR FOR SELF-LOCKING FUNCTION AND A RESISTOR FOR EXCESS CURRENT PROTECTION**

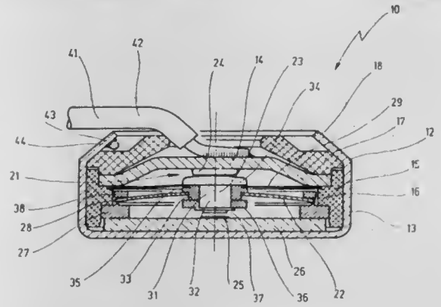
**Michael Becher, Althengstett, and Edwin Güttinger, Königsbach, both of Germany, assignors to Thermik Geratebau GmbH, Pforzheim, Germany**

**Filed Jul. 26, 1996, Ser. No. 686,853**

**Claims priority, application Germany, Jul. 26, 1995, 195 27 254.4**

**Int. Cl.[6] H01H** *37/14;61/02*

**U.S. Cl. 337—104** **18 Claims**



1. A temperature controller, comprising
a bimetallic switching device that changes between at least two switch positions in response to temperature variations,
a first heating resistor connected to said bimetallic switching device and arranged such that it heats said bimetallic switching device when the latter is actuated, in order to provide for a self-locking function, and
a second heating resistor connected to said bimetallic switching device and arranged such that it heats said bimetallic switching device in such a way that it switches the latter when current flowing through said temperature controller exceeds an excess temperature,
said bimetallic swithching device comprising a current carrying part and being connected to said two heating resistors in such a way that in both of said at least two switch positions the current flows through the current carrying part.

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**5,745,023**

**FUSE ELEMENT HAVING LOW MELTING POINT CURVED SURFACE METAL AND CLAMPING PIECES WITH PROJECTIONS**

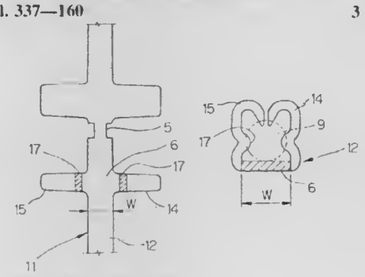
**Mitsuhiko Totsuka, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan**

**Filed Sep. 18, 1996, Ser. No. 710,513**

**Claims prinrity, application Japan, Oct. 13, 1995, 7-265672**

**Int. Cl.[6] H01H** *85/04*

**U.S. Cl. 337—160** **3 Claims**



1. A fuse element, comprising:



a fusible body for electrically connecting a pair of connecting terminal portions to each other, said connecting terminal portions connected to an electric circuit, said fusible body including:
a melting metal adding portion;
a low-melting-point metal piece having a curved surface fixed on said melting metal adding portion in order to adjust a fusion characteristic of said fusible body; and
a pair of clamping pieces extended respectively from both side edges of said melting metal adding portion to clamp the low-melting-point metal piece from both sides, said clamping pieces having projections for holding said low-melting-point metal piece in press contact with each other by projecting into a space defined by a width of said melting metal adding portion when said clamping pieces are upwardly bent from the both sides of said melting metal adding portion.

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**5,745,024**

**FUSE ELEMENT FOR SLOW-BLOW FUSES**

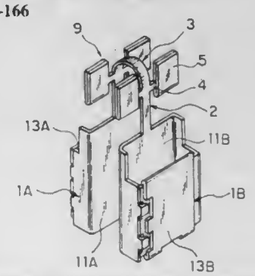
**Manabu Ohta, Ogaki, and Akihiko Shimizu, Ibi-gun, both of Japan, assignors to Pacific Engineering Co., Ltd., Gifu-ken, Japan**

**Filed Sep. 26, 1996, Ser. No. 721,330**

**Claims priority, application Japan, Oct. 2, 1995, 7-279723**

**Int. Cl.[6] H01H** *85/04*

**U.S. Cl. 337—166** **5 Claims**



1. A fuse element for slow-blow fuses, comprising:
a pair of female terminals-,
slender element portions with a middle portion to be fused connecting top ends of said pair of female terminals;
narrow and short bridges formed on both sides of said middle portion to be fused; and
wings having a heat accumulating function formed by way of said narrow and short bridges;
wherein said pair of female terminals, said slender element portions, said narrow and short bridges and said wings are formed by punching out a single electrically conductive sheet, and said wings are tightly bent after said punching, out.

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**5,745,025**

**SNAP-ENGAGING APPARATUS FOR A ROTABLE COMPONENT**

**Oswald Reuss, Unterelsbach, Germany, assignor to Preh-Werke GmbH & Co. KG, Bad Neustadt, Germany**

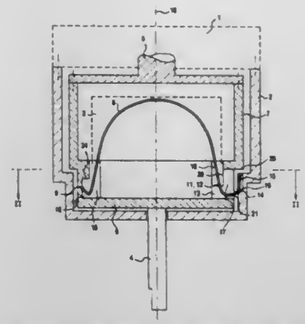
**Filed Jan. 26, 1996, Ser. No. 592,683**

**Claims priority, application Germany, Feb. 3, 1995, 295 01 692 U**

**Int. Cl.[6] H01C** *10/32*

**U.S. Cl. 338—167** **6 Claims**

1. A snap-engaging apparatus for use in a rotatable electrical component having a snap-engaging nose which is flexibly held by a leaf spring in engagement with a rotor which can be rotated about its axis, and a stationary engagement contour wall of the component, with the snap-engaging nose being snapped into engagement with the engagement contour wall by the leaf spring;



wherein the rotor is a hollow body having an axial opening and a circumferential wall, the leaf spring is tensioned to have substantially a U-shape, with first and second ends thereof being self supported on diametrically-positioned portions of the circumferential wall, the engagement contour wall coaxially surrounding the rotor and the rotor axis, the circumferential wall having an opening therein through which the snap-engaging nose, which is formed on an extension of the leaf spring, extends to flexibly engage, radially to the rotor axis, the engagement contour wall.

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**5,745,026**

**VEHICULAR COMMUNICATION SYSTEM USING AN IGNITION KEY**

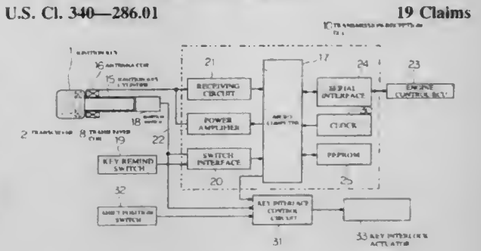
**Sadao Kokubu; Hisashi Aoki; Takashi Mizuno, and Shinichi Koga, all of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi-ken, Japan**

**Filed Jan. 10, 1997, Ser. No. 782,630**

**Claims priority, application Japan, Jan. 11, 1996, 8-003126**

**Int. Cl.[6] G08B** *0/00*

**U.S. Cl. 340—286.01** **19 Claims**




1. A vehicular communication system comprising.
an ignition key having a reception device for storing data received by a reception coil;
an ignition key cylinder switchable between at least a key removal position at which the ignition key can be freely pulled out of the ignition key cylinder and a key removal prevention position that prevents the ignition key from being pulled out of the ignition key cylinder;
a transmission device for transmitting stored data to the reception device during a predetermined communication time sequence while the ignition key is in the ignition key cylinder and the ignition cylinder is in the key removal prevention position; and
switching prevention means for preventing the ignition key cylinder from being switched from the key removal prevention position to the key removal position during the predetermined communication time sequence.

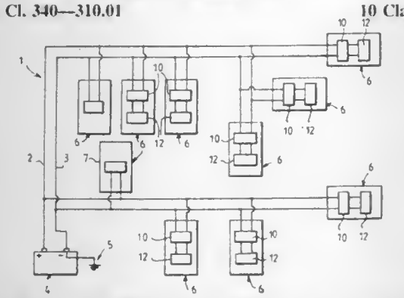
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### 5,745,027
### DATA COMMUNICATION SYSTEM EMPLOYING CARRIER CURRENTS, IN PARTICULAR FOR A MOTOR VEHICLE

**Joël Malville, Chambly, France, assignor to Automobiles Peugeot, Paris, and Automobiles Citroen, Neuilly Sur Seine, both of France**

**Filed Oct. 23, 1995, Ser. No. 546,714**
**Claims priority, application France, Oct. 26, 1994, 94 12831**
**Int. Cl.[6] H04M *11/04***
**U.S. Cl. 340—310.01** **10 Claims**

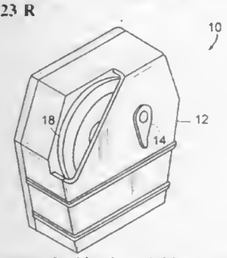


1. Data communication system employing carrier currents, in particular for a motor vehicle, said system comprising in combination: an electric power supply, supply lines constituting a data communication network connected to said power supply, functional devices of said vehicle connected to said supply lines, some of said devices being adapted to communicate with one another, at least some of said functional devices comprising a communication interface and an associated application equipment communicating with other functional devices through the communication interface thereof, the application equipment being connected to the communication interface through a data communication line, said communication interface comprising control means for controlling the power supply of said associated application equipment, means for testing the validation of at least a predetermined criteria, and command means for commanding said control means for commanding, as a function of said validation of said predetermined criterion, the selective feeding of power to said associated application equipment by means of said supply lines.

### 5,745,028
### DIRECTIONAL MOTION INSTRUMENTATION SYSTEM

**Allan G. Hock, Londonderry, N.H., assignor to Sound Motion, Inc., Londonderry, N.H.**

**Filed Apr. 29, 1994, Ser. No. 235,486**
**Int. Cl.[6] G08B *23/00***
**U.S. Cl. 340—323 R** **1 Claim**

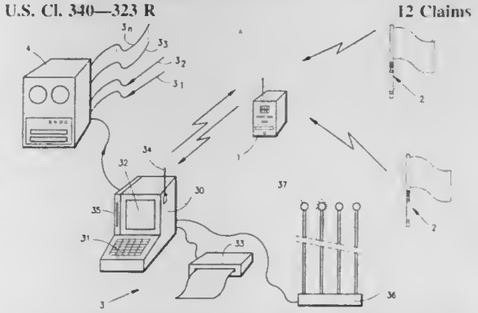


1. A training system for kinetic activities, comprising:
a transducer for mounting on a user, said transducer adapted to provide a first signal responsive to acceleration applied thereto as said user engages in said activity,
means responsive to said first signal for generating an output signal indicating to said user a specific range, among a selected plurality of ranges, in which a characteristic of said first signal is located, to thereby enable said user to monitor said activities, wherein said means for generating includes motion distinguishing means having a frequency response characterized by a rising slope over a first portion thereof and a falling slope over a second portion thereof, for distinguishing between smooth steady signals and fast, non-repetitive signals and including a differentiator for providing said rising slope and an integrator for providing said falling slope.

### 5,745,029
### REFEREEING AID SYSTEM FOR BALL GAMES

**Manuel Garcia, 11 rue Pablo Neruda, 17700 Surgeres, France, assignor to Manuel Garcia, Surceres, France**

**PCT No. PCT/FR93/00840, § 371 Date Mar. 3, 1995, § 102(e) Date Mar. 3, 1995, PCT Pub. No. WO94/05380, PCT Pub. Date Mar. 17, 1994**
**PCT Filed Sep. 3, 1993, Ser. No. 392,914**
**Claims priority, application France, Sep. 3, 1992, 92 10537**
**Int. Cl.[6] G08B *23/00***
**U.S. Cl. 340—323 R** **12 Claims**



1. A refereeing aid system for ball games played on a playing field, in which refereeing is performed by a referee in charge together with at least one auxiliary judge, both present on the playing field, the system including transmitter means carried by the auxiliary judges for selectively sending call signals to the referee, and communication means comprising receiver means carried by the referee for receiving said signals and providing an audible indication thereof, wherein said communication means further comprises transmitter means carried by the referee, enabling refereeing data previously input via input means to be communicated to management means disposed in the vicinity of the playing field and connected to computer means centralizing said refereeing data from a plurality of management means present at distinct playing fields, wherein the transmitter means made available to the auxiliary judges include respective coding circuits enabling the referee to identify the originator of a call signal emitted by the transmitter means by coding the call signal, wherein the call signal coding depends on a state of a switch and wherein the switch is operated automatically by the auxiliary judge holding up a flag in a vertical position.

### 5,745,030
### AUTOMATIC OCCUPANT SENSING ANTI-CARJACKING SYSTEM

**Albert Aaron, P.O. Box 5298, Detroit, Mich. 48205**

**Filed May 14, 1996, Ser. No. 618,832**
**Int. Cl.[6] B60R *25/10***
**U.S. Cl. 340—426** **2 Claims**

1. A method for preventing carjacking and protecting the authorized occupant of the vehicle from being taken hostage in their own vehicle and facilitating the recovery of a vehicle from an unauthorized occupant who attempts or has obtained possession of the vehicle by carjacking the vehicle from the authorized occupant by force in any of various carjacking scenarios, the method comprising the steps of:



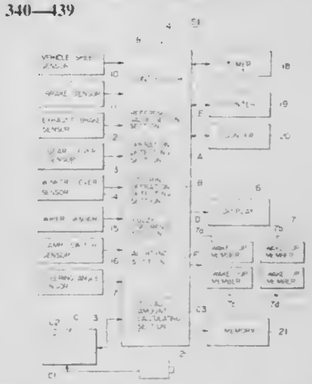


(a) detecting that the authorized operator occupant is in the vehicle monitoring the status of wired communication signals transmitted by array of sensors;
(b) detecting that the authorized operator occupant is not in the vehicle by monitoring the status of wired communication signals transmitted by array of sensors;
(c) detecting that other authorized occupants are in the vehicle by monitoring the status of wired communication signals transmitted by array of sensors;
(d) detecting that other unauthorized occupants are in the vehicle by monitoring the status of wired communication signals transmitted by array of sensors;
(e) detecting a carjacking condition indicating that the authorized occupant is no longer in the vehicle by monitoring the status of wired communication signals transmitted by array of sensors;
(f) detecting a carjacking condition indicating a hostage condition where the unauthorized occupant is in the vehicle with the authorized operator occupant by monitoring the status of wired communication signals transmitted by array of sensors;
(g) disabling the vehicle.

### 5,745,031
### SAFETY DRIVING SYSTEM

**Keiichi Yamamoto, Yokohama, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan**

**PCT No. PCT/JP94/02292, § 371 Date Aug. 28, 1995, § 102(e) Date Aug. 28, 1995, PCT Pub. No. WO95/18433, PCT Pub. Date Jul. 6, 1995**
**PCT Filed Dec. 28, 1994, Ser. No. 507,481**
**Claims priority, application Japan, Dec. 28, 1993, 5-337407**
**Int. Cl.[6] B60Q *1/00***
**U.S. Cl. 340—439** **8 Claims**

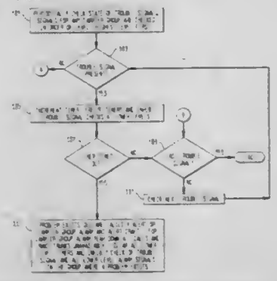


1. A safety driving system comprising:
an operation detecting section including accumulating means accumulating at each first predetermined cycle a constant during the operation of a vehicle and deriving monotonousness and subtracting means for subtracting a weight assigned to an operated device, except for a steering wheel, from a sum of accumulated constants and updating the monotonousness;
a steering detecting section detecting an amount of steering operation within a preset period of time;
a running position detecting section including: an image data memory selectively receiving and storing images of a road surface in front of a vehicle which are photographed at each second predetermined cycle by a camera supported on a vehicle body; image processing means extracting data on white lines of the road surface and determining coordinates of white lines defining a lane; a zigzag amount calculating section receiving coordinate data of the white lines and calculating a zigzag amount which denotes a deviation of the white lines on horizontal coordinates at each second predetermined cycle; and zigzag amount averaging section averaging the zigzag amount data calculated at a predetermined number of times;
a fuzzy inference section inferring a driver's alertness on the basis of membership functions respectively corresponding to the updated monotonousness, the amount of steering operation, and the average zigzag amount; and
an alerting section activating wake-up members depending upon the driver's alertness.

### 5,745,032
### PROCESSING FACILITY ALERT AND ALARM INDICATIONS FOR MULTIPLEXED TRANSMISSION FACILITIES HAVING A PLURALITY OF MULTIPLEX LEVELS

**Douglas Walter Sturm, Wheaton, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Aug. 29, 1996, Ser. No. 703,141**
**Int. Cl.[6] G08B *29/00***
**U.S. Cl. 340—506** **10 Claims**



1. In a multi-level hierarchical alarm system, a method of reporting a specific alarm signal out of a plurality of alarm signals, comprising the steps of:
for each specific alarm signal, performing timing using a timer corresponding to said each specific alarm signal;
if said specific alarm signal becomes active, freezing timing for all lower level alarm signals included in and below said specific alarm signal in a hierarchy of alarm signals;
if said specific alarm signal is absent, unfreezing timing for a lower level alarm indication included in said specific alarm signal; and
reporting said specific alarm signal if the timer corresponding to said specific alarm signal times out.

### 5,745,033
### VEHICULAR REMOTE DISTRESS SIGNAL

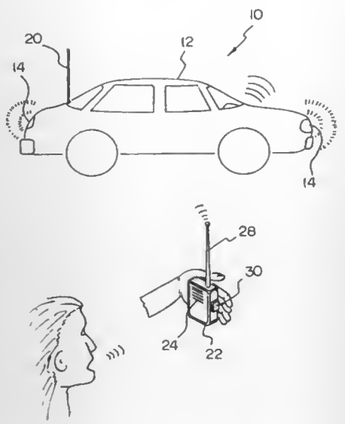
**Joseph Jenkins, Jr., and Karla M. Jenkins, both of 9800 W. Bay Harbor Dr., #503, Bay Harbor Islands, Fla. 33154**

**Filed May 2, 1996, Ser. No. 642,110**
**Int. Cl.[6] G08B *1/08*; B60Q *1/00***
**U.S. Cl. 340—539** **1 Claim**

1. A vehicular remote distress signal comprising, in combination:
a vehicle having a plurality of headlights, brake lights, reverse lights and turn signal lights coupled to a periphery thereof and

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adapted to emit light upon the actuation thereof and a speaker adapted to transmit an amplified audio signal therefrom upon the actuation thereof;

a receiver situated discreetly within an interior of the vehicle and electrically coupled to an antenna, lights, and speaker, the receiver adapted to intermittently actuate the lights and speaker upon the receipt of a distress signal, wherein the speaker transmits a periodic amplified alarm noise and further adapted to allow the transmission of a vocal message from the speaker upon the receipt thereof via free space, wherein the receiver transmits the alarm noise from the speaker for between 5 and 20 minutes; and

a portable transmitter with a generally rectangular configuration having a front face, a rear face, and a periphery situated therebetween thus defining an interior space, the housing having a clip for being worn by a user, the transmitter comprising a short rubber coated coil antenna coupled to a top surface of the housing with the length of the antenna being less than a height of the housing and being approximately 3 inches, a microphone, and control circuitry situated within the interior space and electrically connected to the antenna and microphone, the circuitry adapted to transmit a distress signal upon the instantaneous depression of an actuator button situated on the housing or upon the receipt of a specific audio signal by the microphone, wherein the circuitry is further adapted to transmit via free space a vocal message received from the microphone upon the continuous depression of the actuator button, wherein the receiver is adapted to cease the alarm noise from the speaker upon the receipt of the voice message.

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**5,745,034**

**PROVIDING AN ALARM IN RESPONSE TO A DETERMINATION THAT A PERSON MAY HAVE SUDDENLY EXPERIENCED FEAR**

**Stig Lundegaard Andersen, Havrevej 7, Esbonderup, Graested 3230, Denmark, and Jens Ole Sorensen, P.O. Box 221, North Side, Grand Cayman, Cayman Islands**

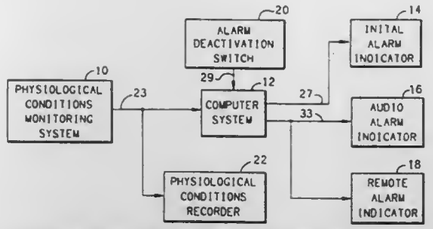
**PCT No. PCT/IB96/01016, § 371 Date Mar. 10, 1997, § 102(e) Date Mar. 10, 1997, PCT Pub. No. WO97/03426, PCT Pub. Date Jan. 30, 1997**

**Continuation-in-part of Ser. No. 500,235, Jul. 10, 1995, Pat. No. 5,568,126. This PCT application Jul. 8, 1996, Ser. No. 793,881**

**Int. Cl.[6] G08B** *21/00*

**U.S. Cl. 340—574** **23 Claims**

**4**. A system for providing an alarm when a person suddenly experiences fear, comprising;




monitoring means for coupling to a person fix monitoring at least one physiological condition of the person to provide physiological data signal(s) that are indicative of the status of the monitored physiological condition(s);

a computer system coupled to the monitoring means for processing the physiological data signal(s) to determine whether the person may have suddenly experienced fear;

first alarm-indicating means coupled to the computer system for providing a first alarm indication in response to a determination by said processing that the person may have suddenly experienced fear;

means for providing an alarm-deactivation signal that causes the computer system to deactivate the first alarm-indicating means; and

means for manually activating a second alarm indication.

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**5,745,035**

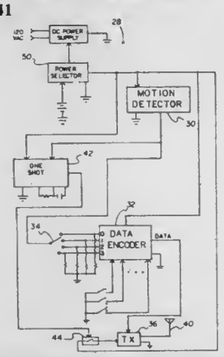
**MOTION DETECTING SYSTEM**

**David W. Deyo, 1208 Collin Dr., Allen, Tex. 75002**

**Filed Feb. 20, 1997, Ser. No. 803,427**

**Int. Cl.[6] G08B** *13/00*

**U.S. Cl. 340—541** **6 Claims**




**1**. A new and improved motion detecting system comprising, in combination:

a plurality of transmitter housings each with a generally rectangular configuration with a front face, a rear face, and a periphery formed therebetween thus defining an interior space, the front face having a lower extent with a semi-cylindrical protrusion protruding therefrom, the protrusion having a plurality of horizontal slots formed therein along an entire width of the front face for allowing communication between the interior space and an exterior, the protrusion further having a plurality of flexible shutters adapted to selectively cover a predetermined area of the slots, the transmitter housing further having a rectangular cut out formed in the rear face thereof and a conventional power plug pivotally coupled within the rectangular cut out about a vertical axis, whereby the horizontal slots may be selectively covered and directed towards various areas upon the plug being inserted within a standard power receptacle;

a plurality of motion detector transmitter means situated in each of the transmitter housings, each motion detector transmitter means including:



a motion detector situated within the associated transmitter housing and adapted to emit a motion signal upon the detection of motion via a portion of the slots uncovered by the shutters,

a data encoder situated within the associated transmitter housing and connected to the motion detector, the data encoder adapted to emit a transmitter coded activation signal upon the receipt of the motion signal, wherein each transmitter coded activation signal is unique and corresponds with the associated transmitter housing,

a transmitter situated within the associated transmitter housing and connected to the data encoder, the transmitter adapted to emit the transmitter coded activation signal via free space upon the receipt thereof only during the receipt of power, and

a one-shot multivibrator situated within the associated transmitter housing and connected to the motion detector and the transmitter, the one-shot multivibrator adapted to transmit power for a predetermined amount of time upon the receipt of the motion signal; and

a receiver unit including a housing with a rectangular configuration having a front face, a rear face, and a periphery formed therebetween thereby defining an interior space, the receiver unit further having receiver means including:

a receiver adapted to receive the transmitter coded activation signal via free space,

a data decoder situated within the receiver housing and connected to the receiver, the data decoder having a plurality of outputs, the data decoder adapted to transmit a pulse to one of the outputs thereof upon the receipt of a corresponding transmitter coded activation signal, wherein the duration of the pulse corresponds to the duration of the transmitter coded activation signal,

a flip flop situated within the receiver housing and having a plurality of inputs connected to the outputs of the data decoder and a plurality of outputs, the flip flop adapted to transmit a consistent pulse at an output thereof corresponding to the input thereof from which the pulse was received, the flip flop adapted to emit the pulse from the output thereof until the receipt of a reset pulse received upon the depression of a reset key disposed on the receiver housing of the receiver unit,

a plurality of light emitting diodes situated on the front face of the receiver housing and connected to a corresponding output of the flip flop for emitting light upon the receipt of a pulse,

a buzzer adapted to emit an audible sound upon the receipt of a pulse, and

a 4-input OR gate connected between the outputs of the flip flop and the buzzer, the OR gate adapted to transmit the pulse to the buzzer upon at least one of the outputs transmitting a pulse.

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**5,745,036**

**ELECTRONIC ARTICLE SECURITY SYSTEM FOR STORE WHICH USES INTELLIGENT SECURITY TAGS AND TRANSACTION DATA**

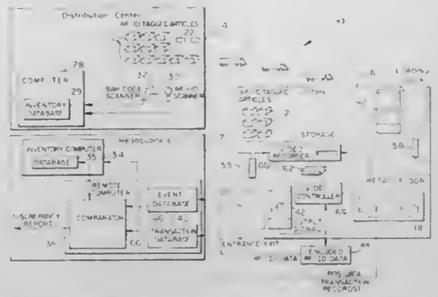
**Thomas J. Clare, Media, Pa., assignor to Checkpoint Systems, Inc., Thorofare, N.J.**

**Filed Sep. 12, 1996, Ser. No. 712,746**

**Int. Cl.[6] G08B** *13/14*

**U.S. Cl. 340—572** **24 Claims**

**1**. An electronic article security system for use in conjunction with articles having a security tag attached thereto, the security tag including a resonant circuit for use in detecting the presence of the article by receiving an interrogation signal and returning a response signal, and an integrated circuit connected to the resonant circuit for storing article identification information and for outputting the article identification information with the response signal upon interrogation of the security tag, the system comprising:



(a) one or more point-of-sale terminals for recording article transactions including article purchases, the transaction records including specific product identification information;

(b) an interrogator for monitoring a detection zone for disturbances in the form of a response signal caused by the presence of a security tag within the zoned the interrogator outputting an interrogator output signal when a security tag is detected in the zone, each interrogator output signal including the article identification information stored in the integrated circuit, the interrogator output signal bring obtained at a location and time which is different than the location and time that the article transaction are recorded; and

(c) a computer for receiving and storing the transaction records and the interrogator output signals, the computer including a comparator for comparing the transaction records and the interrogator output signals, including the product and article identification information, and detecting any discrepancies which occur therebetween.

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**5,745,037**

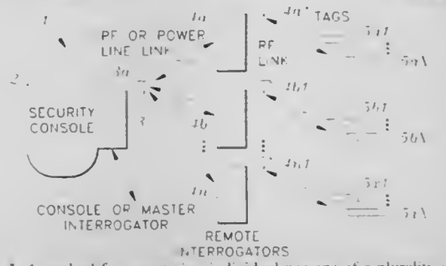
**PERSONNEL MONITORING TAG**

**Warren E. Guthrie, Glen Ellyn, and Daniel D. Cox, Palatine, both of Ill., assignors to Northrop Grumman Corporation, Los Angeles, Calif.**

**Filed Jun. 13, 1996, Ser. No. 663,340**

**Int. Cl.[6] G08B** *23/00*

**U.S. Cl. 340—573** **27 Claims**




**1**. A method for monitoring individual persons of a plurality of persons, comprising the steps of:

transmitting information signals at random times from individual ones of a plurality of tags to at least one master transceiver, the individual ones of the plurality of tags each to be worn by a respective person, the information signals transmitted from the individual tags corresponding to whether the tag is in use, and wherein a probability that an individual one of the plurality of tags will transmit an information signal during a period of time that none of the other ones of the plurality of tags are transmitting information signals is represented by $P_n$, where:

$$P_n = \left[1 - \frac{ton}{ton + toff}\right]^n$$

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-continued

or

$$P_{tx} = 1 - \left[ 1 - \left[ 1 - \frac{ton}{ton + toff} \right]^{n} \right]^{m}$$

and where ton represents a duration of an information signal transmission; toff represents an average time interval between chronological information signal transmissions of interest; n represents the number of the other ones of the plurality of tags, and m represents a number of transmissions attempted during the time period;

in response to the at least one master transceiver receiving an information signal to an associated confirmation device; and

within the confirmation device, in response to receiving an information signal from the master transceiver, confirming that the person corresponding to the tag generating the information signal is accounted for.

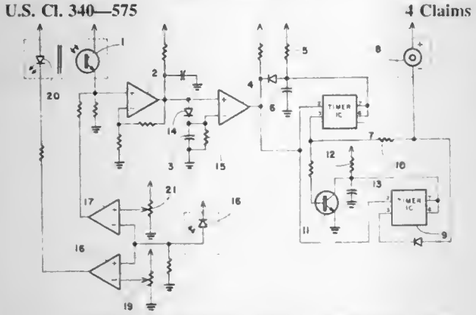
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**5,745,038**

## AWAKENING ALARM FOR MOTOR VEHICLE OPERATORS

**David L. Vance, 112 E. 23rd St. Apt. 22, Roswell, N. Mex. 88201**

**Filed Mar. 21, 1997, Ser. No. 822,213**
**Int. Cl.[6] G08B *21/00***
**U.S. Cl. 340—575** **4 Claims**



1. A method for producing a signal in response to signs of fatigue or sleep in an individual comprising the steps of

providing a signaling means,

providing a timing means to activate said signaling means after a delay,

providing a light sensitive element influenced by eye activity, and

providing means to reset said timing means in response to eye activity wherein a present input level from said light sensitive element is compared to a preceding level from the same to determine significant variation.

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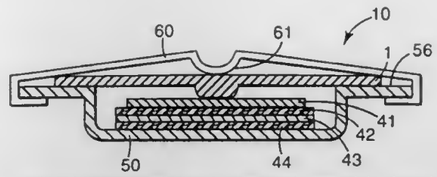
**5,745,039**

## REMOTE STERILIZATION MONITOR

**Craig R. Hof, San Salvador, Bahamas; Gary Focarino, Flemington, N.J.; Samuel David Lannigan, Philipsburg, N.J., and Raymond A. Hof, Lawrenceville, N.J., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Feb. 21, 1997, Ser. No. 803,740**
**Int. Cl.[6] G08B *17/02***
**U.S. Cl. 340—590** **19 Claims**

1. A remotely detectable steam sterilization process monitor for use with an interrogation mechanism capable of interrogating the monitor by providing a pulsed, excitation magnetic field in an interrogation zone, and capable of detecting an identity signal provided by the monitor; the monitor comprising:



a strip of magnetostrictive ferromagnetic material adapted to mechanically resonate when interrogated by the interrogation mechanism,

a magnetic material capable of magnetically biasing the strip of magnetostrictive ferromagnetic material to arm the magnetostrictive ferromagnetic material to provide an identity signal such that, after the pulse of the excitation magnetic field of the interrogation mechanism ends, the magnetostrictive material resonates within the magnetic bias provided by the magnetic material in a decaying fashion to thereby provide the identity signal to the interrogation mechanism; and

clamping means for physically holding the magnetostrictive ferromagnetic material such that the magnetostrictive ferromagnetic material is not allowed to resonate when interrogated by the interrogation mechanism; the clamping means comprising a meltable compound such that, upon exposure of the monitor to predetermined conditions, the meltable compound melts sufficiently to allow the magnetostrictive ferromagnetic material to resonate when interrogated by the interrogation mechanism.

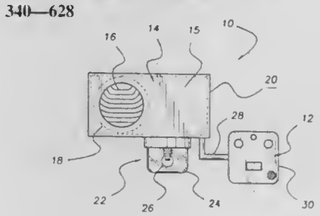
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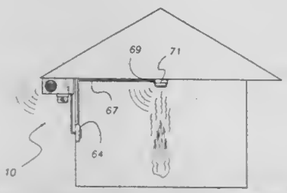
**5,745,040**

## OUTDOOR ALERTING DEVICE FOR SMOKE ALARMS

**Lisa M. Loughridge, 1933 Apple St., Portage, Ind. 46368**

**Filed Oct. 23, 1996, Ser. No. 740,023**
**Int. Cl.[6] G08B *17/10***
**U.S. Cl. 340—628** **8 Claims**





1. An outdoor alerting device for smoke alarms comprising:

an alarm detecting and alerting device drive unit having a alarm detecting circuit for detecting an audible alarm from a smoke detector; and

an exterior alerting device including a housing having an audible noise generating mechanism installed within a compartment formed within said housing, and a visual attraction mechanism in connection with said housing, said audible noise generating mechanism and said visual attraction mechanism being responsive to a signal from said alarm defecting and alerting device drive unit;

said alarm detecting circuit including:

a microphone,

an amplifier circuit,

a band pass filter,



a rectifier circuit,

a comparator including a reference voltage generating network,

a first retriggerable monostable multi-vibrator, and

a first OR logic gate;

said microphone having a microphone output in electrical connection with an amplifier input of said amplifier circuit;

said amplifier circuit having an amplifier output in electrical connection with a filter input of said band pass filter;

said band pass filter having a filter output in electrical connection with a rectifier input of said rectifier circuit;

said rectifier circuit having a rectifier output in electrical connection with a signal input of said comparator;

said reference voltage generating network having a reference voltage output in electrical connection with a reference voltage input of said comparator;

said comparator having a comparator output in electrical connection with a first trigger input of said first retriggerable monostable multi-vibrator and a first OR gate input of said first OR logic gate; and

said first retriggerable monostable multi-vibrator having a first multi-vibrator output in electrical connection with a second OR gate input of said first OR logic gate.

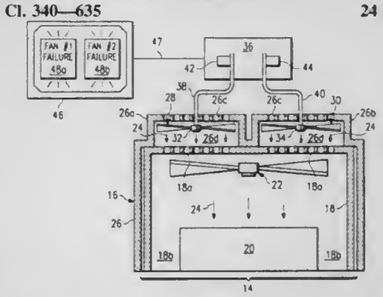
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**5,745,041**

## SYSTEM FOR DISSIPATING HEAT FROM A POWER SUPPLY

**David L. Moss, Austin, Tex., assignor to Dell U.S.A., L.P., Austin, Tex.**

**Continuation of Ser. No. 499,887, Jul. 11, 1995, abandoned. This application May 8, 1997, Ser. No. 853,192**
**Int. Cl.[6] G08B *21/00***
**U.S. Cl. 340—635** **24 Claims**



1. Apparatus for dissipating heat from a power supply mounted in a chassis, the power supply enclosed in a housing that includes at least one opening and a main fan for drawing air through the opening for cooling the power supply, the apparatus comprising:

a plenum structure configured to fit over said housing in the chassis;

at least one auxiliary fan mounted in said plenum structure adjacent to and in a stacked position with the main fan for moving air through said at least one opening so that air passes over said power supply resulting from operation of the main fan and the auxiliary fan; and

means for signaling malfunction of said auxiliary fan to a user.

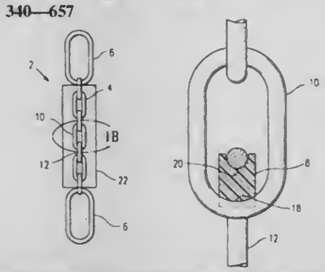
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**5,745,042**

## LOAD INSULATOR

**Hugh Michael Pratt, Marchioness Building, Commercial Road, Bristol BS1 6TG, United Kingdom**

**Continuation of Ser. No. 190,776, Feb. 1, 1994, Pat. No. 5,568,132. This application Jul. 24, 1996, Ser. No. 687,156**
**Claims priority, application United Kingdom, Feb. 3, 1993, 9302122**
**Int. Cl.[6] G08B *21/00***
**U.S. Cl. 340—657** **1 Claim**



1. A load insulator for interposition into a loaded line, the load insulator comprising:

two mechanical links;

a load pin connected to one of the two mechanical links and interlinked with the other link; and

an electrical insulator arranged between the load pin and the other of the two mechanical links to electrically isolate the two mechanical links from each other.

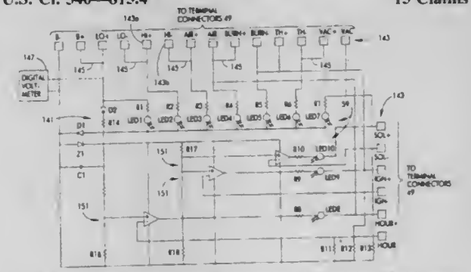
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**5,745,043**

## INDICATOR JUNCTION MODULE FOR PRESSURE WASHER

**Alfred H. Lemke, Siloam Springs; Lenard K. Deilerman, Springdale, and K. Leon Anderson, Siloam Springs, all of Ark., assignors to Clarke Industries, Inc., Springdale, Ark.**

**Filed Oct. 15, 1996, Ser. No. 722,582**
**Int. Cl.[6] G08B *5/00***
**U.S. Cl. 340—815.4** **15 Claims**



1. A pressure washer for dispensing a cleaning fluid under pressure, said pressure washer comprising:

an electrical system including a plurality of components electrically connected by an indicator junction module, said indicator junction module comprising:

a plurality of indicator circuits, each indicator circuit corresponding to one of the components and including a pair of terminals and an indicator device, at least one of the indicator circuits having one of its terminals electrically connected to its indicator device and the other of its terminals electrically connected to another one of the indicator circuits, each indicator device of the indicator circuits providing a visual indication of a condition of the corresponding component;

an enclosure for enclosing the indicator circuits, said indicator devices of the indicator circuits being visible from outside the enclosure to an operator of the pressure washer; and

a plurality of terminal connectors having means for receiving leads from the components thereby to form an electrical

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connection, said receiving means being external to the enclosure, each terminal connector being electrically connected to one of the indicator circuit terminals so that the components connected to the terminal connectors are electrically connected to each other via the indicator circuits whereby the module provides a convenient interface between the components of the electrical system.

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**5,745,044**

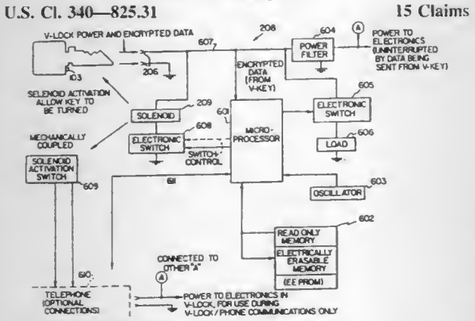
## ELECTRONIC SECURITY SYSTEM

**Richard G. Hyatt, Jr., Shawsville; Douglas Trent, Roanoke, and Charles Hall, Salem, all of Va., assignors to Medeco Security Locks, Inc., Salem, Va.**

**Continuation-in-part of Ser. No. 522,017, May 11, 1990, Pat. No. 5,140,317. This application Apr. 9, 1992, Ser. No. 865,849**

**Int. Cl.[6] H04Q** *1/00*

**U.S. Cl. 340—825.31** **15 Claims**




1. An electronic security system, comprising:

a lock, including

a lock memory storing therein an identification number of said lock, an encryption code associated with said lock, and a seed number, and

means for encrypting said stored seed number with said encryption code to generate an encrypted seed number; key means couplable with said lock for communicating therewith, including

a key memory storing therein a list of lock identification numbers and corresponding encryption codes,

means for receiving said identification number of said lock and said seed number from said lock,

means for encrypting said received seed number with an encryption code retrieved from said key code corresponding to said received identification number to generate an encrypted seed number, and

means for transmitting said encrypted seed number to said lock; said lock further including

means for comparing said encrypted seed number received from said key means with the encrypted seed number generated in said lock, and

means for enabling said key means to open said lock upon determination by said means for comparing that said encrypted seed numbers match.

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**5,745,045**

## OPTICAL ANTI-THEFT SYSTEM

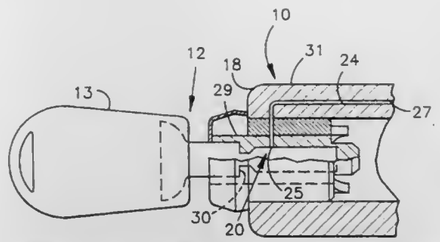
**Steven P. Kulha, Shelby Township; Jeffrey T. Kelley, Plymouth; Jeffrey L. Kulczycki, Westland, and Qingfeng Tang, Dearborn Heights, all of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.**

**Filed Sep. 1, 1995, Ser. No. 522,744**

**Int. Cl.[6] E05B** *49/02*; **B60R** *22/00*; **H01H** *27/00*

**U.S. Cl. 340—825.31** **26 Claims**

1. An optical anti-theft system having a security code, said optical anti-theft system comprising:




a member having a plurality of reflective surfaces on a single track, each reflective surface of said plurality of reflective surfaces having a reflectivity corresponding with a depth, said plurality of reflective surfaces having a pattern corresponding with the security code; and

a base for cooperating with said member, said base comprising:

a light source for generating a light beam to illuminate said plurality of reflective surfaces; and

a light detector for sensing said illuminated plurality of reflective surfaces and for initiating a security function in response to said sensed illuminated plurality of reflective surfaces having said pattern corresponding with the security code.

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**5,745,046**

## SURFACE SHAPE SENSOR, IDENTIFICATION DEVICE USING THIS SENSOR, AND PROTECTED SYSTEM USING THIS DEVICE

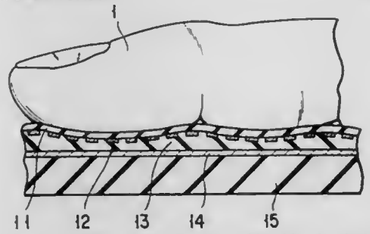
**Kazuhiro Itsumi, Yokohama; Masayuki Shiratori, Kawasaki; Tatsuro Beppu; Shiroh Saitoh, both of Tokyo; Yujiro Naruse, Yokohama; Shigeki Obata, Kanagawa-ken, and Shunji Shirouzu, Ayase, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 178,902, Jan. 7, 1994, Pat. No. 5,559,504. This application Jul. 10, 1996, Ser. No. 676,630**

**Claims priority, application Japan, Jan. 8, 1993, 5-002059; Sep. 20, 1993, 5-256401**

**Int. Cl.[6] H04Q** *1/00*

**U.S. Cl. 340—825.31** **15 Claims**




1. A protected system, which performs identification by sensing a surface shape of an object surface, for administering information data, comprising:

an input unit having a contact surface to be brought into contact with the object surface, said input unit having a plurality of electrodes arranged laterally with intervals in a first direction;

a converter for detecting degrees of an electrical resistance between said plurality of electrodes, and forming data representing a distribution of said electrical resistance in said first direction, said electrical resistance being variable by contact of said contact surface with the object surface;

a comparator for comparing the data formed by said converter with registered data, thereby performing identification;

a system main body having a memory which stores said information data; and

protecting means for switching said system main body between an operable state where said information data is accessible and a disabled state where said information data is not accessible, wherein said protecting means sets said system main body to the operable state when said comparator identifies that the formed data and the registered data coincide.



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**5,745,047**

## DOWNHOLE ELECTRICITY TRANSMISSION SYSTEM

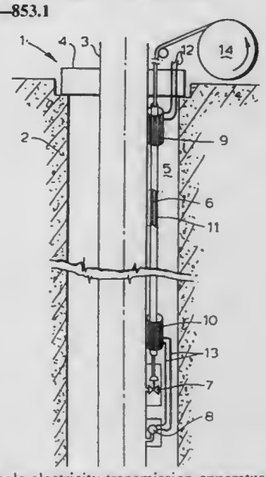
**Stanislaus Johannes Cornelis Henricus Maria Van Gisbergen, and Wilhelmus Johannes Godefridus Joseph Der Kinderen, both of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

**Filed Jan. 3, 1996, Ser. No. 582,568**

**Claims priority, application European Pat. Off., Mar. 1, 1995, 95200001.6**

**Int. Cl.[6] G01V** *3/00*

**U.S. Cl. 340—853.1** **9 Claims**




1. A downhole electricity transmission apparatus comprising:

an electrically conductive pipe that extends through at least a portion of a length of an underground borehole wherein the electrically conductive pipe is reelable;

an insulating lining around the outer surface of the electrically conductive pipe;

a production tubing in the borehole for production of hydrocarbon fluids, wherein the production tubing has a smaller outer diameter than the inner diameter of the borehole and the reelable pipe is a reelable hydraulic line which is inserted in an annular space between the tubing and the borehole, and the hydraulic line is provided with a downhole and an uphole electrical coupling and has an outer surface which is covered over the entire distance between the couplings by a substantially continuous annular body of a plastic electric insulating material; and

a well casing in the annular space between the production tubing and the borehole wall, which well casing is fixed to the borehole wall by means of a substantially annular body of cement and the reelable hydraulic line extends at least partly through the annular body of cement.

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**5,745,048**

## COMMUNICATION SYSTEM

**Akemi Taguchi, Kariya, and Masahito Hyodo, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Oct. 7, 1996, Ser. No. 726,755**

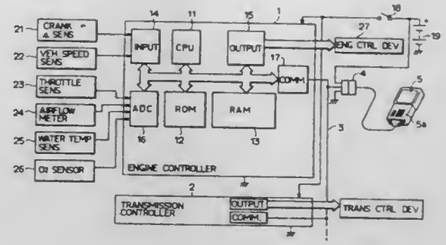
**Claims priority, application Japan, Feb. 9, 1995, 7-021642**

**Int. Cl.[6] G08C** *19/16*

**U.S. Cl. 340—870.01** **10 Claims**

1. A communication system, comprising:

a master device and a slave device connected by a transmissible bidirectional communication line, wherein:




said master device is structured to send on said communication line a request message for causing a response message from said slave device to be continuously sent, and along with this, also to send, within a predetermined time from sending of this request message, a continuation message to cause said continuous sending to be continued; and

said slave device is structured so that when said request message or said continuation message has been received, said slave device continuously sends said response message on said communication line within a predetermined time from this receipt, wherein further:

said slave device is structured so that at a time when said slave device continuously sends said response message, said slave device sends a subsequent response message after confirming that said communication line has been continuously open for a first idle time or longer; and

said master device is structured to send said continuation message after confirming that said communication line has been continuously open for not less than a second idle time which is shorter than said first idle time.

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**5,745,049**

## WIRELESS EQUIPMENT DIAGNOSIS SYSTEM

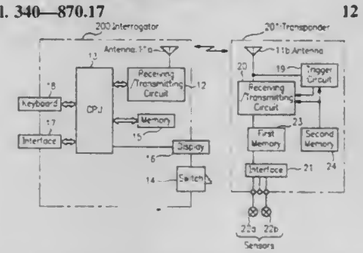
**Koji Akiyama; Satoshi Yoshitake; Minoru Takeuchi; Hiroshi Shimizu; Kazuo Nagata; Kiyoshi Takai, and Toshio Sekiguchi, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan**

**Filed Jul. 15, 1996, Ser. No. 680,888**

**Claims priority, application Japan, Jul. 20, 1995, 7-184164; Jul. 21, 1995, 7-185629; Jul. 25, 1995, 7-189015; Jan. 22, 1996, 8-007950; Apr. 16, 1996, 8-094044; Apr. 19, 1996, 8-098082; May 7, 1996, 8-112664; May 14, 1996, 8-118815**

**Int. Cl.[6] G01S** *13/75*

**U.S. Cl. 340—870.17** **12 Claims**




1. A wireless equipment diagnosis system comprising:

interrogation means for transmitting interrogation waves and for receiving back as response waves the same interrogation waves after modulation in measurement acquisition means to contain diagnosis information of said equipment being diagnosed; and

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said measurement acquisition means physically separated from said interrogation means and comprising means for obtaining diagnosis information of said equipment, means for receiving said interrogation waves from said interrogation means, means for modulating said interrogation waves based on said diagnosis information, and means for outputting the modulated interrogation waves as response waves for wireless transmission to said interrogation means; whereby

said interrogation waves from said interrogation means are used to interrogate the measurement acquisition means and to serve as medium for obtaining diagnosis information from the measurement acquisition means thereby to improve reliability of diagnosis information retrieval.

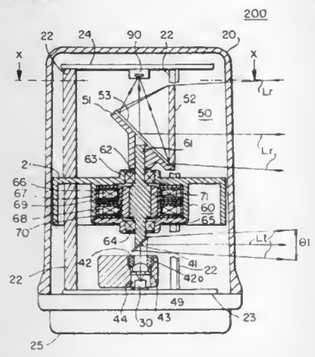
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**5,745,050**

## OBSTACLE DETECTION APPARATUS FOR VEHICLES

**Tetsuya Nakagawa, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha**

**Filed Apr. 26, 1995, Ser. No. 429,189**
**Claims priority, application Japan, Oct. 21, 1994, 6-256707**
**Int. Cl.[6] G08G *1/16***
**U.S. Cl. 340—903** **32 Claims**




1. An obstacle detecting apparatus, comprising:

a light emitting means;

a light projecting means for projecting a light generated in said light emitting means in a predetermined direction via a light emitting path;

a light introducing means for introducing the light reflected by an obstacle via a light receiving path that is different from said light emitting path over an entire length of said light emitting path and said light receiving path within said obstacle detecting apparatus;

a light receiving means for detecting the light introduced by said light introducing means;

a driving means for rotatably supporting said light projecting means and at least a portion of said light introducing means, and for driving said light projecting means and said at least a portion of said light introducing means in a circumferential direction; and

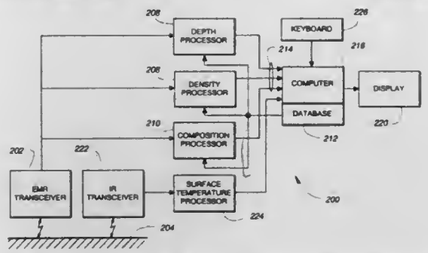
a calculating means for calculating a distance to the obstacle based on a delay time between a time the light is emitted by said light emitting means until a time the light is received by said light receiving means.

**5,745,051**

## SURFACE MATERIAL AND CONDITION SENSING SYSTEM

**John A. Doherty, 829 St. Andrews La., Louisville, Colo. 80027; Charles A. Kalbfleisch, 5 Deer Trail Rd., Boulder, Colo. 80302; Donald P. Keathley, 5 Oxford Dr., Middlefield, Conn. 06455, and William J. Collins, 3053 S. Boston Ct., Denver, Colo. 80231**

**Continuation of Ser. No. 660,232, Jun. 7, 1996, Pat. No. 5,619,193. This application Jan. 14, 1997, Ser. No. 783,556**
**Int. Cl.[6] G08G *1/09***
**U.S. Cl. 340—905** **34 Claims**




1. A system carried by a vehicle for remotely sensing and displaying at least one characteristic of a material deposited on a vehicle travel surface, said apparatus comprising:

an electromagnetic radiation transmitter mounted on said vehicle for transmitting a signal toward said material on said vehicle travel surface;

an electromagnetic radiation receiver mounted on said vehicle for receiving a first reflected signal from said vehicle travel surface and a second reflected signal from said deposited material on said vehicle travel surface;

at least one signal processor connected to said receiver for processing said first and second reflected signals and producing an output signal corresponding to at least one characteristic of said deposited material; and

a computer connected to said processor generating a corresponding display signal.

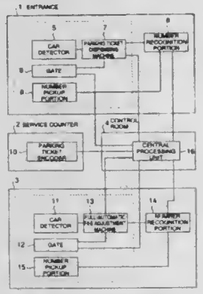
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**5,745,052**

## PARKING LOT CONTROL SYSTEM

**Yasuo Matsuyama; Michio Kimoto, both of Yokohama, and Masaru Iyama, Ebina, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jun. 18, 1996, Ser. No. 665,444**
**Claims priority, application Japan, Jun. 23, 1995, 7-158200**
**Int. Cl.[6] B60Q *1/48***
**U.S. Cl. 340—932.2** **8 Claims**




1. A parking lot control system comprising:

means provided at an entrance of a parking lot for picking an image of a number plate of a car to enter the parking lot;

means provided at the entrance of the parking lot for recognizing a car number of the entering car;



means provided at the entrance of the parking lot for dispensing a parking ticket;

a central processing unit provided in a control room for storing the car number of the entering car, the number of the parking ticket and a time of entry of the car into the parking lot;

a parking encoder provided at a service department of a parking lot-containing facility for reading the parking ticket and a shopping receipt to obtain data therefrom;

means provided at said service department of said parking lot-containing facility for effecting an intermediate fee adjustment processing or a discount processing in accordance with the data of the receipt obtained by said parking encoder, results of said fee adjustment processing and said discount processing being stored in said central processing unit;

means provided at an exit of the parking lot, for picking up the image of the number plate of the car to depart from the parking lot;

means provided at the exit of the parking lot, for recognizing the car number of the departing car; and

means provided at the exit of the parking lot, for automatically effecting a final parking fee adjustment in accordance with the data from said center processing unit.

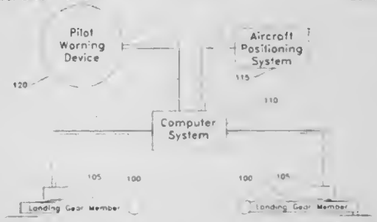
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**5,745,053**

## LANDING GEAR WARNING APPARATUS AND METHOD FOR PILOTS APPROACHING A RUNWAY WITH RETRACTED LANDING GEAR

**Hoyt A. Fleming, III, 4134 W. Quail Ridge Dr., Boise, Id. 83703**

**Filed Dec. 8, 1995, Ser. No. 570,917**
**Int. Cl.[6] G08B *23/00***
**U.S. Cl. 340—970** **13 Claims**




1. A landing gear warning system for an aircraft with at least one retractable landing gear member comprising:

(a) a landing gear indicator adapted for generating a signal representative of the position of the landing gear member;

(b) an aircraft positioning system adapted for generating at least one signal representative of the aircraft's latitude, longitude, and elevation;

(c) a pilot warning device; and

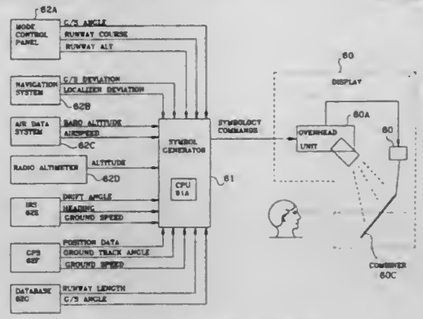
(d) a computer system operatively coupled to the landing gear indicator, the aircraft positioning system, and the pilot warning device, wherein the computer system includes a database that contains the longitude and latitude, and elevation of a plurality of runways, and wherein the computer system is adapted for receiving the at least one signal representative of the aircraft's latitude, longitude, and elevation, adapted for receiving the signal representative of the position of the landing gear member, and adapted for generating a pilot warning signal that activates the pilot warning device if the aircraft's elevation is less than a predetermined value above the elevation of the closest runway in the database to the aircraft and the signal representative of the position of the landing gear member indicates that the retractable landing gear member is retracted.

**5,745,054**

## METHOD AND APPARATUS FOR CONFORMAL RUNWAY ALIGNMENT ON A HEAD UP DISPLAY

**Dean Richard Wilkens, Glendale, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Nov. 18, 1996, Ser. No. 751,444**
**Int. Cl.[6] G01C *21/00***
**U.S. Cl. 340—972** **18 Claims**




1. A display system for an aircraft comprising:

a) an instrument landing system providing localizer deviation data and glideslope deviation data representative of the deviation of said aircraft from a selected ILS flight path;

b) means for providing altitude data representative of the altitude of said aircraft above a target runway;

c) a database providing runway length data;

d) means for providing ground speed data representative of the ground speed of said aircraft;

e) means for computing a lateral deviation rate of said aircraft relative to the extended centerline of said target runway from said localizer deviation data, said glideslope deviation data, said altitude data, and said runway length data;

f) means for computing a track error angle from said lateral deviation rate and said ground speed data; and,

g) means for computing runway bearing relative to ground track from said track error angle and said localizer deviation data; and

h) means for displaying symbology indicative of said runway bearing relative to ground track on a display screen.

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**5,745,055**

## FOOT-OPERATED MULTI-DIRECTIONAL SENSING DEVICE

**Sanford I. Redlich, and Jacqueline H. Heller, both of Portland, Oreg., assignors to Fleetfoot, L.L.C., San Franisco, Calif.**

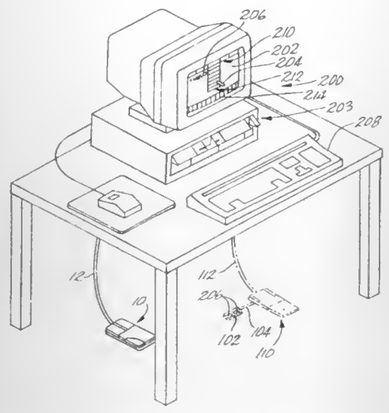
**Filed Jun. 7, 1995, Ser. No. 485,476**
**Int. Cl.[6] H03K *17/94***
**U.S. Cl. 341—20** **25 Claims**

1. A foot-operated input device for providing input information to a remote computer, comprising:

a housing comprising on opposite sides a base for positioning on a support surface and an elongated platform on which a foot is positioned, [the platform being movable in and biasing means for biasing said platform to a neutral position relative to said base when the pressure from said foot is removed, said platform being movable from the neutral position in any radial direction parallel to the base, and movable in any tilting direction toward the base around the neutral position; and

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sensing means for sensing the movement of the platform in said any radial and tilting direction relative to the base for producing input information indicative of said movement to the computer.

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**5,745,056**

**SINGLE-HAND INPUT KEYBOARD**

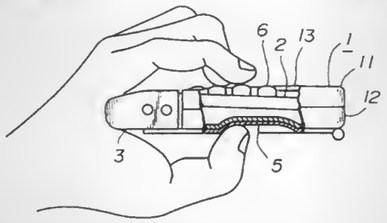
**Kimiyo Takahashi, Iiyama, and Masakatsu Sugimoto, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, and Fujitsu Takamisawa Component Limited, Tokyo, both of Japan**

**Filed Mar. 12, 1996, Ser. No. 614,855**

**Claims priority, application Japan, Oct. 20, 1995, 7-273020**

**Int. Cl.[6] G06F *3/02***

**U.S. Cl. 341—22** **22 Claims**




**1**. A single-hand input keyboard comprising:

a case including an upper case and a lower case, said upper case having an opening at a central portion thereof;

a switch unit mounted in said case, said switch unit having a plurality of button switches facing said opening; and

a holder formed in a back face of said case,

wherein a plurality of said button switches are arranged so as to be pressed by fingers when said single-hand input keyboard is held by a single hand with a thumb and a palm, wherein the holder holds the thumb.

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**5,745,057**

**ADJUSTMENT OPERATING APPARATUS**

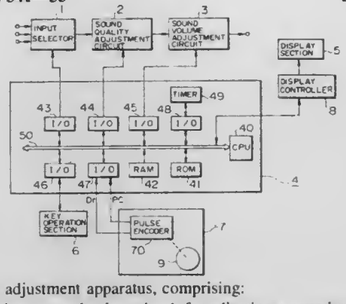
**Makoto Sasaki, and Akira Shinada, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Sep. 24, 1996, Ser. No. 710,945**

**Claims priority, application Japan, Sep. 25, 1995, 7-270614**

**Int. Cl.[6] H03M *1/00***

**U.S. Cl. 341—35** **3 Claims**




**1**. An adjustment apparatus, comprising:

operation means having a knob for adjusting a sound volume so as to increase or decrease said sound volume by rotating said knob clockwise or counterclockwise, respectively, and for producing an adjustment change signal in proportion to a speed and a direction of rotation of said knob; and

control means for generating a sound volume adjustment control signal for adjusting and controlling said sound volume in response to said adjustment change signal from said operation means, wherein said control means varies a first rate of change at which said sound volume is increased and a second rate of change at which said sound volume is decreased in accordance with said speed and said direction of rotation of said knob, and wherein said second rate of change is equal to said first rate of change when said speed of rotation is less than a predetermined speed, and wherein said second rate of change is greater than said first rate of change when said speed of rotation is greater than or equal to said predetermined speed.

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**5,745,058**

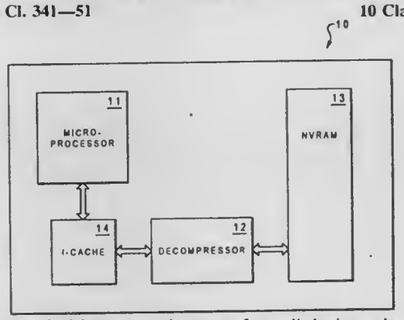
**METHOD AND SYSTEM FOR COMPRESSING MICROCODE TO BE EXECUTED WITHIN A DATA PROCESSING SYSTEM**

**Daniel Jonathan Auerbach, San Jose, Calif.; David John Craft, and Robert Kevin Montoye, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 21, 1996, Ser. No. 734,211**

**Int. Cl.[6] H03M *7/00***

**U.S. Cl. 341—51** **10 Claims**




**1**. A method for compressing a set of compiled microcode to be utilized within a data processing system, said method comprising the steps of:



parsing a set of compiled microcode into a plurality of microcode segments, wherein each of said plurality of microcode segments is of equal length;

compressing each of said plurality of microcode segments by utilizing a data-compression routine;

concatenating all of said plurality of compressed microcode segments to yield a set of compressed executable microcode; and

providing an index for each of said plurality of microcode segments.

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**5,745,059**

**Patent Not Issued For This Number**

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**5,745,060**

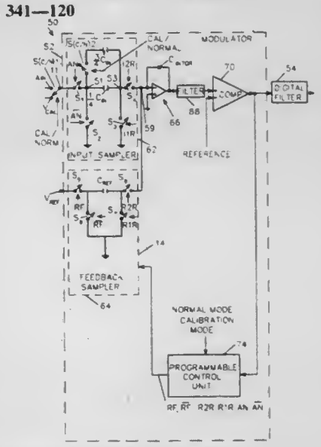
**GAIN CALIBRATION CIRCUITRY FOR AN ANALOG TO DIGITAL CONVERTER**

**Damien McCartney, and John O'Dowd, both of Limerick, Ireland, assignors to Analog Devices, Inc., Norwood, Mass.**

**Filed Feb. 12, 1996, Ser. No. 600,313**

**Int. Cl.[6] H03M *1/10***

**U.S. Cl. 341—120** **13 Claims**




**8**. A delta sigma modulator, comprising:

a feedback signal sampling section for sampling a feedback signal and transferring charge packets corresponding to such sampled feedback signal to a summing node each modulator cycle;

an input signal sampling section having a plurality of capacitors for, during a calibration mode, sampling a calibration voltage with a portion of the plurality of capacitors and transferring charge packets representative of the sampled calibration voltage to the summing node, and for sampling an input voltage, $A_{IN}$, during a normal operating mode with the plurality of capacitors and transferring change representative of the input voltage to the summing node; and,

wherein the calibration voltage is sampled by a different one of the plurality of capacitors over a corresponding different portion of a period of time, T, the plurality of capacitors sampling the calibration voltage over the period of time T.

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**5,745,061**

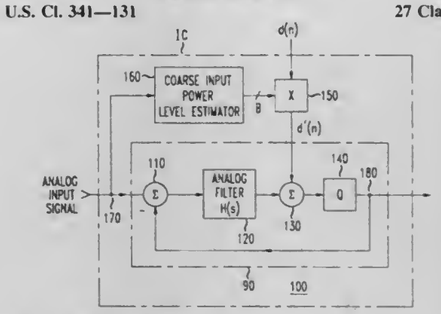
**METHOD OF IMPROVING THE STABILITY OF A SIGMA-DELTA MODULATOR EMPLOYING DITHER**

**Steven Robert Norsworthy, Emmaus, and David Arthur Rich, Whitehall, both of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Jul. 28, 1995, Ser. No. 508,944**

**Int. Cl.[6] H03M *1/18***

**U.S. Cl. 341—131** **27 Claims**




**1**. A circuit comprising:

a sigma-delta modulator including an input signal port, an output signal port and a signal path, said signal path including a feed-forward signal path and a feedback signal path,

said signal path coupled so as to receive a dither signal, and

said circuit being adapted to adjust the dither signal substantially in accordance with the power of a signal applied to the input signal port as determined by a nonlinear signal modifier.

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**5,745,062**

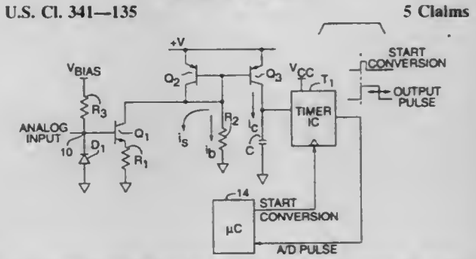
**PULSE WIDTH MODULATION ANALOG TO DIGITAL CONVERTER**

**Russell E. Tavernetti, San Carlos, Calif., assignor to Zircon Corporation, Campbell, Calif.**

**Filed Aug. 10, 1995, Ser. No. 513,302**

**Int. Cl.[6] H03M *1/50***

**U.S. Cl. 341—135** **5 Claims**




**1**. A pulse width modulation analog to digital converter comprising:

an analog signal input terminal;

a diode connected between the analog signal input terminal and a reference voltage;

a first transistor having its control terminal connected to the signal input terminal and having two current handling terminals, a first of which is connected to the reference voltage;

a current mirror having an input terminal connected to the second current handling terminal of the first transistor and having an output terminal;

an integrator connected to the output terminal of the current mirror; and

a timer having an input terminal coupled to the integrator, the timer providing at an output terminal a PWM output signal.

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**5,745,063**

## ARRANGEMENT FOR THE SUMMATION OF PRODUCTS OF SIGNALS

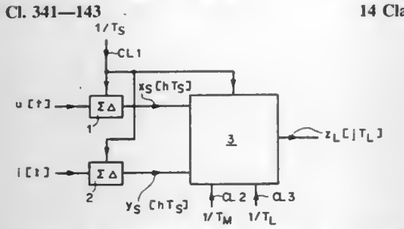
**Peter Gruber, Zwillikon; Raul Cermeno, Cham, and Heinz Llenhard, Zug, all of Switzerland, assignors to Landis & Gyr Technology Innovation AG, Zug, Switzerland**

**Continuation of Ser. No. 434,384, May 3, 1995. This application Jun. 2, 1997, Ser. No. 867,205**

**Claims priority, application Switzerland, May 5, 1994, 1411/94**

**Int. Cl.[6] H03M** *3/00*

**U.S. Cl. 341—143** **14 Claims**




1. A circuit for the summation of products of two different time-dependent signals, comprising:

a first sigma-delta modulator, for receiving a first said time-dependent signal,

a second sigma-delta modulator, for receiving a second said time-dependent signal,

a delaying arrangement having no decimation, connected serially with said first sigma-delta modulator,

a first decimation filter, connected serially with said second sigma-delta modulator,

an adding element,

wherein said delaying arrangement receives a first output signal from said first sigma-delta modulator and outputs a delayed first output signal to a first input of said adding element,

wherein said first decimation filter receives a second output signal from said second sigma-delta modulator and outputs a filtered second output signal to a second input of said adding element,

said first and second sigma-delta modulators, said delaying arrangement, and said first decimation filter being operated at a first clock frequency ($1/T_S$), which is greater than a second clock frequency ($1/T_M$), the latter serving to read said filtered second output signal from said first decimation filter, and

wherein said adding element outputs a signal which is approximately proportional to a summation of products of said first and second time-dependent signals.

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**5,745,064**

## D/A CONVERSION DEVICE HAVING MULTIPLE D/A CONVERTERS WITH SUBSTANTIALLY EQUAL VOLTAGES SUPPLIED THERETO

**Yuri Ohya, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Filed Oct. 19, 1995, Ser. No. 545,400**

**Claims priority, application Japan, Oct. 25, 1994, 6-260169**

**Int. Cl.[6] H03M** *1/66*

**U.S. Cl. 341—144** **9 Claims**

1. A D/A conversion device comprising:

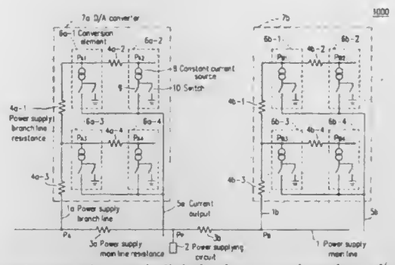
first conversion means for converting a digital signal into an analog signal;

second conversion means for converting a digital signal into an analog signal;

power supplying means for supplying a voltage to the first conversion means and the second conversion means; and

a power supply main line for connecting the first conversion means and the second conversion means to the power supplying means,

wherein each of the first conversion means and the second conversion means includes a plurality of conversion elements, each converting a unit digital value to a unit analog value, and a voltage rise or a voltage drop caused by resistance of the power supply main line from the power supplying means to the first conversion means is substantially equal to a voltage rise or a voltage drop caused by resistance of the power supply main line from the power supplying means to the second conversion means.




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**5,745,065**

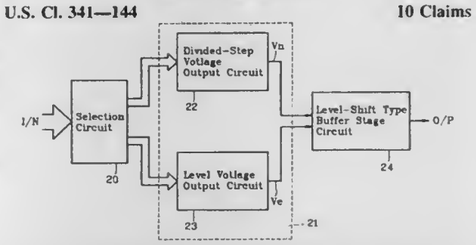
## LEVEL-SHIFT TYPE DIGITAL TO ANALOG CONVERTER

**Rong-Tyan Wu, Hsinchu, Taiwan, assignor to Holtek Microelectronics, Inc., Hsinchu, Taiwan**

**Filed Apr. 7, 1997, Ser. No. 826,694**

**Int. Cl.[6] H03M** *1/66*

**U.S. Cl. 341—144** **10 Claims**




1. A level-shift type digital-to-analog converter comprising:

(a) a selection circuit for converting original digital values to a plurality of digital codes for the digital-to-analog converter and then outputting the plurality of digital codes;

(b) a divided-step voltage output circuit connected to the selection circuit for receiving at least one of the plurality of the digital codes output from the selection circuit, and then outputting a voltage signal according to a predetermined number of steps and the voltage difference of each step;

(c) a level voltage output circuit connected to the selection circuit for receiving at least one of the plurality of digital codes output from the selection circuit, and then outputting a voltage signal according to a predetermined number of levels and the voltage difference of each level; and

(d) a level-shift type buffer stage circuit connected to the divided-step voltage output circuit and the level voltage output circuit, for receiving and processing the output signals from the divided-step voltage output circuit and the level voltage output circuit, and outputting an analog voltage output signal in demand.



**5,745,066**

## AD CONVERTER AND MAGNETIC RECORDING/REGENERATING APPARATUS USING THEREOF

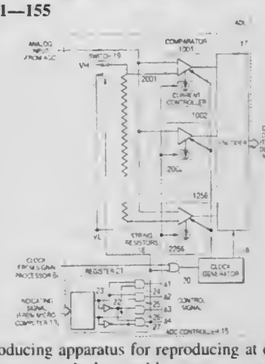
**Tsuguyoshi Hirooka, Fujisawa; Shoichi Miyazawa; Ryutaro Horita, both of Yokohama; Terumi Takashi, Odawara, and Akira Uragami, Sawa-gun, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 253,551, Jun. 3, 1994, Pat. No. 5,557,274. This application Sep. 13, 1996, Ser. No. 712,558**

**Claims priority, application Japan, Jun. 7, 1993, 5-136048**

**Int. Cl.[6] H03M** *1/36;1/14*

**U.S. Cl. 341—155** **30 Claims**




1. A reproducing apparatus for reproducing at different frequencies at different reproducing positions on a recording medium and converting an analog signal read from the recording medium to a digital signal, comprising:

an AD converter having a comparator for comparing said analog signal read from the recording medium with a reference voltage, wherein an operation speed of said comparator is decided by an operating current controlled from outside;

a signal generator for generating a digital signal from a result of comparison performed by said comparator;

an operating speed control circuit for controlling said operation speed of said comparator based upon a value in a register; and

a micro-processor for setting a value corresponding to a frequency of reproduction from said recording medium.

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**5,745,067**

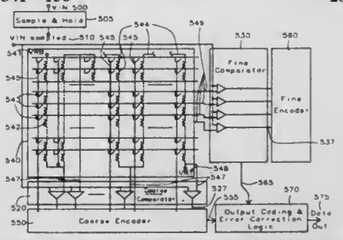
## TWO STAGE ANALOGE-TO-DIGITAL CONVERTER HAVING UNIQUE FINE ENCODING CIRCUITRY

**Shu-Kuang Chou; Yung-Yu Lin, both of Taipei, and Hsueh-Wu Kao, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan**

**Filed Jul. 17, 1996, Ser. No. 682,455**

**Int. Cl.[6] H03M** *1/16*

**U.S. Cl. 341—156** **28 Claims**




1. A two stage analog-to-digital converter to convert an analog input signal voltage to an output digital code having x bits, wherein x is the number of bits in said output digital code, that represents a magnitude of said analog input signal voltage, comprising:

a) an input sampling means that will capture during a first half clock cycle and retain an instantaneous sample of the analog input signal voltage;

b) a coarse comparison means that will compare the instantaneous sample of the analog input signal voltage to a plurality of coarse reference voltages to create a coarse digital thermometer code representing a coarse estimation of the magnitude of the instantaneous sample of the analog input signal voltage during a beginning period of the a second half cycle;

c) a fine comparison means that will compare the instantaneous sample of the analog input signal voltage to a subset of a plurality of fine reference voltages to create a fine digital thermometer code representing a refinement of the coarse estimation of the magnitude of the instantaneous sample of the analog input signal voltage during a ending period of the second half cycle;

d) a voltage reference generator coupled between a first reference voltage source and a second reference voltage source to generate the plurality of coarse reference voltages and the plurality of fine reference voltages;

e) a voltage reference selection switch network to selectively couple an appropriate subset of the plurality of fine reference voltages to the fine comparison means;

f) a voltage reference switch logic means to activate a portion of the voltage reference selection switch network as determined by the coarse digital thermometer code;

g) a coarse encoder to translate the coarse digital thermometer codes to a most significant portion of the output digital code;

h) a fine encoder to translate the fine digital thermometer codes to a least significant portion of the output digital code, wherein said fine encoder comprises:

a thermometer code interpreter array having a plurality of thermometer code inputs connected to the fine digital thermometer codes, an array of logical decision means to determine a boundary bit between the first logical state and the second logical state of the fine digital thermometer code, and an interpreter output to transfer the boundary bit; and

a read only memory containing all possible least significant portions of the output digital code, wherein the boundary bit and an even or odd column selection bit selects an appropriate least significant portion of the output digital code; and

i) an output code correction means to adjust the most significant portion of the output digital code to correct any error created in the coarse comparison means and transfer an adjusted output digital code to circuitry external to said two step analog-to-digital converter.

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**5,745,068**

## REMOTE CONTROLLER AND METHOD FOR PRESETTING CONTROL DATA THEREIN

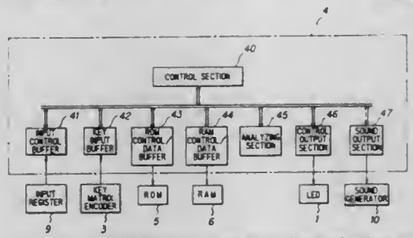
**Toshiyuki Takahashi; Hajime Yano, both of Kanagawa, and Iwao Takiguchi, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Mar. 10, 1994, Ser. No. 208,384**

**Claims priority, application Japan, Mar. 19, 1993, 5-083910; Oct. 7, 1993, 5-274826**

**Int. Cl.[6] G08C** *17/02*

**U.S. Cl. 341—176** **4 Claims**




1. A remote controller having a plurality of operating buttons for causing predetermined control signals to be transmitted to elec-

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tronic equipment in response to operation of said operating button to execute respective operations of said electronic equipment, comprising:

input means for receiving a control signal output from another remote controller;

decoder means for decoding the control signal received by said input means;

first storage means for storing as preset data control signals of a plurality of signal structures associated with different units of the electronic equipment;

second storage means for storing one of the predetermined control signals and identifier codes representative of the control signals associated with each of the plurality of operating buttons;

analyzer means for analyzing the received control signal from said input means and for determining whether a signal structure and a control content of the control signal are in the form of a toggle code; and

control means responsive to said analyzer means determining the control signal to be a toggle code having a portion thereof alternately changed in value in response to successive operations of said operating button and storing the control signal in said second storage means in correspondence with a predetermined one of said operating buttons, wherein if one of the operating buttons corresponding to the control signal stored in said second storage means is operated in an operational mode, the control signal is outputted and transmitted, while the portion of the control signal is changed in response to the number of operational times.

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**5,745,069**

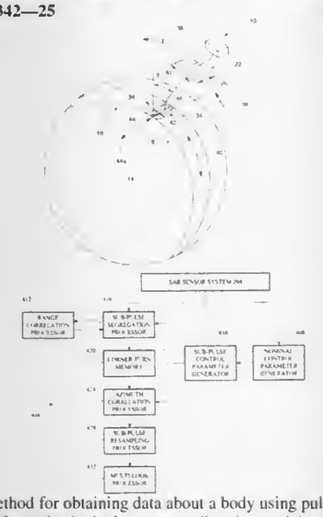
**REDUCTION OF RADAR ANTENNA AREA**

**William B. Gail, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.**

**Filed Sep. 10, 1996, Ser. No. 710,092**

**Int. Cl.[6] G01S *13/90***

**U.S. Cl. 342—25** **36 Claims**



**1**. A method for obtaining data about a body using pulsed signals reflected from the body in a range direction and in an azimuth direction, comprising:

transmitting, toward the body, a predetermined sequence of sub-pulses, said sub-pulses transmitted at a rate that is at least a first predetermined repetition frequency;

detecting, for each said sub-pulse, a corresponding sub-pulse reflection from the body;

storing a plurality of data items, wherein said plurality of data items includes, for each said sub-pulse reflection, a related data item derived from said sub-pulse reflection;

first sampling of said plurality of data items for obtaining a first series of data items;

wherein, there is a first sub-pulse sequence, included in said predetermined sequence of sub-pulses, such that each sub-pulse of said first sub-pulse sequence has a corresponding sub-pulse reflection for which there is a related data item of said first series, and wherein said first sub-pulse sequence has a repetition frequency at least that of the first predetermined repetition frequency;

second sampling of said plurality of data items for obtaining a second series of data items;

wherein, there is a second sub-pulse sequence included in said predetermined sequence of sub-pulses, such that each sub-pulse of said second sub-pulse sequence has a corresponding sub-pulse reflection for which there is a related data item of said second series, and wherein said second sub-pulse sequence has a repetition frequency less than said first predetermined repetition frequency;

providing one or more values related to said plurality of data items, wherein said one or more values have a reduction in sub-pulse reflection ambiguity;

wherein said step of providing includes the following substeps (A1) and (A2):

(A1) reducing, in the azimuth direction, an ambiguity in said one or more of values using said first sampling of said sub-pulse data items;

(A2) reducing, in the range direction, an ambiguity in said one or more of values using said second sampling of said data items;

using said one or more values having a reduced ambiguity for determining a characteristic of the body.

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**5,745,070**

**VEHICLE ACCURATELY DETECT AN OBJECT IN A LANE OF THE RADAR EQUIPPED VEHICLE MOVING IN A CURVE**

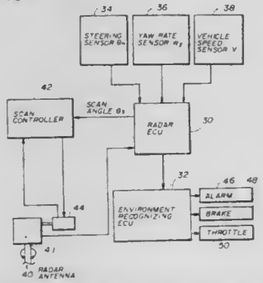
**Yukinori Yamada, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Filed Dec. 24, 1996, Ser. No. 777,968**

**Claims priority, application Japan, Aug. 12, 1996, 8-212813**

**Int. Cl.[6] G01S *13/93***

**U.S. Cl. 342—70** **10 Claims**




**1**. A scan-type radar apparatus provided on a vehicle, comprising:

a scan-type radar for detecting objects existing in a detectable range;

object direction assuming means for assuming a center direction indicating a center of each of the objects detected by said scan-type radar with respect to said vehicle based on a distance between said vehicle and each of the objects and a radius of curvature of a curve where said vehicle is moving;

vehicle moving lane area setting means for setting a vehicle moving lane area corresponding to a vehicle moving lane in which said vehicle is moving, said vehicle moving lane area being set within said detectable range of said scan-type radar, said vehicle moving lane area extending on either side of said center direction with a predetermined angle range; and



vehicle moving lane area correcting means for correcting an extent of the vehicle moving lane area so that an inner area of said vehicle moving lane area is increased when said vehicle is moving along the curve, said inner area being a portion of said vehicle moving lane area located on an inner side of the curve with respect to said center direction.

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**5,745,071**

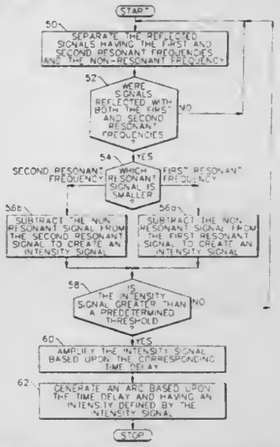
**METHOD AND APPARATUS FOR PRECISELY LOCATING A RESONANT OBJECT**

**James B. Blackmon, Jr., Brownsboro, and Jesse C. James, Huntsville, both of Ala., assignors to McDonnell Douglas Corporation, St. Louis, Mo.**

**Filed Mar. 10, 1997, Ser. No. 814,037**

**Int. Cl.[6] G01S *13/06***

**U.S. Cl. 342—90** **22 Claims**




**1**. An apparatus for locating an object which resonates in response to signals of at least one resonant frequency, the apparatus comprising:

a transmitter for concurrently transmitting first signals having a resonant frequency and second signals having a non-resonant frequency toward the resonant object;

first and second receivers for receiving reflected signals having the resonant frequency and the non-resonant frequency; and

a signal processor, responsive to said receivers, for locating the resonant object based upon the reflected signals received by said receivers, wherein said signal processor comprises means for reducing signal clutter based upon respective differences between the reflected signals having the resonant frequency and the reflected signals having the non-resonant frequency received by each of said receivers to thereby more precisely locate the resonant object.

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**5,745,072**

**METHOD AND APPARATUS FOR PRECISE NONCOHERENT DOPPLER TRACKING OF A SPACECRAFT**

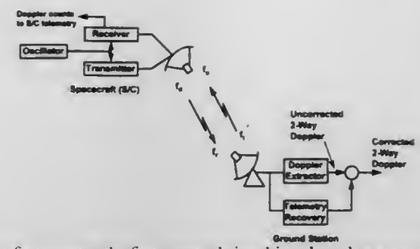
**James Robert Jensen, and Robert Steven Bokulic, both of Columbia, Md., assignors to The Johns Hopkins University, Baltimore, Md.**

**Filed Sep. 20, 1996, Ser. No. 717,395**

**Int. Cl.[6] G01S *13/58***

**U.S. Cl. 342—104** **10 Claims**

**10**. Apparatus on-board a spacecraft for providing a measured value for inclusion in the spacecraft telemetry to a ground station for use in determining the velocity of the spacecraft during two-way noncoherent Doppler tracking, the apparatus comprising:




a first counter, the first counter being driven by a downconverted uplink signal frequency to a predetermined number of zero-crossing counts;

a second counter, the second counter being driven by a signal frequency related to a downlink signal frequency to a measured number of zero-crossing counts; and

a starting means for starting the first and second counters simultaneously;

wherein the first counter, upon reaching the predetermined number of counts, stops the second counter thereby producing the measured number of counts, the measured number comprising the measured value.

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**5,745,073**

**DISPLAY APPARATUS FOR FLIGHT CONTROL**

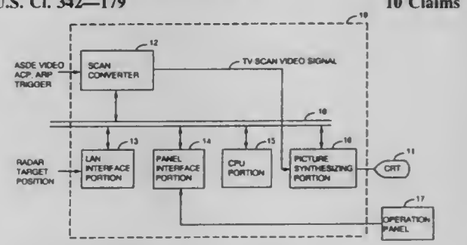
**Atsushi Tomita, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 3, 1996, Ser. No. 582,506**

**Claims priority, application Japan, Jan. 31, 1995, 7-014766**

**Int. Cl.[6] G01S *7/22;13/91***

**U.S. Cl. 342—179** **10 Claims**




**1**. A display apparatus for flight control comprising:

scan conversion means for generating a television scan video signal according to a received radar signal including a radar video signal from ASDE (Airport Surface Detection Equipment), an ACP (Azimuth Count Pulse) signal, an ARP (Azimuth Reference Pulse) signal and a trigger signal;

a LAN (Local Area Network) interface portion which receives radar target position signals from a LAN;

computer graphic means for receiving a radar target position via said LAN interface portion and for generating a computer graphic display by adding control operation information to the radar target;

display synthesizing means which superposes said computer graphic display on said television scan video signal to develop a display picture signal; and

display means which displays a picture represented by said display picture signal from said picture synthesizing means.

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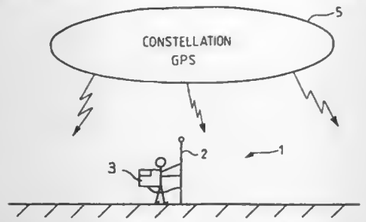


**5,745,074**

## STAKING OUT METHOD AND DEVICE USING A SATELLITE POSITIONING SYSTEM

**Benoit-Marie Laude, Saint Sébastien sur Loire, France, assignor to Dassault Sercel Navigation-Positionnement, France**

**Filed May 23, 1996, Ser. No. 652,006**
**Claims priority, application France, May 23, 1995, 95 06131**
**Int. Cl.[6] G01S** *5/02;* **B43L** *7/10*
**U.S. Cl. 342—357** **8 Claims**




1. Method of staking out a point on the ground using a satellite positioning system, comprising the following steps:

two reference points near a target point, the target point defined by a predetermined x and y coordinates, are marked on the ground using two graduated rulers sliding relative to each other and the positioning system antenna is located on each of said two points to determine their coordinates,

the position of said target point relative to said two reference points is determined from said coordinates,

the point corresponding to said relative position is marked on the ground,

the staking out is done at said point.

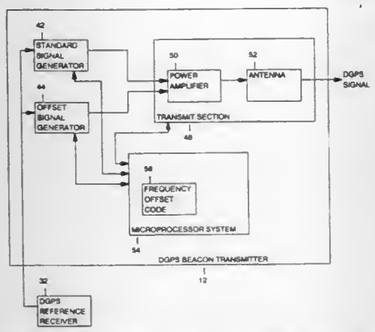
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**5,745,075**

## MULTI-TONE DGPS BEACON TRANSMITTER AND RECEIVER

**Per K. Enge, Mountain View, and David W. Young, Santa Cruz, both of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.**

**Filed Jun. 5, 1996, Ser. No. 658,484**
**Int. Cl.[6] H04B** *7/00;1/00;1/10;* **G01S** *5/02*
**U.S. Cl. 342—367** **36 Claims**




1. A method for obviating destructive interference between a groundwave and a skywave of a signal, comprising steps of:

transmitting a first signal having a first carrier frequency propagating from a transmitter as a first signal groundwave and a first signal skywave;

transmitting a second signal having a second carrier frequency having a frequency offset from said first carrier frequency, said second carrier frequency propagating from said transmitter as a second signal groundwave and a second signal skywave; and

using an ionospheric height for calculating said frequency offset for staggering first distances where destructive interference of said first signal groundwave and said first signal skywave occur from second distances where destructive interference between said second signal groundwave and said second signal skywave occur.

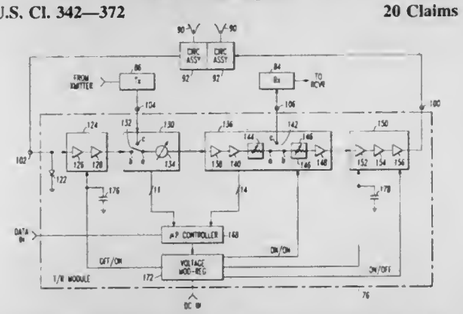
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**5,745,076**

## TRANSMIT/RECEIVE MODULE FOR PLANAR ACTIVE APERTURES

**Thomas R. Turlington, Linthicum; Patrick G. Farrell, Baltimore; Gerald K. Kane, Stevensville; Gary L. Ferrell, Pasadena; Scott K. Suko, Elkridge; Joseph A. Faulkner, Ellicott City; Gregory K. Sinon, Dayton; Francis W. Hopwood, Severna Park, and Andrew J. Piloto, Columbia, all of Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.**

**Filed Sep. 5, 1996, Ser. No. 708,439**
**Int. Cl.[6] H01Q** *3/24*
**U.S. Cl. 342—372** **20 Claims**




14. A transmit/receive (T/R) module for alternately coupling RF signals between a transmitter apparatus and a radiator during a transmit mode and between a radiator and receiver apparatus during a receive mode, comprising:

first and second RF signal input ports and first and second RF signal output ports;

means embodying a first RF signal path between one of said input ports and one of said output ports during the transmit mode to transmit an RF signal from the transmitter apparatus to the radiator; and

means embodying a second RF signal path between the other of said input ports and the other of said output ports during the receive mode to couple an RF signal received by the radiator to the receiver apparatus;

said means embodying said first and said second RF signal paths including a common segment in which common circuit means including variable shift means, variable attenuator means, and RF amplifier means are mutually shared during said transmit and receive modes of the module and in which current direction is the same in said transmit and receive modes of the module.

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**5,745,077**

## HIGH EFFICIENCY SATELLITE EQUALLY LOADED TRANSMITTING COMMUNICATION SYSTEM

**Satyendranath Das, P.O. Box 574, Mt View, Calif. 94042-0574**

**Filed Jun. 17, 1996, Ser. No. 665,309**
**Int. Cl.[6] H01Q** *3/02*
**U.S. Cl. 342—374** **20 Claims**

1. An efficient satellite multibeam equally loaded transmitting communication system containing input beams, an input switch connected to input beams, a switch connected to the input of each power amplifier, power amplifiers, a switch connected to the output of each power amplifier, feed elements, a switch connecting to each feed element, a reflector antenna, output beams, a microprocessor and comprised of;

input beams 1 through n;

four switches:

a first of said four switches having a number of switched terminals equal to the number of input beams;

a first switched terminal of said first switch being connected to said first input beam;

a second switched terminal of said first switch being connected to said second input beam;

each third through nth switched terminal of said first switch being connected to each said third through nth input beam respectively;

a second of said four switches having a number of switched terminals equal to the number of input beams;

power amplifiers 1 through n;

a first switched terminal of said second switch being connected to the input of said power amplifier 1;

a second switched terminal of said second switch being connected to the input of said power amplifier 2;

each third through nth switched terminal of said second switch being connected to the input of each said third through nth power amplifier respectively;

the fixed terminal of the first switch being connected to the fixed terminal of the second switch;

a third of said four switches having a number of switched terminals equal to the number of input beams;

a first switched terminal of said third switch being connected to the output of said power amplifier 1;

a second switched terminal of said third switch being connected to the output of said power amplifier 2;

each third through nth switched terminal of said third switch being connected to the output of each said third through nth power amplifier respectively;

a fourth of said four switches having a number of switched terminals equal to the number of input beams;

a first switched terminal of said fourth switch being connected to the first feed element;

a second switched terminal of said fourth switch being connected to the second feed element;

each third through nth switched terminal of said fourth switch being connected to each said third through nth feed element respectively;

the fixed terminal of the third switch being connected to the fixed terminal of the fourth switch;

a reflector antenna;

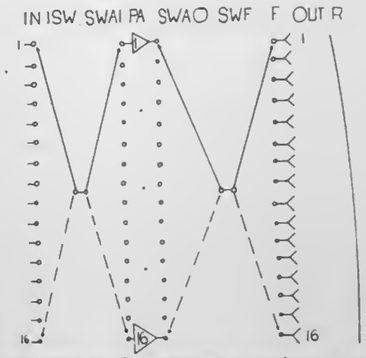
output beams 1 through n respectively;

feed elements 1 through n, for said output beams, being located at or near the focal plane of said reflector antenna, forming each output beam;

said first and fourth switches being switched synchronously at a Nyquist rate by a microprocessor;

said second and third switches being switched synchronously at a rate n times faster than the rate at which said first and fourth switches being switched;






for each switched position of said first and fourth switches, said second and third switches being switched synchronously from 1 through n switched terminals respectively by a microprocessor; and

said input beams, said first switch, said second switch, said power amplifiers, said third switch, said fourth switch, and said feed elements being connected together to produce each single output beam corresponding to each one input beam.

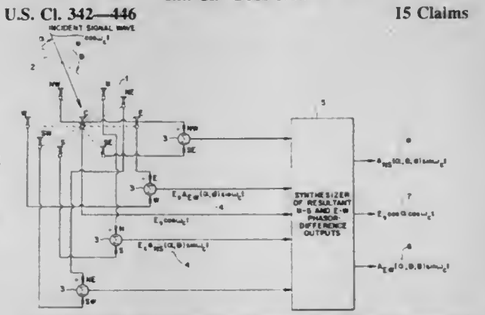
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**5,745,078**

## METHOD AND APPARATUS FOR RADIO LOCATION

**Elie J. Baghdady, 21 Overlook Dr., Weston, Mass. 02193**

**Continuation of Ser. No. 767,883, Sep. 30, 1991, abandoned, which is a division of Ser. No. 524,600, May 17, 1990, Pat. No. 5,084,709. This application Sep. 6, 1995, Ser. No. 523,920**
**Int. Cl.[6] G01S** *3/08*
**U.S. Cl. 342—446** **15 Claims**




1. A method for determining the azimuth and elevation angles of the direction of arrival of a travelling signal wavefront of measurable wavelength, λ, comprising the steps of:

employing a noncircular array of discrete sensor elements;

taking a phasor-difference between the outputs of pairs of spaced elements, said phasor-difference being a function of the azimuth and elevation angles of arrival of said travelling signal wavefront; and

deriving from said phasor-difference the azimuth and elevation angles of the direction of propagation of said signal wavefront relative to angle references associated with said array.

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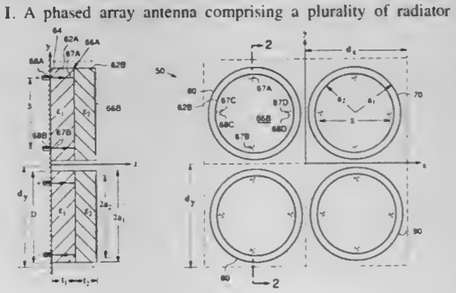
**5,745,079**

## WIDE-BAND/DUAL-BAND STACKED-DISC RADIATORS ON STACKED-DIELECTRIC POSTS PHASED ARRAY ANTENNA

**Allen T.S. Wang, Buena Park; Kuan M. Lee, Brea, and Ruey S. Chu, Cerritos, all of Calif., assignors to Raytheon Company, Lexington, Mass.**

**Filed Jun. 28, 1996, Ser. No. 678,383**
**Int. Cl.[6] H01Q** *1/38;1/48*
**U.S. Cl. 343—700 MS** **11 Claims**

1. A phased array antenna comprising a plurality of radiator



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units arranged in a spaced configuration for radiating energy into free space, and wherein said radiator units each comprise:

a ground plane;

a discrete lower dielectric post having a lower surface disposed adjacent the ground plane and an upper surface, said lower dielectric post fabricated of a high dielectric material;

a discrete thin lower radiator element disposed on said upper surface of said lower dielectric post;

a discrete upper dielectric post having a lower surface and an upper surface, said upper dielectric post stacked on said lower radiator element, said upper dielectric post fabricated of a low dielectric material;

a discrete upper thin radiator element disposed on said upper surface of said upper dielectric post; and

a first pair of spaced probes in electrical contact with said lower radiator element for exciting the lower radiator, wherein the upper radiator element is not fed by feed probes and is a parasitic radiator element, and wherein the radiator structure is not surrounded by waveguide walls or cavity walls, and the radiator structure provides a radiator element suitable for wide-band operation for radiating energy into free space.

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**5,745,080**

## FLAT ANTENNA STRUCTURE

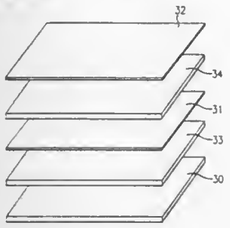
**Joo-Sung Jun, Kyungki-do, Rep. of Korea, assignor to L.G. Electronics Inc., Rep. of Korea**

**Continuation of Ser. No. 523,924, Sep. 6, 1995, abandoned. This application Jun. 9, 1997, Ser. No. 871,642**

**Claims priority, application Rep. of Korea, Sep. 6, 1994, 22383**

**Int. Cl.[6] H01Q** *1/38*

**U.S. Cl. 343—700 MS** **14 Claims**




1. A flat antenna structure comprising:

an earth conductor substrate;

a first foam agent stacked directly on and contacting said earth conductor substrate;

a radiating element substrate for radiating an electromagnetic wave, the radiating element substrate being stacked directly on and contacting said first foam agent and comprising radiating elements and electric power supply lines for supplying electromagnetic energy to the radiating elements;

a second foam agent stacked directly on and contacting said radiating element substrate; and

a slot substrate stacked directly on and contacting said second foam agent and formed with a plurality of parasitic elements and rectangular slots for final radiation of said electromagnetic wave radiated from said radiating element substrate to block unnecessary radiation of said electromagnetic wave from said radiating element substrate,

wherein each radiating element or parasitic element is a resonant structure having dimensions approximately equal to a half wavelength of the electromagnetic wave.

**5,745,081**

## HF ANTENNA FOR A HELICOPTER

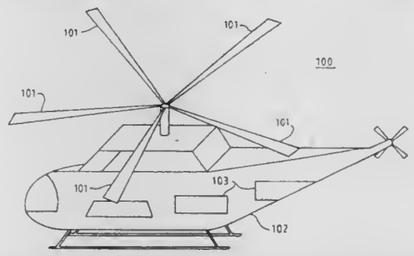
**Luther E. Brown, Stuart, Fla.; Graham Luck, Southampton, United Kingdom, and Terence Keith Gibbs, Stubbington, United Kingdom, assignors to Lockheed Martin Corporation, Bethesda, Md.**

**Continuation of Ser. No. 101,510, Aug. 2, 1993, abandoned. This application Mar. 17, 1995, Ser. No. 405,729**

**Claims priority, application United Kingdom, Aug. 5, 1992, 9216585; Nov. 11, 1992, 9223580**

**Int. Cl.[6] H01Q** *1/28*

**U.S. Cl. 343—705** **17 Claims**




1. An antenna system for high frequency communication in a rotary winged aircraft having a fuselage body provided with a plurality of electrically non-conductive rotor blades that are formed from a composite of non-metallic materials, said antenna system comprising:

conductive antenna means which extend longitudinally along a length of each of said plurality of rotor blades;

connection means for electrically connecting said antenna means to an apparatus for transmission and reception of a plurality of high frequency radio waves having wavelengths in a range from 10 meters to 150 meters, said connection means including a first means rotating with said plurality of rotor blades and electrically connected to said antenna means and a second means electrically coupled to said first means and fixed to said fuselage body and electrically connected to said apparatus for transmission and reception of said high frequency radio waves;

said antenna means including a plurality of electrical conductors each of which is affixed to a surface of a corresponding separate one of said plurality of electrically non-conductive rotor blades with each of said plurality of electrical conductors extending in parallel to a longitudinal axis of said separate one of said plurality of non-conductive rotor blades over substantially the full length of said corresponding separate rotor blade and constituting a radiating element of the antenna system.

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**5,745,082**

## RADIATION SENSOR

**Christopher J. Alder, Malvern, United Kingdom, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Hants, United Kingdom**

**PCT No. PCT/GB94/01262, § 371 Date Aug. 21, 1995, § 102(e) Date Aug. 21, 1995, PCT Pub. No. WO95/00982, PCT Pub. Date Jan. 5, 1995**

**PCT Filed Jun. 13, 1994, Ser. No. 569,092**

**Claims priority, application United Kingdom, Jun. 25, 1993, 9313109**

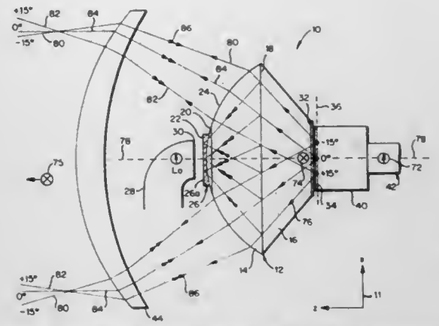
**Int. Cl.[6] H01Q** *19/06;15/02*

**U.S. Cl. 343—753** **18 Claims**

1. A radiation sensor comprising:

radiation guiding means for guiding radiation, the guiding means defining a first focal plane (**26***a*) and a second focal plane (**36**) to or from which radiation is to pass,






receiving means and transmitting means, one of said receiving means and transmitting means located in the vicinity of said first focal plane and the other of said receiving means and transmitting means located in the vicinity of said secon focal plane; and

a switchable reflecting means (**19**) for selectably reflecting and transmitting incident radiation.

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**5,745,083**

## SLOTTED LEAKY WAVEGUIDE ARRAY ANTENNA AND A METHOD OF MANUFACTURING THE SAME

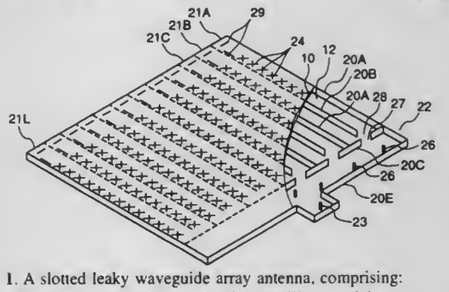
**Masahiro Uematsu; Nobuharu Takahashi; Takashi Ojima, all of Tokyo; Hiroaki Kawaguchi, Odawara; Yutaka Arai, Tokyo; Yoshikazu Takahashi, Odawara, and Seiji Koyama, Odawara, all of Japan, assignors to Nippon Steel Corporation, and Mikuni Corporation, both of Tokyo, Japan**

**Continuation of Ser. No. 551,875, Oct. 16, 1995, abandoned. This application Apr. 29, 1997, Ser. No. 846,169**

**Claims priority, application Japan, Oct. 17, 1994, 6-276986**

**Int. Cl.[6] H01Q** *13/10*

**U.S. Cl. 343—771** **17 Claims**




1. A slotted leaky waveguide array antenna, comprising:

a flat, thin bottom plate made of a metallic material;

a flat, thin slotted plate made of a metallic material, and disposed parallel with said bottom plate at a predetermined distance from said bottom plate to form a space between said slotted plate and said bottom plate, said slotted plate being formed with a plurality of slots arranged in substantially parallel rows extending in a predetermined guide axial direction;

a plurality of flat, thin side walls made of a metallic material and arranged in said space to partition said space between said bottom plate and said slotted plate into a plurality of waveguides communicating with each other, said plurality of waveguides including radiation waveguides extending in parallel in said guide axial direction, wherein a lower surface of each of said side walls is fixed to the bottom plate and an upper surface thereof is fixed to the slotted plate; and

an electrically conductive adhesive agent layer between said upper surface of each of said side walls and said slotted plate for fixing them to each other and having a width substantially corresponding to the width of said upper surface of each of said sidewalls.

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**5,745,084**

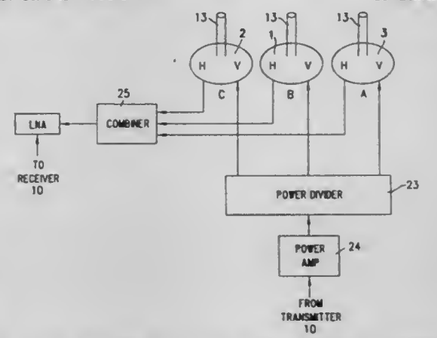
## VERY SMALL APERTURE TERMINAL & ANTENNA FOR USE THEREIN

**Bruce B. Lusignan, 711 Addison Rd., Palo Alto, Calif. 94301**

**Continuation-in-part of Ser. No. 541,757, Oct. 10, 1995, abandoned, which is a continuation-in-part of Ser. No. 259,980, Jun. 17, 1994. This application Oct. 13, 1995, Ser. No. 542,493**

**Int. Cl.[6] H01Q** *19/14*

**U.S. Cl. 343—781 P** **13 Claims**




1. A data transmitting/receiving satellite terminal for transmitting to and receiving from a geosynchronous satellite comprising:

a) an antenna having an aperture forming an antenna receiving pattern with nulls at a first frequency, said nulls corresponding to satellites spaced at regular intervals from the satellite; and

b) a phase and amplitude compensation network coupled to said antenna, said compensation network adjusting a phase and amplitude of a transmitted signal to compensate for transmitting at a second frequency different than the first frequency, wherein the antenna aperture further comprises a main parabolic reflector and two side parabolic reflectors.

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**5,745,085**

## DISPLAY PANEL AND DRIVING METHOD FOR DISPLAY PANEL

**Shigetoshi Tomio, and Toshio Ueda, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation-in-part of Ser. No. 384,371, Feb. 2, 1995, which is a continuation of Ser. No. 188,909, Jan. 31, 1994, abandoned. This application Mar. 28, 1995, Ser. No. 412,137**

**Claims priority, application Japan, Dec. 6, 1993, 5-305415**

**Int. Cl.[6] G09G** *3/30*

**U.S. Cl. 345—63** **20 Claims**

1. A display panel comprising:

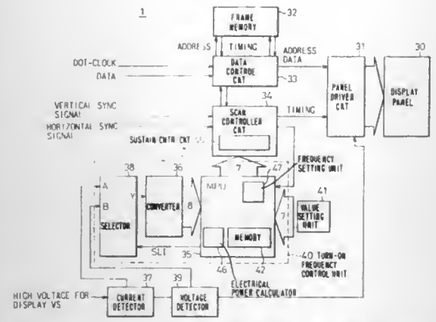
at least two electrode arrays, each array having a plurality of electrodes forming corresponding cell portions that constitute corresponding pixels and each of said cell portions having a function of selectively emitting light in accordance with selection thereof by suitable display data and energization of the selected cell portions by drive voltage pulses applied to said corresponding electrodes and selectively producing a flow of current into the selected cell portions;

a controller controlling the level of the current flowing into the selected cell portions, the level of which increases with an increase in the turn-on display rate of said selected cell portions;

a current detector detecting the level of the current flowing into said cell portions; and

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a current converging value setting unit arbitrarily setting a converging value of the current flowing into said cell portions.

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**5,745,086**

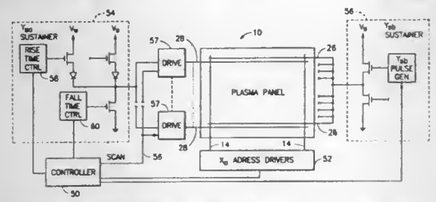
**PLASMA PANEL EXHIBITING ENHANCED CONTRAST**

**Larry F. Weber, New Paltz, N.Y., assignor to Plasmaco Inc., Highland, N.Y.**

**Filed Nov. 29, 1995, Ser. No. 564,926**

**Int. Cl.[6] G09G** *3/28;3/10*

**U.S. Cl. 345—63** **12 Claims**




1. An AC plasma panel comprising plural pixel sites, each site including a dischargeable gas, said pixel sites arranged in rows and columns, each pixel site comprising orthogonally oriented first and second intersecting electrodes, said plasma panel further comprising:

circuit means for applying drive signals to a plurality of said electrodes, each drive signal including at least one ramp voltage which causes a discharge of said gas at each pixel site along an associated electrode and further exhibits a voltage slope that is set to assure that current flow through each said pixel site remains in a positive resistance region of a discharge characteristic of said dischargeable gas, so as to create standardized wall voltages at each pixel site along each said electrode; and

address means for applying data pulses to a plurality of said electrodes during an address period to enable selective discharge of said pixel sites in accord with said data pulses.

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**5,745,087**

**LIQUID CRYSTAL DISPLAY METHOD AND APPARATUS FOR CONTROLLING GRAY SCALE DISPLAY**

**Akira Tomiyoshi, Nara, and Takafumi Kawaguchi, Yamatotakada, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed May 1, 1995, Ser. No. 432,530**

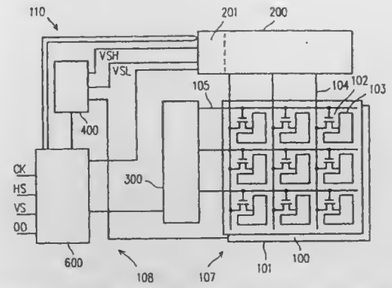
**Claims priority, application Japan, May 19, 1994, 6-105771**

**Int. Cl.[6] G09G** *3/36;* **G02F** *1/133*

**U.S. Cl. 345—89** **13 Claims**

1. A liquid crystal display device comprising:

a pair of opposing substrates with an electrooptical material sealed therebetween;




a plurality of pixel electrodes arranged in a matrix shape on one of the pair of substrates;

a plurality of switching elements, each of the plurality of switching elements being connected to one of the plurality of pixel electrodes;

a plurality of row electrodes, each of the plurality of row electrodes being connected to a control terminal of one of the plurality of switching elements;

a plurality of column electrodes, each of the plurality of column electrodes being connected to a signal input terminal of one of the plurality of switching elements;

a row electrode driving circuit for sequentially selecting and driving each of the plurality of row electrodes;

a digital gray scale signal generation circuit for generating a digital gray scale signal;

a row electrode driving circuit for receiving the digital gray scale signal and a source input having output levels of high and low and for outputting a column electrode driving signal having output levels of high and low, the output levels of high and low of the column electrode driving signal being switched at a cycle determined by the digital gray scale signal; and

a timing control circuit for controlling the row electrode driving circuit and the column electrode driving circuit,

wherein a duty ratio between a high level period and a low level period of the column electrode driving signal is selected to be a different value from a duty ratio of the digital gray scale signal.

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**5,745,088**

**TIME MULTIPLEXED ADDRESSING CIRCUITRY**

**Kevin L. Kornher, Dallas; James L. Conner, Rowlett; Claude E. Tew, Dallas; Hiep Van Tran, Carrollton; Joseph Harry Neal, and Ngai Hung Hong, both of Sugar Land, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 388,649, Feb. 13, 1995, abandoned, which is a continuation-in-part of Ser. No. 300,356, Sep. 2, 1994, Pat. No. 5,548,301, which is a continuation of Ser. No. 2,627, Jan. 11, 1993, abandoned. This application Jun. 6, 1996, Ser. No. 659,547**

**Int. Cl.[6] G09G** *3/34*

**U.S. Cl. 345—85** **9 Claims**

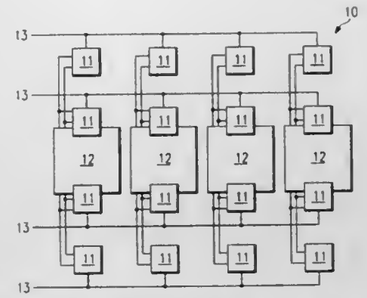
1. A spatial light modulator, comprising:

an array of receiving elements, each of which may be individually set or reset to either of two states depending on a value of a data signal delivered to that element, from an associated memory cell;

a number of memory cells, each directly connected to a unique and predetermined set of elements of said array, such that each said memory cell stores data for each of said receiving elements in its set and communicates those data values to said receiving elements in its set; and

a number of reset lines, connected to said receiving elements such that a different reset line is in communication with each element of a set of elements wherein said receiving elements






have conductive torsion hinges and said reset lines are connected via said hinges.

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**5,745,089**

**METHOD FOR DRIVING APPARATUS**

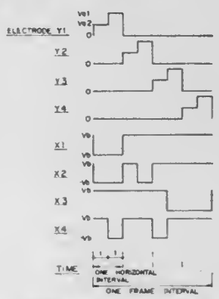
**Jun'ichi Taguchi, Sagamihara; Hiroyuki Mano, Chigasaki; Toshio Tanaka; Koichi Sano, both of Yokohama, and Shigeyuki Nishitani, Ebina, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 14, 1993, Ser. No. 120,551**

**Claims priority, application Japan, Sep. 14, 1992, 4-244511; Dec. 7, 1992, 4-326434**

**Int. Cl.[6] G09G** *3/36*

**U.S. Cl. 345—89** **17 Claims**




1. In a display apparatus for causing a change in physical constant of a material according to a potential difference at a matrix intersection by

(1) forming a matrix having wires arranged longitudinally and laterally,

(2) applying voltages respectively to a longitudinal wire and a lateral wire to form a potential difference at a matrix intersection,

(3) using a material, at least one set among four sets of physical constants of said material changing in response to a root-mean-square value of voltage applied to said material, said four sets being

(3-1) transmittivity of light,

(3-2) reflectance of light,

(3-3) polarization factor of light, and

(3-4) spectrum distribution of transmittivity, reflectance, and polarization factor including light color, and

(4) applying said potential difference at the matrix intersection to said material,

a display apparatus driving method comprising the steps of:

(5) supplying a gradation level to be displayed on the basis of n-bit display data, n being an integer, said n-bit display data being constituted by n bits and thereby having a length of n bits;

(6) on the basis of said length of n bits of said n-bit display data,

(6-1) dividing one frame interval into n equal parts, said n equal parts being equal in number to said length of n bits of said n-bit display data, or

(6-2) dividing one horizontal interval into n equal parts, said n equal parts being equal in number to said length of n bits of said n-bit display data, or

(6-3) conducting time division so that temporal interchange in one frame interval may produce an equivalent of said n equal parts, said n equal parts being equal in number to said length of n bits of said n-bit display data; and

(7) on the basis of display data of respective display bits, controlling the voltage supplied to said matrix.

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**5,745,090**

**WIRING STRUCTURE AND DRIVING METHOD FOR STORAGE CAPACITORS IN A THIN FILM TRANSISTOR LIQUID CRYSTAL DISPLAY DEVICE**

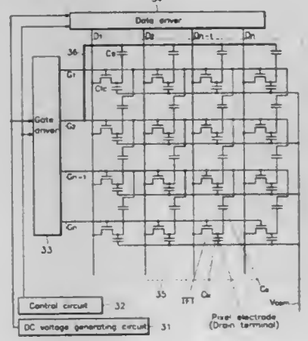
**Dong-Gyu Kim, Suwon; Sang-Chul Lee, Sungnam, and Sang-Soo Kim, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**

**Filed Dec. 8, 1995, Ser. No. 569,613**

**Claims priority, application Rep. of Korea, Dec. 9, 1994, 94-33515; Jan. 13, 1995, 95-546**

**Int. Cl.[6] G09G** *3/36*

**U.S. Cl. 345—90** **13 Claims**




1. A wiring structure for storage capacitors for pixels in a thin film transistor-liquid crystal display having a plurality of gate lines, wherein:

each said storage capacitor has one side terminal connected to a contact point between a drain terminal of a thin film transistor and a liquid crystal capacitance, each said storage capacitor being associated with a corresponding one of a first to a final gate line;

each said storage capacitor associated with the first gate line has another side terminal electrically connected to a gate line selected from any one of the second to the final gate lines; and

each of said storage capacitors associated with the second to the final gate lines, respectively, has another side terminal electrically connected to the next preceding gate line.

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**5,745,091**

**Patent Not Issued For This Number**

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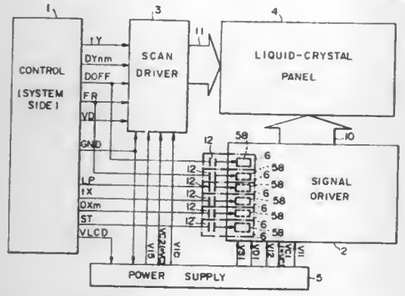


5,745,092

## LIQUID-CRYSTAL DISPLAY SYSTEM AND POWER SUPPLY METHOD THAT SUPPLY DIFFERENT LOGIC SOURCE VOLTAGES TO SIGNAL AND SCAN DRIVERS

Satoru Ito, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 360,058, Dec. 20, 1994, abandoned. This application Oct. 23, 1996, Ser. No. 735,947
Claims priority, application Japan, Dec. 22, 1993, 5-325170
Int. Cl.[6] G09G *3/36*
U.S. Cl. 345—95 22 Claims




1. A liquid-crystal display system comprising:

a signal driver for applying driving voltages to a plurality of signal electrodes which are disposed crossing over a plurality of scan electrodes in a matrix panel including a plurality of pixels arranged in a matrix,

a scan driver for applying driving voltages to said scan electrodes,

power supply means for supplying source voltages to said signal and scan drivers, said power supply means comprising means for supplying a first group of source voltages having a first range of source voltage and a same polarity to one of said signal and scan drivers, means for supplying a second group of source voltages having a second range of source voltage wider than the first range of source voltage and the same polarity to the other of said signal and scan drivers, and means for setting a first center voltage in the first range of source voltage and a second center voltage in the second range of source voltage to a same level,

control means for outputting at least control signals to the signal and scan drivers,

means for supplying a first logic source voltage to the one of said signal and scan drivers to which said first source voltage group is supplied, said first logic source voltage being within said first source voltage range and,

means for supplying a second logic source voltage from the control means to the other of said signal and scan drivers to which said second logic source voltage is supplied, said second logic source voltage being within said second source voltage range.

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5,745,093

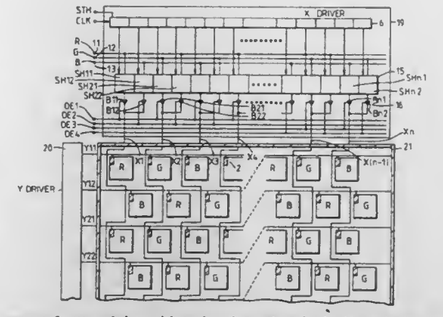
## LIQUID CRYSTAL DISPLAY DRIVING SYSTEM

Yoshiji Tsuzuki, and Tsutomu Sakamoto, both of Saitama-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 27, 1993, Ser. No. 67,831
Claims priority, application Japan, May 27, 1992, 4-135143
Int. Cl.[6] G09G *3/36*
U.S. Cl. 345—103 61 Claims

1. A liquid crystal display driving system comprising:

a liquid crystal display unit which has a screen of matrix arrangement comprised of a plurality of pixels arranged in a plurality of rows and columns relative to the display unit, data lines for driving columns of the pixels, and scanning signal lines for driving rows of the pixels;




means for supplying video signals to the pixels through the data lines;

directing signal generating means for generating first, second, third and fourth output directing signals;

scanning signal line control means for supplying a progressive scanning signal to the scanning signal lines, where the progressive scanning signal is a periodic signal having a frequency lower than that of each of the first, second, third and fourth output directing signals;

first sample-hold means for holding first video signals for pixels corresponding to only odd rows on a first side of the screen and for supplying the first held video signals to data lines corresponding to the first side of the screen based on the first output directing signal;

second sample-hold means for holding second video signals for pixels corresponding to only even rows on the first side of the screen and for supplying the second held video signals to data lines corresponding to the first side of the screen based on the second output directing signal;

third sample-hold means for holding third video signals for pixels corresponding to only odd rows on a second side of the screen and for supplying the third held video signals to data lines corresponding to the second side of the screen based on the third output directing signal; and

fourth sample-hold means for holding fourth video signals for pixels corresponding to only even rows on the second side of the screen and for supplying the third held video signals to data lines corresponding to the second side of the screen based on the fourth output directing signal.

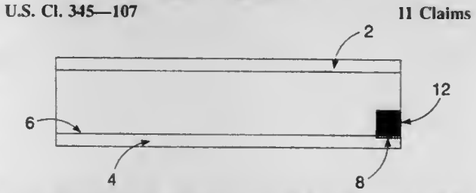
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5,745,094

## ELECTROPHORETIC DISPLAY

Joseph Grover Gordon, II; Mark Whitney Hart, both of San Jose; Andrew Marian Homola, Morgan Hill; Dennis Richard McKean, Cupertino; Lawrence Brian Schein, San Jose; Barton Allen Smith, Campbell, and Sally Ann Swanson, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1994, Ser. No. 365,270
Int. Cl.[6] G09G *3/34*
U.S. Cl. 345—107 11 Claims




1. An ambient light electrophoretic display comprising a plurality of cells containing a suspension of charged pigment particles in a light-transmissive fluid, each cell comprising:

(a) a light-transmissive front window;

(b) a nonobstructing collecting electrode;

(c) a counter electrode; and



(d) a panel having a surface which is light-reflective to reflect incident light back through the cell and the front window.

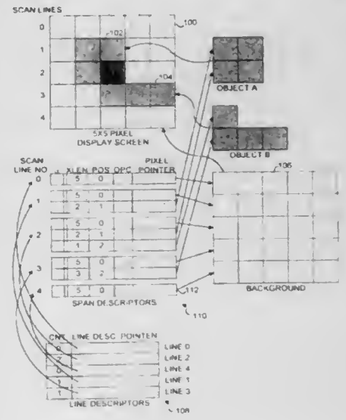
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5,745,095

## COMPOSITING DIGITAL INFORMATION ON A DISPLAY SCREEN BASED ON SCREEN DESCRIPTOR

John M. Parchem, Seattle, and Robert M. Fries, Redmond, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Dec. 13, 1995, Ser. No. 572,292
Int. Cl.[6] G09G *5/00*
U.S. Cl. 345—114 30 Claims




1. A method for displaying objects on a screen as an image that comprises a plurality of scan lines, comprising the steps of:

(a) storing bitmap data in a memory for each object to be displayed on the screen;

(b) creating a data structure based on the bitmap data for each object, said data structure describing each object to be displayed on the screen and including a Screen Descriptor referencing a plurality of Line Descriptors that define the composition of each scan line of the screen, providing a composite of any objects that overlap on the scan line;

(c) storing the data structure in the memory;

(d) processing the data structure to produce video data for each scan line to be displayed on the screen; and

(e) generating an image on the screen using the video data for the scan lines of the screen, said image displaying the composite of any overlapping objects on the scan lines.

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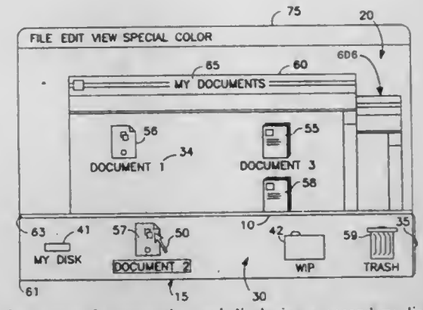
5,745,096

## DESK DRAWER USER INTERFACE

Frank Ludolph, Menlo Park; George Norman, Fremont, and Joel Spiegel, San Jose, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 90,470, Jul. 12, 1993, abandoned, which is a continuation of Ser. No. 709,715, Jun. 3, 1991, abandoned. This application Oct. 18, 1996, Ser. No. 733,545
Int. Cl.[6] G09G *5/14*
U.S. Cl. 345—120 79 Claims

1. In a computer controlled information management system including a display screen containing a primary display region, and means for simultaneously and selectively displaying within said primary display region a plurality of display windows and/or icons, some of which may block or partially block the view of others depending on the number of windows and/or icons being displayed at any given time, a display system comprising:




first means for generating and displaying a secondary display region covering at least a portion of said primary display region and any windows and/or icons being displayed within that portion of the primary display region, said secondary display region and its contents, when present, being completely viewable within said display screen such that, while said secondary display region is displayed it is always displayed over and covering other data including said plurality of display windows and/or icons to the extent said plurality of display windows and/or icons are in said portion of said primary display region;

second means for removing said secondary display region from said display screen thereby allowing said primary display region to be viewed in its entirety;

third means for displaying a plurality of icons within said secondary display region upon display of said secondary display region by said first means;

fourth means for selectively transferring icons into said secondary display region when said secondary display region is displayed, by dragging said icons from said primary display region into said secondary display region and depositing said icons into said secondary display region; and

fifth means for selectively transferring icons from said secondary display region, when said secondary display region is displayed, by dragging said icons from said secondary display region to said primary display region, and depositing said icons into said primary display region.

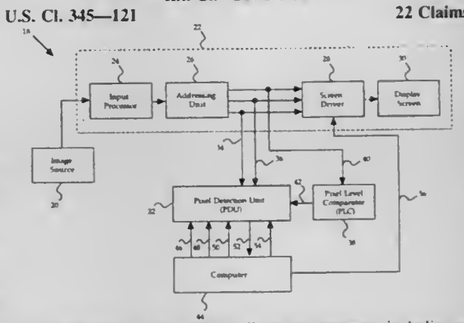
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5,745,097

## APPARATUS AND METHOD FOR AUTOMATIC IMAGE DISPLAY ALIGNMENT

Richard D. Cappels, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Nov. 8, 1995, Ser. No. 555,158
Int. Cl.[6] G07G *5/34*
U.S. Cl. 345—121 22 Claims




1. An automatic image display alignment apparatus, including an image source having an image and a display device having an image alignment register, a pixel address, and a pixel signal, the display device coupled to the image source, said apparatus having means to compare the size of the image to the size of a display screen having column positions and row positions, calculate the

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number of column positions and row positions by which the image is improperly aligned, determine the direction to shift the image so as to align the image in a display screen and command the display device to shift the image, resulting in an automatically aligned image, said apparatus comprising:

a pixel level comparator, for setting, a pixel detect signal to true if the pixel signal exceeds a threshold, the pixel level comparator coupled to the display device;

a computer having a selected address, and coupled to the image alignment register; and

a pixel detection unit, for setting a pixel data signal to true if, while the pixel address and the selected address are equivalent, the pixel detect signal is set to true, the pixel detection unit coupled to the display device, the pixel level comparator and the computer.

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**5,745,098**

## METHOD AND APPARATUS FOR SCROLL DISPLAYING AN IMAGE ON SCREEN

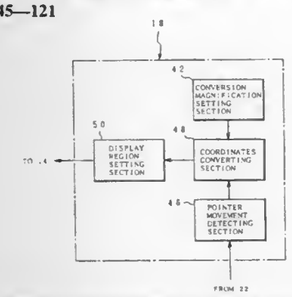
**Satoshi Yamaji, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 279,859, Jul. 26, 1994, abandoned. This application Nov. 4, 1996, Ser. No. 744,070**

**Claims priority, application Japan, Nov. 26, 1993, 5-295871**

**Int. Cl.[6] G09G** *5/34*

**U.S. Cl. 345—121** **15 Claims**




1. An apparatus scroll displaying an image on a screen during a scrolling operation, said apparatus comprising:

a memory section storing whole image information;

a display displaying a partial image extracted from said whole image information of said memory section, said display comprising a display screen;

a first region setting section setting a whole image region having first display coordinates (X, Y) for said whole image information in said memory section said whole image region moving as the coordinates (X, Y) are moved;

a second region setting section setting a screen region having second display coordinates (x, y) for the display screen of said display;

a conversion magnification setting section setting coordinates conversion magnifications (K1, K2) for converting the second display coordinates (x, y) in said screen region into the first coordinates (X, Y) in said whole image region;

a pointer operating section moving a pointer on the display screen of said display during the scrolling operation;

a pointer movement detecting section detecting coordinates values (x, y) of said second display coordinates of a present pointer position during the movement on the screen by said pointer operating section;

a coordinates converting section coupled to the conversion magnification setting section and to the pointer operating section and converting the pointer coordinates values (x, y) after completion of movement detected by said pointer movement detecting section into coordinates values (X, Y) of the first display coordinates of the whole image region by using said coordinates conversion magnifications (K1, K2) causing the coordinates (X, Y) of said whole image region to move as the coordinates (x, y) of the pointer move;

a third region setting section coupled to the coordinates converting section and setting a display region corresponding to said screen region into said whole image region by using the conversion coordinates values (X, Y) obtained by said coordinates converting section as a start point; and

a display control section coupled to the display and to the second region setting section and controlling the scrolling operation by extracting the image of said display region set by said third region setting section from said whole image region and for allowing the image to be scroll displayed by said display.

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**5,745,099**

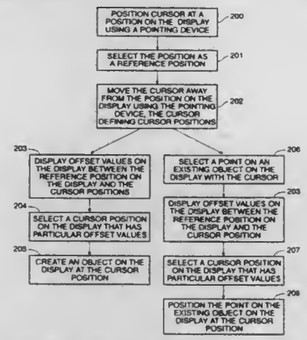
## CURSOR POSITIONING METHOD

**Per Blomqvist, Huntsville, Ala., assignor to Intergraph Corporation, Huntsville, Ala.**

**Filed Dec. 18, 1995, Ser. No. 573,689**

**Int. Cl.[6] G09G** *5/08*

**U.S. Cl. 345—145** **30 Claims**




1. In a computer system including a display and a pointing device, a method for positioning a cursor relative to a reference position on the display using the pointing device, the method comprising the steps of:

positioning the cursor at a position on the display with the pointing device;

selecting the position as the reference position, the reference position associated with an object;

moving the cursor to a plurality of cursor positions not associated with the object on the display with the pointing device; and

displaying a plurality of offset values on the display, the offset values being calculated in response to the reference position and the plurality of cursor positions.

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**5,745,100**

## INPUT DEVICE POINTER REMAP REGION ON A COMPUTER DISPLAY

**Cary Lee Bates, Rochester, and Jeffrey Michael Ryan, Byron, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 2, 1992, Ser. No. 955,625**

**Int. Cl.[6] G09G** *5/08*

**U.S. Cl. 345—157** **14 Claims**

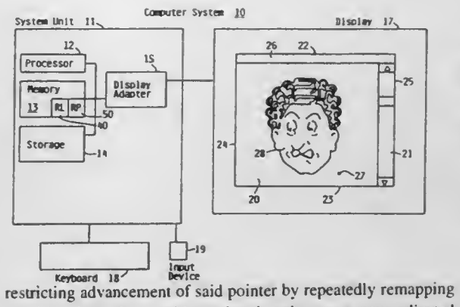
1. A method for remapping a pointer for an input device when said pointer is within a region on a computer display, comprising the steps of:

determining that said pointer is within said region;

advancing said pointer by jumping said pointer to an adjusted location within said region;

repeatedly receiving an indication from said input device that said pointer has moved to another location within said region; and






restricting advancement of said pointer by repeatedly remapping said pointer from said another location to a new adjusted location within said region.

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**5,745,101**

## METHOD AND APPARATUS FOR CONTROLLING IMAGE DISPLAY

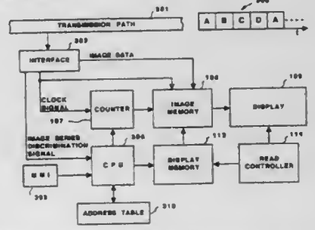
**Mitsuru Yamamoto, Yokohama, and Takayuki Kikuchi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 12, 1992, Ser. No. 834,651**

**Claims priority, application Japan, Feb. 14, 1991, 3-020667; Feb. 14, 1991, 3-020668; Feb. 14, 1991, 3-020669**

**Int. Cl.[6] G09G** *5/00*

**U.S. Cl. 345—185** **16 Claims**




1. A method of controlling an image display process in which image data is input to display an image of the image data on a display unit, said method comprising the steps of:

storing input image data in a first memory with respect to pixels;

obtaining address information on an address of the first memory in which pixel data in the image data on a pixel to be displayed in a display position of the display unit is stored;

storing the address information obtained in the obtaining step into an address of a second memory according to the display position, wherein the second memory has at least a memory space corresponding to a display region of the display unit;

generating synchronous signals for displaying an image and supplying the synchronous signals to the display unit;

reading out the address information of pixel data to be displayed from the address of the second memory which corresponds to the display position of the pixel data in synchronism with the synchronous signals, when the pixel data is displayed on the display position of the display unit; and

reading out the pixel data from the first memory based on the address information read from the second memory in synchronism with the synchronous signals, and displaying a pixel corresponding to the pixel data on the display position of the display unit.

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**5,745,102**

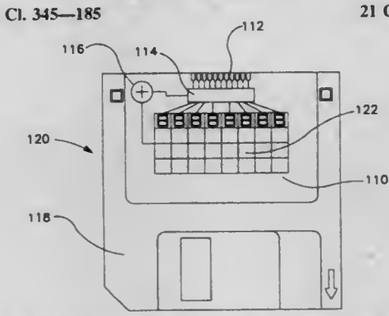
## ELECTRO-OPTICAL DISPLAY FOR A DIGITAL DATA STORAGE DEVICE

**Harry S. Bloch, 871 Greenridge Cir., Langhorne, Pa. 19053, and Nathan Bloch, 16 N. Green Acre Dr., Cherry Hill, N.J. 08003**

**Continuation of Ser. No. 428,901, Apr. 25, 1995, abandoned. This application Mar. 17, 1997, Ser. No. 819,445**

**Int. Cl.[6] G09G** *5/00*

**U.S. Cl. 345—185** **21 Claims**




1. An apparatus for visually displaying information indicative of data stored on a nonvolatile storage medium of a secondary data storage device, wherein the data stored on the nonvolatile storage medium is accessed only via an external data access device, said apparatus for displaying the information when the secondary data storage device is not coupled to the external data access device, the apparatus comprising:

receiving means, mechanically coupled to the secondary data storage device, for receiving, from the external data access device, information indicative of the data stored on the nonvolatile storage medium of the secondary data storage device;

memory means, mechanically coupled to the secondary data storage device and coupled to the receiving means, for storing the received information and for providing a digital signal representing the information; and

display means, mechanically coupled to the secondary data storage device and coupled to the memory means, for receiving and displaying the digital signal representing the information such that information indicative of the data stored on the nonvolatile storage medium can be viewed when the secondary data storage device is not coupled to the external data access device.

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**5,745,103**

## REAL-TIME PALETTE NEGOTIATIONS IN MULTIMEDIA PRESENTATIONS

**Matthew W. Smith, Tulsa, Okla., assignor to Microsoft Corporation, Redmond, Wash.**

**Filed Aug. 2, 1995, Ser. No. 510,258**

**Int. Cl.[6] G09G** *5/06*

**U.S. Cl. 345—199** **30 Claims**

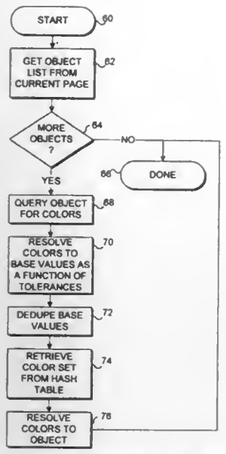
1. A method for determining an optimal color palette for use in displaying a plurality of graphic objects on a computer display, each graphic object having an associated color palette, comprising the steps of:

(a) creating a table having a variable number of entries, each entry corresponding to a different color in the optimal color palette;

(b) repetitively adding the colors from the color palettes associated with each of the graphic objects to the table, if said colors from said color palettes differ from any previous entry in the table by more than a predefined tolerance; and

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(c) assigning the colors in the table to the optimal color palette for use in displaying the graphic objects on the computer display.

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**5,745,104**

**PALETTE CONTROL CIRCUIT**

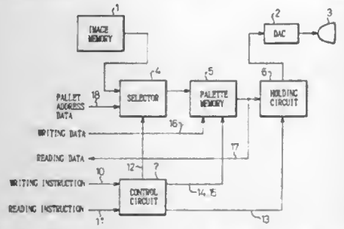
**Hiroshi Minoura, Inagi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 673,097, Jul. 1, 1996, abandoned, which is a continuation of Ser. No. 385,580, Feb. 8, 1995, abandoned, which is a continuation of Ser. No. 113,913, Aug. 31, 1993, abandoned. This application Jun. 4, 1997, Ser. No. 868,538**

**Claims priority, application Japan, Aug. 31, 1992, 4-230662**

**Int. Cl.[6] G09G** *5/06*

**U.S. Cl. 345—199** **9 Claims**




1. A palette control circuit for an image display unit which processes pixel data of images to be displayed, comprising:

a selector for selectively switching one of an image memory output, successive pixel data of which is output at respective, successive fixed periods, and address data;

a palette, operatively connected to said selector, for converting said image memory output into either color or density, and for performing a read or a write operation therein in accordance with an address output from said selector when an access signal is output;

a holding circuit, operatively connected to said palette, for normally outputting an output of said palette for a period corresponding to an individual said fixed period and in response to and only when a data hold signal is received thereby, for outputting an output of said palette for a period corresponding to an output period of said data hold signal and an individual said fixed period; and

a control circuit, operatively connected to said selector, said palette and said holding circuit, for outputting said data hold signal to said holding circuit when said access signal is output to said palette.

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**5,745,105**

**POWER SAVING APPARATUS AND METHOD OF A MONITOR**

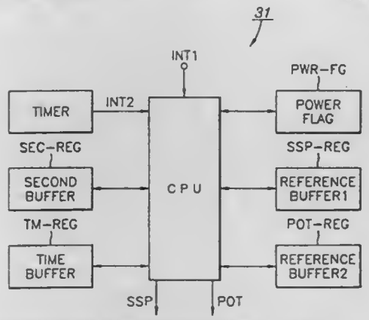
**Yong-Hee Kim, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Continuation of Ser. No. 275,825, Jul. 1, 1994, abandoned. This application Jul. 15, 1996, Ser. No. 680,104**

**Claims priority, application Rep. of Korea, Mar. 31, 1993, 1993-5327**

**Int. Cl.[6] G09G** *5/00*

**U.S. Cl. 345—212** **34 Claims**




1. A power saving apparatus of a monitor, comprising:

input means for generating external input signals in response to user inputs;

power supply signal generating means connected between a computer and said input means, for providing said external input signals from said input means to said computer, and generating a power supply signal in direct response reception of to one of said external input signals; and

power control means connected to said power supply signal generating means, for responding solely to a timing operation and a lack of generation of said power supply signal to execute a power saving function by sequentially cutting off a supply of first and second operating voltages to said monitor when said power supply signal is not received for first and second predetermined time periods, respectively.

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**5,745,106**

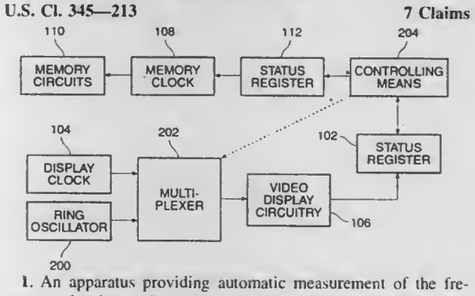
**APPARATUS AND METHOD FOR AUTOMATIC MEASUREMENT OF RING OSCILLATOR FREQUENCY**

**Dinesh D. Chandavarkar, Cupertino, Calif., assignor to Chips & Technologies, Inc., San Jose, Calif.**

**Filed Jan. 15, 1997, Ser. No. 783,270**

**Int. Cl.[6] G09G** *5/00*

**U.S. Cl. 345—213** **7 Claims**




1. An apparatus providing automatic measurement of the frequency of a ring oscillator disposed on an integrated circuit comprising:

a multiplexer having a first data input of which is connected to the output of the ring oscillator, a second data input, a control input, and an output;



a display clock for generating a display clock signal, said display clock having an output connected to said second data input of said multiplexer;

controlling means for switching said multiplexer between said first and second data inputs, said control means coupled to said control input of said multiplexer;

video display circuitry which controls the synchronization of a video display, utilizing said display clock signal, said video display circuitry input being connected to said output of said multiplexer, and

a display register for tracking clock events, the input of said display register being provided by an output of said video display circuitry which contains the signal seen on the output of said multiplexer.

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**5,745,107**

**WINDOW DISPLAY CONTROL SYSTEM FOR COMPUTERS AND METHOD THEREFOR**

**Noriaki Konomi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Continuation of Ser. No. 258,492, Jun. 10, 1994, abandoned. This application Mar. 19, 1997, Ser. No. 825,701**

**Claims priority, application Japan, Jun. 11, 1993, 5-166002**

**Int. Cl.[6] G09G** *5/14*

**U.S. Cl. 345—332** **12 Claims**



1. A window display control system in a computer, comprising:

display means for displaying plurality of windows;

a plurality of input means for inputting data;

data distinction information storage means for storing distinction information to distinguish input data for selection of a window from said plurality of windows as window selection data and input data for cancellation of a selected window as window cancellation data from other input data;

data distinction means for distinguishing whether said input data from said input means is said window selection data or said window cancellation data or the other input data to be displayed on one of said windows by referring to the distinction information stored in said distinction information storage means;

a correspondence table storing information to determine whether or not there is a correspondence between said plurality of input means and said plurality of windows;

window selection means for establishing a correspondence between one of said input means and one of said plurality of windows selected by said window selection data when the data checked by data distinction means is said window selection data, and for canceling a correspondence between one of said input means and a window specified by said window cancellation data which corresponds to a previously selected window when the data checked by said data distinction means is said window cancellation data; and

display control means for displaying the data input from one of said input means to said window having correspondence with said input means providing the data when the data checked by said data distinction means is found to be data other than said window selection data and said window cancellation data.

wherein said window selection means judges whether there is a correspondence between one of said input means providing said window selection data and said window selected by said window selection data by referring to said correspondence table, and if there is no such correspondence with any of said input means, said window selection means establishes a correspondence between said one of said input means and said selected window of said window selection data.

wherein said window selection means judges whether there is a correspondence between one of said input means providing said window cancellation data and said window specified by said window cancellation data by referring to said correspondence table, and if there is such a correspondence, said window selection means cancels the correspondence between said input means and said selected window specified by said window cancellation data.

wherein said window selection means renews said correspondence table when any correspondence is established or canceled between any of said plurality of input means and any of said plurality of windows based on the window selection data or said window cancellation data distinguished by said data distinction means, and

wherein said correspondence table is renewed when a correspondence is established between said one of said input means and one of said plurality of windows by setting a first value in said correspondence table indicative of a current correspondence between said one of said input means and said one of said plurality of windows, and by setting a second value in said correspondence table indicative of non-allowance of a correspondence between said one of said plurality of windows and all others of said input means.

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**5,745,108**

**Patent Not Issued For This Number**

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**5,745,109**

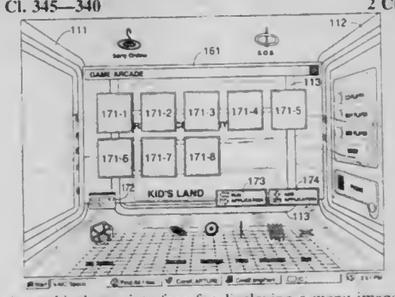
**MENU DISPLAY INTERFACE WITH MINIATURE WINDOWS CORRESPONDING TO EACH PAGE**

**Hiroaki Nakano, San Francisco; Takashi Sugiyama, Sunnyvale; Brian Bakoglu, Milpitas, and George Cossey, San Jose, all of Calif., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., Park Ridge, N.J.**

**Filed Jun. 17, 1996, Ser. No. 664,651**

**Int. Cl.[6] G06F** *3/00*

**U.S. Cl. 345—340** **2 Claims**




1. A graphical user interface for displaying a menu image on a display, comprising:

first means for displaying a window on said display, said window comprising plural pages, only one of said pages being displayed at one time, each of said pages having at least one icon therein selectable by a user to carry out a function corresponding thereto; and

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second means for displaying miniature windows simultaneously with said window being displayed on said display, each of said miniature windows corresponding to each of said pages of said window, each of said miniature windows having miniature icons therein, and the number of said miniature icons in each of said miniature windows being equal to the number of said icons included in a corresponding page of said window, wherein one of said miniature windows which corresponds to the currently displayed page of said window is highlighted.

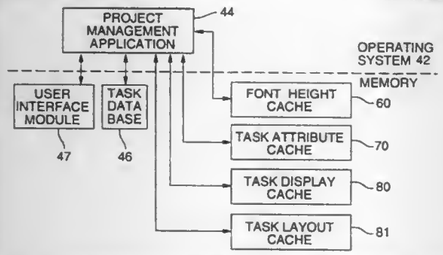
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**5,745,110**

## METHOD AND APPARATUS FOR ARRANGING AND DISPLAYING TASK SCHEDULE INFORMATION IN A CALENDAR VIEW FORMAT

**Tuna Ertemalp, Redmond, Wash., assignor to Microsoft Corporation, Redmond, Wash.**

**Continuation of Ser. No. 401,858, Mar. 10, 1995, abandoned. This application Oct. 8, 1997, Ser. No. 947,045**
**Int. Cl.[6] G06F *15/00***
**U.S. Cl. 345—340** **22 Claims**




13. An apparatus for displaying a plurality of task bars in a task management device, the plurality of task bars including a representation of data for a task over an associated time period, comprising:

a task information database, the task information database containing task information;

a cache in memory;

means for storing task information from the task information database for a plurality of tasks in the cache;

means for selecting a time period;

means for determining which of the plurality of tasks are associated with the selected time period;

means for rendering in the cache, the task bars corresponding to the tasks associated with the selected time period using the task information; and

means for displaying the task bars from the cache on a display device in time based format.

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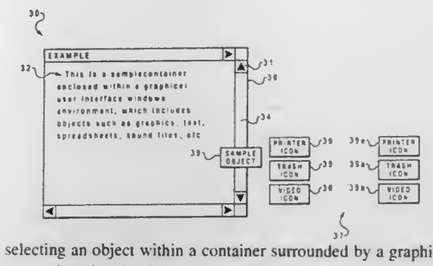
**5,745,111**

## METHOD AND SYSTEM FOR AUTOMATIC PRESENTATION OF DEFAULT-DROP TARGET ICONS AT WINDOW BORDERS

**Troy Lee Cline, Cedar Park, and Ricky Lee Poston, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 13, 1996, Ser. No. 748,667**
**Int. Cl.[6] G06F *3/14;3/00***
**U.S. Cl. 345—348** **6 Claims**

1. A method for efficient invocation of data processing system events utilizing a plurality of target icons, wherein each of said target icons is representative of at least one data processing system event, and wherein said data processing system includes at least one container displayed within a graphical user interface border, comprising the steps of:




selecting an object within a container surrounded by a graphical user interface border;

identifying selected target icons among said plurality of target icons which are representative of data processing system events appropriate for said selected object in response to said selection;

dragging said selected object across said graphical user interface border; and

automatically displaying at least one selected target icon at a location proximate a point where said selected object crosses said graphical user interface border in response to said dragging such that a data processing system event may be invoked by dropping said selected object upon said at least one selected target icon wherein a distance said selected object is dragged to invoke said data processing system event is minimized.

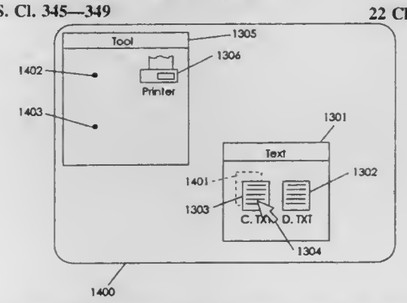
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**5,745,112**

## DEVICE AND METHOD FOR A WINDOW RESPONDING TO A DRAG OPERATION

**Shin-ichi Hirose, Tokyo-to, Japan, assignor to International Business Machine Corp., Armonk, N.Y.**

**Filed Dec. 15, 1995, Ser. No. 573,173**
**Claims priority, application Japan, Dec. 16, 1994, 6-313058**
**Int. Cl.[6] G06F *3/00***
**U.S. Cl. 345—349** **22 Claims**




1. A method for displaying a screen on which drag and drop operation by object icons can be used, comprising the steps of:

in response to a user starting to drag at least one displayed icon, disabling the display of a window that cannot process the dragged icon; and,

in response to the dragging of said dragged icon, enabling the display of a window that can process said dragged icon if the display of said window has been disabled.

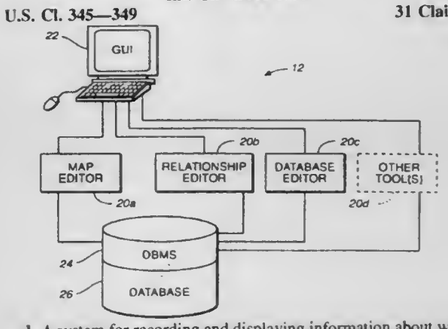


**5,745,113**

## REPRESENTING WORK PRACTICES

**Brigitte Jordan, La Honda; Ron Goldman, Palo Alto, both of Calif., and Patricia Sachs, Mount Vernon, N.Y., assignors to Institute for Research on Learning, Menlo Park, Calif., and Bell Atlantic Science & Technology, Inc., White Plains, N.Y.**

**Filed Apr. 3, 1996, Ser. No. 627,303**
**Int. Cl.[6] G06F *3/00***
**U.S. Cl. 345—349** **31 Claims**




1. A system for recording and displaying information about work practice, comprising a set of graphical tools each having a graphical user interface, the set comprising at least two different tools, where:

each tool is associated with at least one kind of information about work practice and at least one kind of workplace object;

the graphical user interface of each tool displays information about work practice using at least one display metaphor that is characteristic of the tool and that is conventional for a kind of information associated with the tool, the display metaphor including display objects for representing workplace objects of a kind associated with the tool;

the graphical user interface of each tool provides a graphical display in a display metaphor characteristic of the tool for a user to manipulate to provide information about work practice to the system;

each tool has at least one characteristic display metaphor that is different from at least one of the characteristic display metaphors of every other tool in the set of tools; and

the graphical user interface of a first one of the set of tools provides a graphical display with its characteristic display metaphor augmented to display information of a kind associated with a second one of the set of tools.

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**5,745,114**

## GRAPHICAL DISPLAY FOR AN ENERGY MANAGEMENT DEVICE

**William A. King, Lithonia; James Oliver Alexander, Atlanta, both of Ga., and Jeffrey Alan Jenkins, Fort Collins, Colo., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.**

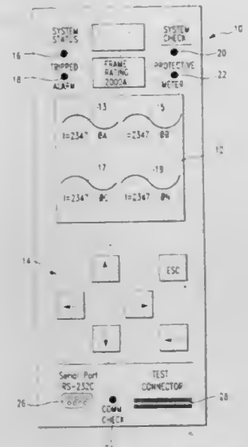
**Division of Ser. No. 315,522, Sep. 30, 1994. This application Mar. 9, 1995, Ser. No. 401,388**
**Int. Cl.[6] G06F *15/00***
**U.S. Cl. 345—352** **20 Claims**

1. A graphical display system having a menu for user selection of power related information for an AC load control device, comprising:

a device for monitoring AC electrical load usage of a load;

a graphical display device connected to said device for monitoring AC electrical load usage, said graphical display device adapted so as to graphically display indicia and at least one parameter of the AC electrical load usage of the load said parameters being displayed as a waveform;

menu means for displaying a plurality of selections on said graphical display device, each of said plurality of selections representing at least one parameter of the AC electrical load usage; and




menu selection means for selecting at least one of said plurality of selections so as to cause said graphical display device to graphically present the waveform representing said at least one parameter of the AC electrical load usage associated with said selections.

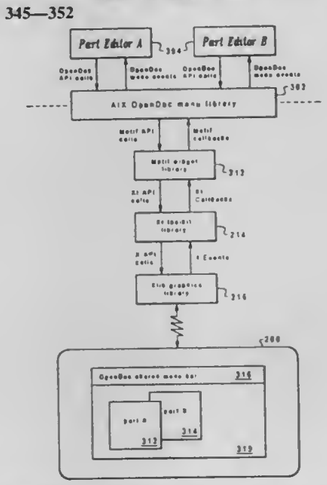
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**5,745,115**

## GRAPHICAL USER INTERFACE HAVING A SHARED MENU BAR FOR OPENED APPLICATIONS

**Lance Jeffery Purple, and Leigh Allen Williamson, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 13, 1996, Ser. No. 587,181**
**Int. Cl.[6] G06F *3/00***
**U.S. Cl. 345—352** **21 Claims**




1. A method of providing a menu bar within a graphical user interface having a plurality of components, wherein said menu bar displays an appropriate set of menu bar items corresponded to each of said components currently focused, said method comprising the steps of:

adding a shared menu bar object, wherein said shared menu bar object includes a base menu bar and a plurality of component menu bars, wherein each of said component menu bars is associated with one of said components within said graphical user interface;

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in response to a focus-selection of one of said components by a user, sending a copy of said base menu bar from said shared menu bar object to said focus-selected component;

applying component specific items to said copy of base menu bar to form a shared menu bar by said focus-selected component; and

displaying said shared menu bar which presents an appropriate set of menu bar items corresponded to said focus-selected component.

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**5,745,116**

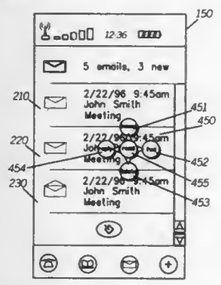
**INTUITIVE GESTURE-BASED GRAPHICAL USER INTERFACE**

**Suthirug Num Pisutha-Arnond, Wheeling, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Sep. 9, 1996, Ser. No. 711,236**

**Int. Cl.[6] G06F *15/00***

**U.S. Cl. 345—358** **16 Claims**




1. A method for providing a microprocessor-controlled intuitive gesture-based graphical user interface for an electronic device having a screen comprising the steps of:

A) displaying a screen object on the screen;

B) receiving a user input corresponding to a selection of the screen object and evaluating the user input as either corresponding to a manual selection or corresponding to a gesture selection;

C) if the user input corresponds to a manual selection, performing the steps of:

1) automatically presenting on the screen a directional palette, the directional palette having at least one palette button, each at least one palette button each having a unique compass direction and a unique function identifier; and

2) receiving a next user input corresponding to a selection of the at least one palette button; and

D) if the user input corresponds to a gesture selection, performing the steps of:

1) providing a user feedback acknowledging the gesture selection;

2) determining if the user input is a function call;

3) if the user input is a function call, performing a function; and

4) if the user input is not a function call, returning to the step of automatically presenting on the screen a directional palette (step C) 1)).

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**5,745,117**

**SYSTEM AND METHOD OF CREATING A THREE-DIMENSIONAL SOLID MODEL FROM A PLURALITY OF TWO-DIMENSIONAL DRAWINGS**

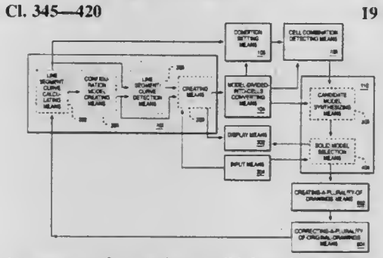
**Hiroshie Masuda, Yamato, and Masayuki Numao, Kawasaki, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 278,432, Jul. 21, 1994, abandoned. This application Feb. 27, 1996, Ser. No. 607,839**

**Claims priority, application Japan, Jul. 26, 1993, 5-184244**

**Int. Cl.[6] G06T *17/20***

**U.S. Cl. 345—420** **19 Claims**



1. An apparatus for creating a solid from incomplete or partly erroneous data representing a plurality of two-dimensional drawings of said solid comprising:

means for creating a wireframe model of edges from a plurality of line segments or curves derived from said plurality of two-dimensional drawings of said solid;

means for converting said wireframe model into a cell-decomposition model having a plurality of cells, each cell including a region specified by said edges;

conditions setting means for determining whether a combination of said cells indicates that at least one of said plurality of two-dimensional drawings is correct; and

means, using said combination of said cells, for creating said solid model.

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**5,745,118**

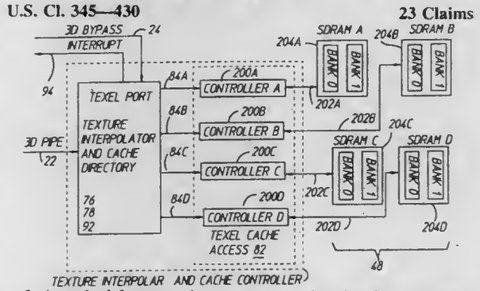
**3D BYPASS FOR DOWNLOAD OF TEXTURES**

**Byron A. Alcorn; Darel N. Emmot, and Steven Paul Tucker, all of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jun. 6, 1995, Ser. No. 465,846**

**Int. Cl.[6] G06T *15/00***

**U.S. Cl. 345—430** **23 Claims**




1. A method for managing texture mapping data in a computer graphics system, the computer graphics system including a host computer, primitive rendering hardware and a textured primitive data path extending between the host computer and the primitive rendering hardware, the host computer passing textured primitives to be rendered by the system using corresponding texture mapping data to the primitive rendering hardware over the textured primitive data path, the host computer having a main memory that stores texture mapping data corresponding to the textured primitives to be rendered, the primitive rendering hardware including a local texture memory that locally stores the texture mapping data corresponding to at least one of the textured primitives to be rendered, the method comprising the step of:

(a) when texture mapping data corresponding to one of the textured primitives to be rendered is stored in the host computer main memory but not within the local texture mapping memory, before completion of rendering the one of the textured primitives, downloading the texture mapping data corresponding to the one of the textured primitives from the host computer main memory to the local texture mapping memory through a texture mapping data path that is separate from the textured primitive data path.



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**5,745,119**

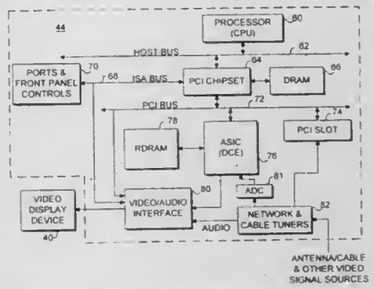
**COLOR DATA CONVERSION USING REAL AND VIRTUAL ADDRESS SPACES**

**John M. Parchem, Seattle, and Robert M. Fries, Redmond, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.**

**Filed Dec. 13, 1995, Ser. No. 571,358**

**Int. Cl.[6] G06T *11/00***

**U.S. Cl. 345—431** **22 Claims**




14. A system for selectively accessing image data in two different color formats, comprising:

(a) a physical, real memory for storing image data and machine instructions, said real memory having a defined range of addresses;

(b) a processor coupled to the memory, said processor executing the machine instructions stored within the memory to implement the following functions:

(i) storing image data having a first color format in the real memory;

(ii) establishing an alternate memory space that is not contained in any physical memory, said alternate memory space having a defined range of addresses that are associated with a second color format, said defined range of addresses of said alternate memory space being outside the defined range of addresses of the real memory;

(iii) detecting specification of an address for a portion of the image data that is within the defined range of addresses of the real memory if the first color format is desired, and in the defined range of addresses of the alternate memory space if the second color format is desired;

(iv) if the address that was specified is not within the real memory:

(1) as a function of the address that was specified in the alternate memory space, determining a corresponding address of the portion of the image data stored in the real memory; and

(2) converting the portion of the image data stored at said corresponding address in the real memory from the first color format to the second color format, producing output data;

(v) else, retrieving the portion of the image data in the first color format, which is stored at the address specified in the real memory, as the output data; and

(vi) making the output data available for use by the processor, any output data produced by converting the portion of the image data stored in the real memory thereby appearing to have been physically stored simultaneously at the address that was specified in the alternate memory space.

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**5,745,120**

**HIGH FIDELITY COLOR RENDERING METHOD AVOIDING MOIRE PROBLEMS**

**Dirk De Baer, Berchem, and René Govaert, Kapellen, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium**

**Filed May 6, 1996, Ser. No. 646,712**

**Claims priority, application European Pat. Off., May 5, 1995, 95201169**

**Int. Cl.[6] G03F *3/08***

**U.S. Cl. 345—431** **4 Claims**

1. A method for rendering on a color output system a specific color by at least four chromatic colorants, comprising the steps of:

A. defining a plurality of colorant sets, each having at most three chromatic colorants;

B. establishing on said color output system, characterisation data for at least two colorant sets;

C. establishing for each said colorant set a corresponding color sub-gamut, disjunctive from each other color sub-gamut;

D. locating said specific color within one disjunctive color sub-gamut, corresponding to a selected colorant set;

E. rendering amounts of chromatic colorants according to said specific color and the characterisation data of said selected colorant set.

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**5,745,121**

**METHODS AND APPARATUS FOR OPTIMIZING THE COMPOSITION OF GRAPHICAL ELEMENTS**

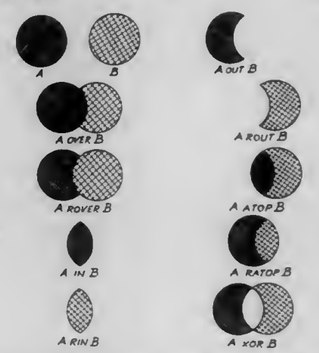
**George Politis, New South Wales, Australia, assignor to Canon Information Systems Research Australia Pty Ltd, New South Wales, Australia, and Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 21, 1995, Ser. No. 505,480**

**Claims priority, application Australia, Jul. 25, 1994, PM 7045**

**Int. Cl.[6] G06T *11/00***

**U.S. Cl. 345—433** **28 Claims**




1. A method of compositing two graphical elements together utilizing a compositing operator wherein one of the graphical elements is opaque, said method being performed by a computer and comprising the steps of:

(a) determining an outline of said at least one opaque object,

(b) determining a corresponding clipping operation for said compositing operator when used in conjunction with said opaque object,

(c) utilizing said clipping operation and said opaque object outline to derive a final clipped graphical element which is

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substantially the same as that produced by compositing said two graphical elements together utilizing said compositing operator.

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5,745,122

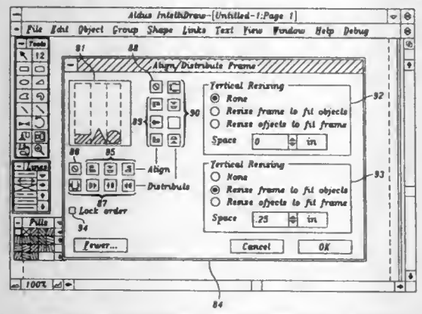
## METHOD OF ESTABLISHING CONSTRAINTS BETWEEN MASTER AND SLAVE GRAPHICAL ELEMENTS

**Jonathan L. Gay, San Diego, and Robert B. Tatsumi, Poway, both of Calif., assignors to Adobe Systems Incorporated, San Jose, Calif.**

**Continuation of Ser. No. 438,977, May 11, 1995, Pat. No. 5,577,189, which is a continuation of Ser. No. 904,059, Jun. 23, 1992, Pat. No. 5,437,008. This application Aug. 20, 1996, Ser. No. 700,038**

**Int. Cl.[6] G06F** *3/00*

**U.S. Cl. 345—433** **3 Claims**




1. A method of establishing spatial relationships between two graphical displayed on a page in response to a user's input, each graphical element having color attributes and a position on the page, comprising:

(a) selecting a first, master graphical element in response to user input;

(b) selecting a second, slave, graphical element in response to user input;

(c) establishing, in response to user input, a constraint relationship between the master and slave graphical elements that links the color attributes of the master element to the color attributes of the slave element, wherein the constraint relationship between the master and slave elements is maintained throughout editing of the elements by the user; and

(d) automatically monitoring any user-identified attempts to edit the color attributes of either the master or slave elements which affect the constraint relationship therebetween; and

(1) if an edit to the color attributes of the master element affecting the constraint relationship is attempted, then modifying the color attributes of both the master and the slave elements in accordance with the constraint relationship; or

(2) if an edit to the color attributes of the slave element affecting the constraint relationship is attempted, then inhibiting the attempt to edit the color attributes of the slave element.

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5,745,123

## METHOD FOR RESIZING AN IMAGE BY A FACTOR OF TWO

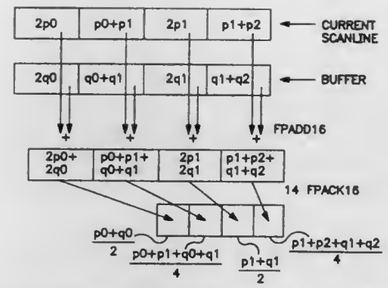
**Daniel S. Rice, Oakland, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.**

**Filed Nov. 27, 1995, Ser. No. 562,693**

**Int. Cl.[6] G06F** *15/00*

**U.S. Cl. 345—439** **18 Claims**

1. A method of scaling an image by two in a computer system comprising the steps of:




a) selectively merging either a first variable or a second variable with itself to create at least one merged variable;

b) merging the first and the second variable to create at least another merged variable;

c) multiplying the at least one merged variable and the at least another merged variables each by a preselected constant to convert to a plurality of expanded variables in an expanded representation; and

d) adding the plurality of expanded variables in pairs to generate a horizontally interpolated data.

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5,745,124

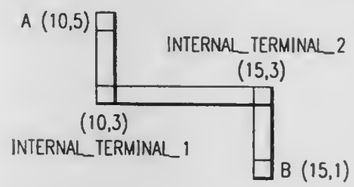
## METHOD AND SYSTEM FOR DATA TRANSLATION

**Jay Scott Parks, League City, and Christopher William Jacobs, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jun. 21, 1996, Ser. No. 669,263**

**Int. Cl.[6] G06F** *15/00*

**U.S. Cl. 345—441** **4 Claims**




1. A method of translating geometric data where said geometric data includes elements and locations of edges of the elements to object-oriented data comprising the steps of:

reading all terminal locations from said geometric data and reading all contact locations from said geometric data;

reading unassociated geometric data;

comparing the location of the edges of the elements of said geometric data with the locations of the terminals and contacts as read from said geometric data;

for each element of the geometric data creating an internal terminal in an object-oriented data structure when an endpoint of said object-oriented data does not correspond to locations of the terminals and contacts as read from said geometric data; and

repeating said creation step until endpoints are found.



5,745,125

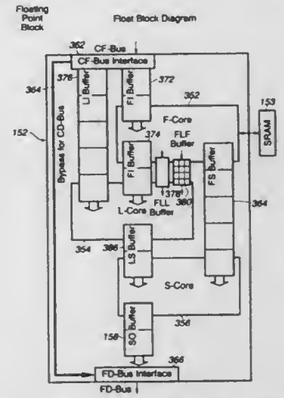
## FLOATING POINT PROCESSOR FOR A THREE-DIMENSIONAL GRAPHICS ACCELERATOR WHICH INCLUDES FLOATING POINT, LIGHTING AND SET-UP CORES FOR IMPROVED PERFORMANCE

**Michael Deering, Los Altos; Wayne Morse, Fremont, and Adeleke Ajirotutu, San Jose, all of Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.**

**Filed Jul. 2, 1996, Ser. No. 676,096**

**Int. Cl.[6] G06F** *15/16*

**U.S. Cl. 345—503** **13 Claims**




1. A floating point processor for use in a three dimensional graphics accelerator, comprising:

a first bus interface for receiving primitive data;

a floating point core coupled to the bus interface which receives the primitive data from the bus interface, wherein the floating point core performs floating point operations on received primitive data

a lighting core comprising a fixed point computational unit for performing lighting computations, wherein the lighting core is coupled to receive output data from the floating point core, wherein the lighting core is also coupled to receive primitive data directly from the bus interface; and

a setup core comprising a fixed point computational unit for performing setup calculations for geometric primitives, wherein the setup core is coupled to receive an output from the lighting core, wherein the setup core is also coupled to receive an output from the floating point core; and

a second bus interface coupled to receive output data from the setup core and adapted to provide the output data on a bus.

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5,745,126

## MACHINE SYNTHESIS OF A VIRTUAL VIDEO CAMERA/IMAGE OF A SCENE FROM MULTIPLE VIDEO CAMERAS/IMAGES OF THE SCENE IN ACCORDANCE WITH A PARTICULAR PERSPECTIVE ON THE SCENE, AN OBJECT IN THE SCENE, OR AN EVENT IN THE SCENE

**Ramesh Jain; Saied Moezzi, both of San Diego, and Arun Katkere, La Jolla, all of Calif., assignors to The Regents of the University of California, Alameda, Calif.**

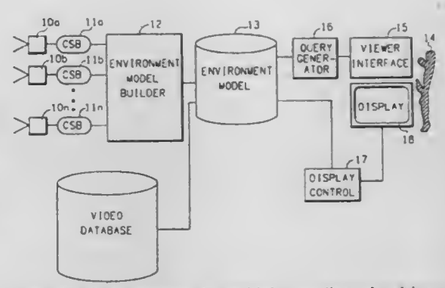
**Division of Ser. No. 414,437, Mar. 31, 1995, Pat. No. 5,729,471. This application Jun. 21, 1996, Ser. No. 667,372**

**Int. Cl.[6] G06T** *13/00*

**U.S. Cl. 345—952** **28 Claims**

1. A method of presenting a particular two-dimensional video image of a real-world three dimensional scene to a viewer comprising:

imaging in multiple video cameras each at a different spatial location multiple two-dimensional images of a real-world scene each at a different spatial perspective;




combining in a computer the multiple two-dimensional images of the scene into a three-dimensional model of the scene;

receiving in a the computer from a prospective viewer of the scene a viewer-specified criterion relative to which criterion the viewer wishes to view the scene;

synthesizing in the computer from the three-dimensional model a particular two-dimensional image of the scene in accordance with the received viewer criterion; and

displaying in a video display the particular synthesized two-dimensional image of the real-world scene to the viewer.

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5,745,127

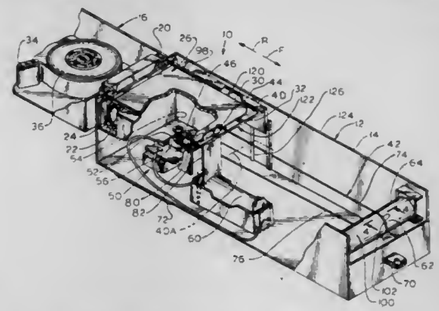
## CHART RECORDER TRANSPORT

**James L. Cox, Charlotte, N.C., assignor to Cox Recorders, Belmont, N.C.**

**Filed Sep. 5, 1996, Ser. No. 707,599**

**Int. Cl.[6] G01D** *15/26;15/34*

**U.S. Cl. 346—136** **12 Claims**



1. A chart recorder comprising:

a housing having a supply station:

an elongated chart strip lying primarily at said supply station, said chart strip having a leading portion;

a string pulling mechanism mounted on said housing;

a string coupled to said leading portion of said chart strip and extending to said string pulling mechanism;

said string pulling mechanism being operable to pull said string to thereby pull said strip along a chart strip path that follows said string;

a chart marker located along said chart strip path and having a stylus to mark said strip.

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5,745,128

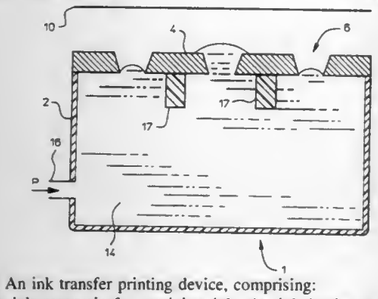
## METHOD AND APPARATUS FOR INK TRANSFER PRINTING

Si-Ty Lam, Pleasanton, and Young-Soo You, Los Altos, both of Calif., assignors to Hewlett Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 295,180, Aug. 24, 1994, abandoned, which is a continuation of Ser. No. 983,007, Nov. 30, 1992, Pat. No. 5,381,166. This application Aug. 16, 1996, Ser. No. 700,629

Int. Cl.[6] B41J 2/005

U.S. Cl. 346—140.1 20 Claims



1. An ink transfer printing device, comprising:

an ink reservoir for retaining ink, the ink having a positive pressure being applied thereto, said reservoir being associated with an ink transfer surface with a plurality of perforations, the ink being such that the viscosity of the ink under ambient conditions prevents the flow of the ink in the perforations;

viscosity control means for inducing a change in the viscosity of the ink near certain of the perforations thereby enabling a controlled amount of the ink near each of said certain of the perforations to flow through said certain of the perforations to an outer surface of said ink transfer surface, the viscosity control means causing the magnitude of change in viscosity of the ink to far exceed the magnitude of change in surface tension for the ink; and

ink transfer means for transferring the ink which has flowed onto the outer surface of the printing media, the ink being transferred by contacting the outer surface of said ink transfer surface to the printing media or an intermediate surface to the transfer of ink which has flowed onto the outer surface to the printing media.

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5,745,129

## INK JET HEAD, INK JET APPARATUS AND DRIVING METHOD THEREFOR

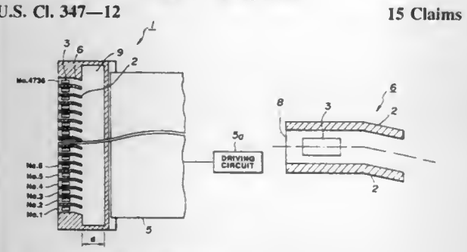
Jiro Moriyama; Yutaka Koizumi, both of Yokohama, and Toshiaki Hirosawa, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 67,581, May 26, 1993, abandoned. This application Sep. 13, 1995, Ser. No. 527,509

Claims priority, application Japan, Jun. 1, 1992, 4-140678

Int. Cl.[6] B41J 2/055

U.S. Cl. 347—12 15 Claims



1. An ink jet head comprising:

a plurality of discharge openings for discharging ink;

a plurality of discharging energy generating means for applying energy to discharge ink;

a plurality of ink paths communicating with said discharge openings for enabling discharge of ink; and

a common ink chamber communicating with an end of each of said ink paths for supplying ink in said common ink chamber to said discharge openings,

wherein said discharge openings are disposed in a plurality of discharge opening groups, said groups being consecutively driven by simultaneously applying energy to ink in those of said ink paths corresponding to selected said discharge openings in each said group,

wherein said end of each of said ink paths corresponding to said discharge openings in each said discharge opening group is disposed in said common ink chamber in ink path groups consecutively arranged in accordance with a driving order of said discharge opening groups, and

wherein a wall opposed to each of said ink paths disposed in said common ink chamber is intersected on an extension of a center line of said end of each said ink path at an angle less than 90° on a next consecutively arranged ink path side.

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5,745,130

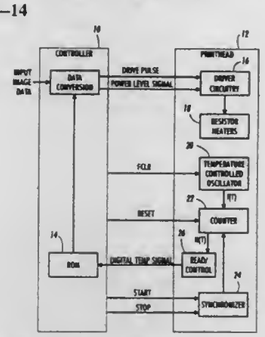
## SYSTEM FOR SENSING THE TEMPERATURE OF A PRINTHEAD IN AN INK JET PRINTER

Juan J. Becerra; Christopher R. Morton, both of Webster, and Thomas A. Tellier, Wolcott, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 11, 1995, Ser. No. 570,024

Int. Cl.[6] B41J 2/125

U.S. Cl. 347—14 2 Claims




1. A thermal ink jet printer comprising:

a printhead having a plurality of ink droplet ejectors, each ejector having a heater resistor activated in response to electrical signals selectively applied from an input signal source,

a temperature controlled oscillator formed on said printhead,

a controller for controlling printhead operations and for applying an enabling signal to said oscillator causing the oscillator to produce binary output pulses whose frequency varies with the temperature variations of the printhead,

a counter for counting the output pulse signals during a predetermined time period defined by start and stop signals from said controller applied through a synchronizer circuit which synchronizes timing operation,

means for converting a count at the end of the predetermined time period into a digital multi-bit signal representative of the printhead temperature and

circuit means responsive to said multi-bit signals for adjusting said electrical signals applied to said heater resistor so as to compensate for ink droplet size and volume changes caused by said temperature variations.



5,745,131

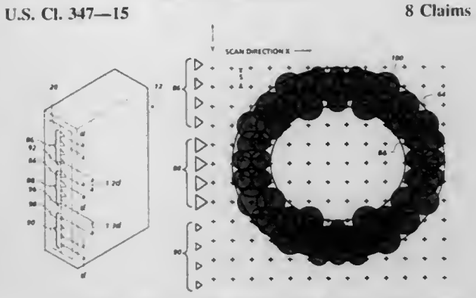
## GRAY SCALE INK JET PRINTER

Gary A. Kneezel, Webster; William R. Burger, Fairport; Steven J. Harrington, Holley; Dale R. Ims, Webster, and Joseph F. Stephany, Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 3, 1995, Ser. No. 510,936

Int. Cl.[6] B41J 2/205

U.S. Cl. 347—15 8 Claims




1. A printing machine of the type in which liquid ink is deposited on a recording medium, comprising:

a printhead including a first linear array of first ejectors, said first ejectors being spaced by a predetermined pitch, for depositing ink spots of a first size on the recording medium, a second linear array of second ejectors, said second ejectors being spaced by the predetermined pitch, for depositing ink spots of a second size on the recording medium, and a third linear array of third ejectors depositing ink spots of a third size, said third linear array aligned substantially parallel with respect to said first linear array said second linear array offset an offset distance from said first linear array in the linear direction, the offset distance being substantially equivalent to an integer multiple of the predetermined pitch plus a partial amount of the predetermined pitch, said third linear array spaced from said second linear array by a second offset distance, the second offset distance being substantially equivalent to an integer multiple of the predetermined pitch plus a second partial amount of the predetermined pitch, the second partial amount of the predetermined pitch being different than the first mentioned partial amount; and

means for moving said printhead in a direction transverse to said first linear array.

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5,745,132

## INK JET RECORDING APPARATUS HAVING TEMPERATURE CONTROL FUNCTION

Hiromitsu Hirabayashi, Yokohama; Naoji Otsuka, Kawasaki; Kentaro Yano, Yokohama; Hitoshi Sugimoto, Kawasaki; Miyuki Matsubara, Tokyo; Kiichiro Takahashi, Yokohama, and Osamu Iwasaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 553,197, Nov. 7, 1995, abandoned, which is a continuation of Ser. No. 921,832, Jul. 30, 1992, abandoned. This application Jun. 23, 1997, Ser. No. 880,536

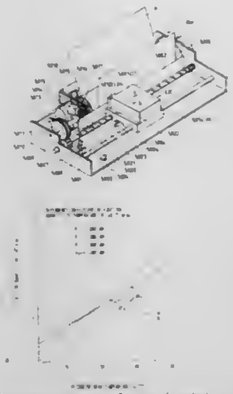
Claims priority, application Japan, Aug. 1, 1991, 3-193177; Aug. 1, 1991, 3-193187; Aug. 2, 1991, 3-194139; Dec. 26, 1991, 3-345052; Dec. 26, 1991, 3-345060; Jan. 31, 1992, 4-016526

Int. Cl.[6] B41J 2/05

U.S. Cl. 347—14 33 Claims

1. An ink jet recording apparatus comprising:

a recording head for ejecting an ink from an ejection portion by thermal energy to cause a change in temperature in a recording period;



temperature keeping means for maintaining a temperature of said recording head at a predetermined keeping temperature not lower than an upper limit of a surrounding temperature range in which said apparatus is normally used;

temperature prediction means for predicting an ink temperature in a vicinity of said ejection portion in the recording period; and

ejection stabilization means for stabilizing ink ejection from said ejection portion according to the predicted ink temperature, said ejection stabilization means having an effective control range for stabilizing ink ejection,

wherein said recording head ejects the ink by receiving at least a pre-pulse and a main pulse with an interval of time therebetween, and said ejection stabilization means modulates at least one of the pre-pulse, the main pulse and the interval of time based on the predicted ink temperature, so as to stabilize a quantity of ink ejection from said ejection portion when the predicted ink temperature is higher than the predetermined keeping temperature.

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5,745,133

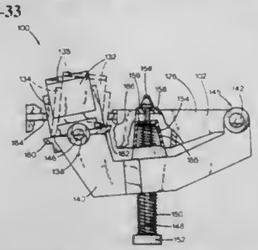
## DUAL PIVOTING WIPER SYSTEM FOR INKJET PRINTHEADS

Jeffrey T. Hendricks, Camas, Wash., and Kris M. English, Portland, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 31, 1995, Ser. No. 558,561

Int. Cl.[6] B41J 2/165

U.S. Cl. 347—33 30 Claims



1. A wiping apparatus for cleaning an inkjet printhead installed in an inkjet printing mechanism having a frame, comprising:

an upright wiper blade, wherein the wiper blade has a blade portion with two opposing side surfaces which taper into a peaked wiping edge that engages the printhead;

a support structure joining the wiper blade to the printing mechanism frame for a rocking motion of the blade with respect to the frame; and

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a biasing element coupled to the support structure and the printing mechanism frame to push the wiper into engagement with the printhead.

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**5,745,134**

## METHOD OF EXCHANGING WASTE INK PACK OF INK JET RECORDING APPARATUS

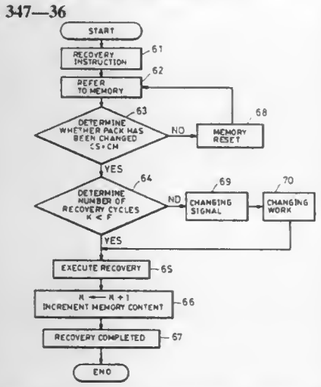
**Hiromitsu Hirabayashi; Hiroshi Tajika, both of Yokohama; Miyuki Matsubara, Tokyo; Noribumi Koitabashi, Yokohama; Atsushi Arai, Yokohama, and Shinji Kanemitsu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 573,154, Dec. 18, 1995, abandoned, which is a continuation of Ser. No. 264,755, Jun. 23, 1994, abandoned, which is a continuation of Ser. No. 945,608, Sep. 16, 1992, abandoned, which is a division of Ser. No. 873,655, Apr. 23, 1992, Pat. No. 5,172,140, which is a continuation of Ser. No. 711,756, Jun. 7, 1991, Pat. No. 5,180,373. This application Jul. 23, 1996, Ser. No. 681,495**

**Claims priority, application Japan, Jun. 13, 1990, 2-152609; Sep. 28, 1990, 2-259164; Jan. 18, 1991, 3-4398**

**Int. Cl.[6] B41J** *2/165*

**U.S. Cl. 347—36** **18 Claims**




1. A method of exchanging a waste ink receiver that stores waste ink discharged by repeated ink clearing operations performed to recover an ink ejecting state of an ink jet head, the method comprising the steps of:

instructing a recovery device to perform one of said ink clearing operations;

determining a cumulative number of times said ink clearing operations have been performed using a particular said waste ink receiver;

comparing said cumulative number with predetermined upper limit data based on a capacity of said particular waste ink receiver, wherein said upper limit data is determined taking into account ambient conditions;

indicating that said waste ink receiver should be exchanged when said cumulative number reaches said upper limit data; and

performing consecutively the ink clearing operations when the upper limit data is greater than said cumulative number of times.

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**5,745,135**

## INK JET RECORDING METHOD AND COLOR INK JET RECORDING DEVICE FOR PRACTICING THE SAME

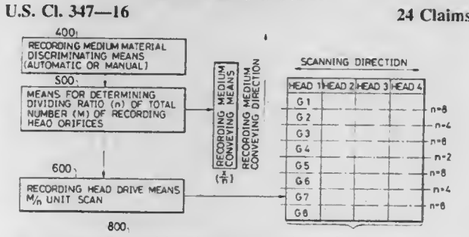
**Hiromitsu Hirabayashi, Yokohama; Atsushi Arai, Kasukabe; Hiroshi Tajika, and Noribumi Koitabashi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 360,121, Dec. 20, 1994, abandoned, which is a continuation of Ser. No. 921,462, Jul. 28, 1992, abandoned, which is a continuation of Ser. No. 671,147, Mar. 18, 1991, abandoned, which is a continuation of Ser. No. 470,775, Jan. 26, 1990, abandoned. This application Jul. 11, 1996, Ser. No. 678,173**

**Claims priority, application Japan, Jan. 28, 1989, 1-018229; Jan. 28, 1989, 1-018230; Jan. 25, 1990, 2-013486**

**Int. Cl.[6] B41J** *2/05;2/21*

**U.S. Cl. 347—16** **24 Claims**




1. An ink jet recording method comprising the steps of:

providing both a carriage movable in a scanning direction and a plurality of ink jet recording heads disposed thereon, each said ink jet recording head having a number of ink discharge energy generating elements and a corresponding number of discharge ports for recording a recording region;

applying driving signals to at least a fraction of said ink discharge energy generating elements corresponding to a fraction of said plural number of said discharge ports;

recording in a one of a first recording mode and a second recording mode, wherein in said first recording mode a first recording covering a recording area is produced during one scanning operation, and wherein said second recording mode involves increasing at a start of recording a quantity of said recording heads which are used during recording of a particular region, and then at a conclusion of recording decreasing said quantity of said recording heads which are used during said recording of said particular region, said particular region having a length relating to a feeding pitch of the recording medium; and

selecting said one of said first recording mode and said second recording mode according to a condition relating at least to a material which the recording medium is made from.

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**5,745,136**

## LIQUID JET HEAD, AND LIQUID JET APPARATUS THEREFOR

**Asao Saito, Yokohama, Japan, assignor to Canon Kabushiki Kaishi, Tokyo, Japan**

**Continuation of Ser. No. 229,221, Apr. 18, 1994, abandoned. This application Dec. 19, 1996, Ser. No. 772,062**

**Claims priority, application Japan, Apr. 16, 1993, 5-090016**

**Int. Cl.[6] B41J** *2/14;2/155*

**U.S. Cl. 347—50** **8 Claims**

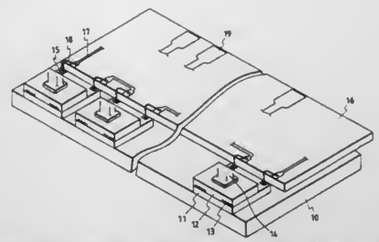
7. A liquid jet apparatus for recording by discharging a liquid, comprising:

a liquid jet head for discharging a liquid, having discharging means for discharging the liquid;

a support member having an end portion;

a plurality of element boards provided in an array at the end portion of the support member, each of said element boards having a plurality of electrothermal transducing elements to generate thermal energy for discharging the liquid, and a





plurality of functional elements to drive said electrothermal transducing elements; and

a circuit board provided on said support member juxtaposed to and along said array of said element boards, said circuit board having a plurality of wirings which transmit a signal outputted from a particular said functional element of a particular said element board to a particular said functional element of a given said element board which is adjacent to said particular element board; and

feeding means for feeding a recording medium, for receiving the liquid,

wherein said functional elements receive a plurality of serial image signals from outside the circuit boards and output a plurality of parallel image signals to an electrothermal transducing element side of said circuit boards.

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**5,745,137**

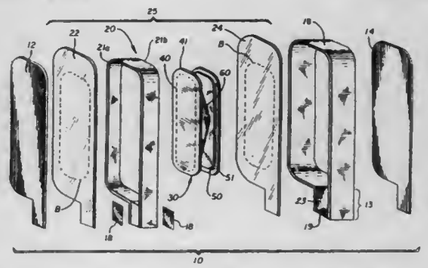
## CONTINUOUS REFILL OF SPRING BAG RESERVOIR IN AN INK-JET SWATH PRINTER/PLOTTER

**Joseph E. Scheffelin, San Diego; Mark E. Young, Escondido; Elizabeth Zapata, San Diego; Kenneth J. Courian, San Diego; George T. Kaplinsky, San Diego; David W. Swanson, Escondido, all of Calif.; James E. Clark, Albany, Oreg., and Tofigh Khodapanah, San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation-in-part of Ser. No. 995,851, Dec. 23, 1992, which is a continuation-in-part of Ser. No. 929,615, Aug. 12, 1992, abandoned. This application May 31, 1995, Ser. No. 454,975**

**Int. Cl.[6] B41J** *2/175*

**U.S. Cl. 347—85** **46 Claims**



1. An ink-jet printer/plotter for ink-jet printing onto a print media, comprising:

an ink-jet cartridge including an ink-jet print head and a spring-bag primary ink reservoir in fluid communication with said print head for holding an internal supply of liquid ink under negative pressure, said reservoir including a movable side wall and an internal spring for biasing said side wall against collapsing as ink is withdrawn from said reservoir and ejected from said print head onto a print medium during printing operations;

a printer/plotter frame;

a print media advancing mechanism for advancing a print medium along a medium path in a media advance direction to a print area;

a cartridge carriage for holding the cartridge;

a cartridge carriage drive mechanism for moving the cartridge carriage relative to the frame along a carriage axis for printing a swath;

an auxiliary ink reservoir secured relative to the frame for holding an auxiliary supply of liquid ink;

a connection tube connectable between said primary reservoir and the auxiliary reservoir for providing a fluid path between the primary and auxiliary reservoirs; and

apparatus for moving the auxiliary reservoir up and/or down without manual intervention during ink replenishment operations to position the ink reservoir at a vertical height position relative to the spring bag internal reservoir.

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**5,745,138**

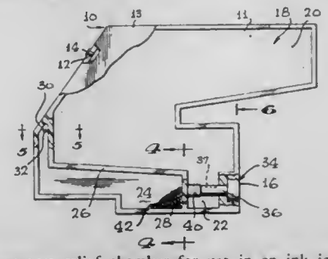
## INK CHAMBER WITH PRESSURE RELIEF CHAMBER HAVING PRESSURE RELIEF APERTURE AND MICROPARTICLES TO EXERT CAPILLIARY ACTION ON INK

**Bruce H. Ostermeier, 4411 Brookside St., Irvine, Calif. 92714**

**Filed May 16, 1996, Ser. No. 643,701**

**Int. Cl.[6] B41J** *2/175*

**U.S. Cl. 347—85** **4 Claims**



3. A pressure relief chamber for use in an ink jet cartridge having an ink chamber comprising:

a pressure relief chamber, said pressure relief chamber configured to be coupled to said ink chamber by at least one aperture, said aperture having a small internal diameter; and

a plurality of microparticles positioned in said pressure relief chamber and having a size larger than said small internal diameter of said aperture, said microparticles forming a plurality of interstices, said interstices forming small capillary paths in said pressure relief chamber.

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**5,745,139**

## INK FEED CONNECTING MEMBER

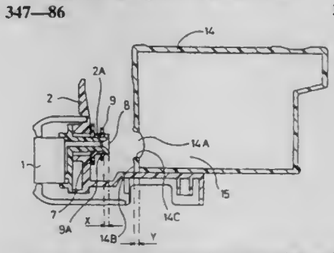
**Toyonori Sasaki, Anjo, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Sep. 21, 1995, Ser. No. 531,773**

**Claims priority, application Japan, Dec. 12, 1994, 6-307599; Jun. 2, 1995, 7-136818**

**Int. Cl.[6] B41J** *2/175;* **B65D** *53/00*

**U.S. Cl. 347—86** **20 Claims**



1. An ink feed connecting member for connecting an ink recording head with a detachable ink cartridge having an ink feed port for feeding ink to the recording head, the ink feed port defined by an

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inner peripheral surface of an opening of the cartridge, the connecting member comprising:

an ink guide having an ink guide port for guiding ink from the ink cartridge to the recording head, said ink guide being insertable into the ink cartridge through the ink feed port; and

sealing means for surrounding at least a part of said ink guide and being disposed opposite the ink feed port of the ink cartridge, said sealing means being inverted when fitted into the ink feed port, wherein a surface of the sealing means comes into contact with the inner peripheral surface of the ink feed port when said ink cartridge is attached to said ink feed connecting member.

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**5,745,140**

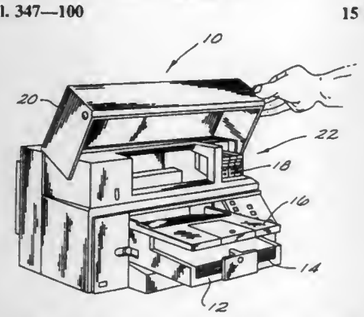
## COLOR INK-JET PRINTER WITH PIGMENT BLACK AND DYE-BASED COLOR INKS

**John L. Stoffel, San Diego; Keshava A. Prasad, San Marcos; Ronald A. Askeland, San Diego; Michele E. Shepard, Escondido; Frank Drogo, San Marcos; Leonard Slevin, San Diego, all of Calif.; Mark S. Hickman, Vancouver, Wash., and Clayton L. Holstun, Escondido, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 234,209, Apr. 28, 1994, abandoned. This application Apr. 2, 1996, Ser. No. 626,432**

**Int. Cl.[6] B41J** *2/01*

**U.S. Cl. 347—100** **15 Claims**




1. A color ink-jet printer employing a selected combination of pigment-based and dye-based inks in an ink-jet ink set, said color ink-jet printer including one print cartridge for dispensing black ink onto a print medium and at least one print cartridge for dispensing color ink onto a print medium such that a printed image is formed on said print medium by said black ink and said color ink, said black ink and said color ink together representing a ink-jet ink set, said print cartridge for dispensing black ink containing a pigment-based ink, said pigment-based ink comprising a vehicle and at least one pigmented colorant dispersed therein, and said at least one print cartridge for dispensing color ink containing a water-miscible dye-based ink, said dye-based ink including a vehicle and at least one water-soluble dye-based colorant, said ink-jet ink set employed in said color ink-jet printer thereby simultaneously realizing

(a) greater edge acuity in said printed image by employing a pigment-based black ink rather than a dye-based black ink, and

(b) reduced need for servicing said color ink-jet printer by employing at least one dye-based color ink rather than employing only pigment-based color inks in said ink-jet ink set.

**5,745,141**

## RECORDING APPARATUS WITH SHEET DISCHARGING SECTION HAVING A SHEET DEFORMATION PREVENTION MECHANISM

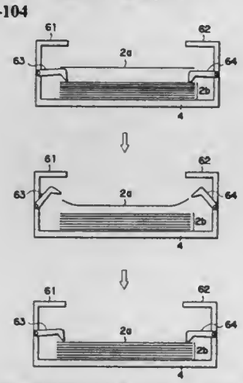
**Takako Miyawaki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 341,954, Nov. 16, 1994, abandoned, which is a continuation of Ser. No. 941,323, Sep. 4, 1992, abandoned. This application Oct. 22, 1996, Ser. No. 731,921**

**Claims priority, application Japan, Sep. 5, 1991, 3-252741**

**Int. Cl.[6] B41J** *2/01*

**U.S. Cl. 347—104** **30 Claims**




1. A recording apparatus for forming an image on a recording medium, said apparatus comprising:

a discharging section for receiving a sheet of the recording medium discharged after an image has been formed thereon; and

deterring means, opposed to at least a side of the sheet discharged to said discharging section, for deterring the sheet of the recording medium from warping due to image formation on the sheet,

wherein said deterring means prevents warping of the recording medium by abutting an upper surface of the sheet of the recording medium discharged to said discharging section.

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**5,745,142**

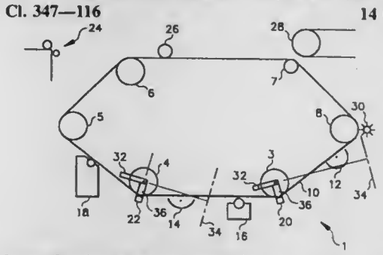
## APPARATUS FOR POSITIONING A LINEAR PRINTHEAD IN AN ACCURATE POSITION WITH RESPECT TO A BELT OR WEB MEMBER

**Christopher B. Liston, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 14, 1994, Ser. No. 356,012**

**Int. Cl.[6] B41J** *2/385;* **G03G** *15/01;* **G01D** *15/06*

**U.S. Cl. 347—116** **14 Claims**




1. Image forming apparatus comprising:

a belt or web image member moving in an in-track direction of motion,

a linear printhead extending in a cross-track direction across the image member generally transverse to the in-track direction of the image member,

a roller supporting the image member,



a castor support supporting the roller for castering movement to align the roller in a direction across the direction of motion of the image member, and a coupling connection between the printhead and the roller to align the printhead also in a direction across the direction of motion of the image member in response to alignment of the roller.

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**5,745,143**

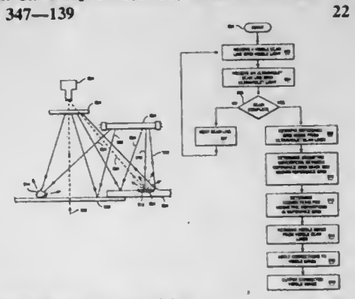
## FLUORESCENT REFERENCE TRACKS FOR AN IMAGE SCANNING SYSTEM

**Albert D. Edgar, Austin, and Steven C. Penn, Georgetown, both of Tex., assignors to International Business Corporation, Armonk, N.Y.**

**Filed Nov. 30, 1994, Ser. No. 346,709**

**Int. Cl.[6] B41J** *2/385;2/435;* **G11B** *7/08;* **G01D** *15/34*

**U.S. Cl. 347—139** **22 Claims**



1. A scanning device comprising:

a sensor for capturing an image on a substrate and a reference grid in register with said image; and

means for illuminating said reference grid with a first type of radiation, said reference grid reradiating said first type of radiation as a second type of radiation; and

said sensor being responsive to said second type of radiation.

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**5,745,144**

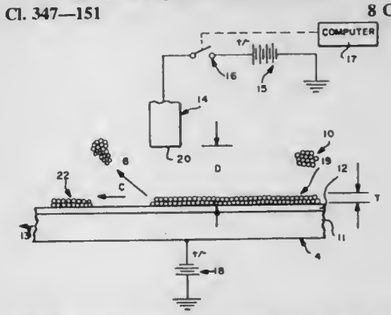
## FIELD EFFECT TONING METHOD

**Orrin D. Christy, 786 Thomas Fox Dr. West, North Tonawanda, N.Y. 14120**

**Division of Ser. No. 356,571, Dec. 15, 1994. This application May 24, 1995, Ser. No. 448,767**

**Int. Cl.[6] B41J** *2/385;2/39;2/395;2/40*

**U.S. Cl. 347—151** **8 Claims**




1. A method of applying a toner image to a moving substrate, using a non-conductive, non-magnetic toner having approximately a 5–20 micron mean particle size, at least one moving conductive member, and an array of primary electrodes, comprising the steps of substantially consecutively and continuously:

(a) electrically charging the non-conductive, non-magnetic toner having approximately said 5–20 micron mean particle size to a level of at least about 8 micro Coulombs/gram;

(b) bringing said at least one moving conducting member into operative association with the electrically charged toner from step (a) so that toner particles adhere thereto, forming a layer thereon;

(c) selectively energizing individual primary electrodes from the array of primary electrodes to cause said individual primarily electrodes to apply electric fields to the layer of toner particles in a no-write condition to effect removal of toner particles where the applied electric field exists at a level greater than an electrostatic adhesion force on the toner particles in the layer, the applied electric field times the charge on the toner being greater than $Q^2/(16*\Pi*\epsilon_0*r^2)$, where Q is a charge on the toner, $\epsilon$, is a permitivity constant for the toner, and r is a toner particle radius; or selectively de-energizing individual primary electrodes from the array of primary electrodes to cause said individual primarily electrodes not to apply electric fields to the layer of toner particles in a write condition, in which the layer of toner particles merely passes past the array of primary electrodes without toner particles being removed from the layer;

(d) transferring the toner particles remaining on said at least one conductive member after it passes past the array of primary electrodes to the moving substrate; and

(e) fusing the toner particles to the substrate;

wherein step (c) is practiced to apply an electric field of greater than about 1.6 volts/μM when in the no-write condition and the magnitude of the electric field applied in the no-write condition is equal to $(V_1-V_2)/D$, where $V_1$=the electric potential of the primary electrode, $V_2$=the electric potential on the first conductive surface, and D=the separation distance between the primary electrode and the first conductive surface, and wherein D=about 75–250 microns;

wherein the primary electrodes are pins or styli, and wherein the first conductive surface is an exterior surface of a first roller; and wherein step (d) is practiced by bringing said exterior surface of said first roller into contact with the moving substrate, and by applying a transfer electrical force to the toner on said exterior surface of said first roller to cause the toner to transfer from said first roller to the substrate.

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**5,745,145**

## INK JET RECORDING APPARATUS AND METHOD

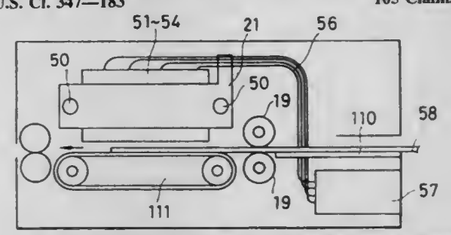
**Hiromitsu Hirabayashi; Hiroshi Tajika; Noribumi Koitabashi, all of Yokohama, and Miyuki Matsubara, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 567,740, Dec. 5, 1995, abandoned, which is a continuation of Ser. No. 293,927, Aug. 22, 1994, abandoned, which is a continuation of Ser. No. 799,564, Nov. 27, 1991, abandoned. This application Dec. 3, 1996, Ser. No. 758,345**

**Claims priority, application Japan, Nov. 30, 1990, 2-329747**

**Int. Cl.[6] G01D** *15/16;* **B41J** *2/36*

**U.S. Cl. 347—183** **105 Claims**




1. An ink jet recording apparatus for performing recording on a recording medium by depositing ink onto the recording medium in response to a recording data signal, said apparatus comprising:

a plurality of recording heads for ejecting inks;

moving means for relatively moving said recording heads and said recording medium;

image identifying means for identifying a recording data signal corresponding to a text region which includes at least one of a

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part of a character and a line thinner than a predetermined thickness, and for identifying a recording data signal corresponding to a halftone region including a dot image; and

recording controlling means for controlling said recording heads to perform recording twice for the text region, and once for the halftone region.

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**5,745,146**

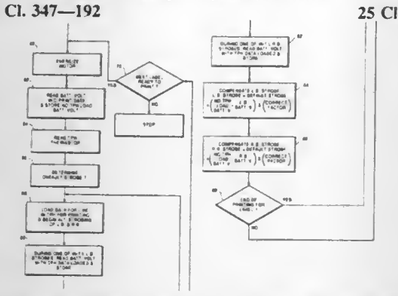
## DYNAMIC STROBE COMPENSATION CONTROL FOR A BARCODE PRINTER

**William B. Durst, Lebanon; Robert B. Schulte, Springboro, and Mitchell G. Stern, Centerville, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio**

**Filed Feb. 15, 1994, Ser. No. 196,709**

**Int. Cl.[6] B41J** *2/35;2/355;2/37;2/36*

**U.S. Cl. 347—192** **25 Claims**



1. A barcode printer powered by a battery having a battery voltage, said barcode printer comprising:

a thermal printhead energizable for printing on a web of record members;

a controller for loading data into said thermal printhead and for energizing said thermal printhead during an energization time having an initial energization period;

means for determining the voltage of said battery, said determining means providing a first battery voltage value representative of the battery voltage prior to the energization time of said thermal printhead and said determining means providing a second battery voltage value representative of the battery voltage during the initial energization period of said thermal printhead for printing a line of data loaded into said thermal printhead; and

means for comparing said first battery voltage value to said second battery voltage value to vary the length of time said thermal printhead is energized to print said line of data in response to a difference between said first and second battery voltage values to dynamically adjust the energization time of said thermal printhead during the printing of a line.

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**5,745,147**

## RESISTANCE-STABLE THERMAL PRINT HEADS

**David Andrew Johnson, Rochester; Gilbert Allan Hawkins, Mendon; James E. Elly, North Chili, and John Alphonse Agostinelli, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 15, 1996, Ser. No. 617,510**

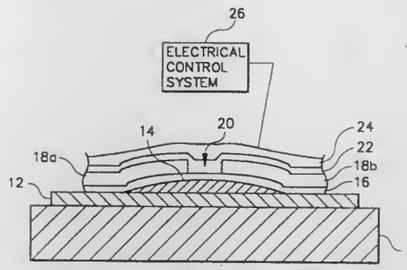
**Int. Cl.[6] B41J** *2/325;2/335*

**U.S. Cl. 347—200** **51 Claims**

1. A thermal print head, including an array of individually addressable resistors on a substrate and adapted to substantially reduce undesirable drift in the resistance values of the resistors, comprising:

a) a thermally stable glaze having a smooth surface formed on the substrate;

b) an electrically resistive doped-semiconductive layer formed on the smooth glaze surface;




c) an array of first and second electrode pairs formed on the resistive layer, each of the first and second electrodes forming a gap therebetween;

d) a protective layer formed over the first and second electrodes and over the resistive layer at the gap;

e) a conductive layer formed on the protective layer; and

f) a wear resistant layer formed on the surface of the conductive layer.

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**5,745,148**

## CORNER HEAD TYPE THERMAL HEAD AND MANUFACTURING METHOD THEREFOR

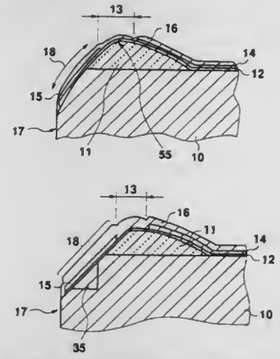
**Hiroaki Ohnishi, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan**

**Continuation of Ser. No. 456,825, Jun. 1, 1995, abandoned, which is a division of Ser. No. 255,312, Jun. 3, 1994, Pat. No. 5,483,736. This application Apr. 11, 1997, Ser. No. 837,337**

**Claims priority, application Japan, Jun. 8, 1993, 5-137955; Jun. 22, 1993, 5-149937**

**Int. Cl.[6] B41J** *2/34;2/335*

**U.S. Cl. 347—201** **2 Claims**




1. A corner head type thermal head comprising:

a substrate having a top face, and a side face;

a glaze layer having an apex provided on the top face of the substrate;

a sloped surface between said apex of said glaze layer and the side face of the substrate; said sloped surface having a first intersection position with the apex of the side layer and a second intersection position with the substrate side, wherein said second intersection position has a convex shape;

a resistance film layer provided on said slope and on said glaze layer;

a heater area formed lying across a top of said corner part;

a common electrode provided on said resistance film layer in said slope area; and

a discrete electrode provided on said resistance film layer in an area facing said common electrode with said heater area between for causing a current to flow into a predetermined portion of said heater area in association with said common electrode and

a reinforcement conductor provided so that said resistance film layer is sandwiched between said reinforcement conductor and said common electrode in said slope area.



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**5,745,149**

## THERMAL PRINTING HEAD

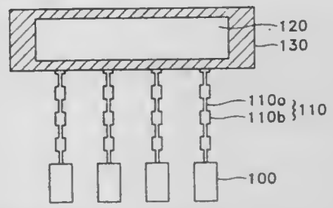
**Sung-soo Park, Suwon, and Hong-geun Yang, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Oct. 4, 1996, Ser. No. 743,148**

**Claims priority, application Rep. of Korea, Nov. 2, 1995, 95-39448**

**Int. Cl.[6] B41J** *2/335*

**U.S. Cl. 347—208** **3 Claims**




1. A thermal printing head comprising:

an alumina substrate on which a plurality of heat resistors and signal supplying pattern elements are formed;

a printed circuit board, which board is located adjacent to said alumina substrate, for supplying an electric signal and power to each of said heat resistors;

a heat sink for discharging heat, said heat sink being attached to the bottom of said printed circuit board and said alumina substrate;

a driving IC mounted on said alumina substrate; and

a solder resist deposition surface for insulating said driving IC from said signal supplying pattern elements,

wherein each of said signal supplying pattern elements is formed of two portions having different widths which are alternately connected in a lengthwise direction along each of said signal supplying pattern elements to minimize or prevent bleeding of a solder resist and an epoxy along the length of each of said signal supplying pattern elements during steps to manufacture said printing head.

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**5,745,150**

## LASER DRAWING APPARATUS HAVING DRAWING BEAMS IN A COMMON PLACE ALIGNED WITH A LENS MERIDIAN

**Takashi Iizuka, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 22, 1994, Ser. No. 279,747**

**Claims priority, application Japan, Aug. 11, 1993, 5-199465**

**Int. Cl.[6] B41J** *2/47;* **G01D** *15/14;* **G02B** *26/00;27/00*

**U.S. Cl. 347—242** **6 Claims**

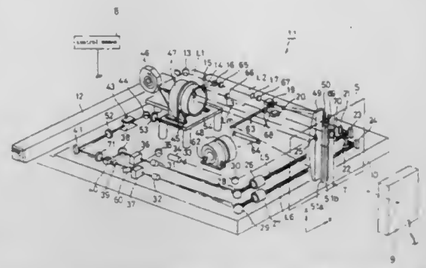
1. A laser drawing apparatus comprising;

a laser source;

a table, a splitting means for splitting laser light emitted from said laser source into groups of drawing beams, the drawing beams being aligned in a common plane;

a lens to which said drawing beams are made incident upon; and,

a scanning means for scanning a drawing surface with said drawing beams passed through said lens in a main scanning direction;



wherein said splitting means is disposed with respect to said laser source so that said common plane is aligned along a meridian of said lens, and each of said drawing beams is made incident upon said lens as linearly polarized light having a direction of oscillation which is parallel with or normal to said meridian of said lens.

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**5,745,151**

## COLOR THERMAL PRINTER COLOR THERMAL PRINTER HAVING MOVABLE FIXING LAMPS

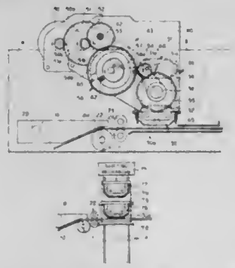
**Takeshi Fujishiro, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Aug. 22, 1995, Ser. No. 517,698**

**Claims priority, application Japan, Aug. 26, 1994, 6-202020**

**Int. Cl.[6] B41J** *2/325;2/315;* **G01D** *15/10*

**U.S. Cl. 347—212** **19 Claims**



1. A color thermal printer for printing a full-color image in frame-sequential fashion on a color thermosensitive recording material including at least first to third thermo-sensitive coloring layers for developing respective different colors, said color thermal printing have transport means for effecting forward and backward movement alternately, said forward movement transporting said recording material in a first direction, said backward movement transporting said recording material in a second direction, a thermal head within a path of movement of said recording material for heating said recording material during said forward movement to record to a selected one of said first to third coloring layers, a first fixing device including a first lamp for applying electromagnetic rays in a first wavelength range to said recording material after recording to said first coloring layer to fix said first coloring layer, and a second fixing device including a second lamp for applying electromagnetic rays in a second wavelength range to said recording material after recording to said second coloring layer to fix said second coloring layer, said first and second fixing devices being forward of said thermal head, said color thermal printer comprising:

a fixer support device for supporting said first and second fixing devices; and

a shifting device, connected to said fixer support device, for shifting said fixer support device, to position one of said first and second fixing devices in a fixing station, said recording material transported past said fixing station by said transport means to receive application of said electromagnetic rays from said one of said first and second fixing devices.

VOL 1209 ISS 4 AP 28 1998 UMI

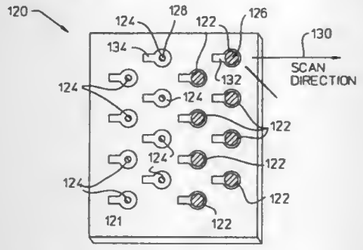


5,745,152

## MULTIPLE BEAM LASER SCANNER USING LASERS WITH DIFFERENT APERTURE SIZES

Kent D. Vincent, Cupertino, Calif., and James G. Bearss, Boise, Id., assignors to Hewlett PAckard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 332,187, Oct. 31, 1994. This application Jul. 21, 1995, Ser. No. 505,052
Int. Cl.[6] G01D *15/14*
U.S. Cl. 347—238 20 Claims




1. In an image forming apparatus having an array of vertical cavity surface emitting lasers, wherein the improvement comprising said array including lasers having a first aperture size and lasers having a second aperture size, the first aperture size being different than the second aperture size, and wherein said image forming apparatus is capable of producing a plurality of dot sizes on a printing medium.

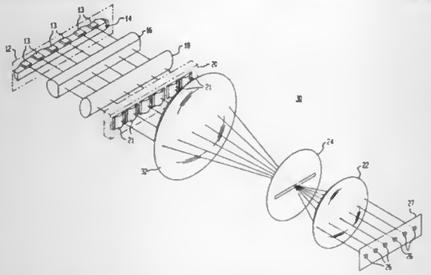
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5,745,153

## OPTICAL MEANS FOR USING DIODE LASER ARRAYS IN LASER MULTIBEAM PRINTERS AND RECORDERS

David Kessler, Rochester, N.Y., and John G. Endriz, Belmont, Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 7, 1992, Ser. No. 986,207
Int. Cl.[6] B41J *2/47*; G02B *27/10*
U.S. Cl. 347—241 5 Claims



1. A laser multibeam printer comprising:
a monolithic laser diode array comprised of a plurality of diode lasers, each of the diode lasers generating a separate one of a plurality of modulated diverging light beams having a predetermined intensity at any instant of time and having predetermined emitting source size, each of the diode lasers spaced from adjacent diode lasers by at least the size of the emitting source size;
a printing lens having an entrance pupil for imaging each of the light beams from the laser diode array at a plane of the entrance pupil onto a light sensitive media as a corresponding compact array of spots of predetermined intensities with a spacing between the spots less than the size of the spot;
optical means for reducing the aperture or divergence of each of the light beams from the plurality of diode lasers by a predetermined amount, and for directing each of the light beams onto the plane of the entrance pupil of the printing lens;
a lenslet array comprising a separate lenslet associated with each of the light beams, wherein each said lenslet directs said associated one of the light beams in a first cross-sectional direction along a width of the laser diode array towards a predetermined area on a plane in front of the printing lens, for focusing each of said light beams in a second cross-sectional direction onto the plane of the entrance pupil, wherein:
the lenslet array substantially collimates each of the light beams from the optical means in the first cross-sectional direction, and directs each of the substantially collimated light beams parallel to each other towards the plane of the entrance pupil; and
a field lens which receives each of the light beams from the lenslet array and focuses and overlaps each of the light beams at the entrance pupil of the printing lens.

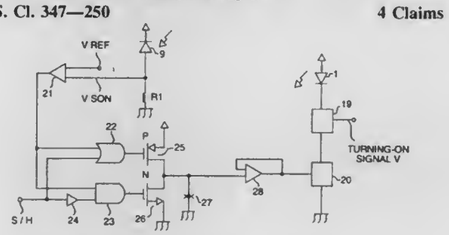
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5,745,154

## DIGITAL IMAGE FORMING APPARATUS WITH SCAN SYNCHRONIZATION

Katsuhiko Nishizawa, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1996, Ser. No. 587,034
Claims priority, application Japan, Jan. 13, 1995, 7-019860
Int. Cl.[6] B41J *2/47*
U.S. Cl. 347—250 4 Claims




1. A digital image forming apparatus, comprising
a laser beam source;
deflection means for making a laser beam scan, said laser beam being emitted from said laser beam source;
synchronizing turning-on means for turning on said laser beam source in an outside of an image writing region for preset time duration in accordance with a reference period;
light sensing means disposed outside said image writing region and for sensing said laser beam emitted from said laser beam source to produce a sync signal;
abnormality detecting means for detecting abnormality by comparing a period of said sync signal produced by said light sensing means with said reference period;
continuous turning-on means for continuously turning on said laser beam source when said abnormality detecting means judges that said period of said sync signal is longer than said reference period; and
abnormality specifying means for specifying contents of abnormality according to whether or not the period of said sync signal produced from said light sensing means during an operation of continuously turning on said laser beam source is shorter than said reference period.

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5,745,155

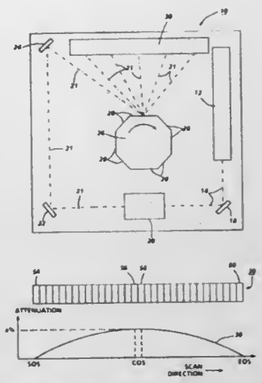
## SCAN UNIFORMITY CORRECTION

Amatzia Feinberg, Los Angeles, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1992, Ser. No. 908,201
Int. Cl.[6] B41J *2/47*
U.S. Cl. 347—256 10 Claims

1. A raster output scanner comprising:
a light source emitting a light beam;
variable reducing means for reducing beam intensity variation;






a scanning means arranged to receive said beam from said light source and scan said beam across said variable reducing means; and
said light beam from said scanning means having an intensity variation over one scan line, whereby said variable reducing means reduces the beam intensity by varying amounts across the scan line.

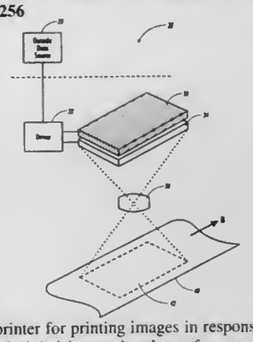
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5,745,156

## DIGITAL PRINTER USING TWO-DIMENSIONAL, FULL FRAME LIGHT VALVE

Anthony M. Federico; William L. Valentine, both of Webster, N.Y., and William D. Turner, San Marino, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1994, Ser. No. 234,896
Int. Cl.[6] B41J *2/47*; G01D *15/14*; G02F *1/11*; G03B *27/72*
U.S. Cl. 347—256 7 Claims



1. A digital printer for printing images in response to full-frame, two-dimensional digital image data input from an outside source, said digital printer comprising:
a two dimensional backlight for producing full frame illumination in a single flash;
a photoreceptor sensitive to light emanating from said backlight;
a two-dimensional, transmissive light valve disposed between said backlight and said photoreceptor so that light from said backlight is transmitted through said light valve to produce a full-frame, two dimensional image on said photoreceptor in response to a single flash of the backlight, said full-frame, two dimensional_image corresponding to a pattern formed on said light valve in response to said full-frame, two dimensional_digital image data;
an imaging system disposed between said light valve and said photoreceptor, such that said imaging system focuses said full-frame, two dimensional_image onto said photoreceptor; and
a driver coupled to said light valve, said backlight and said outside source, said driver coupling said full-frame, two dimensional digital image data from said outside source to said light valve and synchronizing said backlight with said light valve such that said backlight flash exposes said light valve after said pattern is set on said light valve in response to said full-frame, two dimensional digital image data.

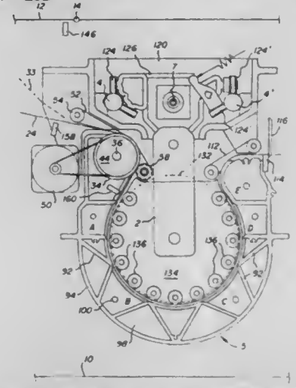
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5,745,157

## DIGITAL PRINTER WITH SUPPORT SHOE AND TRANSLATABLE MEDIA GUIDE MEMBER THEREIN

Mark E. Bridges, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 11, 1995, Ser. No. 371,241
Int. Cl.[6] B41J *2/435*; G01D *15/24*; H01S *1/131*; G11B *7/00*
U.S. Cl. 347—262 8 Claims



1. A printer having a support shoe with an at-least-partially cylindrical inner surface for receiving a light-sensitive recording media, a rotor which is simultaneously rotatable about and linearly translated along a fixed axis, a write head assembly carried by the rotor to expose recording media received on the inner surface of the support shoe; said printer further comprising:
a rotor support member mounted for movement in a direction parallel to the fixed axis of rotation of the rotor; and
a media guide member having an outer surface, the media guide member being carried by the rotor support member for movement to a position within the cylindrical inner surface of the support shoe so as to form a gap between the inner surface of the support shoe and the outer surface of the media guide member, in which gap, recording media can advance around the outer surface of the media guide member and inside of the cylindrical inner surface of the support shoe.

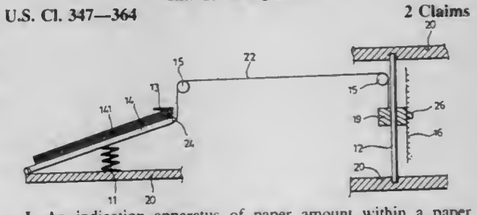
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5,745,158

## INDICATION APPARATUS OF PAPER AMOUNT WITHIN A CASSETTE

De-Jr Lee, Kweishan, Taiwan, assignor to Acer Peripherals, Inc., Taoyuan, Taiwan

Filed Feb. 28, 1996, Ser. No. 608,288
Int. Cl.[6] B41J *2/47*
U.S. Cl. 347—364 2 Claims



1. An indication apparatus of paper amount within a paper cassette, the paper amount being variable due to consumption and

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having a corresponding variable weight, the cassette having a paper guiding means for positioning the papers, the paper guiding means having a bottom plate touching against a spring force, the cassette having a bottom which has a hook means thereon, comprising:

a cable having a first end and a second end, the first end being connected to the hook means;

a shaft, connected to the cassette, for supporting the cable and allowing the cable to slide on a path defined by the shaft;

a glider with a predetermined weight, the glider being connected to the second end of the cable, the glider having an indicator thereon;

a plunger, positioned vertically and engaged with the cassette, for guiding the movement of the glider;

wherein, the indicator indicates the amount of papers within the cassette in response to the variable weight of papers within the cassette, the spring force and the predetermined weight of the glider.

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**5,745,159**

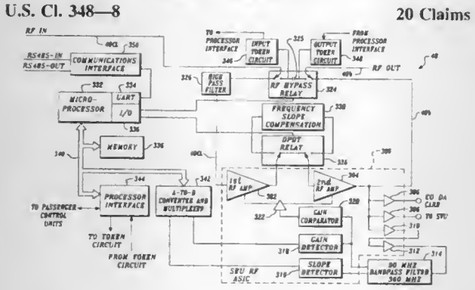
**PASSENGER AIRCRAFT ENTERTAINMENT DISTRIBUTION SYSTEM HAVING IN-LINE SIGNAL CONDITIONING**

**David W. Wax, Seattle, and John Haworth, Lynnwood, both of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed May 11, 1995, Ser. No. 438,980**

**Int. Cl.[6] H04N** *7/10*

**U.S. Cl. 348—8** **20 Claims**




1. An audio and video distribution system for distributing an entertainment signal over a bus from an entertainment signal source to a plurality of audio and video receivers, the entertainment signal containing a first and a second pilot tone, the distribution system comprising:

(a) a bus coupled to the entertainment signal source and carrying the entertainment signal; and

(b) a plurality of seat electronic units (SEUs) coupled to the bus, each of the plurality of SEUs comprising:

(i) a variable gain amplifier connected in series with the bus, the variable gain amplifier having a control input such that a control signal provided to the control input will vary the gain produced by the variable gain amplifier;

(ii) a control circuit coupled to the bus and to the control input of the variable gain amplifier, the control circuit monitoring an amplitude of the first pilot tone of the entertainment signal carried on the bus and generating and applying a control signal to the control input in order to adjust the gain of the variable gain amplifier to maintain the amplitude of the entertainment signal at the desired level;

(iii) a tap coupled to the bus and providing the entertainment signal carried on the bus to one of the plurality of audio and video receivers, and

(iv) a bypass relay connected in series with the bus, wherein in an energized state, the bypass relay connects the variable gain amplifier, control circuit, and tap to the bus, and in an unenergized state, the bypass relay disconnects the variable gain amplifier, control circuit, and tap from the bus.

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**5,745,160**

**VIDEO CONVERSATION/MONITORING SYSTEM HAVING A REMOTE MONITORING FUNCTION**

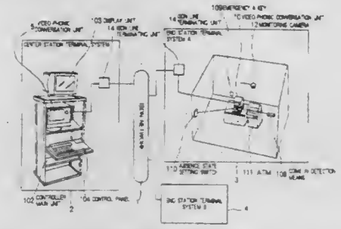
**Kiyoshi Ishida; Nobuyoshi Torii, both of Yokohama; Toshio Watanabe, Kamakura; Takehiko Yamada, Chigasaki; Masato Kidokoro, Yokohama; Toru Ebihara, Sagamihara; Atsuko Nakao, Tokyo; Tokusou Matsuda, Yokohama; Nobuyuki Matsuyama, Fujisawa, and Tooru Aramaki, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 233,746, Apr. 26, 1994, Pat. No. 5,585,839. This application Aug. 29, 1996, Ser. No. 705,314**

**Claims priority, application Japan, Apr. 28, 1993, 5-102177**

**Int. Cl.[6] H04N** *7/15*

**U.S. Cl. 348—15** **3 Claims**



1. A video conversation/monitoring system comprising:

a center station; and

at least one end station connected with said center station through an ISDN line,

wherein said end station includes:

a detector which detects a presence of a person,

an automatic calling unit automatically establishing a call between said center station and said end station in response to an output of said detector,

a first camera which outputs a first image detected by said first camera,

a second camera inputting with a second image detected by said second camera,

a voice input/output unit,

a display unit, and

a controller which controls sending/receiving information by sending the input voice and one of output images of said first and said second cameras to said center station through the ISDN line, switching between output images of said first and second cameras to be sent to said center station in response to a switching indication from said center station, and outputting image and voice sent from said center station to said display unit and said voice input/output unit,

wherein said center station has a conversation with said end station and monitors said end station by monitoring voice and image sent from said end terminal.

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**5,745,161**

**VIDEO CONFERENCE SYSTEM**

**Kan Ito, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 289,261, Aug. 11, 1994. This application Jul. 18, 1997, Ser. No. 896,710**

**Claims priority, application Japan, Aug. 30, 1993, 5-214375**

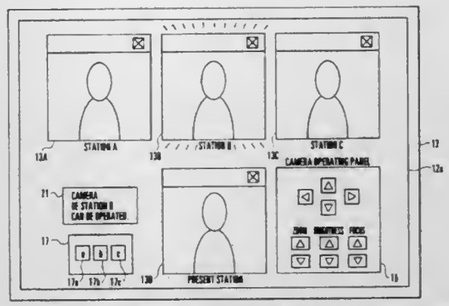
**Int. Cl.[6] H04N** *7/12*

**U.S. Cl. 348—15** **30 Claims**

1. A video conference system arranged to conduct a video conference among multiple interconnected stations having camera by communicating at least images and sounds among the multiple stations, comprising:

(a) display means for displaying moving images respectively obtained from the stations on individual windows on a screen of said display means;






(b) station selecting means for selecting one station from among the plurality of stations by selecting one window from said windows on the screen of said display means; and

(c) control means for enabling operating control of a camera disposed in the station selected by said station selecting means.

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**5,745,162**

**TELECOMMUNICATION TERMINAL HAVING DELAYED ACTIVATION, AND A METHOD FOR USE THEREIN**

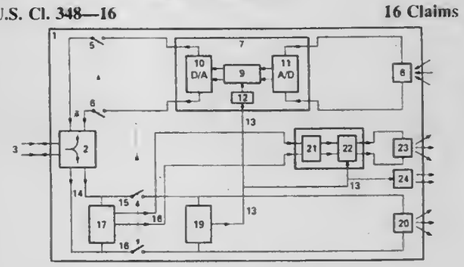
**Arian Koster, Mijdrecht, and Karel Jakob Rijkse, Gouda, both of Netherlands, assignors to Koninklijke PTT Nederland N.V., Netherlands**

**Filed Jan. 3, 1996, Ser. No. 582,471**

**Claims priority, application Netherlands, Jan. 17, 1995, 9500082**

**Int. Cl.[6] H04N** *7/12*

**U.S. Cl. 348—16** **16 Claims**




1. A telecommunications terminal comprising:

a receptor comprising a sound producing circuit for receiving first signals from a telecommunications line and transforming said first signals into sound;

a transmitter comprising a microphone circuit for transmitting second signals to the telecommunications line in response to sound;

a ringing circuit comprising a ringing generator for generating ringing sound in response to a ringing signal; and

wherein said receptor further comprises a detection circuit for detecting a videotelephone signal appearing on the telecommunications line and for generating an activating signal upon detection of the videotelephone signal, said activating signal serving to prevent premature transmission of the second signals, and the terminal further comprises a generating circuit, connected to the detection circuit, for generating an externally perceptible indication signal in response to the activating signal.

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**5,745,163**

**OCULAR FUNDUS CAMERA**

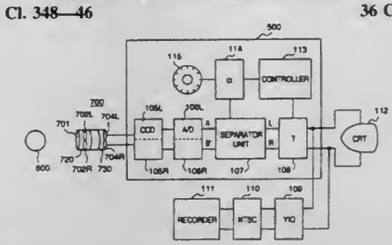
**Toshihisa Nakamura, and Tomohiko Hattori, both of Nakai-machi, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 572,022, Dec. 14, 1995. This application Jul. 15, 1997, Ser. No. 893,188**

**Claims priority, application Japan, Dec. 16, 1994, 6-313740; Sep. 20, 1995, 7-242194; Sep. 20, 1995, 7-266378**

**Int. Cl.[6] A61B** *3/14;* **H04N** *7/18;13/02*

**U.S. Cl. 348—46** **36 Claims**




1. An image processing apparatus for an ocular fundus camera having an optical system that transfers first and second image light components which have a parallax therebetween and which can be separated from each other, comprising:

converting means for converting the first and second image light components into first and second image signals; and

generating means for generating first and second image data by performing proportional distribution of the first and second image signals in accordance with a predetermined coefficient.

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**5,745,164**

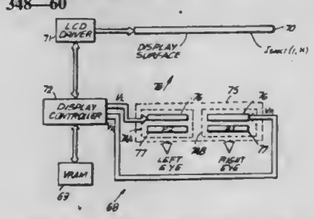
**SYSTEM AND METHOD FOR ELECTRO-OPTICALLY PRODUCING AND DISPLAYING SPECTRALLY-MULTIPLEXED IMAGES OF THREE-DIMENSIONAL IMAGERY FOR USE IN STEREOSCOPIC VIEWING THEREOF**

**Sadeg M. Faris, Pleasantville, N.Y., assignor to Reveo, Inc., Hawthorne, N.Y.**

**Continuation of Ser. No. 152,020, Nov. 12, 1993. This application Jan. 17, 1997, Ser. No. 784,979**

**Int. Cl.[6] H04N** *15/00*

**U.S. Cl. 348—60** **22 Claims**




1. A system for visually presenting a pair of spectrally-multiplexed images of a three-dimensional scene for use in stereoscopic viewing thereof by a viewer having left and right eyes, said system comprising:

image display means for sequentially displaying a first spectrally-multiplexed image during a first display period and a second spectrally-multiplexed image during a second display period, said first spectrally-multiplexed image having a first group of spectral components obtained from a first perspective image of said three-dimensional scene and a second group of spectral components obtained from a second perspective image of said three-dimensional scene, and said second spectrally-multiplexed image having a second group of spectral components obtained from said first perspective image of said three-dimensional scene and a first group of spectral components obtained from said second perspective image; and

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electro-optical image processing apparatus, disposed between said image display means and the left and right eyes of the viewer, for alternatively processing said first and second spectrally-multiplexed images as said first and second spectrally-multiplexed images are visually presented to the left and right eyes of the viewer by said image presentation means, said electro-optical image processing means being operable during said first display period for processing said first spectrally-multiplexed image so as to selectively transmit only the first group of spectral components of said first perspective image to the left eye of the viewer and only the second group of spectral components of said second perspective image to the right eye of the viewer during said first display period, and said electro-optical image processing apparatus being operable during said second display period for optically processing said second spectrally-multiplexed image so as to selectively transmit only the second group of spectral components of said first perspective image to the left eye of the viewer and only the first group of spectral components of said second perspective image to the right eye of the viewer during said second display period,

whereby the first and second groups of spectral components of said first perspective image are transmitted from said image display means to the left eye of the viewer over said first and second display periods, and the first and second groups of spectral components of said second perspective image are transmitted from said image display means to the right eye of the viewer over said first and second display periods so that said three-dimensional scene can be stereoscopically viewed by the left and right eyes of the viewer.

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**5,745,165**

## VIDEO SCOPE CAMERA

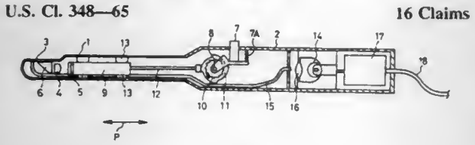
**Hiroshi Atsuta, Katano; Kiyoko Oshima, Shijounawate, and Kazuo Matsuura, Machida, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan**

**Filed Jun. 3, 1996, Ser. No. 657,180**

**Claims priority, application Japan, Jun. 8, 1995, 7-141533**

**Int. Cl.[6] H04N** *7/18*

**U.S. Cl. 348—65** **16 Claims**



15. A video scope camera comprising:

a grip to be held by an operator; and

an insert portion extending from the grip, said insert portion having an entrance window on which imaging light becomes incident and being adapted to be inserted into an oral cavity, one of said grip and said insert portion housing a light source, said insert portion accommodating in the vicinity of the leading end thereof an imaging system having a lens and an image pickup device, and said grip accommodating therein a transmitter for transmitting image signals fed from said imaging system, and a power source for commonly operating said image pickup device, said light source and said transmitter.

**5,745,166**

## VIDEO SECURITY SYSTEM FIELD OF THE INVENTION

**Scott A. Rhodes, Perth, Australia, and Andrew A. Jackson, Las Vegas, Nev., assignors to Maxpro Systems PTY Ltd, Australia**

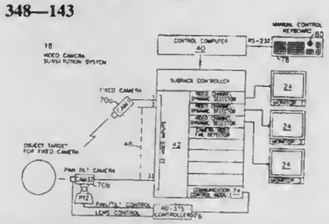
**PCT No. PCT/AU95/00457, § 371 Date Jan. 22, 1997, § 102(e) Date Jan. 22, 1997, PCT Pub. No. WO96/03839, PCT Pub. Date Feb. 8, 1996**

**PCT Filed Jul. 28, 1995, Ser. No. 750,921**

**Claims priority, application Australia, Jul. 26, 1994, PM7083; Aug. 17, 1994, PM7531**

**Int. Cl.[6] H04N** *7/18*

**U.S. Cl. 348—143** **6 Claims**



1. A text insertion system for a video security system having a video camera and a video monitor and/or a VRD capable of operation in a record mode, the text insertion system comprising:

a text insertion means connected between the video camera and the video monitor and/or VRD for inserting a text signal into a video signal received from the video camera for display on the video monitor and/or recordal by the VRD, the insertion of the text signal being timed within the back porch of the video signal so that the text signal does not alter the visible part of the video frame of the video signal;

a control means connected to the text insertion means, the control means generating the text signal and sending the text signal to the text insertion means; and,

a playback means operatively associated with the text insertion means and the control means, the playback means responding to the text signal portion of the video signal, the playback means having a text signal display means for rendering the text signal visible on the video monitor, and a text signal hiding means for rendering the text signal non-visible on the video monitor, the text signal display means and the text signal hiding means being operable by a person using the text insertion system to allow alternating between showing text corresponding to the text signal on the video monitor and showing on the video monitor that part of the video frame which would otherwise be obscured by the text, and the playback means being able to make the text signal visible or hidden during both recording and playback modes of operation of the VRD.

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**5,745,167**

## VIDEO MONITOR SYSTEM

**Satoshi Kageyu, Fujisawa; Akino Inoue, Kawasaki; Masaki Sohma, Yokohama, and Hitoshi Kato, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan**

**Filed Jun. 13, 1996, Ser. No. 661,783**

**Claims priority, application Japan, Jun. 13, 1995, 7-169347**

**Int. Cl.[6] H04N** *7/18*

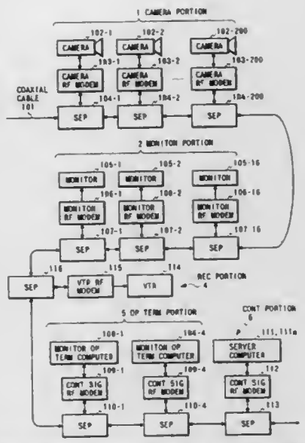
**U.S. Cl. 348—153** **21 Claims**

1. A video monitor system comprising: transmission medium means, having L channels of L video signals for transmitting said L video signals and data;

a video signal source portion including M video signal source units each of said M video signal source units receiving said data from said transmission medium means and selectively generating and suppling one of said L video signals to said transmission medium means through one of said L channels in accordance with said data,

a monitor portion including; N monitor units, each of said N monitor units receiving said data from said transmission





medium means and selectively receiving and reproducing one of said L video signals from one of said L channels in accordance with said data, said L, M, and N being natural number more than one;

a monitor control portion including a plurality of monitor control terminals, each of said monitor control terminals operating in response to a request, to generate and transmit to said transmission medium means said data indicating which one of said M video signal sources is requested to be operated and said data indicating which one of said N monitor units is requested to be operated; and

a control portion including receiving means for receiving all said data from said monitor control portion via said transmission medium means, channel condition detection means responsive to said data indicating which one of said M video signal sources is requested to be operated and said data indicating which one of said N monitor units is requested to be operated for detecting a condition of said L channels, determining means responsive to said channel condition detection means for determining one of said L channels to be used in accordance with said detected condition of said L channels and operating means, responsive to said data indicating which one of said M video signal sources is requested to be operated and said data indicated by said data from said monitor control terminal portion to supply said one of L video signals using said determined one of L channels to said one of said N monitor units indicated by said data from said monitor control terminal portion to receive and reproduce said one of L video signals from the determined one of the L channels.

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**5,745,168**

## HOLE-SIZE MEASURING SYSTEM FOR CRT BLACK MATRIX LAYER

**Takafumi Ninomiya, Shiga, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jan. 26, 1996, Ser. No. 592,202**

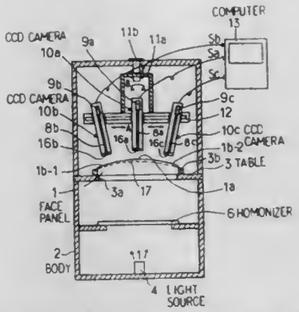
**Claims priority, application Japan, Jan. 26, 1995, 7-010495**

**Int. Cl.[6] H04N** *17/00*

**U.S. Cl. 348—191** **8 Claims**

1. A hole-size measuring system for a black matrix layer, comprising:

an imaging device being slidably and rotatable provided to cover a surface of the black matrix layer and produce an enlarged image of holes of the black matrix layer; and



an image processor for electrically processing said image to thereby measure a size of said holes.

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**5,745,169**

## DETECTING ERRORS IN VIDEO IMAGES

**Angela Ruth Murphy, and Stephen Richard Gunby, both of Essex, United Kingdom, assignors to British Telecommunications public limited company, London, England**

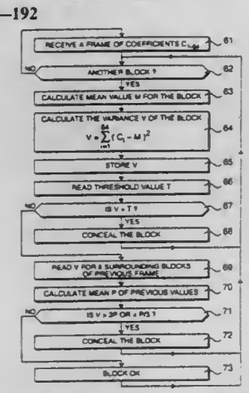
**PCT No. PCT/GB94/01558, § 371 Date Jan. 18, 1996, § 102(e) Date Jan. 18, 1996, PCT Pub. No. WO95/03674, PCT Pub. Date Feb. 2, 1995**

**Continuation-in-part of Ser. No. 126,582, Sep. 27, 1993, abandoned. This PCT application Jul. 19, 1994, Ser. No. 586,647**

**Claims priority, application European Pat. Off., Jul. 19, 1993, 93305646**

**Int. Cl.[6] H04N** *7/133*

**U.S. Cl. 348—192** **13 Claims**



1. A method of detecting an error in a signal representing a video image, said method comprising:

receiving blocks of frequency related coefficients representing respective blocks of the image; and

analyzing the statistical distribution of said coefficients within a block to detect the presence of corrupted data.

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**5,745,170**

## MOUNTING DEVICE FOR JOINING A NIGHT VISION DEVICE TO A SURVEILLANCE CAMERA

**Gary L. Palmer, Vinton, Va., assignor to ITT Corporation, New York, N.Y.**

**Filed Nov. 1, 1995, Ser. No. 548,341**

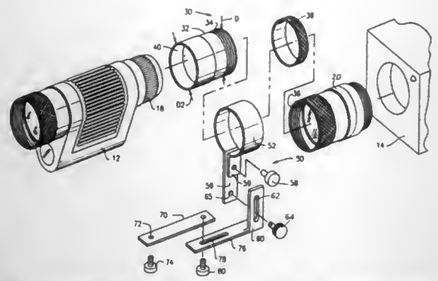
**Int. Cl.[6] H04N** *5/225*

**U.S. Cl. 348—217** **14 Claims**

1. A mounting apparatus for joining a night vision device to a camera containing a charged coupled device, wherein the night

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vision device has an ocular lens assembly and the camera has an objective lens assembly, said apparatus comprising:

an adaptor element having a first end region and a second end region that are coaxially aligned along a longitudinal axis, wherein said first end region is threaded and sized to engage the objective lens assembly of the camera, and said second end region is sized to receive and envelop at least a portion the ocular lens assembly of the night vision device therein, without mechanically joining with the ocular lens assembly;

a bracket assembly extending from said adaptor element, said bracket assembly having an attachment means thereon for attaching said bracket assembly to the night vision device, wherein said bracket assembly rigidly affixes the night vision device to said adaptor element at an orientation where the ocular lens assembly is substantially optically aligned with the objective lens assembly of the camera through the adaptor element.

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**5,745,171**

**DEVICE FOR GENERATING A LUMINANCE SIGNAL FROM A SINGLE FIELD**

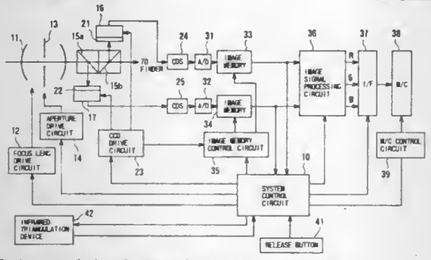
**Kimiaki Ogawa; Nobuhiro Tani, and Harumi Aoki, all of Itabashi-ku, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 6, 1995, Ser. No. 418,572**

**Claims priority, application Japan, Apr. 14, 1994, 6-100532**

**Int. Cl.[6] H04N** *9/68;5/247;9/04*

**U.S. Cl. 348—234** **19 Claims**



1. A control signal generating device, comprising:

a first image sensor in which a plurality of different color filter elements are arranged in rows of pixels aligned in horizontal and in vertical directions;

a second image sensor in which a plurality of different color filter elements are arranged in rows of pixels aligned in horizontal and in vertical directions, said filter elements of said second image sensor each being offset in a horizontal direction by the width of one pixel with respect to the arrangement of each of said filter elements of said first image sensor;

a first reader for reading pixel signals, corresponding to a field, outputted from each horizontal row of pixels by said first image sensor, at every alternate horizontal row;

a second reader for reading pixel signals, corresponding to said field, outputted from each horizontal row of pixels by said second image sensor, at every other alternate horizontal row, said other alternate horizontal rows read by said second reader being adjacent to said alternate horizontal rows read by said first reader; and

a signal generator for generating a luminance signal for setting a photographing condition during a subsequent operation of a camera, said signal generator generating said luminance signal by adding said pixel signals, corresponding to said field, read by said first and second readers, said signal generator thereby generating said luminance signal using pixel signals of a single field at a time.

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**5,745,172**

**NOISE ELIMINATION CIRCUIT IN NEGATIVE IMAGE PICKUP APPARATUS**

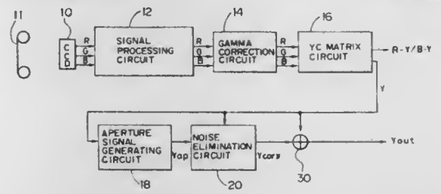
**Mamoru Miyashita, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Apr. 24, 1995, Ser. No. 426,870**

**Claims priority, application Japan, Apr. 25, 1994, 6-086627**

**Int. Cl.[6] H04N** *5/217;5/208*

**U.S. Cl. 348—241** **8 Claims**




1. A noise elimination circuit in a negative image pickup apparatus which receives a luminance signal obtained by negative-positive inverting and gamma-correcting a signal indicating an image on a negative film and a contour correction signal generated from said luminance signal and which eliminates a noise included in said contour correction signal, comprising:

means for generating a signal $Y_{ap1}$ and a signal $Y_{ap2}$ in accordance with a following equation when said luminance signal is Y and said contour correction signal is $Y_{ap}$:

$$Y_{ap1}=Y_{ap}-kY$$

$$Y_{ap2}=Y_{ap}+kY,$$

where k is an attenuating coefficient;

a first slice circuit which picks out signals having a higher level than a maximum level of a noise element in said signal $Y_{ap1}$;

a second slice circuit which picks out signals having a lower level than a minimum level of a noise element in said signal $Y_{ap2}$; and,

an adder which adds up signals picked out by said first and second slice circuits.

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**5,745,173**

**MACHINE VISION CAMERA AND VIDEO PREPROCESSING SYSTEM**

**Michael Kenneth Edwards, 10602 Piping Rock, and Paul Howard Mayeaux, 10606 Piping Rock, both of Houston, Tex. 77042**

**Division of Ser. No. 282,169, Jul. 28, 1994, Pat. No. 5,438,360, which is a continuation of Ser. No. 942,203, Sep. 8, 1992, abandoned. This application Nov. 15, 1994, Ser. No. 340,053**

**Int. Cl.[6] H04N** *5/228;7/18*

**U.S. Cl. 348—208** **17 Claims**

1. A video preprocessing system for use in machine vision systems, comprising:

receiving means for receiving electromagnetic radiation of varying frequencies from a scene and for producing infrared,





visible, and ultraviolet signals corresponding to the infrared, visible, and ultraviolet portions, respectively, of said electromagnetic radiation;

first, second, and third dynamic range transform means receiving said infrared, visible, and ultraviolet signals, respectively, for companding the dynamic range of said received infrared, visible and ultraviolet signals to produce dynamic range companded infrared, visible, and ultraviolet signals; and

means receiving said dynamic range companded infrared, visible, and ultraviolet signals for producing a composite output image using each of said companded infrared, visible, and ultraviolet signals.

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**5,745,174**

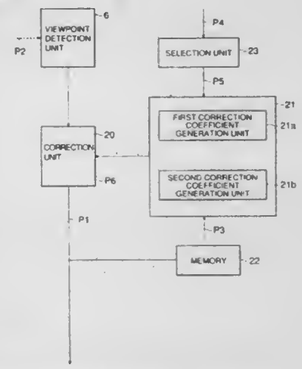
**VIEWPOINT DETECTION APPARATUS WITH SELECTED CORRECTION COEFFICENT GENERATION**

**Hirofumi Nakano, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 7, 1995, Ser. No. 418,467**

**Int. Cl.[6] H04N** *5/232*

**U.S. Cl. 348—333** **8 Claims**




1. A viewpoint detection apparatus comprising:

viewpoint detection means for detecting a viewpoint position of an observer with respect to a finder screen;

detecting means for detecting a deviation between a visual axis direction and a viewpoint direction on the basis of an output from said viewpoint detection means and outputting information corrective of the viewpoint direction of an eye of the observer;

first correction means for calculating a correction coefficient corresponding to the deviation;

a memory for storing at least the correction coefficient data;

second correction means for calculating the correction coefficient using data stored in said memory; and

selection means for selecting one of said first correction means for calculating the correction coefficient without using the data stored in said memory and said second correction means for calculating the correction coefficient using the data stored in the memory.

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**5,745,175**

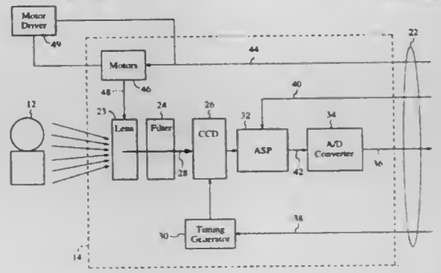
**METHOD AND SYSTEM FOR PROVIDING AUTOMATIC FOCUS CONTROL FOR A STILL DIGITAL CAMERA**

**Eric C. Anderson, San Jose, Calif., assignor to Flashpoint Technologies, Inc., San Jose, Calif.**

**Filed Oct. 2, 1995, Ser. No. 538,074**

**Int. Cl.[6] H04N** *5/232*

**U.S. Cl. 348—345** **11 Claims**




1. A method for automatically focusing an image within a still camera, the still camera including a lens, the method comprising the steps of:

(a) providing initial focus and exposure values of the image, the initial focus and exposure values providing step (a) further comprising the step of (a1) setting an exposure time of the still camera to a midrange value and an analog gain value of the still camera to unity;

(b) calculating an exposure setting for the image;

(c) determining a plurality of focus zones for the image based on an aperture and length of the lens; and

(d) moving the lens through the plurality of focus zones of the image to obtain exposure and focus information concerning the image.

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**5,745,176**

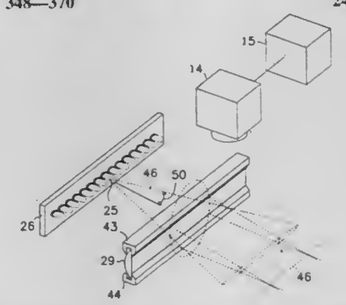
**MACHINE-VISION ILLUMINATION SYSTEM AND METHOD FOR DELINEATING A LIGHTED VOLUME FROM AN UNLIGHTED VOLUME**

**Gary A. Lebens, Chaska, Minn., assignor to PPT Vision, Inc., Eden Prairie, Minn.**

**Filed Oct. 12, 1995, Ser. No. 532,213**

**Int. Cl.[6] H04N** *7/18;9/47;5/222*

**U.S. Cl. 348—370** **24 Claims**



1. An illumination source for illuminating an object in a machine-vision system the machine-vision system including an imaging device that has an optical axis, comprising:

a light source that emits non-collimated light from a plurality of locations, the locations being on a substantially straight line;

a focusing element, the focusing element focusing light from the light source in one dimension to a focal line, wherein the focusing element is separated from the straight line by a distance sufficient to focus rays from the plurality of locations

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into the focal line, and wherein there is a light path from the straight line to the focusing element and then to the focal line; and

a first diaphragm located in the light path between the light source and the focal line and defining a sharp edge in the rays in order to produce a surface substantially delineating a illuminated volume having light from the light source from an unilluminated volume that has substantially no light from the light source and substantially less light overall, and wherein the optical axis of the imaging device passes through the surface such that a portion of the object viewable by the imaging device lies within the illuminated volume and another portion of the object otherwise viewable by the imaging device lies in the unilluminated volume.

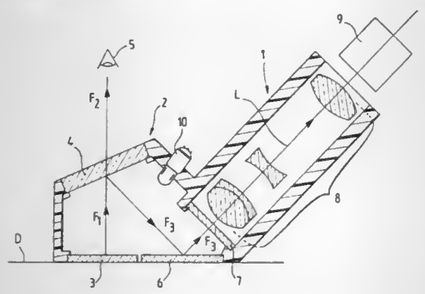
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**5,745,177**

## PICKUP DEVICE FOR READING PEN

**Jacques Lamoure, Meudon, France, assignor to Cherloc S.A., La Roche-Sur-Yon, France**

**Filed Sep. 5, 1995, Ser. No. 523,310**
**Claims priority, application France, Sep. 6, 1994, 94 10641**
**Int. Cl.[6] H04N** *5/225*
**U.S. Cl. 348—373** **7 Claims**




1. Optical pickup device, designed in particular for reading information contained in a given two-dimensional portion of a document comprising:

an aiming window;

pickup lens system designed to form an image of said two-dimensional portion on any light-detector associated with said optical pickup device and located behind said pickup lens system along its longitudinal axis;

a selective mirror located substantially vertically above said window, said selective mirror dividing an optical beam from said window into a transmitted beam and a reflected beam;

a reflecting mirror located in the continuation of the reflected beam from the selective mirror, directing said reflected beam in the direction of said pickup lens system of said device;

a tubular body oriented along a longitudinal axis and containing said pickup lens system;

a closed chamber which extends said tubular body, wherein a lower face of said closed chamber carries said aiming window and reflecting mirror in the same plane, and wherein an upper face of said chamber carries said selective mirror; and

wherein said plane containing said aiming window and said reflecting mirror is parallel to a plane of the document.

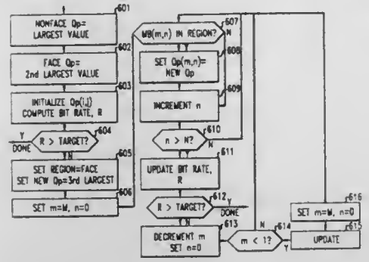
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**5,745,178**

## GLOBAL RATE CONTROL FOR MODEL-ASSISTED CODING OF LOW BIT RATE VIDEO

**John Hartung, Warren, N.J.; Arnaud Eric Jacquin, New York, N.Y., and Jonathan David Rosenberg, Morganville, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Jan. 22, 1996, Ser. No. 589,660**
**Int. Cl.[6] H04N** *7/12;11/02;11/04*
**U.S. Cl. 348—405** **24 Claims**




1. A method of coding an image signal, the image signal representative of an image comprising a plurality of spatial regions, each spatial region comprising a bounded two-dimensional area of the image, each of the regions having one or more corresponding quantization error parameters associated therewith, the method comprising the steps of:

assigning a value to each quantization error parameter;

computing a coding bit rate for the image signal based on the values assigned to the quantization error parameters;

comparing the computed coding bit rate to a bit rate constraint;

adjusting the assigned value of at least one of said quantization error parameters based on the comparison, at least one of the quantization error parameters corresponding to each of at least two of the spatial regions having different resultant values thereby; and

coding each of the spatial regions based on the values assigned to the corresponding quantization error parameters subsequent to the adjusting step.

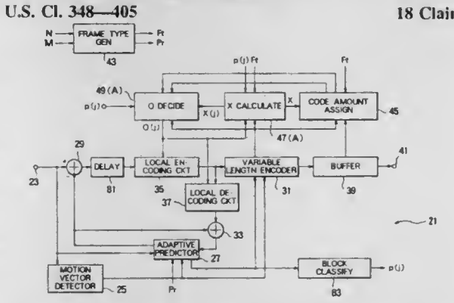
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**5,745,179**

## MOTION PICTURE ADAPTIVE PREDICTION ENCODER WITH A QUANTIZATION PARAMETER DECIDED IN ACCORDANCE WITH BLOCK CLASSIFICATION

**Yuzo Senda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Division of Ser. No. 120,079, Sep. 13, 1993, Pat. No. 5,532,745. This application Jan. 23, 1996, Ser. No. 589,871**
**Claims priority, application Japan, Sep. 11, 1992, 4-242448**
**Int. Cl.[6] H04N** *7/137*
**U.S. Cl. 348—405** **18 Claims**




1. A motion picture encoding device for encoding a motion picture signal composed of successive frames, each of said successive frames composed of a predetermined number of unclassified blocks, and in which selected schemes are selected from a plurality of prediction schemes, said motion picture encoding device comprising:

classifying means for classifying the unclassified blocks of each of said successive frames into classified blocks based on said selected schemes before encoding each of said successive frames;

calculating means for calculating a code amount characteristic value by using a product of a multiplication factor and an amount of codes actually produced from each of said classified blocks as an actually produced code amount;

assigning means for producing assigned code amounts for each of said classified blocks based on respective code amount characteristic values calculated in connection with each of said classified blocks;

deciding means for deciding a quantization parameter for use as said multiplication factor based on said actually produced code amount and one of said assigned code amounts that is produced by using said actually produced code amount; and

encoding means for encoding the classified blocks of said successive frames in accordance with said selected schemes and said quantization parameter.



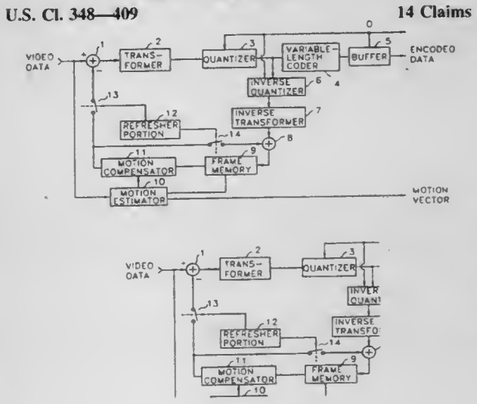
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**5,745,180**

## LOW-DELAY ENCODING METHODS OF MOVING PICTURES

**Joohan Kwon, Suwon, and Jae-moon Jo, Sungnam, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea**

**Filed Jun. 29, 1995, Ser. No. 496,785**
**Claims priority, application Rep. of Korea, Jun. 29, 1994, 94-15192**
**Int. Cl.[6] H04N** *7/30;7/32*
**U.S. Cl. 348—409** **14 Claims**




1. A method of low-delay-encoding digital video data for moving pictures, said method comprising the steps of:

(a) determining a first row position containing first intra-segments in an image frame and a second row position containing second intra-segments therein, wherein segments in each row are enumerated sequentially across the row and said first intra-segments are odd-numbered and said second intra-segments are even-numbered, each intra-segment having a respectively predetermined size, wherein said first intra-segments are offset by one intra-segment width with respect to said second intra-segments;

(b) intra-frame-encoding video data contained in the first and second intra-segments among the video data in the image frame, and inter-frame-encoding video data which exists outside of the first and second intra-segments; and

(c) re-determining said first and second row positions containing, respectively, the first and second intra-segments with respect to the image frame to be used for encoding, by shifting the first row position containing the first intra-segments from the upper end of the screen to the lower end thereof by a predetermined interval, and by shifting the second row position containing the second intra-segments from the lower end of the screen to the upper end thereof by the predetermined interval, whenever the image is changed.

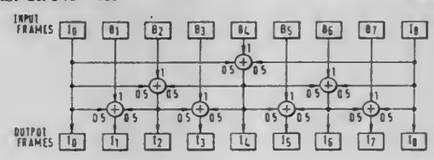
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**5,745,181**

## MOTION COMPENSATED VIDEO PROCESSING

**James Hedley Wilkinson, Tadley, England, assignor to Sony Corporation, Tokyo, Japan, and Sony United Kingdom Limited, Weybridge, England**

**Filed Jun. 5, 1996, Ser. No. 658,591**
**Claims priority, application United Kingdom, Jun. 6, 1995, 9511460**
**Int. Cl.[6] H04N** *7/12;11/02;11/04*
**U.S. Cl. 348—415** **12 Claims**




1. A motion compensated video processing method comprising encoding a video frame group into one of 'I' and 'B' frames, and reordering said 'I' frames between frame groups wherein the timing delay upon decoding can be reduced relative to that of decoding a non-reordered frame group, wherein said 'I' frame of a respective frame group is utilized with said 'I' frame of an adjacent frame group for the decoding and wherein each said 'I' frame is adjacent to one or more of the B frames.

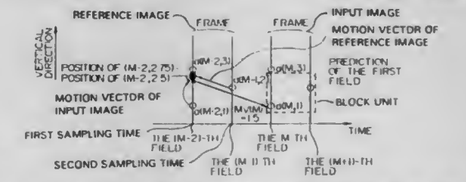
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**5,745,182**

## METHOD FOR DETERMINING MOTION COMPENSATION

**Takeshi Yukitake, and Shuji Inoue, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Division of Ser. No. 970,046, Nov. 2, 1992, Pat. No. 5,369,449. This application Jul. 20, 1994, Ser. No. 278,010**
**Claims priority, application Japan, Nov. 8, 1991, 3-293004; Jul. 9, 1992, 4-181980**
**Int. Cl.[6] H04N** *7/32*
**U.S. Cl. 348—416** **3 Claims**




1. A method of determining motion compensation for an input image from motion vectors between the input image and a plurality of reference images, said method comprising the steps of:

(a) calculating a motion vector MV1 between the input image and one reference image of said plurality of reference images from a motion of at least one block unit at a second set time interval $T_2$ between the input image and said one reference image, said at least one block unit being a part of said input image and comprising a plurality of pixels;

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(b) providing a motion vector MV2 between at least two reference images of the plurality of reference images at a first set time interval $T_1$, which is parallel to the motion vector MV1 at the second set time interval $T_2$ and different in magnitude from the motion vector MV1 at the second set time interval $T_2$ by a value determined by MV1·$T_1$/$T_2$; and

(c) calculating the motion compensation of the input image from both of (i) the motion vector MV1 between the input image and said one reference image and (ii) the motion vector MV2 between the at least two reference images of the plurality of reference images.

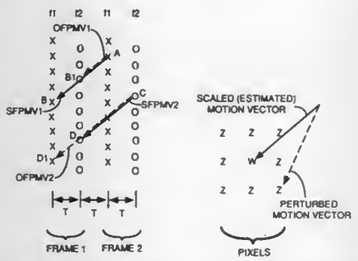
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**5,745,183**

**IMAGE MOTION ESTIMATION SYSTEM WHICH DERIVES CANDIDATE BLOCK FROM INTERPOLATED MOTION VECTORS**

**Wai-Man Lam, Carmel, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**

**Filed Aug. 25, 1995, Ser. No. 519,438**
**Int. Cl.[6] H04N** *7/32*
**U.S. Cl. 348—416** **9 Claims**




8. Motion estimation apparatus for processing video image data in the form of input pixel blocks, comprising:

a motion estimator for providing motion vectors associated with candidate predicted blocks of said input pixel blocks wherein,

(a) for an input pixel block located in a first area of an image said motion estimator uses block match searches to obtain motion vectors and

(b) for an input pixel block located in a second area of said image said motion estimator uses a block match search to obtain a first motion vector and selects a type of motion vector to be extrapolated based on the motion vector type of said first motion vector and temporally extrapolates a second motion vector of said selected motion vector type from said first motion vector; and

a prediction network for identifying a candidate predicted block by using said extrapolated motion vector wherein

said motion estimator selects a type of motion vector based on the field parity of said first motion vector.

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**5,745,184**

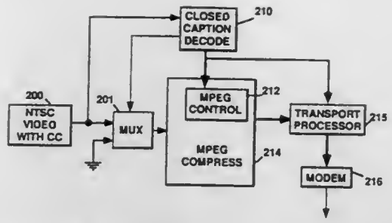
**CLOSED CAPTION SYSTEM FOR USE WITH COMPRESSED DIGITAL VIDEO TRANSMISSION**

**Charles Bailey Neal, Zionsville, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**

**PCT No. PCT/US93/07827, § 371 Date Feb. 7, 1996, § 102(e) Date Feb. 7, 1996, PCT Pub. No. WO95/06391, PCT Pub. Date Mar. 2, 1995**
**PCT Filed Aug. 20, 1993, Ser. No. 596,274**
**Int. Cl.[6] H04N** *7/00;11/00*
**U.S. Cl. 348—468** **7 Claims**

1. In system for digitally compressing an analog video signal which includes a closed caption-like data component, apparatus comprising:

a source (**200**) of said analog video signal which includes closed caption-like data;




circuitry (**210**) coupled to said source for separating the closed caption-like data component from said analog video signal to produce a digital data component corresponding to said closed caption-like data component;

compression apparatus (**214**) coupled to said source for compressing said video signal absent said closed caption-like data component, to generate a compressed digital video signal in MPEG format; and

means (**212**) for separably combining said digital data component with said compressed digital video signal in MPEG format wherein said digital data component is included in user data fields of MPEG picture headers for transmission or storage.

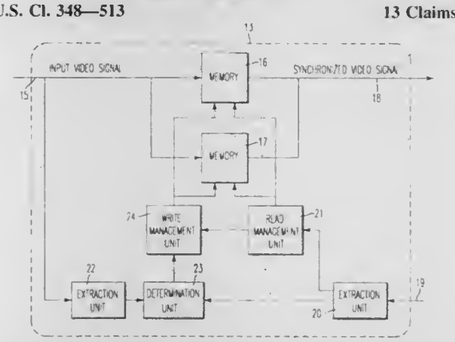
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**5,745,185**

**METHOD OF SYNCHRONIZATION OF A DIGITAL VIDEO SIGNAL AND DEVICE FOR APPLICATION OF THE METHOD**

**Isabelle Portron, Versailles; Alain DeMay, Sartrouville, and Philippe Le Queau, Courbevoie, all of France, assignors to Thomson Broadcast, Cergy-Pontoise Cedex, France**

**Filed Feb. 12, 1996, Ser. No. 599,932**
**Claims priority, application France, Mar. 13, 1995, 95 02877**
**Int. Cl.[6] H04N** *9/475*
**U.S. Cl. 348—513** **13 Claims**




1. Method of synchronization of a digital video signal with respect to a synchronization signal, making use of a memorization unit in which said video signal is written at its own frequency, then re-read at the frequency of said synchronization signal to provide a synchronized video signal, wherein said method consists in:

defining two parallel memory areas in a memorization unit, each of which can store a video image;

reading sequentially and alternately the video images stored in said memory areas;

defining several write states according to a phase difference between a start of writing of an image and a start of reading of an image and to a writing state preceding conditions for changing from one state to another;

at the start of each writing, determining which memory area is being read and determining the write state, in order to determine whether to write the image in one or both of said memory areas.

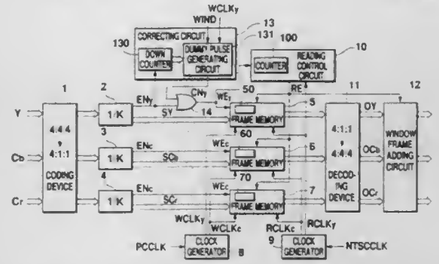


**5,745,186**

**VIDEO SIGNAL PROCESSING CIRCUIT FOR REDUCING A VIDEO SIGNAL**

**Yutaka Shimizu, Ora-gun, and Mitoku Kamei, Isesaki, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan**

**Filed May 17, 1996, Ser. No. 649,158**
**Claims priority, application Japan, May 19, 1995, 7-121391**
**Int. Cl.[6] H04N** *9/74*
**U.S. Cl. 348—562** **18 Claims**




1. A video signal processing circuit comprising:

a coding device for coding an inputted video signal, including a luminance signal and a chrominance signal, to a signal with a reduced resolution chrominance signal;

a reducing circuit for carrying out reduction processing on a luminance signal and a chrominance signal which have been coded by the coding device, and outputting a reduced luminance signal and a reduced chrominance signal;

frame memories for respectively storing the reduced luminance signal and the reduced chrominance signal obtained by the reducing processing;

a reading control circuit for controlling the reading of the reduced luminance signal and the reduced chrominance signal from the frame memories;

a decoding device, to which is inputted read out reduced luminance and reduced chrominance signals, for decoding the reduced luminance signal and the reduced chrominance signal to a signal having a resolution equal to that of the chrominance signal inputted to the coding device;

a correcting circuit, having a discriminating circuit for discriminating a pixel number differential between a horizontal pixel number when the reduced chrominance signal is decoded and a horizontal pixel number of the reduced luminance signal, for correcting a write address to a frame memory by only the pixel number of the discriminated pixel number differential.

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**5,745,187**

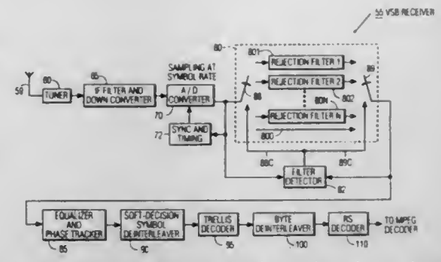
**METHOD AND APPARATUS FOR COMBATING CO-CHANNEL NTSC INTERFERENCE FOR DIGITAL TV TRANSMISSION USING A BANK OF REJECTION FILTERS**

**Samir N. Hulyalkar, Columbia, Md.; Monisha Ghosh, Mohegan Lake, and Aldo G. Cugnini, Ossining, both of N.Y., assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 230,360, Apr. 20, 1994, Pat. No. 5,512,957, which is a continuation-in-part of Ser. No. 197,773, Feb. 10, 1994, Pat. No. 5,452,015. This application Dec. 21, 1995, Ser. No. 577,685**
**Int. Cl.[6] H04N** *5/21;5/455*
**U.S. Cl. 348—607** **22 Claims**

6. A method for reducing a co-channel interference in a digital television signal transmitted by a transmitter, the transmitted digital television signal having an encoded digital television signal component, a co-channel interference component, and a noise component, wherein a precoder, for which precoding is implemented at the television transmitter, encodes the digital television signal, said method comprising the steps:

receiving the transmitted digital television signal and providing a received output signal;




filtering the received output signal to reduce the co-channel interference component thereof, said filtering step comprising using a desired one of a plurality of rejection filters by enabling the desired rejection filter in response to a selection control signal, the enabled rejection filter corresponding to an optimal rejection filter for the precoder for which precoding is implemented at the television transmitter, and providing a filtered output signal;

detecting information regarding the precoder in response to the received output signal, said detecting step comprising selecting the desired one of the plurality of rejection filters in response to the detected information, and providing the selection control signal; and

producing a decoded digital television signal in response to the filtered output signal.

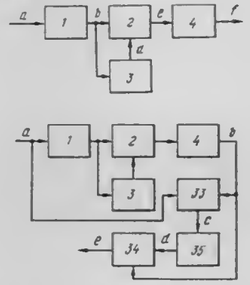
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**5,745,188**

**APPARATUS FOR SUPPRESSING INTERFERENCE IN TELEVISION VIDEO SIGNAL**

**Alexandr Alexandrovich Antonov, 164 Gor'kogo St. , Apt. 59, Kiev 252006, Ukraine**

**PCT No. PCT/UA94/00002, § 371 Date Oct. 23, 1995, § 102(e) Date Oct. 23, 1995, PCT Pub. No. WO94/17621, PCT Pub. Date Aug. 4, 1994**
**PCT Filed Jan. 14, 1994, Ser. No. 495,602**
**Claims priority, application Ukraine, Jan. 15, 1993, 94010063**
**Int. Cl.[6] H04N** *5/21*
**U.S. Cl. 348—607** **13 Claims**




1. An apparatus for suppressing interference in a television video signal comprising an electronic switch (**2**), a signal output of the electronic switch (**2**) being connected to a signal input of a first low-pass filter (**4**), characterized in that it further comprises a high-pass filter (**1**) having an input fed with a video signal, and an output connected to a first signal input of the electronic switch (**2**), and a video signal front detector (**3**) having an input connected to the output of the high-pass filter (**1**), and an output connected to a second signal input of the electronic switch (**2**).

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**Patent Not Issued For This Number**

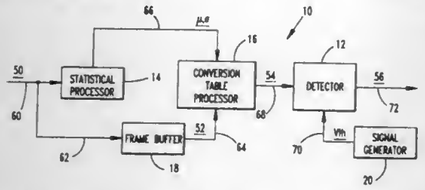
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5,745,190

**METHOD AND APPARATUS FOR SUPPLYING DATA**

**Mikihiro Ioka, Tokyo, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 358,132, Dec. 16, 1994, abandoned. This application Apr. 23, 1997, Ser. No. 839,096**
**Claims priority, application Japan, Dec. 16, 1993, 5-316855**
**Int. Cl.[6] H04N** *7/32*
**U.S. Cl. 348—700** **7 Claims**




1. A method for supplying data for detecting scene switching in a motion picture in which a plurality of frames each formed of a plurality of vertical and horizontal pixels continues in succession and forms a plurality of scenes wherein a group of frames whose signal contents are identical or similar form one scene,

wherein said method computes pixel distribution statistics for each frame using pixel data of each frame, normalizes pixel data of said frames using the computed pixel distribution statistics to create normalized pixels for each frame, and supplies said normalized pixels as input data to a detector of scene transitions, said detector of scene transitions comparing corresponding normalized pixels in successive frames to detect scene transitions.

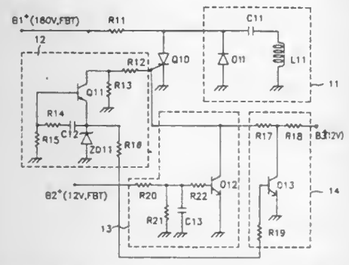
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5,745,191

**SWITCHING DEGAUSSING CIRCUIT FOR TELEVISION SET**

**Ha Joo Jeong, Kyungsangbook-Do, Rep. of Korea, assignor to LG Electronics Inc., Rep. of Korea**

**Filed Jan. 11, 1996, Ser. No. 583,984**
**Claims priority, application Rep. of Korea, Jan. 19, 1905, 386/1995**
**Int. Cl.[6] H04N** *9/29*
**U.S. Cl. 348—725** **5 Claims**




1. A degaussing circuit for a television set, comprising:

an LC oscillating circuit for receiving a first direct current voltage and for flowing a degaussing current;

switching means sequentially turned on in accordance with a turning on/off operation of a television set for enabling an oscillating operation of said LC oscillating circuit;

first trigger means for receiving a second direct current voltage and for enabling the LC oscillating circuit by turning on said switching means after a certain time is lapsed after the television set is turned on;

second trigger means for receiving said second direct current voltage for turning off the switching means when the LC oscillating circuit completes the degaussing operation in accordance with a control of said first trigger means when the television set is turned on; and

third trigger means for receiving a third direct current voltage and for turning on the switching means when the television set is turned off, said third trigger means being blocked when the television set is turned on.

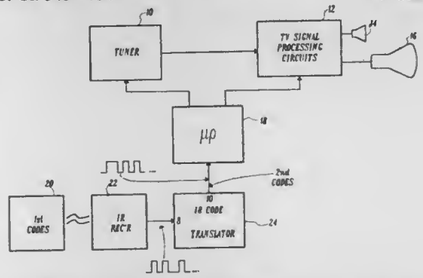
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5,745,192

**IR REMOTE CONTROL CODE TRANSLATOR FOR ENABLING CONTROL OF AN ELECTRONIC DEVICE WITH DIFFERENT FORMAT CONTROL CODES**

**Casimer Bialobrzewski, Niles, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.**

**Filed Sep. 18, 1995, Ser. No. 531,575**
**Int. Cl.[6] H04N** *5/44*
**U.S. Cl. 348—734** **9 Claims**




1. A method of operating a remote control receiver comprising:

transmitting first control signals having a first format to a receiver in an electronic product having controllable functions;

translating the received first control signals into corresponding second control signals; and

decoding the translated second control signals for controlling respective functions of the electronic product.

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5,745,193

**DMD ARCHITECTURE AND TIMING FOR USE IN A PULSE-WIDTH MODULATED DISPLAY SYSTEM**

**Paul M. Urbanus, Dallas, and Jeffrey B. Sampsell, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 255,610, Jun. 8, 1994, which is a division of Ser. No. 137,650, Oct. 15, 1993, Pat. No. 5,339,116, which is a division of Ser. No. 35,525, Mar. 23, 1993, Pat. No. 5,278,652, which is a continuation of Ser. No. 678,761, Apr. 1, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 482,542**
**Int. Cl.[6] G02F** *1/00*
**U.S. Cl. 348—771** **2 Claims**

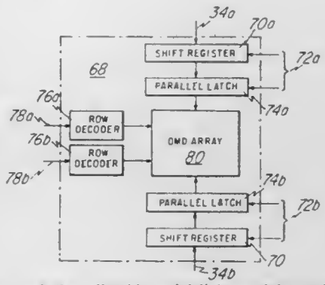
1. An integrated circuit device comprising;

a. an array of spatial light modulator elements, said elements arranged in rows and said rows grouped into subarrays:

b. a block select decoder operable to select one of said subarrays; and

c. an input register for receiving data and for transferring said data to said array of spatial light modulator elements, said input register having an output and a means for clearing said






output such that all said spatial light modulator elements in said selected subarray may be simultaneously switched to an "off" state.

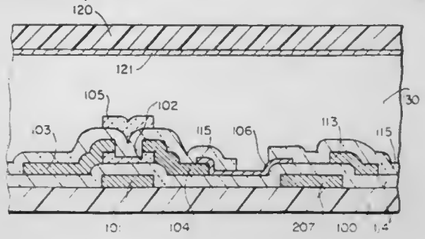
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5,745,194

**ACTIVE MATRIX LCD APPARATUS WITH COMPENSATING CAPACITOR HAVING A PARTICULAR FEATURE**

**Kohji Nakashima, and Osamu Sukegawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Jun. 28, 1995, Ser. No. 496,168**
**Claims priority, application Japan, Jun. 28, 1994, 6-167488**
**Int. Cl.[6] G02F** *1/1343;1/136*
**U.S. Cl. 349—38** **1 Claim**




1. A liquid-crystal display apparatus comprising:

a substrate;

a first scan signal line formed over said substrate;

a first data signal line formed over said substrate and crossing said first scan signal line;

a first switching element formed over said substrate and having a gate electrode connected to said first scan signal line, a first electrode connected to said first data signal line and a second electrode;

a pixel electrode formed over said substrate and connected to said second electrode of said switching element;

a second data signal formed over said substrate in parallel to said first data signal adjacently to said pixel electrode;

a light shielding layer covering said switching element; and

a compensation capacitor formed to capacitance-couple said pixel electrode with said second data line;

wherein said compensation capacitor includes a conductive layer having a first portion overlapping with a part of said pixel electrode and a second portion overlapping with a part of said second data line, said conductive layer being formed over said pixel electrode and said second data line with an intervening dielectric film and made of the same material as said light shielding layer; and

said conductive layer has an end part connected to said pixel electrode through a first contact hole provided in said dielectric film, and said light shielding layer has an end part connected to said first electrode through a second contact hole provided in said dielectric film.

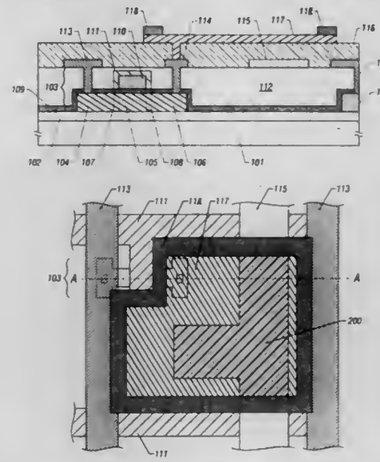
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5,745,195

**LIQUID CRYSTAL ELECTROOPTICAL DEVICE**

**Hongyong Zhang, Kanagawa, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan**

**Filed May 7, 1996, Ser. No. 646,511**
**Claims priority, application Japan, May 7, 1995, 7-134835**
**Int. Cl.[6] G02F** *1/1343*
**U.S. Cl. 349—39** **14 Claims**




12. An electrooptical device comprising:

a transistor;

an interlayer insulating film provided over a gate and a channel region of said transistor;

a first transparent conductive film forming a pixel electrode for forming a pixel;

a dielectric film; and

a second transparent conductive film disposed on the opposite side of said dielectric film from said first transparent conductive film and overlapping at least a part of said pixel electrode with said dielectric film being between said first and second conductive film to provide an auxiliary capacitor comprising said second transparent conductive film, said dielectric film and said pixel electrode,

wherein said transistor and said auxiliary capacitor are provided on the same substrate, and said auxiliary capacitor is provided on said interlayer insulating film.

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5,745,196

**Patent Not Issued For This Number**

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5,745,197

**THREE-DIMENSIONAL REAL-IMAGE VOLUMETRIC DISPLAY SYSTEM AND METHOD**

**Martin S. Leung, Redondo Beach; Neil A. Ives, Hawthorne, and Genghmun Eng, Torrance, all of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.**

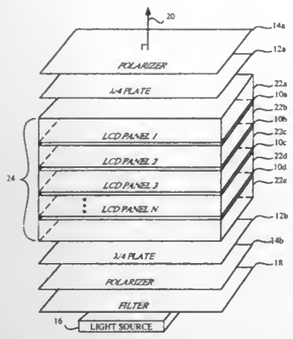
**Filed Oct. 20, 1995, Ser. No. 546,425**
**Int. Cl.[6] G02F** *1/1397*
**U.S. Cl. 349—77** **15 Claims**

1. A display for displaying when exposed to illumination a three dimensional object represented by a plurality of slices represented by respective sliced contour images through said three dimensional object, said display comprising,

a plurality of liquid crystal panels each of which comprising a matrix of light absorbing elements embedded in a transparent medium for unpolarizing said illumination to respectively

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VOLUMETRIC DISPLAY

display said respective sliced contour images, said plurality of liquid crystal panels being stacked to superimpose said respective sliced contour images and to form an inhomogeneous display volume for displaying said three dimensional object, said plurality of liquid crystal panels are for communicating said illumination from a back side of said display through said respective sliced contour images to a front side of said display, and

a pair of polarizers between which is disposed said plurality of liquid crystal panels, said pair of polarizers for cross polarizing said illumination and for filtering said illumination which has been unpolarized by said matrix of light absorbing elements of said plurality of liquid crystal panels.

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**5,745,198**

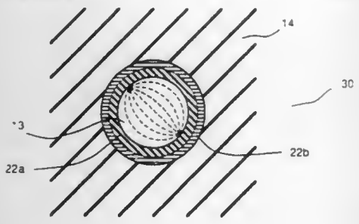
**LIQUID CRYSTAL COMPOSITE AND METHOD OF MAKING**

**John Havens, Menlo Park, Calif.; Kathleen Di Zio, Sunderland, Mass.; Anne Gonzales, Pleasanton, Calif.; Robert H. Reamey, Palo Alto, Calif.; Harriette Atkins, Mountain View, Calif., and Jinlong Cheng, Freemont, Calif., assignors to Raychem Corporation, Menlo Park, Calif.**

**Division of Ser. No. 217,268, Mar. 24, 1994, Pat. No. 5,585,947. This application Jun. 27, 1996, Ser. No. 672,147**

**Int. Cl.[6] G02F** *1/137;* **C09K** *19/54*

**U.S. Cl. 349—90** **12 Claims**




1. A liquid crystal composite comprising plural volumes of liquid crystal material dispersed in a matrix material, wherein the liquid crystal material is at least partially separated from the matrix material by an interfacial material and an encapsulating material successively disposed around the liquid crystal material, wherein the interfacial material is selected from the group consisting of acrylates, methacrylates, epoxies, polyurethanes, polyureas, and siloxanes.

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**5,745,199**

**LIQUID CRYSTAL DISPLAY DEVICE**

**Motoyuki Suzuki, Kyoto; Tetsuo Uchida, Otsu, and Yuko Mikami, Kusatsu, all of Japan, assignors to Toray Industries, Inc., Japan**

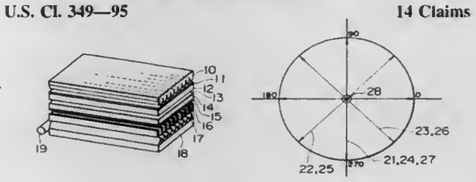
**PCT No. PCT/JP96/00130, § 371 Date Sep. 25, 1996, § 102(e) Date Sep. 25, 1996, PCT Pub. No. WO96/23245, PCT Pub. Date Aug. 1, 1996**

**PCT Filed Jan. 25, 1996, Ser. No. 700,409**

**Claims priority, application Japan, Jan. 26, 1995, 7-031625; Jul. 14, 1995, 7-178867; Jul. 17, 1995, 7-179920**

**Int. Cl.[6] G02F** *1/1335*

**U.S. Cl. 349—95** **14 Claims**




1. A liquid crystal display device having at least a liquid crystal cell including display elements arranged lengthwise and crosswise and a microlens array sheet attached to an observation surface of said liquid crystal cell and including minute unit lenses arranged in a plane, characterized in that said microlens array sheet has at least one diffusion axis in said plane, and wherein the direction of said diffusion axis of said microlens array sheet is substantially within about 15 degrees of a direction of the liquid crystal orientation of said liquid crystal cell.

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**5,745,200**

**COLOR LIQUID CRYSTAL DISPLAY DEVICE AND LIQUID CRYSTAL DISPLAY APPARATUS**

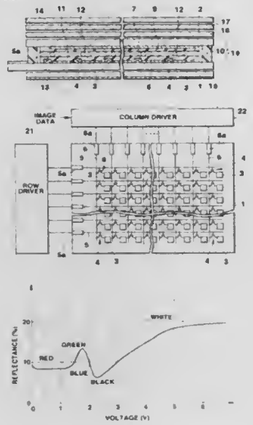
**Zenta Kikuchi, Hamura; Tetsushi Yoshida, Kanagawa, and Hisashi Aoki, Hamura, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Apr. 24, 1995, Ser. No. 427,139**

**Claims priority, application Japan, Apr. 28, 1994, 6-111673; Apr. 28, 1994, 6-111687**

**Int. Cl.[6] G02F** *1/1335;1/1337;* **C09K** *19/02*

**U.S. Cl. 349—99** **29 Claims**




29. A liquid crystal display device comprising:

first and second substrates arranged to face each other;

first and second electrodes formed on opposing surfaces of said first and second substrates;



a first aligning film formed on said first electrode and said first substrate and subjected to an aligning treatment in a first direction;

a second aligning film formed on said second electrode and said second substrate and subjected to an aligning treatment in a second direction intersecting said first direction at substantially 90 degrees;

a liquid crystal located between said first and second aligning films so as to form a liquid crystal layer, a product of a refractive anisotropy Δn and a thickness of said liquid crystal layer being equal to or greater than 0.7 μm and less than 1.1 μm;

a first polarization plate arranged outside of said first substrate and having an optical axis intersecting said first direction at substantially 145 to 160 degrees; and

a second polarization plate arranged outside of said second substrate and having an optical axis intersecting said first direction at substantially 130 degrees or 40 degrees.

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**5,745,201**

**MATRIX TYPE DISPLAY DEVICE**

**Katsuhiro Kawai, Yamatotakada; Satoshi Yabuta, Nara; Masaya Okamoto, Soraku-gun, and Masaru Kajitani, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Oct. 2, 1996, Ser. No. 725,261**

**Claims priority, application Japan, Oct. 3, 1995, 7-256645**

**Int. Cl.[6] G02F** *1/1335;1/1333;1/1343*

**U.S. Cl. 349—110** **12 Claims**



1. A matrix type display device comprising:

one substrate member comprising gate wirings arranged at intervals in parallel to each other, source wirings arranged at right angles with the gate wirings so that insulation therebetween is maintained, a plurality of pixel electrodes arranged for each rectangular pixel formed by the intersection of the gate and source wirings, and switching devices which individually connect the pixel electrodes to the gate and source wirings; and

another substrate member comprising a counter electrode facing the pixel electrodes, and a light-blocking member containing openings at least in regions thereof facing the pixel electrodes;

wherein either the one substrate member or the another substrate member has identifying means for identifying specific pixels.

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**5,745,202**

**LCD HAVING LIGHT INTERCEPTIVE MEMBERS FOR SHIELDING LIGHT FROM EXTERNAL DRIVING CIRCUITS**

**Masamichi Yamauchi, Tokyo, and Yasuhiro Imai, Tokorozawa, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan**

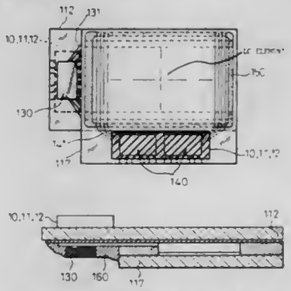
**PCT No. PCT/JP96/00347, § 371 Date Oct. 16, 1996, § 102(e) Date Oct. 16, 1996, PCT Pub. No. WO96/25687, PCT Pub. Date Aug. 22, 1996**

**PCT Filed Feb. 16, 1996, Ser. No. 727,479**

**Claims priority, application Japan, Feb. 17, 1995, 7-028535**

**Int. Cl.[6] G02F** *1/1333;1/1345*

**U.S. Cl. 349—110** **15 Claims**




1. A liquid-crystal display device in which at least two transparent glass substrates each having transparent electrodes formed thereon are arranged so that the transparent electrodes formed on the substrates are opposed to each other with a space between them, a liquid crystal is injected into said space, a seal is fitted into said space for fear said liquid crystal should leak out, and drive circuits for driving said liquid crystal are arranged on said substrates outside said seal, characterized in that:

a second light interceptive member having a light reflective member for reflecting light as one side thereof and having a light absorptive member for absorbing light as the other side thereof is placed on said transparent glass substrates below said drive circuits.

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**5,745,203**

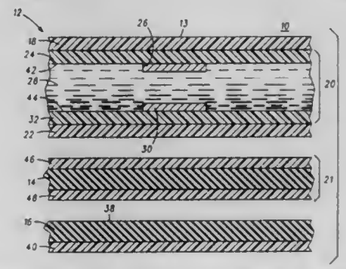
**LIQUID CRYSTAL DISPLAY DEVICE INCLUDING MULTIPLE AMBIENT LIGHT ILLUMINATION MODES WITH SWITCHABLE HOLOGRAPHIC OPTICAL ELEMENT**

**George T. Valliath, Buffalo Grove; Kevin W. Jelley, Lagrange Park; Alan G. Chen, Schaumburg, and Mark J. Johnson, Cary, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 28, 1996, Ser. No. 623,092**

**Int. Cl.[6] G02F** *1/1335;1/13*

**U.S. Cl. 349—113** **14 Claims**




1. A liquid crystal display device for forming a display illuminated by ambient light, said liquid crystal display device comprising:

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a liquid crystal panel comprising at least one region having a transparent mode;

a first holographic optical element optically coupled to the liquid crystal panel to receive light transmitted through said region, the first holographic optical element being switchable between a first mode wherein the first holographic optical element forms a first hologram effective to redirect light transmitted through the liquid crystal panel such that the light is redirected back toward the liquid crystal panel, and a second mode wherein the first holographic optical element is transparent to light transmitted through the liquid crystal panel; and

a second holographic optical element optically coupled to the first holographic optical element and comprising a second hologram effective to redirect light transmitted through the first holographic optical element back toward the liquid crystal panel.

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**5,745,204**

## LIQUID CRYSTAL COLOR DISPLAY DEVICE

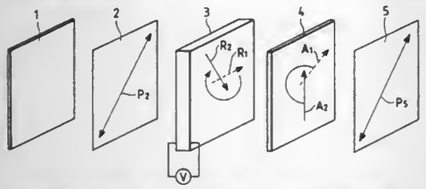
**Toshiaki Hoshino, Fukushima-ken, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan**

**Filed Nov. 21, 1995, Ser. No. 560,240**

**Claims priority, application Japan, Nov. 29, 1994, 6-294927**

**Int. Cl.[6] G02F *1/1335***

**U.S. Cl. 349—117** **5 Claims**




1. A liquid crystal color display device which comprises:

a liquid crystal cell including a pair of electrode substrates, each subjected to aligning treatment on the surface thereof, and a nematic liquid crystal layer which is provided between the pair of electrode substrates and which has positive dielectric anisotropy and an angle of twist set at 180° to 270°;

a birefringent layer provided in face-to-face relation with said liquid crystal cell and capable of bringing about a birefringent effect on transmitted light; and

a pair of polarizers sandwiching the liquid crystal cell and the birefringent layer therebetween, wherein said birefringent layer and said liquid crystal layer in voltage-free condition have, respectively, values of $\Delta n \cdot d$, wherein $\Delta n$ represents a refractive index anisotropy and d represents a thickness, the values being substantially at the same level within a range of 1.4 to 2.0 μm, and wherein the value of $\Delta n \cdot d$ of the liquid crystal cell is continuously varied by controlling a voltage applied thereto.

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**5,745,205**

## METHOD OF INTRODUCING SLIGHTLY TITLTING HOMEOTROPIC ORIENTATION INTO LIQUID CRYSTAL, LIQUID CRYSTAL ELECTRO-OPTICAL DEVICE, AND LIQUID CRYSTAL LIGHT VALVE

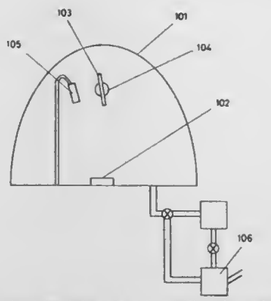
**Naoki Kato; Rieko Sekura, and Tadao Iwaki, all of Chiba, Japan, assignors to Seiko Instruments Inc., Japan**

**Filed Nov. 7, 1995, Ser. No. 554,681**

**Int. Cl.[6] G02F *1/1337***

**U.S. Cl. 349—125** **33 Claims**

1. A method of introducing a slightly tilting homeotropic orientation to a liquid crystal material sandwiched by a pair of substrates and an orientation film formed along a boundary in contact with a layer of the liquid crystal, the method comprising: forming the orientation film by vacuum-evaporating an inorganic material




in a given direction tilted from a normal direction of the substrate, such that an incident angle ψ of the inorganic material is set from 45° to 70° with respect to a direction parallel to the substrate and a thickness d of the orientation film is within the range of 60 nm to 500 nm as measured by a film thickness gauge disposed in a vertical direction at an equal distance between an evaporation source and the substrate during the forming of the orientation film.

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**5,745,206**

## LIQUID CRYSTAL DISPLAY PANEL WITH ALIGNMENT DIVISION AND SMALLER TWIST ANGLE

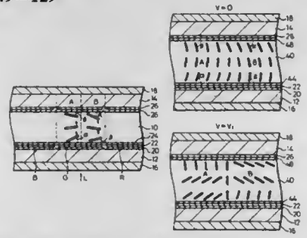
**Yoshio Koike; Syun Tsuyuki; Katsufumi Ohmuro, and Tsuyoshi Kamada, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 331,759, Oct. 31, 1994, abandoned. This application Apr. 11, 1997, Ser. No. 827,771**

**Claims priority, application Japan, Feb. 18, 1994, 6-021555; Aug. 3, 1994, 6-182409**

**Int. Cl.[6] G02F *1/1337;1/1335;* C09K *19/02***

**U.S. Cl. 349—129** **16 Claims**




1. A liquid crystal display panel comprising:

a pair of substrates having alignment films, respectively;

a liquid crystal held between said pair of substrates, the liquid crystal having a layer thickness (d) and an anisotropy of the refractive index (Δn);

a polarizer and an analyzer arranged outside said substrates, respectively;

the alignment films of said pair of substrates being held in such an alignment that liquid crystal molecules twist from one substrate to the other substrate through a predetermined twist angle and the alignment films are divided into minute regions (A and B) so that when a voltage is applied to said liquid crystal, liquid crystal molecules located intermediately between said substrates in one of the regions are tilted with respect to one of the substrates toward one direction and liquid crystal molecules located intermediately between said substrates in other region are tilted with respect to said one of the substrates toward a direction opposite to said one direction, said liquid crystal molecules in said other region;

the twist angle of the liquid crystal being greater than zero but less than 90 degrees; and

the product (Δnd) of the anisotropy of the refractive index (Δn) and the layer thickness (d) of the liquid crystal being greater than 0 μm and less than approximately 0.5 μm and ensuring that a linearly polarized light incident onto the liquid crystal



rotates approximately 90 degrees before the light emerges from the liquid crystal.

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**5,745,207**

## ACTIVE MATRIX LIQUID CRYSTAL DISPLAY HAVING ELECTRIC FIELDS PARALLEL TO SUBSTRATES

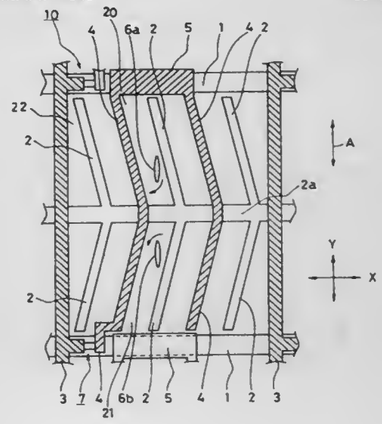
**Satoshi Asada; Yoneharu Takubo, and Mitsuhiro Uno, all of Ishikawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Nov. 27, 1996, Ser. No. 757,160**

**Claims priority, application Japan, Nov. 30, 1995, 7-312010; Sep. 20, 1996, 8-250468**

**Int. Cl.[6] G02F *1/1343;1/139***

**U.S. Cl. 349—141** **15 Claims**




1. An active matrix liquid crystal display comprising:

an array substrate having a plurality of parallel signal wirings and a plurality of parallel scanning wirings which are arranged to form a matrix of pixels, at least one switching device provided at a crossing point of the signal wiring and the scanning wiring in each pixel, a plurality of pixel electrodes connected to the switching device, and a plurality of common electrodes;

an opposing substrate disposed for facing the array substrate;

a liquid crystal layer disposed between the array substrate and the opposing substrate; and

two polarizing plates disposed outside the array substrate and the opposing substrate; wherein

each pixel defined by two adjoining signal wiring and two adjoining scanning wiring is divided into a plurality of display regions which are respectively defined by adjoining common electrode and pixel electrode;

wherein the pixel electrodes and the common electrodes are substantially parallel to each other and respectively have inclined portions that are not parallel to the signal wirings and the scanning wirings, and

the display regions include at least a group of first display regions where the orientation of the liquid crystal molecules is different from that in another group of second display regions when electric fields which are substantially parallel to the array substrate and the opposing substrate are applied.

**5,745,208**

## ELECTRICAL CELL OF THE TYPE COMPRISING TWO PLASTIC PARALLEL SUPPORT PLATES, SET APART FROM EACH OTHER, CARRYING ELECTRODES ON THEIR FACES

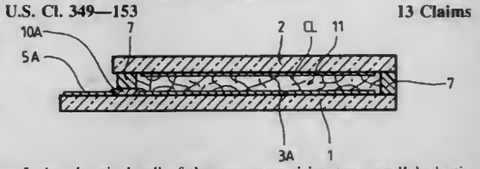
**Joachim Grupp, Neuchâtel, Switzerland, and Bernard Lemarié, Guilherand-Granges-les Valences, France, assignors to Asulab S.A., Bienne, Switzerland**

**Filed Oct. 27, 1995, Ser. No. 549,224**

**Claims priority, application France, Nov. 18, 1994, 94 13850**

**Int. Cl.[6] G02F *1/1339***

**U.S. Cl. 349—153** **13 Claims**




1. An electrical cell of the type comprising two parallel plastic support plates, set apart from each other, carrying electrodes on their opposite faces, the support plates enclosing between them a layer of sensitive material which can change its physical properties when voltage is applied to the electrodes, said sensitive material being protected from contact with the atmosphere by a sealing frame connecting, in a seal tight manner, peripheral parts of the support plates, the sealing frame comprising electrical paths for electrically connecting the electrodes to the exterior, wherein the electrodes situated inside the sealing frame do not pass through the latter, but are electrically connected to contacts situated outside said frame by means of strips of electrically conductive adhesive fixed to at least one support plate and to the sealing frame, said electrically conductive adhesive extending from the interior towards the exterior of the sealing frame and over the entire width of the latter.

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**5,745,209**

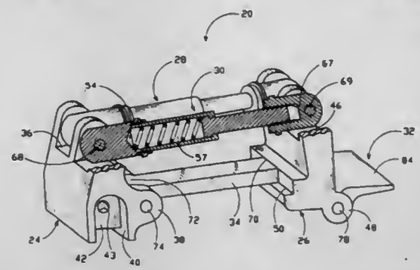
## DOUBLE PISTON SPRING HINGE FOR HINGEABLY CONNECTING TEMPLES TO AN EYEGLASS FRAME

**Carlos A. Khantzis, Woodland Hills, Calif., assignor to California Design Studio Inc., Westlake Village, Calif.**

**Filed Aug. 22, 1996, Ser. No. 701,640**

**Int. Cl.[6] G02C *5/22;5/16***

**U.S. Cl. 351—153** **24 Claims**




1. A pair of double piston spring hinges for respectively hingeably connecting two opposite temples to an eyeglass frame, each double piston spring hinge comprising:

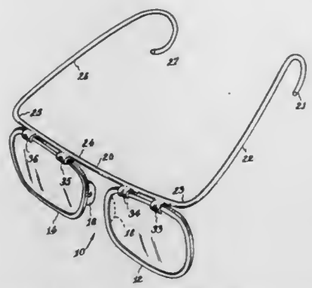
a. a flap lever member having a side surface being permanently affixed to one end of one of said two opposite temples and a transverse attachment end;

b. a rear support structure having a transverse rearward attachment portion, a step-down portion located on an opposite side from the rearward attachment portion and a transverse forward attachment portion located remote from the rearward attachment portion, the rearward attachment portion hingeably connected to said transverse attachment end of said flap lever member;

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c. a front support structure being permanently affixed to the front of the frame and having a transverse medial attachment portion, and a transverse forward attachment portion aligned with said forward attachment portion of said rear support structure;
d. a pair of piston cylinder assemblies, each assembly having a proximal linking member, a distal linking member, spring means, a piston cylinder, and a piston rod;
e. each said distal and proximal linking members having a transverse opening and an opened end with internal screw threads;
f. said each piston cylinder having a closed end with a narrow opening, an opened end with a wide opening, a circumferential sidewall with external screw threads located adjacent to the opened end and an interior chamber extending from the narrow opening to the wide opening, the external screw threads of each respective circumferential sidewall threadedly engaged with said internal screw threads of said each respective opened end of said each respective proximal linking member;
g. said each respective piston rod having a piston end slidable inside said each respective interior chamber of said each respective piston cylinder and a rod portion with external screw threads extending out from said each respective narrow opening of said each respective closed end of said each respective piston cylinder, the external screw threads of the rod portion threadedly engaged with said each respective internal screw threads of said each respective opened end of said each respective distal linking member;
h. said each respective spring means installed inside said each respective interior chamber of said each respective piston cylinder and biasing said each respective piston rod away from said each respective wide opening of said each respective opened end of said each respective piston cylinder;
i. said transverse openings of each said respective proximal and distal linking members hingeably connected to said respective forward attachment portions of said front and rear support structures, where said pair of piston cylinder assemblies are symmetrically and parallel mounted between said front and rear support structures; and
j. a bracket for stabilizing said front and rear support structures and having one end permanently affixed to said step-down portion of said rear support structure and the other end hingeably connected to said medial attachment portion of said front support structure;
k. whereby said pair of piston cylinder assemblies provide flexibility and movement of said pair of temples beyond their normal open position of use, such that said pair of piston cylinder assemblies provide a spring back to firmly secure said two temples to the face of a user.



respectively, absent an independent hinge assembly, whereby said first and second temple portions are movable about said first and second bendable hinge areas from a first, closed position which is from about 5 to 15 degrees relative to said front brow portion to a second wearing position which is from about 80 to 100 degrees relative to said front brow portion.

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**5,745,210**

**INTEGRAL EYEWEAR FRAME**

**Stanley J. Biernat, Jr., Pendleton; Aaron M. Markovitz, and Steven A. Skewes, both of Rochester, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.**

**Continuation of Ser. No. 848,819, Mar. 10, 1992, abandoned. This application Jun. 10, 1997, Ser. No. 872,407**

**Int. Cl.[6] G02C** *1/00*

**U.S. Cl. 351—41** **4 Claims**

1. A unitary eyewear frame having first and second temple portions and a front brow portion extending between said first and second temple portions, said first and second temple portions and said front brow portion comprised of a unitary length of super-elastic material, said unitary length of super-elastic material forming and defining first and second bendable hinge areas between said front brow portion and said first and second temple portions.

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**5,745,211**

**PROGRESSIVE POWER LENS AND EYE GLASS LENS**

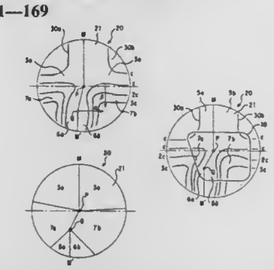
**Hiroyuki Mukaiyama, and Tadashi Kaga, both of Nagano-ken, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan**

**Filed Dec. 26, 1995, Ser. No. 578,237**

**Claims priority, application Japan, Dec. 27, 1994, 6-326491; Nov. 16, 1995, 7-298274**

**Int. Cl.[6] G02C** *7/06*

**U.S. Cl. 351—169** **10 Claims**



1. A progressive power lens for eye glasses comprising:
a far-distance use section having a first refracting power;
a near-distance use section having a second refracting power;
a progressive section between the far-distance use section and the near-distance use section having a progressive refracting power; and
a meridian section in which an astigmatism becomes nearly zero, the meridian section crossing substantially a center of the far-distance use section and a center of the near-distance use section, the meridian section being displaced towards a nose side of the eye glasses to accommodate a convergence between the progressive section and the near-distance use section wherein the astigmatism occurs in both the nose side and an ear side of the far-distance use section and a distribution of the astigmatism in the far-distance use section is asymmetric with respect to the meridian section.



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**5,745,212**

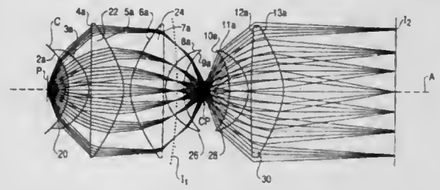
**INDIRECT OPHTHALMOSCOPY DEVICE WITH REINVERTING LENS SYSTEM WITH THE REAL INVERTED IMAGE OR CONJUGATE PUPIL FORMED AT LEAST PARTIALLY WITHIN A LENS OF THE REINVERTING LENS SYSTEM**

**Donald A. Volk, Mentor, Ohio, assignor to Volk Optical, Inc., Mentor, Ohio**

**Filed Oct. 11, 1996, Ser. No. 730,023**

**Int. Cl.[6] A61B** *3/00*

**U.S. Cl. 351—219** **17 Claims**



1. An indirect ophthalmoscopy lens device, comprising:
a first lens system adapted for placement adjacent a patient's eye for capturing light rays emanating from the fundus of the patient's eye and exiting through the cornea of the patient's eye for creating a first, real, inverted image of the patient's fundus outside of the eye; and
a second lens system located anterior of the first lens system and including a lens which is positioned so that the first real, inverted image produced by the first lens system is contained, at least in part, within said lens, the second lens system bending the rays toward a conjugate pupil region where the rays cross the optical axis of the device and are focused by the second lens system to form a real, reinverted image of the patient's fundus anterior of the second lens system.

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**5,745,213**

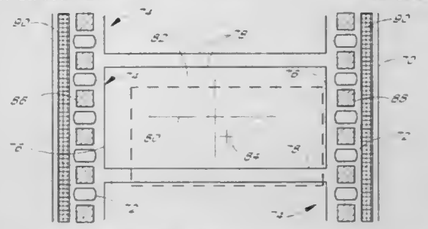
**METHOD OF MAKING ENHANCED RESOLUTION MOTION PICTURE RELEASE-PRINT FILM**

**Dean K. Goodhill, 8942 Wonderland Park Ave., Los Angeles, Calif. 90046, and Don P. Behrns, 13229 Rose Ave., Los Angeles, Calif. 90066**

**Filed May 8, 1996, Ser. No. 646,777**

**Int. Cl.[6] G03B** *31/02*

**U.S. Cl. 352—27** **12 Claims**



1. A method of making enhanced resolution motion picture release-print film, comprising:
providing a strip of motion picture film with a light-sensitive emulsion, wherein the film has two rows of perforations extending along opposite edges of the film for engagement with sprockets of a motion picture film projector;
exposing images onto an area of the film, wherein the area occupied by each image is defined by a frame having a width of at least approximately 0.88 inches that substantially occupies the available space between the rows of perforations, including space ordinarily occupied by a conventional analog soundtrack, and having a height that spans approximately three perforations or less, providing a printed aspect ratio of substantially 1.85:1; and
placing audio information on the film, other than a conventional analog soundtrack, that coordinates sound with the images when projected by the motion picture film projector.

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**5,745,214**

**FILM IMAGE PROCESSING APPARATUS**

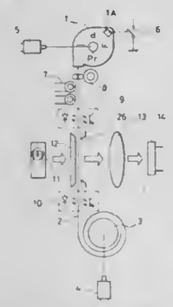
**Norikazu Yokonuma, Yokohama; Kazuyuki Kazami, Tokyo; Hideo Hibino, Kawasaki, and Hisashi Okutsu, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Filed Jun. 25, 1996, Ser. No. 668,473**

**Claims priority, application Japan, Jun. 26, 1995, 7-159579**

**Int. Cl.[6] G03B** *27/00;27/52*

**U.S. Cl. 355—18** **6 Claims**



1. A film image processing apparatus comprising:
an image pickup device that picks up a photographic image formed on developed film;
a screen image signal output device electrically connected to said image pickup device, which outputs a screen image signal to display said image that has been picked up as a screen image on a monitor screen;
a reading device that reads information related to said photographic image from an information recording area provided on said film;
an input device that inputs external information from an external device connected to said film image processing apparatus;
a display device that outputs a display signal to display text information related to said photographic image on said monitor screen; and
a control device electrically connected to said reading device, said input device and said display device, which controls said display device so that, at least, either read information read by said reading device or said external information input from said external device is displayed on said monitor screen as text information together with said screen image of said photographic image.

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**5,745,215**

**MONITOR SYSTEM FOR IMAGE PRINTER**

**Mitsuru Miyauchi, and Shoji Nishibayashi, both of Wakayama, Japan, assignors to Noritsu Koki Co., Ltd., Wakayama-ken, Japan**

**Continuation of Ser. No. 257,767, Jun. 9, 1994, abandoned. This application Jan. 11, 1996, Ser. No. 587,861**

**Claims priority, application Japan, Jun. 15, 1993, 5-143849**

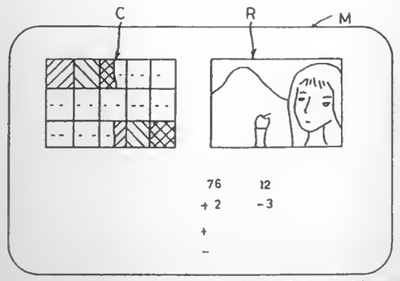
**Int. Cl.[6] G03B** *27/52;* **H04N** *1/46*

**U.S. Cl. 355—38** **4 Claims**

1. A monitor adjusting system for an image printer operable to obtain an exposure condition based on image information picked up by an image sensor from a film and having monitor for displaying a simulated image of a finished photographic print produced by using the exposure condition, the system comprising:
a color calibration film including a color chart image having a plurality of separate areas having different colors from each

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other and a reference image comprised of a natural image of a photographic subject such as a human subject and a landscape subject;

image information correcting means for producing a simulated image of said color chart image and said reference image from image information read from said color calibration film;

display control means for transmitting said simulated image to said monitor; and

a control panel for controlling said image information correcting means while viewing said simulated image of said color image and said reference image being displayed simultaneously on said monitor so as to obtain appropriate quality in said simulated image of said color chart image and said reference image displayed on said monitor.

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**5,745,216**

**EXPOSURE APPARATUS CAPABLE OF SHIFTING AND REMOVING A PLURALITY OF FILTERS FROM A LIGHT PATH**

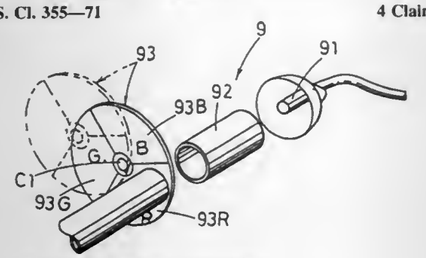
**Masazumi Ishikawa, and Tohru Tanibata, both of Wakayama-ken, Japan, assignors to Noritsu Koki Co., Ltd., Wakayama-ken, Japan**

**Filed Nov. 14, 1995, Ser. No. 557,500**

**Claims priority, application Japan, Nov. 14, 1994, 6-279194**

**Int. Cl.[6] G03B** *27/72;27/32;27/54*

**U.S. Cl. 355—71** **4 Claims**




1. An exposure apparatus, comprising:

a light source for emitting light along a light path;

an electrical exposure shutter;

a color shifting means for changing a wavelength of the light transmitted from said light source into light having predetermined wavelengths, wherein the changing of the wavelength of light occurs prior to the light being irradiated onto a photosensitive material in a pattern of dots;

a locating means for positioning said color shifting means in the light path during a color exposure operation, and for retracting said color shifting means from the light path so as to allow the light transmitted from said light source to travel along the light path in a manner so as to be unaffected by said color shifting means during a monochrome exposure operation.

**5,745,217**

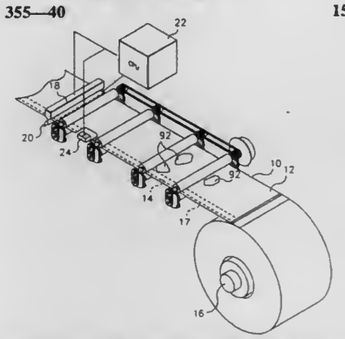
**SYSTEM FOR DETECTING, CODING, AVOIDING, AND REMOVING DEFECTS ON A PHOTOSENSITIVE WEB**

**Ronda Ellen Factor, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 29, 1996, Ser. No. 627,761**

**Int. Cl.[6] G03B** *27/52*

**U.S. Cl. 355—40** **15 Claims**




1. A system for detecting and coding a defect on a photosensitive web containing a magnetic media, said system comprises:

a scanner for scanning a photosensitive web for determining defects on the photosensitive web and producing a signal which provides information with respect to the defects on said magnetic media;

means for taking said signal and transforming it to a form capable of being placed onto the magnetic media; and

means for recording said information with respect to the defects onto said web.

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**5,745,218**

**PHOTOGRAPHIC PROCESSING SYSTEM**

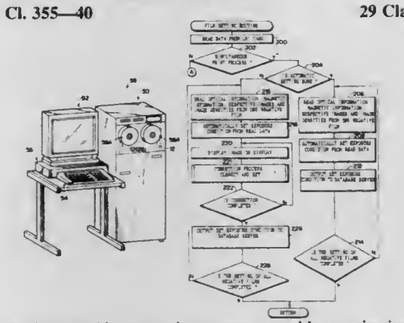
**Koichi Sugahara, and Tsutomu Kimura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Jun. 19, 1996, Ser. No. 665,875**

**Claims priority, application Japan, Jul. 10, 1995, 7-173231**

**Int. Cl.[6] G03B** *27/52*

**U.S. Cl. 355—40** **29 Claims**



1. A photographic processing system operable to print images which have been recorded on a photographic film onto photographic printing paper to form photographic prints, comprising:

a film setting section for setting exposure conditions by which the images recorded on each photographic film are printed onto photographic printing paper;

a storage section for storing the exposure conditions set by said film setting section for respective images recorded on each photographic film

an exposure condition setting section for confirming that exposure conditions are stored for the images of a photographic film, for setting the exposure conditions stored in said storage section as exposure conditions for the images of said each photographic film when photographic prints corresponding to images on each photographic film are re-printed when it is confirmed that the exposure conditions are stored, and for setting exposure conditions when it is not confirmed that the exposure conditions are stored; and

a photographic print section responsive to at least one of said film setting section and said exposure condition setting section, for printing the images on the photographic film onto the photographic printing papers based on the exposure conditions,

wherein said printing section responds to said film setting section during a first printing of photographic prints from the photographic film and said printing section responds to said exposure condition setting section during subsequent printing of photographic prints from the photographic film.



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**5,745,219**

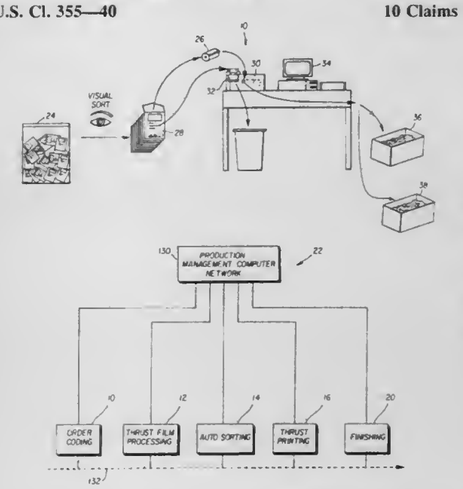
**METHOD AND APPARATUS FOR THE EFFICIENT BATCH PRINTING OF PHOTOGRAPHIC PAPER**

**Jack Charles DeMarti, Jr., Rochester; Walter Charles Slater, Prattsburg, and Joseph Paul Kent, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Continuation of Ser. No. 408,228, May 19, 1995, abandoned, which is a division of Ser. No. 241,986, May 12, 1994, Pat. No. 5,576,794. This application Jun. 17, 1997, Ser. No. 877,412**

**Int. Cl.[6] G03B** *27/52*

**U.S. Cl. 355—40** **10 Claims**




1. A process for printing images from individual customer rolls of developed photographic film onto photographic paper; characterized by:

exposing the photographic paper to the images from the film one-roll-after-another;

monitoring use of the paper and the exposures to determine therefrom utilization of the paper roll; and,

batching the film rolls at the printer based on the monitored paper utilization.

**5,745,220**

**IMAGE SELECTING APPARATUS FOR PHOTOGRAPHIC PRINTER**

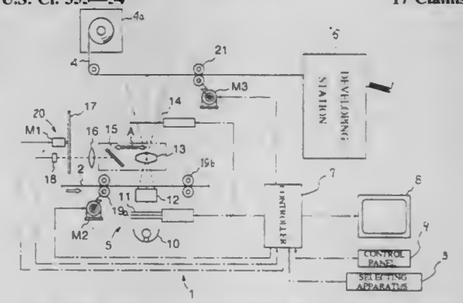
**Hiroki Okazaki; Hironori Masutani, and Junji Yamada, all of Wakayama, Japan, assignors to Noritsu Koki Co., Ltd., Wakayama, Japan**

**Filed Jan. 25, 1996, Ser. No. 591,089**

**Claims priority, application Japan, Jan. 27, 1995, 7-011623; Jan. 30, 1995, 7-012651; Feb. 21, 1995, 7-032261; Mar. 29, 1995, 7-071185**

**Int. Cl.[6] G03B** *27/44;27/52*

**U.S. Cl. 355—54** **17 Claims**




1. An image frame selecting apparatus for a photographic printer comprising:

a film receiving unit defining a receiving surface for receiving a photographic film having a plurality of image frames, said receiving surface being divided into a plurality of areas corresponding to said image frames;

a positioning indicator provided for said film receiving unit for positioning said photographic film on said receiving surface; and

image frame selecting means for selecting an image frame to be printed from said photographic film by designating at least one of said areas; and

wherein said image frame selecting means includes markings formed in relation to said areas of said receiving surface, respectively, and an input device operable to select an image frame to be printed.

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**5,745,221**

**EXPOSURE EQUIPMENT**

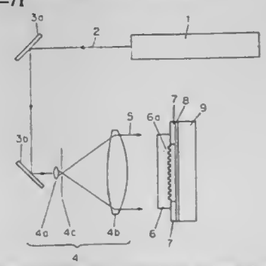
**Seiji Nishiwaki, Osaka; Junichi Asada, Ibaraki, and Keiichi Matsuzaki, Ikeda, all of Japan, assignors to Matsushita Electric Industrial, Co., Ltd., Osaka, Japan**

**Filed Mar. 18, 1997, Ser. No. 816,831**

**Claims priority, application Japan, Mar. 18, 1996, 8-060525; Oct. 2, 1996, 8-261488**

**Int. Cl.[6] G03B** *27/42;27/52*

**U.S. Cl. 355—71** **21 Claims**




1. An exposure equipment comprising a laser beam source, an expanding means for expanding laser beams of wavelength λ outgoing from the laser beam source and forming it into plane wave of parallel beams, a plate-form member formed with transparent material with refraction index n, and an exposure substrate

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located close to the plate-form member on the surface of which sensitized film is formed, wherein on the surface of the plate-form member facing against the exposure substrate side, recessed portion and protruded portion are repeatedly formed, and allowing the plane wave expanded by the expanding means to penetrate the recessed portion or protruded portion generates a ± first order diffracted light, and the sensitized film is located at the position in which the + first order diffracted light and the − first order diffracted light intersect each other, fringes generated by interference between the diffracted lights exposes the sensitized film.

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**5,745,222**

## APPARATUS FOR MAKING A STAMP FROM AN ORIGINAL PICTURE

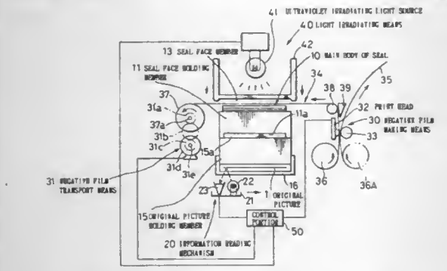
**Takanobu Kameda; Machiko Kano; Rui Kondoh, all of Tokyo, and Kenich Nakajima, Suwa, all of Japan, assignors to King Jim Co., and Seiko Epson Corporation, both of Japan**

**Filed Aug. 18, 1995, Ser. No. 516,875**

**Claims priority, application Japan, Aug. 23, 1994, 6-198478**

**Int. Cl.[6] G03B** *27/02;27/52*

**U.S. Cl. 355—72** **19 Claims**




1. An apparatus for making a stamp from an original picture comprising:

a housing;

holding means, mountable within said housing, for holding the original picture on one end face thereof and for holding a resin stamp blank, from which the stamp is to be made, on a second end face thereof, opposite said one end face;

information reading means, mounted within said housing, aligned with said holding means and facing said one end face, for reading imprint figure information from the original picture;

negative film making means for receiving the imprint figure information from said information reading means and for transferring the imprint figure information onto an ink ribbon to thereby make a negative film;

conveying means for conveying the ink ribbon to a position where the transferred imprint figure information faces the resin stamp blank held on the holding means; and

light irradiating means, aligned with said holding means and, through said holding means, with said information reading means, and facing the resin stamp blank and said second end face, for irradiating areas of the resin stamp blank, through the negative film, with light having a wavelength within a predetermined range to produce irradiated areas in the resin stamp blank having a solubility in a developing fluid different from solubility in the developing fluid of non-irradiated areas, whereby the irradiated blank can be contacted with the developing fluid to produce the stamp.

**5,745,223**

## IMAGE PICK-UP DEVICE CONNECTABLE TO A PAN HEAD

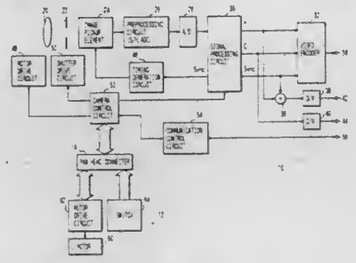
**Kelichi Ikeda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 6, 1995, Ser. No. 524,414**

**Claims priority, application Japan, Sep. 12, 1994, 6-217084**

**Int. Cl.[6] H04N** *5/232*

**U.S. Cl. 356—4.01** **20 Claims**



1. An image pick-up device comprising:

(a) a camera unit having image pick-up means for converting an optical image to an electrical signal;

(b) a pan head unit for supporting said camera unit with an adjustable orientation; and

(c) pan head connection means for connecting said camera unit to said pan head unit, and for transmitting, through said pan head connection means, a control signal of said pan head unit from said camera unit to said pan head unit and status information of said pan head unit from said pan head unit to said camera unit.

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**5,745,224**

## DISTANCE MEASUREMENT DEVICE

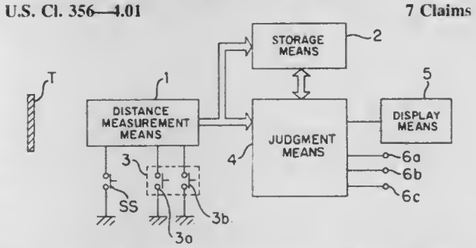
**Hajime Oda, and Takuma Takahashi, both of Yotsukaido, Japan, assignors to Seiko Precision Inc., Japan**

**Filed Sep. 28, 1995, Ser. No. 535,521**

**Claims priority, application Japan, Sep. 28, 1994, 6-233276**

**Int. Cl.[6] G01C** *3/08;* **G01S** *13/00*

**U.S. Cl. 356—4.01** **7 Claims**




1. A device for determining the distance range of an object, comprising: distance measurement means for measuring a distance to an object; storage means for storing at least one distance measurement result obtained by the distance measurement means during a division point setting operation, the at least one stored distance measurement result serving as at least one division point for dividing an effective measurement range of the distance measurement means into a plurality of measurement zones; and judging means for judging which of the plurality of measurement zones a distance measurement result obtained by the distance measurement means during a distance measurement operation other than a division point setting operation belongs to.



**5,745,225**

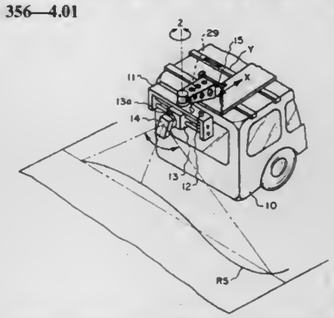
## APPARATUS FOR MEASURING A SHAPE OF ROAD SURFACE

**Hiromitsu Watanabe; Noriyuki Takeuchi, and Tetsuya Arimoto, all of Tokyo, Japan, assignors to Tokimec, Inc., Tokyo, Japan**

**Filed Dec. 14, 1995, Ser. No. 572,330**

**Int. Cl.[6] G01C** *3/08;* **G01B** *11/26*

**U.S. Cl. 356—4.01** **4 Claims**




1. An apparatus mounted on a vehicle for measuring the shape of a road surface comprising; rotatable distance measuring means for measuring the distance to said road surface; rotation drive means for rotating said rotatable distance measuring means in a vertical plane; inclinometer means detecting an inclination angle of said rotation drive means; data processing means receiving a distance signal from said rotatable distance measuring means representing the distance to said road surface, a rotation angle signal from said rotation drive means indicating the rotation angle of said rotatable distance measuring means, and an inclination angle signal representing the inclination angle of said rotation drive means detected by said inclinometer means; said data processing means calculating a vertical distance and horizontal distance to said road surface from said distance signal, said rotation angle signal and said inclination angle signal.

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**5,745,226**

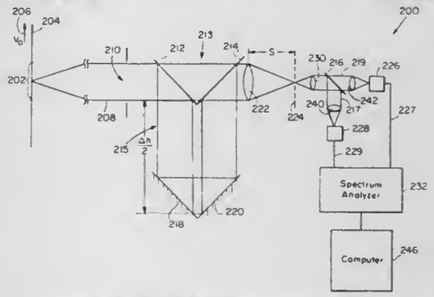
## PASSIVE OPTICAL VELOCITY MEASUREMENT DEVICE AND METHOD

**George W. Gigioli, Jr., Andover, Mass., assignor to Litton Systems, Inc., Woodland Hills, Calif.**

**Filed Nov. 4, 1996, Ser. No. 743,523**

**Int. Cl.[6] G01P** *3/36;* **G01C** *3/08*

**U.S. Cl. 356—28** **13 Claims**




1. A velocity sensing apparatus for sensing the velocity of a wheeled vehicle comprising:

a first sensor receiving light from the vehicle along a first optical path having a first optical path length, the light having a predetermined intensity spatial frequency component associated with a selected feature of the vehicle, the first sensor comprising:

a first grating having a line frequency selected such that the first grating passes light from the vehicle at the spatial frequency associated with the selected feature of the vehicle,

a first detector receiving light passed by the first grating and generating a first signal indicative of motion of the vehicle;

a second sensor receiving the light from the vehicle along a second optical path having a second optical path length, a differential optical path length being defined by a difference between the first and second optical path lengths, the second sensor comprising:

a second grating having the line frequency selected such that the second grating passes light from the vehicle at the spatial frequency associated with the selected feature of the vehicle,

a second detector receiving light passed by the second grating and generating a second signal indicative of motion of the vehicle; and

a processor coupled to the first sensor and the second sensor, the processor receiving the first signal and generating therefrom a first angular velocity measurement for the vehicle, and receiving the second signal and generating therefrom a second angular velocity measurement for the vehicle, wherein the processor computes an absolute velocity of the vehicle using the differential optical path length and the first and second angular velocity measurements.

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**5,745,227**

## METHOD AND APPARATUS FOR DETERMINING THE ERYTHROCYTE SEDIMENTATION RATE

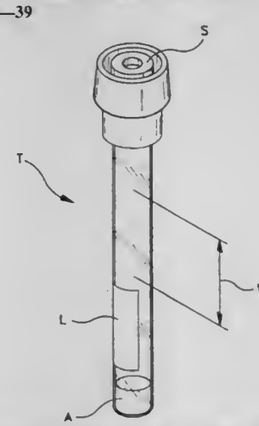
**Christopher Dufresne, Maastricht, Netherlands; Georges Bonnevial, Le Cheylas, and Jean Emin, Saint Etienne de Crossey, both of France, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.**

**Filed Jun. 26, 1996, Ser. No. 670,475**

**Claims priority, application European Pat. Off., Jul. 21, 1995, 95111491**

**Int. Cl.[6] G01N** *15/05;33/49*

**U.S. Cl. 356—39** **7 Claims**




1. An apparatus for determining the erythrocyte sedimentation rate in a blood sample comprising:

at least one test tube comprising a blood sample comprising an open top end, a closed bottom end, a cylindrical sidewall having an inner surface and an outer surface extending between said open top end and said closed bottom end having a length of about 80 mm to about 110 mm, an outside diameter of about 7 mm to about 9 mm and an inside diameter of about 5 mm to about 7 mm, a stopper in said open top end, a label located near said closed bottom end on said outer surface of said sidewall comprising an upper portion and a

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lower portion and a window from about 30 mm to about 40 mm located between said open top end and said upper portion of said label;

at least one rack for receiving at least one of said test tube comprising a C-shaped frame comprising opposite lower and upper horizontal arms for receiving said tube, an upright arm extending between said lower and upper horizontal arms, a hinge connecting said upright arm and said lower horizontal arm, a fixed point connecting said upper horizontal arm and said upright arm, and a thumb-actuated slider lock mechanism on said upright arm, whereby when said tube is loaded into said rack, said rack is then locked in a closed position by said thumb-actuated slider lock mechanism;

a rotary mounting fixture comprising a rotary platform and a drive means connected to said rack whereby said rack is vertically rotated and then inclined at approximately 20° from the vertical position;

a background illumination source;

a detector means for viewing said blood sample in said tube in said rack in said window as a contrasted image against said background illumination source and supplying a first output signal;

a drive means for carrying said detector means in a traverse movement along said tube;

a manual scanner for reading said label on said tube and supplying a second output signal; and

a data processing unit for receiving said first output signal from said detector means and said second output signal from said manual scanner and converting said first output signal to a digital format to calculate the erythrocyte sedimentation rate of said blood sample of said test tube.

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**5,745,228**

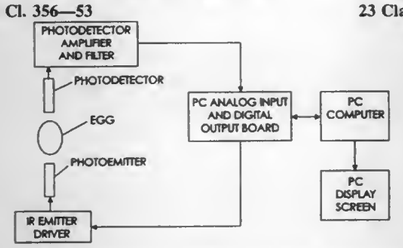
## METHOD AND APPARATUS FOR DISTINGUISHING LIVE FROM INFERTILE POULTRY EGGS

**John Hebrank, Durham, and Daniel De Pauw, Raleigh, both of N.C., assignors to Embrex, Inc., Research Triangle Park, N.C.**

**Filed Jan. 17, 1997, Ser. No. 785,689**

**Int. Cl.[6] G01N** *33/08*

**U.S. Cl. 356—53** **23 Claims**




1. An apparatus for distinguishing live from infertile poultry eggs, comprising:

an egg carrier;

a light measuring system having a light source positioned on one side of said egg carrier and a light detector positioned on the other side of said egg carrier opposite said light source; and

a switching circuit operatively associated with said light source for cycling the intensity of said light source at a frequency greater than 100 cycles per second.

**5,745,229**

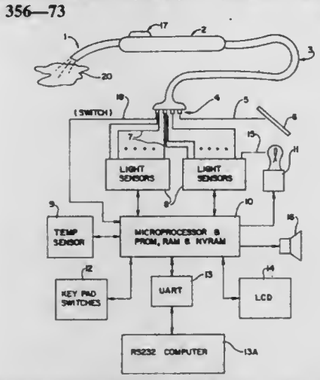
## APPARATUS FOR DETERMINING OPTICAL CHARACTERISTICS OF AN OBJECT

**Wayne D. Jung; Russell W. Jung, both of Morton Grove, and Alan R. Loudermilk, Chicago, all of Ill., assignors to LJ Laboratories, L.L.C., Chicago, Ill.**

**Filed Jan. 2, 1996, Ser. No. 581,851**

**Int. Cl.[6] G01B** *11/30;* **G01J** *3/51;* **G01N** *21/64;21/47*

**U.S. Cl. 356—73** **36 Claims**




1. An apparatus for measuring optical characteristics of an object with a probe as the probe is moved with respect to the object, comprising:

a probe having a central light source and a plurality of light receivers spaced apart from the central light source, wherein light from the central light source is reflected from the object into the plurality of light receivers;

first and second sensors coupled to receive light from the light receivers, wherein at least some of the second sensors measure the value of the intensity of light in predetermined color bands;

a processor coupled to receive data from the first and second light sensors;

wherein the processor monitors intensity values determined by the first sensors and stores data from the second sensors based on the intensity determinations made by the first sensors, wherein the stored data is indicative of optical characteristics of the object.

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**5,745,230**

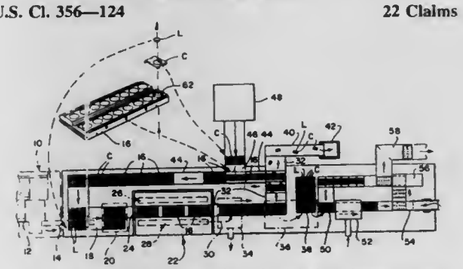
## OPHTHALMIC LENS INSPECTION SYSTEM AND METHOD

**Russell J. Edwards; James A. Ebel, both of Jacksonville, Fla.; Borge Peter Gundersen, Tikob, and Thomas Christian Ravn, Helsingor, both of Denmark, assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.**

**Continuation of Ser. No. 547,073, Oct. 23, 1995, abandoned, which is a continuation of Ser. No. 994,249, Dec. 21, 1992, abandoned. This application Jul. 29, 1996, Ser. No. 681,639**

**Int. Cl.[6] G01B** *9/00*

**U.S. Cl. 356—124** **22 Claims**



1. An apparatus for the inspection of ophthalmic lenses comprising:



a lens pallet having wells for receiving, at a lens container receiving area, a plurality of lens containers for holding a plurality of ophthalmic lenses,

an inspection station including a lamp for illuminating the lenses and the lens containers, and a camera for capturing an image of the lenses produced during illumination of the containers,

image analysis means connected to the camera to receive the images of the lenses from the camera, to determine whether individual ones of the lenses are acceptable or unacceptable, and to produce signals identifying said individual ones of the lenses as acceptable or unacceptable,

a lens disposition mechanism connected to the image analysis means to receive the signals therefrom and, in response to said signals, to remove the lens containers from the pallet and to physically separate acceptable lenses from unacceptable lenses,

a conveyor for transporting the pallet in a first direction from the lens container receiving area to the inspection station then to the lens disposition mechanism,

a pallet restraining means for minimizing movement of the pallet in directions other than the first direction, and

means for returning the pallet from the lens disposition mechanism to the container receiving area.

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**5,745,231**

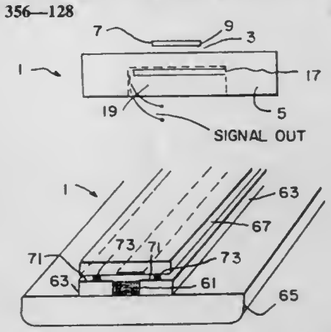
## METHOD OF FLUORESCENCE ANALYSIS COMPRISING EVANESCENT WAVE EXCITATION AND OUT-OF-PLANE PHOTODETECTION

**Howard P. Groger, Gainesville, Fla.; K. Peter Lo, Blacksburg, Va., and Martin Weiss, New Port Richey, Fla., assignors to American Research Corporation of Virginia, Radford, Va.**

**Filed Jun. 12, 1995, Ser. No. 489,436**

**Int. Cl.[6] G01N** *21/41;21/00*

**U.S. Cl. 356—128** **18 Claims**




1. A sensor apparatus for detecting fluorescence comprising a substrate, a waveguide comprising two or more dielectric layers positioned on the substrate, a chemically sensitive fluorophore film positioned over the waveguide, an excitation source positioned near the waveguide for delivering energy to an end facet of the waveguide, and a photodetector placed proximate to the waveguide and positioned such that a field of view of the photodetector is normal to the waveguide wherein the substrate has a hollow portion below an active region of the waveguide, and wherein the photodetector is positioned in the hollow portion of the substrate.

**5,745,232**

## APPARATUS FOR INSPECTING DEFORMATION OF PIPE

**Kiyoshi Hasegawa, Tokyo, Japan, assignor to Kansei Kogyo Co., Ltd., Tokyo, Japan**

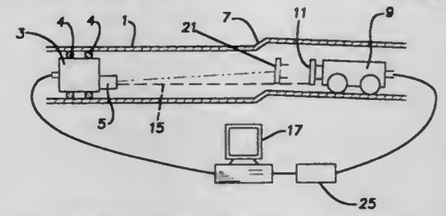
**PCT No. PCT/JP94/00429, § 371 Date Jul. 3, 1996, § 102(e) Date Jul. 30, 1996, PCT Pub. No. WO95/21367, PCT Pub. Date Aug. 10, 1995**

**PCT Filed Mar. 17, 1994, Ser. No. 682,765**

**Claims priority, application Japan, Feb. 3, 1994, 6-033095**

**Int. Cl.[6] G01B** *11/26*

**U.S. Cl. 356—153** **2 Claims**



1. An apparatus for inspecting deformation of a pipe, comprising a beam emitting unit including a beam source and arranged on one end side of the pipe and a target vehicle including a target board which is irradiated with a beam emitted from the beam source and moved from the other end side of the pipe toward said beam emitting unit, whereby an irradiated position on said target board which is irradiated with the beam is detected to inspect deformation of the pipe,

characterized in that said target board is provided thereon with a plurality of light receiving elements, so that at least two of said light receiving elements concurrently receive the beam, whereby said irradiated position is detected depending on a distribution of a difference in intensity between the electric signals from said light receiving elements receiving the beam.

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**5,745,233**

## VOLTAGE DETECTING CIRCUIT

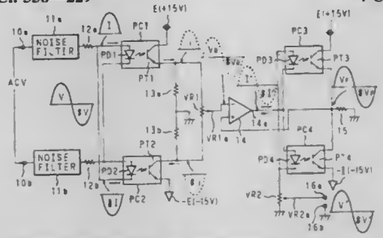
**Katsuhiko Asada, Fukui; Atsuhiko Tamaki, Kyoto, and Tadashi Morita, Suita, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan**

**Filed Feb. 3, 1997, Ser. No. 792,904**

**Claims priority, application Japan, Feb. 6, 1996, 8-020254**

**Int. Cl.[6] G01J** *1/10*

**U.S. Cl. 356—229** **4 Claims**




1. A voltage detecting circuit comprising:

a first photo coupler and a second photo coupler interposed between voltage input terminals to which the voltage to be detected is applied, each having a light emitting element connected parallel reversely and a photo detector;

first voltage generating means for generating a voltage depending on the photo detector side currents of said first photo coupler and second photo coupler;

a differential amplifier whose one input terminal receives the voltage generated by said first voltage generating means;

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a third photo coupler and a fourth photo coupler each having a light emitting element connected parallel reversely for receiving the output currents of said differential amplifier and a photo detector; and

second voltage generating means for generating a voltage corresponding to the photo detector side currents of said third photo coupler and fourth photo coupler,

wherein the voltage generated by said second voltage-generating means is fed into the other input terminal of said differential amplifier,

so that the voltage depending on the light emitting element side currents of said third photo coupler and fourth photo coupler is matched with the voltage fed into said voltage input terminal.

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**5,745,234**

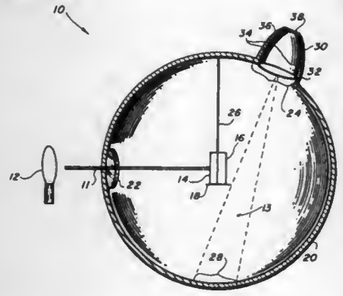
## VARIABLE ANGLE REFLECTOMETER EMPLOYING AN INTEGRATING SPHERE AND A LIGHT CONCENTRATOR

**Keith A. Snail, Silver Spring; Leonard Hanssen, Gaithersburg, both of Md., and David Chenault, Mary Esther, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jul. 31, 1995, Ser. No. 509,480**

**Int. Cl.[6] G01J *1/04***

**U.S. Cl. 356—236** **8 Claims**



1. A reflectometer for measuring reflectance and transmittance of a sample, said reflectometer comprising:

a light source for generating a beam of light;

an integrating sphere having an inner surface, wherein said sample is mounted in the center of said integrating sphere;

means for projecting said beam of light onto said sample whereby said beam of light is reflected by said sample in at least one direction onto said inner surface, wherein the integrating sphere includes a non-imaging concentrator for directing light reflected from the sample and falling upon a field of view (FOV) projection area upon a detecting surface, said non-imaging concentrator comprising a compound hyperbolic concentrator-lens combination wherein said lens has an index of refraction (n) of less than 2 and a focal (f) number of greater than 3;

means for tilting the surface of said sample relative to said projected beam of light;

means for preventing direct scattering of said reflected light from said sample onto said projection area of said field of view and said refracting surface; and

detection means for measuring the power of said concentrated light at said detecting surface.

**5,745,235**

## MEASURING SYSTEM FOR TESTING THE POSITION OF A VEHICLE AND SENSING DEVICE THEREFORE

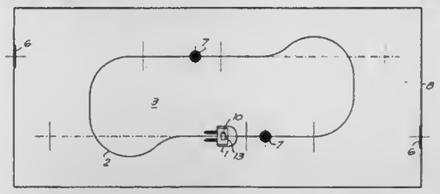
**Jan Maria Ludovicus Vercammen, Antwerpen, and Walter Maria Alfons De Feyter, Schilde, both of Belgium, assignors to Egemin Naamloze Vennootschap, Schoten, Belgium**

**Filed Mar. 26, 1997, Ser. No. 824,742**

**Claims priority, application Belgium, Mar. 26, 1996, 09600271**

**Int. Cl.[6] G01B *11/00***

**U.S. Cl. 356—375** **7 Claims**



1. A measuring system for detecting the actual position and driving direction of a computer guided vehicle relative to a desired position and driving direction for the vehicle along a predetermined desired path of travel for the vehicle, comprising:

a plurality of first optical beacons located and orientated adjacent the path of travel of the vehicle such that they will be observable in a first viewing direction from said vehicle while said vehicle is moving approximately along said desired path of travel;

a plurality of second optical beacons located above or in the plane of travel of the vehicle and along the desired travel path, said second beacons oriented such that they will be observable in a second viewing direction from said vehicle while said vehicle is moving along said desired path;

sensors on board the vehicle for optically detecting said beacons and generating signals indicative of the angular directions of said beacons relative to reference axes that are related to the desired position and direction of travel of the vehicle;

a computer for receiving said signals from said sensors and processing said signals in accordance with a program that calculates the actual position and driving direction of the vehicle relative to a desired position and driving direction of travel of the vehicle;

said sensors comprising a first camera aimed in a first viewing direction approximately along the driving direction of the vehicle and a second camera directed in a second viewing direction extending perpendicular to the plane of the vehicle travel path, said cameras including optical systems adapted to view and image the location of said beacons.

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**5,745,236**

## OPTICAL INSPECTING APPARATUS HAVING A FOCUSING SYSTEM WITH A TELECENTRIC OPTICAL SYSTEM AND AN APERTURE STOP

**Kazumi Haga, Chofu, Japan, assignor to New Creation Co., Ltd., Tokyo-to, Japan**

**Continuation of Ser. No. 267,928, Jul. 6, 1994, abandoned. This application Nov. 12, 1996, Ser. No. 747,993**

**Claims priority, application Japan, May 31, 1994, 6-141118**

**Int. Cl.[6] G01N *21/00***

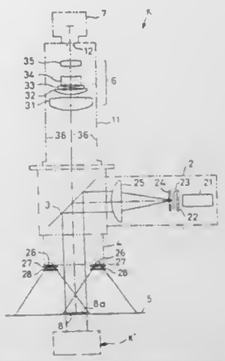
**U.S. Cl. 356—371** **12 Claims**

1. An optical inspecting system comprising:

illuminating means for illuminating a sample having an ID number-formed portion in which an ID number is formed in the form of one of grooves and dots, with a collimated light and a diffused light, said collimated light and said diffused light illuminating said sample on the same side thereof;

focusing system, arranged separately from said illuminating means, for focusing a light from said ID number-formed portion of said sample to form an image of a brightness pattern exhibiting the ID portion of the sample,





said focusing system comprising a telecentric optical system and an aperture stop arranged at one of a back focal plane of said telecentric optical system and in a vicinity of said telecentric optical system in an image space thereof; and

viewing means for presenting an image of said sample based on a light passed through said focusing system.

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**5,745,237**

## METHOD AND APPARATUS FOR MEASURING CROSS SECTIONAL DIMENSIONS OF SECTIONAL STEEL

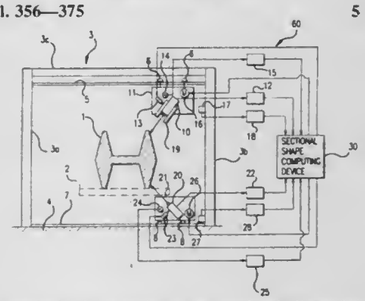
**Kazuhiro Yahiro, Kurashiki; Takayuki Yoshioka, Setagaya-ku, and Kazushi Baba, Kurashiki, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan**

**Filed Mar. 29, 1996, Ser. No. 622,855**

**Claims priority, application Japan, Mar. 31, 1995, 7-074777; Aug. 29, 1995, 7-220459**

**Int. Cl.[6] G01B *11/14***

**U.S. Cl. 356—375** **5 Claims**




1. A method of measuring cross sectional dimensions of an intermediate product of sectional steel during the course of rolling by simultaneously horizontally reciprocating two laser range finders which are disposed opposite to each other in a vertical direction of the sectional steel, the laser range finders reciprocating in a direction crossing a conveyance line of the sectional steel, comprising the steps of:

irradiating said sectional steel with a laser beam at a predetermined angle from each of said laser range finders to measure a first plurality of positions of said laser range finders, a first plurality of distances to said sectional steel and a first plurality of irradiation angles in forward traveling, the predetermined angle being in relation to the vertical direction of the sectional steel;

irradiating said sectional steel with a laser beam at an angle different from the predetermined angle in forward traveling to measure a second plurality of positions of said laser range finders, a second plurality of distances to said sectional steel and a second plurality of irradiation angles in backward traveling;

selecting measurement data at a position on said sectional steel from the measurement data obtained to output space coordinates of a section of said sectional steel so that the selected measurement data for the position coincide with each other; and

computing shape information from the space coordinates.

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**5,745,238**

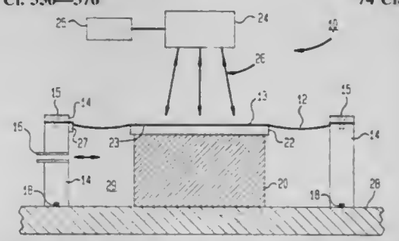
## APPARATUS AND METHOD FOR NON-DESTRUCTIVE INSPECTION AND/OR MEASUREMENT

**David Clifford Long, Wappingers Falls; John Blake Pavelka, Beacon, both of N.Y.; Karl Friedrich Stroms, Las Vegas, Nev., and Gerhard Weiss, deceased, late of LaGrangeville, N.Y., by Helga Weiss, Executrix, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 22, 1992, Ser. No. 995,258**

**Int. Cl.[6] G01N *21/17***

**U.S. Cl. 356—376** **74 Claims**



1. A method for the inspection and/or measurement of surfaces, comprising:

(a) securing at least one flexible membrane to a housing, said flexible membrane having opposed surfaces, and wherein said at least one flexible membrane is in a slack state after it is secured to said housing,

(b) at least one external means to create and maintain a pressure differential between said opposed surfaces of said at least one flexible membrane, so that at least a portion of said flexible membrane is in conformal contact with at least a portion of said surfaces to be inspected and/or measured while at least a portion of said flexible membrane not in contact with said surface to be inspected and/or measured is in a non-tense state, and wherein said external pressure does not distort the surface topology of said surface to be inspected and/or measured,

(c) at least one inspection means to inspect at least a portion of the surface of said flexible membrane that is in conformal contact with said surfaces to be inspected while said pressure differential is maintained across said at least one flexible membrane, wherein said at least one inspection means is contained inside said housing.

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**5,745,239**

## MULTIPLE FOCAL PLANE IMAGE COMPARISON FOR DEFECT DETECTION AND CLASSIFICATION

**Bor-Cheng Chen, Taipei, and Yeh-Jye Wann, Hsin-chu, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-chu, Taiwan**

**Filed Apr. 7, 1997, Ser. No. 826,713**

**Int. Cl.[6] G01B *11/28***

**U.S. Cl. 356—380** **19 Claims**

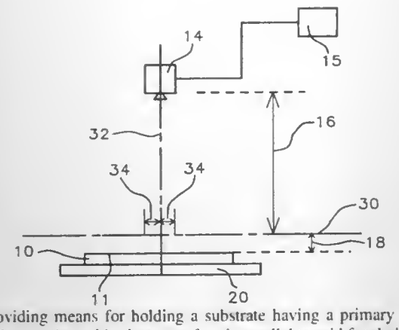
1. A method of optical analysis, comprising the steps of:

providing an optical system having an optical axis and a focal plane wherein said optical axis is perpendicular to said focal plane and said optical system forms an image of that part of said focal plane within an image field distance of said optical axis;

providing means to analyze each said image formed by said optical system;

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providing means for holding a substrate having a primary surface so that said primary surface is parallel to said focal plane, a step distance away from said focal plane, and perpendicular to said optical axis;

providing means for varying said step distance;

providing means for varying the position at which said optical axis intersects said primary surface;

setting said position at which said optical axis intersects said primary surface at an analysis position;

setting a characteristic number of said step distances for each of said analysis positions;

forming one said image for each of said step distances at each of said analysis positions, thereby forming said characteristic number said images at each of said analysis positions; and

analyzing said characteristic number of said images for each of said analysis positions.

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**5,745,240**

**METHOD AND DEVICE FOR IN SITU STRESS MEASUREMENT WITHIN A THIN FILM UPON ITS DEPOSITION ON A SUBSTRATE**

**Fatima Frakso, Les Ponts Ce; Richard Bosmans, Noiseau, and Luc Nouvelot, St Egreve, all of France, assignors to Essilor International Compagnie Generale d'Optique, Charenton Le Pont, France**

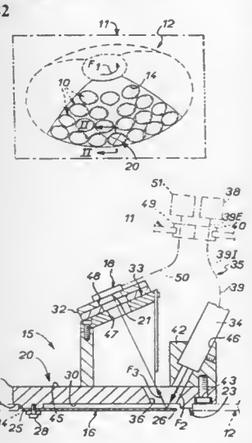
**PCT No. PCT/FR95/00619, § 371 Date Jun. 3, 1996, § 102(e) Date Jun. 3, 1996, PCT Pub. No. WO95/31706, PCT Pub. Date Nov. 23, 1995**

**PCT Filed May 11, 1995, Ser. No. 652,535**

**Claims priority, application France, May 11, 1994, 94 05793**

**Int. Cl.[6] G01B *11/06***

**U.S. Cl. 356—382** **24 Claims**




1. In a method for the deposition of a thin film on substrates in a processing chamber, the substrates being supported on a rotatable collective holder having a plurality of sites therefor and the thin film being deposited in the course of rotation of the collective holder, further comprising the steps of: providing an individual holder for carrying a test sample at one of the plurality of sites on the collective holder, and at least part of a sensor adapted to measure deformation of the test sample; and measuring with the sensor deformation of the thin film deposited on the test sample so as to determine the stress within the film deposited on the test sample and thereby the stress within the film deposited on the substrates.

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**5,745,241**

**METHOD OF RECOGNIZING CYLINDRICAL PART**

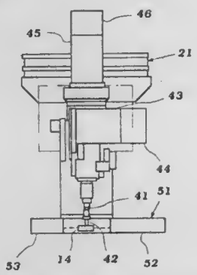
**Kazuhisa Hashimoto, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan**

**Filed Nov. 9, 1995, Ser. No. 555,521**

**Claims priority, application Japan, Nov. 11, 1994, 6-278137**

**Int. Cl.[6] G01B *11/00***

**U.S. Cl. 356—384** **31 Claims**




1. An apparatus for picking up and positioning articles having at least one cylindrical section at an accurate location, said apparatus being comprised of a pick-up device rotatable about an axis and movable in the X, Y, and Z directions to manipulate a picked up article, said pick-up device being adapted to releasably hold the article, means for taking a first measurement of the cylindrical section of the article when held by said pick-up device in a first angular position, means for rotating said pick-up device and the held article through a predetermined angle and for taking a second measurement of said cylindrical section in the second angular position, and means for calculating X, Y, and rotational offsets for calculating a corrective factor indicative of the offset of the article relative to the pick-up device for accurate positioning thereof.

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**5,745,242**

**POSITION DETECTING SYSTEM AND EXPOSURE APPARATUS HAVING THE SAME**

**Hideo Hata, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 25, 1995, Ser. No. 547,796**

**Claims priority, application Japan, Oct. 28, 1994, 6-265218**

**Int. Cl.[6] G01B *11/00***

**U.S. Cl. 356—401** **8 Claims**

1. A position detecting system for detecting a position of an object, said system comprising:

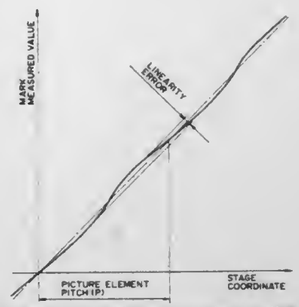
light detecting means having arrayed light detecting elements;

moving means for moving the object relative to said light detecting means, along a predetermined coordinate system; and

control means for causing said moving means to move the object incrementally, and causing said light detecting means to detect, at respective incremental positions, an image of a mark provided on the object, said control means calculating, at the respective incremental positions, a position of the image of the mark upon said light detecting means and determining the position of the mark with respect to the coordinate system on the basis of an average of the calculated positions of the images of the mark,

wherein, when said light detecting elements are arrayed with a pitch P, the number of averaging times is M, and the amount of incremental movement on said light detecting means is D, a relation D=P×N+P/M is satisfied, where N is an integer.






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**5,745,243**

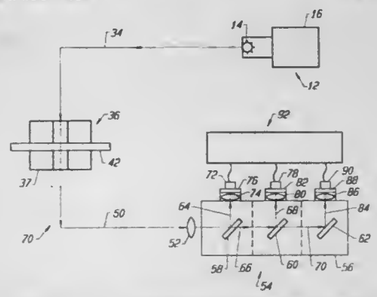
**PHOTOMETER APPARATUS**

**Steven Wilcox, and Don S. Goldman, both of Folsom, Calif., assignors to Optical Solutions, Inc., Folsom, Calif.**

**Filed Nov. 15, 1996, Ser. No. 749,419**

**Int. Cl.[6] G01N *21/27***

**U.S. Cl. 356—419** **11 Claims**




1. A photometer for measuring electromagnetic radiation properties modified by a sample comprising:

a. a source of electromagnetic radiation;

b. sensing means for transmitting the electromagnetic radiation from said source through the sample to produce an electromagnetic signal;

c. fiber optic conduit means for directing electromagnetic radiation from said source to said sensing means;

d. detecting means for converting said electromagnetic signal to an electrical signal at multiple wavelengths, said detecting means including a first beam splitter receiving said electromagnetic signal and outputting first and second electromagnetic beams, each of said first and second beams possessing all wavelengths of the electromagnetic radiation from said source, a second beam splitter receiving said second beam from said first beam splitter and outputting third and fourth electromagnetic beams, each of said third and fourth beams possessing all wavelengths of the electromagnetic radiation, a first detector having a first wavelength filter, a second detector having a second wavelength filter, a third detector having a third wave length filter, said first detector receiving said first beam from said beam splitter, said second detector receiving said third beam from said second beam splitter, said fourth beam from said second beam splitter passing to said third detector, said first, second, and third detectors, each producing an output signal; and

e. analyzing means for receiving said output signals of said first, second, and third detectors and quantifying the same into data representing a property of the sample, said analyzing means further comprising means for generating a reference signal, selectively, from the output signals of said first, second, and third detectors, said reference signal being compared to said non-reference signals of said first, second, and third detectors.

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**5,745,244**

**SCANNING DEVICE FOR SCANNING A PHYSICAL PROPERTY OF A FIBROUS WEB**

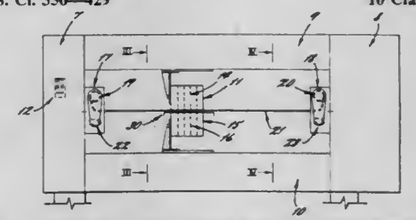
**Tord O. S. Svanqvist, and B. Lennart H. Örtemo, both of Karlstad, Sweden, assignors to Valmet-Karlstad AB, Karlstad, Sweden**

**Filed Aug. 9, 1996, Ser. No. 689,467**

**Claims priority, application Sweden, Sep. 13, 1995, 9503173**

**Int. Cl.[6] G01N *21/86;21/89***

**U.S. Cl. 356—429** **10 Claims**




1. A scanning device for scanning at least one physical property of a moving fibrous web, such as a paper web, which has two longitudinal edges and is intended to run along a predetermined path of movement past the device, said device comprising:

(a) a scanning head;

(b) at least one carriage for carrying the scanning head;

(c) a support supporting the carriage for movement transversely to the direction of movement of the web;

(d) a drive for imparting to the carriage with its scanning head a reciprocating movement transversely to the direction of movement of the web, from one longitudinal edge of the web to the other; and

(e) means associated with the carriage for providing, in essentially the same plane as the predetermined path of movement of the web, a planar web supporting surface at locations between the carriage and the two longitudinal edges of the web during passage of the web past the device.

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**5,745,245**

**COMMUNICATION APPARATUS**

**Koichi Shibata, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan**

**Filed Dec. 29, 1995, Ser. No. 581,340**

**Claims priority, application Japan, Jan. 6, 1995, 7-000636; Jan. 6, 1995, 7-000637**

**Int. Cl.[6] H04N *1/417;1/41;1/415***

**U.S. Cl. 358—262.1** **8 Claims**

1. A communication apparatus which codes image data including binarized pixels and transmits the coded image data, comprising:

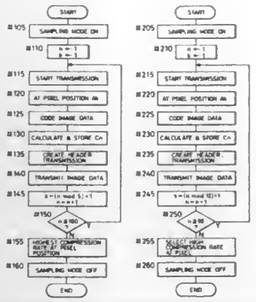
coding means for coding an image data by successively coding values of pixels of the image data, said coding means referring to a reference pixel located at a predetermined relative position to a pixel to be coded;

pixel position storing means for storing a predetermined number of relative positions for the reference pixel;

compression rate calculating means for calculating a compression rate of a coding by comparing sizes of the image data before and after being coded by the coding means;

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storing means for storing the relative position of the reference pixel referred to by the coding means and the compression rate calculated by the compression rate calculating means; and

controlling means operating in a first mode in which said controlling means reads out one of the relative positions from the pixel position storing means in a predetermined order,

causes the coding means to code an image data with the reference pixel at the relative position read out,

transmits the image data coded by the coding means,

causes the compression rate calculating means to calculate a compression rate of the coding, and

stores the relative position and the compression rate in the storing means, and

in a second mode in which said controlling means reads out a relative position corresponding to a high compression rate from among the relative positions stored in the storing means in the first mode,

causes the coding means to code an image data with the reference pixel at the relative position, and transmits the image data coded by the coding means, and wherein

the controlling means, when operating in the second mode, successively reads out relative positions corresponding to high compression rates from among the relative positions stored in the storing means,

causes the coding means to code an image data with the reference pixel at each of the relative positions, and

causes the compression rate calculating means to calculate a compression rate of each coding,

and wherein said calculating means operates for a predetermined period of time such that the number of calculations performed by said calculating means within said predetermined period is variable for different image data, and

transmits a coded image data corresponding to a highest compression rate among the image data coded during the predetermined period.

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**5,745,246**

**APPARATUS FOR READING IMAGES FROM DOCUMENTS AND PRINTING INFORMATION ON SHEETS AND HAVING DOCUMENT AND SHEET INSERTING AND DISCHARGING SECTIONS AT A FRONT SURFACE THEREOF**

**Kosuke Takaki; Takao Araki, both of Dazaifu; Junichi Mutoh, Fukuoka-ken; Katsuzi Ichimaru, Saga-ken; Hiroshi Matsumoto, Kasuga, and Tetsurou Fukuzoe, Fukuoka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd.., Osaka, Japan**

**Filed Jul. 15, 1994, Ser. No. 275,535**

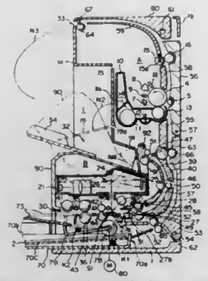
**Claims priority, application Japan, Aug. 2, 1993, 5-191079**

**Int. Cl.[6] H04N** *1/04;* **G03G** *21/00*

**U.S. Cl. 358—296** **16 Claims**

1. An image reading and printing apparatus comprising:

a housing having front and rear faces, opposite side faces, and top and bottom faces, said front and rear faces being positioned between said top and bottom faces and between said opposite side faces,



a printing part for performing printing on a sheet such as an ordinary sheet, and

a reading part for reading data from a document, said printing part and said reading part being vertically and integrally incorporated with each other within said housing, means provided at said front face of said housing, for supplying and discharging the document at said front face of said housing and means provided at said front face of said housing, for supplying and discharging the sheet at said front face of said housing; said printing part including a sheet conveying path formed in a C-like shape; said reading part including a document conveying path formed in a C-like shape which is laid inside of said sheet conveying path and which is shorter than the same.

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**5,745,247**

**IMAGE FORMING APPARATUS HAVING A CONTROLLED FIXING UNIT**

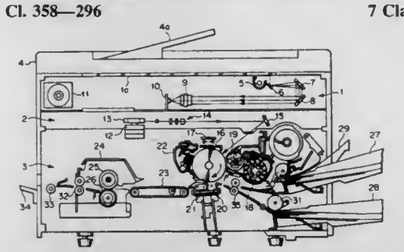
**Motokazu Yasui, and Yasuhisa Kato, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jan. 27, 1995, Ser. No. 379,927**

**Claims priority, application Japan, Jan. 28, 1994, 6-008305**

**Int. Cl.[6] H04N** *1/00;1/29;1/32;* **G03G** *21/00*

**U.S. Cl. 358—296** **7 Claims**



1. An image forming apparatus selectively operable in an ordinary mode for reading a document image every time an image is formed on an image carrier or in a high-speed mode for forming a plurality of images by a single reading while feeding papers at a shorter interval than in said ordinary mode, said apparatus comprising:

reading means for reading said document image and digitizing said document image;

storing means for storing the digitized document image;

image forming means for forming an image representing the digitized document image on the image carrier and for transferring said image from said image carrier to a paper;

a fixing roller for thermally fixing the image transferred to the paper; and

control means for controlling an operation, a temperature, or the operation and the temperature of said fixing roller based on whether the ordinary mode or the high-speed mode is selected.



**5,745,248**

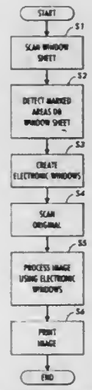
**TRANSPARENT EDIT SHEET WITH ATTACHED BACKGROUND**

**Michael J. Nickerson, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Feb. 3, 1997, Ser. No. 794,602**

**Int. Cl.[6] H04N** *1/40;1/04;1/387;* **B32B** *3/10*

**U.S. Cl. 358—296** **9 Claims**



1. A window location carrier scannable through a constant-velocity transport scanning system, comprising:

a light-transmissive portion defining an edge; and

a reflective portion having one edge thereof permanently bonded to the edge of said light-transmissive portion;

said light-transmissive portion and said reflective portion having identical lengthwise and widthwise dimensions.

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**5,745,249**

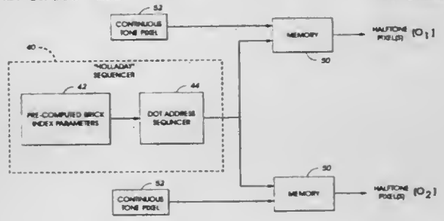
**PIPELINED ARCHITECTURE FOR PATTERNED HALFTONE GENERATION**

**Peter A. Crean, Penfield, and Norman W. Zeck, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 20, 1996, Ser. No. 770,922**

**Int. Cl.[6] H04N** *1/40;* **G06K** *9/54*

**U.S. Cl. 358—298** **18 Claims**



1. An apparatus for the parallel processing of continuous tone pixels to produce a halftone output signal representing the continuous tone pixels, comprising:

a memory block storing at least a portion of a halftone dot pattern at a plurality of locations therein;

a sequencer for producing an index into said memory as a function of a position of the pixel relative to the halftone dot pattern; and

memory addressing circuitry for combining the index produced by said sequencer and a pixel value for the pixel to produce a memory address, the memory address being thereby employed to access one of said plurality of locations in memory and to cause said memory to output a signal according to the halftone dot pattern.

**5,745,250**

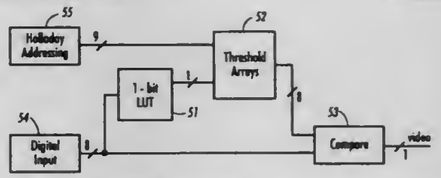
**METHOD OF PRODUCING TINT DOTS WITH PAIRS OF HOLLADAY HALFTONES**

**Charles M. Hains, Altadena, Calif., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Mar. 7, 1997, Ser. No. 812,554**

**Int. Cl.[6] H04N** *1/40*

**U.S. Cl. 358—298** **4 Claims**



1. A halftone generator comprising:

image means for generating an image signal which is a function of coverage of the current pixel,

address means for generating an address signal of the position of the current pixel,

threshold means comprising one or two threshold arrays responsive to the address and the image signal, for generating a threshold signal which will produce either an interstice-centered dot, a pixel-centered dot, an interstice-centered hole or a pixel-centered hole, and

a comparator for comparing the image signal and the threshold signal to produce a portion of a halftone pattern.

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**5,745,251**

**IMAGE PROCESSING METHOD AND APPARATUS FOR ENCODING VARIABLE-LENGTH DATA**

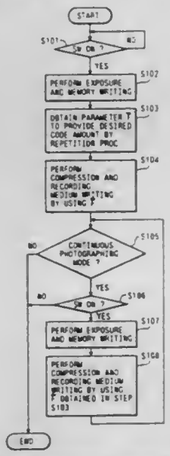
**Taku Yamagami, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 21,103, Feb. 23, 1993, Pat. No. 5,384,644, which is a division of Ser. No. 753,660, Aug. 30, 1991, Pat. No. 5,216,518. This application Nov. 14, 1994, Ser. No. 339,664**

**Claims priority, application Japan, Sep. 4, 1990, 2-234985; Sep. 4, 1990, 2-234986; Nov. 5, 1990, 2-297073**

**Int. Cl.[6] H04N** *1/41*

**U.S. Cl. 358—426** **10 Claims**



1. An image processing apparatus comprising:

input means for inputting image data representing an image;

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means for determining whether a single image or a plurality of continuous images are input by said input means;

encoding means for encoding image data representing the image and generating encoded image data; and

control means for controlling an amount of the encoded image data by varying a quantization parameter of said encoding means when said means for determining determines that a single image is input by said input means, said control means controlling said encoding means to cause a default common quantization parameter to be used for encoding image data representing the plurality of continuous images when said means for determining determines that a plurality of continuous images are input by said input means.

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**5,745,252**

## METHOD AND APPARATUS FOR PRODUCING PHOTOGRAPHIC INDEX PRINTS

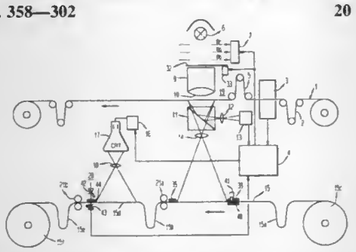
**Hans-Juergen Rauh, StraBlach-Hailafing; Helmut Treiber, Munich, and Hans-Georg Schindler, Holzkirchen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Continuation of Ser. No. 441,764, May 16, 1995, abandoned. This application Sep. 15, 1997, Ser. No. 931,063**

**Claims priority, application Germany, May 27, 1994, 44 18 601.0**

**Int. Cl.[6] H04N *1/23;1/46;* G03B *27/80***

**U.S. Cl. 358—302** **20 Claims**



1. In a method of printing regular photographic prints on a strip of photographic paper, along with index prints, having images that are smaller than those in the regular prints, from series of negatives on film, whereby the smaller images are projected next to and one after another along the strip of photographic paper to produce an index print as wide as the strip of photographic paper, the improvement comprising the steps of printing the regular prints and the index prints at different printing points along the path of movement of the strip of photographic paper; regulating the distance the strip of paper advances from one printing point to the other to ensure that the strip of photographic paper is advanced to the index print printing point once the last negative in a series has been projected onto the strip of photographic paper until the trailing edge of the last print arrives at the margin of the exposure area in the index print printing point; determining the length of the strip of photographic paper required for printing index prints and interrupting the printing procedure at the regular print printing point until the trailing end of the length of the strip of photographic paper that is reserved for the index prints associated with that series of negatives and that must accordingly not be exposed to light has crossed the edge of the exposure opening of the regular print printing point nearest the index print printing point.

**5,745,253**

## IMAGE READING APPARATUS AND METHOD FOR READING IMAGES OF DIFFERENT SIZES OF ORIGINALS

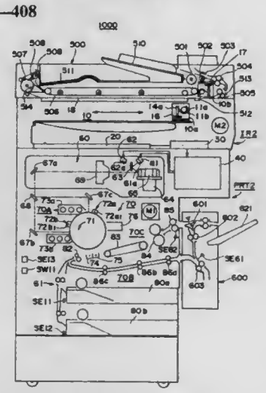
**Hideo Muramatsu, Shinshiro; Munehiro Nakatani, Toyonashi, and Akio Nakajima, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Division of Ser. No. 979,077, Nov. 19, 1992. This application Feb. 24, 1995, Ser. No. 394,944**

**Claims priority, application Japan, Dec. 27, 1991, 3-345947; Apr. 24, 1992, 4-106226**

**Int. Cl.[6] H04N *1/00***

**U.S. Cl. 358—408** **8 Claims**



1. An image reading apparatus comprising:

an exposure platen;

feeding means for feeding and setting an original to the exposure platen; and

reading means for reading an image of the original, said reading means reading a first side of the original while said original is being fed to the exposure platen and reading a second side of the original after said original has been set on the exposure platen.

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**5,745,254**

## IMAGE READING DEVICE USED IN A FACSIMILE MACHINE

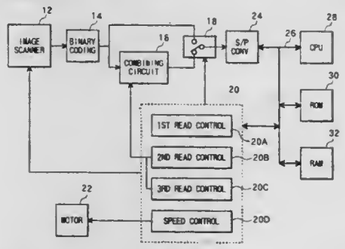
**Tatsuya Satou, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed May 15, 1995, Ser. No. 440,923**

**Claims priority, application Japan, May 13, 1994, 6-124231**

**Int. Cl.[6] H04N *1/36;1/04***

**U.S. Cl. 358—412** **17 Claims**




1. An image reading device comprising:

an image scanner for reading an image from a document by scanning the document at a fixed speed in a main-scanning direction;

a motor for feeding the document at a speed in an auxiliary-scanning direction perpendicular to the main-scanning direction;



speed control means for controlling the speed at which said motor feeds the document;

first read control means for obtaining one line's worth of data from data obtained by M-scans of said image scanner when said motor is feeding the document at a first speed A;

second read control means for obtaining one line's worth of data from data obtained by N-scans of said image scanner when said motor is feeding the document at a second speed A×M/N; and

third read control means for obtaining a-number lines' worth of data, each line's worth of data of the a-number lines' worth of data being obtained by m-scans of said image scanner, and for obtaining b-number lines' worth of data, each line's worth of data of the b-number lines' worth of data being obtained by n-scans of said image scanner, when said motor is feeding the document at a third speed that is between the first speed A and the second speed A×M/N,

wherein a relationship between values of M, N, a, b, m, and n is represented by:

$$N>(ma+nb)/(a+b)>M.$$

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**5,745,255**

## ELECTROPHOTOGRAPHIC DIGITAL PRINTER HAVING DATA EXPANSION MEANS RESPONSIVE TO DESIRED IMAGE QUALITY AND TYPE OF RECORDING MEDIUM USED

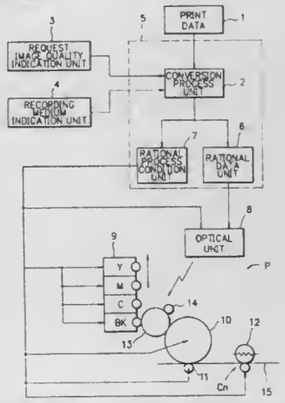
**Chiseki Yamaguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed May 17, 1996, Ser. No. 649,545**

**Claims priority, application Japan, May 18, 1995, 7-120266**

**Int. Cl.[6] H04N *1/41***

**U.S. Cl. 358—426** **18 Claims**




1. A printer for recording on a recording medium, comprising:

a data expanding means for executing a data expansion by expanding a set of print data from an upper layer device into a set of image data in response to a combination of a first command and a second command, said first command corresponding to an external request for an image quality level and said second command corresponding to a type of recording medium, the data expanding means including:

a first adaptation means, responsive to the combination of said first command and said second command, for selecting one of a plurality of sets of first control data stored in said first adaptation means for controlling the data expansions and

a second adaptation means, responsive to the combination of said first command and said second command, for selecting one of a plurality of sets of second control data;

an image printing means, responsive to the set of second control data selected by said second adaptation means, for printing on the recording medium an image according to the set of image data; and

a medium conveying means for conveying the recording medium to said image printing means.

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**5,745,256**

## IMAGE PROCESSING CONTROLLER

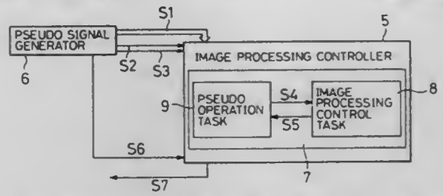
**Masaya Fujimoto, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan**

**Filed Jan. 23, 1995, Ser. No. 377,117**

**Claims priority, application Japan, Jan. 27, 1994, 6-007456**

**Int. Cl.[6] H04N *1/00***

**U.S. Cl. 358—434** **12 Claims**




1. An image processing controller which sets various data necessary for an image forming operation by performing a data communication with an operation unit of an image forming apparatus, said image processing controller comprising:

pseudo operation means having a function equivalent to a function of an operation unit of an image forming apparatus with respect to data transfer; and

image processing control means for performing a handshaking operation with the pseudo operation means.

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**5,745,257**

## COMMUNICATION DEVICE

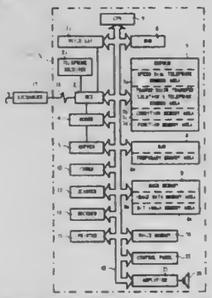
**Tokunori Kato, Ichinomiya, and Junji Hatamura, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Dec. 19, 1995, Ser. No. 574,688**

**Claims priority, application Japan, Dec. 28, 1994, 6-327871; May 16, 1995, 7-116976; May 19, 1995, 7-121179**

**Int. Cl.[6] H04N *1/00***

**U.S. Cl. 358—440** **15 Claims**



9. A data forwarding method for forwarding data from a sending device to a receiving device through an intermediate device, comprising the steps of:

setting an operating condition for the intermediate device;

setting a retransmission function to a forwarding destination appropriate to the operating condition;

storing a telephone number for each recipient of the retransmission function in a first memory;

detecting an incoming communication;

storing the incoming communication in a second memory;

determining if identification data accompanies the incoming communication; and

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executing the retransmission function to the forwarding destination when the identification data matches a condition for executing the retransmission function, wherein the condition for executing the retransmission function excludes retransmitting the incoming transmission to a source of the incoming transmission.

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5,745,258

## IMAGE CONTROL APPARATUS WITH A PLURALITY OF FUNCTIONAL UNITS PROVIDED ON SEPARATE PRINTED BOARDS, AND MOUNTING STRUCTURE OF THE PRINTED BOARDS

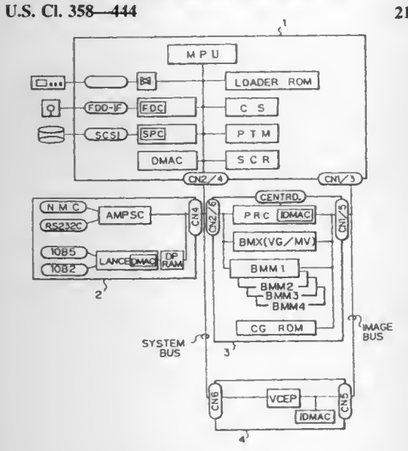
**Ichiro Kawabata; Atsuo Matsunaga; Katsuaki Furui, and Tomomi Ohta, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan**

**Continuation of Ser. No. 89,295, Jul. 9, 1993, abandoned. This application Sep. 27, 1995, Ser. No. 534,303**

**Claims priority, application Japan, Jul. 29, 1992, 4-202553; Jul. 29, 1992, 4-202554**

**Int. Cl.[6] H04N *1/40*; H05K *7/00***

**U.S. Cl. 358—444** **21 Claims**




1. An image control apparatus, comprising:

a communication control unit for effecting communication with the outside of the apparatus;

an image processing control unit for controlling processings required for given image data;

a main control unit for controlling the communication control unit and the image processing control unit;

a first printed board mounting thereon said communication control unit;

a second printed board mounting thereon said image processing control unit;

a third printed board mounting thereon said main control unit;

a first connector for connecting and disconnecting said first printed board and said third printed board;

each of the communication control unit and the image processing control unit including a control register and an acknowledgment circuit,

wherein said main control unit includes a connector that is coupled in a lateral direction to a corresponding connector of said communication control unit, said main control unit further including another connector that is coupled to a corresponding connector of a development unit in an up-and-down direction, said development unit having another connector that is coupled in a lateral direction to a corresponding connector of said image processing control unit.

5,745,259

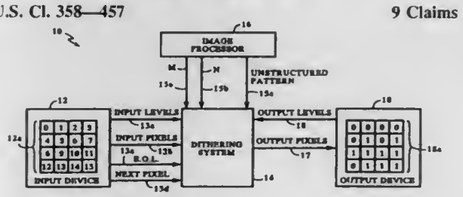
## VOID AND CLUSTER APPARATUS AND METHOD FOR GENERATING DITHER TEMPLATES

**Robert Alan Ulichney, Stow, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Continuation of Ser. No. 961,244, Oct. 15, 1992, Pat. No. 5,535,020. This application Jan. 29, 1996, Ser. No. 592,913**

**Int. Cl.[6] H04N *1/40***

**U.S. Cl. 358—457** **9 Claims**




1. A method for generating an output image having a first number of representation levels from an input image having a second, greater number of representation levels, said method comprising the steps of:

storing, in a memory, a dither template comprising an array of elements representing a uniform distribution of integer threshold values, the dither template elements being generated by a plurality of patterns, each pattern having a plurality of elements, each element having a value, wherein the value of each element of said patterns is determined by filtering said pattern; and

determining, for each input image pixel, responsive to a value of said each input image pixel and responsive to an integer threshold value at a location of said dither template corresponding to said location of said each input image pixel, an output image pixel value.

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5,745,260

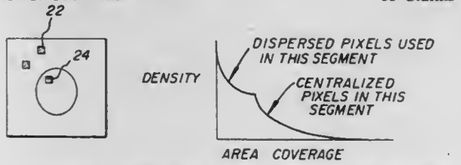
## COARSE/FINE FONTS

**Richard N. Blazey, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 20, 1995, Ser. No. 575,745**

**Int. Cl.[6] G06F *15/00***

**U.S. Cl. 358—456** **15 Claims**




1. A method for generating a font for use in digital halftoning comprising the steps of:

providing a computational element capable of performing digital halftoning algorithms;

inputting a digitized version of a continuous toned image into the computational element;

dividing the digitized image into a series of macropixel elements, where each macropixel is made up of N micropixels;

identifying a central feature area and a detached micropixel areas within each macropixel, wherein the detached micropixel area is separated from the central feature area;

generating an integral number of micropixels to represent detached micropixel areas, where the integral number is a fraction of a central feature area total;

representing the macropixel with a font generated from the central area feature and a reconstituted detached area feature, the reconstituted detached area feature employing the fraction to determine density of the detached area.



5,745,261

## REPRODUCTION OF PICTORIAL MASTERS

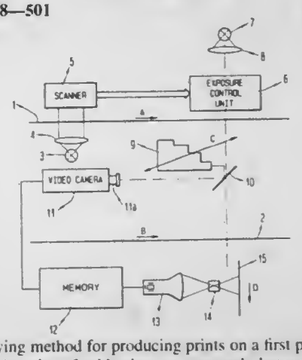
**Jörk Hebenstreit, Jena; Wilfried Reichel, Gera, and Helmut Bock, Jena, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Continuation of Ser. No. 116,054, Sep. 2, 1993, abandoned. This application Jul. 3, 1996, Ser. No. 675,519**

**Claims priority, application Germany, Sep. 11, 1992, 42 30 449**

**Int. Cl.[6] H04N *1/46***

**U.S. Cl. 358—501** **25 Claims**




1. A copying method for producing prints on a first photographic material and copies of said prints on a second photographic material, comprising the steps of determining exposure data, which is optimized as to color or density or both, for a master; making a first copy of a selected major portion of said master on said first photographic material using radiation which has a color composition based on said exposure data;

converting an image resulting from said radiation into a set of image signals representing at least one predetermined portion of said master, and using said image signals to produce said second copy of said predetermined portion on a second photographic material.

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5,745,262

## IMAGE READ-OUT AND PROCESSING APPARATUS HAVING A PARAMETER CORRECTION CIRCUIT

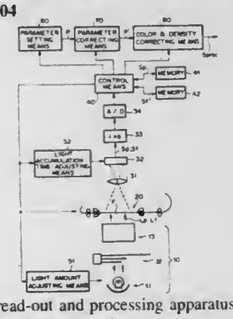
**Setsuji Tatsumi, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan**

**Filed Oct. 16, 1996, Ser. No. 720,976**

**Claims priority, application Japan, Oct. 16, 1995, 7-266816**

**Int. Cl.[6] H04N *1/46*; G03F *3/08***

**U.S. Cl. 358—504** **25 Claims**



1. An image read-out and processing apparatus comprising:

i) an image read-out section for:

carrying out a preliminary read-out operation by irradiating light, which has been produced by a light source, to an image storage sheet, on which an image has been recorded, and by detecting the light carrying image information representing the image, which light has passed through the image storage sheet or has been reflected by the image storage sheet, with a photoelectric conversion means, the image information being detected under read-out conditions, in which the amount of light irradiated to the image storage sheet and/or the light accumulation time of the photoelectric conversion means is set to be equal to a predetermined value, and

carrying out a final read-out operation by irradiating light, which has been produced by a light source, to the image storage sheet and by detecting the light carrying the image information representing the image, which light has passed through the image storage sheet or has been reflected by the image storage sheet, with a photoelectric conversion means, final read-out image information being thereby obtained, the amount of light irradiated to the image storage sheet and/or the light accumulation time of the photoelectric conversion means being adjusted appropriately in the final read-out operation in accordance with preliminary read-out image information, which has been obtained from the preliminary read-out operation, and

ii) an image processing section provided with a color and density correcting means for correcting the final read-out image information such that the color and the density of the image may become appropriate, and for determining the degree of correction, which is carried out on the final read-out image information, in accordance with a parameter, which is set in accordance with the preliminary read-out image information,

wherein the image read-out and processing apparatus further comprises a parameter correcting means for correcting the parameter in accordance with the final read-out image information.

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5,745,263

## COLOR CORRECTING METHOD AND PRINTING APPARATUS IN COLOR PRINTER

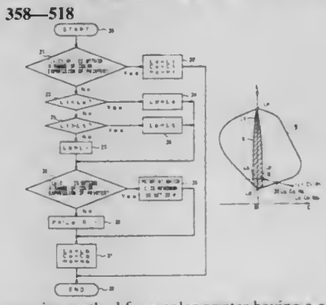
**Akira Oryo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Jul. 19, 1995, Ser. No. 504,154**

**Claims priority, application Japan, Jul. 26, 1994, 6-193552**

**Int. Cl.[6] G03F *3/08***

**U.S. Cl. 358—518** **7 Claims**



1. A correcting method for a color printer having a color expression range which is expressed by lightness, saturation, and hue, said correcting method comprising the steps of:

comparing input image data which is expressed by lightness, saturation, and hue with said color expression range of the color printer;

using said input image data as output data for said color printer in respect to a portion of said input image data which, in said comparing, is found to overlap with the color expression range of said color printer;

with respect to another portion of the input image data which does not overlap the color expression range of the color printer, forming respective output data for said color printer by changing the lightness of said other portion of the input image data to a point on the outer edge of the color expression range of the color printer; and

when the lightness of the input image data is larger than the lightness of the image that can be outputted from said color

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printer, obtaining a lightness Li' by correcting a lightness Li of the input image data in accordance with the following expression in which a maximum value of the lightness of the input image data is set to Lmax, a minimum value of said lightness is set to Lmin, an upper limit of the color expression range of said color printer is set to Lh, and a lower limit is set to Ld:

$$Li' = \frac{(Lh - Ld)}{(L_{max} - L_{min})} (Li - L_{min}) + Ld$$

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**5,745,264**

**Patent Not Issued For This Number**

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**5,745,265**

**OPTICAL ELEMENT UTILIZED FOR OPTICAL STORAGE UNIT AND OPTICAL DEVICE INCLUDING THE OPTICAL ELEMENT**

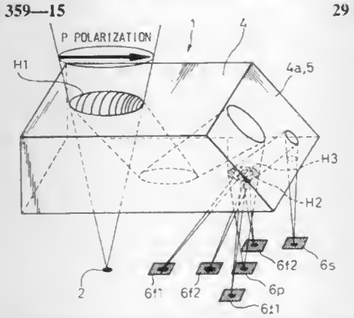
**Shinya Hasegawa; Kohichi Tezuka, and Hiroyasu Yoshikawa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Feb. 7, 1996, Ser. No. 597,710**

**Claims priority, application Japan, Feb. 7, 1995, 7-018865; Jan. 19, 1996, 8-007737**

**Int. Cl.[6] G02B** *5/32;5/18;* **G11B** *7/135*

**U.S. Cl. 359—15** **29 Claims**




1. An optical element utilized for an optical storage unit including:

an optical substrate made of a material allowing the transmission of a laser beam emitted from a semiconductor laser, and disposed between the semiconductor laser and an optical storage unit including an optical storage medium;

a first hologram formed on said optical substrate in such a manner as to transmit the laser beam emitted from the semiconductor laser, and to allow it to be incident into said optical storage medium and to diffract the laser beam reflected by said optical storage medium into said optical substrate;

a second hologram formed on said optical substrate in such a manner as to transmit one of two polarization components contained in said laser beam diffracted by said first hologram and propagating inside said optical substrate, to diffract another one of said two polarization components and to thus separate said two polarization components; and

a third hologram formed on said optical substrate in such a manner as to diffract the laser beam diffracted by said first hologram;

wherein said first hologram is disposed in such a manner that the direction of a grating thereof is at right angles to the direction of linear polarization of said laser beam emitted from said semiconductor laser, and said second hologram is disposed in such a manner that the direction of a grating thereof is optically inclined at 45° to the direction of the grating of said first hologram.

**5,745,266**

**QUARTER-WAVE FILM FOR BRIGHTNESS ENHANCEMENT OF HOLOGRAPHIC THIN TAILLAMP**

**Ronald T. Smith, Corona Del Mar, Calif., assignor to Raytheon Company, Lexington, Mass.**

**Filed Oct. 2, 1996, Ser. No. 665,278**

**Int. Cl.[6] G03H** *1/00*

**U.S. Cl. 359—34** **9 Claims**




1. A holographic rear exterior lamp for a vehicle, comprising:

a light pipe having first and second opposing surfaces;

a rear exterior lamp hologram attached to one of said first and second opposing surfaces of said light pipe;

a polarization rotating retarder film attached to one of said first and second opposing surfaces oppositely from said rear exterior lamp hologram;

means for providing a reconstruction beam;

holographic coupling means attached to one of said first and second opposing surfaces of said light pipe for coupling said reconstruction beam into said light pipe such that a portion of said reconstruction beam propagates as internally reflected light pursuant to internal reflection within said light pipe, said rear exterior lamp hologram and said polarization rotating retarder film;

said polarization rotating retarder film configured to impart a substantially halfwave retardance to internally reflected light that passes twice therethrough;

whereby said rear exterior lamp hologram diffracts a portion of said internally reflected light to provide rear exterior lamp illumination.

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**5,745,267**

**APPARATUS FOR MAKING HOLOGRAMS INCLUDING A VARIABLE BEAM SPLITTER ASSEMBLY**

**Stephen J. Hart, San Clemente, Calif., assignor to Voxel, Laguna Hills, Calif.**

**Continuation of Ser. No. 323,568, Oct. 17, 1994, Pat. No. 5,592,313, which is a continuation of Ser. No. 982,316, Nov. 27, 1992, abandoned. This application Aug. 15, 1996, Ser. No. 698,119**

**Int. Cl.[6] G03H** *1/18;1/28*

**U.S. Cl. 359—35** **21 Claims**

1. An apparatus for making holograms, comprising:

a reference beam source for generating a reference beam;

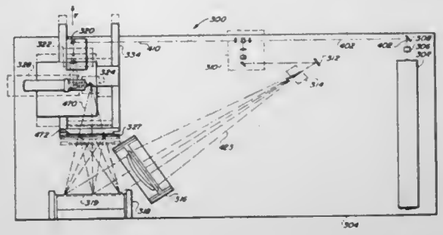
an object beam source for generating an object beam;

a substrate holder disposed in the beam paths of the beams generated by said reference beam source and said object beam source;

object projection assembly for sequentially projecting multiple two-dimensional images upon said substrate holder;

means for controlling the effective exposure energy of each image;






means for varying the distance between said projection assembly and said substrate holder, such that each of said two dimensional images is projected onto said substrate holder at a predetermined respective distance from said substrate holder; and,

a second means for controllably varying a beam splitter assembly to allocate said source beam into said reference and said object beam in accordance with the image content of a plurality of data slices.

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**5,745,268**

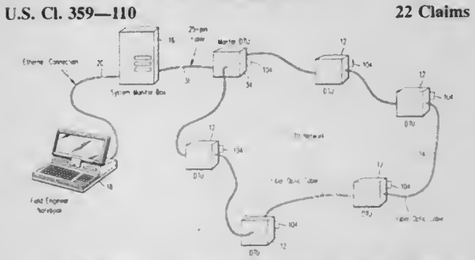
**VASCULAR PORTABLE ASSISTANT COMPUTER SYSTEM**

**Roger Eastvold, Newport Beach; Tim Peeler, Mission Viego; Dimitrios Loumakis, Lake Forrest; Milutin Nikolic, Santa Marguarita; Jyoti Lachhwani, San Clemente; Dan Durick, Newport Beach; Hatem El-Sebaaly, Lake Forest, and Lech Molga, Laguna Niguel, all of Calif., assignors to Toshiba America Medical Systems, Inc., Tustin, Calif.**

**Filed Jun. 7, 1995, Ser. No. 477,297**

**Int. Cl.[6] H04B** *10/08*

**U.S. Cl. 359—110** **22 Claims**




22. An apparatus for communicating with a plurality of devices, each device having a test point and containing one or more electrical components, the plurality of devices collectively implement a diagnostic system, the apparatus comprising

a plurality of distributed test units each capable of issuing instructions to and receiving information from an associated one of the plurality of devices, with each test unit including means for communicating with the associated device for controlling the test point to maintain a desired value at the test point;

a master distributed test unit which directs instructions to the plurality of distributed test units and receives from the plurality of distributed test units information relating to the plurality of devices;

an optical network which permits communication of information among the master distributed test unit and plurality of distributed test units;

a system monitor unit communicating with the plurality of distributed test units by way of the master distributed test unit, the system monitor unit including

a control unit which gathers information from the plurality of distributed test units;

a data base compiled from the information gathered from the plurality of distributed test units; and

a diagnostic unit which analyzes the gathered information and identifies conditions in one or more of the plurality of devices which may require servicing.

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**5,745,269**

**METHOD FOR THE MANAGEMENT OF WAVELENGTH-DIVISION-MULTIPLEXED OPTICAL LOOPS**

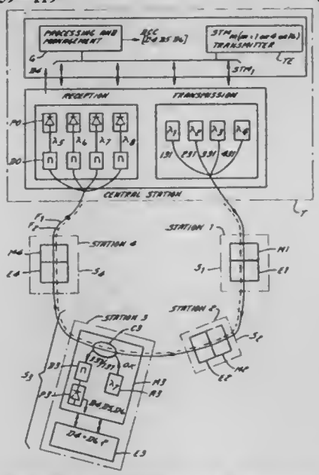
**Mouhammad Jamil Chawki, Lannion; Ivan Le Gac, Perros Guirec, and Valérie Tholey, Lannion, all of France, assignors to France Telecom, Paris, France**

**Filed Mar. 6, 1996, Ser. No. 611,646**

**Claims priority, application France, Mar. 21, 1995, 95 03292**

**Int. Cl.[6] H04B** *10/20;* **H04J** *14/00*

**U.S. Cl. 359—119** **18 Claims**




12. A configuration management system for a network in which data information elements are transmitted between stations on an optical fiber, the configuration system comprising:

the optical fiber; and

the stations including

a plurality of secondary stations, and

a central station, the central station being connected to each of the plurality of secondary stations by the optical fiber, and the central station including

a plurality of optical transmitters which transmit data information elements to the plurality of secondary stations using a plurality of transmission wavelengths, each of the plurality of optical transmitters transmitting configuration messages which each include

a transmitted wavelength identifier which identifies a first wavelength, the first wavelength being one of the plurality of transmission wavelengths and being the transmission wavelength on which the configuration message is transmitted,

a designated station identifier which identifies a secondary station designated by the confirmation message, and an instructed wavelength identifier which identifies a second wavelength, the second wavelength being another one of the plurality of transmission wavelengths and being the transmission wavelength to which the designated secondary station is instructed to tune itself, and

wherein each of the plurality of optical transmitters transmits a configuration message to each of the plurality of secondary stations, such that all of the secondary stations receive a configuration message on all of the transmission wavelengths of the central station.

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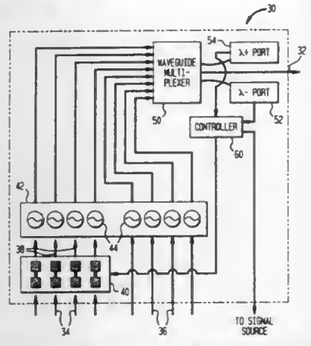


**5,745,270**

## METHOD AND APPARATUS FOR MONITORING AND CORRECTING INDIVIDUAL WAVELENGTH CHANNEL PARAMETERS IN A MULTI-CHANNEL WAVELENGTH DIVISION MULTIPLEXER SYSTEM

**Thomas Lawson Koch, Holmdel, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Mar. 28, 1996, Ser. No. 625,265**
**Int. Cl.[6] H04J** *14/02*
**U.S. Cl. 359—124** **25 Claims**




1. A system for determining if a channel signal assigned to a channel of a discrete wavelength is centered at said discrete wavelength, comprising:

a signal generator source, coupled to said channel, for superimposing a secondary signal over said channel signal; and

at least one signal detector for detecting whether said secondary signal superimposed over said channel signal is maintained at a wavelength center relative to said discrete wavelength,

wherein said at least one signal detector is configured to include a first detector for detecting said secondary signal at wavelengths longer than said discrete wavelength and a second detector for detecting said secondary signal at wavelengths shorter than said discrete wavelength.

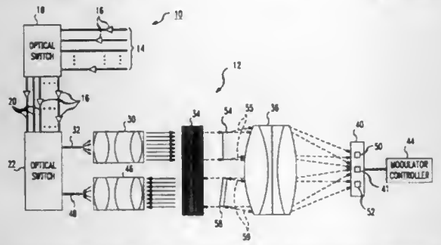
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**5,745,271**

## ATTENUATION DEVICE FOR WAVELENGTH MULTIPLEXED OPTICAL FIBER COMMUNICATIONS

**Joseph Earl Ford, Oakhurst; David Andrew Barclay Miller; Martin C. Nuss, both of Fair Haven, and James Albert Walker, Howell, all of N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.**

**Filed Jul. 31, 1996, Ser. No. 690,696**
**Int. Cl.[6] H04J** *14/02;* **G02B** *6/00*
**U.S. Cl. 359—130** **29 Claims**




1. An optical signal attenuation device for selectively attenuating different wavelength signals contained within a multiplexed transmission, comprising:

a first diffraction element for diffracting the light associated with the multiplexed transmission, wherein each wavelength signal contained within the multiplexed transmission is directed along a separate optical path; and

a modulator disposed along each separate optical path, wherein each modulator receives a wavelength signal from said diffraction element and causes a corresponding signal to be produced at a selective optical signal strength.

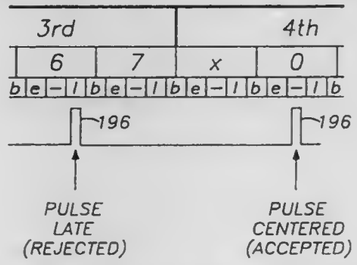
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**5,745,272**

## OPTICAL DATA COMMUNICATION AND LOCATION APPARATUS, SYSTEM AND METHOD AND TRANSMITTERS AND RECEIVERS FOR USE THEREWITH

**Robert T. Shipley, Oakland, Calif., assignor to Fisher Berkeley Corporation, Oakland, Calif.**

**Division of Ser. No. 532,045, Sep. 21, 1995, Pat. No. 5,633,742, which is a continuation-in-part of Ser. No. 309,848, Sep. 21, 1994, abandoned. This application Oct. 15, 1996, Ser. No. 732,657**
**Int. Cl.[6] H04J** *14/08;* **H04B** *10/06*
**U.S. Cl. 359—137** **4 Claims**




1. A receiver for use in an optional data communication and location system for at least one location for receiving optical data from a plurality of transmitters, each being capable of transmitting by optical energy data packets of data pulses representing bits of binary data comprising circuit means for receiving data packets from the transmitters, said circuit means including a receiving clock, means under the control of the receiver clock for receiving at least two frames in each data packet and at least two data slots in each frame and for receiving from each frame only one pulse in one data time slot, each data time slot being divided into three legal pulse position areas identified respectively as "early", "centered" and "late" and means coupled to the receiver clock such that when a pulse is received "early" the receiver clock is adjusted forward by one said pulse position area of a time slot so that the next pulse received will be "centered" and when a pulse is received "late", the receiver clock is adjusted back by one said pulse position area of a time slot so that the next pulse received will be "centered";

and means in the receiver for rejecting a data packet if any pulse therein arrives at a time in the data time slot which is not "early", "centered" or "late" and which is bridging two time slots.

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**5,745,273**

## DEVICE FOR SINGLE SIDEBAND MODULATION OF AN OPTICAL SIGNAL

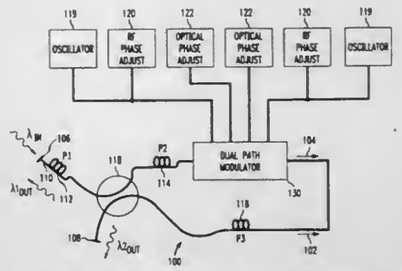
**Robert Meachem Jopson, Rumson, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Nov. 27, 1996, Ser. No. 772,444**
**Int. Cl.[6] H04B** *10/04*
**U.S. Cl. 359—181** **8 Claims**

1. A single sideband modulator circuit for modulating an optical signal with an RF signal to produce a single sideband frequency shifted replica of the optical signal, the optical signal being carded by an optical fiber, said circuit comprising:

optical signal phase adjust means for adjusting the phase angle of the optical signal;






RF signal phase adjust means for adjusting the phase angle of the RF signal;

a dual path modulator connected to said optical signal phase adjust means and to said RF signal phase adjust means and having two optical signal terminals for inputting and outputting optical signals and a first electrical terminal for inputting the RF signal in a first direction, the optical signal being input to one of said optical signal terminals so that the optical signal propagates through the dual path modulator in said first direction for forming a first optical output signal having a first sideband and at least one of a carrier band and a second sideband and that is output at the other of said optical signal terminals, the optical signal also being input to said other optical signal terminal so that the optical signal propagates through the dual path modulator in a second direction different from said first direction of the RF signal for forming a second optical output signal having said at least one of said carrier band and said second sideband and that is output at said one optical signal terminal; and

a combiner for combining the first and second optical output signals to form a combined optical output signal having a first power level so that said at least one of said carrier band and said second sideband in the first and second optical output signals cancel out.

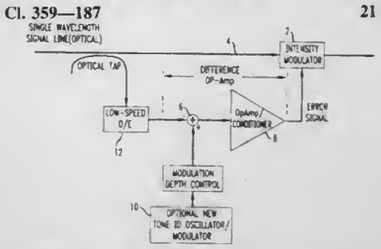
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**5,745,274**

## MAINTENANCE OF OPTICAL NETWORKS

**Mohammad T. Fatehi, and Fred Ludwig Heismann, both of Monmouth County, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Dec. 27, 1995, Ser. No. 579,529**
**Int. Cl.[6] H04B** *10/04;10/16*
**U.S. Cl. 359—187** **21 Claims**




1. Apparatus disposed along an optical transmission line for adding a dither signal to an optical carrier modulated with an information signal, comprising:

a dithering element having an input and output disposed in series with a transmission line carrying an optical carrier modulated with an information signal;

a differential element having an inverting input, a non-inverting input, and an output coupled to the input of the dithering element;

a signal generator for producing a desired dither signal to be added to the modulated optical carrier, the dither signal generator being coupled to the non-inverting input of the differential element, and

a feedback element for producing a signal related to the output of the dithering element and coupling the signal related to the output of the dithering element to the inverting input of the differential element.

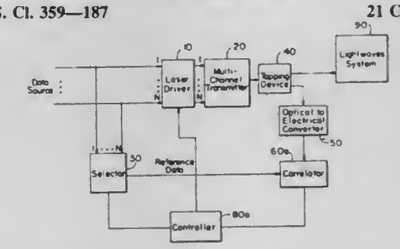
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**5,745,275**

## MULTI-CHANNEL STABILIZATION OF A MULTI-CHANNEL TRANSMITTER THROUGH CORRELATION FEEDBACK

**Clinton Randy Giles, Morganville, and Martin Zirngibl, Middletown, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Oct. 15, 1996, Ser. No. 729,934**
**Int. Cl.[6] H04B** *10/04*
**U.S. Cl. 359—187** **21 Claims**




1. A correlation feedback multi-channel stabilization system comprising:

a data source for generating N data channels;

a laser driver for receiving said N data channels from said data source and for generating a driving signal for each of said N data channels;

a multi-channel transmitter for receiving said driving signals for each of said N data channels from said laser driver and for generating a total power output signal;

means for tapping a sample of light, said tapping means receiving said total power output signal from said multi-channel transmitter and splitting said total power output signal into two tap signals;

means for converting an optical signal to an electrical signal, said conversion means receiving one of the tap signals from said tapping means and generating an output electrical signal;

means for correlating said output electrical signal and at least one reference data signal from a set of reference data signals associated with each of said N data channels and for generating at least one correlation voltage; and

a controller for receiving said at least one correlation voltage from said correlating means and for adjusting at least one of a '0' current level, a '1' current level, a current bias and a modulation current of at least one of said N data channels as a function of said at least one correlation voltage, wherein said controller generates at least one correction signal used to control said at least one of a '0' current level, '1' current level, current bias and modulation current of said associated N data channels via a feedback loop connected to said laser driver.

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**5,745,276**

## UNIVERSAL OPTICAL SIGNAL RECEIVER

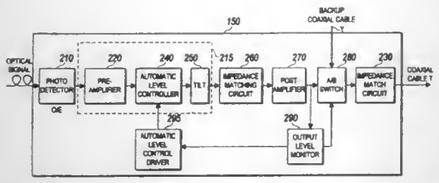
**Ching Ho; Yue-Syan Jou, both of San Jose; Chun-Meng Su, Moraga; Peter Wang, Sunnyvale, and Yong Cheng Tu, Santa Clara, all of Calif., assignors to Qualop Systems Corporation, Sunnyvale, Calif.**

**Filed Apr. 27, 1995, Ser. No. 430,893**
**Int. Cl.[6] H04B** *10/06*
**U.S. Cl. 359—189** **19 Claims**

1. An optical receiver comprising:

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a photo detector disposed to receive an input optical signal having a plurality of channels at selected wave bands for converting said input optical signal to a corresponding electrical signal;

a first impedance matching circuit coupled to said photo detector for maintaining a substantially consistent power level across said plurality of channels; and

a second impedance matching circuit coupled to said first impedance matching circuit for transmitting said electrical signal onto a coaxial cable, said second impedance matching circuit being effective for reducing return loss in electric signals transmitted from said second impedance matching circuit to a coaxial cable.

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**5,745,277**

**SCANNER OPTICS AND IMAGE FORMATION APPARATUS USING THE SAME**

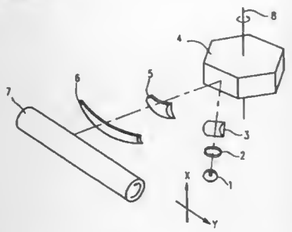
**Kazutake Boku, Yao; Motonobu Yoshikawa, Osaka; Yoshiharu Yamamoto, Toyonaka; Hironori Nakashima, Takarazuka, and Akinori Yusa, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Filed May 19, 1995, Ser. No. 445,175**

**Claims priority, application Japan, May 23, 1994, 6-108723**

**Int. Cl.[6] G02B** *26/08*

**U.S. Cl. 359—207** **3 Claims**




1. A scanner optics for deflecting a laser light flux emitted from a light source with a polygon mirror and scanning a scanning surface with the deflected laser light flux via a condensing lens arrangement, the condensing lens arrangement comprising: a first aspherical lens having a positive refractive power and a convex meniscus surface on a side of the scanning surface; and a second toric lens having a positive refractive power, the refractive power of the second toric lens in a sub-scanning direction at a center portion in a scanning direction being different from the refractive power of the second toric lens at a peripheral portion;

wherein an emergent surface of the second toric lens is barrel toroidal where a point on the emergent surface has a smaller radius of curvature in the sub-scanning direction as the point is farther from the optical axis in the scanning direction.

**5,745,278**

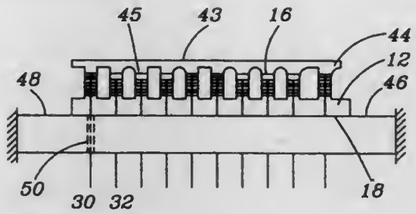
**INNOVATIVE DEFORMABLE MIRROR ACTUATOR CONFIGURATION**

**Carlo La Fiandra, New Canaan, Conn., assignor to Raytheon Optical Systems, Inc., Danbury, Conn.**

**Filed Feb. 5, 1997, Ser. No. 796,008**

**Int. Cl.[6] G02B** *26/08*

**U.S. Cl. 359—224** **7 Claims**




1. An assembly comprising:

a base;

a thin optical substrate having a light reflective first surface and an opposite back surface;

coupling means for controllably movably coupling said back surface of said optical substrate and said base to one another; and

said coupling means including a plurality of piezoelectric actuators, each actuator including opposite vertically extending sides and a configuration of multilayers comprised of oppositely charged electrodes which are printed onto stacked layers of ceramic in a vertically interdigitated manner, the stacked electrodes extending to one of said vertically extending sides depending on the designated polarity, the plurality of actuators being integrally connected to the base such that an array length of said actuators creates a pocketcomb-like configuration.

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**5,745,279**

**COLLIMATOR FOR RADIATION THERAPY**

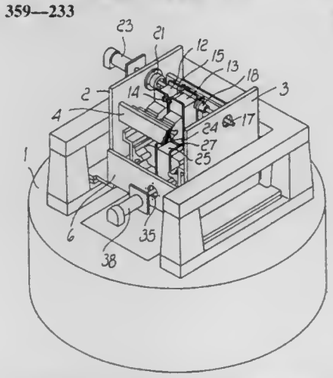
**Doriano Ciscato; Aldo Rossi; Federico Colombo, all of Padova, and Angiolino Grillini, S. Lazzaro Di Savena, all of Italy, assignors to Bassano Grimeca S.p.A., Ceregnano, Italy**

**Filed Nov. 27, 1996, Ser. No. 757,722**

**Claims priority, application Italy, Mar. 6, 1996, B096A0116**

**Int. Cl.[6] G02B** *26/02*

**U.S. Cl. 359—233** **10 Claims**




1. A collimator for radiation therapy, particularly for medical use, comprising:

an upper pair of deflecting blocks mutually arranged with respect to one another to define an upper slit extending in a first plane, said upper pair of deflecting blocks being adapted for deflecting a radiation-therapy beam so as to guide the beam in said upper slit;



a lower pair of deflecting blocks mutually arranged with respect to one another to define a lower slit extending in a second plane, said lower pair of deflecting blocks being adapted for deflecting the radiation-therapy beam so as to guide the beam in said lower slit;

a pair of mutually perpendicular guides upon a respective one of which a respective one of said pairs of deflecting blocks is slidably movable; and

motor means for slidably moving said pairs of deflecting blocks along said guides;

said upper pair of deflecting blocks being arranged above said lower pair of deflecting blocks such that a substantially linearly extending gap is defined extending through said upper slit and said lower slit in correspondence with an intersection of said first and second planes for directing said radiation-therapy beam through said linear gap.

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**5,745,280**

**LIGHT MODULATION APPARATUS AND METHOD FOR MAKING LIGHT MODULATION APPARATUS**

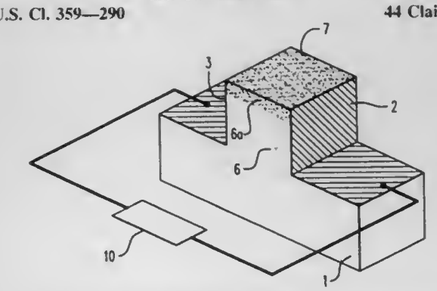
**Hirohisa Kitano, Osaka, Japan, assignor to Minolta Co., Ltd., Osaka, Japan**

**Filed Feb. 1, 1994, Ser. No. 189,765**

**Claims priority, application Japan, Feb. 4, 1993, 5-017211**

**Int. Cl.[6] G02B** *26/00*

**U.S. Cl. 359—290** **44 Claims**




1. A light modulating apparatus comprising:

a material having an electro-optic effect, said material including a portion where an electric field is applied, wherein an electrical characteristic of a part of said portion is modified so as to avoid residual electrical charge within said portion; and

means for applying an electric field to said portion of said material.

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**5,745,281**

**ELECTROSTATICALLY-DRIVEN LIGHT MODULATOR AND DISPLAY**

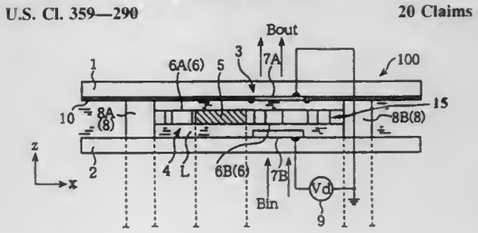
**You-Wen Yi, Yokohama, and Mitsuchika Saito, Kawasaki, both of Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Dec. 20, 1996, Ser. No. 771,566**

**Claims priority, application Japan, Dec. 29, 1995, 7-352615**

**Int. Cl.[6] G02B** *26/00*

**U.S. Cl. 359—290** **20 Claims**




1. A light modulation device comprising:

a lithium niobate light modulator for modulating light from a light source in accordance with an input electrical signal, and then outputting the modulated light, the lithium niobate light modulator having a terminal for terminating said electrical signal;

a variable bias amplifier for amplifying said electrical signal to a level where it can drive said lithium niobate light modulator, and then outputting the amplified signal to said lithium niobate light modulator, the variable bias amplifier including an amplifying element at an output stage, a bias voltage of the amplifying element being set by an externally supplied DC voltage; and

a bias control circuit for supplying said DC voltage to said variable bias amplifier, and supplying, to said terminal via a terminating resistor, a DC operating voltage for setting a modulation operating point of said lithium niobate light modulator.

**5,745,282**

**LIGHT MODULATION DEVICE**

**Keiji Negi, Tokyo, Japan, assignor to Ando Electric Co., Ltd., Tokyo, Japan**

**Filed Mar. 26, 1996, Ser. No. 621,963**

**Claims priority, application Japan, Mar. 28, 1995, 7-070047**

**Int. Cl.[6] G02F** *1/00*

**U.S. Cl. 359—322** **6 Claims**




1. A light modulation device comprising:

a substrate pair including a first substrate and a second substrate positioned parallel to each other and spaced from one another to define a cavity;

an opaque light shielding layer located on at least one of the substrates, the light shielding layer defining a translucent window;

a shutter assembly located in the cavity, the shutter assembly including:

a shutter plate movably mounted adjacent the window,

a shutter suspension comprising elastic support members disposed between the shutter plate and the substrate pair to movably mount the shutter plate, the shutter suspension having a mechanically-stable position and deforming elastically from the mechanically-stable position in response to a change in overlap between the shutter plate and the window, the overlap between the shutter plate and the window controlling an amount of light passing through the window; and

electrodes located on at least two of:

the shutter assembly,

an inside surface of the first substrate, and

an inside surface of the second substrate,

the electrodes being located to change the overlap between the shutter plate and the window by electrostatic force.

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5,745,283

## METHOD AND APPARATUS FOR CONTROLLING OPTICAL AMPLIFIER USED FOR OPTICALLY AMPLIFYING WAVELENGTH-DIVISION MULTIPLEXED SIGNAL

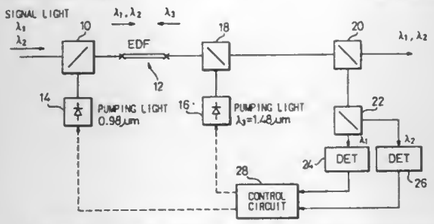
**Shinya Inagaki; Kenji Tagawa, both of Kawaski; Norifumi Shukunami, Sapporo, and Nobuhiro Fukushima, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Aug. 21, 1996, Ser. No. 697,252**

**Claims priority, application Japan, Aug. 23, 1995, 7-214602; Nov. 21, 1995, 7-302907**

**Int. Cl.[6] H01S** *3/00*

**U.S. Cl. 359—341** **26 Claims**




1. A method of controlling an optical amplifier including a rare-earth-doped fiber for optically amplifying a wavelength-division multiplexed signal carrying a plurality of optical signals at respective, different wavelengths, comprising the steps of:

injecting first pumping light into the rare-earth-doped fiber;

injecting second pumping light into the rare-earth-doped fiber, the second pumping light giving a gain characteristic to the rare-earth-doped fiber different from a gain characteristic given thereto by the first pumping light gives; and

controlling respective injection power of the first and the second pumping lights.

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5,745,284

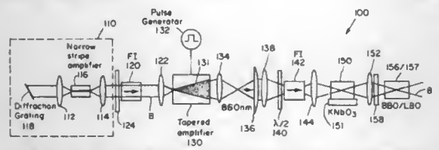
## SOLID-STATE LASER SOURCE OF TUNABLE NARROW-BANDWIDTH ULTRAVIOLET RADIATION

**Lew Goldberg, Fairfax, Va.; Dahv A.V. Kliner, and Jeffrey P. Koplow, both of Cambridge, Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.**

**Continuation-in-part of Ser. No. 609,768, Feb. 23, 1996, abandoned. This application May 1, 1996, Ser. No. 640,568**

**Int. Cl.[6] H01S** *3/00;3/10*

**U.S. Cl. 359—344** **51 Claims**




1. A solid-state tunable ultraviolet laser system, comprising:

a tunable diode laser which generates laser light;

a pulsed optical amplifier which pulse amplifies the laser light and is isolated from the tunable diode laser; and

a frequency conversion stage which converts the pulsed laser light into ultraviolet light.

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5,745,285

## PASSIVE SCENE BASE CALIBRATION SYSTEM

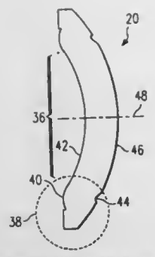
**James A. Harder, Bedford, and Val J. Herrera, Double Oak, both of Tex., assignors to Raytheon TI Systems, Inc., Lewisville, Tex.**

**Filed Oct. 30, 1996, Ser. No. 741,877**

**Int. Cl.[6] G02B** *13/14;3/02*

**U.S. Cl. 359—356** **6 Claims**

1. A field lens in a forward looking infrared system, comprising:




an inner portion having a first surface and a second surface for performing an image forming function therethrough;

an outer portion having said first surface and said second surface for performing a calibration function therethrough, said first and second surfaces at said outer portion having a different curvature than said first and second surfaces at said inner portion.

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5,745,286

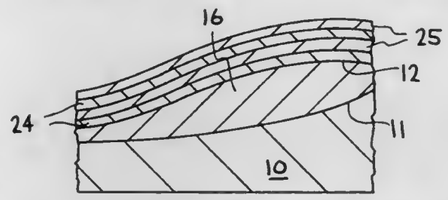
## FORMING ASPHERIC OPTICS BY CONTROLLED DEPOSITION

**Andrew M. Hawryluk, Modesto, Calif., assignor to Regents of the University of California, Oakland, Calif.**

**Filed Oct. 13, 1995, Ser. No. 542,758**

**Int. Cl.[6] G02B** *5/08;1/10;5/10*

**U.S. Cl. 359—359** **20 Claims**




1. An optic component for deep ultra violet and x-ray wavelengths, comprising:

a substrate,

an aspheric surface on said substrate, said aspheric surface being composed of reflective material and

at least one layer of reflective material on said substrate.

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5,745,287

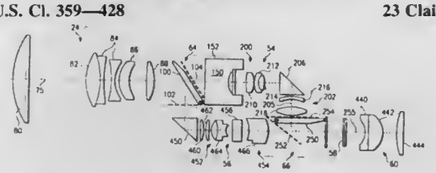
## RETICLE ASSEMBLY FOR OPTICAL SIGHT

**Kenneth W. Sauter, Garland, Tex., assignor to Litton Systems, Inc., Woodland Hills, Calif.**

**Filed Oct. 31, 1996, Ser. No. 741,614**

**Int. Cl.[6] G02B** *23/00;* **F14G** *1/38*

**U.S. Cl. 359—428** **23 Claims**



1. A reticle assembly, comprising:

a housing including a first slot formed along an inside surface by a first set of opposing side walls;

the first slot extending between a first side and a second side of the inside surface of the housing;



the housing including an extended aperture formed in the first slot;

a cross slide disposed in the first slot;

the cross slide including opposing edges engaging the first set of opposing side walls;

the cross slide operable to slide between the first side and the second side of the inside surface;

the cross slide including a second slot formed by a second set of opposing side walls substantially normal to the first set of opposing side walls;

the second slot extending between a third side and a fourth side of the inside surface of the housing;

the cross slide including an elongated aperture formed in the second slot;

a reticle holder disposed in the second slot;

the reticle holder including opposing edges engaging the second set of opposing side walls;

the reticle holder operable to slide between the third side and the fourth side of the inside surface;

the reticle holder including a viewing aperture;

a reticle coupled to the reticle holder in alignment with the viewing aperture;

the viewing aperture operable to overlap the elongated aperture of the cross slide; and

the elongated aperture operable to overlap the extended aperture of the housing.

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5,745,288

## TRANSMISSION TYPE PROJECTION SCREEN

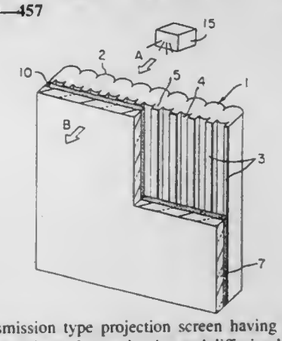
**Hideki Miyata, and Makoto Honda, both of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan**

**Continuation of Ser. No. 432,020, May 1, 1995, abandoned. This application Jun. 3, 1997, Ser. No. 867,880**

**Claims priority, application Japan, May 12, 1994, 6-115831**

**Int. Cl.[6] G03B** *21/60*

**U.S. Cl. 359—457** **16 Claims**




1. A transmission type projection screen having a single or a plurality of lens sheets for condensing and diffusing light; comprising:

lens sheet means having a front side directed to a viewer and a rear side directed to a light source;

a plurality of lenses provided on the rear surface of said lens sheet means at mutually spaced relation along said rear surface, said lenses condensing, on said front side, light received from the light source such that said front side will have dim parts which do not receive the light condensed by said lenses and bright parts which do receive the light condensed by said lenses;

at least one adhesive layer contacting said front side of said lens sheet means only at said dim parts; and

a continuous transparent protective film attached to said front side of said lens sheet means via only said at least one adhesive layer.

whereby air-gaps are formed between said bright parts and said transparent protective film.

5,745,289

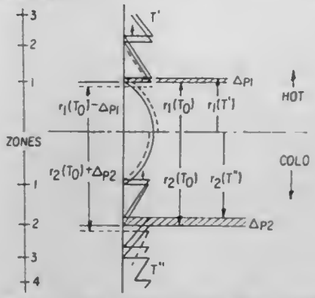
## ATHERMALIZED DIFFRACTIVE OPTICAL ELEMENTS

**David P. Hamblen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 21, 1996, Ser. No. 668,166**

**Int. Cl.[6] G02B** *1/18*

**U.S. Cl. 359—565** **30 Claims**




17. A diffractive optical element (DOE) which comprises a light transmissive body of material subject to changes in dimension with temperature, a plurality of lines on a surface of said body which define a grating having a plurality of zones, successive ones of which zones are adjacent each other, and the spacings between said lines which define the widths zones differing from each other in an amount sufficient to athermalize said DOE across a range of temperature, wherein at least some of the zones have a width greater than their nominal zone widths at a certain temperature, and at least some of the zones have a width less than their nominal zone widths at said certain temperature, said certain temperature being between the lower, cold temperature and the upper, hot temperature ends of said range.

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5,745,290

## BEAM SPLITTER

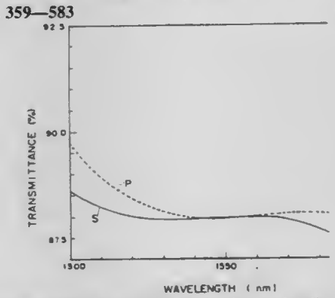
**Hiroaki Matsuda, Sapporo; Hideki Noda, and Nobuhiro Fukushima, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Division of Ser. No. 556,771, Nov. 2, 1995, Pat. No. 5,661,602. This application Mar. 31, 1997, Ser. No. 825,568**

**Claims priority, application Japan, Mar. 16, 1995, 7-057154**

**Int. Cl.[6] G02B** *1/10*

**U.S. Cl. 359—583** **4 Claims**




1. A beam splitter formed by laminating a plurality of optical films on a substrate, wherein:

said substrate comprises a glass substrate having a refractive index of 1.51±0.10; and

said optical films comprise:

a first layer formed on said glass substrate, said first layer having a refractive index of 2.23±0.10 and an optical film thickness of 0.40–0.50;

a second layer formed on said first layer, said second layer having a refractive index of 1.44±0.10 and an optical film thickness of 0.40–0.50;

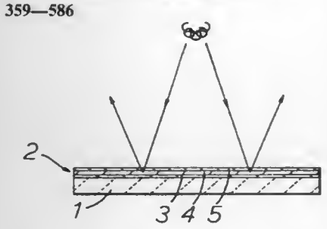
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a third layer formed on said second layer, said third layer having a refractive index of 2.23±0.10 and an optical film thickness of 0.30–0.40;
a fourth layer formed on said third layer, said fourth layer having a refractive index of 1.44±0.10 and an optical film thickness of 0.10–0.20;
a fifth layer formed on said fourth layer, said fifth layer having a refractive index of 2.23±0.10 and an optical film thickness of 0.10–0.20;
a sixth layer formed on said fifth layer, said sixth layer having a refractive index of 1.44±0.10 and an optical film thickness of 0.10–0.20;
a seventh layer formed on said sixth layer, said seventh layer having a refractive index of 2.23±0.10 and an optical film thickness of 0.10–0.20;
an eighth layer formed on said seventh layer, said eighth layer having a refractive index of 1.44–0.10 and an optical film thickness of 0.20–0.30;
a ninth layer formed on said eighth layer, said ninth layer having a refractive index of 2.23±0.10 and an optical film thickness of 0.55–0.65;
a tenth layer formed on said ninth layer, said tenth layer having a refractive index of 1.44±0.10 and an optical film thickness of 0.40–0.50;
an eleventh layer formed on said tenth layer, said eleventh layer having a refractive index of 2.23±0.10 and an optical film thickness of 2.50–3.50; and
a twelfth layer formed on said eleventh layer, said twelfth layer having a refractive index of 1.44±0.10 and an optical film thickness of 0.20–0.30.

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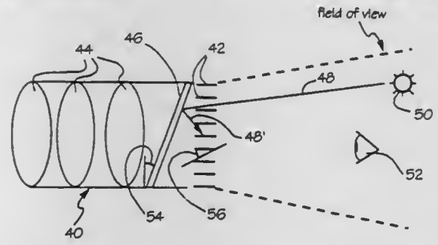
**5,745,291**
**MIRROR INCLUDING A GLASS SUBSTRATE AND A PYROLYTIC SILICON REFLECTING LAYER**
**Timothy Jenkinson, Wigan, United Kingdom, assignor to Pilkington Glass Limited, St. Helens, United Kingdom**
**Continuation of Ser. No. 454,714, May 31, 1995, abandoned, which is a division of Ser. No. 87,329, Jul. 8, 1993, Pat. No. 5,505,989. This application Feb. 10, 1997, Ser. No. 796,457**
**Claims priority, application United Kingdom, Jul. 11, 1992, 9214766; Apr. 30, 1993, 9309036**
**Int. Cl.[6] G02B** *5/08;5/28*
**U.S. Cl. 359—586** **14 Claims**




1. A mirror comprising a glass substrate and a reflective coating carried thereon wherein said coating is selected from the group consisting of:
coating (1): a plurality of layers having at least an inner layer nearest the glass substrate, an outer layer furthest from the glass substrate, and an intermediate layer between the inner and outer layers, wherein the inner layer is a pyrolytic silicon reflecting layer of optical thickness λ/4, where λ is a wavelength of light in the visible region of the spectrum, and the intermediate and outer layers are reflection enhancing layers, and
coating (2): a plurality of layers having at least an inner layer nearest the glass substrate, an outer layer furthest from the glass substrate, and an intermediate layer between the inner and outer layers, wherein the outer layer is a pyrolytic silicon reflecting layer of optical thickness λ/4, where λ is a wavelength of light in the visible region of the spectrum, and the intermediate and inner layers are reflection enhancing layers;
said mirror having a visible light reflection of at least 70%.

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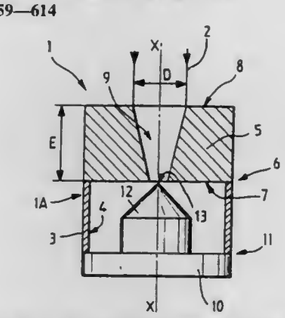
**5,745,292**
**OPTICAL DEVICES AND REFLECTION CONTROL TECHNIQUES**
**Peter W. J. Jones, Belmont, Mass., assignor to Tenebraex Corporation, Boston, Mass.**
**Filed Nov. 25, 1992, Ser. No. 981,877**
**Int. Cl.[6] G02B** *27/00;21/00*
**U.S. Cl. 359—613** **28 Claims**




1. An optical device having an optical axis and a field of view, comprising:
an array of substantially tubular elements positioned in front of a reflective surface, the reflective surface being tilted to a non-orthogonal position with respect to the optical axis of the device wherein at least a substantial portion of light from a source in the field of view of the device and reflected from the surface is not projected outward from the device.

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**5,745,293**
**LIGHT TRAP**
**Martine Lassalle, Voisins le Bretonneux, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France**
**Filed Aug. 28, 1996, Ser. No. 697,558**
**Claims priority, application France, Aug. 28, 1995, 95 10124**
**Int. Cl.[6] E02B** *27/00*
**U.S. Cl. 359—614** **6 Claims**




1. A light trap for a parallel light beam, including an enclosure in the form of a body of revolution comprising:
a lateral wall with an absorbent internal surface;
an entry member disposed longitudinally at one end of said enclosure, having an internal face, an external face and a frustoconical opening through it coaxial with said enclosure through which the light beam enters said enclosure;
a back wall disposed longitudinally at the other end of said enclosure; and
a conical body attached to said back wall and coaxial with said enclosure, the point of the cone facing said frustoconical opening,
wherein:



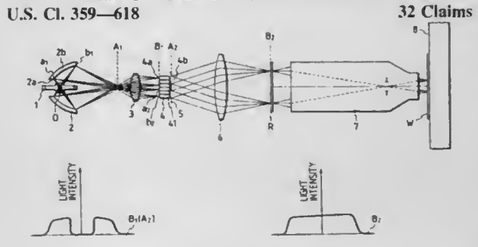
said frustoconical opening narrows in the direction from the external face of said entry member towards the internal face to concentrate the light and has on said external face a diameter equal to the diameter D of said light beam;
said entry member has a thickness E in the longitudinal direction of said enclosure defined by the equation:

$$E=D/(\tan 2A+\tan A),$$

where tan A is the tangent of A and A is the cone angle of said frustoconical opening; and
said conical body is made from a material reflecting light uniformly in all directions.

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**5,745,294**
**ILLUMINATING OPTICAL APPARATUS**
**Yuji Kudo, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan**
**Continuation of Ser. No. 154,548, Nov. 19, 1993, abandoned. This application Mar. 1, 1996, Ser. No. 609,180**
**Claims priority, application Japan, Nov. 24, 1992, 4-312545; May 31, 1993, 5-128642**
**Int. Cl.[6] G02B** *27/10;* **F21V** *29/00;7/00*
**U.S. Cl. 359—618** **32 Claims**

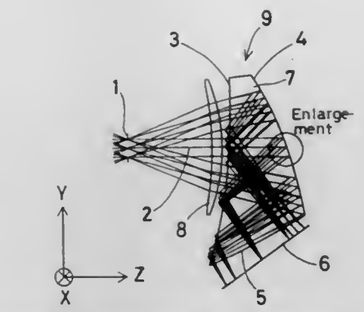



17. An illuminating optical apparatus comprising:
a light source providing a light beam;
a rotationally symmetrical mirror having a non-reflecting area and a light passing area which are spaced along an optical axis of said illuminating optical apparatus, and a reflecting area which extends between said non-reflecting area and said light passing area symmetrically about said optical axis and which reflects said light beam;
a light source image forming device which forms light source images based on the reflected light beam; and
a condensing optical system which condenses light beams from said light source images for uniformly illuminating an object of illumination;
wherein said light source image forming device includes an imaging optical system which forms an image of a portion of said reflecting area which is the closest to said non-reflecting area and an image of a portion of said reflecting area which is closest to said light passing area substantially on a predetermined plane at a surface of said light source image forming device.

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**5,745,295**
**IMAGE DISPLAY APPARATUS**
**Koichi Takahashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**
**Filed Nov. 27, 1996, Ser. No. 757,245**
**Claims priority, application Japan, Nov. 28, 1995, 7-309229**
**Int. Cl.[6] G02B** *27/14*
**U.S. Cl. 359—631** **19 Claims**

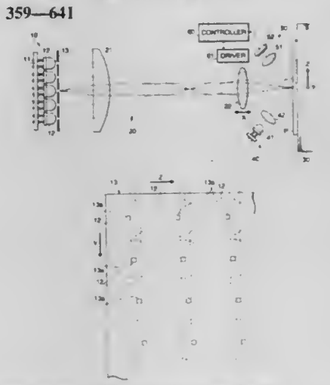
1. An image display apparatus comprising an image display device for displaying an image, and an ocular optical system for projecting the image displayed by said image display device and for leading the projected image to an observer's eyeball,




said ocular optical system including a first optical element and a second optical element,
said first optical element having at least three surfaces, wherein a space formed by said at least three surfaces is filled with a medium having a refractive index larger than 1, said at least three surfaces being, in order in which light rays pass according to backward ray tracing from said observer's eyeball toward said image display device, a first surface which serves as both a refracting surface and an internally reflecting surface, a second surface which is a reflecting surface of positive power facing said first surface and decentered or tilted with respect to an observer's visual axis, and a third surface which is a refracting surface closest to said image display device,
said second optical element having refracting action and being disposed between said first surface and said observer's eyeball.

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**5,745,296**
**MULTIBEAM RECORDING DEVICE**
**Tetsuya Nakamura; Koichi Maruyama, and Takashi Iizuka, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**
**Filed May 16, 1996, Ser. No. 648,767**
**Claims priority, application Japan, May 17, 1995, 7-142744; May 17, 1995, 7-142745; May 17, 1995, 7-142747; Aug. 14, 1995, 7-228531; Aug. 14, 1995, 7-228532**
**Int. Cl.[6] G02B** *27/10*
**U.S. Cl. 359—641** **37 Claims**




1. A multibeam recording device, comprising:
an emitter unit having a plurality of light sources arranged in a two-dimensional pattern;
a reduction lens system for focusing beams emitted by said emitter unit on a photosensitive surface, said reduction lens system including a positive first lens group, for forming collimated beams from light emitted by said emitter unit, and a second lens group, for relaying said collimated beams formed by said first lens group;

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a system that drives said second lens group in the optical axis direction; and

a system that controls said driving system to maintain an in-focus condition of said reduction lens system with respect to said photosensitive surface.

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**5,745,297**

**RETROFOCUS LENS SYSTEM**

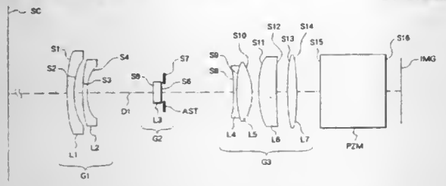
**Toshihide Kaneko; Shinsuke Shikama, and Eiichi Toide, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 11, 1996, Ser. No. 678,691**

**Claims priority, application Japan, Jul. 13, 1995, 7-177570**

**Int. Cl.[6] G02B** *3/00;13/04*

**U.S. Cl. 359—651** **14 Claims**



**1**. A retrofocus lens system comprising, in order from a large conjugate side:

a first lens group having a negative refracting power and including a plurality of lens elements, said first lens group including, in order from the large conjugate side, a first lens element having a negative refracting power and a second lens element having a negative refracting power;

a second lens group having a positive refracting power, said second lens group including, in order from the large conjugate side, a third lens element having a positive refracting power; and

a third lens group having a positive refracting power, said third lens group including, in order from the large conjugate side, a fourth lens element having a negative refracting power, a fifth lens element bonded to said fourth lens element and having a positive refracting power, a sixth lens element having a positive refracting power and a seventh lens element having a positive refracting power;

wherein each of said lens elements of said first lens group has a negative refracting power.

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**5,745,298**

**ZOOM LENS SYSTEM**

**Satoshi Yahagi, Saitama-ken, Japan, assignor to Fuji Photo Optical Co., Ltd., Japan**

**Filed Oct. 2, 1995, Ser. No. 538,009**

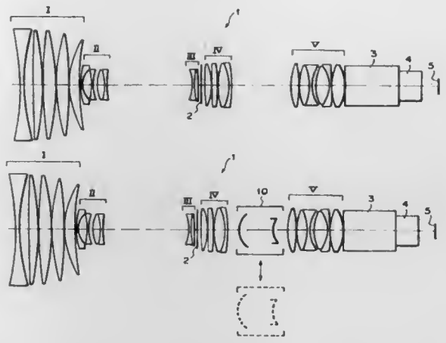
**Claims priority, application Japan, Oct. 13, 1994, 6-247498; Sep. 6, 1995, 7-229204**

**Int. Cl.[6] G02B** *15/14;15/02*

**U.S. Cl. 359—683** **5 Claims**

**1**. A zoom lens system consisting of five adjacent lens groups designated as first to fifth lens groups and arranged serially in this order from the object side, the first, third and fifth lens groups being fixed, the second lens group being moved in the direction of the optical axis of the zoom lens system when zooming the zoom lens system and the fourth lens group being moved in the direction of the optical axis to correct change in the image position due to the zooming and to correct change in the image position due to change in the object distance, characterized in that

the first lens group has a positive refracting power, the second lens group has a negative refracting power, the third lens group has a negative refracting power, the fourth lens group has a positive refracting power and the fifth lens group has a positive refracting power.



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**5,745,299**

**ZOOM LENS SYSTEM**

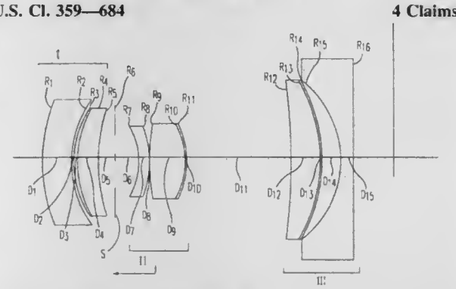
**Noriyuki Iwata, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Oct. 3, 1995, Ser. No. 538,614**

**Claims priority, application Japan, Oct. 3, 1994, 6-239031**

**Int. Cl.[6] G02B** *15/14*

**U.S. Cl. 359—684** **4 Claims**



**1**. A zoom lens system comprising:

a first lens group, a second lens group, and a third lens group, which are sequentially arranged from an object side of the zoom lens system to an image side;

an aperture stop disposed between said first lens group and said second lens; group;

wherein said first lens group and said second lens group have a positive focal length, said third lens group has a negative focal length, and wherein said second lens group is utilized for focusing; and

wherein said aperture stop and said first, second and third lens groups are disposed such that when said zoom lens system performs a zooming operation from a wide-position to a tele-position, said first lens group, said second lens group, said third lens group, and said aperture stop are moved along an optical axis toward said object side of said zoom lens system so that a distance between said first lens group and said aperture stop increases, and so that a distance between said aperture stop and said second lens group increases, and a distance between said second lens group and said third lens group decreases.



**5,745,300**

**ZOOM LENS OF THE INNER FOCUS TYPE**

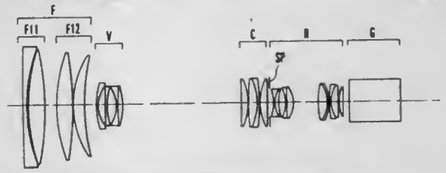
**Fumiaki Usui, and Kiyoshi Fukami, both of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 196,459, Feb. 15, 1994, abandoned. This application May 12, 1997, Ser. No. 854,773**

**Claims priority, application Japan, Feb. 17, 1993, 5-051447; Jul. 29, 1993, 5-207080**

**Int. Cl.[6] G02B** *15/14*

**U.S. Cl. 359—684** **13 Claims**



**1**. A zoom lens comprising, from front to rear:

a first lens unit of positive refractive power, said first lens unit having (a) a fixed front lens subunit having a negative lens and a positive lens and (b) a rear lens subunit of positive refractive power, said rear lens subunit being moved to effect focusing; and

a rear lens unit having a zooming section, wherein the following condition is satisfied,

$$5<\Delta\nu X$$

where $\Delta\nu X$ is a difference between Abbe numbers of said negative lens and said positive lens, said zoom lens further satisfying the following condition:

$$1.04<FN1\leqq 1.55$$

where FN1= f1/(fT/FNT), and wherein f1 and FN1 are a focal length and an F-number of said first lens unit, respectively, and fT and FNT are a focal length and an F-number of said zoom lens in a telephoto end, respectively.

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**5,745,301**

**VARIABLE POWER LENS SYSTEMS FOR PRODUCING SMALL IMAGES**

**Ellis I. Betensky, Toronto, Canada; Melvyn H. Kreitzer, and Jacob Moskovich, both of Cincinnati, Ohio, assignors to BenOpcon, Inc., Cincinnati, Ohio**

**Filed Dec. 19, 1994, Ser. No. 358,927**

**Int. Cl.[6] G02B** *15/14*

**U.S. Cl. 359—689** **35 Claims**

**1**. A variable power lens system for forming an image of an object, said system having a minimum focal length $f_{min}$ and comprising:

(a) a first lens unit having a negative power and a focal length $f_1$;

(b) a second lens unit which (i) is on the image side of said first lens unit, (ii) has a positive power, and (iii) has a focal length $f_2$; and

(c) a third lens unit which is on the image side of said second lens unit, said third lens unit having a focal length $f_3$;

wherein:

the focal length of the lens system is changed by changing the spacing between the first lens unit and the second lens unit;

the ratio of $f_2$ to $f_{min}$ is greater than about 1.3; and

the first lens unit includes only negative lens elements, has a negative power $\Phi_{U1}$ equal to $1/f_1$, and includes a lens surface that:

(i) is concave to the image, and

(ii) has a negative power $\Phi_{U1S}$, the ratio of $\Phi_{U1S}$ to $\Phi_{U1}$ being greater than 1.0.

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**5,745,302**

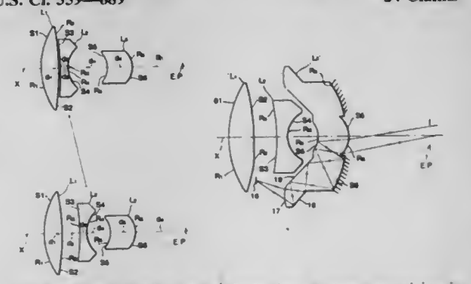
**INVERTED GALILEAN TYPE ZOOM FINDER LENS SYSTEM**

**Kazunori Ohno, Saitama, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan**

**Filed Mar. 25, 1997, Ser. No. 829,821**

**Int. Cl.[6] G02B** *15/14;17/08;* **G03B** *13/02*

**U.S. Cl. 359—689** **24 Claims**



**1**. An inverted Galilean zoom finder lens system comprising in order from the object side to the image side a positive power objective lens, a negative power lens axially movable to change a zoom ratio of the zoom finder lens system, and a negative power eye piece lens having an object side concave surface, said zoom finder lens system satisfying the following conditions:

$$0.6<R_5/R_6<0.9$$

$$-1.8<d_5/R_5<-1.4$$

where

$R_5$ the radius of paraxial curvature of the object side surface of the eye piece lens;

$R_6$ is the radius of paraxial curvature of the image side surface of the eye piece lens; and

$d_5$ is the axial distance between the object side surface and the image side surface of the eye piece lens.

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**5,745,303**

**ZOOM LENS SYSTEM**

**Kazunori Ohno, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama-ken, Japan**

**Filed Jun. 13, 1995, Ser. No. 487,245**

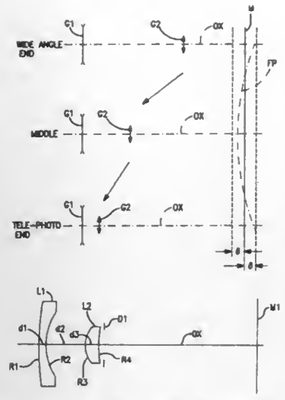
**Int. Cl.[6] G02B** *15/14;3/02*

**U.S. Cl. 359—691** **9 Claims**

**1**. A zoom lens system comprising in order from the object end to the image end a first negative power lens group which is

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stationary with respect to said zoom lens system and a second positive power lens group which is movable along an optical axis of the zoom lens system, said second positive power lens group being changed between two specific axial positions so as to yield a short focal length suitable for wide angle photography and a long focal length suitable for a tele-photography, respectively, the zoom lens system satisfying the following condition:

$$f_W\beta^{1/2}/(1+\beta^{1/2})<f_2\leqq(2\cdot F_{NO}\cdot LD/1500)\cdot\beta^{1/2}/(1\beta^{1/2})^2$$

where $f_w$ is the overall focal length of the zoom lens system at the wide angle end, $\beta$ is the zoom ratio of the zoom lens system which is expressed by a ratio of the overall focal length between the tele-photo end and the wide angle end, $f_2$ is the focal length of the second lens group, $F_{NO}$ is the F number of the zoom lens system at the wide angle end, and LD is the diagonal length of the image area.

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**5,745,304**

**INTEGRATED OPTICAL PICKUP SYSTEM CAPABLE OF READING OPTICAL DISKS OF DIFFERENT THICKNESS**

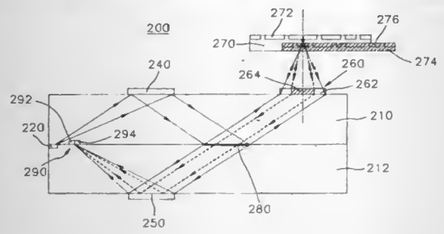
**Hwan-Moon Choi, Seoul, Rep. of Korea, assignor to Daewoo Electronics, Co., Ltd., Seoul, Rep. of Korea**

**Filed Nov. 27, 1996, Ser. No. 757,710**

**Claims priority, application Rep. of Korea, Nov. 27, 1995, 95-43819**

**Int. Cl.[6] G11B** *7/00*

**U.S. Cl. 359—719** **23 Claims**




**10**. An integrated optical pickup system for reading information signals recorded on a recording surface of a selected optical disk, which is selected among N optical disks, N being a positive integer, wherein the distance between a recording surface of each of the N optical disks and the integrated optical pickup system is different from each others, the optical pickup system comprising:

a first glass substrate, having a top and a bottom surfaces, equipped with means for generating N conversed light beams to have one of them impinge onto the recording surface of the selected optical disk and collimating said one of the converged light beams after being reflected from the recording surface of the selected optical disk, the top surface of the first glass substrate being in a facing relation with the optical disk, wherein the first glass substrate includes:

a semiconductor laser for generating a light beam, wherein the semiconductor laser is attached to a predetermined position on the bottom surface of the first glass substrate;

a reflection layer for reflecting a portion of the light beam, wherein the reflection layer is formed on the bottom surface of the first glass substrate at a predetermined distance from the semiconductor laser;

a reflection lens, integrated onto the top surface of the first glass substrate, for collimating the light beam and guiding it to the reflection layer; and

an optical device for converging the collimated light beam into N converged light beams on N different focal positions, wherein each focal position corresponds to the position of the recording surface of each corresponding optical disk and the optical device is integrated onto the top surface of the first glass substrate in a facing relation with the recording surface of the selected optical disk to thereby generate the converged light beam;

a second glass substrate, having a top and a bottom surfaces provided with a detecting lens, wherein the detecting lens is integrated onto the bottom surface of the second glass substrate and the bottom surface of the first glass substrate is coupled with the top surface of the second glass substrate; and

a detector provided with a first and a second reception surfaces for reading the information signals off the recording surface of the selected optical disk.

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**5,745,305**

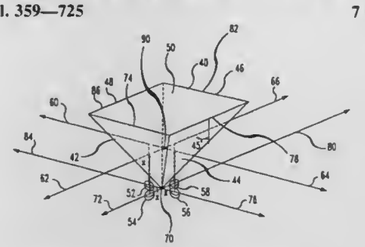
**PANORAMIC VIEWING APPARATUS**

**Vishvjit Singh Nalwa, Middletown, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Apr. 28, 1995, Ser. No. 431,356**

**Int. Cl.[6] G02B** *13/06;* **H04N** *7/00;* **G03B** *37/04*

**U.S. Cl. 359—725** **7 Claims**




**1**. A panoramic viewing apparatus, comprising:

a plurality of image gathering devices, each having an optical center; and

a pyramid shaped element having a base, a vertex and a plurality of reflective side facets facing in different directions so as to reflect images from different directions to said plurality of image gathering devices, each of said plurality of reflective side facets reflecting an image to an image gathering device belonging to said plurality of image fathering devices, each of said optical centers being in a plane parallel to said base and being co-planar to said vertex, and each of said plurality of image gathering devices having a direction of view perpendicular to and in the direction of said base.



**5,745,306**

**INTERNAL FOCUSING TELEPHOTO LENS**

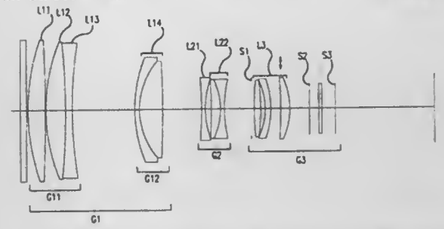
**Susumu Sato, Chiba-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Filed Apr. 17, 1996, Ser. No. 634,032**

**Claims priority, application Japan, May 26, 1995, 7-152709**

**Int. Cl.[6] G02B** *13/02;27/64*

**U.S. Cl. 359—745** **25 Claims**




**1**. An internal focusing telephoto lens having a plurality of lens groups arranged along an optical axis from an object side to an image side to form a total lens system, the telephoto lens comprising:

a first lens group with positive refractive power, said first lens group comprising a front group with positive refractive power and a rear group with positive refractive power;

a second lens group with negative refractive power positioned on the image side of the first lens group; and

a third lens group with positive refractive power positioned on the image side of the second lens group,

wherein said first lens group and said second lens group form a substantially afocal system and focusing is performed by moving said second lens group along the optical axis, and

wherein the condition $0.7<f11/f12<1.4$ is satisfied, where **f11** is a focal length of the front group and **f12** is a focal length of the rear group.

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**5,745,307**

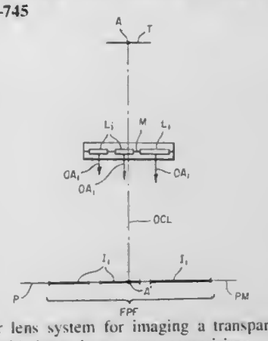
**CLUSTER LENS SYSTEM SUCH AS FOR USE IN PHOTOGRAPHIC PRINTERS**

**Barbara J. Kouthoofd, and Lee R. Estelle, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Continuation of Ser. No. 577,027, Dec. 22, 1995, abandoned. This application May 6, 1997, Ser. No. 851,870**

**Int. Cl.[6] G02B** *13/02;13/04;7/02;* **G03B** *27/44*

**U.S. Cl. 359—745** **9 Claims**




**1**. A cluster lens system for imaging a transparency onto an image plane, said cluster lens system comprising:

a plurality of lenses, which simultaneously have a field of view sufficient to include the transparency, said plurality of lenses having substantially identical image side numerical apertures, and wherein at least two of said plurality of lenses have about 2X magnification and another lens has about 4X magnification;

a mount for said plurality of lenses such that all of said lenses image simultaneously and, said plurality of lenses being located in a spaced relationship to each other so that not one of said plurality of lenses encroaches upon a section of the field of view of another lens that is used to image the transparency onto the image plane, and wherein at least one of said plurality of lenses is a telephoto lens and at least one other of said plurality of lenses is an inverse telephoto lens.

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**5,745,308**

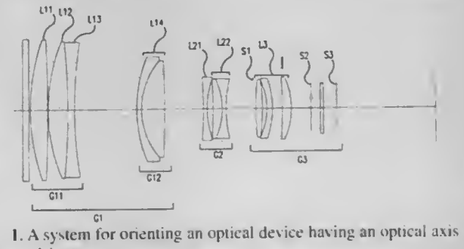
**METHODS AND APPARATUS FOR AN OPTICAL ILLUMINATOR ASSEMBLY AND ITS ALIGNMENT**

**Peter E. Spangenberg, Monroe, Conn., assignor to Bayer Corporation, Tarrytown, N.Y.**

**Filed Jul. 30, 1996, Ser. No. 692,930**

**Int. Cl.[6] G02B** *7/02*

**U.S. Cl. 359—818** **9 Claims**




**1**. A system for orienting an optical device having an optical axis comprising:

a body having a section of a cylinder, the cylinder section having a curvature and a longitudinal axis relative to the curvature corresponding to said optical axis;

a first turnbuckle and a second turnbuckle mounted to a base for rotation, each of the first and second turnbuckles having a left threaded section and a right threaded section, a first slide mounted on the left threaded section for translation along the left threaded section in response to a rotation of the turnbuckle, and a second slide mounted on the right threaded section for translation along the right threaded section in response to said rotation of the turnbuckle, wherein in each of the first and second slides further comprises a surface having a curvature, wherein the curvature of the cylindrical surface section of the slide is perpendicular to the curvature of the cylindrical section of the body;

wherein the body is supported by the surface of the first and second slides, and for a given turnbuckle, the supported body is vertically translated relative to said given turnbuckle by an applied rotation of said turnbuckle to raise or lower the body, and wherein the body can be translated vertically in response to said applied rotation being applied to the first and second turnbuckles equally.

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**5,745,309**

**METHOD FOR REMOVING TILT CONTROL IN ADAPTIVE OPTICS SYSTEMS**

**Joseph Thaddeus Salmon, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Continuation of Ser. No. 516,505, Aug. 17, 1995, abandoned, which is a continuation of Ser. No. 258,892, Jun. 13, 1994, abandoned. This application Mar. 25, 1997, Ser. No. 823,706**

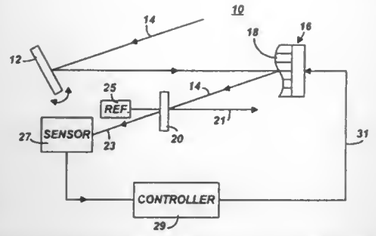
**Int. Cl.[6] G02B** *5/08;7/182;* **G01J** *1/00;1/20*

**U.S. Cl. 359—846** **4 Claims**

**1**. In an adaptive optics system of the type wherein a steering mirror steers an impinging wavefront toward a deformable mirror to impinge on said deformable mirror, said deformable mirror being of the type having its surface deformed selectively by means of a plurality of actuators to compensate for aberrations in said impinging wavefront, and wherein said compensated wavefront from said deformable mirror is sampled by a wavefront sensor array to measure the displacement error of the wavefront, and

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wherein said measured displacement error is coupled through a controller to control the actuators of the deformable mirror, an improved method of controlling the actuators which utilizes a single multiplication of the measured displacement error by a gain matrix, G', to remove tilt components of the measured displacement errors in controlling the actuators, which comprises:

a) adjusting the measured displacement errors to generate signals to control said actuators by multiplying the measured displacement errors by a gain matrix given by

$$G'=(I-X(X^TX)^{-1}X^T)G(I-A)$$

wherein

I=a first matrix, said first matrix is an identity matrix with dimensions of M×M, and M is the number of said actuators,

A=a second matrix, said second matrix multiplied by the measured displacement error yielding an average tilt for all elements of said wavefront sensor array,

z=GS where z is the displacement error vector in the actuators, S is the measured displacement error vector of the wavefront sensor array, and G is an initial gain matrix;

X=is a configuration matrix given by Xc=z where c is the coefficient vector of the planar fit to read z; and

$X^T$ is the transpose of X.

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**5,745,310**

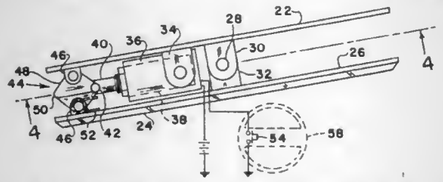
**METHOD AND APPARATUS FOR TEMPORARY VIEW SHIFTING OF VEHICLE SIDE MIRROR**

**Raymond J. Mathieu, 3426 Calumet Rd., Ludlow Falls, Ohio 45339**

**Filed Mar. 25, 1996, Ser. No. 621,786**

**Int. Cl.[6] G02B** *5/08;7/182*

**U.S. Cl. 359—843** **9 Claims**




1. In an apparatus including a mirror mounted on the side exterior of a vehicle for temporarily shifting the viewing angle of the mirror to an angle other than an angle to which the mirror has been preset by the vehicle operator for use during normal driving, said apparatus including:

a base member providing said preset viewing angle of said mirror;

said mirror, when at said preset angle, lying in a generally vertical plane and at an angle substantially perpendicular to said vehicle;

electrically-operable operating means mounting said mirror for limited, essentially instantaneous pivotal movement about a predetermined axis relative to said base member;

a normally-open momentary contact switch accessible to said operator from within said vehicle, said switch being physically activatable and maintainable by said operator in a closed position for energizing said operating means, said switch being dedicated solely to pivot said mirror relative to said base member about said axis to a second angle;

said switch including biasing means quickly restoring said switch to its normally open position to deenergize said operating means and thereby pivoting said mirror from its second angle to said first angle upon discontinuation of physical activation of said switch; and,

means for stabilizing said mirror in both its preset and second angles.

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**5,745,311**

**OPTICAL COMPONENT WELDING APPARATUS**

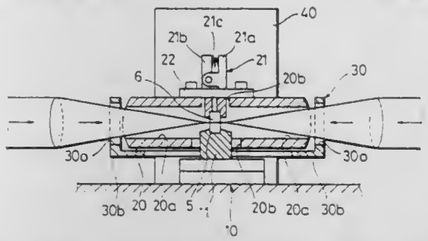
**Satoshi Fukuoka; Motohiro Yamane, and Shizuka Yamaguchi, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 357,726, Dec. 16, 1994, abandoned. This application Aug. 19, 1996, Ser. No. 699,473**

**Claims priority, application Japan, Jan. 28, 1994, 6-008163**

**Int. Cl.[6] G02B** *6/255;* **B23K** *26/00;26/02*

**U.S. Cl. 359—896** **12 Claims**




1. An optical component welding apparatus for welding together first and second optical components each having an optical axis in a Z-axis direction and each having a contact surface, the optical component welding apparatus comprising:

an X—Y stage for fixing the first optical component and aligning the optical axis of the first optical component by moving the first optical component in an X-axis and Y-axis direction;

a fixing disk having a plurality of apertures extending radially of the fixing disk and intersecting one another at a center of the fixing disk with respect to the radial direction, the fixing disk including fixing means for fixing the second optical component in the center of the fixing disk with respect to the axial and radial directions thereof in a manner such that the contact surface of the second optical component faces the contact surface of the first optical component;

a holding member having a plurality of apertures each formed in a position respectively corresponding to a position of one of the plurality of apertures of the fixing disk, the holding member releasably holding the fixing disk and being adapted to carry the fixing disk for axial movement of the fixing disk in a Z-axis direction and for inclined movement of the fixing disk in an inclination direction relative to an X—Y plane;

a Z stage for moving the holding member in the Z-axis direction to fit the respective contact surfaces of the first and second optical components to each other; and

laser emitting heads for emitting a laser beam through corresponding apertures of the fixing disk and holding member to weld the first and second optical components together at the respective fitted contact surfaces thereof, with the optical axes of the first and second optical components in alignment with each other.



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**5,745,312**

**CALCULATING, AT RATE FASTER THAN I-NRZI MODULATION CLOCK RATE, ONES AND ZEROES FOR INSERTION INTO I-NRZI MODULATION**

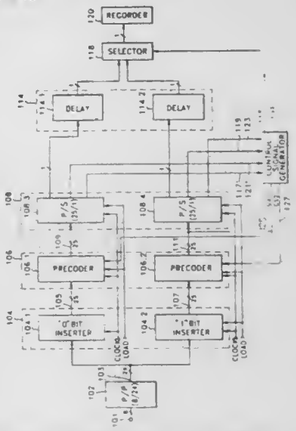
**Soon-tae Kim, Kumi, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Division of Ser. No. 472,275, Jun. 7, 1995. This application Feb. 13, 1997, Ser. No. 800,131**

**Claims priority, application Rep. of Korea, Oct. 31, 1994, 95-28377**

**Int. Cl.[6] G11B** *5/09*

**U.S. Cl. 360—46** **5 Claims**




1. Digital signal recording apparatus comprising:

a recorder, for recording parallel tracks of digital signal modulation on a recording medium;

an input port for serially receiving n-bit information words;

circuitry for inserting a "0" bit into each said received n-bit information word and generating a (n+1)-parallel-bit "positive"information word at an information word rate slower by a factor of (n+1) than the rate of a system clock;

circuitry for inserting a "1" bit into each said received n-bit information word and generating a (n+1)-parallel-bit "negative" information word at said information word rate, which (n+1)-parallel-bit "negative" information word is supplied concurrently with said(n+1)-parallel-bit "positive" information word generated from the same one of said n-bit information words;

a first precoder for coding each (n+1)-parallel-bit "positive" information word to convert it into a corresponding "positive"-information (n+1)-parallel-bit channel word, generated at a channel word rate slower by a factor of (n+1) than the rate of said system clock;

a second precoder for coding each (n+1)-parallel-bit "negative" information word to convert it into a corresponding "negative"-information (n+1)-parallel-bit channel word, generated at said channel word rate;

means for selecting one of each concurrent pair of "positive"-information and "negative"-information (n+1)-parallel-bit channel words for serial recording at said system clock rate, said means for selecting one of each concurrent pair of (n+1)-parallel-bit channel words for recording including

first parallel-to-serial conversion means for generating first parallel-to-serial conversion results by converting the selected (n+1)-parallel-bit channel word to serial-bit form, and

a selector switch responsive to a control signal for selecting one of said first parallel-to-serial conversion results for application to said recorder, for serial recording at said system clock rate;

second parallel-to-serial conversion means for generating second parallel-to-serial conversion results by converting at least one of each concurrent pair of (n+1)-parallel-bit channel words to serial-bit form; and

a control signal generator for selecting a prescribed spectral response for the one of the parallel tracks on said magnetic recording medium being currently recorded, for determining from said second parallel-to-serial conversion results how much respective spectral responses for "positive"-information and "negative"-information (n+1)-parallel-bit channel words most recently generated by said first and second precoders will deviate in energy from said prescribed spectral response if recorded in a prescribed non-return-to-zero-invert-on-ONEs format, and for comparing the amplitudes of the respective deviation results for the "positive"-information and "negative"-information (n+1)-parallel-bit channel words most recently generated by said first and second precoders, to generate a control signal indicating which one of said "positive"-information and "negative"-information (n+1)-bit channel words has a spectral response that least deviates from said prescribed spectral response, wherein said second parallel-to-serial conversion means converts said "positive"-information and "negative"-information (n+1)-parallel-bit channel words to respective (n+1)-serial-bit channel words, each of which is supplied to said control signal generator at a second clock rate that is substantially higher than said system clock rate.

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**5,745,313**

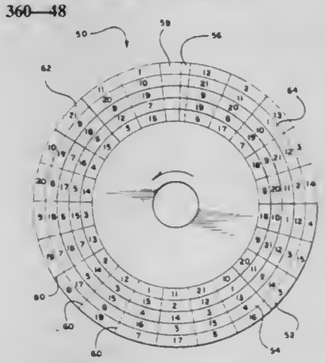
**METHOD AND APPARATUS FOR EXPANDING DATA STORAGE CAPACITY ON A FLOPPY DISKETTE**

**Michael V. Sliger, Issaquah, Wash., assignor to Microsoft Corporation, Redmond, Wash.**

**Filed Mar. 23, 1995, Ser. No. 409,217**

**Int. Cl.[6] G11B** *5/09*

**U.S. Cl. 360—48** **6 Claims**




1. A diskette for use in connection with a computer for magnetically storing data thereon, the diskette comprising:

a magnetic data storage area comprising:

a plurality of generally concentric tracks divided into sectors identified by a sector number, each sector including a 1024 byte field for storing data; and

an inter-sector gap between adjacent sectors on each respective track,

wherein each inter-sector gap is thirty-six bytes.

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## 5,745,314
## CLOCK GENERATING CIRCUIT BY USING THE PHASE DIFFERENCE BETWEEN A BURST SIGNAL AND THE OSCILLATION SIGNAL

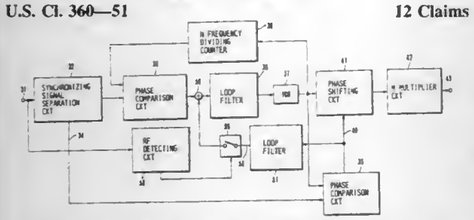
**Shingo Ikeda, and Shinichi Yamashita, both of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 71,328, Jun. 2, 1993, abandoned, which is a continuation of Ser. No. 585,474, Sep. 20, 1990, abandoned. This application Sep. 1, 1994, Ser. No. 299,811**

**Claims priority, application Japan, Sep. 27, 1989, 1-251290; Oct. 2, 1989, 1-258349; Oct. 2, 1989, 1-258350**

**Int. Cl.[6] G11B *5/09***

**U.S. Cl. 360—51** **12 Claims**




1. A clock generating circuit for generating a clock of a predetermined frequency corresponding to a video signal, comprising:

video input means for inputting the video signal and obtaining a synchronizing signal and a burst signal from the input video signal;

a PLL circuit including phase comparing means for generating a phase comparing signal, oscillation means for generating an oscillation signal, as the clock, having a frequency corresponding to the burst signal of the video signal according to the phase comparing signal, and a counter for counting the oscillation signal and for outputting a counted signal according to a counting result of the oscillation signal, said phase comparing means comparing a phase of the synchronizing signal obtained by said video input means and a phase of the counted signal output from the counter to generate the comparing signal indicating a phase difference between the synchronizing signal and the counted signal;

phase difference detection means for detecting a phase difference between the burst signal obtained by said video input means and the oscillation signal to output a detection signal; and

adding means for adding the detection signal and the phase comparing signal, said oscillation means generating the oscillation signal according to an output of said adding means.

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## 5,745,315
## PHASE ERROR DETECTOR AND MAGNETIC STORAGE DEVICE USING THE SAME

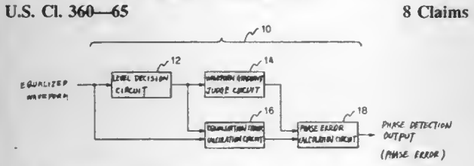
**Morishige Aoyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Nov. 1, 1996, Ser. No. 742,484**

**Claims priority, application Japan, Nov. 17, 1995, 7-299596**

**Int. Cl.[6] G11B *05/09***

**U.S. Cl. 360—65** **8 Claims**




1. A phase detector comprising:

level decision means for determining one of a plurality of aimed equalization levels predetermined in the partial response signalling system which is the closest to a sampled value of an equalized waveform equalized substantially to a waveform of the partial response signalling system;

waveform gradient judge means for determining a gradient of the equalized waveform on the basis of the aimed equalization level determined by said level decision means;

equalization error calculation means for calculating an equalization error which is a difference between the sampled value of the equalized waveform and the aimed equalization level determined by said level decision means; and

phase error detecting means for detecting a phase error on the basis of the equalization error calculated by said equalization error calculation means and the gradient of the equalized waveform determined by said waveform gradient judge means.

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## 5,745,316
## PHASE DETECTOR FOR A RECORDER/PLAYER USING A CONDUCTING LOOP DRIVEN BY A WINDING STRAND OF THE HEAD DRUM MOTOR

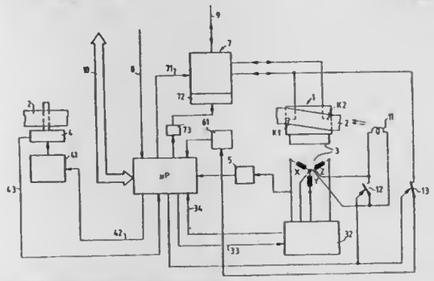
**Hartmut Schandl, Vienna, Austria, assignor to Deutsche Thomson Brandt GmbH, Germany**

**Division of Ser. No. 190,060, May 11, 1994. This application May 23, 1995, Ser. No. 447,595**

**Claims priority, application Germany, Sep. 20, 1991, 41 31 278.3**

**Int. Cl.[6] G11B *21/04***

**U.S. Cl. 360—70** **5 Claims**



1. A recorder/player comprising:

a rotating head drum for recording and playing back signals in the helical tracks of a tape-type recording medium which can be driven by a capstan motor according to a helical scan method,

a motor directly driving the head drum,

the motor having winding strands which are electronically commutated,

a circuit arrangement for the phase regulation of one of the head drum and tape driving mechanism using a motor control circuit coupled to the winding strands,

said motor control circuit comprising:

means for generating control signals for the commutation of the winding strands derived from commutation signals which are created through induction at a commutation-dependent phase winding circuit for generation of motor torque signals in the winding strands,

phase detection means for the read/write heads being located on the perimeter of the rotating head,

a position indicator sensor provided for obtaining command and regulating variables for the phase regulation of one of the head drum and tape driving mechanisms,

said position indicator sensor further determining a commutation signal from which a microprocessor derives command and regulating variables for the phase regulation of one of the head drum and tape driving mechanism, the position sensor being formed by one of the rotating read/write heads and a conducting loop fed with current derived from one of the winding strands thereby causing a magnetic field to be generated, whereby said conducting loop is disposed in a fixed position outside the region of tape/head contact on the stationary part of the head drum.



## 5,745,317
## APPARATUS FOR REPRODUCING INFORMATION FROM A TAPE-SHAPED RECORDING MEDIUM USING CALCULATED ADDRESS INFORMATION

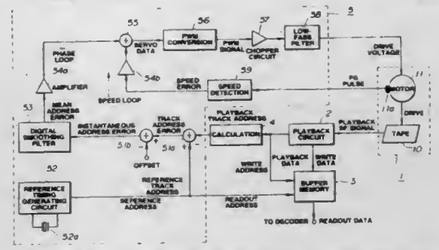
**Takanobu Sano, Kanagawa; Takuji Himeno, Chiba; Katsumi Ikeda, Kanagawa, and Hiroshi Takahata, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Oct. 10, 1995, Ser. No. 541,652**

**Claims priority, application Japan, Oct. 14, 1994, 6-249008**

**Int. Cl.[6] G11B *15/52;15/46;5/584***

**U.S. Cl. 360—73.11** **8 Claims**




1. An apparatus for reproducing information from a tape-shaped recording medium having recorded on inclined tracks data in the form of blocks and address information recorded with each of the blocks in the form of a track address and a block address, said block address specifying a position of a respective block in a given track, said apparatus comprising:

read-out means for reading out data by scanning said inclined tracks on said tape-shaped recording medium at a rate at which the inclined tracks were recorded;

address extracting means for extracting said address information from said data for each track read out by said read-out means from said tape-shaped recording medium;

storage means for storing said data read out by said read-out means, in which said data read out by said read-out means is written in said storage means based upon said address information extracted by said address extracting means;

calculating means for calculating a block address of a block disposed substantially at a center of a respective track based upon said address information for said respective track extracted by said address extracting means; and

control means for generating a read-out address for reading out said data stored in said storage means and for controlling a running speed of said tape-shaped recording medium based upon a comparison between address information for a pre-set position on a track of said tape-shaped recording medium extracted by said address extracting means and said calculated block address supplied from said calculating means.

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## 5,745,318
## DIGITAL VIDEO TAPE REPRODUCING APPARATUS FOR REPRODUCING VIDEO SIGNALS FROM TRACKS IN A MAGNETIC TAPE HAVING REPRODUCING HEADS HAVING WIDTHS THE SAME AS OR DIFFERENT FROM THAT OF THE RECORDING HEADS

**Yukio Kubota, and Keiji Kanota, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 966,540, Oct. 23, 1992, Pat. No. 5,499,148. This application Mar. 6, 1996, Ser. No. 611,714**

**Claims priority, application Japan, Oct. 30, 1991, 3-310156**

**Int. Cl.[6] G11B *15/46***

**U.S. Cl. 360—73.06** **19 Claims**

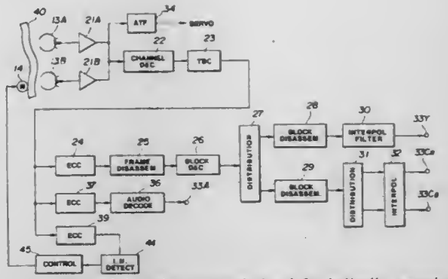
1. A digital video tape recording and/or reproducing apparatus for reproducing digital video signals azimuth-recorded in oblique tracks on a magnetic tape, said oblique tracks having one of a number of widths determined by the width of a head or heads used during recording, said apparatus comprising:

a pair of rotary magnetic heads each having a predetermined head width and a respective azimuth angle which is different from that of the other magnetic head for helically scanning said oblique tracks in said magnetic tape as said tape is advanced;

tape drive means for driving said tape at a tape transport speed selected from a standard speed and another speed that is one-half said standard speed;

tape drive control means for controlling said tape drive means to drive said tape at said standard speed when said oblique tracks have a track width equal to said predetermined head width, and to drive said tape at said other speed when said oblique tracks have a track width that is one-half said predetermined head width; and

tracking control means for causing each of said magnetic heads to simultaneously scan a respective pair of adjacent oblique tracks when said oblique tracks have a track width that is one-half said predetermined head width, one track of each said pair having a direction of magnetization that corresponds to the azimuth angle of the one of said pair of magnetic heads then scanning a pair of oblique tracks and the other track of said pair having a direction of magnetization that corresponds to the azimuth angle of the other of said pair of magnetic heads.




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## 5,745,319
## RECORDING/REPRODUCING APPARATUS WITH COARSE AND FINE HEAD POSITIONING ACTUATORS AND AN ELASTIC HEAD GIMBAL

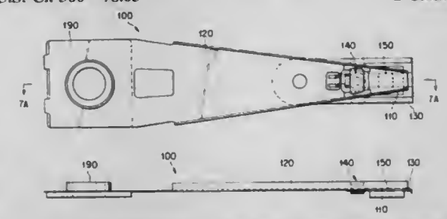
**Shigeru Takekado, Tokyo, and Yasuo Ohtsubo, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 100,993, Aug. 3, 1993, abandoned. This application Apr. 27, 1995, Ser. No. 429,575**

**Claims priority, application Japan, Aug. 12, 1992, 4-214415; Mar. 3, 1993, 5-042869**

**Int. Cl.[6] G11B *5/596***

**U.S. Cl. 360—78.05** **2 Claims**




1. A recording/reproducing apparatus for use with a recording medium, the recording/reproducing apparatus comprising:

a recording/reproducing head for reading and writing information on and to said recording medium;

a suspension arm having a first end and second end;

a connecting member, arranged between said recording/reproducing bead and said suspension arm, for supporting said recording/reproducing head to said suspension arm;

first driving means attached between said first end of said suspension arm and said recording/reproducing head parallel

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to said connecting member for finely moving said recording/reproducing head relative to said suspension arm; and

second driving means attached to said second end of said suspension arm for coarsely moving said first end of said suspension arm to move said recording/reproducing head to a desired position on said recording medium,

wherein said first driving means comprises:

an elastic member arranged between said recording/reproducing head and said suspension arm, wherein said elastic member functions as a gimbal;

a driving coil arranged at one end of said elastic member; and

a magnetic circuit surrounding said driving coil.

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**5,745,320**

## APPARATUS FOR CLEANING HEADS OF A ROTARY DRUM IN A RECORDING AND/OR REPRODUCING APPARATUS

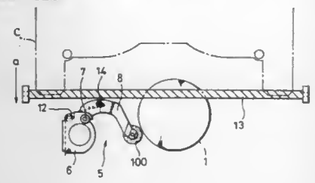
**Eiji Ohshima, and Atsuhiro Kumagai, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**

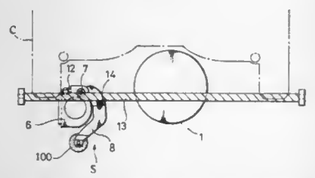
**Continuation of Ser. No. 653,821, May 28, 1996, abandoned, which is a continuation of Ser. No. 366,375, Dec. 29, 1994, abandoned, which is a continuation of Ser. No. 81,172, Jun. 25, 1993, abandoned. This application Feb. 27, 1997, Ser. No. 806,482**

**Claims priority, application Japan, Jul. 7, 1992, 4-203012**

**Int. Cl.[6] G11B** *5/41*

**U.S. Cl. 360—128** **3 Claims**





1. A magnetic head cleaning apparatus for cleaning a magnetic head mounted on a rotary head drum in a recording and/or reproducing apparatus for a tape cassette which has a loading mechanism for loading and unloading the tape cassette, and includes a translating rod, said magnetic head cleaning apparatus comprising:

rotatably supported cleaning roller means for cleaning said magnetic head when an outer surface of the cleaning roller means is brought in rotatable contact with said rotary head drum, said cleaning roller means including the outer surface thereof and an interior being made of polyurethane foam having a three-dimensional mesh structure and said cleaning roller means being supported in a generally upright configuration;

very small grains suitable for grinding are accumulated in said three-dimensional mesh structure of said outer surface and said interior of said cleaning roller means, wherein when said very small grains along the outer surface of said cleaning roller means are consumed, said very small grains accumulated in the interior of said cleaning roller means appear near the outer surface in synchronism with the rotation of said cleaning roller means to thereby achieve a continuous cleaning of said magnetic head; and

arm means for supporting said cleaning roller means and having an upper surface on which is formed a projection, said arm means being operable for bringing said cleaning roller means into rotatable contact with the rotary head drum when the cassette is unloaded, said arm means being pivotally movable between a first position, wherein said cleaning roller means is brought into contact with the rotary head drum, and a second position, wherein the projection formed on said upper surface of said arm means is directly engaged by said translating rod of said loading mechanism of the recording and/or reproducing apparatus only when a cassette is loaded, wherein the cassette pushes the translating rod which pushes said arm means such that said cleaning roller means is removed from the rotary head drum.

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**5,745,321**

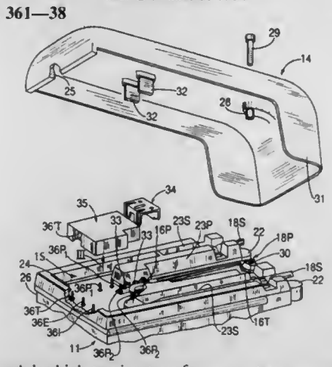
## HIGH-TENSION TRANSFORMER PARTICULARLY FOR USE WITH DISCHARGE-TYPE TUBULAR LIGHTING FIXTURES

**Jean-Phillippe Faure, Saint Martin sur Ocre, France, assignor to ICEM S.P.A., San Marino**

**Filed Jan. 31, 1996, Ser. No. 594,132**

**Int. Cl.[6] H02H** *7/04*

**U.S. Cl. 361—38** **18 Claims**



1. A modular high tension transformer system comprising:

a body which contains a primary coil, a secondary coil and a corresponding magnetic core;

a cover which is attached securely on said body to create a casing in which are arranged input terminals for connection to the primary coil, and output terminals for connection to the secondary coil;

a plurality of interchangeable modules for providing different kinds of electrical protection; and

a connector for selectively connecting said one module to said terminals;

wherein several different high transformer assemblies are formed by inserting one module of said plurality of modules into said casing and connecting said one module to said terminals through said connector to said coils to provide a corresponding protection.

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**5,745,322**

## CIRCUIT PROTECTION ARRANGEMENTS USING GROUND FAULT INTERRUPTER FOR OVERCURRENT AND OVERVOLTAGE PROTECTION

**Hugh Duffy, Cupertino; Justin Chiang, Newark; John Midgley, San Carlos, and Brian Thomas, San Francisco, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.**

**Filed Nov. 28, 1995, Ser. No. 563,321**

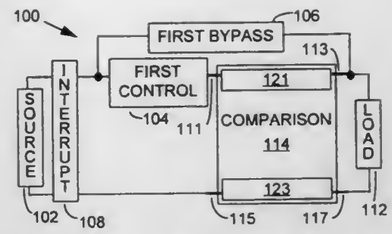
**Int. Cl.[6] H02H** *3/16*

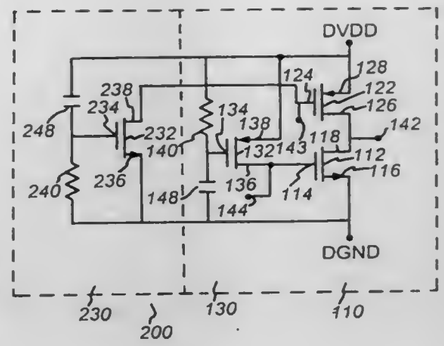
**U.S. Cl. 361—45** **52 Claims**

1. An electrical protection system which can be connected between an electrical power supply and an electrical load to form an operating circuit having a current-carrying line and a return line, and which, when so connected, protects the operating circuit from (A) ground faults and (B) overcurrents and/or overvoltages, which system comprises:

a. a circuit interruption element, which can adopt a normal state which permits the flow of a normal current, $I_{NORMAL}$, in the






circuit, or a fault state which permits the flow of at most a reduced current, substantially less than $I_{NORMAL}$, in the circuit;

b. a comparison element, which,

(1) comprises

(a) a line sense component which senses the level of a current, $I_{LINE}$, in the current-carrying line of the circuit at a line sense point between a line sense input and a line sense output,

(b) a return sense component which senses the level of a current, $I_{RETURN}$, in the return line of the circuit at a return sense point between a return sense input and a return sense output, and

(c) optionally, a passthru sense component which senses the level of a current, $I_{PASSTHRU}$, at a passthru sense point in a passthru line, and

(2) determines a net effective current, $I_{COMPARISON}$, by comparing the levels of $I_{LINE}$, $I_{RETURN}$ and, if the comparison element comprises a passthru sense component $I_{PASSTHRU}$, and changes the circuit interruption element from its normal state to its fault state if $I_{COMPARISON}$ increases from a value less than a predetermined current imbalance value, $I_{IMBALANCE}$, to a value more than $I_{IMBALANCE}$; and

c. a first bypass element which has a current through it, $I_{FIRST-BYPASS}$, which, when the circuit is subjected to an overcurrent and/or an overvoltage, changes and thus causes $I_{COMPARISON}$ to increase to more than $I_{IMBALANCE}$, thereby causing the comparison element to change the circuit interruption element from its normal state to its fault state.

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**5,745,323**

## ELECTROSTATIC DISCHARGE PROTECTION CIRCUIT FOR PROTECTING CMOS TRANSISTORS ON INTEGRATED CIRCUIT PROCESSES

**Stephen T. English, Groveland, and Edward L. Wolfe, North Andover, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.**

**Filed Jun. 30, 1995, Ser. No. 496,933**

**Int. Cl.[6] H02H** *9/00*

**U.S. Cl. 361—56** **6 Claims**

3. A method for protecting a switching circuit from electrostatic discharge, the switching circuit having an output, first and second control inputs, and first and second signal inputs, the switching circuit responsive to a first control signal at the control input for activating a first state of the switching circuit in which the output is coupled to the second signal input, the switching circuit responsive to a second control signal at the second control input for activating a second state of the switching circuit in which the output is coupled to the first signal input, the electrostatic discharge being applied between the output and the second signal input of the transistor circuit, the method comprising steps of:

detecting when an electrostatic discharge occurs; and

when an electrostatic discharge occurs, providing the first control signal to the first control input of the switching circuit to activate the first state of the switching circuit and providing the second control signal to the second control input of the switching circuit to activate the second state of the switching circuit, such that the first input of the switching circuit is coupled to the second input of the switching circuit.

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**5,745,324**

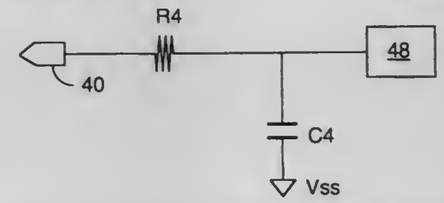
## ELECTROSTATIC DISCHARGE AND EXCESSIVE VOLTAGE PROTECTION CIRCUIT

**Bruce M. Forsland, Santa Clara, and Kim T. Rubin, Menlo Park, both of Calif., assignors to Greenspring Computers, Inc., Menlo Park, Calif.**

**Filed Nov. 20, 1996, Ser. No. 754,218**

**Int. Cl.[6] H02H** *9/00*

**U.S. Cl. 361—56** **16 Claims**




1. A protection circuit for providing protection to an electronic circuit from electro-static discharge, the circuit comprising:

an input/output node;

a resistive element having a first end coupled to said input/output node and a second end coupled to a port of said electronic circuit; and

a varistor having a first end coupled to a ground node and a second end coupled to the second end of said resistive element.

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**5,745,325**

## MAGNETIC DISK DRIVE HAVING AN IMPROVED OUTER STOPPER MECHANISM

**Takashi Matsumoto, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 515,376, Aug. 15, 1995, abandoned. This application Feb. 4, 1997, Ser. No. 795,449**

**Claims priority, application Japan, Dec. 28, 1994, 6-326895**

**Int. Cl.[6] G11B** *5/54*

**U.S. Cl. 360—105** **5 Claims**

1. A disk drive comprising:

a housing having a base;

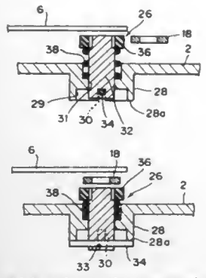
a disk rotatably mounted in said housing and having a plurality of tracks;

a head for performing reading/writing of data on said disk;

a head actuator for moving said head across said tracks of said disk, said head actuator having an actuator arm rotatably

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mounted on said housing and a suspension having one end fixed to a front end of said actuator arm and having another end supporting said head;

an inner stopper adapted to abut against said actuator arm in the vicinity of said front end to inhibit excess inward movement of said actuator arm beyond an innermost one of said tracks of said disk;

an outer stopper mounted on said base and adapted to abut against said actuator arm in the vicinity of said front end to inhibit excess outward movement of said actuator arm beyond an outermost one of said tracks of said disk;

said outer stopper being movable between an upper position where said outer stopper comes into abutment against said actuator arm to inhibit said excess outward movement of said actuator arm and a lower position where loading of said head over said disk is allowed; and

a pin fixed to said outer stopper and configured for locking said outer stopper in said lower position by engaging said base.

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**5,745,326**

**MAGNETIC DISK DRIVE**

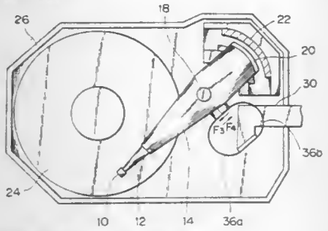
**Hiroshi Koriyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Continuation of Ser. No. 453,078, May 30, 1995, abandoned, which is a division of Ser. No. 389,746, Feb. 14, 1995, which is a continuation of Ser. No. 993,851, Dec. 21, 1992, abandoned. This application Oct. 21, 1996, Ser. No. 734,079**

**Claims priority, application Japan, Dec. 20, 1991, 3-355195**

**Int. Cl.[6] G11B *5/55;5/54;5/02***

**U.S. Cl. 360—106** **5 Claims**



3. A magnetic disk drive comprising:

a base;

a magnetic head facing a magnetic disk;

a suspension supporting said magnetic head;

a movable carriage supporting said suspension; and

a flexible loop affixed to said carriage and to said base, said loop having at least one flexible printed circuit (FPC) for transferring signals between said magnetic head and an external control circuit, wherein said flexible loop is entirely closed and located on one side of said carriage and positioned such that the tensions ascribable between the forces of said flexible loop cancel each other to minimize tensions applied to movable carriage.

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**5,745,327**

**DEVICE FOR PREVENTING SURGE NOISE IN CONNECTING COMPUTERS AND PERIPHERALS THEREOF**

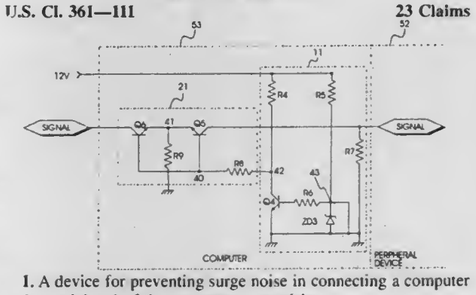
**Youn-Chul Choo, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Jun. 3, 1996, Ser. No. 656,809**

**Claims priority, application Rep. of Korea, Jun. 2, 1995, 14627/1995**

**Int. Cl.[6] H02H *3/00***

**U.S. Cl. 361—111** **23 Claims**



1. A device for preventing surge noise in connecting a computer and a peripheral of the computer, comprising:

transmission path forming means connected to an internal power source and a ground wire of a peripheral device, for alternatively forming and interrupting a signal transmitting path only when said signal transmitting path between said peripheral and said computer is electrically connected and a ground connecting path between said computer and said peripheral is not electrically connected, thereby establishing an operational state of the signal transmitting path; and

signal transmission means for transmitting a signal between the computer and the peripheral device in accordance with the operational state of the signal transmitting path.

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**5,745,328**

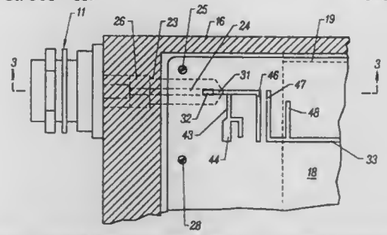
**ELECTROMAGNETIC IMPULSE SUPPRESSION CURCUIT**

**John V. Bellantoni, Redwood City, Calif., assignor to Watkins-Johnson Company, Palo Alto, Calif.**

**Filed Mar. 3, 1997, Ser. No. 811,111**

**Int. Cl.[6] H02H *3/00***

**U.S. Cl. 361—119** **3 Claims**



1. An electrical impulse suppressor for suppressing electromagnetic impulse energy in a coaxial transmission line connected to a microwave circuit including a strip transmission line comprising:

a discharge means having a known breakdown voltage and impedance connected between the center and outer conductors of the coaxial transmission line;

a first strip transmission line in shunt with said first portion of strip transmission line to form with the impedance of said discharge means a first resonant circuit;

a second strip transmission line in shunt with a second portion of said strip transmission line to form a second resonant circuit; and,

coupled strip transmission lines interposed between said first and second portions of said transmission line, said coupled strip transmission line and said first and second resonant circuits to form a bandpass filter structure for attenuating the flow of energy above and below a band limited range of microwave frequencies.



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**5,745,329**

**MAGNETIC RECORDING/READING HEAD**

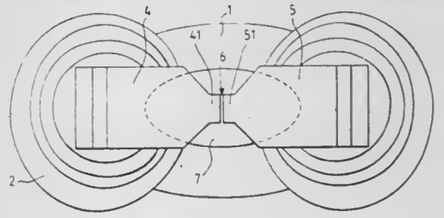
**Jean-Claude Lehureau, Ste Genevieve des Bois, France, assignor to Thomson-CSF, Paris, France**

**Filed Sep. 11, 1996, Ser. No. 712,491**

**Claims priority, application France, Sep. 12, 1995, 95 10658**

**Int. Cl.[6] G11B *5/31***

**U.S. Cl. 360—126** **4 Claims**



1. A magnetic head comprising:

a magnetic layer;

at least one magnetic field induction conductor positioned on this magnetic layer;

a first zone made of an insulating material including the conductor and covering a part of the magnetic layer;

two magnetic poles made of layers overlapping the zone made of insulator material, each pole having a first end magnetically coupled with the magnetic layer and a second end separated from the second end of the other pole by a gap that is located on the zone made of insulator material;

wherein the plane of the magnetic layer comprises a second zone made of insulator material located beneath the magnetic poles between the first ends and not having any magnetic material, the portions of the magnetic layer coupled to the first ends of the magnetic poles being connected magnetically to one another by at least one element of magnetic material located in the plane of the magnetic layer.

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**5,745,330**

**SURGE ABSORBER**

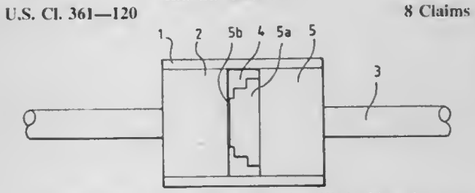
**Binglin Yang, F201, Syueiso, 1-14-10 Kamiochiai, Shinjuku-ku, Tokyo, Japan**

**Continuation of Ser. No. 378,969, Jan. 26, 1995, abandoned. This application Oct. 31, 1996, Ser. No. 742,267**

**Claims priority, application Switzerland, Feb. 5, 1994, 94202711.6**

**Int. Cl.[6] H02H *7/10***

**U.S. Cl. 361—120** **8 Claims**



1. A surge absorber comprising a housing filled with an inert gas therein; a housing core mounted in said housing, said housing core including at least a layer of conductive material and a layer of a non-conductive material; and two electrodes respectively connected to each end of said housing core, wherein said conductive material is selected from the group consisting of monocrystalline silicon, hard metals or metallic alloys, and said non-conductive material is selected from the group consisting of ceramic, glass, or mixture of ceramic and glass, and wherein said non-conductive material layer is disposed on a top surface of the conductive material layer of a multiple stepped tower-like core and said non-conductive material layer has a thickness of more than 0.04 mm so as to maintain a distance between said conductive material layer and one of said electrodes.

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**5,745,331**

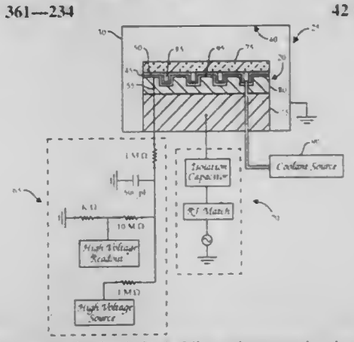
**ELECTROSTATIC CHUCK WITH CONFORMAL INSULATOR FILM**

**Shamouil Shamouilian, San Jose; Sasson Somekh, Los Altos Hills, both of Calif.; Hyman J. Levinstein, Berkeley Heights, N.J.; Manoocher Birang, Los Gatos, Calif.; Semyon Sherstinsky, San Francisco, Calif., and John F. Cameron, Los Altos, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.**

**Continuation-in-part of Ser. No. 189,562, Jan. 31, 1994, abandoned. This application Jan. 31, 1995, Ser. No. 381,786**

**Int. Cl.[6] H02N *13/00***

**U.S. Cl. 361—234** **42 Claims**



1. An electrostatic chuck for holding substrates, the chuck comprising:

(a) a base having an upper surface with spaced apart first grooves therein; and

(b) a substantially continuous electrical insulator film conformal to the first grooves on the upper surface of the base to provide second grooves sized and distributed for holding coolant for cooling the substrate held on the chuck, the insulator film comprising an electrode embedded therein.

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**5,745,332**

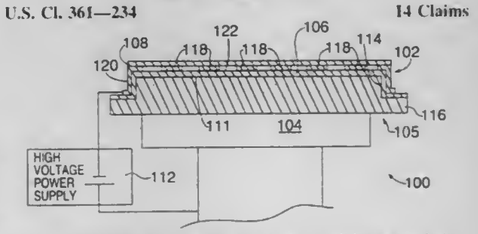
**MONOPOLAR ELECTROSTATIC CHUCK HAVING AN ELECTRODE IN CONTACT WITH A WORKPIECE**

**Vincent E. Burkhart, San Jose, and Stefanie E. Harvey, Santa Clara, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.**

**Filed May 8, 1996, Ser. No. 639,842**

**Int. Cl.[6] H02N *13/00***

**U.S. Cl. 361—234** **14 Claims**



1. A monopolar electrostatic chuck for retaining a workpiece comprising:

a chuck body having a surface:

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a wafer spacing mask of conductive material deposited upon said surface of said chuck body, where said wafer spacing mask further comprises a plurality of individual support members for supporting said workpiece in a spaced apart relation with respect to said surface of said chuck body and where at least one of said individual support members is adapted for connection to a power supply.

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**5,745,333**

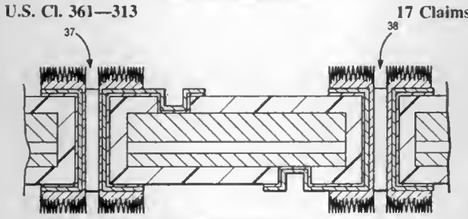
## LAMINAR STACKABLE CIRCUIT BOARD STRUCTURE WITH CAPACITOR

**Jerome Albert Frankeny, Taylor; Richard Francis Frankeny, Austin; Terry Frederick Hayden, Round Rock; Ronald Lann Imken, Round Rock, and Janet Louise Rice, Round Rock, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 21, 1994, Ser. No. 342,507**

**Int. Cl.[6] H01G** *4/06*

**U.S. Cl. 361—313** **17 Claims**




1. A circuit board capacitor, comprising:

an electrically conductive first power plane;

a first dielectric layer of uniform thin film high dielectric composition formed directly on one surface of the first power plane;

an electrically conductive second power plane extending over the first dielectric layer, the first power plane, first dielectric layer and second power plane forming a capacitor thereby;

a first via extending through the first power plane, the second power plane and the first dielectric layer, electrically connected by a contact to a planar surface of the second power plane and electrically insulated from the first power plane by a relatively thick second dielectric layer; and

a second via extending through the first power plane, the second power plane and the first dielectric layer, electrically connected by a contact to a planar surface of the first power plane and electrically insulated from the second power plane by the relatively thick second dielectric layer.

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**5,745,334**

## CAPACITOR FORMED WITHIN PRINTED CIRCUIT BOARD

**Joseph Gerard Hoffarth, Binghamton; John Matthew Lauffer, Waverly, both of N.Y., and Issa Said Mahmoud, late of Austin, Tex., by Jane C. Mahmoud, legal representative, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 25, 1996, Ser. No. 625,423**

**Int. Cl.[6] H01G** *4/008;4/06*

**U.S. Cl. 361—313** **22 Claims**

8. A multi-layer printed circuit board comprising:

a first metallic layer;

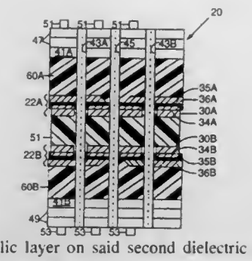
a first Ta or Hf layer on a face of said first metallic layer;

a first $Ta_2O_5$ or HfO layer on a face of said first Ta or Hf layer, respectively, opposite said first metallic layer;

a second metallic layer on said $Ta_2O_5$ or HfO layer opposite said first Ta or Hf layer;

a first dielectric layer on said first metallic electrode layer opposite said first Ta of Hf layer;

a second dielectric layer on said second metallic layer opposite said $Ta_2O_5$ or HfO layer;




a third metallic layer on said second dielectric layer opposite said second metallic layer;

a second Ta or Hf layer on a face of said third metallic layer opposite said second dielectric layer;

a second $Ta_2O_5$ or HfO layer on a face of said second Ta or Hf layer, respectively, opposite said third metallic layer;

a fourth metallic layer on said second $Ta_2O_5$ or HfO layer opposite said second Ta or Hf layer; and

a third dielectric layer on said fourth metallic layer opposite said second $Ta_2O_5$ or HfO layer.

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**5,745,335**

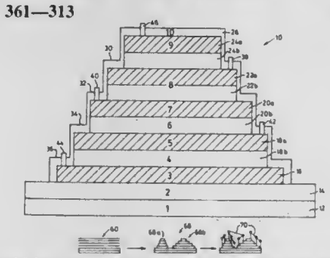
## MULTI-LAYER FILM CAPACITOR STRUCTURES AND METHOD

**Michael Man-Kuen Watt, North York, Canada, assignor to Gennum Corporation, Burlington, Ontario, Canada**

**Filed Jun. 27, 1996, Ser. No. 671,057**

**Int. Cl.[6] H01G** *4/06;4/228*

**U.S. Cl. 361—313** **17 Claims**



1. A multi-layer capacitance structure formed on a substrate and comprising:

(a) a bottom film electrode layer overlying said substrate,

(b) at least one pair of intermediate layers of a film electrode and a film dielectric material overlying said bottom electrode,

(c) a top pair of layers of a film electrode and a film dielectric material overlying the uppermost pair of intermediate layers,

(d) said bottom electrode having a connection portion extending laterally beyond the intermediate layers, said connection portion having a first upper surface, said first upper surface including means adapted to be connected to a circuit,

(e) at least one electrode of said intermediate layers having a connection portion extending laterally beyond the layers above it, said connection portion having a second upper surface, said second upper surface including means adapted to be connected to a circuit,

(f) said top electrode layer having a third upper surface, said third upper surface including means adapted to be connected to a circuit,

(g) said layers being arranged in a mesa structure, so that said at least one pair of intermediate layers extends laterally beyond said top layers around the entire periphery of said top layers, and said bottom electrode extends laterally beyond said at least one pair of intermediate layers around the entire periphery of said intermediate layers.



**5,745,336**

## CAPACITOR FOR SEMICONDUCTOR INTEGRATED CIRCUIT

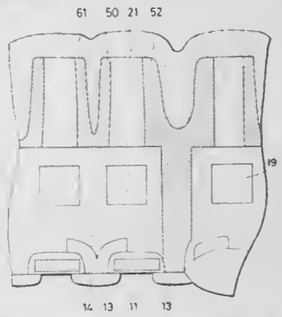
**Katsuaki Saito; Michio Ohue; Takuya Fukuda; JaiHo Choi, and Yukinobu Miyamoto, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Division of Ser. No. 995,977, Dec. 23, 1992, Pat. No. 5,434,742. This application Apr. 6, 1995, Ser. No. 417,839**

**Claims priority, application Japan, Dec. 25, 1991, 3-342726; Jan. 30, 1992, 4-015446; Feb. 19, 1992, 4-032212; Apr. 3, 1992, 4-082461**

**Int. Cl.[6] H01G** *4/06*

**U.S. Cl. 361—321.5** **16 Claims**




1. A capacitor comprising a ferroelectric material on a substrate and at least two electrodes for applying an electric field to said ferroelectric material, wherein said ferroelectric material is made of blocks of elongated crystals, elongated in a lengthwise direction, and said electrodes are disposed so as to apply an electric field substantially perpendicular to the lengthwise direction of said elongated crystals, wherein said ferroelectric material provided on the substrate is formed into a wall shape which is substantially perpendicular to said substrate, and each side wall of said ferroelectric material provided on the substrate has at least one of said at least two electrodes.

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**5,745,337**

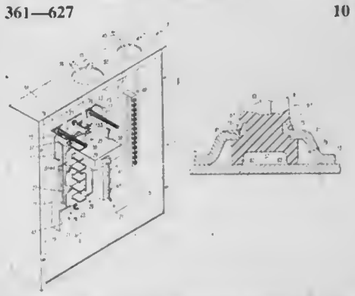
## WIRE BARRIER FOR ELECTRICAL PANEL BOARD

**Richard A. Reiner, Hanover, Pa., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Jun. 10, 1996, Ser. No. 662,727**

**Int. Cl.[6] H02B** *1/01*

**U.S. Cl. 361—627** **10 Claims**



1. An integrally molded wire barrier for mounting in an opening in a planar member of an electrical load center, said barrier comprising:

a base member;

an elongated member projecting axially from said base member;

attachment means comprising at least two elastically deformable hook members having hook fingers projecting laterally outward in divergent directions, said hook fingers being sized and axially spaced from said base member to pass through said opening in said planar member and clamp said base member against said planar member;

wherein said elongated member comprises two crossed planar elements; and

wherein said hook fingers project laterally outward and axially toward said base member from opposite edges of one of said planar elements of said elongated member.

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**5,745,338**

## DEVICE FOR ASSEMBLY AND ELECTRICAL CONNECTION OF MODULAR APPARATUSES SUCH AS CIRCUIT BREAKERS OR SIMILAR

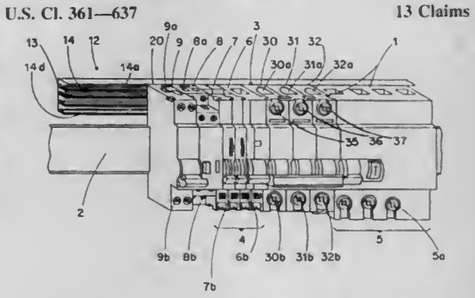
**William Bartolo, Eybens; Noël Lecorre, St. Hilaire du Touvet, and Francois Reynaud, Reaumont, all of France, assignors to Schneider Electric S.A., France**

**Filed May 7, 1996, Ser. No. 646,107**

**Claims priority, application France, Jun. 7, 1995, 95 07014**

**Int. Cl.[6] H02B** *1/20*

**U.S. Cl. 361—637** **13 Claims**




1. A circuit breaker device for assembly and electrical connection of a plurality of modular power apparatuses installed on a mounting rail with auxiliary units, said circuit breaker device comprising:

modular cases adjoined by their lateral sides to form a horizontal row;

power apparatuses residing within said modular cases and being electrically connected and/or supplied with power up-line by a common connecting comb in the form of a bus;

at least one conducting bar extending generally parallel to the longitudinal direction of the rail, and generally perpendicular to the lateral sides of said modular cases and facing said comb;

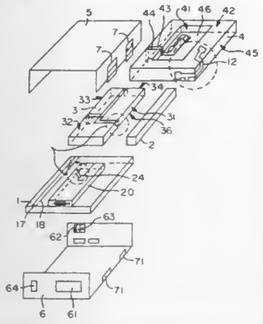
contact strips of each of said power apparatuses being electrically and selectively connected up-line to at least one conducting bar; connectors, each connector having a first end electrically connected to a contact strip and a second end for engaging a selected conducting bar, whereby the contact strip of each power apparatus forms an end part housed in a groove provided in a face of the modular case;

said groove being open in the direction of the comb, and said end part and groove extend perpendicularly to the at least one conducting bar over virtually the whole height of the common connecting comb to enable a connector to be connected to a contact strip in several positions along said end part, corresponding to a longitudinal position of at least one conducting bar.

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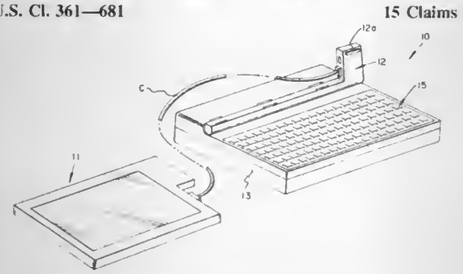
5,745,339
**PACKING ELEMENT INCLUDING A FOAM PLASTIC BODY AND A DEVICE RELATING TO THIS PACKING ELEMENT**
Gundokar Braumann, Galileistrasse 10, 82152, Planegg/Martinsried, and Ralf H. F. Seitz, Kederbacherstr. 18, 81377, München, both of Germany
Continuation of Ser. No. 430,674, Apr. 28, 1995, abandoned.
This application Apr. 7, 1997, Ser. No. 833,460
Claims priority, application Germany, Apr. 30, 1994, 44 15 200.0
Int. Cl.[6] H05K *5/02;7/02*
U.S. Cl. 361—679 18 Claims



1. A packing element for packing and arranging at least one component within an appliance including an electrical contact, the packing element comprising:
an electrically insulating foamed plastic body shaped to at least partially enclose the at least one component to thereby hold the at least one component in the appliance without additional mounting structure, the foamed plastic body comprising at least one current-conducting track being fixedly and continuously disposed on the foamed plastic body for electrically connecting the at least one component with the electrical contact of the appliance.

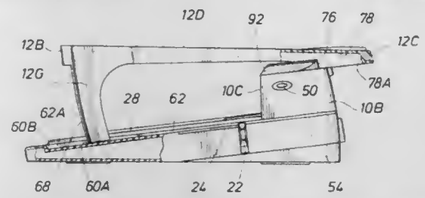
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5,745,340
**SEPARABLE DISPLAY OF COMPUTER GENERATED INFORMATION**
Jennifer Landau, 219 E. 5th St. Apt. 7, New York, N.Y. 10003
Filed Dec. 19, 1994, Ser. No. 358,838
Int. Cl.[6] H05K *7/10;* G06F *1/16*
U.S. Cl. 361—681 15 Claims



11. Apparatus comprising
a flat-panel display module;
means for storing display information in said module;
means for disconnecting said module from the storing means while preserving the display information stored therein.

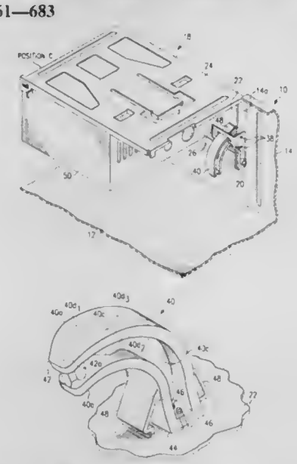
5,745,341
**INCLINED DOCKING BASE FOR A PORTABLE COMPUTER WITH A SLIDABLE MONITOR SUPPORT MEMBER**
Stacy L. Wnlff, and Wayne T. Brezovar, both of Houston, Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Filed Dec. 31, 1996, Ser. No. 775,616
Int. Cl.[6] G06F *1/16;* H05K *7/10*
U.S. Cl. 361—682 20 Claims



1. System adapted for use with a portable computer, comprising:
a base having a front section and a back section, said front section having a top surface adapted to receive the portable computer and said back section having a top surface including a coupling member that extends above said back section top surface;
slides disposed on said front section top surface and sloping downwardly from the direction of the back section to the front section;
a support member having a top and a bottom for being removably positioned on said base;
legs extending from said bottom of said support member, each leg adapted to be received on one of said slides; and
a support member coupling member positioned on said bottom of said support member and being aligned with said base back section coupling member when said legs are moved from an initial sliding position to a desktop operation position.

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5,745,342
**HINGE DETENT MECHANISM IN A COMPUTER SYSTEM**
John Jeffries, Marble Falls, and Gilberto Hernandez, Pflugerville, both of Tex., assignors to Dell U.S.A., L.P., Austin, Tex.
Filed Dec. 20, 1996, Ser. No. 770,400
Int. Cl.[6] G06F *1/16;* H05K *7/16*
U.S. Cl. 361—683 31 Claims



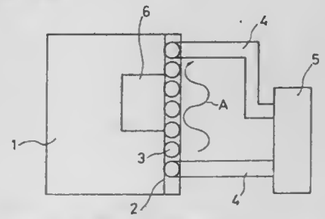
1. A computer system comprising:
a chassis having first and second members for mounting a power supply;



said second chassis member movably connected to said first chassis member;
a microprocessor mounted on said first chassis member;
a memory module operably connected to the microprocessor;
a bracket fixedly mounted on the first chassis member; and
a flexible hinge detent member connected to the second chassis member and extending therefrom to movably engage the bracket, the hinge detent member having a wavy surface of sequentially variable protrusions and depressions, the wavy surface being in continuous friction engagement with the bracket in response to the hinge member being deflected when the second chassis member is moved relative to the first chassis member.

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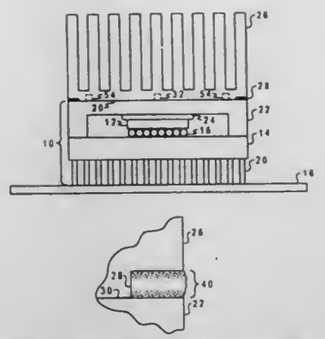
5,745,343
**CUBICLE FOR INVERTER**
Makoto Takeshita, Yamanashi, Japan, assignor to Fanuc, Ltd., Yamanashi, Japan
Continuation of Ser. No. 550,368, Oct. 30, 1995, abandoned.
This application Aug. 12, 1997, Ser. No. 911,438
Claims priority, application Japan, Nov. 11, 1994, 6-277480
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—689 2 Claims



1. A cubicle for an inverter, comprising:
a housing having a heat exchange wall and an internal chamber substantially completely surrounded by the housing, the heat exchange wall having a length and a width;
a switching element for an inverter which generates heat, mounted on the heat exchange wall of the housing to extend on the heat exchange wall along the length and width of the heat exchange wall such that the switching element is substantially completely surrounded by the housing; and
a cooling system comprising:
a continuous piping having a plurality of layers extending in a width direction of the heat exchange wall, along the heat exchange wall in a shape such that the continuous piping is folded back at the ends of the heat exchange wall, with a flow direction of a coolant in the piping alternating every layer; and
coolant flowing in the piping so that heat is diffused through the wall to simultaneously cool the housing and the inverter, whereby improving the heat diffusion of said cubicle for an inverter and eliminating the need for a heat sink for said cubicle for an inverter, resultantly reducing the external dimension of said cubicle for an inverter.

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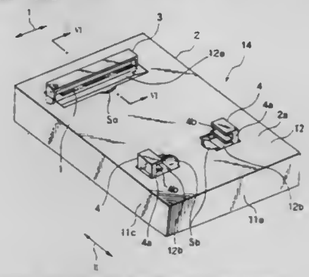
5,745,344
**HEAT DISSIPATION APPARATUS AND METHOD FOR ATTACHING A HEAT DISSIPATION APPARATUS TO AN ELECTRONIC DEVICE**
Douglas A. Baska, Oronoco; Darryl J. Becker, Rochester; James D. Bielick, Oronoco; Phillip D. Isaacs, and Michael L. Zumbrunnen, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 6, 1995, Ser. No. 554,633
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—705 12 Claims
1. An apparatus comprising:



a heat transfer body mounted in proximity to an electronic device, said heat transfer body having a surface;
an adhesive distributed on said heat transfer body, wherein said adhesive affixes said surface of said heat transfer body in proximity to said electronic device, said adhesive being distributed such that heat transfer from said electronic device to said heat transfer body occurs substantially independently of said adhesive; and
a thermally conductive material disposed between and in contact with said electronic device and said surface of said heat transfer body, wherein said thermally conductive material is a liquid at an operating temperature of said electronic device;
wherein said surface of said heat transfer body is in contact with both said thermally conductive material and said adhesive, said surface having at least one channel formed therein that is located between regions of said surface contacted by said adhesive and regions of said surface contacted by said thermally conductive material such that said at least one channel limits contact between said thermally conductive material and said adhesive.

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5,745,345
**PORTABLE INFORMATION APPARATUS WHICH IS CONSIDERABLY SMALL IN SIZE AND IN THICKNESS WHEN A CARD IS DISCONNECTED THEREFROM**
Manabu Deguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed May 20, 1996, Ser. No. 650,858
Claims priority, application Japan, May 18, 1995, 7-120159
Int. Cl.[6] H05K *1/14*
U.S. Cl. 361—741 15 Claims



1. A portable information apparatus comprising:
a case member having a top plate;
a card connector for connecting a card which is placed parallel to said top plate and on an upper surface of said top plate for expanding functions of said portable information apparatus;
a connector holding member connected to said case member for holding said card connector, said connector holding member being movable between a position below said top plate and a position above said top plate; and

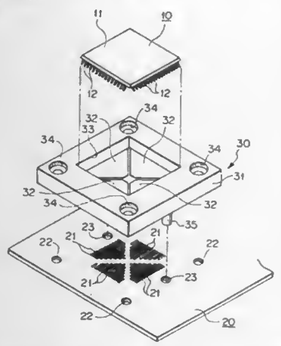
VOL 1209 ISS 4 APR 28 1998 UMI



card guiding means connected to said case member for guiding said card in parallel to said top plate, said card guiding means being movable between a position below said top plate and a position above said top plate.

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**5,745,346**
**CONNECTING SOCKET FOR A SEMICONDUCTOR PACKAGE**
**Nobuyoshi Ogawa, and Motoo Yonekubo, both of Nagano-ken, Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan**
**Filed May 14, 1996, Ser. No. 649,123**
**Claims priority, application Japan, Jun. 8, 1995, 7-164504**
**Int. Cl.[6] H01L** *27/00*
**U.S. Cl. 361—769** **4 Claims**

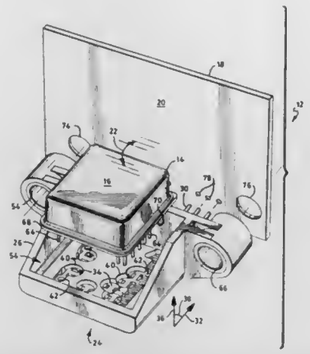


1. A connecting socket for a semiconductor package and a circuit board which comprises, as an assembly:
a) a base body made from an electrically insulating material in the form of a frame having a mounting opening penetrating from the top surface to the bottom surface thereof for mounting of a semiconductor package; and
b) an anisotropically electroconductive sheet member having elasticity and electroconductivity in the direction of thickness and bonded onto the bottom surface of the base body in such a fashion that at least a part thereof appears in the mounting opening of the base body so as to come into contact with the electrode terminals of a circuit board when the socket is mounted on the circuit board and to come into contact with the electrode terminals of a semiconductor package when the semiconductor package is put into the mounting opening of the base body,
wherein the mounting opening is in a square or rectangular form and the anisotropically electroconductive sheet member is divided into four quasi-triangular pieces, each of which is bonded to the bottom surface of the base body along the periphery of one of the inside walls of the mounting opening to be protruded into the mounting opening.

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**5,745,347**
**ADAPTER FOR CONNECTING AIRBAG ACCELEROMETER TO A PRINTED CIRCUIT BOARD AND ASSEMBLY THEREOF**
**Timothy J. Miller, Warren, Pa., and Eric D. Bowman, Lake Orion, Mich., assignors to OSRAM Sylvania Inc., Danvers, Mass.**
**Filed Oct. 11, 1996, Ser. No. 728,724**
**Int. Cl.[6] H05K** *7/04*
**U.S. Cl. 361—813** **15 Claims**

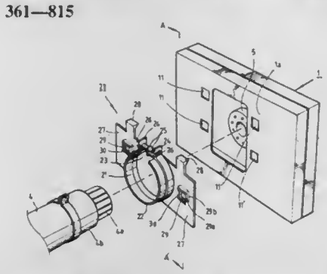
1. An adapter for use in electrically connecting accelerometer leads of an airbag accelerometer to a printed circuit board, said airbag accelerometer having a horizontal mounting plane and said



printed circuit board having a printed circuit board mounting plane which is disposed at an angle relative to said horizontal mounting plane, comprising:
a leadframe housing; and
a leadframe embedded within said leadframe housing, said leadframe comprising a plurality of printed circuit board connecting tails which extend in a first direction and a plurality of airbag accelerometer facing segments, each facing segment being comprised of apertures which extend through said leadframe and being disposed so as to face in a second direction, said second direction being oriented at an angle relative to said first direction, said leadframe housing further comprising a plurality of openings exposing respective ones of said plurality of facing segments.

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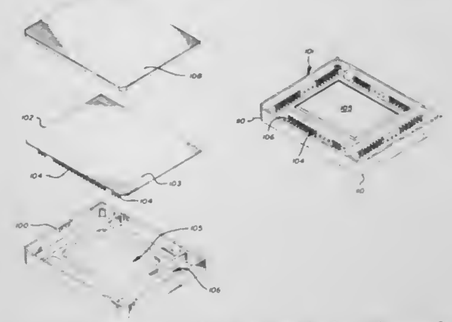
**5,745,348**
**PRINTED CIRCUIT BOARD COUPLING DEVICE FOR USE WITH A CATHODE RAY TUBE**
**Jong-tai Cha, Suwon City, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea**
**Filed Dec. 4, 1995, Ser. No. 566,951**
**Claims priority, application Rep. of Korea, Dec. 2, 1994, 94-32620**
**Int. Cl.[6] H04B** *1/03;* **H01J** *29/82;* **H04N** *5/645;* **H01R** *13/627*
**U.S. Cl. 361—815** **8 Claims**



1. A printed circuit board coupling structure for affixing the circuit board to a cathode ray tube having a neck in which one end of the neck is to be connected to a socket formed on the circuit board, said structure comprising:
coupling means for coupling the cathode ray tube to the circuit board, said coupling means having a holder for receiving the one end of the neck so as to secure the center of the neck with the weight of the circuit board evenly distributed about the neck, and a support plate having a pair of first and second fastening means integrally formed on it for attaching said coupling means to one side of the circuit board; and
a plurality of assembly slots formed on said one side of the circuit board for engagement with at least one of said first and second fastening means.



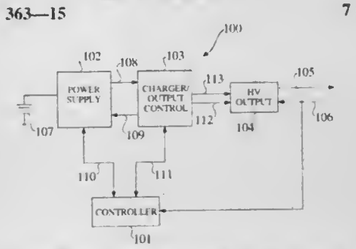
**5,745,349**
**SHIELDED CIRCUIT BOARD CONNECTOR MODULE**
**Timothy Lemke, Carlisle, Pa., assignor to Berg Technology, Inc., Reno, Nev.**
**Continuation of Ser. No. 583,489, Jan. 5, 1996, abandoned, which is a continuation of Ser. No. 196,516, Feb. 15, 1994, abandoned. This application Jan. 13, 1997, Ser. No. 782,715**
**Int. Cl.[6] H05K** *9/00;7/20*
**U.S. Cl. 361—818** **14 Claims**



1. A shielded module for a circuit board having a front surface and a rear surface, said circuit board having electronics and at least one connector extending from said front surface, said circuit board adapted to be detachably connected to another circuit board, comprising:
a conductive frame capable of being mechanically coupled to said front surface of said circuit board to substantially enclose said electronics between said frame and said circuit board;
a conductive cover capable of being mechanically coupled to one of said rear surface and said conductive frame to substantially cover said rear surface, said conductive frame together with said conductive cover being adapted to shield said entire circuit board from electromagnetic interference; and
a thermal transfer medium disposed between said conductive frame and said electronics for coupling thermal energy generated by said electronics to said conductive frame.

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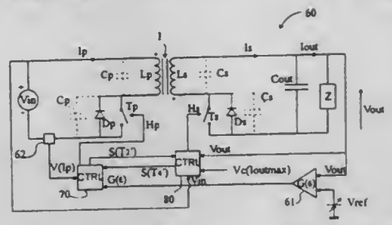
**5,745,350**
**POWER SUPPLY CIRCUIT WITH A WIDELY VARYING INPUT VOLTAGE**
**Stephen T. Archer, Sunnyvale, and Kenneth J. Carroll, Los Altos, both of Calif., assignors to Pacesetter, Inc., Sunnyvale, Calif.**
**Filed Jun. 7, 1996, Ser. No. 660,411**
**Int. Cl.[6] H02M** *3/22*
**U.S. Cl. 363—15** **7 Claims**




1. A power supply circuit receiving power from a battery, comprising:
a transformer, coupled to said battery, said transformer including a primary winding and a boost winding providing an output voltage;
a changer providing a voltage source, said changer deriving said voltage source alternatively between said battery and said output voltage of said boost winding; and
a plurality of regulated power supply circuits each providing an output voltage based on said voltage source.

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**5,745,351**
**DC-TO-DC BIDIRECTIONAL VOLTAGE CONVERTERS AND CURRENT SENSOR**
**Christophe Taurand, Valence, France, assignor to Sextant Avionique, Velizy Villacoublay, France**
**Filed Jan. 11, 1996, Ser. No. 583,772**
**Claims priority, application France, Jan. 13, 1995, 95 00541**
**Int. Cl.[6] H02M** *3/00;3/335;7/537*
**U.S. Cl. 363—20** **18 Claims**




1. A method for controlling a voltage converter (**30**, **40**, **50**, **60**, **300**) of the type comprising:
an inductive element (**1**, Lp, Ls) adapted to store energy in a magnetic form,
a first chopping switch (Tp) and a first diode (Dp) in parallel, forming with the inductive element (Lp) a primary circuit connected to a DC supply voltage source (Vin),
at least a second chopping switch (Ts) and a second diode (Ds) in parallel, forming with the inductive element (Ls) at least a secondary circuit providing a load (Cout, Z) with an output voltage (Vout) of the converter,
said method comprising the steps of
controlling said switches (Tp, Ts) to achieve operation cycles of the converter so that each cycle includes a primary period (T1) during which the first switch (Tp) is on and the second switch (Ts) is off, and a secondary period (T3) during which the second switch (Ts) is on and the first switch (Tp) is off,
determining the duration of the secondary period (T3) by a calculation means, and
triggering the switching-off of the secondary switch (Ts) when the calculated duration of the secondary period (T3) is ended;
wherein the duration of the primary period (T1) is determined by the switching-off of the first switch (Tp) which is triggered when a current (Ip) in the primary circuit is higher than a control signal (G(ε)) depending upon the difference (ε) between the output voltage of the converter (Vout) and a reference voltage (Vref).

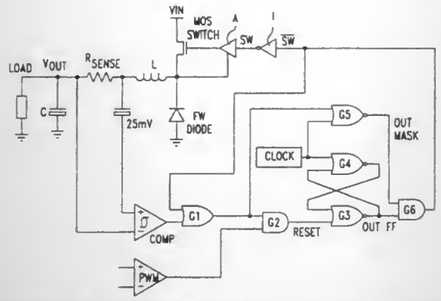
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**5,745,352**
**DC-TO-DC CONVERTER FUNCTIONING IN A PULSE-SKIPPING MODE WITH LOW POWER CONSUMPTION AND PWM INHIBIT**
**Paolo Sandri, Milan; Maria Rosa Borghi, Marcallo con Casone, and Luca Rigazio, Cigliano, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy**
**Continuation of Ser. No. 549,340, Oct. 27, 1995, abandoned, which is a continuation of Ser. No. 549,601, Oct. 27, 1995, abandoned. This application Dec. 23, 1996, Ser. No. 772,303**
**Claims priority, application European Pat. Off., Oct. 27, 1994, 94830507**
**Int. Cl.[6] H02M** *1/12;* **G05F** *1/10*
**U.S. Cl. 363—41** **20 Claims**

8. A DC-to-DC static converter composed of a power section which comprises at least a switch driven at a switching frequency set by a clock or local oscillator signal, an inductor, a discharge diode, an output storage capacitor, a PWM control loop suitable to

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control the duty-cycle of said switch by commanding the turning off in function of the current level in the inductor and of the output voltage of the converter, and a control circuit for reducing the overall switching frequency during idle periods as long as the current in the inductor remains below a minimum threshold value set by a comparator, comprising logic means capable of inhibiting any turn-off command of said PWM control loop switch of the converter for as long as the current in the inductor remains below said minimum threshold value.

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**5,745,353**

**SNUBBER CIRCUIT THAT SUPPRESSES SURGE AND RUSH CURRENT FLOWING TO A SWITCHING ELEMENT OF A SELF EXCITATION-TYPE FLYBACK POWER SUPPLY**

**Morio Sato, Saitama-ken; Kenichiro Momose, Kanagawa-ken; Tadao Saito, Kanagawa-ken, and Takao Kusaka, Kanagawa-ken, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan**

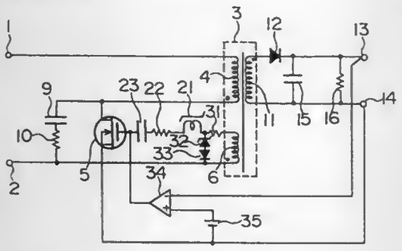
**PCT No. PCT/JP93/01357, § 371 Date Jul. 12, 1995, § 102(e) Date Jul. 12, 1995, PCT Pub. No. WO94/07300, PCT Pub. Date Mar. 3, 1994**

**PCT Filed Sep. 22, 1993, Ser. No. 403,857**

**Claims priority, application Japan, Sep. 24, 1992, 4-076388; Jan. 14, 1993, 5-004632**

**Int. Cl.[6] H02H** *7/122*

**U.S. Cl. 363—56** **17 Claims**




1. A snubber circuit suppressing surge and rush currents flowing to a switching element the snubber circuit being connected in series to a drive circuit for driving the switching element, the snubber circuit comprising:

a saturable inductor delaying an ON voltage applied to said switching element from said drive circuit,

said saturable inductor having an exciting current, $I_{ex}$, of not more than 3 (A) and an amount of magnetic flux, $\Phi$ (Wb/m$^2$), in the range from 2% to 20% of the product of the operating period, T (sec), multiplied by a voltage (V) applied to said saturable inductor.

**5,745,354**

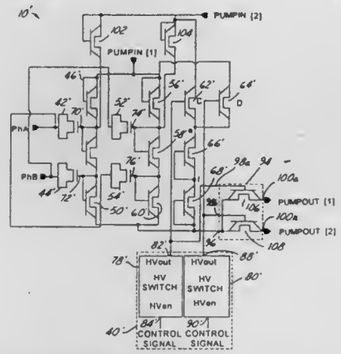
**PUMP CIRCUIT FOR GENERATING MULTIPLE HIGH VOLTAGE OUTPUTS FROM TWO DIFFERENT INPUTS**

**S. Babar Raza, Sunnyvale, Calif., assignor to Cypress Semiconductor Corporation, San Jose, Calif.**

**Filed Apr. 1, 1996, Ser. No. 627,250**

**Int. Cl.[6] H02M** *3/18*

**U.S. Cl. 363—60** **25 Claims**




1. A circuit comprising:

(a) a plurality of voltage inputs, each having a voltage level;

(b) a pump configured to: (i) receive said plurality of voltage inputs, (ii) increase each of said voltage levels and (iii) provide a plurality of outputs having different voltage levels; and

(c) a selector configured to (i) receive a control signal and (ii) select one of said outputs in response to said control signal.

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**5,745,355**

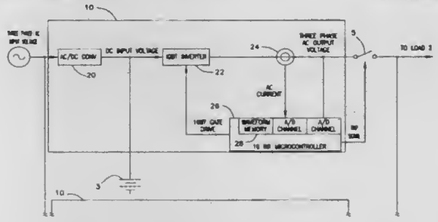
**WIRELESS SELECTIVE TRIPPING OF AC POWER SYSTEMS CONNECTED IN PARALLEL**

**John G. Tracy, Raleigh, and Frederick Tassitino, Jr., Wake Forest, both of N.C., assignors to Exide Electronics Corporation, Raleigh, N.C.**

**Filed Jun. 25, 1996, Ser. No. 669,940**

**Int. Cl.[6] H02M** *7/00;* **G05F** *1/40*

**U.S. Cl. 363—71** **19 Claims**




1. A power system for providing AC power to a load via a power connection, said power connection including means for disconnecting said power system from said load upon receipt of a trip signal, comprising:

means for generating an AC output voltage;

means for sampling said AC output voltage to provide AC current samples and AC voltage samples;

means for storing at least a cycle of said AC current samples and said AC voltage samples;

means for determining a current transient as a difference between an AC current sample from said sampling means and an AC current sample at a corresponding point of a previous AC current cycle stored in said storing means and for determining a voltage transient as a difference between an AC voltage sample from said sampling means and an AC voltage sample at a corresponding point of a previous AC voltage cycle stored in said storing means; and

means for generating said trip signal when said current transient and said voltage transient both increase or both decrease in value by predetermined amounts.



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**5,745,356**

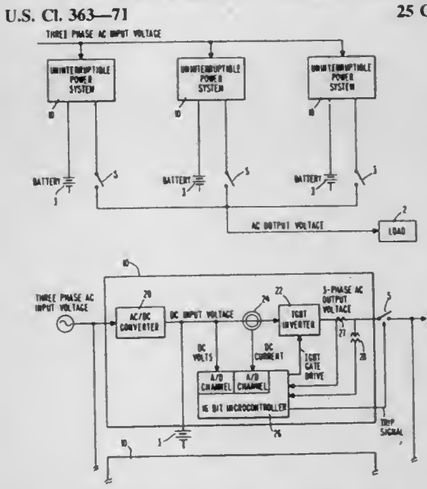
**INDEPENDENT LOAD SHARING OF AC POWER SYSTEMS CONNECTED IN PARALLEL**

**Frederick Tassitino, Jr., Wake Forest, and John G. Tracy, Raleigh, both of N.C., assignors to Exide Electronics Corporation, Raleigh, N.C.**

**Filed Jun. 25, 1996, Ser. No. 673,602**

**Int. Cl.[6] H02M** *7/00;7/5387;* **H02J** *3/00*

**U.S. Cl. 363—71** **25 Claims**




1. A parallel redundant power system comprising at least two power systems connected in parallel so as to provide AC power to a load via a common power connection, at least one of said power systems comprising:

means for generating an AC output voltage from a DC input power source;

means for sampling one of a DC input voltage from the DC input power source and said AC output voltage from said AC output voltage generating means to provide power level samples;

means for determining the AC output power of said AC output voltage generating means from the power level samples; and

means for providing a control signal to said AC output voltage generating means to control the AC output phase and output frequency of said AC output voltage from said AC output voltage generating means based on the output power level of the AC output voltage generating means and a derivative of the output power level of the AC output voltage generating means so as to affect load sharing in a manner proportional to a unit power rating of said power system with other power systems to which the power system is connected in parallel without requiring inter-unit signaling between the power systems.

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**5,745,357**

**REGULATOR CIRCUIT AND MULTI-OUTPUT SWITCHING POWER UNIT USING THE REGULATOR CIRCUIT**

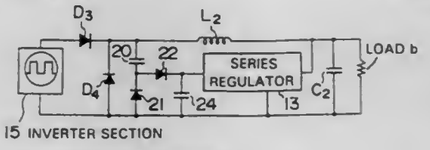
**Tadahiko Matsumoto, Yokohama, Japan, assignor to Murata Manufacturing Co., Ltd., Japan**

**Filed Jun. 7, 1996, Ser. No. 661,391**

**Claims priority, application Japan, Jun. 8, 1995, 7-166860; May 20, 1996, 8-148605**

**Int. Cl.[6] H02M** *7/68*

**U.S. Cl. 363—84** **6 Claims**




1. A regulator circuit comprising:

an input section for receiving an AC signal;

a rectifier circuit connected with said input section, for rectifying the AC signal input to said input section;

a choking coil connected in series with an output of said rectifier circuit;

a series circuit of a first diode and a voltage up capacitor connected to the output of said rectifier circuit with said voltage up capacitor connected to an input side of said choking coil; and

a series regulator connected between a series connection point of said first diode and said voltage up capacitor and an output side of said choking coil.

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**5,745,358**

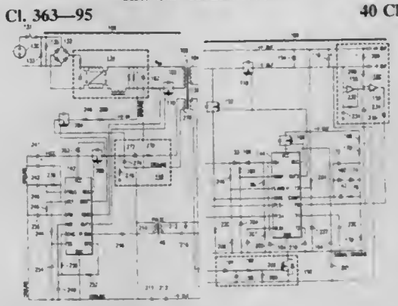
**VARIABLE-FREQUENCY CONVERTER WITH CONSTANT PROGRAMMED DELAY**

**Richard A. Faulk, Cypress, Tex., assignor to Compaq Computer Corporation, Houston, Tex.**

**Filed Dec. 31, 1996, Ser. No. 775,558**

**Int. Cl.[6] H02M** *7/539*

**U.S. Cl. 363—95** **40 Claims**



1. A power converter circuit, comprising:

a transformer having primary and secondary windings;

a first controllable switch connected to vary current, from an input voltage connection, through said primary winding; wherein said input voltage varies substantially continuously;

a power output connection operatively connected to draw power from said secondary winding of said transformer; and

control logic operatively connected to control switching of said switch, with a variable switching frequency, in a control relationship which includes a delay which is independent of the switching frequency, and is not dependent on direct sensing of the current across said switch nor of the current across said primary winding, and is determined by the LC time constant of the inductance of said primary winding in combination with the net capacitance across terminals of said switch.

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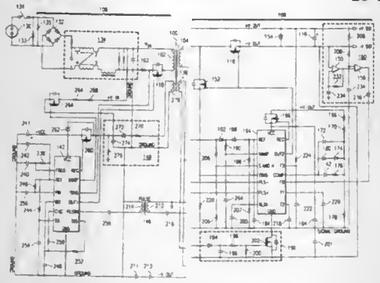


**5,745,359**

## VARIABLE-INPUT-VOLTAGE CONVERTER WITH DELAY PROPORTIONAL TO $V_{IN}/V_{OUT}$

**Richard A. Faulk, Cypress, Tex., assignor to Compaq Computer Corporation, Houston, Tex.**

**Filed Dec. 31, 1996, Ser. No. 777,848**
**Int. Cl.[6] H02M** *7/539*
**U.S. Cl. 363—95** **26 Claims**



1. A power converter circuit, comprising:
a transformer having primary and secondary windings;
a controllable switch connected to vary current, from an input voltage connection, through said primary winding; wherein said input voltage varies substantially continuously;
a power output connection operatively connected to draw power from said secondary winding of said transformer; and
control logic operatively connected to control switching of said switch in a control relationship which, under at least some circumstances, includes a delay which is dependent on the ratio between the input voltage and the voltage of said power output connection, and is not dependent on direct sensing of the current across said switch nor of the current across said primary winding.

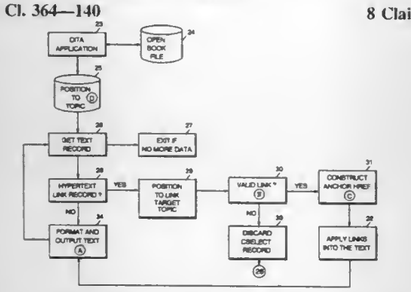
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**5,745,360**

## DYNAMIC HYPERTEXT LINK CONVERTER SYSTEM AND PROCESS

**Paul Thomas Leone, Raleigh; Mark Williams Lumsden, Apex, and Victor Edward Pulizzi, Holly Springs, all of N.C., assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed Aug. 14, 1995, Ser. No. 514,935**
**Int. Cl.[6] G05B** *11/01*
**U.S. Cl. 364—140** **8 Claims**




5. A hypertext link converter for converting input source file materials containing non-HTML formatted hypertext links to output file HTML formatted hypertext links, comprising steps executable in a computer, and effective for:
accessing a user requested topic segment in said input source file material;
identifying any hypertext links included in said topic segment;
verifying that any referenced material contained in each hypertext link exists;
recording the location in a referenced work where said referenced material may be found;
constructing HTML formatted anchor reference tags for each said hypertext link identified in said topic segment; and
formatting an output file text that includes said HTML formatted anchor reference tags in place of any said hypertext links included in said accessed topic segment.

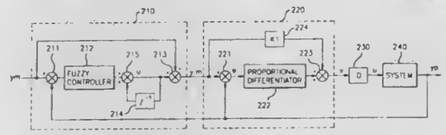
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**5,745,361**

## POSITION CONTROL APPARATUS FOR MACHINE TOOL WITH FUZZY COMPENSATOR

**Jong-Hwan Kim, and Jeong-Yul Jeon, both of Daejon, Rep. of Korea, assignors to LG Industrial Systems Co., Ltd., Seoul, Rep. of Korea**

**Filed Nov. 18, 1996, Ser. No. 752,180**
**Claims priority, application Rep. of Korea, Nov. 23, 1995, 43158/1995**
**Int. Cl.[6] G06F** *19/00; G05B 13/02*
**U.S. Cl. 364—148** **6 Claims**




1. A position control apparatus for a machine tool, comprising:
a pre-unit fuzzy compensator for outputting a fuzzy-compensated signal according to an evolutionary computation algorithm after obtaining an error and a rate of a change of the error from a positional feedback output signal from a machine tool positioning system;
a proportional-derivative controller for carrying out a proportional-derivative control and outputting a torque value after obtaining an error from an output signal from the pre-unit fuzzy compensator and the output signal from the system; and
an actuator for multiplying the torque value by a predetermined coefficient to obtain a control signal and outputting the control signal to the system.

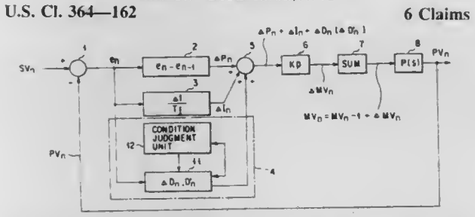
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**5,745,362**

## DIGITAL PID CONTROL APPARATUS

**Kazuo Hiroi, and Yoshiyuki Yamamoto, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jun. 19, 1996, Ser. No. 666,089**
**Claims priority, application Japan, Jun. 20, 1995, 7-153392**
**Int. Cl.[6] G05B** *13/02;11/42*
**U.S. Cl. 364—162** **6 Claims**




4. A digital PID (P:proportional, I:integral, D:derivative) control apparatus, in which a deviation is obtained from a controlling amount of an object to be controlled, and an input target value, a velocity type PI control operation is carried out on the deviation, a velocity type D control operation is carried out on the deviation of the controlling amount, the velocity type control operation outputs are synthesized, and then converted into a position type manipulation signal, and this signal is supplied to the object to be controlled, said digital PID control apparatus comprising:
a derivation processing unit further comprising:
a judgement unit for judging whether $K=2\cdot\Delta t/(\Delta t+2\eta\cdot TD)\leqq 1$, or $K>1$ by using a control operation period $\Delta t$, a derivative time TD and a derivative gain $1/\eta$;



means for carrying out the velocity D control operation on the deviation, including a means for extracting velocity type D control operation results $\Delta D_n$, $\Delta D'_n$ and a derivative output $D_n$ by performing the following operation:
when $K\leqq 1$,
$\Delta D_n=\{(2\cdot TD)/(\Delta t+2\eta\cdot TD)\}\cdot(e_n-e_{n-1})-K\cdot D_{n-1}$
$D_n=D_{n-1}+\Delta D_n$
when $K>1$,
$\Delta D'_n=(TD/\Delta t)\cdot(e_n-2e_{n-1}+e_{n-2})$
$D_n=D_{n-1}+\Delta D'_n$; and
means for carrying out the velocity type D control operation on the controlling amount, including a means for extracting velocity type D control operation results $\Delta D_n$, $\Delta D'_n$ and a derivative output $D_n$ by performing the following operation:
when $K\leqq 1$
$\Delta D_n=\{(2\cdot TD)/(\Delta t+2\eta\cdot TD)\}\cdot(PV_{n-1}-PV_n)-K\cdot D_{n-1}$
$D_n=D_{n-1}+\Delta D_n$
when $K>1$,
$\Delta D'_n=(TD/\Delta t)\cdot(2PV_{n-1}-PV_n-PV_{n-2})$
$D_n=D_{n-1}+\Delta D'_n$,
where $e_n$: the amount of deviation at the present time, $e_{n-1}$: the amount of deviation at the time of the immediately previous control operation period, $e_{n-2}$: the amount of deviation at the time of one before the immediately previous control operation period, $PV_n$: the control amount at the present time, $PV_{n-1}$: the control amount at the time of the immediately previous control operation period, $PV_{n-2}$: the control amount at the time of one before the immediately previous control operation period, $D_n$: the derivative output at present time, and $D_{n-1}$: the derivative output at the time of the immediately previous control operation period.

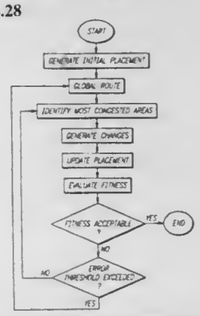
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**5,745,363**

## OPTIMIZATION PROCESSING FOR INTEGRATED CIRCUIT PHYSICAL DESIGN AUTOMATION SYSTEM USING OPTIMALLY SWITCHED COST FUNCTION COMPUTATIONS

**Michael D. Rostoker, Boulder Creek; James S. Koford, San Jose; Edwin R. Jones, Sunnyvale; Douglas B. Boyle, Palo Alto, and Ranko Scepanovic, Cupertino, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.**

**Continuation of Ser. No. 559,206, Nov. 13, 1995, Pat. No. 5,636,125, which is a continuation of Ser. No. 229,826, Apr. 19, 1994, Pat. No. 5,495,419. This application Feb. 13, 1996, Ser. No. 600,588**
**Int. Cl.[6] G06F** *15/00*
**U.S. Cl. 364—468.28** **23 Claims**




1. A physical design automation system for producing a highest fitness cell placement for an integrated circuit chip, comprising:
a fitness computer for computing a fitness value for a population of cell placements;
a placement alterator for altering said cell placements using a predetermined fitness improvement algorithm in accordance with said fitness values respectively; and a controller for controlling the fitness computer to initially compute said fitness values using a predetermined second fitness function after reaching a computation optimization criterion which is predetermined to maximize convergence of said cell placements toward an optimal configuration and to reduce probability of convergence of said cell placements toward a local optima.

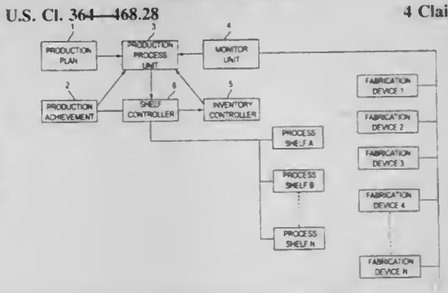
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**5,745,364**

## METHOD OF PRODUCING SEMICONDUCTOR WAFER

**Yoichi Togashi, Yamagata, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Dec. 26, 1995, Ser. No. 578,027**
**Claims priority, application Japan, Dec. 28, 1994, 6-327885**
**Int. Cl.[6] G06F** *19/00*
**U.S. Cl. 364—468.28** **4 Claims**




1. A method of producing a semiconductor wafer comprising the steps of:
(a) a production process comparing/calculating step for comparing a production plan, which has been prepared in advance, with production achievement data, and subsequently calculating a production progress,
(b) a fabrication device status monitor step for monitoring the processing status of fabrication devices,
(c) an inventory control step for controlling semiconductor wafers that have been placed on process shelves to be processed in said fabrication devices, and,
(d) a process shelf controller step for automatically searching said process shelves for a next semiconductor wafer to be processed by said fabrication devices, whereby calculation of said production progress of step (a) is started in response to a timing signal from step (b), said production progress being used to determine said next semiconductor wafer to be processed, such that step (d) enables the searching of said process shelves for said next semiconductor wafer,
wherein if more than one suitable candidate for said next semiconductor wafer is located on the process shelves for said fabrication device, a priority determination is made whereby a ratio is calculated for each candidate wafer and the candidate wafer with the largest corresponding ratio is given highest priority and the candidate wafer with the smallest ratio is given lowest priority, all candidate semiconductor wafers with intermediate ratios being given a priority accordingly,
said ratio being calculated by dividing the difference between actual process time for the wafer, including fabrication device set up time, and the planned process time, given by said production plan, by the difference between the planned delivery time, also given by said production plan, and said planned process time.

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5,745,365

## WEB MONITORING FOR PAPER MACHINES

John Russell Parker, Gravesend, Great Britain, assignor to John Heyer Paper Ltd., Aylesford, Great Britain

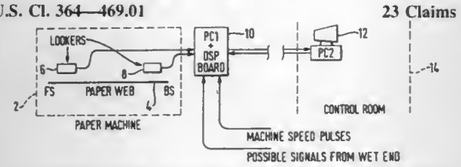
PCT No. PCT/GB95/01222, § 371 Date May 7, 1997, § 102(e) Date May 7, 1997, PCT Pub. No. WO95/34810, PCT Pub. Date Dec. 21, 1995

PCT Filed May 26, 1995, Ser. No. 750,500

Claims priority, application United Kingdom, Jun. 14, 1994, 9411908

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—469.01 23 Claims




1. A method of analyzing variations in a moving web comprising the steps of:

(a) repeatedly or continuously sampling the variations in a characteristic of the web at each of a plurality of inspection locations spaced apart across the web to produce a corresponding plurality of raw data signals;

(b) determining from the raw data signals a plurality of intermediate signals, at least one intermediate signal being representative of either a weighted or unweighted additive or subtractive combination of two or more of the raw data signals;

(c) calculating a power spectrum for each of the intermediate signals;

(d) subtracting one of either a weighted or unweighted pair of said power spectra from the other of the pair to produce a variation output; and,

(e) determining the variations in the sampled web characteristic according to the variation output.

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5,745,366

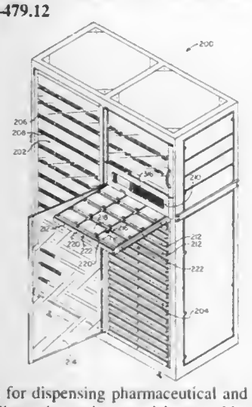
## PHARMACEUTICAL DISPENSING DEVICE AND METHODS

John D. Higham, Menlo Park; Peter P. Godlewski, San Carlos, and Richard C. Arnold, San Jose, all of Calif., assignors to Omnicell Technologies, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 274,926, Jul. 14, 1994. This application Oct. 10, 1995, Ser. No. 544,379

Int. Cl.[6] G06F *17/00*; G06G *7/48*

U.S. Cl. 364—479.12 43 Claims




1. A method for dispensing pharmaceutical and medical supply items from a dispensing unit comprising a cabinet having a processor and a plurality of retractable drawers, with at least some of the drawers having a plurality receptacles for holding the items and with at least some of the drawers having lockable lids for at least some of the receptacles in the drawer, the method comprising:

entering user identification information into the processor to identify a user that is requesting access to the pharmaceutical or medical supply items held in the dispensing unit;

entering pharmaceutical or medical supply item identification information into the processor, the pharmaceutical or medical supply item identification information identifying specific pharmaceutical or medical supply items that the user requests to remove from the dispensing unit;

comparing the user identification information with an access list having information as to which of the requested pharmaceutical or medical supply items that the user may be given access based on the previously entered user identification information to determine one or more of the drawers to which the user may be given access;

unlocking one of the drawers having one of the requested pharmaceutical or medical supply items if the access list indicates that the user may have access to the requested pharmaceutical or medical supply item in that drawer;

retracting the unlocked drawer;

actuating a receptacle visual indicator adjacent one of the receptacles in the retracted drawer having the requested pharmaceutical or medical supply item;

unlocking the lid adjacent the actuated visual indicator if the retracted drawer includes at least some lockable lids to allow access to the receptacle adjacent the actuated visual indicator while preventing access to the other receptacles having lockable lids; and

removing the requested pharmaceutical or medical supply item from the receptacle adjacent the actuated visual indicator.

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5,745,367

## FLY BACK TRANSFORMER, AND ITS INDUCTANCE ADJUSTING METHOD AND DEVICE

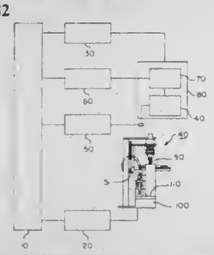
Sang Yeob Cha, Seoul, Rep. of Korea, assignor to Samsung Electro-Mechanics Co., Ltd., Kyongki-do, Rep. of Korea

Filed May 29, 1996, Ser. No. 655,020

Claims priority, application Rep. of Korea, May 29, 1995, 1995-13702; May 27, 1996, 1996-17961

Int. Cl.[6] H01F *38/20*

U.S. Cl. 364—482 14 Claims




1. An inductance adjusting method of a FBT having top and bottom cores, comprising:

a step in which a palette to be fixed with the FBT is conveyed to a designated assembling position through a conveyor and then a presence or absence of the palette is detected by a position detecting means,

a step in which a driving means and a chucking device provided to a clamping unit are integrally driven by an ascending and descending means and a detector contacts with a terminal pin protruded at a top side of a low voltage bobbin of the FBT whereby the top core is driven to a setting position,

a step in which a conveying means for conveying the top and bottom cores upwardly and downwardly is clamped by a chucking device, the driving means is driven by a signal of a driving control means whereby a clamping pin of the conveying means to be clamped to a chuck of the chucking device is rotationally driven and simultaneously the top core is conveyed to a reference position,

a step for repeating a process which compares whether or not an inductance value according to a measured signal inputted from an LCR measuring means is set within a tolerance value, and when the inductance value is within the tolerance value, drives the driving means by the signal of the driving control means and thereby finely rotating the clamping pin of the conveying means to be clamped to the chuck of the chucking device, and

a step, when said inductance value is set within the tolerance value, releasing the clamping pin of the conveying means, and driving the clamping unit provided with the driving means integral with the chucking device to discharge the palette placed with said FBT for a hardening of an adhesive agent introduced by the conveyor between the top and bottom cores.



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5,745,368

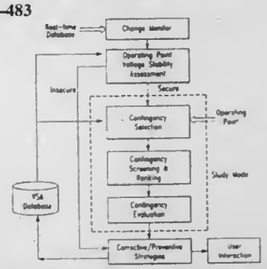
## METHOD FOR VOLTAGE STABILITY ANALYSIS OF POWER SYSTEMS

Gabriel C. Ejebe, and Jianzhong Tong, both of Plymouth, Minn., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Mar. 29, 1996, Ser. No. 625,053

Int. Cl.[6] G05F *1/10*

U.S. Cl. 364—483 6 Claims




1. A method for Voltage Stability Analysis of a bulk power supply system, comprising the following steps:

A. selecting at least two contingencies of a plurality of contingencies of the bulk power supply system;

B. screening and ranking the contingencies based on a predetermined ranking algorithm and generating a voltage collapse index;

C. approximating a stable branch of the bulk power supply system based on the screened and ranked contingencies of step B;

D. creating a voltage versus power curve by determining a plurality of stable equilibrium points on the curve;

E. using the plurality of determined stable equilibrium points to create and fit the approximate stable branch of step C;

F. calculating an approximate voltage collapse point for use in conjunction with the voltage collapse index.

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5,745,369

## METHOD AND APPARATUS FOR DETERMINING A PEAK POSITION OF A SPECTRUM

Juichiro Ukon, Miyanohigashi-machi, Japan, assignor to Horiba Ltd., Kyoto, Japan

Filed May 30, 1995, Ser. No. 453,765

Int. Cl.[6] G01J *3/42*; G01N *21/25*

U.S. Cl. 364—487 25 Claims

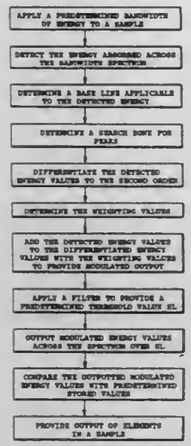
1. A method of determining peak positions in a spectrum of data, comprising the steps of:

receiving a range of data over the spectrum;

storing the range of spectrum data;

subjecting a duplication of the range of data to a differential calculus operation of an even number order to obtain a differential spectrum data;

combining the initial range of spectrum data with the differential spectrum data by multiplying them together; and




determining the peak positions from the combined initial and differential spectrum data.

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5,745,370

## ELECTROMAGNETIC FIELD INTENSITY CALCULATING DEVICE

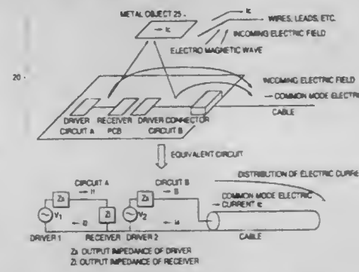
Shinichi Obtsu; Makoto Mukai; Sekiji Nishino, and Kenji Nagase, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 1, 1995, Ser. No. 432,261

Claims priority, application Japan, May 10, 1994, 6-095364

Int. Cl.[6] H04B *17/00*

U.S. Cl. 364—488 12 Claims




1. An electromagnetic field intensity calculating device for calculating at least one of an electric field intensity and a magnetic field intensity radiated by an electric circuit device having a metal portion and a dielectric portion based on a moment method, comprising:

input means for inputting structure information on a printed circuit board and components of the electric circuit device affecting the electromagnetic field of the electric circuit device including structure information of the metal portion and structure information of the dielectric portion with precision;

deriving means for deriving simultaneous equations according to the moment method based on the structure information of the electric circuit device input to said input means, an electric current flowing through the metal portion and an equivalent electric current and an equivalent magnetic current flowing through the dielectric portion being set as unknowns in the simultaneous equations;

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calculating means for calculating the electric current, the equivalent electric current and the equivalent magnetic current by solving the simultaneous equations derived by said deriving means; and

computation means for calculating at least one of the electric field intensity and the magnetic field intensity radiated by the electric circuit device based on calculation results obtained by said calculating means.

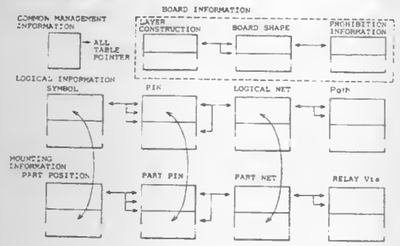
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**5,745,371**

## SYSTEM AND METHOD FOR MOUNTING COMPONENTS AND LAYOUT FOR PRINTED BOARDS

**Akihisa Shouen, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Jan. 10, 1995, Ser. No. 370,855**
**Claims priority, application Japan, Mar. 18, 1994, 6-049472**
**Int. Cl.[6] H05K** *3/36*
**U.S. Cl. 364—489** **15 Claims**




1. A system for mounting and designing printed boards which designs a mounting construction of a printed circuit board by making parts corresponding to each of a plural logical function elements which forms a logical circuit correspond to the printed circuit board, comprising:

preparation means for preparing a part symbol in which a logical function information indicating the logical function elements and a mounting information including a shape and a size of the parts are defined on the whole;

shape processing means for setting an outline frame of the printed circuit board;

displaying means for displaying the outline frame of the printed circuit board set by said shape processing means and the part symbol prepared by said preparation means on the screen;

arrangement designating means for inputting the logical function information in the outline frame of the printed circuit board of the screen by using the part symbol displayed in said displaying means and designating positions of the parts; and

connection designating means for designating a wiring connection relation among each of the parts by adding a logical connection information indicating a connection among each of the logical function elements to the part symbol displayed in said displaying means.

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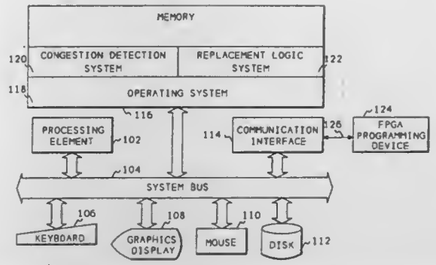
**5,745,372**

## APPARATUS AND METHOD FOR ROUTING SIGNALS IN A FIELD PROGRAMMABLE GATE ARRAY INTEGRATED CIRCUIT

**Michael W. Fluegge, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed May 4, 1995, Ser. No. 434,836**
**Int. Cl.[6] G06F** *17/50*
**U.S. Cl. 364—489** **16 Claims**

1. A method for allocating connecting signals and placing circuits within areas of an integrated circuit, said method comprising the steps of:




(a) retrieving a net that defines a connection between at least two circuits;

(b) examining at least one of a plurality of connecting signals available to establish said connection defined by said net, and allocating a free one of said connecting signals;

(c) when no free connecting signal is available for establishing said connection, exchanging said circuit with another circuit within said integrated circuit, said exchanging comprising the step of:

(c1) successively examining nearest neighbors of said circuit to locate a nearest neighbor circuit having no output connecting signal already allocated, and when a nearest neighbor is found having no output connecting signal already allocated, exchanging said circuit with said nearest neighbor circuit having no output connecting signal already allocated

(c2) when no nearest neighbor is found that has no output connecting signal allocated, successively examining nearest neighbors of said circuit to locate a nearest neighbor circuit having no output connecting signal to a location a same distance as a location of a connecting signal of said circuit, and when a nearest neighbor is found having no output connecting signal to a farther location, exchanging said circuit with said nearest neighbor circuit having no output connecting signal to a farther location; and

(d) repeating steps (a) through (c) until all nets for said integrated circuit have been processed.

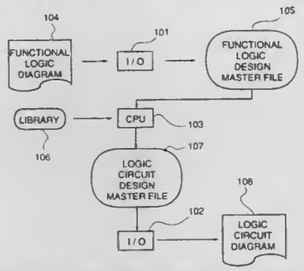
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**5,745,373**

## LOGIC CIRCUIT GENERATING METHOD AND APPARATUS

**Hiroo Watai, Fuji; Akira Yamaoka, Hadano; Kazuhiko Matsumoto, Kawasaki, and Hiromoto Sakaki, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Mar. 13, 1995, Ser. No. 402,699**
**Claims priority, application Japan, Mar. 11, 1994, 6-067840**
**Int. Cl.[6] G06F** *17/50*
**U.S. Cl. 364—490** **34 Claims**




1. An automated machine-implemented method for transforming a logic expression into logic circuit connection information, comprising the steps of:

inputting a logic expression including input polarities and corresponding output polarities for the logic expression;



reducing the input logic expression to a tree structure representation of a logic circuit, said tree structure having a single node joining a net of the tree structure to all outputs of the tree structure, wherein said outputs correspond to said output polarities one-to-one;

developing, by retrieval from a library of logic circuit cells, a set of logic circuit cells that solve the input logic expression, each logic circuit cell containing at least one logic gate;

selecting one of the developed logic circuit cells for each branch of the tree structure based upon a first criterion of minimum cell fan-out from the node;

generating logic circuit connection information containing the selected logic circuit cells; and

outputting the logic circuit connection information.

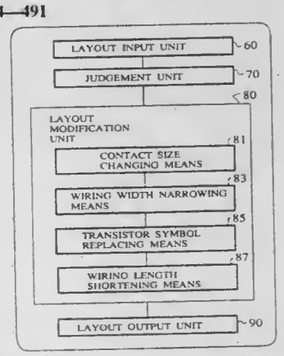
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**5,745,374**

## LAYOUT METHOD FOR SEMICONDUCTOR INTEGRATED CIRCUIT AND LAYOUT APPARATUS FOR SEMICONDUCTOR INTEGRATED CIRCUIT

**Nobu Matsumoto, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jul. 21, 1995, Ser. No. 505,735**
**Claims priority, application Japan, Jul. 22, 1994, 6-171012**
**Int. Cl.[6] H01L** *21/60;21/74*
**U.S. Cl. 364—491** **11 Claims**




1. A layout method for a semiconductor integrated circuit comprising the steps of:

a) extracting a mask layout to be processed;

b) changing dimensions of a symbolic layout included in said mask layout;

c) replacing transistor symbols included in said mask layout with symbols having diffusion layer terminals each having a constant length in a channel width direction and not having extent in a channel length direction;

d) shortening a length of wiring included in said mask layout in the channel width direction of said transistor symbols;

e) compacting said mask layout in the channel length direction of said transistor symbols;

f) shortening a length of wiring included in said mask layout in the channel length direction of said transistor symbols;

g) compacting said mask layout in the channel width direction of said transistor symbols;

h) narrowing a length of wiring included in said mask layout in the channel width direction of said transistor symbols; and

i) removing notches which do not satisfy a design rule by a filling process and developing hierarchically symbols after the step h),

wherein respective steps are performed in that order.

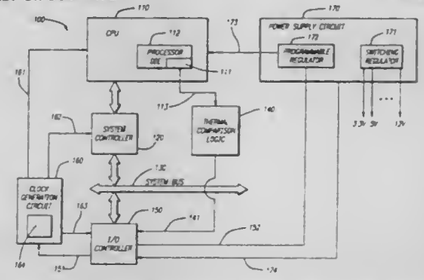
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**5,745,375**

## APPARATUS AND METHOD FOR CONTROLLING POWER USAGE

**Dennis Reinhardt, Palo Alto; Ketan Bhat, Mountain View; Robert T. Jackson; Borys Senyk, both of San Jose; Eugene P. Matter, and Stephen H. Gunther, both of Folsom, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Sep. 29, 1995, Ser. No. 537,146**
**Int. Cl.[6] H02J** *03/16*
**U.S. Cl. 364—492** **33 Claims**




1. A power control circuit adapted for use by an electronic device comprising:

a clock generation circuit that supplies a clock signal having a scalable frequency to the electronic device;

a power supply circuit that provides a power supply signal having a scalable voltage to the electronic device; and

a controller coupled to said clock generator circuit and said power supply circuit, said controller generates a first and second signal in response to an event in order to dynamically control power usage by the electronic device, the power usage is capable of being (i) reduced by decreasing the frequency of the clock signal followed by the voltage of the power supply signal or (ii) increased by increasing the voltage followed by the frequency.

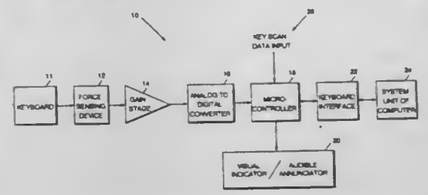
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**5,745,376**

## METHOD OF DETECTING EXCESSIVE KEYBOARD FORCE

**John Howard Barker, Cumming, Ga.; Gennaro Battiloro, Boca Raton, Fla.; Gary Robert McClurg, Louisburg, N.C.; Guy Francis Verrier, Boca Raton, Fla., and Gary Edward Webb, Cumming, Ga., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 9, 1996, Ser. No. 647,097**
**Int. Cl.[6] G01L** *1/10*
**U.S. Cl. 364—508** **14 Claims**




1. A method of detecting when a user is typing with excessive force on a keyboard, said method comprising the steps of:

detecting the force applied by the user to each key of the keyboard during a first period of time;

determining from said detecting step a normal level of force applied by the user for each key during said first period of time;

detecting the force applied by the user to a key of the keyboard during a second period of time;

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determining if the force applied by the user to said key during said second period of time is greater than the normal level of force for said key; and

indicating to the user that force greater than the normal force is being applied to said key of the keyboard.

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**5,745,377**

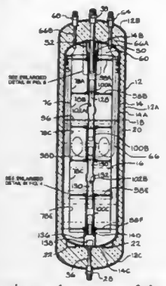
## METHOD AND APPARATUS FOR DETERMINING QUANTITY OF LIQUID IN A CONTAINER AND/OR LACK OF MOTION THEREOF

**Wendy Power, Westford; Michael A. Reed, Chelmsford, both of Mass.; Dominick J. Frustaci, Williamsville, N.Y.; Gerald Larocque, Bedford, and Brenda Marchetti, Plainville, both of Mass., assignors to Figgie International Inc., Willoughby, Ohio**

**Filed Mar. 20, 1995, Ser. No. 406,508**

**Int. Cl.[6] G01F** *23/26*

**U.S. Cl. 364—509** **30 Claims**



1. A method for sensing at least one of the volume of a liquid in a container independent of its spatial orientation and the spatial orientation of the container independent of the volume of the liquid therein, wherein the container comprises an enclosed surrounding side wall divided into a plurality of zones, comprising the steps of:

a. providing the container having a plurality of capacitors corresponding to the plurality of zones wherein the capacitors comprise first and second conductors with the first conductor provided by a plurality of continuous first conductive members disposed in a proximately spaced and parallel relationship with respect to the second conductor provided by the surrounding side wall to divide the container into the plurality of zones, and wherein the liquid in the container is capable of flowing freely between the first and second conductors to serve at least partially as a dielectric therefor;

b. measuring the percentage of contact by the liquid of each of the plurality of zones into which the container is divided corresponding to the capacitance of each of the plurality of capacitors; and

c. comparing the set of measured percentages of contact to a plurality of sets of reference percentage of contact values for the container at various volume percentages and spatial orientations to select a volume percentage and/or spatial orientation which is a best fit to the set of measured percentages of contact.

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**5,745,378**

## PARAMETER INPUT FOR DRUG DELIVERY PUMP

**Craig S. Barker, San Carlos, and Gordon E. Bell, Walnut Creek, both of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.**

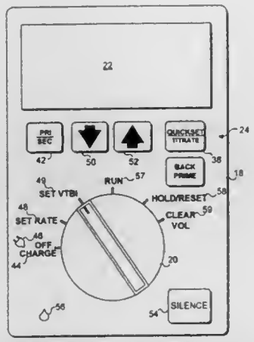
**Filed Dec. 4, 1995, Ser. No. 587,098**

**Int. Cl.[6] F04B** *49/00*; **A61M** *37/00*

**U.S. Cl. 364—510** **15 Claims**

1. A method for input of a desired value for a parameter used to control a medical device, comprising the steps of:

(a) defining a set of values for said parameter, said values increasing in unequal increments and being selected for inclusion in the set based upon a frequency of use in controlling the medical device, said values in said set being used substantially more often than other values not included in the set;




(b) providing a dedicated quick entry control on the medical device that when actuated by an operator scrolls through said set of values displaying successive values from said set, said successive values that are displayed being independent of a rate at which said quick entry control is actuated by the operator; and

(c) employing a value that is displayed for the parameter, for use in controlling the medical device.

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**5,745,379**

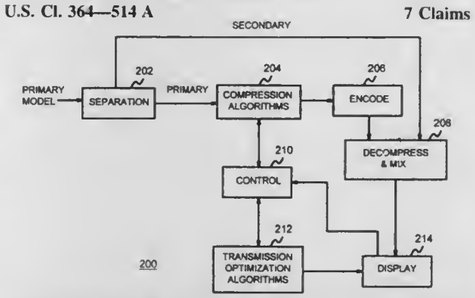
## METHOD FOR THE PRODUCTION AND TRANSMISSION OF ENHANCED MULTIMEDIA INFORMATION

**Scott W. Lewis, Saratoga, Calif., assignor to Multimedia Systems Corporation, San Jose, Calif.**

**Continuation of Ser. No. 369,279, Jan. 5, 1995, abandoned, which is a continuation of Ser. No. 976,941, Nov. 16, 1992, abandoned. This application Aug. 20, 1996, Ser. No. 700,131**

**Int. Cl.[6] G09G** *5/00*

**U.S. Cl. 364—514 A** **7 Claims**




1. A method for the production and transmission of interactive multimedia information comprising the steps of:

(a) separating the interactive multimedia information based upon a program model into primary and secondary layers;

(b) compressing at least one of the primary and secondary layers;

(c) encoding the compressed at least one of the primary and secondary layers;

(d) transmitting the compressed and encoded at least one of the primary and secondary layers;

(e) transmitting the other of the primary and secondary layers;

(f) receiving the at least one and the other of the primary and secondary layers;



(g) decompressing the compressed and encoded at least one of the primary and secondary layers;

(h) mixing the decompressed at least one of the primary and secondary layers with the other of the primary and secondary layers in accordance with psychographic parameters, the psychographic parameters comprising spatial color, audio, and temporal parameters; and

(i) displaying the decompressed at least one of the primary and secondary layers and the other of the primary and secondary layers to provide enhanced interactive multimedia data to a display.

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**5,745,380**

## PRIORITY CONTROLLED TRANSMISSION OF MULTIMEDIA STREAMS VIA A TELECOMMUNICATION LINE

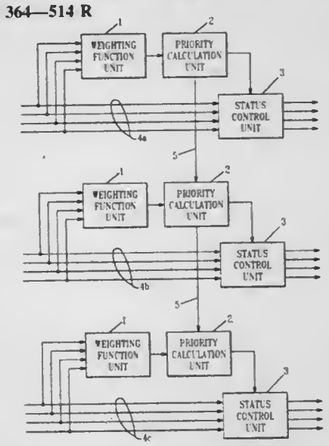
**Jochen Sandvoss, Mannheim, and Boris Kownatzki, Berlin, both of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 6, 1995, Ser. No. 468,175**

**Claims priority, application European Pat. Off., Jan. 30, 1995, 95101214**

**Int. Cl.[6] G06K** *15/00*

**U.S. Cl. 364—514 R** **8 Claims**




1. A method for transmitting multimedia streams via at least one telecommunication line, each multimedia stream having at least two substreams, with at least one of the substreams having an attribute for controlling the priority of at least one of the multimedia streams, the method comprising:

a. continuously detecting changes in attributes of the substreams;

b. providing a scale of priorities for the active transmission of the multimedia streams;

c. dynamically changing the priority status of each multimedia stream according to the change of at least one of the attributes; and

d. actively transmitting only those of the multimedia stream(s) with the highest priority level(s).

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**5,745,381**

## APPARATUS AND METHOD FOR EVALUATING OPERABILITY OF APPLIANCES AND AN APPARATUS FOR IMPROVING THE OPERABILITY OF THE APPLIANCES

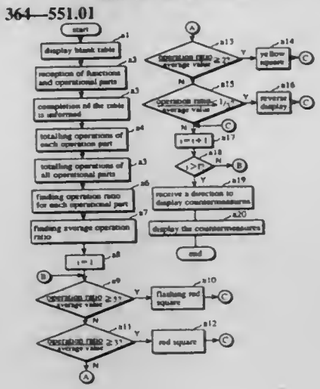
**Hirohiko Tanaka, Moriguchi, and Takeshi Nawata, Kadoma, both of Japan, assignors to Matsushita Electric Industrial, Osaka-fu, Japan**

**Filed Jun. 26, 1995, Ser. No. 494,964**

**Claims priority, application Japan, Jun. 27, 1994, 6-144770**

**Int. Cl.[6] G06F** *17/60*

**U.S. Cl. 364—551.01** **34 Claims**




1. A method for evaluating operability of a completed appliance at a designing stage, comprising the steps of:

forming a function-operation correspondence table which includes functions that the completed appliance is supposed to have, operational parts to exert each of the functions, and a number of times each of the operational parts is actuated to exert each of the functions;

finding a total number of times each of the operational parts is actuated to exert all the functions in a case where all the functions are selected one time each, by using the function-operation correspondence table;

adding up all the total numbers of times;

calculating a ratio of the number of times each of the operational parts is actuated to the total numbers of times all the operational parts are actuated to exert all the functions;

finding unbalance of using frequencies among the operational parts, from the calculated ratio and the number of the operational parts; and

evaluating the operability of the appliance, based on the unbalance found.

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**5,745,382**

## NEURAL NETWORK BASED SYSTEM FOR EQUIPMENT SURVEILLANCE

**Richard B. Vilim, Aurora; Kenneth C. Gross, Bolingbrook, and Stephan W. Wegerich, Glendale Hts., all of Ill., assignors to ARCH Development Corporation, Chicago, Ill.**

**Filed Aug. 31, 1995, Ser. No. 521,892**

**Int. Cl.[6] G06F** *19/00*

**U.S. Cl. 364—551.01** **20 Claims**

1. A method of performing surveillance of transient signals of an industrial device to determine an operating state thereof, comprising the steps of:

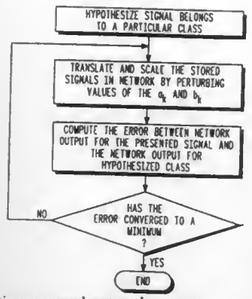
(a) reading into a memory training data;

(b) determining neural network weighting values by the steps comprising:

(1) solving a set of linear equations for obtaining the neural network weighting values;

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(2) computing a neural network output;

(3) evaluating the neural network output to determine whether the output is close to a set of target outputs;

(4) continuing steps (1)–(3) until achieving the target outputs; and

(5) providing a neural network output;

(c) providing signals characteristic of an industrial process;

(d) comprising the neural network output to said industrial process signals to ascertain the operating state of the industrial process comprising the steps of:

(1) hypothesizing said industrial process signals belong to a particular class;

(2) at least one of translating and scaling stored neural network training signals: and

(3) determining error between the neural network output for said industrial process signals and said stored neural network training signals.

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**5,745,383**

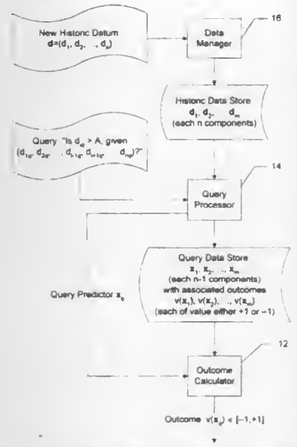
**METHOD AND APPARATUS FOR EFFICIENT THRESHOLD INFERENCE**

**Timothy P. Barber, 11931 Chalon La., San Diego, Calif. 92128**

**Filed Feb. 15, 1996, Ser. No. 601,713**

**Int. Cl.[6] G06F** *17/60*

**U.S. Cl. 364—554** **22 Claims**




**1**. A method for discriminating by a control system between two alternatives, the discrimination based on inferring the likelihood of each alternative compared to the other, the alternatives corresponding to values of −1 or +1 of a physical outcome $v(\vec{x}_q)$ associated with a set of predictor values $\vec{x}_q$ representing assumed values of a set of physical parameters, the physical outcome $v(\vec{x}_q)$ ranging in value from −1 up to and including +1 and representing the likelihood of each alternative compared to the other, the method comprising the steps of:

i) estimating the physical outcome $v(\vec{x}_q)$ based on other outcomes $v(\vec{x}_1), v(\vec{x}_2), \ldots v(\vec{x}_m)$ associated with other predictor values $\vec{x}_1, \vec{x}_2, \ldots, \vec{x}_m$, each predictor having p components where p>0, and

ii) inferring that the alternative closer to the estimated value of the physical outcome $v(\vec{x}_q)$ will be the alternative more likely to occur, the likelihood expressed by how close the estimated value of the physical outcome $v(\vec{x}_q)$ lies to the nearer alternative,

wherein the improvement comprises estimating the physical outcome $v(\vec{x}_q)$ according to a weighted average

$$v(\vec{x}_q) = \sum_{k=1}^{p} a_k g_k(\vec{x}_q)$$

where $a_1, a_2, \ldots, a_p$ are the weights of the weighted average such that $a_1+a_2+\ldots+a_p=1$, and where

$$g_k(\vec{x}_q) = \int_{\vec{a}} S(\vec{a}\cdot\vec{x}_q)\left[\sum_{i=1}^{m}(1+v_i S(\vec{a}\cdot\vec{x}_i))\right]^k d\vec{a},$$

which yields a value between −1 and +1.

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**5,745,384**

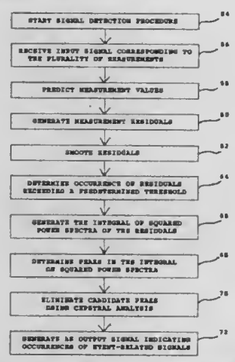
**SYSTEM AND METHOD FOR DETECTING A SIGNAL IN A NOISY ENVIRONMENT**

**Louis J. Lanzerotti, Morristown; Carol G. Maclennan, Summit; Lester V. Medford, and David James Thomson, both of Murray Hill, all of N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.**

**Filed Jul. 27, 1995, Ser. No. 508,274**

**Int. Cl.[6] H03F** *1/26*

**U.S. Cl. 364—574** **60 Claims**




**58**. A method for detecting an event-related signal that propagates in an environment between a detector equipment location and a remote location, the method comprising the steps of:

detecting electromagnetic signals propagating in the environment of the detector equipment location to store said environmental measurements over a period of time;

determining a set of expected values based on said environmental measurements, said expected values being a prediction of a difference in electrical potential, across a section of the earth between the detector equipment location and the remote location;



measuring the electrical potential across the section of the earth between the detector equipment location and the remote location to determine measured values of the difference in electrical potential therebetween;

generating a set of residual values based on said set of expected values and said set of measured values; and

analyzing said set of residual values to detect the event-related signal.

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**5,745,385**

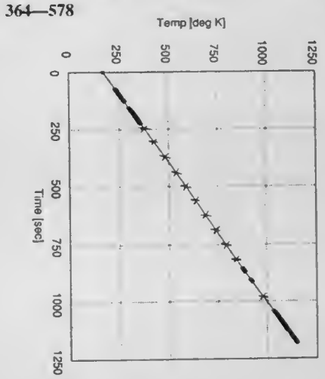
**METHOD FOR STROCHASTIC AND DETERMINISTIC TIMEBASE CONTROL IN STOCHASTIC SIMULATIONS**

**William Dinan Hinsberg, III, and Frances Anne Houle, both of Fremont, Calif., assignors to International Business Machines Corproation, Armonk, N.Y.**

**Filed Apr. 25, 1994, Ser. No. 233,022**

**Int. Cl.[6] G06F** *9/455*

**U.S. Cl. 364—578** **30 Claims**




**1**. A method for operating a computer system to perform stochastic simulation of a chemical kinetic process over a time domain in terms of a sequence of time values, within the time domain, the chemical kinetic process operating over a range of values for a programed state variable which is a predetermined function of time, the chemical kinetic process including a dependent state variable which is a function of the programmed state variable, the method comprising the computer-implemented steps of:

calculating a value for a process parameter, the step of calculating including calculating a state of the chemical kinetic process, given in terms of a current value of the dependent state variable, based on a current value of the programmed state variable for a current time value;

selecting a time value to be a value of the sequence based on a first selection technique where the process parameter has a value within a range of values; and

selecting a time value to be a value of the sequence based on a second selection technique where the process parameter has a value outside the range of values; and

repeating the steps of calculating, selecting based on a first technique, and selecting based on a second technique, until a predetermined condition representative of a conclusion of the chemical kinetic process is reached.

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**5,745,386**

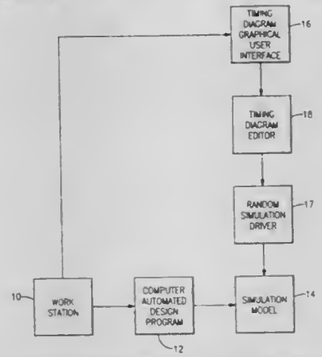
**TIMING DIAGRAM METHOD FOR INPUTTING LOGIC DESIGN PARAMETERS TO BUILD A TESTCASE FOR THE LOGIC DIAGRAM**

**Bruce Wile, Poughkeepsie; Dean Gilbert Bair, Bloomington, and Edward James Kaminski, Jr., Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 25, 1995, Ser. No. 533,128**

**Int. Cl.[6] G06F** *15/62*

**U.S. Cl. 364—578** **13 Claims**




**9**. A method for inputting parameters via a graphical user interface into a data base in order to build a testcase for a computer simulation of a logic design, comprising the steps of:

inputting facility parameters of said logic design via a graphical user interface screen that specifies inputs for an input/output descriptor, a facility name, and a facility bit range;

inputting cycle values for each facility via a graphical user interface screen that specifies for each selected cycle a cycle value for each facility;

inputting recurring cycles via a graphical user interface screen that specifies inputs for end conditions for each recurring cycle;

inputting limiting conditions and a limitor probability for a timing diagram that respectively defines conditions for invocation of the timing diagram in a testcase and a probability that it will be invoked via a user interface screen;

generating an interface protocol to said computer simulation of a logic design via a timing diagram formatted graphical user interface screen from said inputting steps, which timing diagram graphical user interface screen lists facilities in a vertical column and cycle values for each facility in a horizontal row from said inputting steps and corresponding cycle values for each facility aligned in vertical columns.

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**5,745,387**

**AUGMENTED REALITY MAINTENANCE SYSTEM EMPLOYING MANIPULATOR ARM WITH ARCHIVE AND COMPARISON DEVICE**

**Nelson Raymond Corby, Jr.; Peter Michael Meenan, both of Scotia, N.Y.; Claude Homer Solanas, III, Morgan Hill; David Clark Vickerman, Pleasanton, both of Calif., and Christopher Allen Nafis, Rexford, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Sep. 28, 1995, Ser. No. 536,011**

**Int. Cl.[6] G06F** *15/50*

**U.S. Cl. 364—578** **5 Claims**

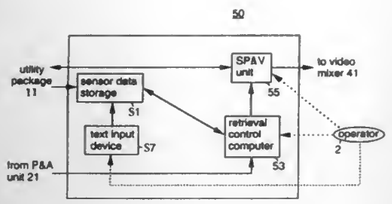
**1**. A remote maintenance system for inspection and identifying differences in structures in a predetermined region over time comprising:

a) a manipulator arm having

1. a utility package, for inspecting said structures according to selected acquisition settings, and for creating a present

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multi-dimensional sensor signal indicating physical properties of said structures, and

2. actuators capable of maneuvering the manipulator arm responsive to user-selected input;

b) environmental model storage device capable of retaining computer graphic information regarding said structures;

c) a position and attitude (P&A) sensing unit for measuring a position and orientation of the manipulator arm;

d) environment modeler for receiving the computer graphic information defining said structures and producing a conventional computer generated model of said structures and storing the model in the environment model storage device;

e) environment renderer coupled to the environment model storage device for generating an image of said structures from the environment model as viewed from a user-selected viewpoint;

f) manipulator arm renderer coupled to the P&A sensing unit for generating a conventional computer generated image of the manipulator arm at a position and orientation corresponding to that of the manipulator arm, generated from a prestored model of the manipulator arm as viewed from a user-selected viewpoint;

g) monitor for displaying images provided to it;

h) video mixer coupled to the environment renderer and the manipulator arm renderer for displaying the images on the monitor, thereby allowing an operator to visualize the position of the manipulator arm relative to its environment; and

i) an archive and comparison (A&C) device coupled to the video mixer and the P&A sensing unit and utility package, operating to:

i. archive the present multi-dimensional sensor signal from the utility package along with its acquisition settings,

ii. retrieve a previously archived multi-dimensional sensor signal measuring the same structure and its physical properties, and its associated acquisition settings,

iii. rectify the present and archived multi-dimensional sensor signals to have the same acquisition settings,

iv. compare the rectified signals to identify and characterize differences, and

v. display differences and archived signals on the monitor.

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**5,745,388**

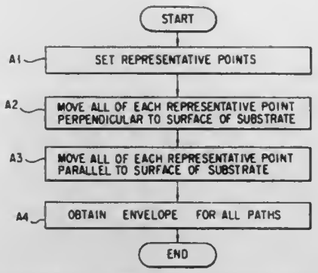
**PROFILE SIMULATION METHOD AND PATTERN DESIGN METHOD**

**Shoji Mimotogi, Sagamihara, and Soichi Inoue, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Nov. 7, 1995, Ser. No. 551,803**
**Claims priority, application Japan, Nov. 8, 1995, 6-273534**
**Int. Cl.[6] G06F** *17/50*
**U.S. Cl. 364—578** **12 Claims**

1. A profile simulation method for predicting an after processing profile of a surface of a film mounted on a substrate, wherein said film is to be processed using isotropic etching, said profile simulation method comprising the steps of:

setting a plurality of representative points on an unprocessed surface of the film;




moving the plurality of representative points in a first direction perpendicular to the unprocessed surface of the film in accordance with processing velocities at the plurality of representative points;

switching the moving direction of the representative points from the first direction to at least one second direction parallel to the unprocessed surface of the film and moving the plurality of representative points in the at least one second direction in accordance with processing velocities at the plurality of representative points; and

setting all loci of the plurality of representative points which have moved from the first direction to the at least one second direction in a predetermined processing time as paths and obtaining an envelope or surface for all the paths as the after processing profile.

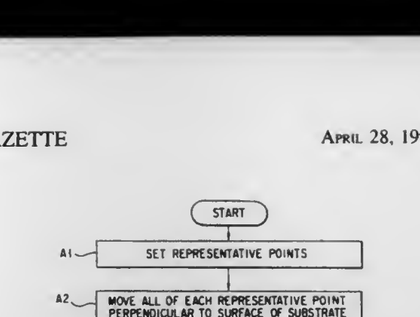
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**5,745,389**

**SYSTEM AND MECHANISM FOR ASSIGNING PRE-ESTABLISHED ELECTRONIC ADDRESSES TO PRINTED CIRCUIT BOARDS**

**Robert J. Russell, South Boston, Mass., assignor to Bull HN Information Systems Inc., Billerica, Mass.**

**Filed Apr. 4, 1996, Ser. No. 628,589**
**Int. Cl.[6] G06F** *11/00;* **H04K** *1/00*
**U.S. Cl. 364—580** **10 Claims**




10. An electronic address generation facility for use in a test system for providing unique preestablished addresses which are to be written into the memory elements of printed circuit boards during the manufacture thereof, each PCB being previously encoded with a scannable board serial number label, the test system including a processing unit and a memory coupled to the processing unit containing test software for directing the testing of PCBs when installed therein, the electronic address generation facility being installable in the memory of the test system and comprising:

(a) a first set of tables containing first and last serial number entries defining one of number of ranges of board serial numbers which are to be assigned to all of the PCBs of a particular type manufactured over a life cycle time period;

(b) a second set of tables containing first and last electronic address entries defining one of a number of preestablished electronic addresses which can be utilized by a manufacturer of all of the PCBs of the particular type;

(c) a subroutine selection and control element operatively coupled to the test software and to the first and second sets of tables;

(d) a number of offset subroutine computation elements operatively coupled to the control element, each offset subroutine computation element for deriving offset values for a predetermined one of the ranges of serial numbers; and

(e) a number of electronic address subroutine computation elements operatively coupled to the control element, each electronic address subroutine computation element for generating unique electronic address values in one of the ranges of preestablished electronic addresses defined by the first and last electronic address entries contained in the second set of tables,

the control element in response to a first signal from the test software indicating near completion of having tested the PCB installed in the test system, requesting the test software to read the scannable board serial number of the PCB, the control element upon receiving a representation of the board serial number invoking in succession each of the number of offset subroutine computation elements until a second signal is received specifying the validity of the board serial number and a value indicating the sequence position of the board serial number within the range and in response to the signal from one of the offset computation element indicating that the board serial number is valid the control element invoking one of the electronic address subroutine computation elements as a function of the value of the board serial number for generating a unique electronic address within the range of electronic addresses defined by the second set of tables from the sequence position value for writing into the memory element of the PCB having been tested by the test software.



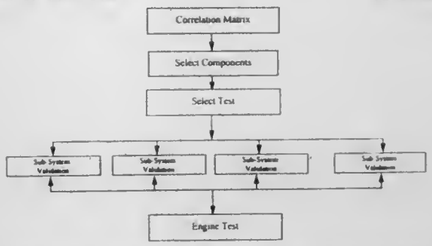
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**5,745,390**

**METHOD AND SYSTEM FOR REDUCING DEVELOPMENT TIME OF COMPLEX SYSTEMS UTILIZING CORRELATION MATRICES**

**Parviz Daneshgari, Flint, Mich., assignor to Regents of the University of Michigan, Ann Arbor, Mich.**

**Filed Feb. 21, 1997, Ser. No. 804,393**
**Int. Cl.[6] G05B** *17/02*
**U.S. Cl. 364—580** **32 Claims**




1. A method for reducing development time of a complex system utilizing correlation matrices, the complex system having major systems, each major system having subsystems and each subsystem having components, the method comprising the steps of:

creating and storing on a computer system correlation matrices for correlating the major systems to the subsystems and the subsystems to the components;

selecting subsystems to be tested and components required for each subsystem test from the stored correlation matrices; and

testing the selected subsystems in parallel separate from the complex system to obtain a first set of test results for each of the tested subsystems.

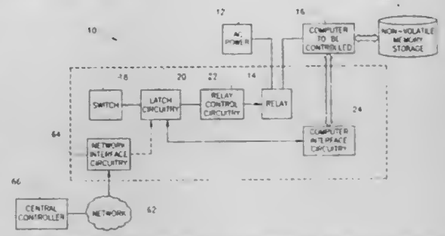
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**5,745,391**

**APPARATUS FOR AND METHOD OF TURNING ON AND SHUTTING OFF A COMPUTING DEVICE**

**Yakov Topor, 21 Yonitzman Street, Tel Aviv, Israel**

**Filed Sep. 13, 1995, Ser. No. 527,617**
**Int. Cl.[6] G06F** *1/00;1/18;1/26*
**U.S. Cl. 364—707** **6 Claims**




1. An apparatus for turning on and shutting down a computing device, comprising:

a control switch separate from any power on/off switch constituent to the computing device, said control switch for receiving on and off commands for toggling the computing device between an on state and an off state;

latch circuitry electrically coupled to said control switch, said latch circuitry

(a) for retaining whether the computing device is in said on state or said off state;

(b) for sensing said control switch on and off commands; and,

(c) for providing turn-on and turn-off commands to the computing device;

a relay controller, said relay controller electrically coupled to said latch circuitry for controlling the operation of a relay;

said relay electrically coupled to said relay controller and to a source of electrical current, said relay for controlling the flow of electrical current to the computing device;

non-volatile memory for storing the internal state of the computing device while the computing device is in said off state;

a saving program for

saving the current internal state of the computing device to said non-volatile memory upon receipt by said control switch of said off command,

said saving program for disconnecting electrical power from the computing device whereby the computing device is put into said off state;

a restoring program for

providing electrical power to the computing device whereby the computing device is put into said on state,

said restoring program for restoring the internal state of the computing device from said non-volatile memory, upon receipt by said control switch of said on command; and,

computer interface circuitry for communication between said latch circuitry and said saving program and said restoring program.

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**5,745,392**

**METHOD FOR REDUCING DATA STORAGE AND TRANSMISSION REQUIREMENTS FOR SEISMIC DATA**

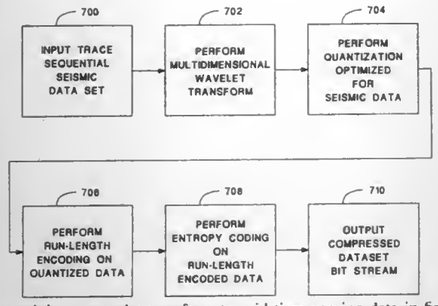
**Raymond A. Ergas, Laguna Beach, Calif.; Paul L. Donoho, Houston, Tex., and John Villasenor, Santa Monica, Calif., assignors to Chevron U.S.A. Inc., La Habra, Calif.**

**Filed Oct. 5, 1995, Ser. No. 539,415**
**Int. Cl.[6] G06F** *7/00*
**U.S. Cl. 364—715.02** **19 Claims**

1. A method for reducing data storage requirements for a set of seismic data collected from a plurality of seismic sensors in response to at least one seismic shot, wherein each sensor generates time-varying data which is sampled, digitized and stored, and wherein the data from said plurality of said sensors have a spatial relationship therebetween in at least two spatial dimensions, said method comprising the steps of:

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applying a wavelet transform to said time-varying data in first, second and third dimensions to generate subbands of transformed data comprising wavelet coefficients which represent said time-varying data and which are organized in accordance with frequency characteristics, wherein one of said first, second and third dimensions corresponds to time, another of said first, second and third dimensions corresponds to said first spatial dimension, and the last of said first, second and third dimensions corresponds to said second spatial dimension;

scalar quantizing said subbands of wavelet coefficients, wherein wavelet coefficients are replaced by integer equivalents, each integer equivalent representing a range of values for said wavelet coefficients, said integer equivalents selected for each subband based upon the relative geophysical significance of each subband, wherein less significant subbands have fewer ranges and more significant subbands have more ranges;

compressing said replacement integer equivalents to generate a compressed seismic data set; and

storing said compressed seismic data set.

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**5,745,393**

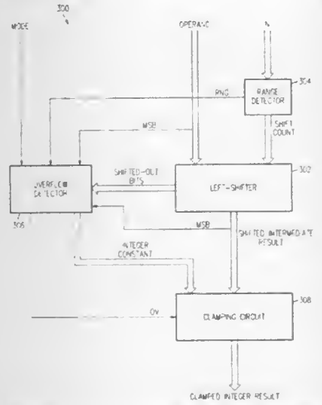
**LEFT-SHIFTING AN INTEGER OPERAND AND PROVIDING A CLAMPED INTEGER RESULT**

**Roney S. Wong, Sunnyvale, Calif., assignor to Samsung Electronics Company, Ltd., Rep. of Korea**

**Filed Oct. 17, 1996, Ser. No. 731,655**

**Int. Cl.[6] G06F** *7/00*

**U.S. Cl. 364—715.08** **50 Claims**




**25**. An apparatus for left-shifting an unsigned integer operand and providing a clamped integer result, comprising:

a left-shifter for left-shifting the operand by N bit positions, where N is an integer, to obtain a shifted intermediate result and N shifted-out bits;

an overflow detector for generating an overflow signal with a first logical value when any of the shifted-out bits is a one, and for generating the overflow signal with a second logical value when all the shifted-out bits are zero's; and

a clamping circuit for providing a maximum unsigned integer as the clamped integer result when the overflow signal has the first logical value, and for providing the shifted intermediate result as the clamped integer result when the overflow signal has the second logical value.

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**5,745,394**

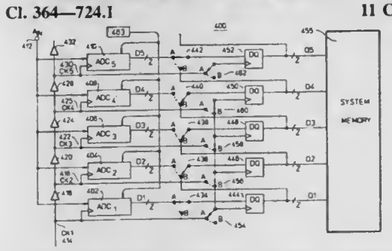
**HIGH SPEED ANALOG TO DIGITAL CONVERTER, DECIMATION AND STORAGE SYSTEM**

**Jon R. Tani, Palo Alto, Calif., assignor to Hewlett Packard Company, Palo Alto, Calif.**

**Filed Aug. 31, 1995, Ser. No. 521,617**

**Int. Cl.[6] G06F** *17/17*; **H03M** *1/00*;*1/12*

**U.S. Cl. 364—724.1** **11 Claims**




**1**. A high speed analog to digital converter, decimation and storage system comprising:

a plurality of X analog to digital converters receiving an analog signal, a jth one of the analog to digital converters generating a digital sample of the analog signal responsive to a sampling clock signal having a period X*T and delayed in time by ((j−1)*T);

means for receiving a user defined decimation factor N;

means for activating at least one of the X ADCs as a function of the decimation factor N;

a plurality of X storage elements having outputs, a jth storage element receiving the digital sample from the jth analog to digital converter if the jth analog to digital converter is active and receiving the output from a (j−1)th storage element if the jth analog to digital converter is not active;

an array of memory cells receiving the outputs from the storage elements; and

means for writing the outputs of the storage elements into the array of memory cells when all the storage elements have been loaded with digital samples subsequent to any prior memory writes, wherein the data samples written to the memory cells represent the analog signal sampled at a rate of (1/N)*(X/T).

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**5,745,395**

**SIGNAL PROCESSING APPARATUS AND METHOD**

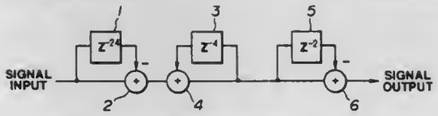
**Jun Makino, Kunitachi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 18, 1996, Ser. No. 588,397**

**Claims priority, application Japan, Jan. 20, 1995, 7-026001**

**Int. Cl.[6] G06F** *17/10*

**U.S. Cl. 364—724.17** **20 Claims**




**1**. A signal processing apparatus comprising:

first subtraction means for subtracting a second sampled signal from a first sampled signal to generate a first resultant signal, the first sampled signal being delayed for a time period of 4nT to create the second sampled signal, wherein n is a positive integer and T is a sampling time period;

addition means for adding the first resultant signal to a third sampled signal to generate a second resultant signal, the second resultant signal being delayed for a time period of 4T to create the third sampled signal; and

second subtraction means for subtracting a fourth sampled signal from the second resultant signal and for outputting a third resultant signal, the second resultant signal being delayed for a time period of 2T to create the fourth sampled signal.



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**5,745,396**

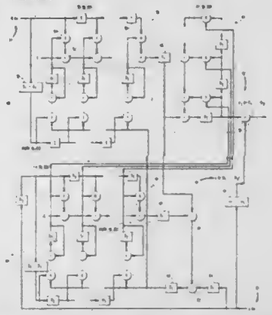
**PIPELINED ADAPTIVE IIR FILTER**

**Naresh Ramnath Shanbhag, Scotch Plains, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Apr. 28, 1995, Ser. No. 431,371**

**Int. Cl.[6] G06F** *17/10*

**U.S. Cl. 364—724.19** **24 Claims**



**1**. A pipelined adaptive infinite impulse response (PAIIR) filter including an adaptive section and a non-adaptive section, the PAIIR filter being responsive to first and second input signals comprising:

the adaptive section including:

delay means for re-timing a first polynomial value signal, the second input signal, and an error signal; and

first polynomial signal generating means for performing relaxed look-ahead processing on the second input signal in the adaptive section, the first polynomial signal generating means being responsive to the re-timed error signal so as to generate and adaptively update a first set of weight signals corresponding to first polynomial weights and so as to generate the first polynomial value signal therefrom and

adding means responsive to the re-timed second input signal to generate the error signal therefrom; and

the non-adaptive section including:

output filter means for processing the first set of weight signals to generate an expected output signal.

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**5,745,397**

**ADDITION OVERFLOW DETECTION CIRCUIT**

**Kouhei Nadehara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Feb. 6, 1996, Ser. No. 597,189**

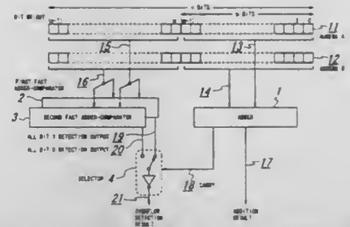
**Claims priority, application Japan, Feb. 7, 1995, 7-041435**

**Int. Cl.[6] G06F** *7/38*;*7/50*

**U.S. Cl. 364—745.03** **13 Claims**

**1**. An addition overflow detection circuit for detecting that a result of addition of unsigned binary numbers, each having a bit length of n bits, cannot be represented correctly with a bit length of m bits such that an overflow occurs, n and m being integers, n being equal to or greater than m, comprising:

an adder having a bit length of m or more bits for adding lower m bits of an augend having a bit length of n bits and lower m bits of an addend having a bit length of n bits;



a first fast adder-comparator for detecting that all bits of a result of addition of upper n−m bits of the augend and upper n−m bits of the addend are all equal to 1;

a second fast adder-comparator for detecting that all bits of the result of addition of the upper n−m bits of the augend and the upper n−m bits of the addend are all equal to 0; and

a selector for referring to a carry from an (m−1)th bit to an mth bit extracted from said adder to select and logically invert one of an all bit **1** detection output of said first fast adder-comparator and an all bit **0** detection output of said second fast adder comparator and outputting a result value as an overflow detection result.

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**5,745,398**

**METHOD FOR THE IMPLEMENTATION OF MODULAR MULTIPLICATION ACCORDING TO THE MONTGOMERY METHOD**

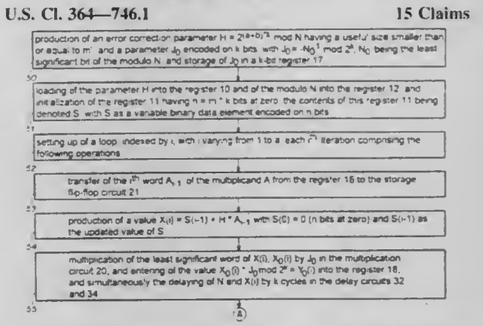
**Guy Monier, Rognac, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France**

**Filed Nov. 7, 1995, Ser. No. 545,408**

**Claims priority, application France, Nov. 8, 1994, 94 13594**

**Int. Cl.[6] G06F** *7/52*

**U.S. Cl. 364—746.1** **15 Claims**




**1**. A method for implementing modular multiplication according to the Montgomery method, wherein a multiplicand A and a multiplier B are encoded respectively using a number a and a number b of words of k bits, wherein the most significant words of A and B are non-zero, a modulo N is encoded using m words of k bits, the modulo having (m−m') most significant words with k zero bits, with $0 < m' \leq m$, comprising the step of:

multiplying in a multiplication circuit having a serial input to receive data elements encoded using at least m' words of k bits, a parallel input to receive encoded words of k bits, and a serial output; and

wherein, during the step of multiplying, a predetermined number p of words is applied successively to the parallel input of the multiplication circuit, wherein p is not an integer multiple of m and is greater than or equal to the number a.

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5,745,399

## DECIMAL ARITHMETIC APPARATUS AND METHOD

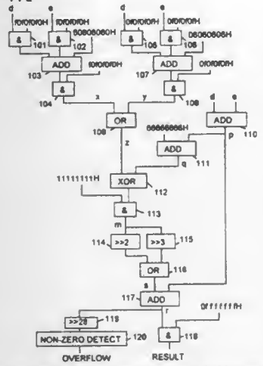
John Richard Eaton, Salford, and Kevin Hughes, Glossop, both of England, assignors to International Computers Limited, Putney, London, United Kingdom

Filed Apr. 26, 1996, Ser. No. 638,171

Claims priority, application United Kingdom, May 27, 1995, 9510834

Int. Cl.[6] G06F *7/52*

U.S. Cl. 364—771 4 Claims




1. Apparatus for adding first and second BCD numbers comprising:

means for generating a sum without carries, by forming the binary sum of said numbers and an all-sixes pattern, without any carries between BCD digits;

means for generating a sum with carries, by forming the binary sum of said numbers and an all-sixes pattern, with carries between BCD digits;

means for generating a mask pattern comprising a six in each BCD digit where said sum without carries is unequal to said sum with carries; and

means for generating a result by forming the binary sum of said numbers and said mask pattern, with carries between BCD digits.

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5,745,400

## CURRENT MEMORY

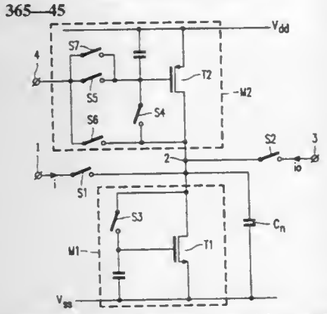
John B. Hughes, Hove, and Kenneth W. Moulding, Horley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 27, 1996, Ser. No. 708,159

Claims priority, application United Kingdom, Aug. 31, 1995, 9517785

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—45 14 Claims




1. An analogue current memory comprising: a first, coarse, current memory cell comprising a first field effect transistor having a first switch connected between its drain and gate electrodes, and a second, fine, current memory cell comprising a second field effect transistor having a second switch connected between its drain and gate electrodes and a third switch connected between its gate electrode and a bias potential source, means for applying an input current to be stored to inputs of the first and second current memory cells, means for applying output currents from the first and second current memory cells to a summing node, and means for deriving a stored current from the summing node, wherein the first and third switches are closed for a first period during the application of the input current and the second switch is closed for a second period during the application of the input current; wherein the current memory further comprises means for providing a discharge path for a capacitance at the summing node for an initial portion of the second period, said discharge path causing at least some of the charge on said capacitance to be discharged other than through the second transistor.

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5,745,401

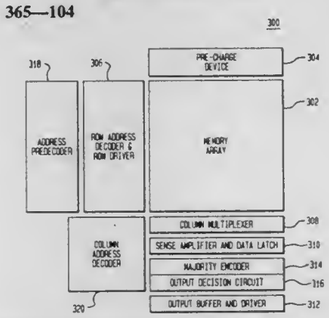
## HIGH-SPEED PROGRAMMABLE READ ONLY MEMORY

Kang W. Lee, Allentown, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Feb. 14, 1997, Ser. No. 800,346

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—104 11 Claims




1. An integrated circuit having a read only memory, comprising:

(a) a memory array of cells arranged in rows corresponding to word lines and columns corresponding to bit lines, wherein each column of cells may be programmed in a conventional programming mode or an inverted programming mode in which each cell that would be programmed in the conventional programming mode is unprogrammed in the inverted programming mode and each cell that would be unprogrammed in the conventional programming mode is programmed in the inverted programming mode;

(b) an encoder adapted to record whether each column is programmed in the conventional programming mode or in the inverted programming mode; and

(c) an output generator coupled to the encoder and to the memory array, and adapted to generate an output for each column of the memory array based on information recorded in the encoder, wherein a true output is generated if the column is programmed in the conventional programming mode and a complement of the true output is generated if the column is programmed in the inverted programming mode.

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5,745,402

## FERROELECTRIC NON-VOLATILE MEMORY

Kenshiro Arase, Kanagawa, Japan, assignor to Sony Corporation, Japan

Filed Nov. 22, 1996, Ser. No. 755,403

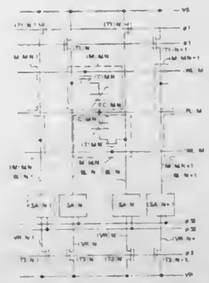
Claims priority, application Japan, Nov. 24, 1995, 7-306217

Int. Cl.[6] G11C *11/22*

U.S. Cl. 365—145 5 Claims

1. A ferroelectric non-volatile memory comprising:





at least one first bit line and at least one second bit line arranged adjoining each other in a column direction and together constituting a folded bit-line structure,

a first word line and a second word line arranged in a row direction orthogonal to the folded direction,

a first memory cell constituted by a first ferroelectric capacitor and a first select transistor, one terminal of the first select transistor being connected to the first bit line, another terminal of the first select transistor being connected to one electrode of the first ferroelectric capacitor, and a gate of the first select transistor being connected to the first word line,

a second memory cell constituted by a second ferroelectric capacitor and a second select transistor, one terminal of the second select transistor being connected to the second bit line, another terminal of the second select transistor being connected to one electrode of the second ferroelectric capacitor, and a gate of the second select transistor being connected to the second word line,

a first sense amplifier provided corresponding to the first bit line, and

a second sense amplifier provided corresponding to the second bit line,

wherein, when selecting the first memory cell and reading out its data, the data of the first memory cell is read out to the first bit line with the second bit line being set to a constant shield voltage, a potential of the first bit line and a reference voltage for comparison are compared by the first sense amplifier, and the data of the first memory cell is electronically determined as a result of the comparison and,

when selecting the second memory cell and reading out its data, the data of the second memory cell is read out to the second bit line with the first bit line being set to a constant shield voltage, a potential of the second bit line and a reference voltage for comparison are compared by the second sense amplifier, and the data of the second memory cell is electronically determined as a result of the comparison.

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5,745,403

## SYSTEM AND METHOD FOR MITIGATING IMPRINT EFFECT IN FERROELECTRIC RANDOM ACCESS MEMORIES UTILIZING A COMPLEMENTARY DATA PATH

Craig Taylor, Colorado Springs, Colo., assignor to Ramtron International Corporation, Colorado Springs, Colo.

Filed Feb. 28, 1997, Ser. No. 810,608

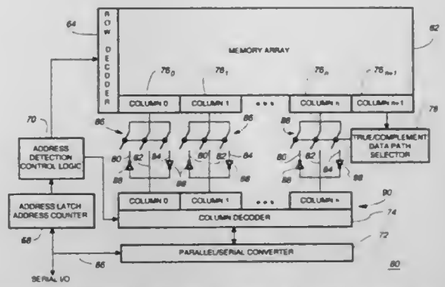
Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—145 32 Claims

1. A memory device comprising an array of memory cells, each of said memory cells being capable of being written with data in the form of a data bit having one of two opposite states thereof and each of said memory cells being further accessible for reading a written data bit therefrom as one of said two opposite states thereof, said memory device comprising:

a true data path coupling an external data path to said memory array for writing a first group of user data bits to said memory cells and reading said written first group of user data bits from said memory cells in an unaltered state thereof;

a complement write data path coupling said external data path to said memory array for writing a second group of user data bits to said memory cells in an opposite state thereof; and




a complement read data path coupling said memory array to said external data path for reading said written second group of user data bits from said memory cells in an opposite state thereof.

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5,745,404

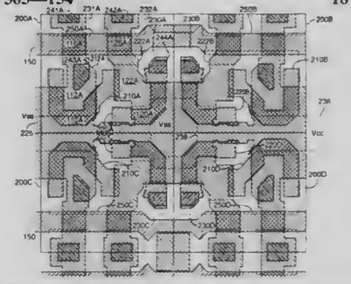
## ISRAM LAYOUT AND STRUCTURE

Chuen-Der Lien, Los Altos, and Kyle W. Terrill, Campbell, both of Calif., assignors to Integrated Device Technology, Inc, Santa Clara, Calif.

Filed Dec. 5, 1995, Ser. No. 567,443

Int. Cl.[6] G11C *11/00;* H01L *27/11*

U.S. Cl. 365—154 18 Claims



1. A memory comprising a first memory cell which includes four transistors and a resistive path connecting a first node in the first memory cell to a constant voltage, wherein two of the transistors are cross-coupled and are within a first area, and wherein the resistive path extends from the first area across a second area which is adjacent the first area and includes a portion of a second memory cell.

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5,745,405

## PROCESS LEAKAGE EVALUATION AND MEASUREMENT METHOD

Chan Yuan Chen, and Kao Min Chi, both of Hsin-chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, LTD, Hsinchu, Taiwan

Filed Aug. 26, 1996, Ser. No. 703,078

Int. Cl.[6] G11C *11/00*

U.S. Cl. 365—154 11 Claims

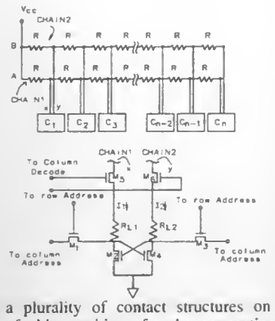
1. A method for the measurement of a leakage current within each cell of an array of SRAM cells to evaluate effects of modifying of a set of semiconductor process parameters, comprising the steps of:

a) subdividing a semiconductor wafer into a plurality of chip partitions;

b) placing a plurality of arrays of the SRAM cells within each of the plurality of chip partitions such that the array of SRAM cells are organized into rows and columns of SRAM cells, wherein each SRAM cell has two cross coupled field effect transistors, two transfer gate field effect transistors, a first load resistor, and a second load resistor;

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c) placing a plurality of contact structures on each of the plurality of chip partitions for the connecting of a power supply voltage source to said chip partition;
d) connecting a first plurality and a second plurality of series connected resistors to each of the plurality of contact structures, wherein each resistor of the first and second plurality of series connected resistors is of a high resistance;
e) connecting one pass gate of a plurality of pass gates to each intersection of each pair of resistors of the first and second pluralities of series connected resistors, wherein each pass gate is a field effect transistor having a drain connected to the intersection of each pair of resistors, a gate connected to one pass gate select line of a plurality of pass gate select lines, and source;
f) connecting each first load resistor of each of the plurality of SRAM cells of the arrays of SRAM cells to the source of the field effect transistor that is a pass gate connected to the intersection of each pair of resistors of the first plurality of series connected resistors and connecting each second load resistor of each of the plurality of SRAM cells of the arrays of SRAM cells to the source of the field effect transistor that is a pass gate connected to the intersection of each pair of resistors of the second plurality of series connected resistors;
g) activating sequentially each pass gate select line of the plurality of pass gate select lines to couple one of the first and second load resistors to the intersection of the pair of resistors of the plurality of series connected resistors;
h) measuring a magnitude of the leakage current passing from the power supply voltage source through the plurality of series connected resistors, the pass gate, and the SRAM cell;
i) calculating an expected leakage current which is a quotient of a division of the magnitude of a threshold voltage of a field effect transistor subtracted from the magnitude of the power supply voltage source and a summation of a resistance of the load resistor and the resistance of the plurality of series connected resistors from the connection of the pass gate to the contact structure;
j) comparing the magnitude of the leakage current and the expected leakage current; and
k) repeating of steps g, h, i, and j above to evaluate the effects of modifying said set of semiconductor process parameters upon the leakage current.

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**5,745,406**

**HIGH-SPEED, LOW-CURRENT MAGNETORESISTIVE MEMORY DEVICE**

**Haruki Yamane; Yoshinori Maeno, and Masanobu Kobayashi, all of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan**

**Filed Nov. 12, 1996, Ser. No. 745,479**
**Claims priority, application Japan, Nov. 13, 1995, 7-294003**
**Int. Cl.[6] G11C** *11/00;11/15*
**U.S. Cl. 365—158** **20 Claims**

1. A magnetoresistive memory device for storing binary information, comprising:
at least one memory cell having a first memory element and a second memory element, each of these memory elements separately having at least two ferromagnetic layers that collectively exhibit one electrical resistance when magnetized in a parallel state and a different electrical resistance when magnetized in an antiparallel state, and each of these memory elements separately having a writing electrode for the passage of a current generating a magnetic field capable of switching said ferromagnetic layers between said parallel state and said antiparallel state;
a write access circuit coupled to said memory cell, for supplying current to each said writing electrode in said memory cell, responsive to said binary information, thereby storing a first binary value in said memory cell by setting the ferromagnetic layers in said first memory element to said parallel state and the ferromagnetic layers in said second memory element to said antiparallel state, and storing a second binary value in said memory cell by setting the ferromagnetic layers in said first memory element to said antiparallel state and the ferromagnetic layers in said second memory element to said parallel state; and
a read access circuit coupled to said memory cell, for comparing the electrical resistance of the ferromagnetic layers in said first memory element with the electrical resistance of the ferromagnetic layers in said second memory element, thereby reading the binary value stored in said memory cell.

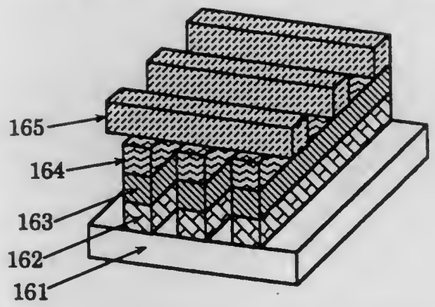
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**5,745,407**

**TRANSISTORLESS, MULTISTABLE CURRENT-MODE MEMORY CELLS AND MEMORY ARRAYS AND METHODS OF READING AND WRITING TO THE SAME**

**Harold J. Levy, Seal Beach, and Thomas C. McGill, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.**

**Division of Ser. No. 238,390, May 5, 1994, Pat. No. 5,535,156.**
**This application Apr. 5, 1996, Ser. No. 628,821**
**Int. Cl.[6] G11C** *11/00;11/36;* **H01L** *27/108*
**U.S. Cl. 365—159** **9 Claims**




1. A self-aligned, three-dimensional computer memory structure comprising:
a plurality of first conducting regions arranged in C columns, each of the first conducting regions having a plurality of sides;
a first array having a plurality of first semiconducting regions arranged in R rows and C columns, each of the first semiconductor regions having a plurality of sides, a first side of each of the first semiconducting regions in a column coupled to a first side of the first conducting region in the corresponding column;
a second array having a plurality of second semiconducting regions arranged in R rows and C columns, each of the second semiconducting regions having a plurality of sides, a first side of each of the second semiconducting regions coupled to a second side of a corresponding one of the first semiconducting regions; and
a plurality of second conducting regions arranged in R rows, each of the second conducting regions having a plurality of sides, a second side of each of the second semiconducting regions in a row coupled to a first side of the second conducting region in the corresponding row;
wherein a second side and a third side of the first conducting region in each column are aligned to a third side and a fourth side of each of the first semiconducting regions in the corresponding column, respectively; the third side and the fourth side of each of the first semiconducting regions are aligned to a third side and a fourth side of a corresponding one of the second semiconducting regions, respectively; a fifth side and a sixth side of each of the first semiconducting regions are aligned to a fifth side and a sixth side of a corresponding one of the second semiconducting region, respectively; and the fifth side and the sixth side of each of the second semiconducting regions in a row are aligned to a second side and a third side of the second conducting region in the corresponding row, respectively;
wherein the first semiconducting regions and the second semiconducting regions are transistorless devices and each of the first semiconducting regions comprises either of a switch diode or a load device.



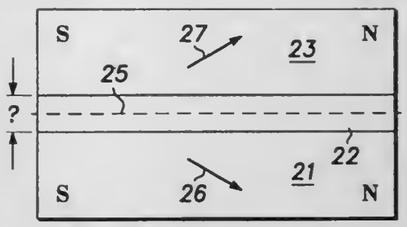
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**5,745,408**

**MULTI-LAYER MAGNETIC MEMORY CELL WITH LOW SWITCHING CURRENT**

**Eugene Chen, Gilbert; Saied N. Tehrani, and Herbert Goronkin, both of Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Sep. 9, 1996, Ser. No. 709,589**
**Int. Cl.[6] G11C** *11/15*
**U.S. Cl. 365—173** **16 Claims**




7. A multi-state, multi-layer magnetic memory cell comprising two substantially similar layers of magnetoresistive magnetic material positioned in parallel, overlying relationship and separated by a layer of non-magnetic material, each of the layers of magnetoresistive magnetic material having a width that is less than a width of magnetic domain walls within the layer of magnetic material so that magnetic vectors in the layers of magnetic material point substantially along a length of the layers of magnetic material each of the layers of magnetoresistive magnetic material having opposed edges extending along the length thereof and an accumulation of poles or pole effects along the edges during switching of the magnetic vectors within each of the layers of magnetoresistive magnetic material and the magnetic vectors rotating laterally in opposite directions during switching, the two substantially similar layers defining a central plane parallel with the two substantially similar layers, and the two substantially similar layers being formed and positioned symmetrically on either side of the central plane to produce mutual cancellation of the accumulation of poles or pole effects along the edges whereby switching current is reduced.

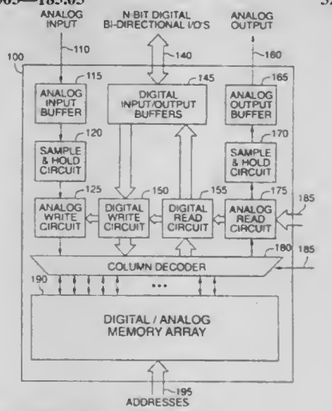
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**5,745,409**

**NON-VOLATILE MEMORY WITH ANALOG AND DIGITAL INTERFACE AND STORAGE**

**Sau C. Wong, Hillsborough, and Hock C. So, Redwood City, both of Calif., assignors to INVOX Technology, Santa Clara, Calif.**

**Filed Sep. 28, 1995, Ser. No. 535,441**
**Int. Cl.[6] G11C** *7/00*
**U.S. Cl. 365—185.03** **32 Claims**




1. An integrated memory comprising:
an array of non-volatile memory cells;
an analog write circuit coupled to the array, wherein the analog write circuit sets a threshold voltage of a memory cell to a level which depends on an analog signal; and
a digital write circuit coupled to the array, wherein the digital write circuit sets a threshold voltage of a memory cell to a binary state which indicates a value of a bit in a digital signal.

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**5,745,410**

**METHOD AND SYSTEM FOR SOFT PROGRAMMING ALGORITHM**

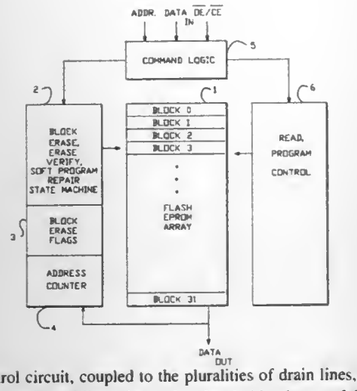
**Tom Dang-Hsing Yiu, Milpitas, Calif.; Fuchia Shone, Hsinchu, Taiwan; I-Long Lee, I-Lan Hsian, Taiwan; Chia-Shing Chen, I-Lan Hsian, Taiwan; Hun-Song Chen, Kee-Lung City, Taiwan; Yuan-Chang Liu, Miao-Li City, Taiwan; Tzeng-Huei Shiau, Hsin-Chu Hsian, Taiwan; Kuen-Long Chang, Taipei, Taiwan, and Ray-Lin Wan, Milpitas, Calif., assignors to Macronix International Co., Ltd., Taiwan**

**PCT No. PCT/US95/15051, § 371 Date Mar. 21, 1996, § 102(e) Date Mar. 21, 1996, PCT Pub. No. WO97/19452, PCT Pub. Date May 29, 1997**
**PCT Filed Nov. 17, 1995, Ser. No. 619,485**
**Int. Cl.[6] G11C** *11/40*
**U.S. Cl. 365—185.3** **50 Claims**

1. A floating gate memory integrated circuit, comprising:
a set of floating gate memory cells arranged in a plurality of rows and columns;
a plurality of drain lines coupled to drain terminals of respective columns of cells in the set;
a plurality of source lines coupled to source terminals of respective columns of cells in the set;
a plurality of word lines coupled to control gate terminals of respective rows of cells in the set;

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a control circuit, coupled to the pluralities of drain lines, source lines and word lines, for setting threshold voltages of the cells in the set to a low threshold state, including voltage supply circuits to supply a voltage sequence to lower the thresholds of cells which results in some cells having thresholds lowered below a selected limit of threshold voltages, and then to supply a repair pulse during a repair time interval across the plurality of source lines and the plurality of drain lines, while setting the voltage on the plurality of word lines to a level below the selected limit.

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**5,745,411**

**SEMICONDUCTOR MEMORY DEVICE**

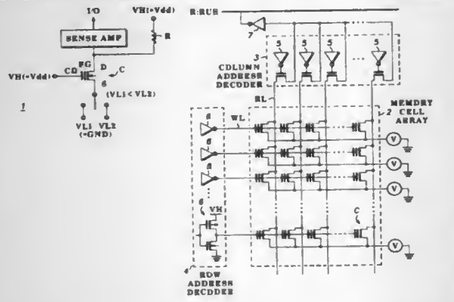
**Tadashi Usami, Hino, Japan, assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Dec. 7, 1995, Ser. No. 570,169**

**Claims priority, application Japan, Dec. 8, 1994, 6-331509**

**Int. Cl.[6] G11C *11/34***

**U.S. Cl. 365—185.09** **4 Claims**




1. A semiconductor memory device, having a plurality of cell transistors for storing predetermined data corresponding to intersections between a plurality of bit lines and a plurality of word lines, said semiconductor memory device operative at a preset operating voltage Vdd,

wherein a high-potential voltage VH, which is at the same potential as said operating voltage Vdd, is applied to a control gate electrode of each of said cell transistors, and wherein either a first low-potential voltage VL1, which is a ground potential, or a second low-potential voltage VL2, which is at a higher potential than the first low-potential voltage VL1, is selectively applied to a source electrode of each of said cell transistors depending on the operating status.

**5,745,412**

**PROGRAMMABLE NONVOLATILE MEMORY AND METHOD OF PROGRAMMING THE SAME**

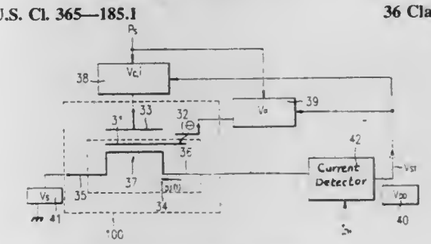
**Woong-Lim Choi, Kwacheon-si, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-Do, Rep. of Korea**

**Filed Sep. 29, 1995, Ser. No. 537,327**

**Claims priority, application Rep. of Korea, Aug. 21, 1995, 25761/1995**

**Int. Cl.[6] G11C *11/34***

**U.S. Cl. 365—185.1** **36 Claims**




1. A nonvolatile memory device comprising:

a substrate;

a floating gate over the substrate;

an insulating layer between the floating gate and the substrate;

a dielectric layer adjacent the floating gate;

a program gate, adjacent the floating gate, for providing charge carriers directly to said floating gate through the dielectric layer for the purpose of programming;

a control gate, adjacent the floating gate, for controlling an amount of charge carriers provided to said floating gate for programming;

a first voltage source for supplying a first voltage to said control gate and a second voltage source for supplying a second voltage to said program gate, said first voltage being a positive value varying in correspondence with a respective threshold level programming of a multi-level programming and said second voltage being fixed negative value; and

a field effect transistor for verifying charge carriers provided to said floating gate during programming, said field effect transistor including said floating gate and an active region in the substrate, the active region including a source, a drain, and a channel region between said source and said drain.

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**5,745,413**

**ELECTRICALLY PROGRAMMABLE NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH NAND CELL STRUCTURE**

**Hiroshi Iwahashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Division of Ser. No. 433,071, May 3, 1995, Pat. No. 5,596,525, which is a division of Ser. No. 288,219, Aug. 9, 1994, Pat. No. 5,448,517, which is a continuation of Ser. No. 115,100, Sep. 2, 1993, abandoned, which is a continuation of Ser. No. 913,451, Jul. 15, 1992, Pat. No. 5,270,969, which is a continuation of Ser. No. 685,650, Apr. 16, 1991, Pat. No. 5,148,394, which is a continuation of Ser. No. 212,649, Jun. 28, 1988, Pat. No. 5,008,856. This application Oct. 22, 1996, Ser. No. 731,914**

**Claims priority, application Japan, Jun. 29, 1987, 62-161625; Jun. 30, 1987, 62-163023; Dec. 23, 1987, 62-325686**

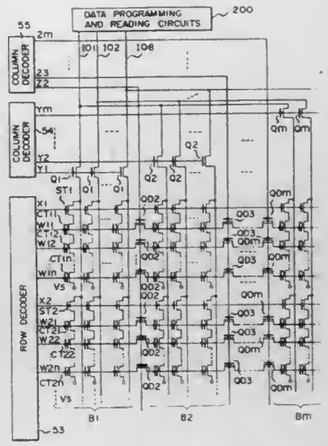
**Int. Cl.[6] G11C *11/40***

**U.S. Cl. 365—185.17** **31 Claims**

1. A non-volatile semiconductor memory device, comprising:

a plurality of memory cell arrays, each of the memory cell arrays including memory cells arranged in a matrix form having row lines and column lines, each of the memory cells having a floating gate and a control gate, and storing data in accordance with a storage state of charges of the floating gate, the memory cells in the same row being commonly connected to






one of the row lines, and the memory cells in the same column being commonly connected to one of the column lines;

selecting means for selecting a part of the plurality of memory cell arrays, and selecting at least one memory cell in the selected part of the memory cell arrays; and

programming means for programming the selected memory cell of the selected memory cell array.

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**5,745,414**

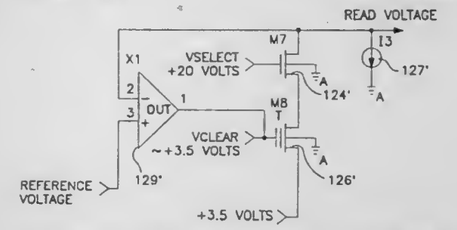
**INTEGRATED CIRCUIT SYSTEM HAVING REFERENCE CELLS FOR IMPROVING THE READING OF STORAGE CELLS**

**Lawrence D. Engh, Redwood City, and Trevor Blyth, Milpitas, both of Calif., assignors to Information Storage Devices, Inc., San Jose, Calif.**

**Division of Ser. No. 306,266, Sep. 14, 1994, Pat. No. 5,629,890. This application Nov. 26, 1996, Ser. No. 756,564**

**Int. Cl.[6] G11C *11/34***

**U.S. Cl. 365—185.2** **8 Claims**




1. In an analog storage apparatus having a row of EEPROM cells, an improvement comprising:

providing a reference EEPROM cell having first and second transistors connected in series, with a gate of the first transistor connected to a clear input line and a gate of the second transistor connected to a select input line;

providing a comparator having first and second inputs with the first input connected to a source of the second transistor and a second input connected to a reference voltage line and with an output of the comparator connected to the gate of the first transistor; and

wherein the gate of the first transistor is connected to gates of first transistors of each of the row of EEPROM cells.

**5,745,415**

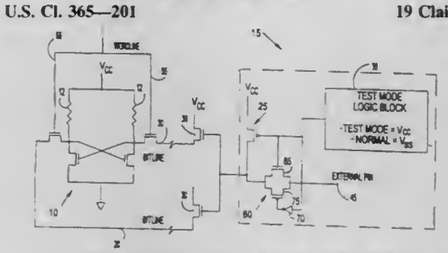
**CIRCUIT FOR SRAM TEST MODE ISOLATED BITLINE MODULATION**

**Kenneth W. Marr, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.**

**Continuation of Ser. No. 421,506, Apr. 12, 1995, Pat. No. 5,568,435. This application Oct. 18, 1996, Ser. No. 734,064**

**Int. Cl.[6] G11C *7/00***

**U.S. Cl. 365—201** **19 Claims**




1. A circuit in a memory device for selectively applying a test mode voltage and a supply voltage to gates of bitline load devices in the memory device while the supply voltage is applied to peripheral circuitry in the memory device, the circuit comprising:

circuitry for isolating the supply voltage from the gates of the bitline load devices and for applying the test mode voltage to the gates of the bitline load devices while the supply voltage is applied to the peripheral circuitry; and

circuitry for isolating the test mode voltage from the gates of the bitline load devices and for applying the supply voltage to the gates of the bitline load devices while the supply voltage remains applied to the peripheral circuitry.

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**5,745,416**

**NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE**

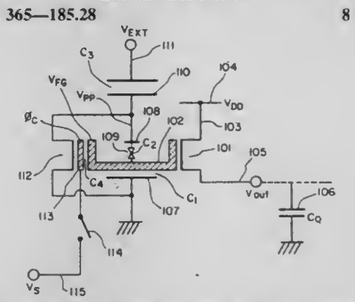
**Tadashi Shibata, 5-2, Nihondaira, Taihaku-ku, Sendai-shi, Miyagi-ken 982-02; Tadahiro Ohmi, 1-17-301, Komegahukuro 2-chome, Aoba-ku, Sendai-shi, Miyagi-ken 980, and Yuichiro Yamashita, Sendai, all of Japan, assignors to Tadashi Shibata, and Tadahiro Ohmi, both of Japan**

**Filed Dec. 29, 1995, Ser. No. 581,740**

**Claims priority, application Japan, Jan. 11, 1995, 7-002944**

**Int. Cl.[6] G11C *11/34***

**U.S. Cl. 365—185.28** **8 Claims**




1. A non-volatile semiconductor memory device, comprising: a first MOS type transistor having a first floating gate which is electrically isolated, a first electrode which is capacitively coupled with said first floating gate; a second electrode which is connected to said first floating gate via a tunnel junction; a third electrode which is capacitively coupled with said second electrode; a second MOS type transistor including a source and drain which interconnect said first and second electrodes; and means for applying a predetermined potential difference between said first and third electrodes to thereby cause a tunnel current to flow through said tunnel junction and to store an electric charge on said first floating gate thereby causing said second MOS type transistor to conduct when said electric charge has reached a predetermined value.

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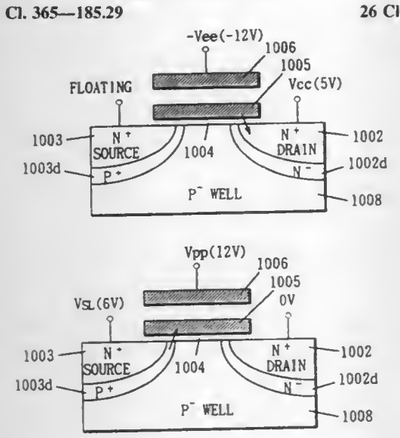


## 5,745,417

### ELECTRICALLY PROGRAMMABLE AND ERASABLE NONVOLATILE SEMICONDUCTOR MEMORY DEVICE AND OPERATING METHOD THEREFOR

Shinichi Kobayashi; Yasushi Terada; Yoshikazu Miyawaki; Takeshi Nakayama; Tomoshi Futatsuya; Natsuo Ajika; Yuichi Kunori; Hiroshi Onoda; Atsushi Fukumoto, and Makoto Ohi, all of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 43,889, Apr. 7, 1993, abandoned.
This application Jun. 11, 1996, Ser. No. 661,930
Claims priority, application Japan, Apr. 7, 1992, 4-085281; Jun. 30, 1992, 4-172812; Jul. 6, 1992, 4-178116; Sep. 7, 1992, 4-238546; Dec. 24, 1992, 4-344807
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—185.29 26 Claims



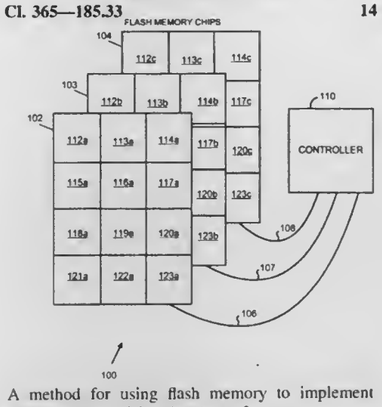

1. A nonvolatile semiconductor memory device comprising:
a plurality of memory cells being arranged in a plurality of rows and a plurality of columns;
a plurality of word lines being provided in correspondence to said plurality of rows;
a plurality of bit lines being provided in correspondence to said plurality of columns; and
a source line being provided in common for said plurality of memory cells;
each of said plurality of memory cells including a control gate being connected to a corresponding one of said word lines, a drain being connected to a corresponding one of said bit lines, a source being connected to said source line, and a floating gate,
each of said plurality of memory cells being a stack gate type memory cell in which a control gate length in a channel direction is substantially the same as a floating sate length in that direction,
electron injecting means for simultaneously injecting electrons into the floating gates of a plurality of memory cells in erasing to force said plurality of memory cells to a first threshold voltage at a high level; and
electron extracting means for extracting electrons from the floating gate of a selected one of said plurality of memory cells in programming to force said selected one of said plurality of memory cells to a second threshold voltage at a low but positive level.

## 5,745,418

### FLASH MEMORY MASS STORAGE SYSTEM

Chung-Wen Ma; Chun-Hung Lin; Tai-Yao Lee; Li-Jen Lee, all of Hsin Chu; Ju-Xu Lee, Bing Dong, all of Taiwan, and Ting-Chung Hu, Milpitas, Calif., assignors to Macronix International Co., Ltd., Hsinchu, Taiwan

Filed Nov. 25, 1996, Ser. No. 756,304
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—185.33 14 Claims



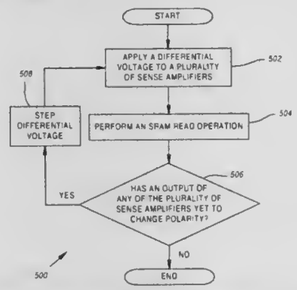

1. A method for using flash memory to implement a mass storage system, comprising the steps of:
(a) dividing said flash memory into a plurality of blocks;
(b) forming a first type of blocks from said plurality of blocks, said first type of blocks being used to store data organized in accordance with a pre-defined addressing scheme;
(c) forming a second type of blocks from said plurality of blocks, said second type of blocks being used as a temporary buffer for storing data intended to be written to one of said first type of blocks;
(d) forming a third type of blocks that contain invalid data that will be erased; and
(e) changing at least one of said plurality of blocks from one of said first, said second and said third types of blocks to another type.

## 5,745,419

### METHOD AND APPARATUS FOR MEASURING THE OFFSET VOLTAGES OF SRAM SENSE AMPLIFIERS

Jeffery C. Brauch, Fort Collins, Colo., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Filed Jul. 30, 1996, Ser. No. 690,631
Int. Cl.[6] G11C *29/00*
U.S. Cl. 365—201 13 Claims




1. A method of measuring the offset voltages of a plurality of sense amplifiers in an SRAM, the method comprising the steps of:
a) applying a differential voltage to the plurality of sense amplifiers;
b) performing an SRAM read operation; and



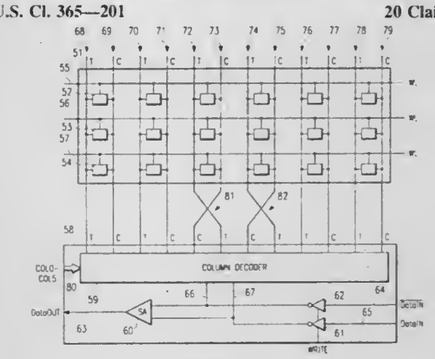
c) if an output of any of the plurality of sense amplifiers has yet to change polarity, stepping the differential voltage applied to the plurality of sense amplifiers and repeating the SRAM read operation.

## 5,745,420

### INTEGRATED MEMORY CIRCUIT WITH SEQUENCED BITLINES FOR STRESS TEST

David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 509,196, Jul. 31, 1995, abandoned.
This application Apr. 7, 1997, Ser. No. 833,582
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—201 20 Claims




1. An integrated circuit comprising:
a memory array having a plurality of memory cells arranged in rows and columns;
a column decoder having column terminals and bidirectional read/write terminals;
a boundary area located between said memory array and said column decoder such that none of the memory cells that are located within said memory array are located on the same side of said boundary area as said column decoder.
wherein each column includes a plurality of memory cells connected in parallel by way of a pair of true and complement bitlines that extend out from the memory array and that are coupled to the column terminals of the column decoder, at least one pair of said bitlines crossing over one another within said boundary area; and
wherein, inside the memory array, the true bitline of each pair is adjacent exclusively to a complement bitline of another pair of true and complement bitlines and the complement bitline of said each pair is adjacent exclusively to a true bitline of another pair of true and complement bitlines, the true and complement bit lines being so exclusively adjacent to one another along the entire lengths of the respective bitline portions that are inside the memory array.

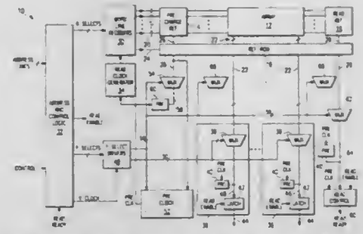
## 5,745,421

### METHOD AND APPARATUS FOR SELF-TIMED PRECHARGE OF BIT LINES IN A MEMORY

Luat Q. Pham, Houston, and Francisco A. Cano, Missouri City, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 8, 1996, Ser. No. 745,399
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—203 26 Claims

1. A method for timing the precharging of bit lines in a memory array, comprising:
charging a first reference column bit line to create a first reference column voltage; and



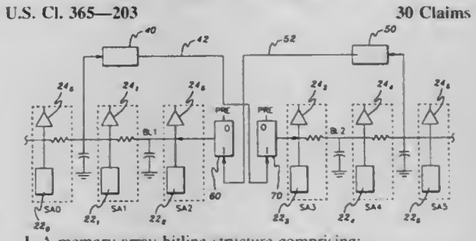
charging a plurality of bit lines in the memory array until the first reference column voltage exceeds a first threshold.

## 5,745,422

### CROSS-COUPLED BITLINE SEGMENTS FOR GENERALIZED DATA PROPAGATION

Joseph A. Iadanza, Hinesburg, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 12, 1996, Ser. No. 748,076
Int. Cl.[6] G11C *7/00;7/02;8/00;5/06*
U.S. Cl. 365—203 30 Claims




1. A memory array bitline structure comprising:
a first bitline segment for carrying a state determinable by a selected first bitline drive device of a plurality of first bitline drive devices coupled thereto;
a second bitline segment for carrying a state determinable by a selected second bitline drive device of a plurality of second bitline drive devices coupled thereto;
a first controllable drive circuit coupled to said first bitline segment; and
a second controllable drive circuit coupled to said second bitline segment;
wherein said second bitline segment is coupled to control said first controllable drive circuit and said first bitline segment is coupled to control said second controllable drive circuit such that the state of the first bitline segment is provided to the second bitline segment upon activation of the selected first bitline drive device and the state of the second bitline segment is provided to the first bitline segment upon activation of the selected second bitline drive device.

## 5,745,423

### LOW POWER PRECHARGE CIRCUIT FOR A DYNAMIC RANDOM ACCESS MEMORY

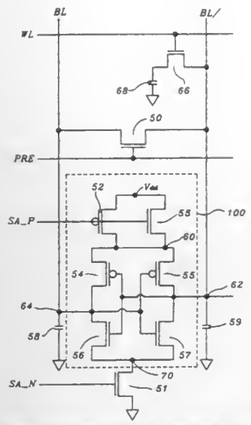
Jy-Der David Tai, Hsinchu, Taiwan, assignor to Powerchip Semiconductor Corp., Hsinchu, Taiwan

Filed Dec. 17, 1996, Ser. No. 768,986
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—203 18 Claims

1. A low power precharge circuit for dynamic random access memory having a plurality of memory cells therein, said precharge circuit comprising:
equalization means connected to a pair of bitlines for allowing an electric charge on the bitline having a higher voltage to flow to the bitline having a lower voltage, said equalization means being activated by a precharge control signal;

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voltage pull means for providing a constant voltage in response to a first sense control signal, wherein said voltage pull means comprises a first pull transistor and a second pull transistor, gate electrodes of said first pull transistor and said second pull transistor being connected to the first sense control signal; and

voltage amplifying means connected to the pair of bitlines for amplifying the voltages of the bitlines in response to a second sense control signal so that the voltage of one bitline is complementary to the voltage of the other bitline.

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**5,745,424**

**METHOD FOR TRANSFERRING DATA BIT FOR DRAM**

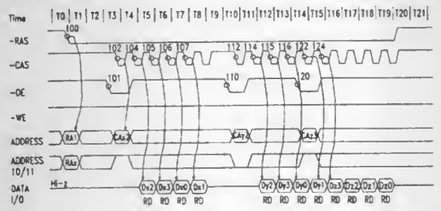
**Minoru Furuta, Fuksawa, and Toshio Sunaga, Kusatsu, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 17, 1996, Ser. No. 587,428**

**Claims priority, application Japan, Jan. 17, 1995, 7-022194**

**Int. Cl.[6] G11C** *7/00*

**U.S. Cl. 365—233** **8 Claims**




1. A DRAM transfer system comprising:

a first signal line for latching an address in a row direction in synchronization with transition of its signal level;

a second signal line for latching an address in a column direction in synchronization with transition of its signal level; and

a third signal line (OE) in which a function is changed according to the change of operation mode, said third signal line has a function to start the burst transfer from said latched address in said row direction and a data bit relating to said latched address in said column direction when changes of signal level is detected in a first operation mode, and a function to enable output of said data bit only when the signal level is at either high or low predetermined level in a second operation mode.

**5,745,425**

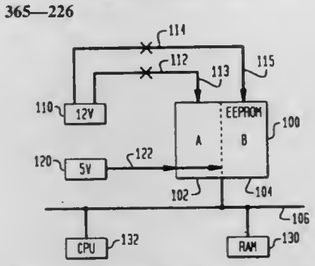
**RELIABLE BACKUP MEMORY**

**Dennis Lee Anderson, Naperville, and Steven Anthony Jacks, Villa Park, both of Ill., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Aug. 29, 1996, Ser. No. 703,143**

**Int. Cl.[6] G11C** *17/00*

**U.S. Cl. 365—226** **3 Claims**




1. A method of providing reliable backup memory from an electrically erasable programmable read only memory (EEPROM), having a higher voltage power supply that must be connected to the EEPROM in order to change its contents, comprising the steps of:

removing said higher voltage power supply when the EEPROM is not being updated;

applying said higher voltage power supply only when said EEPROM is being updated;

splitting said EEPROM into at least two segments, each segment being fed by a separately controllable source of said higher voltage; and

updating one of said segments while retaining a previous version of the information stored in said EEPROM in the other segment while supplying the higher voltage only to the one segment being updated.

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**5,745,426**

**MEMORY CARD AND CIRCUIT BOARD USED THEREFOR**

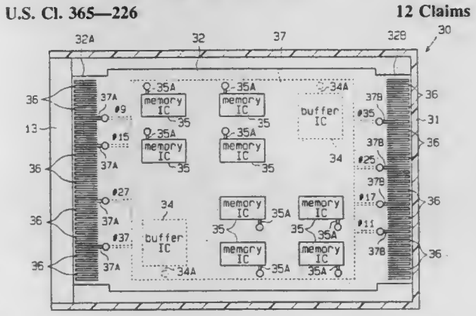
**Akinori Sekiyama, Kasugai, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Dec. 24, 1996, Ser. No. 773,332**

**Claims priority, application Japan, Dec. 28, 1995, 7-342757**

**Int. Cl.[6] G11C** *5/14*

**U.S. Cl. 365—226** **12 Claims**




1. A memory card having a printed circuit board connected to an interface connector, said circuit board having a rectangular shape and a plurality of edges, a memory device mounted on the printed circuit board and a power line patterned on the printed circuit board to supply a supply voltage to the memory device, said memory card comprising:



a case accommodating said circuit board;

a plurality of line groups disposed on the edges of the circuit board and provided in association with a value of the supply voltage for the memory device, said plurality of line groups including a plurality of lead lines having different layouts, wherein at least one of said plurality of lead lines is directly connected to the power line on the circuit board,

wherein when the interface connector selectively connects to the plurality of line groups according to the value of the supply voltage, the interface connector is exposed from the case.

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**5,745,427**

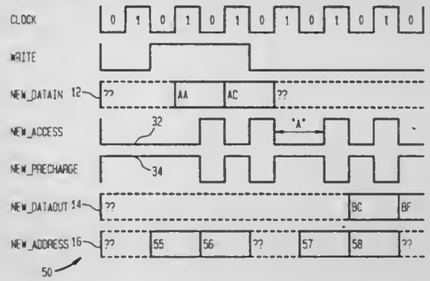
**PHASE-SHIFTED EMBEDDED RAM APPARATUS AND METHOD**

**Ronald Lamar Freyman, Bethlehem, and Clinton Hays Holder, Slatington, both of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Dec. 27, 1996, Ser. No. 773,706**

**Int. Cl.[6] G11C** *8/00*

**U.S. Cl. 365—230.01** **21 Claims**




1. A random access memory device adapted to operate in connection with a given clock signal, said clock signal having a first phase and a second phase for each clock cycle thereof, wherein a read access cycle to a memory location of said random access memory device occurs during said first phase of said clock cycle, said device comprising:

a plurality of memory cells, wherein each of said memory cells stores an individual bit of digital data; and

a data bus coupled to said memory cells for providing means to communicate said digital data to and from said memory cells during write and read operations, wherein during a write operation to a designated memory location of said random access memory device, a write access cycle is phase shifted at least one phase later relative said read access cycle.

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**5,745,428**

**PIPELINED ADDRESS MEMORIES, AND SYSTEMS AND METHODS USING THE SAME**

**G. R. Mohan Rao, Dallas, Tex., assignor to Cirrus Logic, Inc., Fremont, Calif.**

**Division of Ser. No. 502,479, Jul. 14, 1995, Pat. No. 5,598,374.**

**This application Jun. 14, 1996, Ser. No. 664,471**

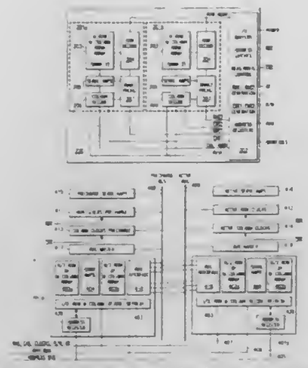
**Int. Cl.[6] G11C** *7/00*

**U.S. Cl. 365—230.03** **14 Claims**

1. A dynamic random access memory device comprising:

circuitry for generating a plurality of internal row address strobes; and

a plurality of memory banks, each including an array of dynamic random access memory cells and associated dynamic control circuitry, a first one of said banks entering precharge in response to a precharge cycle of a first one of said internal row address strobes and a second one of said banks simultaneously entering an active cycle in response to an active cycle of a second one of said internal row address strobes.



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**5,745,429**

**MEMORY HAVING AND METHOD FOR PROVIDING A REDUCED ACCESS TIME**

**Timothy B. Cowles; Troy A. Manning, and Todd A. Merritt, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**

**Filed Aug. 28, 1995, Ser. No. 520,241**

**Int. Cl.[6] G11C** *8/00*

**U.S. Cl. 365—230.08** **25 Claims**



1. A memory device, comprising:

an array of memory cells arranged in rows and columns;

a row decoder coupled to said array said row decoder operable to receive a row address and a row address strobe and operable to fire a row of said memory cells in response to a transition of said row address strobe, said row being identified by said row address, and

a row latch coupled to said row decoder said row latch operable to receive said row address and a latch signal and operable to provide said row address to said row decoder said row latch operable to store said row address in response to a transition of said latch signal that occurs a first predetermined time before said transition of said row address strobe.

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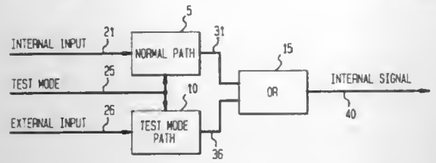


5,745,430

## CIRCUIT AND METHOD TO EXTERNALLY ADJUST INTERNAL CIRCUIT TIMING

Hing Wong, Norwalk, Conn.; Toshiaki Kirihata, Wappingers Falls, N.Y., and Bozidar Krsnik, St. Cloud, France, assignors to Siemens Aktiengesellschaft, Munich, Germany, and International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1996, Ser. No. 777,559
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—233 30 Claims




1. A method for controlling timing of an internal control signal in an integrated circuit device using external control, the method comprising:

providing first and second signal paths;

generating a test mode signal that determines a mode of operation, the integrated circuit device being in the first mode of operation when the test mode signal is at a first signal level and being in the second mode of operation when the test mode signal is at a second signal level;

when the integrated circuit device is in the first mode of operation, the first signal path receives an internal signal and generates a first output signal in response to the internal signal, the first output signal being used to derive the timing of the internal control signal in the first mode of operation; and

when the integrated circuit device is in the second mode of operation, the second signal path receives an external signal provided at an external pin of the integrated circuit and generates a second output signal in response to the external signal, the second output signal being used to derive the timing of the internal control signal in the second mode of operation.

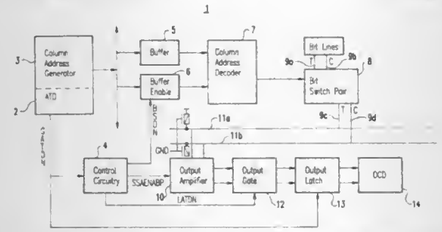
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5,745,431

## ADDRESS TRANSITION DETECTOR (ATD) FOR POWER CONSERVATION

Dale Edward Pontius, Colchester; Steven William Tomashot, Chittenden County, both of Vt.; Toshiaki Kirihata, Dutchess County, N.Y., and Robert Henry Kruggel, Chittenden County, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 5, 1996, Ser. No. 583,263
Int. Cl.[6] G11C *8/00*
U.S. Cl. 365—233.5 16 Claims




1. An address decoding circuit for decoding an address signal having a power saving feature, comprising:

means for passing a partial address signal to the address decoding circuit;

means for detecting a change in said address signal;

means for generating a first control signal in response to a detected change in the address signal; and

means for gating a remainder of said address signal to the decoding circuit with the first control signal, said decoding circuit being in a power conservation state until receiving said remainder of said address signal.

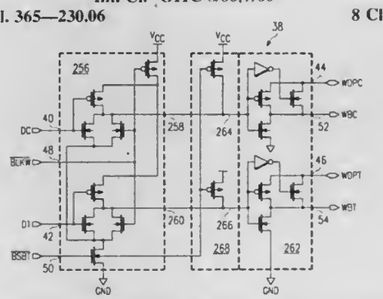
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5,745,432

## WRITE DRIVER HAVING A TEST FUNCTION

David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jan. 19, 1996, Ser. No. 589,141
Int. Cl.[6] G11C *8/00;7/00*
U.S. Cl. 365—230.06 8 Claims




1. A driver circuit for writing data to a memory cell, said driver circuit comprising:

first and second data input terminals coupled to receive first and second data signals;

a test terminal coupled to receive a test signal;

first and second write power terminals;

first and second write terminals coupled to said memory cell; and

switching means operable to uncouple said first and second write terminals from said first and second write power terminals respectively when said test signal has a first signal level.

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5,745,433

Patent Not Issued For This Number

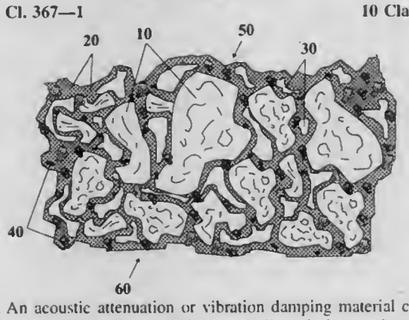
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5,745,434

## ACOUSTIC ABSORPTION OR DAMPING MATERIAL WITH INTEGRAL VISCOUS DAMPING

William B. Cushman, Pensacola, Fla., assignor to Poiesis Research, Inc., Pensacola, Fla.

Filed Jan. 9, 1997, Ser. No. 780,271
Int. Cl.[6] G10K *11/16*
U.S. Cl. 367—1 10 Claims




1. An acoustic attenuation or vibration damping material comprised of a matrix material with a plurality of viscous damping passageways penetrating throughout said matrix material, and with at least two species of particles incorporated within said matrix material, said particles being species differentiated by their characteristic acoustic impedances.



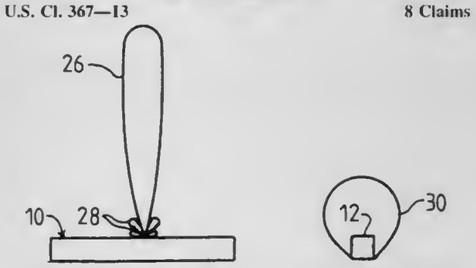
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5,745,435

## METHOD OF TESTING AN ACOUSTIC ARRAY ANTENNA

Jean-Michel Fage, Paris, and Rémy Tasso, Chateaufort, both of France, assignors to Remtech, Velizy, France

Filed Feb. 10, 1997, Ser. No. 797,033
Claims priority, application France, Feb. 12, 1996, 96 01676
Int. Cl.[6] H04B *17/00*
U.S. Cl. 367—13 8 Claims




1. A method of testing an acoustic array directional antenna comprising a plurality of acoustic transducers disposed side by side in a matrix-type configuration and driven by means for generating and processing signals, the method consisting in using at least one acoustic transducer of non-directional type for receiving a given signal simultaneously via said transducer and via the antenna, and in comparing the received signals to identify possible fixed echoes in the signal received by the antenna, and for verifying whether or not the antenna and the associated circuits are in a nominal operating state.

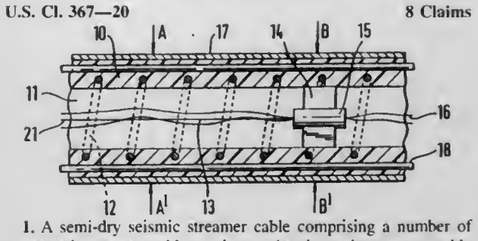
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5,745,436

## SEMI-DRY MARINE SEISMIC STREAMER CABLE SECTION

Simon Hastings Bittleston, Slependen, Norway, assignor to Geco A.S., Stavanger, Norway

PCT No. PCT/NO95/00108, § 371 Date Dec. 10, 1996, § 102(e) Date Dec. 10, 1996, PCT Pub. No. WO95/35513, PCT Pub. Date Dec. 28, 1995
PCT Filed Jun. 20, 1995, Ser. No. 750,495
Claims priority, application Norway, Jun. 20, 1994, 942357
Int. Cl.[6] G01V *1/38;1/20*
U.S. Cl. 367—20 8 Claims




1. A semi-dry seismic streamer cable comprising a number of connected streamer cable sections, wherein each streamer cable section comprises a plurality of seismic signal sensor means provided at the center of the cable and forming a detector array, signal transmission means for connecting the array to a signal processing device, and an extruded cylindrical mechanical jacket forming the outer portion of the cable and an inner hollow core for enclosing said signal sensor and transmission means, and wherein the jacket contains axial stress members embedded in said jacket during extrusion thereof for transmitting axial loads, and a radial reinforcement member for relieving radial loads and likewise embedded in the jacket during extrusion thereof, said reinforcement member either surrounding the axial stress members or being enclosed by the latter.

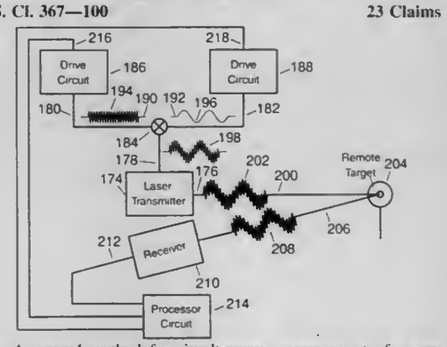
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5,745,437

## METHOD AND APPARATUS FOR COHERENT BURST RANGING

Eric A. Wachter, 138 Bay Path Dr., Oak Ridge, Tenn. 37830, and Walter G. Fisher, 8514 Carl Valentine, Knoxville, Tenn. 37931

Filed Aug. 5, 1996, Ser. No. 692,183
Int. Cl.[6] G01S *15/00*
U.S. Cl. 367—100 23 Claims




1. A general method for simultaneous measurement of coarse and fine distance (**10**) consisting of the steps of:

A) forming at least one transmitter signal (**14**) by applying at least one coherent burst drive signal (**30**) to at least one transmitter (**32**), wherein the at least one coherent burst drive signal (**30**) comprises high-frequency modulated radiation (**16**) having at least one modulation frequency which is phase-coherent (**18**) with at least one reference signal (**12**);

B) transmitting the at least one transmitter signal (**14**) onto at least one target (**34**);

C) reflecting a portion of the high-frequency modulated radiation (**16**) transmitter signal (**14**) by the at least one target (**34**);

D) collecting a portion of the reflected high-frequency modulated radiation (**16**) emanating from the at least one target (**34**) by a receiver (**36**) to form a receiver signal (**20**);

E) processing the receiver signal (**20**) from the receiver (**36**) using at least one bandwidth limited processor circuit to form at least one real phase component (**98**) and at least one imaginary phase component (**100**);

F) processing the at least one real phase component (**98**) and the at least one imaginary phase component (**100**) to determine one or more target parameters selected from a group consisting of range, velocity and composition of the at least one target (**34**).

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5,745,438

## ELECTROSTATIC TRANSDUCER AND METHOD FOR MANUFACTURING SAME

James A. Hill, and Anthony R. H. Goodwin, both of Moscow, Id., assignors to Gas Research Institute, Chicago, Ill.

Continuation of Ser. No. 381,540, Jan. 31, 1995, Pat. No. 5,600,610. This application Jan. 31, 1997, Ser. No. 791,185
Int. Cl.[6] H04R *19/00*
U.S. Cl. 367—181 25 Claims

1. An apparatus for an electrostatic transducer for percussion waves, comprising:

an inner electrode having a biasing surface;

a dielectric layer overlapping said inner electrode and having inner and outer surfaces, said outer surface having protruding support fingers; and

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an outer electrode layer being supported by said support fingers in a position adjacent to said biasing surface, said outer electrode layer for interacting percussion waves in an adjacent medium by movement of said moveable outer electrode relative to said inner electrode;

whereby an electrical bias can be generated and sensed between said biasing surface and said outer electrode layer based upon said movement of said outer electrode layer relative to said inner electrode.

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**5,745,439**

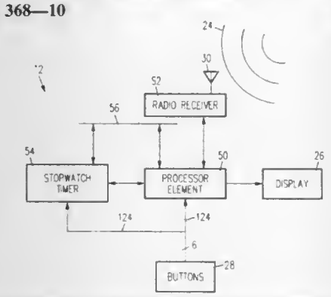
**COMBINED STOPWATCH AND PAGER**

**Bruce C. Nepple, Portland, Oreg., assignor to Seiko Communications Systems, Inc., Beaverton, Oreg.**

**Filed Oct. 3, 1996, Ser. No. 720,893**

**Int. Cl.[6] H04B *7/00*; G04C *11/00***

**U.S. Cl. 368—10** **6 Claims**




1. In combination a paging device and a stopwatch, the combination comprising:

user operable buttons;

a radio signal receiver;

a processor element interactive with said radio signal receiver to receive paging information according to a given paging information broadcast protocol, said processor element receiving said paging information according to a first priority level; and

a stopwatch timer including a counter and control circuitry independent of said processor element, said control circuitry being responsive to at least one of said user operable buttons to control operation of said counter, said processor element obtaining for display a time value originating from said counter according to a second priority level less than said first priority level.

**5,745,440**

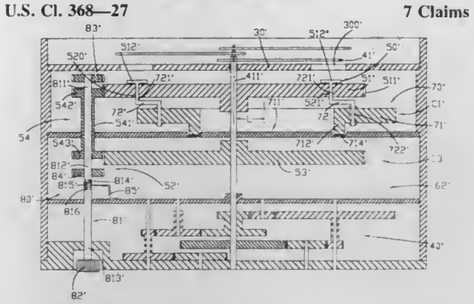
**TIME EQUIPMENT WITH TIME ZONE MECHANISM**

**Eddie Zon Tsu Chen, 17411 Seco Ct., Rowland Heights, Calif. 91748**

**Filed Jul. 17, 1996, Ser. No. 665,307**

**Int. Cl.[6] G04B *19/22***

**U.S. Cl. 368—27** **7 Claims**



1. A time equipment, comprising

a 24-hour dial having a plurality of hour numerals inscribed thereon;

an hour hand and a minute hand mounted for rotating above said dial;

a movement for driving said hour hand to rotate one revolution per 24 hours and said minute hand to rotate one revolution per hour;

a time zone mechanism comprising a time zone disc rotatably and coaxially mounted adjacent to said dial, said time zone mechanism further comprising a driving device for driving said time zone disc to rotate one revolution per 24 hours, and that said time zone disc of said time zone mechanism has an outer time zone ring portion which is disposed around the periphery of said dial and provided with a plurality of time zone city indicators arranging in a predetermined order;

a setting mechanism for said time zone mechanism, wherein said setting mechanism is adapted to drive said time zone disc to rotate independently until one of said time zone city indicators is aligned with said hour hand, so that the current time of said other time zone city indicators are capable of being read simultaneously coincident with said plurality of corresponding hour numerals inscribed on said dial respectively; and

a maintaining mechanism incorporated with the time zone mechanism, in which said time zone disc has a plurality of time zone openings arranged circularly and uniformly spaced apart angularly, each of said time zone city indicators comprising an indicating city disc which has a corresponding time zone city inscribed thereon and is supported to dispose on said corresponding time zone opening by means of said maintaining mechanism, and that said maintaining mechanism is adapted to drive said plurality of indicating city discs to rotate independently so as to enable said indicating city discs maintaining in upright position respectively during the rotation of said time zone disc.

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**5,745,441**

**MECHANICAL TIMER INCLUDING CAM OPERATED CLAPPER AND CHIMES**

**Kirk M. Dunsbergen; Daniel F. Wunderlich, and Michael D. Lafrenz, all of Newton, Iowa, assignors to Maytag Corporation, Newton, Iowa**

**Filed Mar. 21, 1996, Ser. No. 620,101**

**Int. Cl.[6] G04F *3/00*; H01H *43/00***

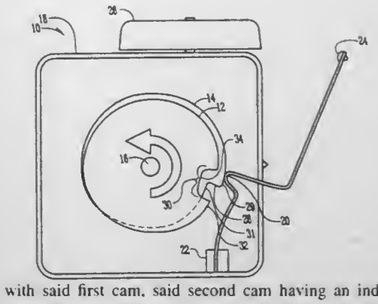
**U.S. Cl. 368—100** **17 Claims**

1. A timer mechanism comprising:

a first cam rotatable in a first direction, said first cam having a step formed on its perimeter;

a second cam rotatable independently from said first cam in a direction opposite said first direction about a common axis





with said first cam, said second cam having an indentation formed on its perimeter;

a cam follower disposed proximate the perimeters of said first and second cams such that said cam follower can move in response to movement of said first and second cams;

a clapper coupled to said cam follower;

a chime disposed proximate said clapper; and

wherein said cam follower causes said clapper to strike said chime when said cam follower is aligned with said indentation formed in said second cam and said step formed in said first cam moves past said cam follower.

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**5,745,442**

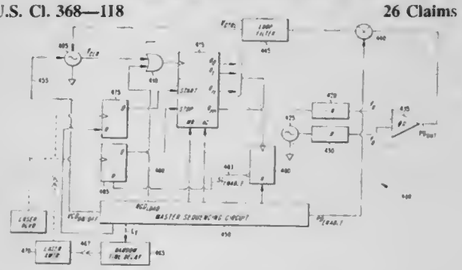
**DIGITAL TIME INTERVAL MEASUREMENT ENGINE FOR A TIME OF FLIGHT SYSTEM**

**Bret A. Herscher, Cupertino, Calif., assignor to Power Spectra, Inc., Sunnyvale, Calif.**

**Filed Oct. 22, 1996, Ser. No. 735,182**

**Int. Cl.[6] G04F *8/00*; G01S *13/18*; G01C *3/08***

**U.S. Cl. 368—118** **26 Claims**



1. A method for measuring a time interval, comprising the steps of:

using a counter in a first circuit to synthesize a measurement clock having a predetermined frequency;

disconnecting the counter from the first circuit;

applying the measurement clock to the counter and starting counter operation in response to a start signal;

stopping counter operation in response to a stop signal; and

using an output of the counter to measure the time interval between the start signal and the stop signal.

**5,745,443**

**MAGNETO-OPTICAL DISC HAVING A PROTECTIVE FILM WITH MINIMAL PROJECTIONS AND METHOD OF PRODUCTION OF SAME**

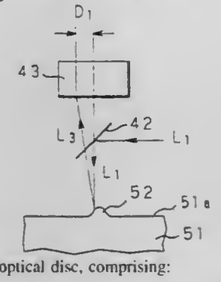
**Mikio Yoshida, and Etsuro Ikeda, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Jun. 19, 1996, Ser. No. 667,227**

**Claims priority, application Japan, Jun. 21, 1995, 7-154400**

**Int. Cl.[6] G11B *11/00***

**U.S. Cl. 369—13** **5 Claims**




1. A magneto-optical disc, comprising:

a substrate;

a recording layer formed on said substrate; and

a protective film formed on said recording layer, wherein information is recorded in said recording layer by a magnetic head floating above the magneto-optical disc by a predetermined floating distance from said recording layer,

wherein,

said protective layer comprises a film of resin filtered to remove impurities greater than 0.2 μm, said recording layer comprises one or more thin film layers the height of projections on the surface of the protective film of the magneto-optical disc being smaller than the floating distance of the magnetic head and not more than 10 μm.

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**5,745,444**

**METHOD OF CONTROLLING RECORDING INFORMATION ON AN OPTICAL DISK USING REPLACEMENT CONTROL INFORMATION**

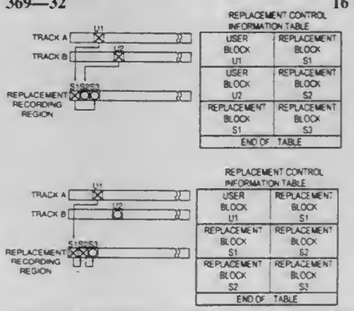
**Norimoto Ichikawa; Kenji Tokumitsu, both of Odawara, and Makoto Seita, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Computer Engineering Co., Ltd., Kanagawa-ken, both of Japan**

**Filed Dec. 18, 1995, Ser. No. 574,131**

**Claims priority, application Japan, Dec. 19, 1994, 6-314454**

**Int. Cl.[6] G11B *17/22*; *3/90***

**U.S. Cl. 369—32** **16 Claims**




1. A method of controlling recording of data on a rewritable information recording medium which has a recording area divided into a plurality of predetermined recording units and having, in said recording area, a user region for recording user data in normal user blocks, a replacement region for recording user data in a replacement block when it is determined that a defective user block exists in which data cannot be recorded normally, and a replace-

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ment control region having a table for registering address information of said defective user blocks and address information of a link between said defective user blocks and said replacement blocks, comprising the steps of:

storing address information of defective replacement blocks in the replacement control region and address information of said replacement blocks to which said defective replacement blocks are linked;

referring to said table when data is read from said medium so that one of said replacement blocks is read from said replacement region when a corresponding one of said defective user blocks is to be read;

reusing said defective user blocks when during recording of data in said user region, one of said defective user blocks is determined to be normal, including deleting the link information stored in said table between said one defective user block and said one replacement block and recognizing said one replacement block as an unnecessary replacement block thereafter; determining for said unnecessary replacement block if there is another replacement block, that has one link to another defective user block, following said unnecessary replacement block in said replacement region; and updating said table to include said unnecessary replacement block in said one link with said another replacement block when said another replacement block is determined to exist.

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**5,745,445**

## DIGITAL RECORDING AND REPRODUCING APPARATUS AND METHOD WHICH PREVENTS OR MANAGES A DATA LOSS

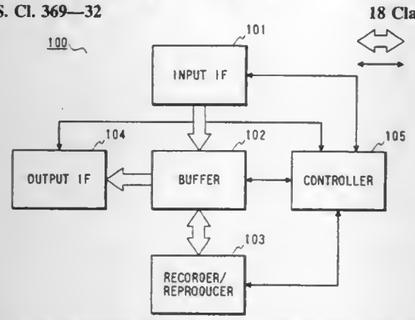
**Ryuji Yasukohchi; Akio Uesugi; Masaki Sato, all of Tokyo, and Hiroshi Nishikawa, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Nov. 29, 1996, Ser. No. 758,533**

**Claims priority, application Japan, Dec. 1, 1995, 7-314137**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—32** **18 Claims**




1. In an apparatus for recording and reproducing a time-series digital data set to and from a disk recording media via a buffer, a method for preventing a data loss caused by each of seek operations in a series of accesses, concerning the data set, to the disk recording media, the method comprising the steps of:

determining, prior to said series of accesses, whether the amount of data in said buffer will remain within the capacity of said buffer throughout the period of said series of accesses; and

in the event said determining results in a negative result, changing a rate of data transfer with the outside prior to said series of accesses and again executing said determining step.

**5,745,446**

## MULTI-DISC STORAGE PLAYER FOR PERFORMING CONTINUOUS PLAYING OF A PLURALITY OF DISCS WITHOUT OCCURRENCE OF A DISC-SEARCH-DISABLED STATE CAUSED BY IMPERFECT STORAGE OF DISCS

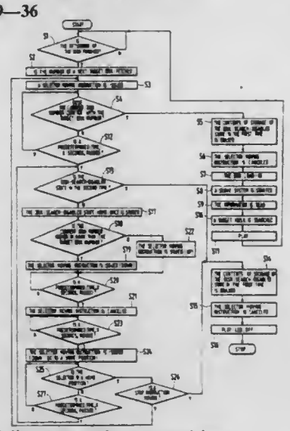
**Yusuke Akama; Kunio Matsumoto, and Noritaka Kunimaru, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Continuation of Ser. No. 987,075, Dec. 7, 1992, abandoned, which is a continuation of Ser. No. 419,352, Oct. 10, 1989, abandoned. This application Jul. 28, 1997, Ser. No. 901,743**

**Claims priority, application Japan, Nov. 14, 1988, 63-288332; Dec. 2, 1988, 63-306259**

**Int. Cl.[6] G11B *17/22***

**U.S. Cl. 369—36** **14 Claims**



1. A multi-disc storage player comprising:

means for issuing an instruction of playing;

a positioning means for performing relative positioning of a disc storage portion, which is capable of systematically storing a plurality of discs, and a disc playing means in the direction of arrangement of said discs; and

a disc moving means for making a selected disc move between said disc storage portion and said disc playing means;

said positioning means including a movable member for carrying a selected one of said disc storage portion and said disc playing means, a driving mechanism for making said movable member move according to an instruction of movement, and a controlling means for issuing said instruction of movement to said driving mechanism until a designated position corresponding to a disc designated by said instruction of playing coincides with a current position of said movable member;

said controlling means issuing an instruction of movement to said driving mechanism in a direction reverse to a first direction upon detecting passage of a predetermined period of time before said designated position coincides with said current position, after issuance of said instruction of movement in said first direction to said driving mechanism, to attendantly sense when a disc is imperfectly stored in said disc storage portion and is thereby suppressing movement of said disc playing means relative to said disc storage portion in the direction of arrangement of said discs, through engagement of the disc, which is imperfectly stored, with said movable member, resulting in a disc-search-disabled state, wherein said controlling means further judges the number of disc-search-disabled states which has occurred, and then stops a disc selecting operation when the number of disc-search-disabled states becomes greater than a predetermined number, wherein said controlling means erases storage of the disc-search-disabled state which has occurred a first time when the number of disc-search-disabled states becomes greater than the predetermined number; and in which said disc storage portion has an urging means for urging said disc toward a storage position.



**5,745,447**

## THREE-AXIS MOVING ACTUATOR FOR OPTICAL PICK-UP

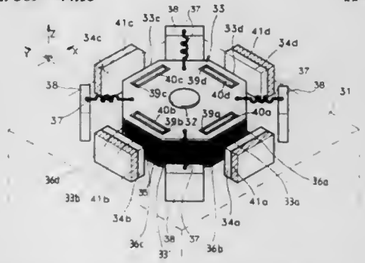
**Seong-ho Kang, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea**

**Filed Jun. 13, 1996, Ser. No. 663,532**

**Claims priority, application Rep. of Korea, Jun. 15, 1995, 95-13565**

**Int. Cl.[6] G11B *07/00***

**U.S. Cl. 369—44.15** **11 Claims**



1. A three-axis moving actuator for an optical pickup, comprising:

a base;

an object lens positioned on an optical axis;

a lens holder having two side planes operative to be parallel with a radial direction of a disk track and two side planes operative to be parallel with a tangential direction of the disk track, said object lens being fixed to said lens holder;

a plurality of suspension members for supporting said lens holder such that said lens holder is movable above said base;

first and third magnets installed on said base to face said two side planes parallel with the radial direction of the disk track, respectively;

second and fourth magnets installed on said base to face said two side planes parallel with the tangential direction of the disk track, respectively;

a focus coil wound around said lens holder; and

first to fourth tracking coil means attached to said focus coil and positioned to face said first to fourth magnets, respectively.

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**5,745,448**

**Patent Not Issued For This Number**

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**5,745,449**

## OPTICAL INFORMATION RECORDING/REPRODUCING METHOD AND APPARATUS FOR DETERMINING A RELATIVE TRACKING OFFSET AMOUNT OF LIGHT SPOTS ON A RECORDING MEDIUM TO PERFORM TRACKING CONTROL

**Osamu Koyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 9, 1992, Ser. No. 973,975**

**Claims priority, application Japan, Nov. 14, 1991, 3-325106**

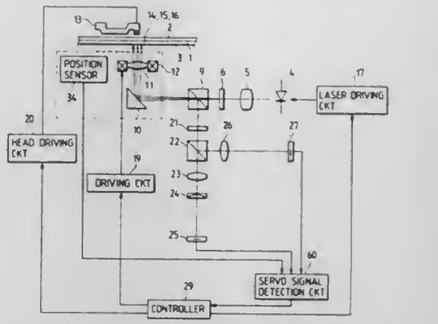
**Int. Cl.[6] G11B *7/09***

**U.S. Cl. 369—44.32** **7 Claims**

3. An optical information recording and/or reproducing apparatus for effecting recording and/or reproduction while positioning a plurality of light spots to a single information track or a plurality of information tracks, said apparatus comprising:

means for forming first and second light spots on an optical information recording medium to perform at least one of recording information on and reproducing information from the recording medium;

tracking control means for conducting tracking control for at least one of the first and second light spots;




detecting means for detecting a relative track deviation amount of the first and second light spots, said detecting means detecting the relative track deviation amount from signals generated when the first and second light spots cross a track of the recording medium;

calculating means for calculating a tracking offset amount to be assigned, at a predetermined ratio, to the first and second light spots based on the detected track deviation amount; and

applying means for applying the calculated offset amount to said tracking control means upon recording information on and reproducing information from the recording medium.

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**5,745,450**

## FOCUSING SERVO SYSTEM AND FOCUS SERVO ACQUISITION ENABLE WITH MULTIPLE VELOCITY ACQUISITION MODES

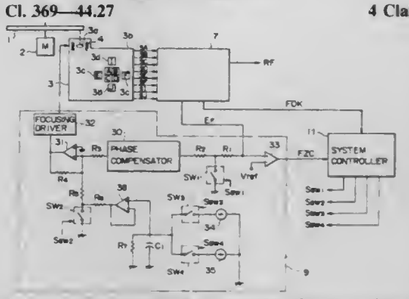
**Shunichi Miyazono, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 405,504, Mar. 16, 1995, abandoned, which is a division of Ser. No. 221,892, Mar. 30, 1994. This application Feb. 18, 1997, Ser. No. 801,547**

**Claims priority, application Japan, Apr. 2, 1993, 5-098323; Sep. 8, 1993, 5-246113**

**Int. Cl.[6] G11B *7/09***

**U.S. Cl. 369—44.27** **4 Claims**




1. A focusing servo system that executes a focus search procedure in which a light beam projected from an objective lens on to the surface of a disk-shaped recording medium is focused by driving the objective lens in a direction perpendicular to the disk medium surface on the basis of predetermined driving signals to detect an in focus condition, at which point a focusing servo loop is closed to carry out a focusing servo operation to acquire and maintain focus of the light beam on the recording medium, said focusing servo system comprising:

a first focus search drive signal generator which drives the objective lens at a relatively high velocity $V_H$ either toward the recording medium surface or away from the recording medium surface for a first high speed search operation;

a second focus search drive signal generator which drives the objective lens at a relatively low velocity $V_L$ away from the recording medium surface in a second low speed search operation, where $V_L < V_H$;

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a light beam detector for generating a focusing error signal $E_f$, a sum signal $R_f$, a focus acquisition enable range detection signal FOK which is on when $R_f$ is above a threshold value, and a zero crossing signal FZC which is pulsed on when $E_f$ equals a reference voltage $V_{ref}$; and

a controller supplied with the FOK signal and the FZC signal for engaging the first focus search drive signal generator to perform the first high speed search operation until the FOK signal is detected as being HIGH, then causing the first focus search drive signal generator to drive the objective lens at the velocity $V_H$ toward the recording medium surface for a predetermined period of time, then causing the second focus search drive signal generator to perform the second low speed search operation until the controller simultaneously detects that the FOK signal is high and the amplitude of the FZC signal is falling, and then closing the focusing servo loop.

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**5,745,451**

## DISC RECORDING AND/OR REPRODUCING APPARATUS

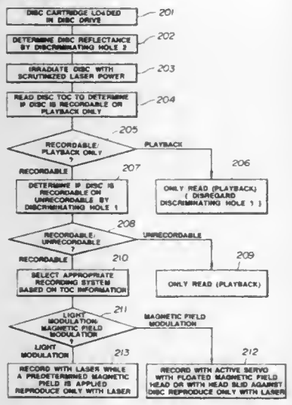
**Hiroshi Mukawa; Hirotoshi Fujisawa, and Ryo Ando, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 670,101, Jun. 25, 1996, abandoned, which is a continuation of Ser. No. 190,691, Feb. 2, 1994, abandoned, which is a continuation of Ser. No. 834,409, Feb. 12, 1992, abandoned. This application Sep. 15, 1997, Ser. No. 929,546**

**Claims priority, application Japan, Feb. 18, 1991, 3-044025; Jul. 31, 1991, 3-214555**

**Int. Cl.[6] G11B** *7/095*

**U.S. Cl. 369—44.29** **3 Claims**




1. An optical disc recording and/or reproducing apparatus for recording or reproducing a plurality of reflectivity deferent type of optical discs having a data recording area for recording data and a contents data area for recording contents data of the recording area, said apparatus comprising:

a disc cartridge including a cartridge body for housing one of said optical discs and a first discriminating portion formed on said cartridge body, said first discriminating portion for indicating the reflectivity of one of the optical discs housed in said cartridge body by a plurality of unevenness;

recording and/or reproducing means for recording or reproducing to or from the optical disc housed in said disc cartridge and having an optical pickup for irradiating a light beam to the optical disc housed in said disc cartridge;

a detecting switch mechanically contacted to said first discriminating portion of said disc cartridge loaded on said apparatus;

servo means for controlling the focus and the position of the light beam radiated from said optical pickup on the optical disc housed in said disc cartridge; and

a controller for supplying the output signal from said detecting switch and for discriminating the reflectivity of the optical disc housed in said disc cartridge, said controller for controlling the output level of the light beam emitted from said optical pickup according to the discriminating result and for setting the gain of said servo means according to the discriminating result before recording or reproduction to or from the optical disc housed in said disc cartridge;

wherein said recording and/or reproducing means reads out contents data of the optical disc housed in said disc cartridge by said optical pickup after completing the control operation of the light beam emitted from said optical pickup and the setting operation of the gain of said servo means; and

wherein said controller discriminates the type of the optical disc housed in said disc cartridge according to the read-out contents data and controls said recording and/or reproducing means according to the discriminating result of the contents data of the optical disc housed in said disc cartridge.

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**5,745,452**

## APPARATUS AND METHOD FOR QUICKLY FOCUSING AN OPTICAL DISK PLAYER

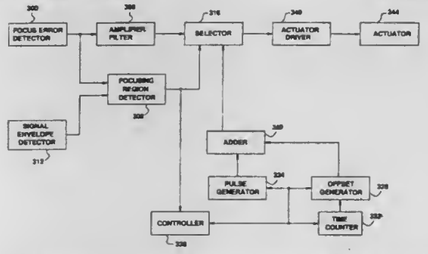
**Young-san Ko, Kwangmyeong, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea**

**Filed Aug. 5, 1996, Ser. No. 692,130**

**Claims priority, application Rep. of Korea, Aug. 11, 1995, 95-24850**

**Int. Cl.[6] G11B** *7/095*

**U.S. Cl. 369—44.29** **6 Claims**




1. An apparatus for approaching a focusing region in an optical disk player comprising:

a focus error detector for detecting focus errors and outputting a focus error detection signal;

a signal envelope detector for detecting a signal envelope and outputting a signal envelope detection signal;

a focusing region detector for receiving the focus error detection signal and the signal envelope detection signal, detecting the focusing region according to the focus error detection signal and the signal envelope detection signal, and outputting a focusing region detection signal;

a pulse generator for generating search pulses;

a time counter for counting time from a starting point of said search pulses to a finish of said focusing region search and outputting a counted value;

an offset generator for generating an offset voltage according to the counted value output from said time counter;

an adder for adding signals output from said pulse generator and said offset generator and outputting a corresponding voltage;

an actuator driver for driving an actuator according to the voltage output by said adder; and

a controller for controlling said pulse generator, offset generator and time counter according to the focusing region detection signal output by said focusing region detector.



**5,745,453**

## DISK, RECORDING DEVICE, REPRODUCING DEVICE, RECORDING METHOD AND REPRODUCING METHOD INCLUDING CALCULATION, STORAGE AND UTILIZATION OF PARITY INFORMATION

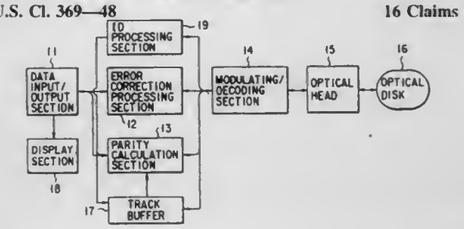
**Kenichi Ikeda, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Sep. 5, 1995, Ser. No. 523,213**

**Claims priority, application Japan, Sep. 7, 1994, 6-213331; Sep. 9, 1994, 6-215408; Feb. 20, 1995, 7-030910**

**Int. Cl.[6] G11B** *5/09*

**U.S. Cl. 369—48** **16 Claims**




11. A reproducing device, comprising:

a disk recording medium in which information signals given error correction codes are recorded by sector units given specified sector numbers in every one of a plurality of tracks given specified track numbers and a parity is recorded for an information recording block having M (M is an integer of 2 or larger) of tracks on every other L (L is an integer of 1 or larger) pieces of tracks;

reading means for reading recorded data recorded in said recording medium; and

reproducing means for reproducing said information signals from the recorded data read by said reading means, wherein

said reproducing means reproduces said information signals by using parities in said parity sector in the data when said information signals cannot be reproduced from said read recorded data by using said error correction codes in the data.

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**5,745,454**

## RECORDING MEDIUM HAVING TEXT INFORMATION RECORDED THEREON AND REPRODUCING APPARATUS

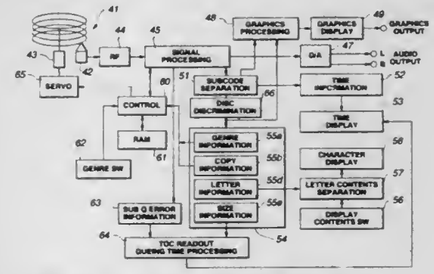
**Teppei Yokota, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Sep. 20, 1996, Ser. No. 716,953**

**Claims priority, application Japan, Sep. 22, 1995, 7-244959**

**Int. Cl.[6] G11B** *7/00*

**U.S. Cl. 369—48** **20 Claims**




1. A disc-shaped recording medium comprising:

a program area having recorded thereon at least one type of program information; and

a management area for managing the program information recorded in the program area, wherein

data recorded in the management area made up of a plurality of frames blocked with a pre-set block length;

each of the frames being made up of a synchronization signal section and a plurality of subcode channels;

wherein one of the subcode channels manages a recording position on the recording medium associated with each type of program information recorded in the program area and a recording capacity for all programs;

wherein subcode channels, other than the one of the plural subcode channels, are used for managing letter information associated with each program information type recorded in the program area as text information and for managing an identifier identifying a type of letter information; and

wherein the identifier identifying the type of the letter information is a code capable of identifying at least one of a title of the program information recorded in the program area, a classification of the program information recorded in the program area, and a name of a producer.

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**5,745,455**

## DISC DEVICE HAVING ECCENTRICITY MEASUREMENT AND CLOCK CORRECTION

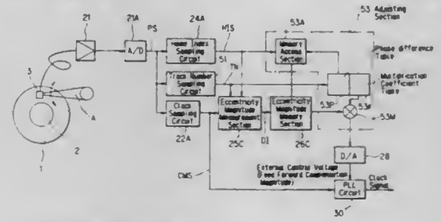
**Toru Takeda, Saitama; Satoru Seko, Kanagawa; Hideaki Ishioka, Kanagawa, and Itaru Tomisaki, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 555,542, Nov. 9, 1995, Pat. No. 5,615,191, which is a continuation of Ser. No. 159,620, Dec. 1, 1993, abandoned. This application Mar. 21, 1997, Ser. No. 821,330**

**Claims priority, application Japan, Dec. 4, 1992, 4-350578; Feb. 23, 1993, 5-057764; Mar. 2, 1993, 5-066248**

**Int. Cl.[6] G11B** *27/30*

**U.S. Cl. 369—48** **1 Claim**




1. A disc device comprising:

a disc having data tracks containing information and provided in advance with a plurality of clock marks at equal intervals in each circular track for providing a timing standard and with a home index signal;

a reproduction head;

a turntable arm arranged for movement relative to the disc and having mounted thereon the reproduction head for reproducing information recorded on the disc;

home index sampling means for sampling the home index signal reproduced by the reproduction head for indicating the rotational phase origin of the disc and producing a rotational phase signal;

track number sampling means for sampling track numbers of the disc from an output signal of the reproduction head and producing a track number signal;

clock sampling means for extracting a first clock signal from the output signal of the reproduction head;

eccentricity magnitude measuring means receiving the rotational phase signal, the track number signal, and the first clock signal for obtaining therefrom a signal corresponding to the eccentricity of the data tracks of the disc with respect to the axis of rotation of the disc;

eccentricity magnitude memory means for storing the signal corresponding to the eccentricity;

a phase difference table receiving the track number signal and for storing in correspondence with the sampled track numbers a phase difference between the home index on the axis of rotation of the disc and the home index on the data tracks and for producing an output signal corresponding to the phase differences according to input track numbers;

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memory access means receiving the rotational phase signal from the home index sampling means and the output signal from the phase difference table for addressing the eccentricity magnitude memory means and reading out signals therefrom corresponding to the eccentricity;

a multiplication coefficient table for storing in correspondence with the sampled track numbers amplitudes of the time intervals of the clock mark reproduction signals as eccentricity adjustment coefficients and for reading out the eccentricity adjustment coefficients in response to the track number signal from the track number sampling means;

a multiplier for multiplying the signal corresponding to the eccentricity output from the eccentricity magnitude memory means by the adjustment coefficients from the multiplication coefficient table to produce an adjusted eccentricity signal;

a digital to analog converter for converting the adjusted eccentricity signal to an analog voltage; and

a phase lock loop circuit including a voltage controlled oscillator receiving said first clock signal from said clock sampling means for causing a second clock signal output by the voltage controlled oscillator to follow the first clock signal by changing one of the phase and the frequency of the second clock signal in response to the analog voltage from the digital to analog converter.

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**5,745,456**

## DISK SENSING APPARATUS FOR DISCRIMINATING DISK TYPE IN A DUAL PURPOSE DISK PLAYER

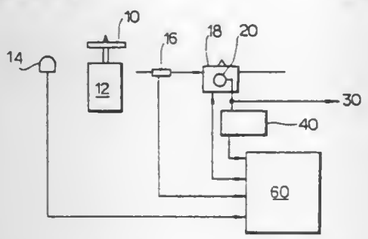
**Kim Young-Han, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**

**Filed Jul. 23, 1992, Ser. No. 917,380**

**Claims priority, application Rep. of Korea, Jul. 31, 1991, 91-13287**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—50** **15 Claims**




1. A disk sensing apparatus, comprising:

a disk sensor for sensing whether a disk is loaded on a clamper;

a pickup;

laser disk discriminating means for detecting a data domain of a laser disk according to the output of a tilt sensor mounted on the pickup, said laser disk discriminating means comprising:

detecting means for receiving light reflected from said disk in response to light output by said tilt sensor and outputting a level value corresponding to the quantity of said received light, and

comparing means for comparing the level value output by said detecting means to a predetermined reference value and for generating a comparison result signal;

a compact disk recognition switch; and

a microprocessor for determining said disk to be a compact disk when focus lock is achieved by said pickup after said pickup is moved to a position adjacent to said compact disk recognition switch once loading of disks is perceived by disk sensor, and for determining said disk to be a laser disk when focus lock is not achieved after said pickup is moved to said position adjacent said compact disk recognition switch and when said laser disk discriminating means does not detect said data domain of said laser disk.

**5,745,457**

## OPTICAL DISK PLAYER WITH COARSE AND FINE SPEED CONTROL

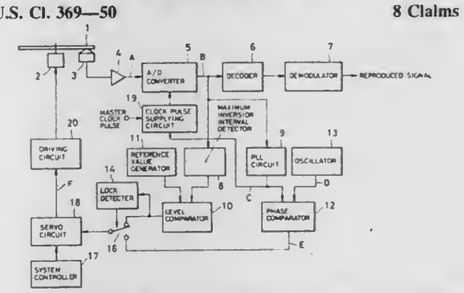
**Hideki Hayashi, and Hideki Kobayashi, both of Tsurugashima, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Feb. 26, 1996, Ser. No. 606,993**

**Claims priority, application Japan, Feb. 28, 1995, 7-039555**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—50** **8 Claims**




1. An optical disk player for reading data recorded on an optical disk and obtaining a reproduced signal, comprising:

a spindle motor for rotating said optical disk;

pickup means for irradiating a light beam toward a recording surface of said optical disk, receiving a light reflected from said optical disk, and generating an analog read signal according to the amount of the received light;

A/D (Analog/Digital) converting means for converting said read signal to a digital read signal consisting of a plurality of bits in synchronism with a sampling clock;

decoding means for decoding said digital read signal and generating decoded data;

error signal generating means for generating a coarse adjustment speed error signal and a fine adjustment speed error signal according to the difference between an actual rotational speed of said optical disk and a specified speed on the basis of said digital read signal;

a switch for alternately relaying only one of said coarse adjustment speed error signal and said fine adjustment speed error signal; and

means for controlling a rotational speed of said spindle motor in accordance with the error signal relayed.

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**5,745,458**

## OVERLAPPED SPIN-UP PROCESS FOR OPTICAL DISK DRIVE

**Thomas C. Oliver; David J. Ellis, and Leo J. Embry, all of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 222,973, Apr. 5, 1994, abandoned. This application Oct. 18, 1996, Ser. No. 732,753**

**Int. Cl.[6] G11B *3/90***

**U.S. Cl. 369—54** **16 Claims**

14. A method for storing and retrieving data in a optical disk library system adapted for storing a plurality of optical disks, at least one optical disk drive system, and an autochanger configured to transfer one of said plurality of optical disks between an associated storage location and a selected optical disk drive, and a controller for interfacing with a host processor and for controlling optical disk library operations, the method comprising the steps of:

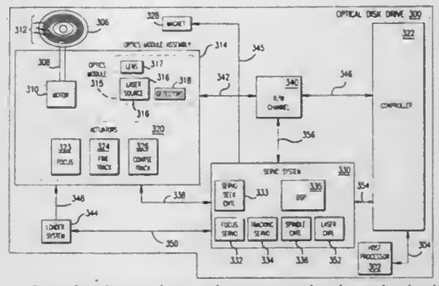
(A) receiving a data request from the host processor;

(B) performing a disk selection and retrieval process by the autochanger under the command of the controller to position a selected optical disk into a selected optical disk drive; and

(C) performing a load process by the selected optical disk drive, including the steps of:

(1) performing a load disk sub-process to prepare the optical disk for acceleration in the optical disk drive; and






(2) performing a spin-up sub-process to thereby make the disk immediately accessible to the host processor for data transfer, including the steps of:

(a) accelerating the optical disk towards a target speed;

(b) concurrently with step (C)(2)(a), performing speed-independent optical disk drive preparatory operations, including turning on a laser source of the optical disk drive system as soon as the optical disk begins to rotate;

(c) performing a first set of speed-dependent optical disk drive preparatory operations after the optical disk achieves a speed within a first variance of said target speed, wherein said first set of speed-dependent optical disk preparatory operations requires said optical disk speed to be within said first variance of said target speed; wherein said first set of speed-dependent optical disk drive preparatory operations comprise the steps of:

(i) reading optical disk header information to determine optical disk media type, and (ii) performing initial calibrations.

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**5,745,459**

## METHODS AND APPARATUS FOR MANAGING RECORDING MEDIUM

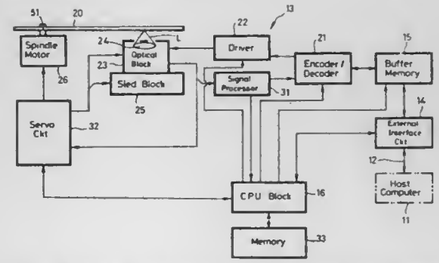
**Tatsuya Inokuchi, Kanagawa; Shigeki Tsukatani, Tokyo, and Tadayuki Misaizu, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 338,241, Nov. 14, 1994, abandoned. This application Mar. 24, 1997, Ser. No. 824,071**

**Claims priority, application Japan, Nov. 12, 1993, 5-283722**

**Int. Cl.[6] G11B *5/09***

**U.S. Cl. 369—54** **6 Claims**




1. An apparatus operable in accordance with small computer system interface (SCSI) commands transmitted through an SCSI interface from a host computer for recording information on a recordable recording medium loaded on the apparatus, comprising:

means for reading medium attribute information from said recordable recording medium, said medium attribute information indicating respective characteristics of said recording medium and some of which are unchangeable;

means for generating changeable medium attribute information indicating a respective recording state of said recordable recording medium and for automatically changing said changeable medium attribute information in response to performance of a recording on said recordable recording medium, reservation of a track on said recordable recording medium, and loading of a second recordable recording medium on the apparatus for recording in place of the first mentioned recordable recording medium;

means for integrating said unchangeable medium attribute information and said changeable medium attribute information to produce a mode page having integrated medium attribute information; and

memory means apart from said recording medium and said host computer for storing said mode page having integrated medium attribute information for use in a next recording of said recordable recording medium without resort to said host computer.

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**5,745,460**

## DISK DISCRIMINATING METHOD AND APPARATUS

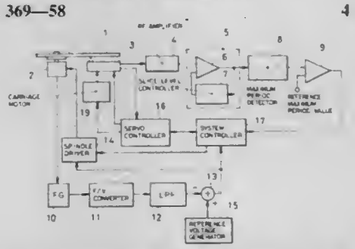
**Kiyoshi Tateishi, Tsurugashima, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Mar. 22, 1996, Ser. No. 620,612**

**Claims priority, application Japan, Mar. 24, 1995, 7-066531**

**Int. Cl.[6] G11B *19/12***

**U.S. Cl. 369—58** **4 Claims**




1. A disk discriminating method of discriminating plural types of disks with different recording densities, comprising the steps of:

rotating a disk by a constant number of rotations and reading a recorded signal from said disk to acquire a read signal;

detecting a maximum period or a minimum period of said read signal; and

determining a type of said disk in accordance with said detected maximum period or minimum period.

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**5,745,461**

## METHOD AND A SYSTEM OF OPTICAL DISK AUTO-DISCRIMINATION

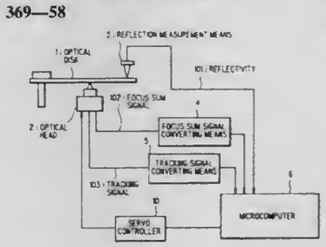
**Satoshi Kawasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Dec. 4, 1996, Ser. No. 760,336**

**Claims priority, application Japan, Dec. 4, 1995, 7-315174**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—58** **10 Claims**




6. A system for automatic type discrimination of an optical disk mounted on an optical disk unit; comprising:

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reflection measurement means for measuring reflectivity of a back surface of the optical disk mounted on the optical disk unit provided on an opposite side of the optical disk to an optical head;

focus sum signal converting means for outputting a level of a focus sum signal indicating a sum of reflected light returned to said optical head during focus searching operation of said optical head;

tracking signal converting means for outputting a peak to peak value of a tracking signal output of said optical head after said focus searching operation; and

a microcomputer for estimating material of a recording area, a layer number of said recording area and recording density of said optical disk by comparing said reflectivity, said level of said focus sum signal and said peak to peak value of said tracking signal with corresponding values of a reference table prepared therein, and confirming a type of said optical disk by data obtained of said optical disk after a tracking servo mechanism of said optical head is actuated.

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**5,745,462**

## RECORDING APPARATUS HAVING A RECORDING OPERATION CONTROLLED BASED UPON SILENT PORTIONS OF INPUTTING DATA

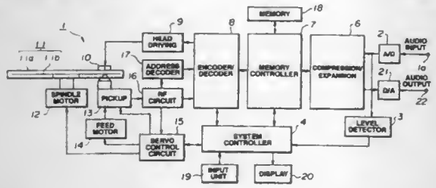
**Junichi Aramaki, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 561,895, Nov. 22, 1995, abandoned, which is a division of Ser. No. 319,258, Oct. 6, 1994. This application Apr. 17, 1997, Ser. No. 844,363**

**Claims priority, application Japan, Oct. 8, 1993, 5-253458**

**Int. Cl.[6] G11B *3/90***

**U.S. Cl. 369—58** **4 Claims**




3. An apparatus for recording a first program of inputted data during a recording operation to a recording medium having address data pre-recorded thereon and also having a data recording region for recording said inputted data based upon said data and a control data region for recording control data for said data recording region, said apparatus comprising:

storage means for storing an address if the signal level of the inputted data becomes lower than a pre-set level;

recording control means for stopping the recording operation; and

editing means for editing the recording control data in the control region for separating the data recording region into a data recorded region that contains the inputted data recorded upstream of the address stored in the storage means, and into a data recorded region that contains the inputted data recorded downstream of the address stored in said storage means;

wherein upon a subsequent recording operation, a second program of inputted data is recorded to the data recordable region of the recording medium in succession to the first program thereby deleting the inputted data recorded downstream of the address stored in said storage means.

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**5,745,463**

## PHASE-CHANGE OPTICAL DISC RECORDING METHOD AND APPARATUS, AND INFORMATION RECORDING APPARATUS AND RECORDING PRE-COMPENSATION METHOD

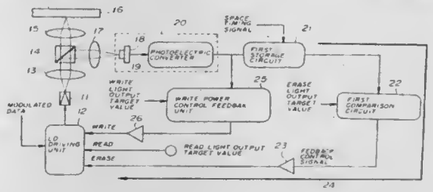
**Hiroshi Maegawa, and Ikuo Aoki, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Division of Ser. No. 536,833, Sep. 26, 1995, Pat. No. 5,648,952. This application Mar. 5, 1997, Ser. No. 812,970**

**Claims priority, application Japan, Sep. 28, 1994, 6-232830; Oct. 27, 1994, 6-263339**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—59** **6 Claims**




1. A recording pre-compensating method to be used in a phase-change optical disc recording system, comprising steps of:

a) dividing one pulse for forming one record mark on a phase-change optical disc into a series of multiple pulses; and

b) changing a recording speed at which said record mark is formed in said disc;

wherein said step a) uses a fixed reference clock signal for producing said series of multiple pulses when said step b) changes said recording speed, said reference clock signal having a frequency which obtained as a result of multiplying by an integer a frequency of a recording synchronizing signal, which is one necessary for a highest one of a plurality of recording speeds, said step b) selecting one from among said plurality of recording speeds.

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**5,745,464**

## EDGE POSITION DATA REPRODUCTION APPARATUS

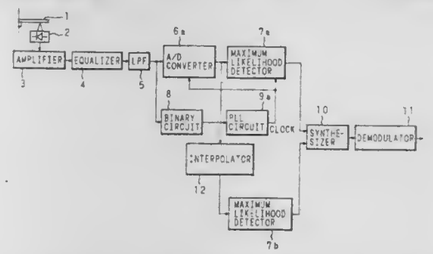
**Masakazu Taguchi, and Haruhiko Izumi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 604,714, Feb. 21, 1996, abandoned. This application Mar. 27, 1997, Ser. No. 826,286**

**Claims priority, application Japan, Dec. 6, 1995, 7-145006**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—59** **12 Claims**




1. A data reproduction apparatus for reproducing data using front and rear edges of marks recorded in an optical disk, comprising:

means for obtaining a reproduction waveform from the optical disk;

a single A/D converter for obtaining sampling values representing each front edge in the obtained reproduction waveform;

interpolating means for obtaining interpolation digital values representing each rear edge in the obtained reproduction waveform by an interpolation calculation using the obtained sampling values; and



means for reproducing data in the optical disk on the basis of the sampling value and the interpolation digital value.

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**5,745,465**

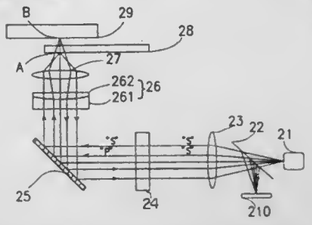
## DIGITAL VIDEO DISC PICK-UP HEAD SYSTEM

**Shin-Ter Tsai, Hsinchu Hsien, and Zu-Wen Chan, Shinchu City, both of Taiwan, assignors to Industrial Technology Research Institute, Taiwan**

**Filed Jan. 23, 1997, Ser. No. 786,330**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—110** **18 Claims**




1. An optical pick-up head system for reading from and writing to a disc, comprising:

a laser diode light source, for generating a first light beam;

a beam splitter, for receiving the first light beam, and then generating a second light beam having an energy smaller than the first beam, and that the direction of propagation of the second beam is the same as the first beam;

a collimating lens, for receiving the second light beam and generating an approximately horizontal parallel light beam;

a polarization changer, for receiving the parallel light beam, and generating an approximately horizontal third light beam;

a deflecting mirror, for receiving the third light beam, and generating an approximately vertical, upwardly-propagating fourth light beam;

an optical crystal assembly, for receiving the fourth light beam, and generating an approximately vertical, upwardly-propagating, essentially parallel fifth light beam when the fourth light beam is of a first polarization, and generating an approximately vertical, upwardly-propagating, non-parallel fifth light beam when the fourth light beam is of a second polarization,

an objective lens, for receiving the fifth light beam, and focusing the beam onto a disc surface, and also for receiving a reflected light beam from the disc surface, and generating an approximately vertical, downwardly-propagating sixth light beam; and

a photosensor assembly, for receiving an approximately vertical, downwardly-propagating seventh light beam generated by the sixth light beam after passing through the beam splitter, and generating a detectable opto-electrical signal.

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**5,745,466**

## OBJECTIVE LENS DRIVE APPARATUS FOR A RECORDING AND REPRODUCING DIFFERENT DISCS OF DIFFERENT FORMAT

**Akihiro Kasahara, Chiba-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Dec. 22, 1995, Ser. No. 576,139**

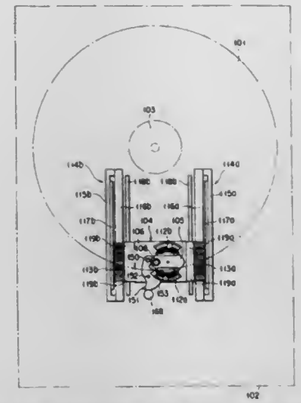
**Claims priority, application Japan, Dec. 26, 1994, 6-322067; Mar. 22, 1995, 7-062235; Aug. 22, 1995, 7-213513**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—112** **33 Claims**

24. An objective lens drive apparatus comprising:

a movable member which can be moved along a surface of an optical information recording medium;




an objective lens fixed to the movable member, for allowing a light beam to pass and for concentrating the beam onto the optical information recording medium;

a first diaphragm member fixed to the movable member and having a first aperture for determining a diameter of the light beam passing;

a second diaphragm member provided such that the second diaphragm member can be at least one of excluded from a light path of the light beam and inserted into the light path, and having a second aperture for determining the diameter of the light beam passing;

the first aperture being closer to the objective lens than the second aperture;

the first aperture being larger than the second aperture; and

an engaging member which is engaged with the second diaphragm member when the second diaphragm member is at least one of excluded and inserted.

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**5,745,467**

## OPTICAL INFORMATION RECORDING METHOD AND APPARATUS

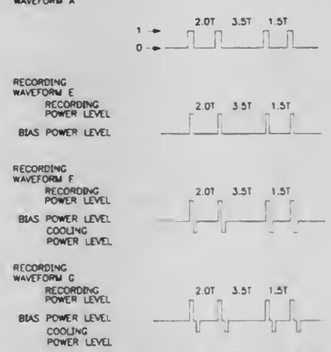
**Yoshitaka Sakaue, Hirakata; Kenichi Nishiuchi, Moriguchi, and Eiji Ohno, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Oct. 8, 1996, Ser. No. 725,944**

**Claims priority, application Japan, Oct. 9, 1995, 7-261246; Oct. 9, 1995, 7-261262; Jul. 25, 1996, 8-195880**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—116** **36 Claims**




1. An optical information recording method by which a modulated signal is recorded, by switching laser light between a plurality of powers on an optical recording medium having a thin

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recording film that exhibits a reversible change between optically recognizable states, comprising the steps of:

modulating said laser light between a preset first power having power equal to or higher than a recording power used for recording on said thin recording film, and a preset second power having power lower than said first power, to form a recorded mark using a recording pulse train,

applying a cooling pulse after said recording pulse train, said cooling pulse having a cooling power lower than a bias power which is set lower than said recording power, and

varying said laser light power during a period starting from the moment an end pulse in said recording pulse train begins to fall until said cooling power is reached.

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**5,745,468**

## MARK EDGE RECORDED SIGNAL REPRODUCING DEVICE FOR USE IN OPTICAL DISK APPARATUS

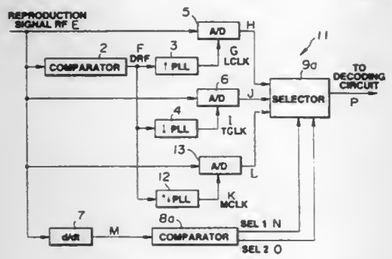
**Junichi Nakano, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Dec. 27, 1995, Ser. No. 579,149**

**Claims priority, application Japan, Jan. 11, 1995, 7-002797**

**Int. Cl.[6] G11B** *7/00;5/09*

**U.S. Cl. 369—124** **18 Claims**




**18**. A signal reproducing device for use in an optical disk apparatus adapted to irradiate an optical disk with light beams and detect a reproduction signal associated with a mark formed on the optical disk from light beams reflected by the optical disk and reproduce data recorded thereon on the basis of the reproduction signal, comprising:

first clock generating means for generating a first clock corresponding to a leading edge of the mark;

second clock generating means for generating a second clock corresponding to a trailing edge of the mark;

third clock generating means for generating a third clock having a phase which is intermediate between phases of the first and second clocks;

first sampling means for sampling the reproduction signal according to the first clock;

second sampling means for sampling the reproduction signal according to the second clock;

third sampling means for sampling the reproduction signal according to the third clock;

selection means for selecting one of outputs of the first, second and third sampling means; and

means for performing a maximum likelihood decoding on the one of the outputs selected by said selection means.

**5,745,469**

## SIGNAL-PROCESSING PREAMPLIFIER FOR AN OPTICAL DISC SYSTEM

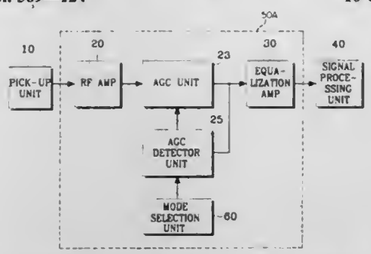
**Chun-Sup Kim, and Yong-Serk Kim, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea**

**Filed Feb. 25, 1997, Ser. No. 805,726**

**Claims priority, application Rep. of Korea, Feb. 26, 1996, 1996-4650**

**Int. Cl.[6] G11B** *7/00*

**U.S. Cl. 369—124** **10 Claims**




1. A preamplifier for an optical disc system including a pick-up unit for reading an optical signal from an optical disc and a signal processing unit for processing the optical signal, said preamplifier comprising:

a radio frequency amplifier for amplifying an output signal from the pick-up unit;

an automatic gain control unit for amplifying an output signal from the radio frequency amplifier to a desired level;

an automatic gain control detector unit having an input and output terminal respectively coupled to an output and input terminal of said automatic gain control unit, said automatic gain control detector unit being operative to rectify an output signal from said automatic gain control unit, to compare the rectified signal with a predetermined reference signal, and to output a signal representative of the comparison of the rectifed signal and the predetermined reference signal to said automatic gain control unit; and

a mode selecting unit, coupled to the automatic gain control detector unit, being operative to select one of several modes of operation, respectively corresponding to different equalization characteristics.

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**5,745,470**

## HEAD MOVING APPARATUS WHICH CANCELS LEAKAGE FLUX

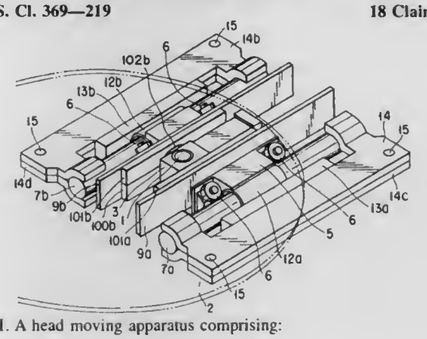
**Koichi Nagai, Chigasaki, and Hidenori Sai, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed May 30, 1996, Ser. No. 655,163**

**Claims priority, application Japan, May 31, 1995, 7-132468**

**Int. Cl.[6] G11B** *7/085;21/02*

**U.S. Cl. 369—219** **18 Claims**




1. A head moving apparatus comprising:



a head portion for selectively recording and reproducing data to/from a recording medium;

a support mechanism, having a ferromagnetic member, for supporting movement of said head portion;

a guide rail, contacting said support mechanism, for guiding movement of said support mechanism to a predetermined direction together with said head portion;

a first electromagnetic driving element having a first magnet magnetized in a first direction so as to generate magnetic flux necessary for generating driving force for moving said head portion to said predetermined direction;

a second electromagnetic driving element having a second magnet which elongates along a longitudinal axis extending in said predetermined direction and over a moving distance of said head portion by said first electromagnetic driving element, and is magnetized in a second direction different from said first direction so as to generate magnetic flux necessary for generating driving force for moving said head portion in a direction perpendicular to said recording medium; and

a base for fixing said guide rail, said first magnet and said second magnet on said apparatus.

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**5,745,471**

## DEVICE FOR DAMPING VIBRATIONS OR SHOCKS IN AN OPTICAL DISK PLAYER

**Jin Seung Son, Seoul; Gyu Chool Kim, Suwon, and Jung Hun Pang, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Continuation of Ser. No. 503,799, Jul. 18, 1995, abandoned, which is a continuation of Ser. No. 222,923, Apr. 5, 1994, abandoned. This application Oct. 2, 1996, Ser. No. 725,892**

**Claims priority, application Rep. of Korea, Jul. 13, 1993, 93/13134**

**Int. Cl.[6] G11B** *33/08*

**U.S. Cl. 369—263** **9 Claims**




1. A vibration-damping housing structure for an optical disk player, comprising:

an external housing,

a deck housing located in said external housing for supporting an optical disk player, said deck housing including first and second substantially vertical side walls, each of said side walls including a first surface defining a first vertical plane and having a plurality of first holes,

said external housing including second surfaces facing respective ones of said first surfaces, each of said second surfaces defining a second vertical plane and having second holes disposed opposite from, and spaced from, respective ones of said first holes of said deck housing, whereby said first and second holes of said external housing and said deck housing form pairs of substantially horizontally spaced, aligned first and second holes, and

vibration damping members extending between said external housing and said deck housing, each of said vibration damping members comprising a container formed of an elastic material filled with a fluid, each of said vibration damping members being mounted in one of said pairs of aligned first and second holes such that said fluid is situated in both holes of said pair, said fluid disposed on opposite horizontal sides of each of said first and second planes.

**5,745,472**

## VIBRATION ATTENUATION APPARATUS OF OPTICAL DISC PLAYER

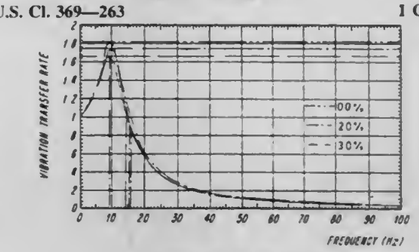
**Jin-Seung Son, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Continuation of Ser. No. 650,771, May 20, 1996, abandoned, which is a continuation of Ser. No. 293,952, Aug. 24, 1994, abandoned. This application May 5, 1997, Ser. No. 851,491**

**Claims priority, application Rep. of Korea, Aug. 24, 1993, 93-16456; Jan. 31, 1994, 94-1765**

**Int. Cl.[6] G11B** *23/00*

**U.S. Cl. 369—263** **1 Claim**




TRANSFER RATE OF DAMPER FILLED WITH SILICON OIL AND SILICA (VISCOSITY 100,000 CS)

1. An automobile optical disc player comprising:

a frame;

a chassis mounted to said frame;

an optical disc playing mechanism mounted to said chassis; and

a vibration attenuating mechanism including a pair of relatively movable members connected to said frame and chassis, respectively, one of said members forming a chamber filled with a viscous fluid which dampens relative movement between said members;

said viscous fluid being a mixture of silicone oil and silica, said silicone oil having a viscosity of about 100,000 centistokes and being about 85% of the weight of the mixture; and the silica being a synthetic hydrated silica having a viscosity in the range of 50,000 to 150,000 centistokes and being about 15% of the mixture weight.

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**5,745,473**

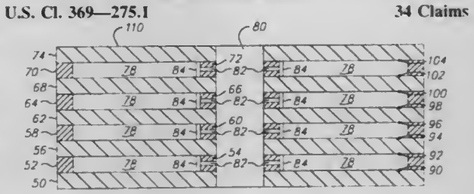
## MULTIPLE DATA LAYER OPTICAL DISK WITH RECORDED INFORMATION IDENTIFYING THE TYPE OF TRACKING

**Margaret Evans Best, San Jose; Hal Jervis Rosen, Los Gatos; Kurt Allan Rubin, Santa Clara, and Timothy Carl Strand, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 695,178, Aug. 1, 1996, Pat. No. 5,610,901, which is a continuation of Ser. No. 425,015, Apr. 18, 1995, abandoned, which is a division of Ser. No. 378,690, Jan. 26, 1995, Pat. No. 5,513,170, which is a division of Ser. No. 188,613, Jan. 26, 1994, Pat. No. 5,410,530, which is a division of Ser. No. 79,483, Jun. 18, 1993, Pat. No. 5,381,401, which is a division of Ser. No. 710,226, Jun. 4, 1991, Pat. No. 5,255,262. This application Feb. 24, 1997, Ser. No. 805,377**

**Int. Cl.[6] G11B** *7/24*

**U.S. Cl. 369—275.1** **34 Claims**




1. An optical data storage medium comprising:

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a first electromagnetic radiation-transmissive member having a first data surface containing optical media for storing recorded data in data tracks, the first data surface including tracking marks, the data being detectable by an electromagnetic radiation beam that is maintained on the data tracks of the first data surface by the tracking marks of the first data surface;

a second member having a second data surface containing optical media for storing recorded data in data tracks, the second data surface including tracking marks, the data being detectable by said electromagnetic radiation beam that is maintained on the data tracks of the second data surface by the tracking marks of the second data surface; and

a connecting device for connecting the first and second members together such that the first and second data surfaces are in a spaced-apart relationship; and wherein the recorded data on at least one of the data surfaces includes information identifying the type of tracking marks contained in said at least one data surface.

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**5,745,474**

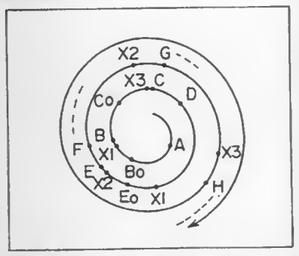
**APPARATUS AND METHOD FOR REPRODUCING DATA FROM DISK, METHOD FOR RECORDING DATA ON DISK AND DISK**

**Hidetaka Owaki, Tokyo, Japan, assignor to Sega Enterprises, Ltd., Japan**

**Continuation of Ser. No. 379,592, Feb. 3, 1995, abandoned. This application Nov. 4, 1996, Ser. No. 730,629**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—275.3** **6 Claims**




1. A disk recording method for recording data on a disk comprising:

a first step of recording sequential data on the disk;

a second step of recording data on a recording area located in a position discontinuous to the recorded part on which the sequential data is recorded; and

a third step of recording, on a predetermined recording area, data which forms a beginning part to be followed by the data recorded on said recording area located in the discontinuous position and which is to be read in advance of reading the data recorded in the second step.

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**5,745,475**

**OPTICAL INFORMATION RECORDING MEDIUM**

**Eiji Ohno, Hirakata; Kenichi Nishiuchi, Moriguchi; Yoshitaka Sakaue, Nara; Kazuhisa Ide, Osaka; Naoyasu Miyagawa, Suita, and Nobuo Akabira, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

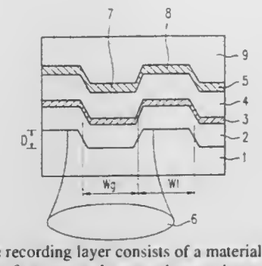
**Continuation of Ser. No. 424,818, Apr. 19, 1995, abandoned. This application Jun. 27, 1997, Ser. No. 884,318**

**Claims priority, application Japan, Apr. 20, 1994, 6-081532**

**Int. Cl.[6] G11B *7/24***

**U.S. Cl. 369—275.4** **16 Claims**

1. An optical information recording medium comprising: a substrate including a groove having a concave shape and a land having a convex shape adjacent to the groove; and a recording layer on the substrate,




wherein the recording layer consists of a material which changes between a first state and a second state whose optical property is different from that of the first state,

a first portion of the optical information recording medium consisting of said material in the first state having a first reflectance, said first portion being located on both the land and the groove, and

a second portion of the optical information recording medium consisting of said material in the second state having a second reflectance which is different from the first reflectance, said second portion being located on both the land and the groove, said first and second portions including user recording marks, whereby information is recorded onto the groove and the land,

and wherein a ratio of the first reflectance to the second reflectance, a phase of reflected light from said material in the first state and a phase of reflected light from said material in the second state are set such that at least one of an amplitude and a carrier to noise ratio (CNR) of a signal obtained by reproducing information from the groove is approximately identical to that from the land.

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**5,745,476**

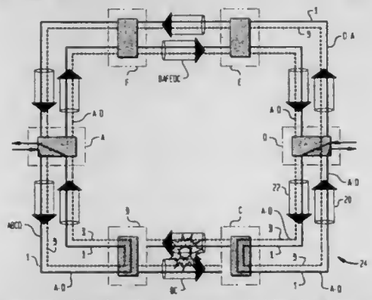
**ERRORLESS SWITCHING TECHNIQUES IN RING NETWORK**

**Sid Chaudhuri, East Brunswick, N.J., assignor to AT&T Corp., Middletown, N.J.**

**Filed Jul. 16, 1996, Ser. No. 682,064**

**Int. Cl.[6] H04J *1/16***

**U.S. Cl. 370—222** **16 Claims**




1. A method of performing errorless switching in a ring network comprising one or more rings and comprising a data transmitting medium exhibiting a transmission delay, said network defining a plurality of data transmitting routes along said transmitting medium including a first route and a second route, said method comprising in combination the steps of

comparing the transmission delays of at least predetermined sections said first and second routes;

adding a predetermined first delay to at least one of said first and second routes, the value of said first delay depending at least in part on the results of said comparing;

adding a predetermined second delay to at least one of said first and second routes for enabling alignment of signals transmitted on said first and second routes and errorless switching between said first and second routes;

switching between said first and second routes; and



adjusting at least one of said first and second delays for reducing cumulative delays on at least one of said first and second routes.

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**5,745,477**

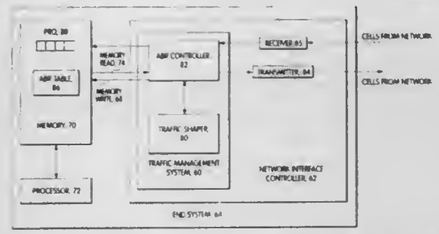
**TRAFFIC SHAPING AND ABR FLOW CONTROL**

**Qin Zheng, Belmont; Randy B. Osborne, and John H. Howard, both of Cambridge, all of Mass., assignors to Mitsubishi Electric Information Technology Center America, Inc., Cambridge, Mass.**

**Filed Jan. 25, 1996, Ser. No. 591,141**

**Int. Cl.[6] H04L *12/24;12/56***

**U.S. Cl. 370—230** **7 Claims**




1. In an ATM network having available bit rate flow control, a network interface controller at a node of said network for controlling the rate at which cells are injected into said network at said node to control the flow of said cells, said controller including an external processor having an external memory and means for adjusting the rate at which cells are injected into said network;

an available bit rate controller; and,

means for coupling said available bit rate controller to said external processor, said available bit rate controller having means for submitting available bit rate requests to said external processor for the adjustment of the rate at which said cells are injected into said network, said means for submitting said available bit rate requests to said external processor including means for submitting said requests when said network interface controller sends or receives a resource management cell, means responsive thereto for generating and sending a resource management cell over said network, and means for initiating processing by said external processor when a cell transmission limit has been exceeded such that said network interface controller reads data from said external memory, determines what cell to send, and what transmission rate to use in the transmission of said cells.

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**5,745,478**

**ATM POLICING DEVICE**

**Jacob Cornelis Van Der Wal, Ve Delft, Netherlands, assignor to Koninklijke PTT Nederland N.V., Groningen, Netherlands**

**Filed Mar. 13, 1996, Ser. No. 615,625**

**Claims priority, application Netherlands, Mar. 27, 1995, 9500585**

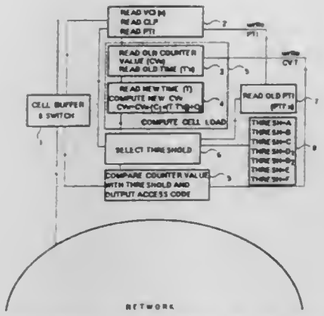
**Int. Cl.[6] H04L *12/26;12/56***

**U.S. Cl. 370—234** **10 Claims**

1. For use with a transmission system, an admission device for admitting data cells provided with VC codes to a transmission medium, the admission device comprising:

means for reading out the VC code of an arriving data cell,

means for comparing a count value, which is a measure of a load of the data cell with said read out VC code, with a threshold value selected from a multiplicity of thresholds, on the basis of at least one sort code, and




means for thereafter issuing an admission code having a value which depends on the result of the comparison by the means for comparing.

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**5,745,479**

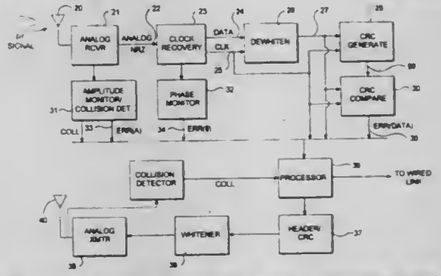
**ERROR DETECTION IN A WIRELESS LAN ENVIRONMENT**

**Lawrence M. Burns, Mountain View; Scott Mitchell, San Jose, and Bruce Kendall, Sunnyvale, all of Calif., assignors to 3COM Corporation, Santa Clara, Calif.**

**Filed Feb. 24, 1995, Ser. No. 394,378**

**Int. Cl.[6] H04B *17/00***

**U.S. Cl. 370—245** **28 Claims**




22. An apparatus for detecting errors in a network data packet transmitted in a wireless radio medium as a frequency modulated RF signal modulated in response to the network data packet with a data rate of greater than one megabit per second, comprising:

an antenna which receives the RF signal in a microwave communication band;

a radio frequency (RF) amplifier tuned to the microwave communication band which receives the RF signal from the wireless radio medium;

a downconverter, coupled with the RF amplifier, which converts the received RF signal from the communication band down to an intermediate band;

a filter, coupled to the downconverter, tuned for the intermediate band which outputs an intermediate band signal; and

a detector, coupled to the filter, which produces a serial data stream from the intermediate band signal;

a signal strength indication circuit, coupled with the filter, which indicates signal strength for the intermediate band signal;

a signal phase monitoring circuit coupled with the detector which indicates phase of transitions in the serial data stream; and

processing resources, coupled with the signal strength indication circuit, which monitor the signal strength of the intermediate band signal and phase of transitions in the serial data stream to detect anomalies typical of erroneous data in the serial data stream, and produce a receive data error signal in response to a detected anomaly in strength or a detected anomaly in phase.

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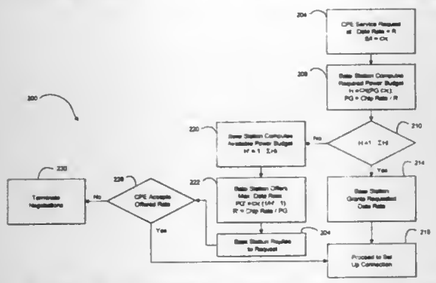


**5,745,480**

## MULTI-RATE WIRELESS COMMUNICATIONS SYSTEM

**Saman Behtash, Berkeley; Christopher Flores, Oakland, and Adel Ghanem, Danville, all of Calif., assignors to Adicom Wireless, Inc., Hayward, Calif.**

**Filed Jul. 22, 1996, Ser. No. 681,191**
**Int. Cl.[6] H04J** *13/02;* **H04Q** *7/34*
**U.S. Cl. 370—252** **53 Claims**



1. A multi-rate communication system having a base station communicating with a plurality of active user terminals, and a requesting user terminal, each of said user terminals having a transmitter and a receiver, said base station comprising:

means for receiving a message from said requesting user terminal to said base station, said requesting user terminal requesting communication using a desired data rate and a desired quality of service QOS parameter;

means for determining a suitable data rate, a suitable QOS, and expected received signal power for said requesting user terminal based on said desired data rate and said desired QOS; and

means for communicating said suitable data rate, said suitable QOS, and said expected received signal power to said requesting user terminal.

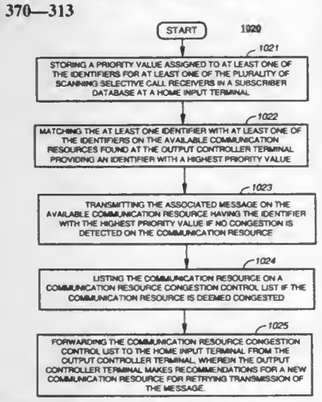
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**5,745,481**

## MESSAGE SYSTEM AND METHOD FOR EFFICIENT MULTI-FREQUENCY ROAMING

**W. Garland Phillips, Arlington; Jheroen P. Dorenbosch, Paradise, and Terence Edward Sumner, Azle, all of Tex., assignors to Motorola, Inc.**

**Filed Jun. 3, 1996, Ser. No. 657,267**
**Int. Cl.[6] H04J** *3/16*
**U.S. Cl. 370—313** **20 Claims**




1. A method for efficient multi-frequency roaming and messaging for a plurality of selective call receivers in a selective call messaging system using identifiers on various communication resources recognized by at least one of the plurality of selective call receivers, comprising the steps of:

storing a priority value assigned to at least one of the identifiers for at least one of the plurality of selective call receivers in a memory at a home input terminal;

matching at least one identifier with at least one of the identifiers on a set of available communication resources found at an output controller terminal providing an identifier with a highest priority value; and

transmitting an associated message on at least one of the set of available communication resources having the identifier with the highest priority value.

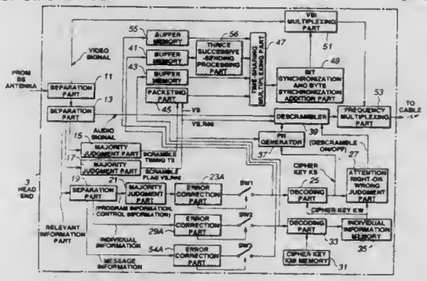
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**5,745,482**

## REPEATING DEVICE

**Masaaki Nishiura, Saitama-ken, and Shinichi Ooi, Kanagawa-ken, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan**

**PCT No. PCT/JP94/01851, § 371 Date Aug. 28, 1995, § 102(e) Date Aug. 28, 1995, PCT Pub. No. WO95/12950, PCT Pub. Date May 11, 1995**
**PCT Filed Nov. 2, 1994, Ser. No. 481,280**
**Claims priority, application Japan, Nov. 5, 1993, 5-277154**
**Int. Cl.[6] H04L** *1/08;9/18;* **H04N** *7/167*
**U.S. Cl. 370—327** **7 Claims**



1. A repeating device for receiving a transmission signal transmitted through a first transmission system to send the transmission signal to a second transmission system, said transmission signal including a main signal and n first information packets, wherein each of the first information packets have the same content, n being a number greater than 1, said repeating device comprising:

separation means for separating and extracting said main signal and said first information packets from the transmission signal transmitted through said first transmission system; and

signal sending means for superimposing upon said main signal a second information packet having the same content as that of each of said first information packets separated by said separation means, said signal sending means superimposing the second information packet m times wherein m is greater than 1 and less than n, to send out the second information packet to said second transmission system a sufficient number of times to maintain transmission accuracy and to conduct a majority judgment in a decoder coupled with said second transmission system.

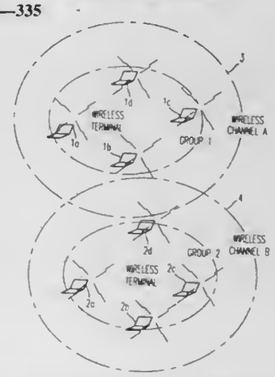


**5,745,483**

## WIRELESS COMPUTER NETWORK COMMUNICATION SYSTEM AND METHOD HAVING AT LEAST TWO GROUPS OF WIRELESS TERMINALS

**Yoshikatsu Nakagawa, Yamato; Masamitsu Suzuki; Satoshi Takahashi, both of Yokohama, and Harumi Kokaji, Hino, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Sep. 29, 1995, Ser. No. 536,248**
**Claims priority, application Japan, Sep. 29, 1994, 6-234631**
**Int. Cl.[6] H04B** *7/204*
**U.S. Cl. 370—335** **15 Claims**




1. A wireless network communication method using at least two groups of respective wireless terminals communicating on separate communication channels which correspond to the groups, comprising the steps of:

communicating on a first channel by a first group of the wireless terminals;

determining a vacant channel by a terminal of a second group of the wireless terminals;

selecting the vacant channel and notifying other terminals of the second group of the selection, by said terminal;

acknowledging the selected channel by the other terminals; and

communicating on the selected channel by the second group of terminals,

wherein said step of communicating on the selected channel by the second group of terminals is performed such that each of the terminals of the second group have equal control over the communication channel, and

wherein said step of communicating on the selected channel by the second group of terminals is performed without the use of a base station which controls the communicating by the second group.

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**5,745,484**

## EFFICIENT COMMUNICATION SYSTEM USING TIME DIVISION MULTIPLEXING AND TIMING ADJUSTMENT CONTROL

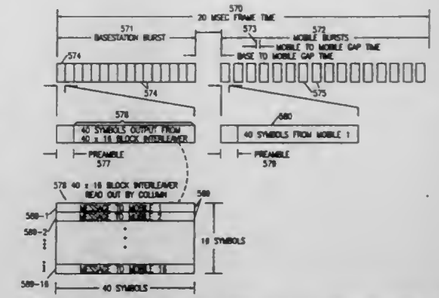
**Logan Scott, Breckenridge, Colo., assignor to Omnipoint Corporation, Colorado Springs, Colo.**

**Filed Jun. 5, 1995, Ser. No. 465,137**
**Int. Cl.[6] H04J** *3/06;* **H04B** *7/26*
**U.S. Cl. 370—347** **26 Claims**

1. A method for communicating between a base station and a plurality of user stations comprising the steps of

transmitting from a base station, over a specified frequency band and during an initial portion of a time frame, a plurality of base-to-user messages directed to user stations, each of said base-to-user messages corresponding to a different base time slot,

receiving at said base station from said user stations, over said specified frequency band and during a latter portion of said time frame, a plurality of user-to-base messages directed to said base station, each of said user-to-base messages corresponding to a different user time slot, and




transmitting from said base station, over said specified frequency band and during a subsequent time frame, a timing adjustment command to at least one of said user stations, whereby at least one subsequent user-to-base message from said user station is advanced or retarded in time by an amount specified by said timing adjustment command.

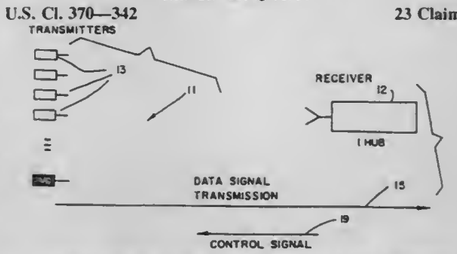
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**5,745,485**

## DUAL CODE MULTIPLE ACCESS FOR WIRELESS DATA NETWORKS

**Norman Abramson, San Francisco, Calif., assignor to Aloha Networks, Inc., San Francisco, Calif.**

**Filed Jun. 19, 1996, Ser. No. 665,843**
**Int. Cl.[6] H04J** *13/00*
**U.S. Cl. 370—342** **23 Claims**




1. A method of providing multiple access to a data communications channel, comprising forming multiple data signals with a first identical code spreading sequence and a second code spreading sequence in multiple transmitters, transmitting the multiple data signals from the multiple transmitters, detecting the multiple signals with matched filters or correlator or a multiplicity of matched filters or correlators matched to the first and second code spreading sequences in a hub station, using an output of the matched filters in the hub station for respectively offsetting the transmitted data signals by retarding and advancing some of the transmitted data signals, and transmitting control signals from the hub station to the transmitters for respectively advancing or retarding timing of some of the multiple transmitters for offsetting the transmitted data signals from the transmitters using the first or second identical code spreading sequence for receiving at the hub station data signals offset from each other.

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**5,745,486**

## HIGH CAPACITY ATM SWITCH

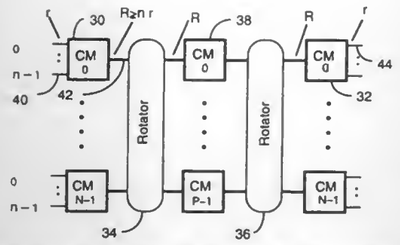
**Maged E. Beshai, Stittsville, and Ernst A. Munter, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Japan**

**Filed Oct. 26, 1995, Ser. No. 548,716**
**Int. Cl.[6] H04Q** *11/04*
**U.S. Cl. 370—352** **15 Claims**

1. A high capacity ATM switching system for switching data in a heterogeneous burst of a predetermined number of cells among N

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inlet modules and M outlet modules in each successive access time, M and N being a positive integer or integers, comprising:

said N inlet modules having buffers, each buffer dedicated to each of said outlet modules, for storing cells according to the destination outlet modules of said cells in respective buffers;

P memories, P being a positive integer, each memory having M memory sections, each of which is able to hold at least said predetermined number of cells and is dedicated to each outlet module;

an inlet rotator for cyclically connecting in each access time said N inlet modules and P memories so that respective cells are transferred from said N inlet modules and stored in respective sections according to the destination outlet module of each cell; and

an outlet rotator for cyclically connecting in each access time said P memories and M outlet modules so that respective outlet modules are connected to respective memory sections for reading out cells contained therein.

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**5,745,487**

**COMMUNICATION APPARATUS FOR TRANSMITTING/RECEIVING DIFFERENT TYPES OF DATA IN ONE TDM SLOT**

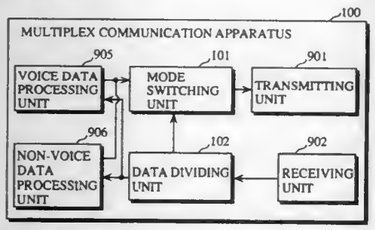
**Takayuki Hamaki, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Filed Nov. 14, 1996, Ser. No. 749,096**

**Claims priority, application Japan, Nov. 16, 1995, 7-298012**

**Int. Cl.[6] H04J** *3/02*

**U.S. Cl. 370—352** **6 Claims**




1. A communication apparatus for transmitting and receiving a plurality types of data with a TDM slot by changing data from one of the plurality types to another of the plurality types by changing a mode, the communication apparatus comprising:

non-acknowledgement-type transmitting means for transmitting data by changing the mode without obtaining a acknowledgement from a remote station; and

non-acknowledgement-type receiving means for receiving the data from the remote station and identifying the type of the data, wherein

the non-acknowledgement-type transmitting means comprises:

a transmitting unit for transmitting time slot data which includes a control directive and one of first data and second data, wherein the first data is of a type different from a type of the second data;

a first judging unit for, during a transmission of the time slot data including the first data by the transmitting unit, detecting a necessity for transmitting the second data to the remote station and judging whether a length of the second data is less than a predetermined value; and

a multiplexing unit for inserting the second data and a non-acknowledgement-type mode switch directive into the time slot data and letting the transmitting unit transmit the time slot data by an interrupt if the first judging unit judges that the length of the second data is less than the predetermined value, wherein

the non-acknowledgement-type receiving means comprises:

a receiving unit for receiving the time slot data from the remote station;

a second judging unit for judging whether the received time slot data includes the non-acknowledgement-type mode switch directive; and

an identifying unit for identifying the second data included in the received time slot data if the second judging unit judges that the received time slot data includes the non-acknowledgement-type mode switch directive.

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**5,745,488**

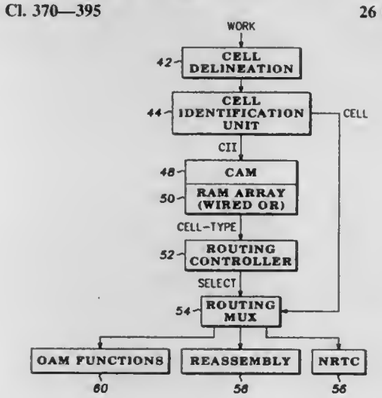
**METHOD AND APPARATUS FOR DETECTION OF PACKET TYPES IN A COMMUNICATIONS NETWORK**

**Horace C. Thompson, Scottsdale, Ariz.; David C. Feldmeier, Morristown, and William S. Marcus, Berkeley Heights, both of N.J., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Apr. 29, 1996, Ser. No. 639,603**

**Int. Cl.[6] H04L** *12/50;12/56*

**U.S. Cl. 370—395** **26 Claims**




1. In a packet based communications network that transports information packets between nodes in said network, a method for use in detecting packet type, comprising the steps of:

receiving a first information packet including a first portion containing packet identification information, said first information packet identifying one of a plurality of packet types;

providing a table that includes a plurality of entries, each entry corresponding to at least one of said plurality of packet types;

comparing said first portion of said first information packet to entries in said plurality of entries, wherein at least two of said entries in said plurality of entries are substantially simultaneously compared to said first portion; and

determining said packet type of said first information packet based on a result from said step of comparing.



**5,745,489**

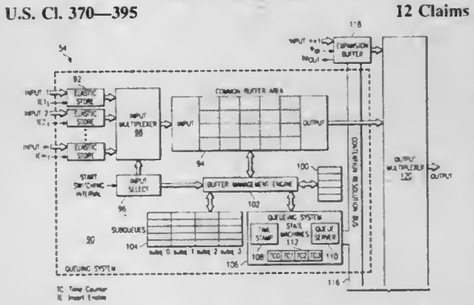
**BUFFERED CROSSPOINT MATRIX FOR AN ASYNCHRONOUS TRANSFER MODE SWITCH AND METHOD OF OPERATION**

**Felix V. Diaz, and Jack H. Stanley, both of Plano, Tex., assignors to DSC Communications Corporation, Plano, Tex.**

**Continuation of Ser. No. 228,598, Apr. 15, 1994, Pat. No. 5,537,400. This application Jul. 16, 1996, Ser. No. 680,830**

**Int. Cl.[6] H04J** *3/02*

**U.S. Cl. 370—395** **12 Claims**




1. A switching element for use in a buffered crosspoint matrix of an asynchronous transfer mode switch, comprising:

a plurality of multicast/routing elements for receiving separate segments, said segments including asynchronous transfer mode cells; and

a plurality of vertical bar elements coupled to each multicast/routing element for receiving said segments from said multicast/routing elements, each vertical bar element receiving said segments at a plurality of crosspoints, said multicast/routing elements generating insert enable signals according to individual and group address information within said segments to determine which crosspoints of said vertical bar elements are to receive said segments, each segment having a weighted age indicating a length of time and a priority within the vertical bar elements, the weighted age increasing at a faster rate for segments having a higher priority than for segments having a lower priority, each vertical bar element outputting a selected segment according to the weighted age of said selected segment.

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**5,745,490**

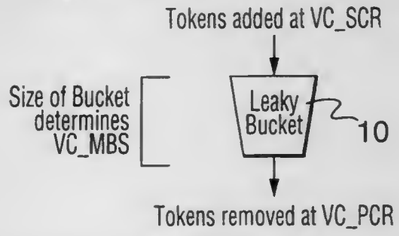
**VARIABLE BIT RATE SCHEDULER**

**Salman Ghufran, Burnaby, and David Wong, Vancouver, both of Canada, assignors to PMC-Sierra, Inc., Burnaby, Canada**

**Filed Jun. 19, 1996, Ser. No. 666,087**

**Int. Cl.[6] H04L** *12/28*

**U.S. Cl. 370—397** **13 Claims**




1. A variable bit rate scheduler for ATM traffic shaping, comprising:

(a) a service rate queue (SRQ) counter for generating a base traffic profile for the control of data transmission on a virtual channel;

(b) a virtual channel peak cell rate determinator coupled to said SRQ counter and operative to determine a virtual channel peak cell sub-rate, VC_PCR;

(c) a leaky bucket having an input for receiving sub-tokens and an output for discharging sub-tokens; and

(d) means for adding sub-tokens at the virtual channel peak cell rate to the leaky bucket and, when a cell is to be transmitted, removing a number of sub-tokens from the bucket equal to the ratio of the virtual channel peak cell rate to a virtual channel sustainable cell rate.

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**5,745,491**

**INFORMATION STORAGE AND OUTPUT SYSTEM**

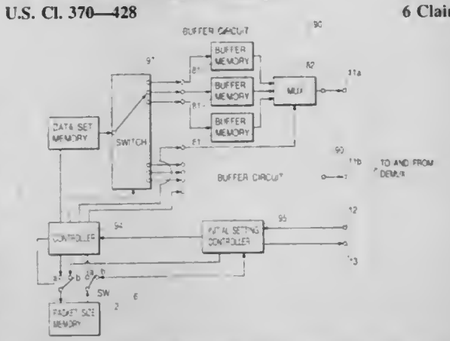
**Ichiro Ando, Yokosuka, Japan, and Masato Matsuzawa, Berkshire, United Kingdom, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Aug. 21, 1996, Ser. No. 700,832**

**Claims priority, application Japan, Aug. 31, 1995, 7-248472; Feb. 29, 1996, 8-070998**

**Int. Cl.[6] H04J** *3/22*

**U.S. Cl. 370—428** **6 Claims**




1. A system for storing a plurality of variable transfer rate data sets and, responsive to a request for one of said data sets from one of a plurality of terminals, for multiplexing and outputting the requested one of said plurality of data sets with other channel packets which are currently being output, the system comprising:

means for storing transfer rate information for each of said plurality of variable transfer rate data sets; and

means responsive to said request for one of said data sets for setting, on the basis of said transfer rate information, a start time for multiplexing and outputting said requested data set for such an earliest frame that, if the output of said requested data set is started at said earliest frame, the total transfer rate does not exceed a predetermined transfer rate throughout the transmission period of said requested data set.

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**5,745,492**

**SPEECH INFORMATION FREEZE-OUT CONTROL METHOD AND EQUIPMENT IN MOBILE SATELLITE COMMUNICATION SYSTEM**

**Yoshinobu Nakamura, Zushi; Yutaka Ohto; Takashi Ueda, both of Yokohama, and Tomoyuki Ohya, Yokosuka, all of Japan, assignors to NTT Mobile Communications Network, Inc., Japan**

**PCT No. PCT/JP95/01446, § 371 Date Jan. 31, 1996, § 102(e) Date Jan. 31, 1996, PCT Pub. No. WO96/03816, PCT Pub. Date Feb. 8, 1996**

**PCT Filed Jul. 20, 1995, Ser. No. 591,458**

**Claims priority, application Japan, Jul. 21, 1994, 6-169826; Aug. 30, 1994, 6-205722**

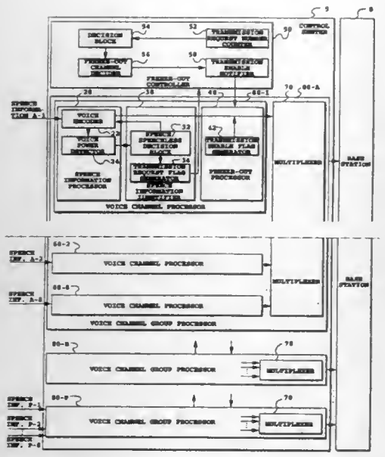
**Int. Cl.[6] H04B** *7/26;7/15;* **H04T** *3/00*

**U.S. Cl. 370—435** **18 Claims**

1. Speech freeze-out control equipment in a mobile satellite communication system having a plurality of telephone terminals, a control center connected with the telephone terminals through voice channels, a radio base station connected with the control

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center through time division multiplexing radio frequency channels, and a plurality of mobile stations connected with the base station through transponders, said control center performing, by assigning speech information from the telephone terminals to time slots of the time division multiplexing radio frequency channels, freeze-out of the speech information when sending the speech information to the base station so that the number of channels connected to the transponders is limited within a predetermined upper limit value, said speech freeze-out control equipment comprising:

presence/absence detection means for detecting the presence and absence of a speech spurt of said speech information in frames on said voice channels;

means for interrupting transmission from said control center to said radio base station in a time slot on said time division multiplexing radio frequency channels, said time slot corresponding to said voice channel including no speech spurt;

means for counting the number of said voice channels including said speech spurt for each time slot on said time division multiplexing radio frequency channels, said counting being carried out from one frame interval before a current time to said current time, said means for counting producing a count value;

means for freezing out speech information on one of said voice channels which is counted last when said count value exceeds said predetermined upper limit value; and

means for transmitting speech information on one of said voice channels which is counted last to said base station when said count value of said voice channels including speech spurts is equal to or less than said predetermined upper limit value.

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**5,745,493**

**METHOD AND SYSTEM FOR ADDRESSING MULTIPLE COMPONENTS ON A COMMUNICATION BUS**

**Joe Christopher St. Clair, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 20, 1995, Ser. No. 560,917**

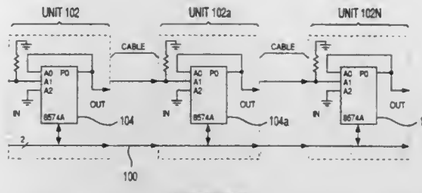
**Int. Cl.[6] H04Q** *1/30*

**U.S. Cl. 370—438** **14 Claims**

1. A method of addressing a chain of units coupled to a communication bus, said method comprising the steps of:

dynamically altering, in response to receiving a reset command, each one of said units to have a reset address;

dynamically altering, in response to receiving an access command, a first one of said units to have an access address; and



dynamically altering, each time a unit having an access address receives a sequential command, said receiving unit to have a reset address and the next succeeding unit to have said access address.

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**5,745,494**

**BROADCAST COMMUNICATION METHOD IN RING LAN**

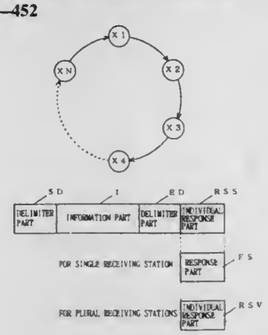
**Akihiro Tatsuta, Nara; Yasuo Nagaishi, Ikoma; Koichiro Tanaka, Katano, and Tomonori Shiomi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 511,852, Aug. 7, 1995, abandoned. This application May 21, 1997, Ser. No. 859,774**

**Claims priority, application Japan, Aug. 8, 1994, 6-185954**

**Int. Cl.[6] H04L** *12/403;12/42*

**U.S. Cl. 370—452** **2 Claims**



1. A broadcast communication method for simultaneously transferring data from one transmitting station to a plurality of receiving stations in a ring LAN, said method comprising:

transmitting a data frame from said transmitting station, said data frame being provided with an individual response part corresponding to all said stations on said ring LAN, wherein said transmitting station initializes said individual response part in data transfer;

outputting from each said receiving station a corresponding state of each receiving station to a prescribed position of said individual response part; and

monitoring by said transmitting station said individual response part to determine whether or not said data is normally transmitted to those of said receiving stations for receiving said data;

wherein the contents forming said individual response part in said data frame being transmitted by said transmitting station are temporally changed.



**5,745,495**

**APPARATUS FOR MONITORING AND CONTROLLING AUTONOMOUS SWITCHING OF TRUNK/SUBSCRIBER LINES IN A DISTRIBUTED SWITCHING SYSTEM**

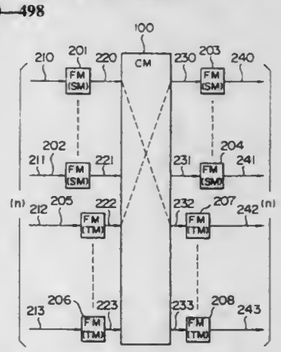
**Yoshito Sakurai; Shinobu Gohara, both of Yokohama; Kenichi Ohtsuki, Kanagawa-ken; Takao Kato, Yokohama; Hiroshi Kuwahara, and Eiichi Amada, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 654,590, Feb. 13, 1991, Pat. No. 5,573,177, which is a continuation of Ser. No. 96,011, Sep. 14, 1987, Pat. No. 5,043,979. This application May 5, 1995, Ser. No. 435,960**

**Claims priority, application Japan, Sep. 16, 1986, 61-215767; Sep. 16, 1986, 61-215768; Feb. 25, 1987, 62-40205**

**Int. Cl.[6] H04Q** *11/04*

**U.S. Cl. 370—498** **6 Claims**



1. A distributed switching system, comprising:

a plurality of first switching modules each having a call processing circuit for performing a call processing in accordance with information from a subscriber line or trunk line; and

a second switching module, coupled to each of said plurality of first switching modules via a transmission line for carrying a plurality of fixed length packets, said second switching module having a self-routing switch for switching information transmitted/received by the subscriber line or trunk line,

said switching by said self-routing switch being performed in units of a fixed-length packet which has a header added thereto that contains destination information indicating a destination of said transmitted/received information, said switching by said self-routing switch being performed autonomously in accordance with contents of said header, whereby the call processing function is distributed.

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**5,745,496**

**APPARATUS AND METHOD OF ESTABLISHING A DOWNLINK COMMUNICATION PATH IN A WIRELESS TELECOMMUNICATIONS SYSTEM**

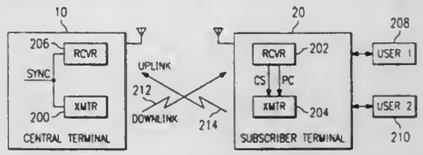
**Martin Lysejko, Bagshot, United Kingdom, assignor to DSC Communications Corporation, Plano, Tex.**

**Filed Nov. 16, 1995, Ser. No. 558,443**

**Claims priority, application United Kingdom, Jun. 2, 1995, 9510870; Jun. 7, 1995, 9511546; Jun. 28, 1995, 9513172**

**Int. Cl.[6] H04J** *3/06*

**U.S. Cl. 370—515** **8 Claims**



1. A method of establishing a downlink communication path in a wireless telecommunications system, comprising the steps of:

receiving a downlink signal transmitted from a transmitter in a central terminal at a receiver in a subscriber terminal, the downlink signal including a master code sequence of the transmitter in the central terminal;

comparing a code and phase of the master code sequence of the transmitter in the central terminal with a code and phase of the slave code sequence of the receiver in the subscriber terminal;

adjusting the phase of the slave code sequence to match the phase of the master code sequence, matching of the slave code sequence to the master code sequence determines a path delay between the transmitter in the central terminal and the receiver in the subscriber terminal;

continuously monitoring the slave code sequence to maintain a match with the master code sequence;

readjusting the phase of the slave code sequence to match the phase of the master code sequence in response to changes in the path delay between the transmitter in the central terminal and the receiver in the subscriber terminal, wherein the phase of the slave code sequence is readjusted in a fine adjustment mode having one sixteenth increments of a chip period.

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**5,745,497**

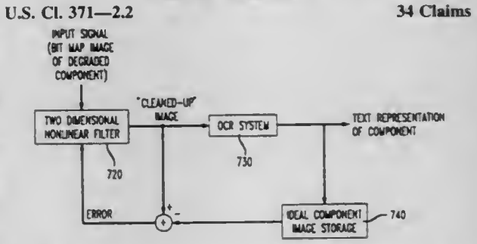
**CONVOLUTIONAL INTERLEAVING/DE-INTERLEAVING METHOD AND APPARATUS FOR DATA TRANSMISSION**

**Nadav Ben-Efraim, Sunnyvale, and Peter Tze-Hwa Liu, Alameda, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.**

**Continuation of Ser. No. 242,199, May 13, 1994, Pat. No. 5,592,492. This application Jan. 7, 1997, Ser. No. 779,397**

**Int. Cl.[6] G06F** *11/00*

**U.S. Cl. 371—2.2** **34 Claims**



31. A method for communicating a series of symbols over a communication channel by selectively interleaving the symbols, communicating the interleaved symbols over the communication channel, and de-interleaving the symbols to restore the symbols into their original series, said method comprising steps of:

(a) providing a random access memory (RAM), and defining in said RAM plural memory segments according to the function $C_K = K \times \lceil N/B \rceil$, where K is a segment number from zero (0) through (B−1), $C_K$ is the number of memory locations in the respective segment K, N is a predetermined block length of the series of symbols, B is a predetermined interleaving depth, and the ratio is rounded up to the next larger integer;

(b) providing a respective memory segment pointer to the first memory location of each memory segment, and further providing for each memory segment both a current-location pointer and a next-location pointer to respective memory locations each by an offset relative to the respective memory segment pointer of the memory segment;

(c) for memory segments one (1) through (B−1) storing symbols of said series of symbols seriatim in successive ones of said memory locations, and for symbols allocated to the $K_0$ segment communicating the symbols directly via said communication channel;

(d) sequentially for memory segments one (1) through (B−1) reading a stored symbol out of a memory location designated by a current-location pointer the respective memory segment, transmitting the symbol via said communication channel, and then writing the next symbol from said series of symbols into

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the current memory location and redesignating the next-location pointer as a current-location pointer, and incrementing the next-location pointer in the memory segment;

(e) repeating steps (c) through (d) for memory segment numbers zero (0) through (B−1); and

(f) repeating steps (c) through (e) until the series of symbols have been communicated in interleaved form via the communication channel.

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**5,745,498**

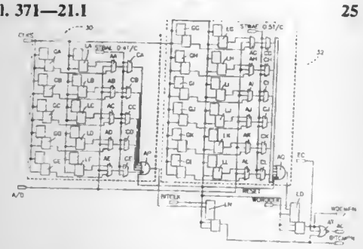
**RAPID COMPARE OF TWO BINARY NUMBERS**

**Robert Dean Adams, Essex Junction; John Connor, Burlington; Garrett Stephen Koch, Cambridge, and Luigi Ternullo, Jr., Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation-in-part of Ser. No. 398,468, Mar. 3, 1995, Pat. No. 5,535,164. This application Jun. 11, 1996, Ser. No. 661,575**

**Int. Cl.[6] G06F** *11/00*

**U.S. Cl. 371—21.1** **25 Claims**



1. A method of determining the end count of a predetermined succession of binary numbers generated on successive clock cycles wherein one number and its relation in the succession to the end count number is known, comprising the steps of:

providing a circuit having a binary digit output;

storing at least a portion of one number in said succession which is unique with respect to all preceding numbers in the succession in a storage device and has a known sequential relationship to said end count number;

generating said succession of binary numbers as output of said circuit on successive cycles;

comparing each generated binary number of the circuit output to said portion of said number being stored, and outputting a READY signal when said stored number compares with the number output by said circuit;

and generating a control signal on the cycle when the generated number following said READY signal corresponds to the end count number in the sequence.

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**5,745,499**

**SUPERVOLTAGE DETECTION CIRCUIT HAVING A MULTI-LEVEL REFERENCE VOLTAGE**

**Adrian E. Ong, San Jose, Calif., assignor to Micron Technology, Inc., Boise, Id.**

**Filed Oct. 11, 1995, Ser. No. 540,915**

**Int. Cl.[6] G01R** *31/28*

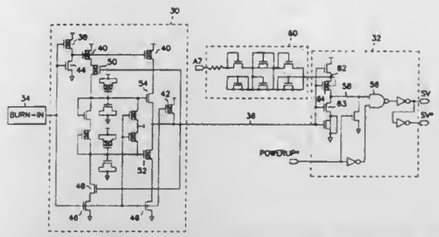
**U.S. Cl. 371—21.4** **20 Claims**

1. An integrated circuit comprising:

an external input;

a supervoltage reference circuit for generating a variable reference voltage in response to a test mode signal; and

a supervoltage detector circuit connected to the external input and the supervoltage reference circuit, the supervoltage detector circuit comparing a voltage on the external input with the variable reference voltage for detecting a supervoltage provided on the external input.




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**5,745,500**

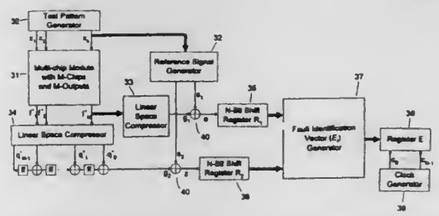
**BUILT-IN SELF TESTING FOR THE IDENTIFICATION OF FAULTY INTEGRATED CIRCUIT CHIPS IN A MULTICHIP MODULE**

**Thyagaraju Damarla, Eatontown, N.J.; Moon J. Chung, Okemos, Mich.; Wei Su, Staten Island, N.Y., and Gerald T. Michael, Ocean, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Oct. 22, 1996, Ser. No. 734,819**

**Int. Cl.[6] G01R** *31/28*

**U.S. Cl. 371—22.4** **12 Claims**




1. A built-in self-test method for the identification of a faulty integrated circuit chip in a multichip module having a plurality of chips, comprising the steps of:

applying a test pattern to the multichip module, each of the chips being responsive to the test pattern and having at least one output representing a test response;

applying a test pattern to a reference signal generator, the reference signal generator generating first and second reference signals in response thereto, whereby the first and second reference signals represent test responses of a fault free multichip module;

compressing the outputs from the chips into first and second compressed outputs using first and second linear space compressors respectively;

deriving a first fault detection output by adding the first compressed output to the first reference signal using exclusive OR logic;

deriving a second fault detection output by adding the second compressed output to the second reference signal using exclusive OR logic;

storing the first and second fault detection outputs in first and second N-bit shift registers respectively;

comparing the stored outputs in the first and second N-bit shift registers to detect a fault condition; and

applying a series of recursive logic operations to identify the faulty chip.



**5,745,501**

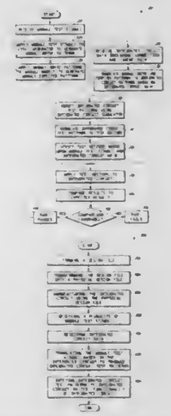
**APPARATUS AND METHOD FOR GENERATING INTEGRATED CIRCUIT TEST PATTERNS**

**Robert E. Garner, Miyagi-ken, Japan; Connie Astrachan, and Edward J. Hathaway, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 546,249, Oct. 20, 1995, abandoned. This application Mar. 26, 1997, Ser. No. 824,381**

**Int. Cl.[6] G06F** *11/00*

**U.S. Cl. 371—27** **13 Claims**



1. A method for generating integrated circuit test patterns, the method comprising the steps of:

(a) providing a plurality of independent integrated circuit modules, each independent integrated circuit module in the plurality of integrated circuit modules containing logic gates to perform a specified function wherein each integrated circuit module communicates to an internal bus which is common to all integrated circuit modules;

(b) providing a test source code segment for each independent integrated circuit module, each test source code segment respectively testing one of the independent integrated circuit modules using the internal bus and dedicated external terminals associated with the respective independent integrated circuit module;

(c) simulating each independent integrated circuit module in the plurality of independent integrated circuit modules using the test source code segments to derive simulation signal activity, the simulation signal activity being the stimulus needed on the internal bus and on the dedicated external terminals in order to test each integrated circuit module in the plurality of independent integrated circuit modules;

(d) integrating the plurality of independent integrated circuit modules onto a single integrated circuit where all of the independent integrated circuit modules are coupled to the internal bus, the internal bus being coupled to an internal test port module which is located on the single integrated circuit;

(e) providing integrated circuit data which: (1) indicates a manner in which the plurality of independent integrated circuit modules are integrated onto the single integrated circuit; and (2) indicates an external terminal configuration of the internal test port module; and

(f) providing the integrated circuit data and simulation signal activity to a software program to generate integrated circuit test patterns, the integrated circuit test patterns being patterns which, when applied to external terminals of the internal test port module of the single integrated circuit, reproduce the simulation signal activity on the internal bus in order to test the independent integrated circuit modules of the single integrated circuit.

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**5,745,502**

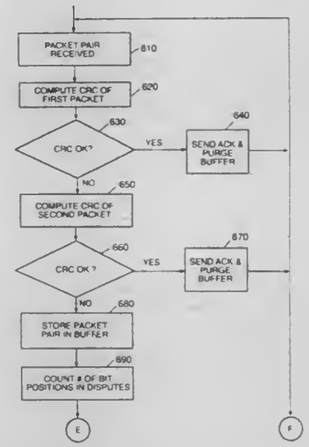
**ERROR DETECTION SCHEME FOR ARQ SYSTEMS**

**Ali S. Khayrallah, Apex, and David R. Irvin, Raleigh, both of N.C., assignors to Ericsson, Inc., Research Triangle Park, N.C.**

**Filed Sep. 27, 1996, Ser. No. 723,217**

**Int. Cl.[6] H03M** *13/00*; **H04L** *1/02*; *1/08*; *1/18*

**U.S. Cl. 371—35** **17 Claims**




13. An error correcting method for correcting errors in a diversity receiver where multiple copies of the transmitted data packet are received, said error correcting method comprising the steps of:

a) comparing the multiple copies of said received data packet to determine the disputed bit positions;

b) creating a set of composite packets by substituting all possible combinations of values at the disputed bit positions into a string containing the undisputed bit positions;

c) determining the validity of each composite packet; and

d) if only one composite packet is valid, outputting the valid composite packet.

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**5,745,503**

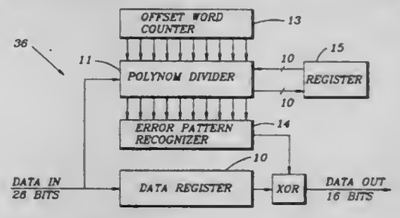
**ERROR CORRECTION DECODER THAT OPERATES IN EITHER ARDS SYSTEM OR A RBDS SYSTEM**

**Tero Kuusinen, Turku, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland**

**Filed Apr. 11, 1995, Ser. No. 419,918**

**Int. Cl.[6] H23M** *13/00*

**U.S. Cl. 371—37.1** **13 Claims**




1. A data decoder for use in a receiver, comprising:

a receiver for receiving a coded data block that includes error correction coded bits which have been coded with one of a

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first or a predetermined data word associated with a first data transmission system second predetermined data word associated with a second data transmission system;

a first circuit block for processing said coded bits with a predetermined mathematical function;

a second circuit block for detecting from the processed bits which one of the first or second predetermined data words the coded bits have been coded with; and

said first circuit block is further responsive to an operation of said second circuit block, for further processing the processed bits for obtaining correct decoding of the coded data block and for processing subsequently received coded data blocks with one of a set of first predetermined data words and a set of second predetermined data words.

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**5,745,504**

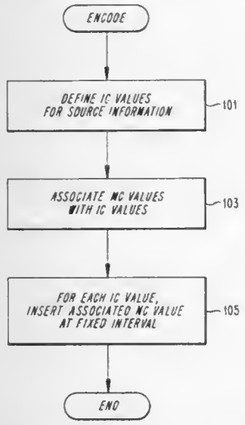
## BIT ERROR RESILIENT VARIABLE LENGTH CODE

**Karl Göran Bång, Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**

**Filed Jun. 25, 1996, Ser. No. 668,460**

**Int. Cl.[6] H03M** *7/42;13/00*

**U.S. Cl. 371—37.1** **36 Claims**




1. A method for transmitting data over a channel in a telecommunications system, the method comprising the steps of:

providing a plurality of fixed length code tables, wherein each of the fixed length code tables has a size that is different from a size of every other fixed length code table;

encoding the data as a plurality of information code words, wherein each information code word is a selected value from one of the fixed length code tables;

providing a plurality of marker codes, wherein the marker codes are variable length codes;

associating a unique one of the marker codes with each of the fixed length code tables;

generating channel code words by inserting the associated marker code one bit at a time into each of the information code words at a fixed bit interval; and

transmitting the channel code words over the channel.

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**5,745,505**

## DIGITAL SIGNAL ENCODING METHOD AND APPARATUS, DIGITAL SIGNAL RECORDING MEDIUM, AND DIGITAL SIGNAL DECODING METHOD AND APPARATUS

**Jun Yonemitsu, Kanagawa; Ryuichi Iwamura, Tokyo; Yasushi Fujinami, Kanagawa; Katsuji Igarashi, Tokyo, and Yoshiyuki Akiyama, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

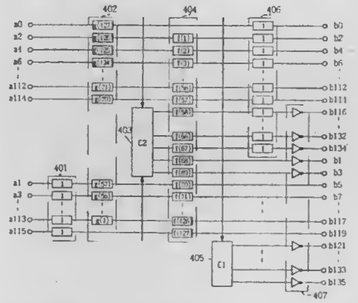
**PCT No. PCT/JP95/00305, § 371 Date Mar. 1, 1996, § 102(e) Date Mar. 1, 1996, PCT Pub. No. WO95/24037, PCT Pub. Date Sep. 8, 1995**

**PCT Filed Feb. 28, 1995, Ser. No. 530,303**

**Claims priority, application Japan, Mar. 1, 1994, 6-056680; Mar. 19, 1994, 6-074445**

**Int. Cl.[6] G11B** *20/18;* **H03M** *13/00*

**U.S. Cl. 371—37.4** **45 Claims**




1. A digital signal encoding method for encoding a digital signal by adding an error correction code thereto, said method comprising the steps of:

interleaving samples of an input digital signal to generate an interleaved input digital signal;

adding to said interleaved input digital signal a first parity to generate a modified interleaved signal, said first parity being obtained by using at least a first code series of said interleaved input digital signal;

deinterleaving said modified interleaved signal to generate an intermediate signal;

adding to said intermediate signal a second parity obtained by using a second code series which corresponds to a plurality of symbols taken out from said plurality of adjacent first code series by shifting the symbols by one symbol; and

arranging said input digital signal to which said first and said second parity are added so that an arrangement of said second code series symbols does not correspond to the sequence of symbols as recorded on a recording medium.

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**5,745,506**

## ERROR CORRECTING DECODER

**Syugo Yamashita, Osaka; Yoshikazu Tomida, Hirakata; Masayuki Takada, Tokyo; Toru Kuroda, Tokyo; Tadashi Isobe, Tokyo, and Osamu Yamada, Tokyo, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, and Nippon Hoso Kyokai, Tokyo, both of Japan**

**Filed May 25, 1995, Ser. No. 449,916**

**Claims priority, application Japan, May 25, 1994, 6-110798**

**Int. Cl.[6] H03M** *13/00*

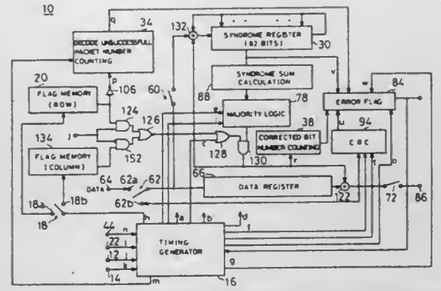
**U.S. Cl. 371—37.9** **7 Claims**

1. An error correcting decoder which decodes a code comprising:

majority logic means for outputting an error correction signal when an error correction for each of bits included in said code is needed; and

counting means for counting the number of bits that have been error-corrected on the basis of said error correction signal,






wherein said error correction is deemed to be unsuccessful if a count value of said counting means is larger than a first predetermined number.

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**5,745,507**

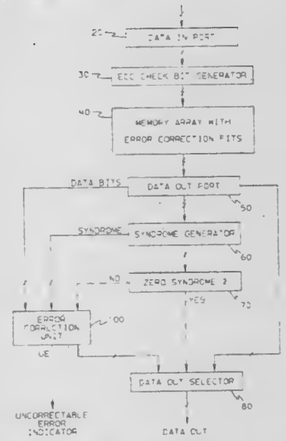
## SYSTEMATIC SYMBOL LEVEL ECC FOR USE IN DIGITAL MEMORY SYSTEMS

**Chin-Long Chen, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 31, 1995, Ser. No. 414,674**

**Int. Cl.[6] G06F** *11/10*

**U.S. Cl. 371—40.1** **4 Claims**




1. A digital memory system comprising:

a memory array with addressable memory locations capable of holding data bit values and check bit values at said locations, said data bit values being arranged as M symbols with b bits per symbol, wherein b is greater than one;

a check bit generator for generating check bits for memory store operations;

a syndrome generator receiving data bit and check bit values from said memory locations for producing a syndrome vector; and

error correction circuit means receiving said syndrome and said data bits and producing therefrom corrected data bits,

wherein said check bit generator and said syndrome generator are the same circuit and wherein said error correction means is operable to correct single symbol errors and to detect double symbol errors.

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**5,745,508**

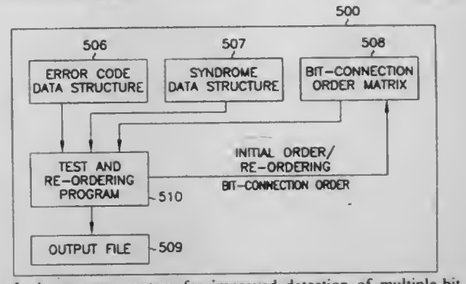
## ERROR-DETECTION CODE

**Thomas Roy Prohofsky, Bloomington, Minn., assignor to Tricord Systems, Inc., Plymouth, Minn.**

**Filed Nov. 13, 1995, Ser. No. 556,335**

**Int. Cl.[6] G06F** *11/10*

**U.S. Cl. 371—40.1** **19 Claims**




1. A computer system for improved detection of multiple-bit errors which occur within a single memory circuit, the computer system comprising:

a main computer;

a memory, the memory comprising a plurality of memory circuits, at least one of the plurality of memory circuits having a data interface more than two bits wide; and

a multiple-bit-error-detect (MBED) circuit, wherein bits from the plurality of memory circuits are coupled to the MBED circuit in an order which causes the MBED circuit to preferentially detect multiple-bit errors which occur on the data interface of any single one of the plurality of memory circuits.

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**5,745,509**

## TRANSMISSION SYSTEM VIA COMMUNICATIONS PROTECTED BY AN ERROR MANAGEMENT CODE

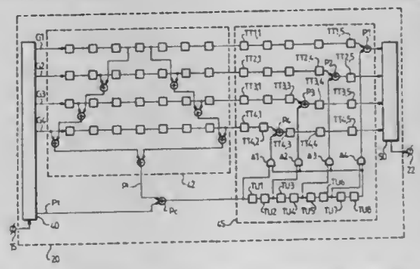
**Philippe Marchand, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 17, 1995, Ser. No. 559,963**

**Claims priority, application France, Nov. 30, 1994, 9414375**

**Int. Cl.[6] H03M** *13/12*

**U.S. Cl. 371—43.1** **3 Claims**



1. A transmission system for successive bit strings of data and which provides error protection by applying an error management code which takes into account, at least twice, the value of each bit; said system comprising:

an encoding device which has

an input access for input data to be transmitted, the input data having a bit frequency equal to 1/T,

serial-to-parallel converting means for receiving the input data from the input access and having a plurality "n" of outputs at which parallel-converted input data is produced at instants which are multiples of nxT,

a data analysis circuit for receiving parallel-converted data from said converting means and producing an error management code therefrom, and

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an output circuit for producing protected data at an output access thereof by assigning said error management code to the parallel-converted input data;

means for transmitting the protected data; and

a decoding device which has

a receiving access for receiving the transmitted protected data,

an error processing circuit, and

an output access at which data recovered from the received data is produced;

wherein said data analysis circuit comprises

a plurality "n" of cascade combinations of delay elements, each cascade delaying a string of parallel-converted data received from such converting means for time periods which are multiples of n×T, and

a plurality of combining circuits having inputs connected to at least two tapping points of each of said cascade combinations and which combine data bits present at said tapping points to thereby derive said error management code;

each of said cascade combinations of said data analysis circuit having tapping points following two delay elements therein which are equal to, respectively, (p−j+1)×(n×T) and (p+j)×(n×T), where j=1 . . . n, and p represents the average total number of delay elements in each of said cascade combinations.

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**5,745,510**

**SYSTEM FOR DETECTING FRAME/BURST SYNCHRONIZATION AND CHANNEL ERROR USING CYCLIC CODE**

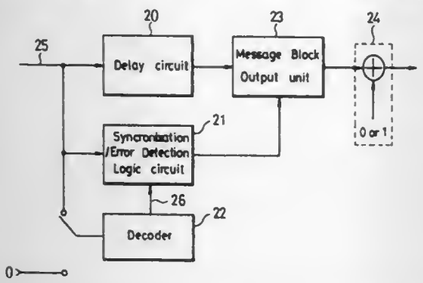
**Yang Ho Choi, Seoul, Rep. of Korea, assignor to Korea Telecommunications Authority, Seoul, Rep. of Korea**

**Filed Jun. 29, 1995, Ser. No. 496,683**

**Claims priority, application Rep. of Korea, Jun. 29, 1994, 94-15086**

**Int. Cl.[6] H04L** *7/00*

**U.S. Cl. 371—47.1** **5 Claims**




1. A system for detecting a frame/burst synchronization and a channel error using a cyclic code (n,k), comprising means for receiving a block of 2n−k bits, dividing the received block into a head block including first n−k bits of the received block, a middle block including the subsequent k bits of the received block and a tail block including last n−k bits of the received block, obtaining head and tail syndromes on the basis of the divided head, middle and tail blocks and discriminating the frame/burst synchronization and the presence of the channel error on the basis of the obtained head and tail syndromes.

**5,745,511**

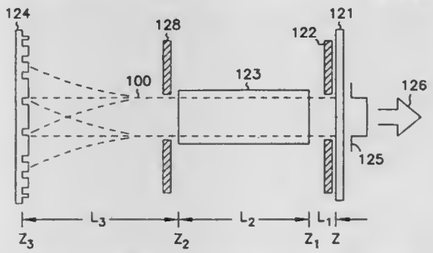
**PHASE GRATING AND MODE-SELECTING MIRROR FOR A LASER**

**James R. Leger, Plymouth, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.**

**Continuation of Ser. No. 434,788, May 4, 1995, which is a division of Ser. No. 239,028, May 6, 1994, Pat. No. 5,454,004. This application Jul. 16, 1996, Ser. No. 682,918**

**Int. Cl.[6] H01S** *3/098*

**U.S. Cl. 372—19** **40 Claims**




1. A mode-discriminating laser resonator having a laser beam that has an optical path, the laser beam having a specified mode profile at a location along the optical path, the laser resonator comprising:

a laser gain medium within the laser resonator;

a laser feedback element optically coupled to the laser gain medium; and

a first mode-discriminating diffractive element, optically coupled to the laser gain medium and to the laser feedback element, and positioned within the laser resonator such that an optical wavefront in the optical path is incident to the first mode-discriminating diffractive element, the first mode-discriminating diffractive element including a phase-conjugating pattern that reconstructs the specified mode profile, in order to transfer energy more efficiently from the gain medium to the laser beam.

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**5,745,512**

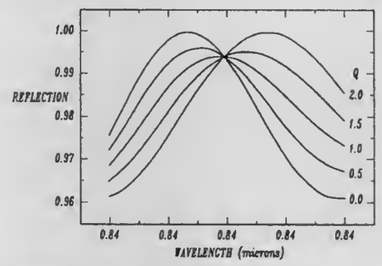
**TUNABLE LASERS BASED ON ABSORBERS IN STANDING WAVES**

**David Andrew Barclay Miller, Fair Haven, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.**

**Continuation of Ser. No. 55,492, Apr. 30, 1993, abandoned. This application Sep. 15, 1995, Ser. No. 528,800**

**Int. Cl.[6] H01S** *3/10*

**U.S. Cl. 372—20** **9 Claims**




1. A tunable laser comprising

at least two reflective elements (**101 102**) defining a laser cavity supporting a predetermined lasing frequency;

a multiple layer semiconductor structure placed into a standing wave pattern formed by interference of light beams in the laser cavity, the multiple layer structure having at least one of positive absorptive layers and negative absorptive layers and being placed into the standing wave pattern at positions that constrain the laser to lase at a wavelength that causes at least one of standing wave minima at points between adjacent positive absorptive layers and standing wave maxima at points between pairs of negative absorptive layers; and

means for varying the absorbance of at least one absorptive layer to change the form of the standing wave pattern and thereby change the lasing frequency.



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**5,745,513**

**LASER OSCILLATOR WITH STABILIZED POINTING**

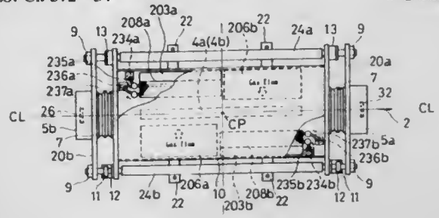
**Satoshi Nishida, and Akihiro Otani, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 654,894, May 29, 1996, Pat. No. 5,675,598. This application Mar. 27, 1997, Ser. No. 825,087**

**Claims priority, application Japan, May 16, 1994, 6-101372**

**Int. Cl.[6] H01S** *3/04*

**U.S. Cl. 372—34** **3 Claims**




1. A laser oscillator comprising:

a casing sealingly containing a laser medium gas and having a center point along a longitudinal center line;

a pair of discharging electrodes oppositely disposed in the casing so as to oscillate a laser beam by use of the laser medium gas;

a circulating means for circulating the laser medium gas in the casing; and

a plurality of heat exchangers disposed in the casing to cool the laser medium gas that is heated by discharge generated by the discharging electrodes, the heat exchangers being disposed at substantially symmetrical positions in relation to the center point of the casing.

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**5,745,514**

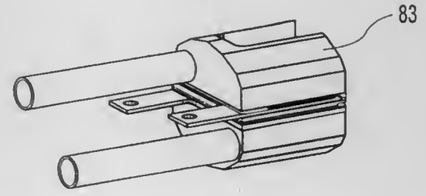
**LASER DIODE STRUCTURE WITH INTEGRATED HEAT SINK**

**Rushikesh Patel, and Michael Ung, both of Tucson, Ariz., assignors to Opto Power Corporation, Tucson, Ariz.**

**Filed Apr. 26, 1996, Ser. No. 638,545**

**Int. Cl.[6] H01S** *3/18*

**U.S. Cl. 372—43** **10 Claims**




1. A laser diode structure, said structure including first, second and third planar layers, said first layer comprising a laser diode, said third layer comprising an electrode, said second layer comprising a metallic gasket and being sandwiched between said first and third layers, said second layer having first and second surfaces having first and second shallow recesses therein respectively, each of said recesses having a wide and a narrow end, said second layer having an aperture therethrough at said wide ends for connecting said first and second recesses, said first, second and third layers comprising an integrated structure, said first and third layers having coolant inlet and outlet ports therethrough in registry with said narrow ends of associated ones of said recesses.

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**5,745,515**

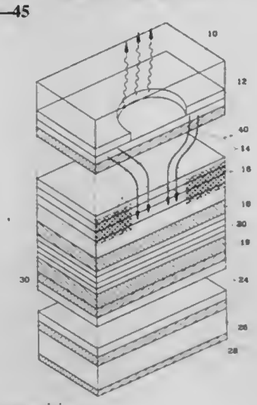
**SELF-LIMITING INTRINSICALLY EYE-SAFE LASER UTILIZING AN INCREASING ABSORPTION LAYER**

**Teresa M. Marta, White Bear Lake, and Robert A. Morgan, Plymouth, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Jul. 18, 1996, Ser. No. 683,277**

**Int. Cl.[6] H01S** *3/19*

**U.S. Cl. 372—45** **22 Claims**




1. A laser, comprising:

an active region;

a first mirror;

a second mirror, said active region being disposed between said first and second mirrors, said active region and said first and second mirrors being selected to emit light of a preselected wavelength; and

a power limiting layer that limits the power of said light of said preselected wavelength emitted by said laser as a function of an operating parameter of said laser, said power limiting layer exhibiting a higher increase in absorptivity in response to an increase in said operating parameter than the other layers of said laser.

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**5,745,516**

**ARTICLE COMPRISING A UNIPOLAR SUPERLATTICE LASER**

**Federico Capasso, Westfield; Alfred Yi Cho, Summit; Jerome Faist, Scotch Plains; Albert Lee Hutchinson, Piscataway, all of N.J.; Gaetano Scamarcio, Bari, Italy; Carlo Sirtori, Summit, and Deborah Lee Sivco, Warren, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Nov. 6, 1996, Ser. No. 744,292**

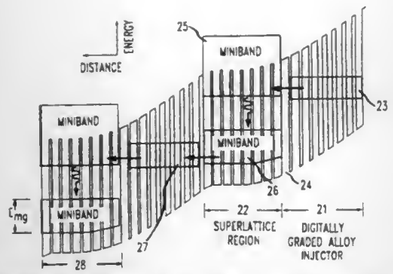
**Int. Cl.[6] H01S** *3/19*

**U.S. Cl. 372—45** **6 Claims**

1. An article comprising a unipolar semiconductor laser comprising, in sequence, an upper cladding region, a core region, and a lower cladding region, and further comprising contacts for electrically contacting the laser, said core region comprising a multiplicity of active regions and injector regions, respectively, with an injector region disposed between any two adjacent active regions, the active regions selected to facilitate radiative carrier transition from an upper to a lower energy state resulting in emission of a photon of energy hv, where h is Planck's constant and v is the photon frequency, and the injector regions selected to facilitate,

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under appropriate electrical bias, charge carrier passage from the lower energy state of a given active region to the upper energy state of the immediately adjacent downstream active region;

CHARACTERIZED IN THAT

the given active region comprises a doped superlattice comprising alternating quantum wells and barriers, with the quantum wells being of thickness $t_w$ and the barriers being of thickness $t_b$, with the superlattice selected such that the given active region has an upper and a lower conduction miniband, with a minimum energy difference $E_{mR}$ between the upper and lower minibands, with the radiative carrier transition being from the upper to the lower mini-band with hv being substantially equal to $E_{mR}$.

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**5,745,517**

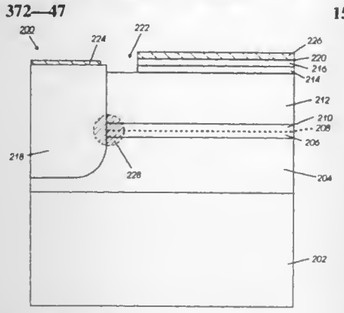
**ALTERNATIVE DOPING FOR ALGAINP LASER DIODES FABRICATED BY IMPURITY-INDUCED LAYER DISORDERING (IILD)**

**David P. Bour, Cupertino; Robert L. Thornton, Los Altos, both of Calif., and Kevin J. Beernink, Urbana, Ill., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 29, 1995, Ser. No. 581,691**

**Int. Cl.[6] H01S** *3/19;* **H01L** *29/167*

**U.S. Cl. 372—47** **15 Claims**




1. An AlGaInP semiconductor laser comprising

a substrate,

a first cladding layer of p-type conductivity deposited on said substrate,

a first confinement layer of p-type conductivity deposited on said cladding layer,

an active layer deposited on said first confinement layer,

a second confinement layer deposited on said active layer,

a second cladding layer deposited on said second confinement layer,

a contact layer deposited on said second cladding layer,

n-diffused regions which extend from said contact layer into said first cladding layer, and

electrodes for passing current through said active layer to thereby cause light emission from said active layer.

**5,745,518**

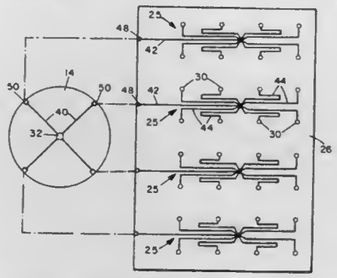
**EXPLOSIVELY PUMPED LASER APPARATUS**

**Jaime Cuadros, Hacienda Heights, Calif., assignor to Hughes Missile Systems Company, Los Angeles, Calif.**

**Filed Feb. 9, 1996, Ser. No. 599,199**

**Int. Cl.[6] H01S** *3/091;3/20*

**U.S. Cl. 372—70** **6 Claims**




1. An explosively pumped laser apparatus, comprising:

an outer casing;

a laser rod mounted in the casing;

a hollow cylinder of explosive material encircling the laser rod and extending coaxially along the length of the laser rod to define an annular gas chamber for containing noble gas between the laser rod and explosive cylinder;

a plurality of detonator pads arranged on the explosive cylinder for detonating the explosive material, the pads being located at longitudinally spaced intervals along the entire length of the cylinder, and at spaced intervals around the circumference of the cylinder;

firing means for actuating the detonator pads;

connecting paths between each detonator pad and the firing means for connecting the firing means to the detonator pads, the connecting paths being of approximately the same length for simultaneous actuation of all the detonator pads;

said firing means having a central initiation point at one end of said explosive cylinder, and said connecting paths extend from said central initiation point to said detonator pads;

said detonator pads being arranged at spaced intervals along a plurality of longitudinal rows extending parallel to the laser rod, the rows of spaced detonator pads being located at spaced intervals around the periphery of the explosive cylinder; and

the connecting paths including a plurality of radial connecting lines projecting radially outwardly from said central initiation point to the outer periphery of one end of said explosive cylinder, a plurality of longitudinally-extending connecting lines extending parallel to said laser rod from said one end along at least part of the length of said cylinder, each longitudinal connecting line extending from the end of a respective one of said radial connecting lines between an adjacent pair of rows of detonator pads, and a plurality of side connecting lines extending from each longitudinal connecting line to all of the detonator pads in the adjacent rows.

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**5,745,519**

**LASER DIODE SYSTEM**

**Mitchell C. Ruda; Tilman W. Stuhlinger, and David Pace Caffey, all of Tucson, Ariz., assignors to Opto Power Corp., Tucson, Ariz.**

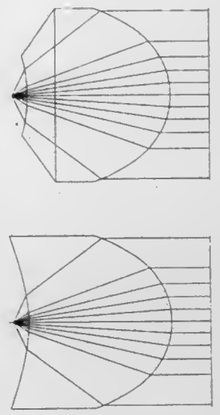
**Filed Nov. 12, 1996, Ser. No. 745,446**

**Int. Cl.[6] H01S** *3/08;* **G02B** *3/02;3/06;27/10*

**U.S. Cl. 372—101** **7 Claims**

1. A diode laser system comprising a laser bar having a plurality of emitting facets, said system including a microlens aligned astride said facets and being operative to collimate light from each





of said facets, said microlens having a superconic cross section with a non planar surface facing said emitting facet.

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**5,745,520**

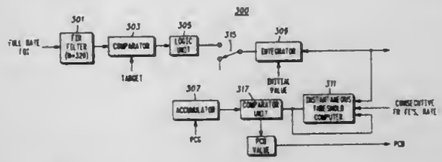
**METHOD AND APPARATUS FOR POWER CONTROL IN A SPREAD SPECTRUM COMMUNICATION SYSTEM USING THRESHOLD STEP-DOWN SIZE ADJUSTMENT**

**Robert T. Love, Barrington; Kenneth A. Stewart, Chicago, and William R. Bayer, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 15, 1996, Ser. No. 616,542**

**Int. Cl.[6] H04B** *1/69;* **H04J** *13/02*

**U.S. Cl. 375—200** **12 Claims**




1. An apparatus for power control in a spread-spectrum communication system where a base station compares an energy of a signal received from a remote unit to a threshold and instructs the remote unit to power up or power down based on the comparison, and the threshold is decreased by a first step-down size based on a quality of the signal received by the remote unit the apparatus comprising:

a receiver for receiving a plurality of frames;

a filter coupled to the receiver, said filter storing the plurality of frames to produce a plurality of stored frame attributes;

a comparator coupled to the filter, said comparator determining an amount of poor-quality frames existing within the plurality of stored frame attributes to produce a determination of poor-quality frames; and

an integrator coupled to said comparator, said integrator adjusting the first step-down size to produce a second step-down size based on the determination of poor-quality frames.

**5,745,521**

**SPREAD SPECTRUM COMMUNICATION APPARATUS AND SIGNAL INTENSITY DETECTION APPARATUS**

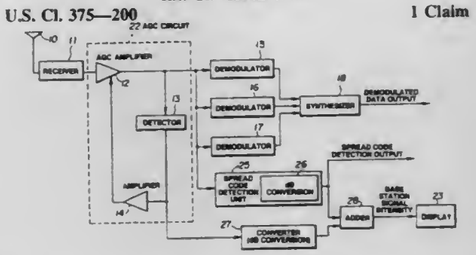
**Takehiro Sugita, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 391,064, Feb. 21, 1995, Pat. No. 5,644,590. This application Mar. 26, 1997, Ser. No. 824,349**

**Claims priority, application Japan, Feb. 23, 1994, P06-025264**

**Int. Cl.[6] H04B** *1/707*

**U.S. Cl. 375—200** **1 Claim**




1. A spread spectrum communication system for use in a code division multiple access cellular system for communications with a plurality of communication units, comprising:

an antenna;

a receiver connected to said antenna for receiving signals of a frequency channel including a target communication unit and producing an input signal;

an automatic gain control circuit for adjusting said input signal to a pre-set power, including:

an automatic gain control amplifier to produce an automatic gain control output;

a detector receiving said automatic gain control output for detecting a signal intensity and producing a detector output signal;

a feedback amplifier for feeding back said detector output to control said automatic gain control amplifier;

a first converter for converting said detector output signal into a first logarithmic output representing a total power of said input signal;

a spread code detection unit for receiving said automatic gain control output for detecting therein a signal intensity of the spread spectrum code of the target communication unit, including:

a second converter for converting an output of said spread code detection unit into a second logarithmic output representing a measured signal intensity of said input signal;

an adder for adding said first logarithmic output with said second logarithmic output to produce a reception intensity output signal;

a display for displaying said reception intensity output signal;

a plurality of demodulators fed with said automatic gain control output to produce a plurality of demodulated outputs; and

a combiner for combining said plurality of demodulated outputs to produce a combined demodulated signal.

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**5,745,522**

**RANDOMIZER FOR BYTE-WISE SCRAMBLING OF DATA**

**Chris Heegard, Ithaca, N.Y., assignor to General Instrument Corporation of Delaware, Chicago, Ill.**

**Filed Nov. 9, 1995, Ser. No. 556,415**

**Int. Cl.[6] H04B** *15/00;* **H04K** *1/00;* **H04L** *27/30*

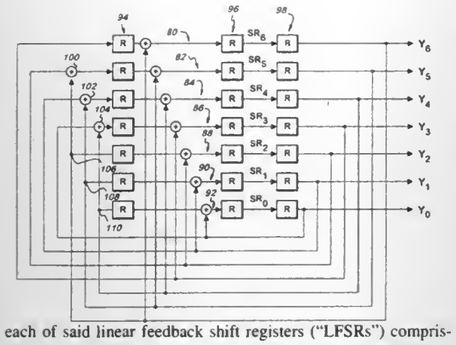
**U.S. Cl. 375—208** **15 Claims**

6. A data randomizer for scrambling seven-bit data bytes, said randomizer comprising:

a bank of seven linear feedback shift registers $SR_0$–$SR_6$ for providing as output seven binary pseudorandom (PN) sequences $Y_0$–$Y_6$, respectively;

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each of said linear feedback shift registers ("LFSRs") comprising three register stages in series and having feedback taps after said first and third register stages;

the PN sequences $Y_0$–$Y_6$ from the third stages of the LFSRs being fed back to the tap that follows the first stage of the respective LFSR;

the first stage of LFSRs $SR_6$, $SR_0$, $SR_1$, and $SR_2$ receiving as inputs the PN sequences $Y_3$, $Y_4$, $Y_5$, and $Y_6$respectively; and

the first stage of LFSRs $SR_3$, $SR_4$, and $SR_5$ receiving as inputs the exclusive-OR's $Y_0 \ominus Y_4$, $Y_1 \ominus Y_5$, and $Y_2 \ominus Y_6$, respectively.

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**5,745,523**

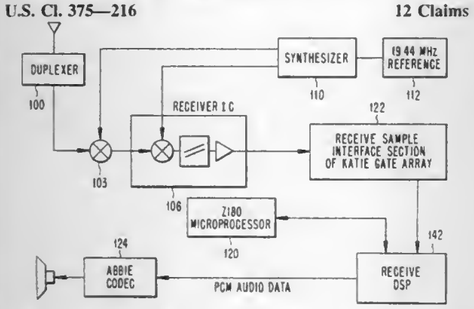
**MULTI-MODE SIGNAL PROCESSING**

**Paul W. Dent, Stehag, and Björn Olof Peter Ekelund, Lund, both of Sweden, assignors to Ericsson Inc., Research Triangle Park, N.C.**

**Filed Oct. 27, 1992, Ser. No. 967,027**

**Int. Cl.[6] H04L** *27/34;27/36;27/38*

**U.S. Cl. 375—216** **12 Claims**




9. A multi-mode cellular radio telephone capable of receiving digital speech signals or analog speech signals comprising:

down conversion means to convert a received signal to a intermediate signal in a digital speech reception mode and an analog speech reception mode;

vector analog-to-digital conversion means to convert said intermediate signal in said digital speech reception mode and said analog speech reception mode to a stream of complex numbers preserving phase and amplitude information;

numerical processing means capable of processing said stream of complex numbers in said digital speech reception mode and said analog speech reception mode in order to obtain speech samples; and

D-to-A conversion means to process said speech samples into an analog signal waveform for driving a speaker.

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**5,745,524**

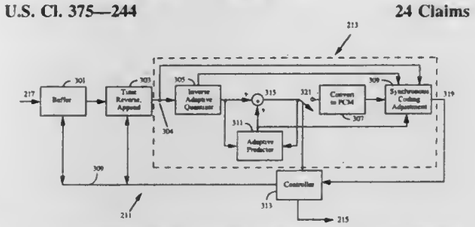
**SELF-INITIALIZED CODER AND METHOD THEREOF**

**Andrew William Hull, North Richland Hills, Tex., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Jan. 26, 1996, Ser. No. 592,755**

**Int. Cl.[6] H04B** *14/06*

**U.S. Cl. 375—244** **24 Claims**




1. In a communications receiver adapted to receive an information stream, the information stream encoded by a coder, a method of initializing a coder decoding the information stream, the method including the steps of:

storing a portion of the information stream,

reversing, temporally, a first part of said portion to provide a file header,

first decoding said file header to provide an estimate of the state parameter, and thereafter

second decoding, using said estimate, said portion of the information stream to provide a decoded signal.

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**5,745,525**

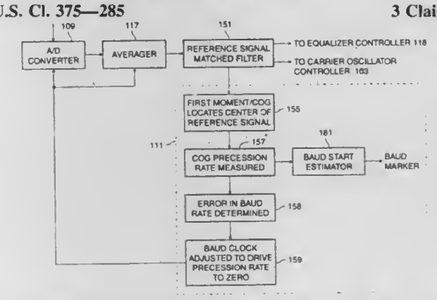
**METHOD AND SYSTEM FOR SIMULTANEOUSLY BROADCASTING AND RECEIVING DIGITAL AND ANALOG SIGNALS**

**Bill J. Hunsinger, Urbana, and Derek D. Kumar, Champaign, both of Ill., assignors to USA Digital Radio Partners, L.P., Linthicum, Md.**

**Continuation of Ser. No. 274,140, Jul. 12, 1994. This application Jun. 7, 1995, Ser. No. 485,599**

**Int. Cl.[6] H04B** *15/00*

**U.S. Cl. 375—285** **3 Claims**




1. A signal receiver for receiving through a medium a radio frequency signal including a digital signal, said digital signal being robust to multipath degradation and intersymbol interference, said receiver comprising:

means for receiving said radio frequency signal wherein said digital signal is composed of a modulated set of spectrally shaped and substantially orthogonal modulated waveforms defined by multivalued numerical sequences of substantially equal length having good autocorrelation properties; and

demodulation means for determining and outputting digital data from said digital signal represented as said spectrally shaped and substantially orthogonal waveforms.



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**5,745,526**

**RADIO TRANSMITTERS AND METHODS OF OPERATION**

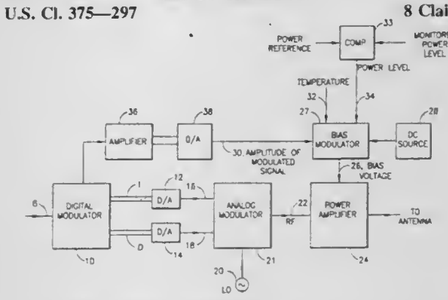
**Arne Lennart Kumm, Basingstoke, and Robert Jonathan Annett, Herfordshire, both of England, assignors to Nokia Mobile Phones Limited, Salo, Finland**

**Continuation of Ser. No. 567,784, Dec. 5, 1995. This application Mar. 11, 1997, Ser. No. 814,972**

**Claims priority, application United Kingdom, Dec. 15, 1994, 9425357**

**Int. Cl.[6] H04L** *27/20*

**U.S. Cl. 375—297** **8 Claims**




1. A radio transmitter comprising:

a first modulator having an input coupled to a digital signal and a plurality of outputs for outputting in-phase (I) and quadrature (Q) signals corresponding to said digital input signal;

a second modulator having first inputs coupled to said outputs of said first modulator and a second input coupled to an output of a radio frequency oscillator for generating a radio frequency carrier signal that is modulated in accordance with said in-phase (I) and quadrature (Q) signals;

a linear power amplifier having an input coupled to an output of said second modulator for amplifying said modulated radio frequency carrier signal; a voltage source for providing a bias voltage for the linear power amplifier;

means, having an input coupled to an output of said first modulator, for deriving an amplitude signal as a mathematical function of a magnitude of the amplitudes of said in-Phase (I) and quadrature (Q) signals;

a feedback circuit having a first input coupled to an output of said linear power amplifier for detecting an actual power level of said output, a second input coupled to a desired power level reference signal, and an output providing an error signal expressive of a difference between the actual power level and the desired power level reference signal; and

means for modifying the bias voltage in accordance with a combination of said amplitude signal and said error signal to produce a modified bias voltage which is applied to the linear power amplifier for varying the operating point of said linear power amplifier to maintain linear operation despite variations in said amplitude signal.

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**5,745,527**

**ENCODING METHOD FOR CONSTELLATION SYMBOLS OF AN RF TRANSMITTER**

**James Robert Kelton, Oak Park, and David Paul Gurney, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Feb. 16, 1993, Ser. No. 17,892**

**Int. Cl.[6] H04L** *27/20;27/36*

**U.S. Cl. 375—308** **20 Claims**

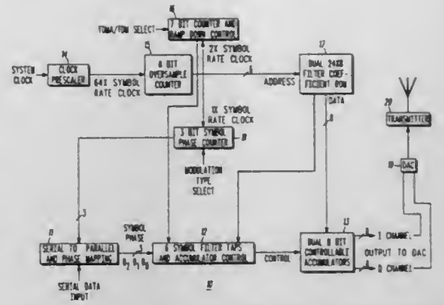
1. An apparatus for encoding a signal, the apparatus comprising:

a serial to parallel converter and phase mapping device having a first input, a second input, and an output, the first input coupled to receive a serial data input stream, the output comprising phase data;

a filter tap module storing the phase data in a filter tap memory having a plurality of filter taps, each of the plurality of filter taps responsive to at least some of the phase data, the filter tap module having an output responsive to at least one of the plurality of filter taps and producing a filter tap control signal;

a memory containing a plurality of finite impulse response filter coefficients; and

an accumulator coupled to the filter tap module and the memory, the accumulator receiving the filter tap control signal and the filter coefficients and performing an arithmetic operation on the finite impulse response filter coefficients in response to the filter tap control signal to produce an output signal.




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**5,745,528**

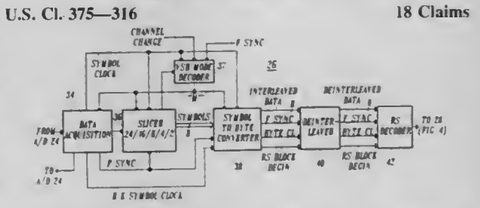
**VSB MODE SELECTION SYSTEM**

**Mark Fimoff, Hoffman Estates, and Timothy G. Laud, Mundelein, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.**

**Filed Jul. 13, 1995, Ser. No. 501,966**

**Int. Cl.[6] H03K** *9/00;* **H04L** *27/06;27/14;27/22*

**U.S. Cl. 375—316** **18 Claims**




1. A method of operating a receiver in one of a plurality of modes each defined by a respective mode control signal comprising:

providing a periodic succession of received mode control signals;

setting a count to a predetermined value in response to a selected operation of said receiver;

storing a current one of said received mode control signals in response to the value of said count being equal to said predetermined value;

comparing said stored mode control signal with each subsequently received mode control signal and incrementally changing the value of said count in a first direction if said compared signals match and incrementally changing the value of said count in the opposite direction if said compared signals do not match; and

operating a circuit in said receiver in response to said stored mode control signal for performing a predetermined function.

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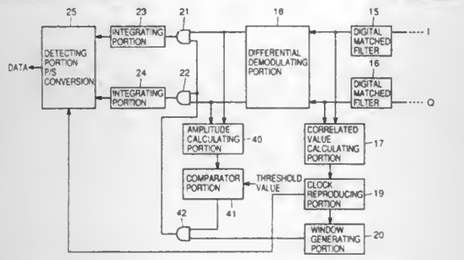


5,745,529

## POST DETECTION INTERGRATION (PDI) RECEIVER

Keiji Hikoso, Narashino, and Naoki Okamoto, Chiba, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 4, 1996, Ser. No. 657,943
Claims priority, application Japan, Jun. 5, 1995, 7-138219
Int. Cl.[6] H04B 7/216
U.S. Cl. 375—316 10 Claims




1. A Post Detection Integration (PDI) receiver, comprising:

A/D converting means for sampling received signals at a sampling period of at least twice a chip rate of a predetermined bits;

correlation filter means for correlating said received signals digitized by said A/D converting means with the predetermined bits;

correlated value calculating means for calculating amplitude of a correlated value from correlated waveform of an output from said correlation filter means;

clock reproducing means for generating a reproduction clock signal in accordance with the correlated value calculated by said correlated value calculating means;

demodulating means for digitally demodulating an output from said correlation filter means;

window generating means for generating a window pulse of a period determined dependent on a propagation path, referring to the reproduction clock signal generated by said clock reproducing means; and

detecting means for detecting data by integrating, of output signals from said demodulating means, signals within the window pulse generated by said window generating means.

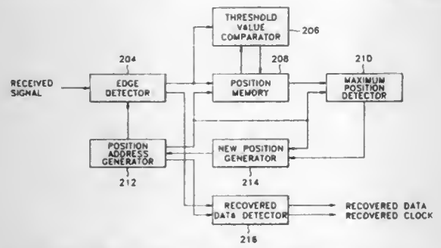
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5,745,530

## DIGITAL DATA RECOVERING APPARATUS

Hyun-gee Baek, Anyang; Young-hoon Chang, Suwon, and Ho-rang Jang, Incheon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Dec. 29, 1995, Ser. No. 581,684
Claims priority, application Rep. of Korea, Dec. 31, 1994, 94-40673
Int. Cl.[6] H04L 27/06
U.S. Cl. 375—342 8 Claims




1. A digital data recovering apparatus comprising:

an edge detector for detecting an edge where the state of received data changes from logic level **0** to logic level **1** or from logic level **1** to logic level **0**;

a threshold comparator for generating a reference threshold value and comparing the number of the edges detected by said edge detector with the reference threshold value;

a position address generator for sampling the received data at N-time frequency of the received data and generating a position address with respect to 1/N phase;

a position memory for storing the position value of the received data with respect to each position address thereof;

a maximum position detector for detecting a maximum position by continuously comparing a position value having the maximum value of the edges to be detected with respect to each position value stored in said position memory with a previous maximum position value stored in said position memory;

a new position generator for continuously generating a new position by comparing the maximum position detected by said maximum position detector with a current position; and

a recovered data detector for recovering original data from the received data by determining a maximum level value using the clock pulses at the center of symbol data supplied from said position address generator as well as above and below the center.

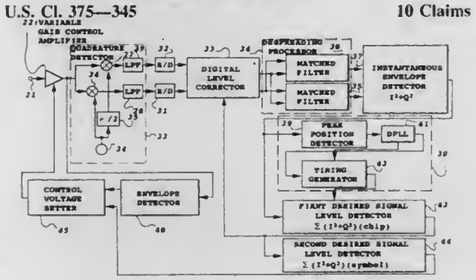
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5,745,531

## AUTOMATIC GAIN CONTROL APPARATUS, COMMUNICATION SYSTEM, AND AUTOMATIC GAIN CONTROL METHOD

Mamoru Sawahashi, Yokosuka, and Fumiyuki Adachi, Yokohama, both of Japan, assignors to NTT Mobile Communications Network, Inc., Japan

PCT No. PCT/JP94/01310, § 371 Date Jun. 26, 1995, § 102(e) Date Jun. 26, 1995, PCT Pub. No. WO95/05038, PCT Pub. Date Feb. 16, 1995
PCT Filed Aug. 9, 1994, Ser. No. 411,605
Claims priority, application Japan, Aug. 11, 1993, 5-199448
Int. Cl.[6] H04L 27/08
U.S. Cl. 375—345 10 Claims




1. An automatic gain control apparatus of a spread spectrum signal receiver, in a CDMA mobile communication system, having analog variable gain control amplifying means for amplifying a received spread spectrum signal, quadrature detection means for quadrature-detecting a signal amplified by said variable gain control amplifying means, and despreading means for despreading a signal quadrature-detected by said quadrature detection means, said automatic gain control apparatus further comprising:

means for obtaining an in-phase component and a quadrature component of a modulated signal despread by said despreading means;

A/D converting means for converting output signals of said quadrature detection means into digital signals to be supplied to said despreading means;

digital level correcting means for digitally converting a level of an in-phase component and that of a quadrature component of said digital signals to obtain a level corrected signal;

instantaneous envelope detecting means for obtaining a square component of an amplitude of said level corrected signal;

symbol timing generating means for detecting a symbol timing from an output signal of said instantaneous envelope detecting means:



first desired signal level detecting means for obtaining a signal level of a desired signal by accumulating the output signal of said instantaneous envelope detection means over a range of a propagation delay time using a symbol timing signal outputted from said symbol timing generating means as a reference; and

second desired signal level detecting means for obtaining a signal level of the desired signal by accumulating, over a few symbol interval, a desired signal level outputted from said first desired signal level detecting means.

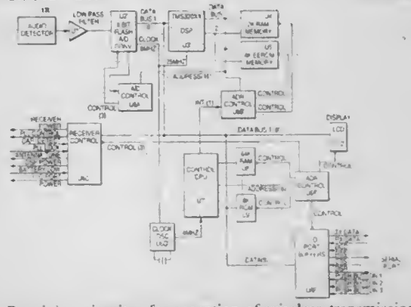
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5,745,532

## SYSTEM FOR WIRELESS TRANSMISSION AND RECEIVING OF INFORMATION AND METHOD OF OPERATION THEREOF

Thomas J. Campana, Jr., Chicago, Ill., assignor to NTP Incorporated, Annandale, Va.

Continuation-in-part of Ser. No. 391,555, Feb. 21, 1995, Ser. No. 386,060, Feb. 7, 1995, Ser. No. 385,312, Feb. 7, 1995, and Ser. No. 385,143, Feb. 7, 1995, each which is a continuation-in-part of Ser. No. 112,256, Aug. 26, 1993, Pat. No. 5,446,759, which is a continuation-in-part of Ser. No. 850,275, Mar. 12, 1992, abandoned, Ser. No. 850,276, Mar. 12, 1992, abandoned, and Ser. No. 850,487, Mar. 12, 1992, abandoned, Ser. No. 386,060, which is a continuation-in-part of Ser. No. 112,256, which is a continuation-in-part of Ser. No. 850,275, Ser. No. 850,276, and Ser. No. 850,487. This application Jun. 2, 1995, Ser. No. 458,651
Int. Cl.[6] H04B 7/10; H04L 1/02
U.S. Cl. 375—347 62 Claims



1. Receiving circuitry for reception of wireless transmission of information which is subject to fading for a time interval with a radio frequency carrier modulated with a subcarrier with the subcarrier modulated with first and second encoded information streams each containing the information to produce first and second parallel information streams modulating cycles of the subcarrier with the first parallel information stream containing the first encoded information stream and with the second parallel information stream containing the second encoded information stream with the first and second parallel information streams being transmitted with a time delay interval between the first and second parallel information streams which is equal to or greater than the time interval, the first and second encoded information streams comprise a plurality of synchronization bits for synchronizing the receiving circuitry with transmitting circuitry transmitting the radio frequency carrier modulated with the subcarrier and frames of information, a plurality of the frames each having a plurality of bits encoding error correction code and a plurality of bits encoding the information with the error correction code of the frames of the first encoded information stream not being capable of correcting for a fade of the time interval producing faded information in the first parallel information stream and representing a bit error if uncorrected which will cause a loss of synchronism between the receiving circuitry and the transmitting circuitry and the error correction code of the frames of the second encoded information stream not being capable of correcting for a fade of the time interval producing faded information in the second parallel information stream and representing a bit error if uncorrected which will cause a loss of synchronism between the receiving and the transmitting circuitry, the receiving circuitry comprising:

a detector for detecting the transmitted first and second parallel information streams; and

a processor, coupled to the detector and responsive to the detected parallel information streams including the plurality of synchronization bits with the synchronization bits synchronizing the receiving circuitry with the transmitting circuitry, for determining if faded information is present in at least one of the detected first and second parallel information streams, in response to determined faded information replacing the faded information caused by a fade with replacement information from at least one of the first and second parallel information streams which is time offset at transmission from the faded information by the time delay interval to maintain synchronization between the receiving and transmitting circuitry and outputting transmitted information including the replacement information.

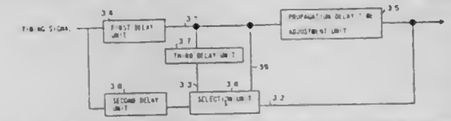
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5,745,533

## APPARATUS AND METHOD FOR ADJUSTING THE SKEW OF A TIMING SIGNAL USING PROPAGATION DELAY TIME OF SIGNALS GENERATED BY A RING OSCILLATOR FORMING A DIGITAL CIRCUIT

Yoshimi Asada, and Tatsumi Nakada, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 30, 1995, Ser. No. 452,539
Claims priority, application Japan, Jun. 2, 1994, 6-120854
Int. Cl.[6] H04L 7/00
U.S. Cl. 375—354 25 Claims



1. A skew adjustment apparatus for use in a digital system having a timing signal supply path for supplying a timing signal to a digital circuit, comprising:

first delay means provided on the timing signal supply path;

propagation delay time adjustment means provided on the timing signal supply path for adjusting a propagation delay time of the timing signal supply path;

second delay means connected to an output terminal of said propagation delay time adjustment means and an input terminal of said first delay means; and

selection means for selectively forming a first loop circuit operating as a ring oscillator, the first loop circuit including said first delay means said second delay means and said propagation delay time adjustment means the first loop circuit having a first propagation delay time, or a second loop circuit operating as a ring oscillator, the second loop circuit including said first delay means and said second delay means, the second loop circuit having a second propagation delay time.

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5,745,534

## METHOD AND APPARATUS FOR DATA COMMUNICATION

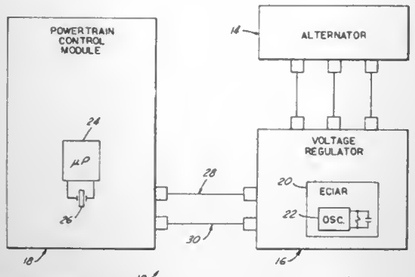
Charles James DeBiasi, Plymouth Township; Vikas Tuteja, Novi; Zeljko Deljevic, Westland, and John Francis Renehan, South Lyon, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 353,601, Dec. 12, 1994, abandoned. This application Jun. 4, 1996, Ser. No. 657,394
Int. Cl.[6] H04L 7/00
U.S. Cl. 375—354 14 Claims

4. An apparatus adapted for data communication, said apparatus comprising:

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a first electronic device;

a second electronic device;

wherein said first electronic device is adapted to transmit a first signal to said second electronic device and said second electronic device is adapted to transmit a second signal to said first electronic device;

wherein said second electronic device further comprises means for measuring a frequency of said first signal and means for adjusting a frequency of said second signal in response to said measured frequency;

wherein said means for adjusting a frequency of said second signal further comprises means for setting said frequency of said second signal equal to said frequency of said first signal;

wherein said second device comprises a crystal as a time base for said second signal; and

wherein said first device comprises an R-C oscillator as a time base for said first signal.

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**5,745,535**

**PRECISION SYMBOL DISCRIMINATION TIMING DETECTION (CLOCK RECOVERY) SYSTEM FOR MULTI-CARRIER MODULATION SIGNAL**

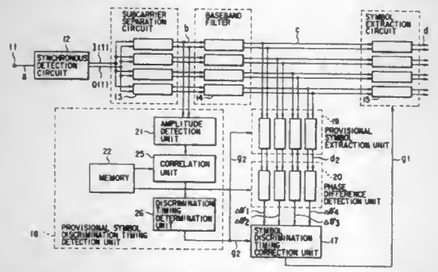
**Takashi Mori, Atsugi, Japan, assignor to Anritsu Corporation, Tokyo, Japan**

**Filed Nov. 3, 1995, Ser. No. 553,063**

**Claims priority, application Japan, Nov. 8, 1994, 6-273837**

**Int. Cl.[6] H04L *7/00***

**U.S. Cl. 375—355** **23 Claims**




1. A symbol discrimination timing detection apparatus for a digital modulation signal digital-modulated by a multi-subcarrier modulation scheme using a plurality of subcarriers each having a predetermined frequency, said digital modulation signal including a predetermined number of symbols each having a predetermined timing, said apparatus comprising:

demodulation means for demodulating said digital modulation signal;

provisional symbol discrimination timing detection means for detecting a provisional symbol discrimination timing for discriminating, as a provisional timing, a timing at which each symbol is contained in said digital modulation signal;

provisional symbol extraction means for demodulating a demodulated signal, demodulated by said demodulation means, for each subcarrier using the provisional symbol discrimination timing detected by said provisional symbol discrimination timing detection means, thereby extracting a provisional symbol;

reference signal generation means for generating a reference signal for each subcarrier;

phase difference detection means for detecting a phase difference between a phase at a predetermined timing of the provisional symbol extracted by said provisional symbol extraction means and a phase of the reference signal generated by said reference signal generation means, the phase of the reference signal corresponding to the predetermined timing; and

symbol discrimination timing correction means for converting the phase difference detected by said phase difference detection means for each subcarrier into a time difference on the basis of each frequency of the subcarriers and correcting the provisional symbol discrimination timing detected by said provisional symbol discrimination timing detection means in accordance with the time difference.

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**5,745,536**

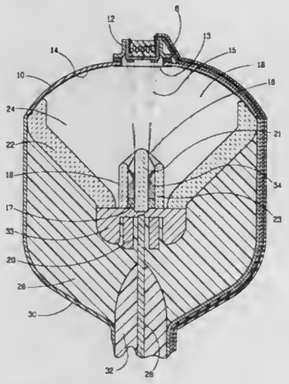
**SECONDARY ELECTRON ION SOURCE NEUTRON GENERATOR**

**John P. Brainard, and Daryl R. McCollister, both of Albuquerque, N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.**

**Filed Jun. 5, 1996, Ser. No. 659,695**

**Int. Cl.[6] G21K *5/00***

**U.S. Cl. 376—114** **21 Claims**



1. A neutron generator comprising:

a housing having a grounded outer shell;

an electron emitter adjacent said shell for emitting electrons into said housing;

ion source means within and electrically insulated from said outer shell for producing ions when bombarded by electrons from said electron emitter; and

target means within said housing and spaced between said electron emitter and said ion source means for producing neutrons when struck by said ions.



**5,745,537**

**NEUTRON TUBE WITH MAGNETIC CONFINEMENT OF THE ELECTRONS BY PERMANENT MAGNETS AND ITS METHOD OF MANUFACTURE**

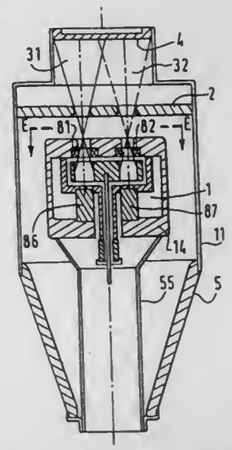
**Gérard Verschoore, Cretell, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 310,826, Sep. 22, 1994, abandoned. This application Apr. 8, 1997, Ser. No. 833,621**

**Claims priority, application France, Sep. 29, 1993, 93 11608**

**Int. Cl.[6] G21G *4/02***

**U.S. Cl. 376—114** **5 Claims**




1. A method of increasing the operating lifetime of a sealed neutron tube containing a deuterium-tritium or deuterium-deuterium gas mixture under low pressure and having a Penning ion source with 2n elementary emission cells, an extraction-acceleration electrode and a target electrode, each of said elementary emission cells including at least one individual permanent magnet associated uniquely with said each elementary emission cell for forming a confinement magnetic field that channels ions formed in said each elementary emission cell to said extraction-acceleration electrode for bombardment of said target electrode, comprising the steps of:

magnetizing a first half of said permanent magnets to a nominal value that allows correct operation of the emission cells associated with said first half of said permanent magnets and, magnetizing a second half of said permanent magnets to a zero or low value that does not allow correct operation of the emission cells associated with said second half of said permanent magnets,

operating said neutron tube during a first portion of the operating lifetime thereof with said first half of said permanent magnets being magnetized to said nominal value and said second half of said permanent magnets being magnetized to said zero or low value,

magnetizing said second half of said permanent magnets to be nominal value that allows correct operation of the emission cells associated with said second half of said permanent magnets and, magnetizing said first half of said permanent magnets to a zero or low value that does not allow correct operation of the emission cells associated with said first half of said permanent magnets,

operating said neutron tube during a second portion of the operating lifetime thereof with said second half of said permanent magnets being magnetized to said nominal value and said first half of said permanent magnets being magnetized to said a zero or low value.

**5,745,538**

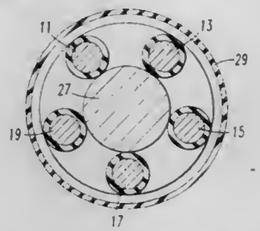
**SELF-POWERED FIXED INCORE DETECTOR**

**Michael D. Heibel, Penn Township, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Oct. 5, 1995, Ser. No. 539,803**

**Int. Cl.[6] G21C *17/00***

**U.S. Cl. 376—153** **10 Claims**




1. A self-powered fixed incore detector for measuring power distribution in a core of a given axial length of a nuclear reactor, said detector comprising:

a neutron sensitive emitter element constructed from a first material having a length extending from a first end of said neutron sensitive emitter element substantially along said given axial length of said core for providing a full length signal;

a number of gamma sensitive emitter elements of different lengths constructed from a second material which is different from the first material, each of said gamma sensitive emitter elements having a first end adjacent said first end of said neutron sensitive emitter element and extending along said neutron sensitive emitter element to provide sequentially increasing overlap with the neutron sensitive emitter element which defines axial regions of said core, and producing apportioning signals which substantially proportionally define the relative power in each of said axial regions of said core; and

signal processing means which separately compares the signals from adjacent gamma sensitive emitters to define respectively the proportion of the total power represented by the non-overlapping, axial sections between such adjacent gamma emitters, and applies those proportions to the signal from the full neutron sensitive emitter element to provide outputs representative of the power in each of said axial regions of said core.

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**5,745,539**

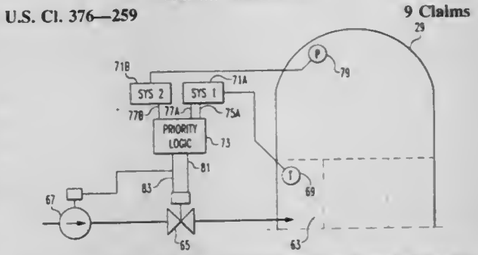
**APPARATUS AND METHOD FOR PRIORITIZATION OF MULTIPLE COMMANDS IN AN INSTRUMENTATION AND CONTROL SYSTEM**

**Glenn E. Lang, Cabot, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Nov. 14, 1995, Ser. No. 557,532**

**Int. Cl.[6] G21D *3/04***

**U.S. Cl. 376—259** **9 Claims**




1. An instrumentation and control system for a nuclear reactor comprising:

a process control component operable to at least two operating states in response to a final command;

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first independent control means generating a first command for operating said process control component to one of said operating states;

second independent control means diverse from said first independent control means and generating a second command for operating said process control component to one of said operating states; and

prioritizing means generating said final command for operating said process control component to an operating state commanded by both said first command and said second command when said first command and second command command a same operating state, and to the operating state commanded by the other of said first command and second command when one of said first command and second command is ambiguous.

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**5,745,540**

## PORTABLE BILL COUNTER DETECTING FORGERIES

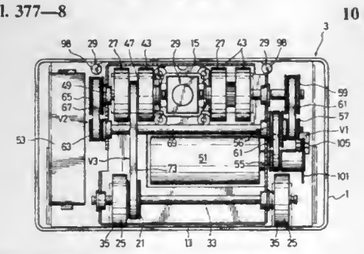
**Hidemi Okada, Tokyo, and Susumu Ozawa, Niiza, both of Japan, assignors to Mu Co., Ltd., Japan**

**Filed Aug. 9, 1995, Ser. No. 513,138**

**Claims priority, application Japan, Aug. 10, 1994, 6-188472; Nov. 28, 1994, 6-293216**

**Int. Cl.[6] G06M** *7/00*

**U.S. Cl. 377—8** **10 Claims**



1. A bill counter which comprises:

a case body formed to be a size which can be held by a single hand;

a display section provided on the surface of the case body;

an insertion port provided on one side of the case body which is capable of being expanded/contracted;

a taking-out port provided on the other side of the case body;

a first feeding-out device which ms provided on the insertion port side within the case body and feeds out bills in a bundle inserted to the insertion port by a few sheets;

a second feeding-out device which is provided on the taking-out port side within the case body and feeds out bills one by one fed out by the first feeding-out device;

a driving section which drives simultaneously the first and the second feeding-out devices;

an identifying sensor which identifies bills fed out by said second feeding-out device; and

a control section which outputs a signal displaying the number of sheets by unit of each bill and the total amount at least to said display section based on the signal from said identifying sensor and a signal which stops the operation of the driving section when a forged bill is detected.

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**5,745,541**

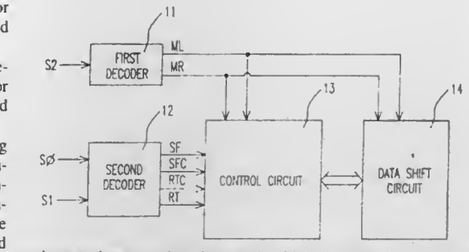
## DATA SHIFT CONTROL CIRCUIT

**Yi Lin; Jason Chen, and Henry Fan, all of Hsinchu, Taiwan, assignors to Holtek Microelectronics, Inc., Hsinchu, Taiwan**

**Filed Feb. 7, 1997, Ser. No. 797,006**

**Int. Cl.[6] G11C** *19/00*

**U.S. Cl. 377—69** **8 Claims**



1. A circuit for controlling a shift register in response to a logic operation command code, said shift register comprising a first register and a second register and said logic operation command code comprising a first portion and a second portion, comprising:

a first decoder for decoding said first portion to transmit a move signal;

a second decoder for decoding said second portion to transmit a control signal;

a control signal channel, electrically connected to said first register and said second register, for allowing said first register and said second register to receive said control signal and for allowing said shift register to execute a first action; and

a move signal channel, electrically connected to all registers of said shift register for allowing said all registers to receive said move signal and for allowing said shift register to execute a second action.

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**5,745,542**

## RING SUPPRESSION FILTER FOR USE IN COMPUTED TOMOGRAPHY SYSTEMS

**Bernard M. Gordon, Magnolia, and Lai Ching-Ming, Wakefield, both of Mass., assignors to Analogic Corporation, Peabody, Mass.**

**Continuation of Ser. No. 614,541, Mar. 31, 1996, abandoned. This application Apr. 29, 1997, Ser. No. 840,367**

**Int. Cl.[6] A61B** *6/03*

**U.S. Cl. 378—4** **43 Claims**



1. A computed tomography system for creating a computed tomographic image of a patient and including (a) a source of X-rays and (b) channel defining means for defining a plurality of signal processing channels having corresponding transfer functions and comprising means, including a corresponding plurality of detectors of a detector array for detecting X-rays emitted from said source, for generating a plurality of image data signals as a function of the X-rays detected by the corresponding detectors at each of a plurality of projection angles of a tomographic scan and representative of the tomographic image of the patient, said system further comprising:

means for generating error correction data in response to image data signals generated during an entire scan of a patient; and

means for automatically calibrating the transfer functions of said channels as a function of said error correction data so as to minimize ring artifacts in computed tomographic images produced from said image data signals.



**5,745,543**

## APPARATUS FOR SIMULTANEOUS X-RAY DIFFRACTION AND X-RAY FLUORESCENCE MEASUREMENTS

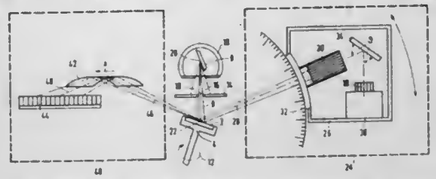
**Pieter K. De Bokx; Paul Van Der Sluis, both of Eindhoven, and Bruno A. R. Vrebos, Almelo, all of Netherlands, assignors to U.S. Philips Corporation, NY, N.Y.**

**Filed Sep. 30, 1996, Ser. No. 722,649**

**Claims priority, application European Pat. Off., Oct. 3, 1995, 95202647**

**Int. Cl.[6] G01N** *23/223*

**U.S. Cl. 378—45** **3 Claims**



1. An apparatus for the examination of materials by simultaneous X-ray diffraction and X-ray fluorescence, comprising:

a sample location (**4**) for accommodating a sample (**2**) of the material to be examined,

an X-ray source (**10**) for irradiating the sample holder (**4**) by means of polychromatic X-rays (**6**, **18**),

a collimator (**14**) which is arranged to transmit at least one X-ray beam of line-shaped cross-section and is positioned between the X-ray source (**10**) and the sample holder (**4**),

a diffraction unit (**24**) which comprises a detection device (**26**) for the detection of X-rays (**28**) diffracted by the sample (**2**) of the material to be examined, and

a fluorescence unit (**40**) which comprises a detection device with an analysis crystal (**42**) for the detection of fluorescent radiation (**46**) generated in the sample (**2**) of the material to be examined,

characterized in that

the X-ray source (**10**) is arranged to produce a line-shaped X-ray focus (**20**),

the collimator (**14**) comprises only one aperture (**16**) which extends parallel to the line-shaped X-ray focus (**20**), and

the detection device of the fluorescence unit (**40**) comprises a location-sensitive detection array (**44**) for the detection of X-rays (**48**) reflected by the analysis crystal (**42**).

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**5,745,544**

## BONE DENSITOMETER WITH FILM CASSETTE

**Richard B. Mazess, Madison, Wis., assignor to Lunar Corporation, Madison, Wis.**

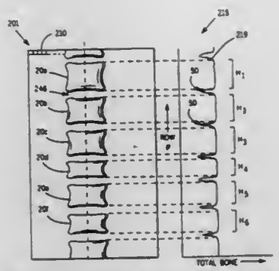
**Continuation of Ser. No. 551,685, Nov. 1, 1995, abandoned, which is a division of Ser. No. 344,328, Nov. 23, 1994, abandoned, which is a continuation-in-part of Ser. No. 241,270, May 10, 1994, Pat. No. 5,509,042, which is a continuation-in-part of Ser. No. 67,651, May 26, 1993, Pat. No. 5,291,537, which is a continuation-in-part of Ser. No. 73,264, Jun. 7, 1993, Pat. No. 5,306,306, which is a division of Ser. No. 944,626, Sep. 14, 1992, Pat. No. 5,228,068, which is a continuation of Ser. No. 862,096, Apr. 2, 1992, abandoned, which is a continuation of Ser. No. 655,011, Feb. 13, 1991, abandoned. This application Mar. 5, 1997, Ser. No. 810,875**

**Int. Cl.[6] G06F** *159/00*

**U.S. Cl. 378—56** **8 Claims**

1. A method of making measurements of vertebrae of a patient's spine with a densitometer having an opposed radiation source and detector, the source and detector positioned at a predetermined angle about the spine to obtain a two dimensional array of pixels representing the attenuation of radiation at corresponding locations through the patient, comprising the steps of:

(a) reading the two dimensional array of pixels into the memory of digital computer to:



(1) identify bone pixels that measure radiation attenuated by bone;

(2) isolate the bone pixels to individual vertebra;

(3) analyze the isolated bone pixels to measure the height of the individual vertebra represented by the isolated bone pixels;

(4) analyzing the heights of more than two vertebrae to develop a statistically normal height for the vertebrae;

(5) identifying the deviation between the height of at least one individual vertebra and the statistically normal height; and

(6) providing an indication of an operator of the identified vertebrae and of the deviation.

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**5,745,545**

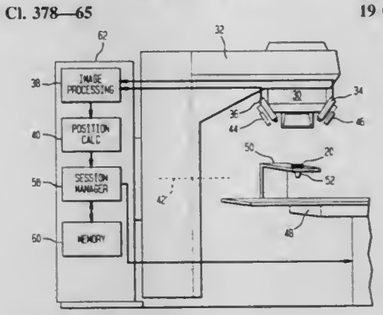
## ALIGNMENT SYSTEM AND METHOD FOR INTRA-OPERATIVE RADIATION THERAPY

**John H. Hughes, Martinez, Calif., assignor to Siemens Medical Systems, Inc., Iselin, N.J.**

**Filed Aug. 16, 1996, Ser. No. 708,066**

**Int. Cl.[6] G21K** *5/16*

**U.S. Cl. 378—65** **19 Claims**



1. A system for applying radiation therapy comprising:

a radiation source for emitting a radiation beam having a beam axis;

an applicator spaced apart from said radiation source, said applicator being mechanically independent of said radiation source, said applicator having a beam inlet end and a beam outlet end;

a plurality of targets affixed to said applicator in a single configuration which enables said applicator to be used on a plurality of patients;

imaging means affixed to said radiation source for forming image data representative of said targets; and

position means for determining positions of said targets based upon said image data.

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### 5,745,546
### ANODE FOR AN X-RAY TUBE

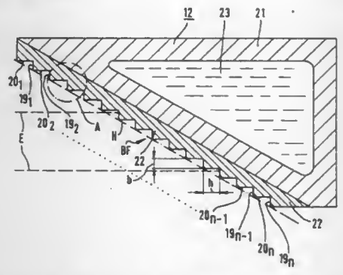
**Erich Hell, Erlangen, and Manfred Fuchs, Nuernberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Mar. 12, 1996, Ser. No. 613,724**

**Claims priority, application Germany, Mar. 20, 1995, 195 10 047.6**

**Int. Cl.[6] H01J** *35/08*

**U.S. Cl. 378—143** **14 Claims**



1. In an x-ray tube having an electron source which emits an electron beam and having an anode with an incident surface on which said electron beam is incident at a focal spot with x-rays emanating from said focal spot, the improvement comprising:

said anode having a region of said surface at least coinciding with said focal spot during operation of said x-ray tube having a step-like structure formed by a plurality of end faces disposed substantially at a right angle to, and being struck by, said electron beam during operation of said x-ray tube for producing x-rays, and said region having a plurality of sidewalls respectively connecting said end faces, each sidewall being disposed at an angle of substantially 98° relative to an end face connected thereto so that electrons backscattered from said end faces during operation of said x-ray tube are incident on said sidewalls and said sidewalls producing x-rays upon being struck by said backscattered electrons.

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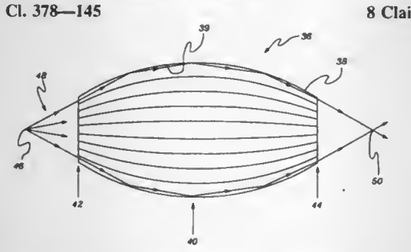
### 5,745,547
### MULTIPLE CHANNEL OPTIC

**Qi-Fan Xiao, Latham, N.Y., assignor to X-Ray Optical Systems, Inc., Albany, N.Y.**

**Filed Aug. 2, 1996, Ser. No. 691,525**

**Int. Cl.[6] G21K** *1/00*

**U.S. Cl. 378—145** **8 Claims**



1. A multiple-channel optic comprising a plurality of channels, each channel having a radius of curvature that varies with channel size.

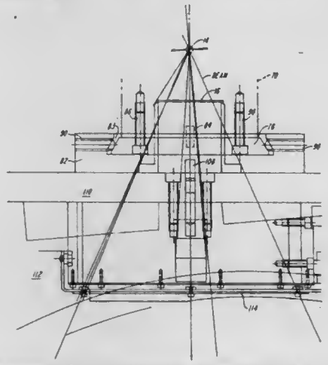
### 5,745,548
### APPARATUS FOR AND METHOD OF ADJUSTABLY PRECALIBRATING THE POSITION OF THE FOCAL SPOT OF AN X-RAY TUBE FOR USE IN A CT SCANNER SYSTEM

**John Dobbs, Hamilton; Ruvin Deych, Brookline, and David Banks, Framingham, all of Mass., assignors to Analogic Corporation, Peabody, Mass.**

**Continuation of Ser. No. 563,658, Nov. 28, 1995, abandoned. This application Feb. 18, 1997, Ser. No. 800,587**

**Int. Cl.[6] G01D** *18/00;* **A61B** *6/08*

**U.S. Cl. 378—207** **31 Claims**



1. An apparatus for precalibrating the position of the focal spot of an energy source adapted for use in an energy system prior to mounting the energy source in the energy system so that said focal spot will be correctly positioned within the system when the energy source is mounted in the system, said apparatus comprising:

detector means for receiving and detecting energy emitted by said energy source;

means for defining at least three beam paths which intersect at a predetermined point in space which is the desired spatial position of said focal spot when said energy source is mounted in said energy system;

support means for supporting said energy source; and

adjustment means, coupled to said support means, for controllably adjusting the position of said energy source relative to said support means prior to mounting the energy source in the energy system until the detection of energy by said detector means satisfies an alignment condition.

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### 5,745,549
### LINE BREAK DETECTION DEVICE AND MODEM COMPRISING SUCH A DEVICE

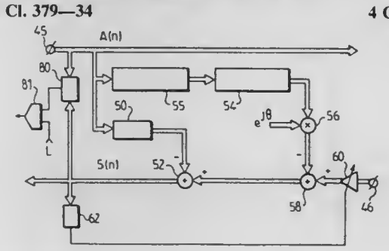
**Jean-Luc Botto, 5, place Jules Ferry, 92120 Montrouge, and Walid Hachem, 39, boulevard Garibaldi, 75015 Paris, both of France**

**Continuation of Ser. No. 302,567, Sep. 8, 1994. This application Dec. 19, 1996, Ser. No. 769,604**

**Claims priority, application France, Sep. 13, 1993, 93 10868**

**Int. Cl.[6] H04M** *1/24;3/22;9/08*

**U.S. Cl. 379—34** **4 Claims**



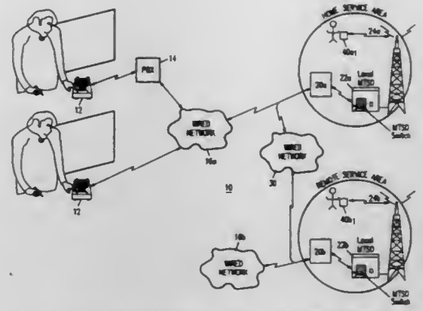
1. A transmission system which includes a near-end modem and a far-end modem connected by a transmission line for duplex transmission of data samples there-between, at least one of the modems including echo suppression means for suppressing received echoes of data samples transmitted by said one modem there being an echo delay period of the transmission path between said modems; said one modem further including a line break detection device which comprises:

a correlation meter for evaluating a measure of the degree of correlation between data samples transmitted by said one modem and data samples subsequently received thereby after a time delay which is a portion of said echo delay period;

automatic gain control means for maintaining a constant level $L_{CAG}$ of data samples received by said one modem; and

a threshold meter for triggering a line break alarm when the evaluated correlation exceeds a threshold level L related to said constant level $L_{CAG}$.





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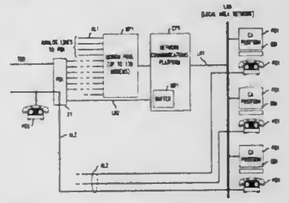
### 5,745,550
### MULTIPLY ACCOMMODATED MESSAGE RELAYING FOR HEARING IMPAIRED CALLERS

**Jerry Eisdorfer, Somerset; Leonard R. Kasday, Moorestown, both of N.J., and David E. Schulz, Wheaton, Ill., assignors to AT&T, Middletown, N.J.**

**Continuation-in-part of Ser. No. 299,937, Sep. 1, 1994, Pat. No. 5,475,733, which is a continuation-in-part of Ser. No. 147,391, Nov. 4, 1993, Pat. No. 5,463,665. This application Jun. 7, 1995, Ser. No. 476,811**

**Int. Cl.[6] H04M** *11/00*

**U.S. Cl. 379—52** **6 Claims**



1. A method of relaying a call between a telephone device for the deaf (TDD) and other users, comprising:

automatically notifying a TDD caller of readiness to receive input;

automatically analyzing received calling information in an expertise-identifying parsing routine;

selecting a communication assistant capable of expertise identified in the analyzing step; and

automatically routing the call to the selected communication assistant;

wherein the expertise is identified on the basis of syntax corrections required.

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### 5,745,551
### TELECOMMUNICATION APPARATUS FOR RECEIVING, STORING AND FORWARDING A PLURALITY OF VOICE SIGNALS TO A WIRELESS NETWORK, IN RESPONSE TO A CONTROL SIGNAL THEREFROM

**Roger Strauch, Piedmont, and Daniel H. Miller, Kensington, both of Calif., assignors to TCSI Corporation, Berkeley, Calif.**

**Filed Oct. 27, 1993, Ser. No. 144,127**

**Int. Cl.[6] H04M** *11/00;1/64*

**U.S. Cl. 379—58** **30 Claims**

1. A telecommunication system for receiving and forwarding a plurality of voice signals, said system comprising:

a first communication network for receiving the plurality of voice signals and for transmitting the plurality of voice signals;

a first communication means, connected to said first communication network for receiving the plurality of voice signals, storing the plurality of voice signals, and retrieving a portion thereof for transmission;

a second wireless public carrier communication network in communication with said first communication means to receive the portion of voice signals therefrom and for transmitting the portion of voice signals and having means for generating a control signal indicative of said wireless network having transmission capacity;

a plurality of second communication means; each of said second communication means including means for communicating with said wireless network to receive one of the voice signals; a second storage means for storing a received one voice signal; a second playback means for retrieving a voice signal stored on the second storage means; and a second control means for controlling said second playback means; and

wherein said first communication means including means for receiving the control signal from the wireless network; means for receiving the plurality of voice signals transmitted on said wired network; a first storage means for storing a received plurality of voice signals; a first playback means for retrieving a portion of the stored plurality of voice signals; and a first control means for controlling said first playback means to transmit the retrieved portion of voice signals to said wireless network, in response to said control signal indicative of said wireless network having the capacity to receive the portion of stored voice signals.

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### 5,745,552
### LINE COMMUNICATION SYSTEMS INCORPORATING MAINS ELECTRICITY CONDUCTORS FOR COMMUNICATIONS

**Gordon William Chambers, Romsey, and Alexander Schroder Philip, Wimborne, both of England, assignors to GPT Limited, Coventry, England**

**Filed Nov. 22, 1995, Ser. No. 562,226**

**Claims priority, application United Kingdom, Nov. 24, 1994, 9423701; Dec. 8, 1994, 9425039**

**Int. Cl.[6] H04M** *11/00*

**U.S. Cl. 379—61** **8 Claims**

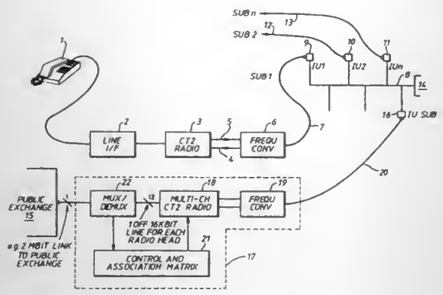
1. A line communication system for linking a plurality of telephone subscribers to a public telephone exchange, wherein the subscribers are each located within a same general area, and wherein each subscriber is fed from the same mains electricity substation with mains electricity via mains electricity supply conductors, comprising:

subscriber apparatus including a cordless telephone (CT) handset and a frequency convertor for each subscriber, the handset being hard-wired to the mains electricity supply conductors via the frequency convertor so that CT signals at UHF are down-converted to HF for transmission through the mains electricity conductors;

a CT base station connected to the public telephone exchange, the CT base station connected to the mains electricity supply

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conductors via a further frequency convertor for HF line communication purposes; and

a control matrix provided in operative association with the base station to associate an address corresponding to a telephone number for each subscriber as recognized by the public telephone exchange with corresponding channels assigned by the CT protocol to each subscriber wherein the public telephone exchange and the subscribers are placed in mutual two-way communication.

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**5,745,553**

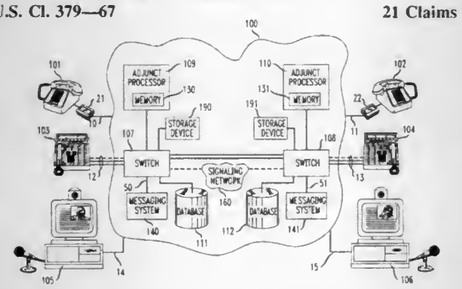
**ON-DEMAND COMMUNICATIONS SERVICES**

**Jean-Robert Mirville, Manalapan, and David Phillip Silverman, Somerville, both of N.J., assignors to AT&T Corp., Middletown, N.J.**

**Filed Apr. 16, 1996, Ser. No. 632,864**

**Int. Cl.[6] H04M** *1/64;3/42*

**U.S. Cl. 379—67** **21 Claims**




1. A method carried out by a provider for delivering communications services feature information comprising the steps of:

recognizing that a call is being established between a party and a subscriber;

retrieving database information related to a communications services feature that is invokable during said call from a database based on the identity of said subscriber or said party;

transmitting communications services feature information to said party based on said database information and the current state of said call.

**5,745,554**

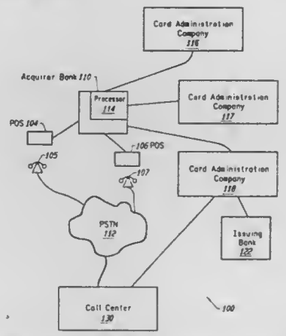
**SYSTEMS FOR REQUESTING SERVICES USING CARD READING TERMINALS**

**Maks Rozetti, Danville, Calif., assignor to Impact With Quality, Inc., Oakland, Calif.**

**Filed Jul. 18, 1996, Ser. No. 683,483**

**Int. Cl.[6] H04M** *11/00*

**U.S. Cl. 379—91.02** **13 Claims**




11. A method by a requester to request services from a service provider using a card reading device, comprising the steps of:

assigning a card number to said requester, said card number having a set of digits referencing a call center of said service provider and a set of digits referencing said requester;

reading said card number using said card reading device;

entering a contact number associated with a communication device located in the proximity of said card reading device;

sending said card number read by said card reading device and said entered contact number to said call center associated with said card number;

obtaining information relating to said requester based on said card number;

assigning an agent in said call center to contact said requester based on said information; and

contacting said requester by said agent of said call center using said contact number.

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**5,745,555**

**SYSTEM AND METHOD USING PERSONAL IDENTIFICATION NUMBERS AND ASSOCIATED PROMPTS FOR CONTROLLING UNAUTHORIZED USE OF A SECURITY DEVICE AND UNAUTHORIZED ACCESS TO A RESOURCE**

**Andrew R. Mark, New York, N.Y., assignor to Smart Tone Authentication, Inc., New York, N.Y.**

**Division of Ser. No. 286,825, Aug. 5, 1994, Pat. No. 5,583,933. This application Jun. 7, 1996, Ser. No. 657,594**

**Int. Cl.[6] H04M** *1/66*

**U.S. Cl. 379—95** **13 Claims**

1. A security method for controlling unauthorized access to a resource, comprising the steps of:

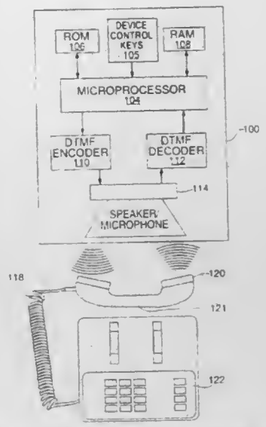
requesting an authorized user of a security device to select a set of N PINs and N distinct phrases, each one of the N distinct phrases including at least one word, each one of the N distinct phrases being associated with a corresponding one of the N PINs for identifying the corresponding one of the N PINs and for acting as a prompt to remind the authorized user of the corresponding one of the N PINs, wherein N is a positive integer;

storing in the security device the N PINs and the associated N distinct phrases;

transmitting an encoded signal from the security device to a verification service, the encoded signal representing the N PINs and the associated N distinct phrases;

receiving the encoded signal from the security device at the verification service;






decoding the encoded signal at the verification service to obtain the N PINs and the associated N distinct phrases;

selecting, by the verification service, a first one of the N PINs;

prompting, by the verification service, a current user of the security device for a first time using the one of the N distinct phrases associated with the first selected one of the N PINs as a first prompt;

receiving at the verification service a first response to the first prompt from the current user;

determining at the verification service, as a function of the first response, whether the current user of the security device is the authorized user, wherein the step of determining includes the step of comparing the first response to the first selected one of the N PINs to determine if there is a match; and

granting, to the current user by the verification service, access to a resource if it is determined that the current user of the security device is the authorized user.

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**5,745,556**

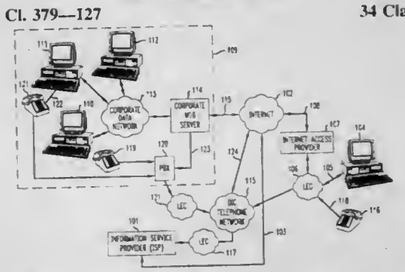
**INTERACTIVE AND INFORMATION DATA SERVICES TELEPHONE BILLING SYSTEM**

**Yzhak Ronen, West Windsor, N.J., assignor to AT&T Corp., Middletown, N.J.**

**Filed Sep. 22, 1995, Ser. No. 532,336**

**Int. Cl.[6] H04M** *15/00*

**U.S. Cl. 379—127** **34 Claims**




1. A method of billing for charges for information and/or interactive services provided to a user by a provider on a first point-to-point connection between the user and the provider at least in part over a data network, the user being associated with a telephone number on a switched telephone network separate from the data network, the method comprising the steps of:

initiating, by the user, on a second separate connection over the switched telephone network, a billing telephone call directed to a provider's telephone number, the provider's telephone number being the type of telephone number in which the charge to a caller for a telephone call to that telephone number is determined by a called party, the charge for the billing telephone call to the provider's telephone number representing the cost for the user to obtain the information and/or interactive services provided by the provider on the first connection;

associating the billing telephone call on the switched telephone network with the first point-to-point connection between the user and the provider at least in part over the data network; and

billing a telephone account associated with the telephone number associated with the user for the cost of the billing telephone call.

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**5,745,557**

**CIDCW PRIMARY/SECONDARY ARBITRATION**

**Ron Anglikowski, Morgan Hill, Calif., assignor to CIDCO Incorporated, Morgan Hill, Calif.**

**Continuation-in-part of Ser. No. 388,108, Feb. 13, 1995. This application Apr. 28, 1995, Ser. No. 431,172**

**Int. Cl.[6] H04M** *1/60;13/00*

**U.S. Cl. 379—177** **38 Claims**



1. A method for receiving identifying information about a telephone call by a plurality of conforming customer premises equipments (CCPEs) coupled to a telephone line, said method comprising the steps of:

monitoring said telephone line with at least one of said CCPEs for a carrier signal transmitted by any of said other CCPEs; and

providing said carrier signal from said one of said CCPEs on said telephone line when said carrier signal is not detected in said monitoring step.

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**5,745,558**

**THREE-WAY CALL DETECTION AND RESPONSE SYSTEM**

**Charles T. Richardson, Jr., Norcross; Samuel F. Billingsley, III, Atlanta, and Robert W. Livingston, Jr., Suwanee, all of Ga., assignors to United States Advanced Network, Inc., Norcross, Ga.**

**Filed Oct. 27, 1995, Ser. No. 549,258**

**Int. Cl.[6] H04M** *3/20*

**U.S. Cl. 379—189** **33 Claims**

1. A method of processing a telephone call, said method comprising the steps of:

identifying a first location as a location requiring monitoring;

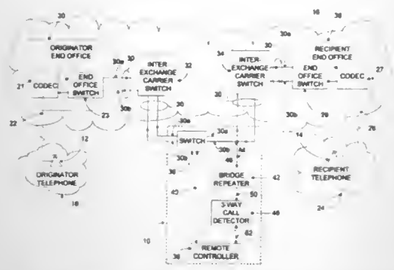
establishing a communication path to allow monitoring;

mapping the communication path to a port of a monitoring apparatus;

monitoring the communication path connecting a telephone call originator at the first location and a telephone call recipient at a second location to detect an attempted three-way telephone

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call placement by the telephone call recipient, wherein monitoring is performed at a location distant from the first location, and

upon detection of an attempted three-way telephone call placement, responding in a predetermined manner.

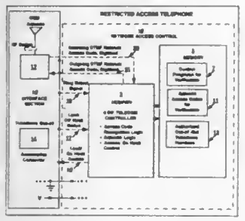
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**5,745,559**

**RESTRICTED ACCESS TELEPHONES FOR LOGICAL TELEPHONE NETWORKS**

**Earline Madsen Weir, 1210 Second St., Manhattan Beach, Calif. 90266**

**Filed Jul. 24, 1996, Ser. No. 685,692**
**Int. Cl.[6] H04M *1/66***
**U.S. Cl. 379—199** **25 Claims**



**1.** A restricted access telephone for use in a switched communications network, said restricted access telephone containing a first network access code identifying said restricted access telephone as a member of a first auxiliary logical network containing a plurality of telephones similar to one another, comprising:

communications means for placing and answering telephone calls to establish a telephone connection with a second telephone over said switched communications network for permitting communication there between, said communications means including dialing means for dialing telephone numbers;

a network access code listing of network access codes of auxiliary logical networks to which said restricted access telephone is a member, including said first network access code;

call origination status monitoring means for monitoring whether said communications means places or answers a telephone call;

first verification means, responsive to said call origination status monitoring means determining that said communications means has placed a call, for automatically determining whether a second telephone with which a telephone connection is established contains a listed network access code contained in said network access code listing and for thereafter automatically sending said listed network access code to said second telephone when said automatic determination is positive; and

second verification means, responsive to said call origination status monitoring means determining that said communications means has answered a call from a second telephone, for automatically sending said first network access code to said second telephone and for thereafter automatically determining whether said second telephone contains said first network access code; and

perceptible indication means for providing a perceptible indication, responsive to either of said first and second verification means making a negative automatic determination.

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**5,745,560**

**Patent Not Issued For This Number**

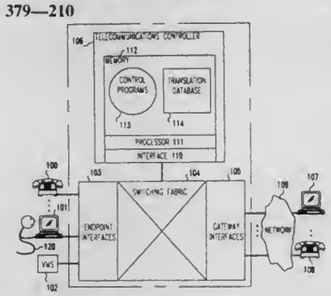
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**5,745,561**

**MULTIPLE INDEPENDENT NAMED CALL-COVERAGE PATHS**

**Stephen A. Baker, and Douglas J. Blondin, both of Thornton, Colo., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed May 31, 1996, Ser. No. 656,133**
**Int. Cl.[6] H04M *3/54***
**U.S. Cl. 379—210** **14 Claims**



**1.** A communications system comprising:

a memory, associated with a principal address for receiving communications, for storing information defining a plurality of independent coverage paths for the principal address, each coverage path comprising a plurality of alternative addresses for receiving a communication directed to the principal address, an indication of whether the coverage path has been made active by the principal, and a name of the cover path given to the coverage path by the principal, the name being independent of criteria for using the coverage path and different from names of all others of the plurality of independent coverage paths for the principal address; and

means selectively responsive to receipt of a communication directed to the principal address, for selecting an active one of the plurality of coverage paths to an exclusion of all others of the plurality of coverage paths and redirecting the communication to an alternative address included in the selected coverage path.

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**5,745,562**

**TELEPHONE STATION VOICE ANNOUNCE DEVICE AND METHOD**

**Randall J. Penning, Middletown, N.J., assignor to Lucent Technologies, Inc., Murray Hill, N.J.**

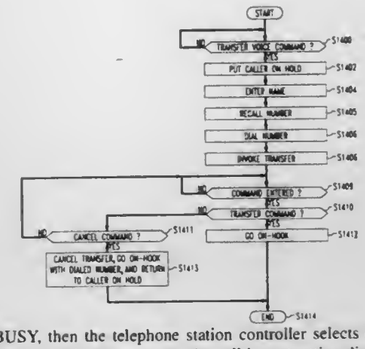
**Filed Dec. 27, 1995, Ser. No. 579,174**
**Int. Cl.[6] H04M *3/42;1/57***
**U.S. Cl. 379—215** **16 Claims**

**1.** A telephone station voice announce device for a telephone station, comprising:

user interface devices; and

a telephone station controller coupled to the user interface devices, wherein the telephone station controller selects at least one of the user interface devices to announce a call from a remote caller based on a state of the telephone station and wherein the user interface devices comprise a display device, and if the state of the telephone station is SPEAKER and





BUSY, then the telephone station controller selects only the display device to announce the call by outputting displayable data to the display device.

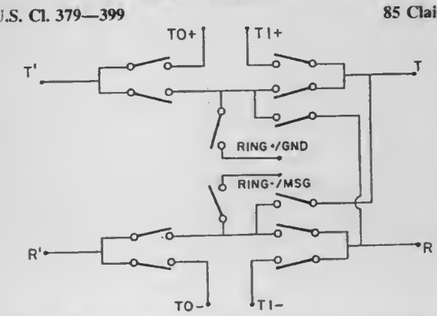
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**5,745,563**

**TELEPHONE SUBSCRIBER LINE CIRCUIT, COMPONENTS AND METHODS**

**John S. Prentice, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.**

**Filed Feb. 25, 1992, Ser. No. 840,547**
**Int. Cl.[6] H04M *1/00***
**U.S. Cl. 379—399** **85 Claims**




**1.** In a telephone subscriber line circuit for relaying audio signals from a digital switch matrix and ring signals to a subscriber wire pair, and having plural relays for plural functions, the improvement wherein at least one of said plural relays comprises a plurality of analog, zero offset, bidirectional, semiconductor integrated circuit switches that have substantially identical operating characteristics.

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**5,745,564**

**ECHO CANCELLING ARRANGEMENT**

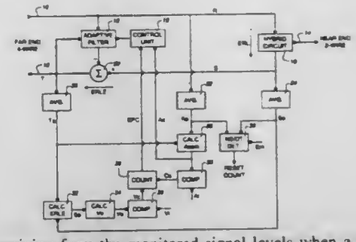
**Quentin James Meek, Gloucester, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Jan. 26, 1995, Ser. No. 378,335**
**Int. Cl.[6] H04M *9/00***
**U.S. Cl. 379—410** **27 Claims**

**1.** A method of detecting echo path changes in an echo cancelling arrangement in which an estimated echo signal is produced from a receive path signal and is subtracted from an incoming transmit path signal to produce an outgoing transmit path signal, comprising the steps of:

monitoring signal levels on said paths;

determining from the monitored signal levels when a first echo attenuation parameter of the echo cancelling arrangement is less than a first threshold value;



determining from the monitored signal levels when a variation of a second echo attenuation parameter of the echo cancelling arrangement is less than a second threshold value; and

detecting that an echo path has changed in response to determinations that the first echo attenuation parameter is less than the first threshold value and that the variation of the second echo attenuation parameter is less than the second threshold value.

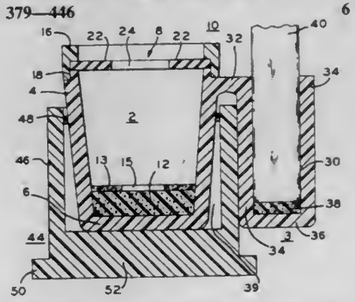
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**5,745,565**

**COMBINATION CUP AND CELLULAR PHONE HOLDER**

**Ivan Nelson Wakefield, Cary, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.**

**Filed May 6, 1996, Ser. No. 643,705**
**Int. Cl.[6] H04M *1/00*; A47K *1/08***
**U.S. Cl. 379—446** **6 Claims**



**1.** A combination beverage and portable communication unit holder for insertion into an existing vehicle beverage holder having side walls comprising:

an integral beverage holder portion and portable communicator holder portion;

said beverage holder portion including outer walls with an opening at the upper end and dimensioned for insertion and retention in said vehicle beverage holder;

said portable communicator holder portion including a holding pocket with an opening at the upper end hereof;

a connector joining said open end of said beverage holder portion to the open end region of said portable communicator holder portion with a space between said beverage holder and portion and said portable communicator holder portion below said connector dimensioned to slip over said side walls of said existing vehicle beverage holder;

said beverage holder portion being dimensioned to enable insertion into said existing vehicle beverage holder to provide a nested beverage holder with adjacent portable communication holder.

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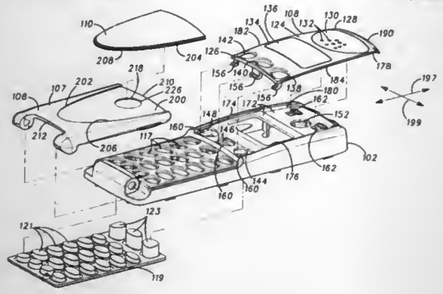


5,745,566

## PORTABLE COMMUNICATION DEVICE HAVING REMOVABLE ESCUTCHEON ELEMENTS

Thomas Athony Petrella, Burlington, Wis., and Rudy Yorio, Mundelein, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 15, 1996, Ser. No. 730,189
Int. Cl.[6] H04M 1/00
U.S. Cl. 379—433 24 Claims



1. A portable communication device comprising:
a housing including a rear housing and a front housing, the front housing having a front surface and including a first end and a second end;
a keypad cover movably disposed on the first end of the front housing, the keypad cover having an inner surface and an outer surface;
a first escutcheon removably disposed on the front surface proximate the second end of the housing; and
a second escutcheon removably disposed on the outer surface of the keypad cover,
the first escutcheon and the second escutcheon configured for removable attachment to the front surface of the front housing for customizing appearance of the portable communication device.

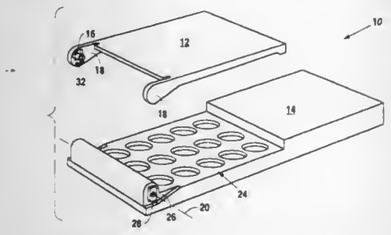
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5,745,567

## DETENT ASSEMBLY FOR HOUSING COVER

David Desmond Middleton, Raleigh, N.C., assignor to Ericsson, Inc., Research Triangle Park, N.C.

Filed Nov. 7, 1996, Ser. No. 743,759
Int. Cl.[6] H04M 1/00
U.S. Cl. 379—433 12 Claims



1. A detent assembly for a housing cover, comprising:
a housing having a pair of substantially parallel spaced apart mounting surfaces positioned normal to an axis extending through a predefined portion of said housing;
a cover having a pair of spaced apart mounting arms whereby said cover is pivotally attached to said housing for rotation about said axis between a closed position at which the cover is disposed at a position overlying at least a portion of the housing and an open position at which said cover is spaced from said portion of the housing;
a pair of pivot pins, each pin of said pair having a predefined cross-sectional area and being coaxially aligned with the axis extending through said housing and disposed on a predetermined one of said pair of mounting surfaces on the housing and said pair of mounting arms of the cover;
a pair of apertures, each aperture of said pair being coaxially aligned with the axis extending through said housing and adapted to rotatably receive a respective one of said pivot pins, said apertures being respectively formed in the other one of said pair of mounting surfaces on the housing and said pair of mounting arms of the cover;
an embossment extending outwardly from each of the mounting surfaces on the housing and having side surfaces defining a peripheral boundary, each embossment being disposed normal to said axis and positioned so that the axis extending through a portion of the housing also passes through said embossment, and each embossment having a cross-sectional area normal to said axis extending through a portion of said housing that is greater than the cross-sectional area of a respective one of said pivot pins; and
a recess formed in each of said mounting arms of the cover normal to said axis extending through a portion of said housing, each of said recesses having a shape adapted to receive a respective one of said embossments when said cover is at said closed and open positions, and each of said recesses being positioned so that the axis extending through a portion of the housing also passes through said recess, said respective embossments being non-rotatably seated within said respective recesses when said cover is at said open and said closed positions, and said respective recesses being urged in a direction away from each other when said cover is moved between said open and said closed positions and are displaced from said seated position within said respective recess.

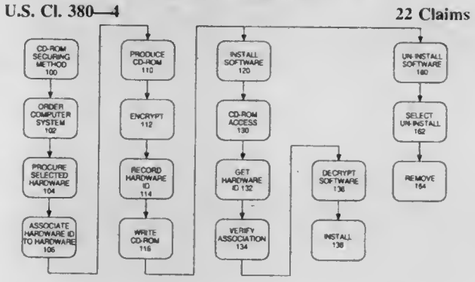
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5,745,568

## METHOD OF SECURING CD-ROM DATA FOR RETRIEVAL BY ONE MACHINE

Clint H. O'Connor, Austin, and John J. Pearce, Del Valle, both of Tex., assignors to Dell USA, L.P., Round Rock, Tex.

Filed Sep. 15, 1995, Ser. No. 528,961
Int. Cl.[6] H04L 9/00
U.S. Cl. 380—4 22 Claims




1. A method of securing data on a storage medium for exclusive retrieval by a specified computer system comprising the steps of:
requisitioning a computer system designating a selected hardware configuration and selected software components;
procuring the selected hardware;
associating a hardware identifier to the selected hardware;
programming a storage medium containing software program files corresponding to the selected software components including the steps of:
encrypting the software program files using the hardware identifier as an encryption key; and
writing the encrypted software program files to the storage medium; and
installing the software programs on the selected hardware including the steps of:
retrieving the hardware identifier associated to the selected hardware;
decrypting the software program files using the hardware identifier as a decryption key; and
installing the decrypted software program files on the hardware.



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5,745,569

## METHOD FOR STEGA-CIPHER PROTECTION OF COMPUTER CODE

Scott A. Moskowitz, North Miami Beach, Fla., and Marc Cooperman, Palo Alto, Calif., assignors to The Dice Company, Miami, Fla.

Filed Jan. 17, 1996, Ser. No. 587,943
Int. Cl.[6] H04L 9/00
U.S. Cl. 380—4 20 Claims

16. A method for copy protecting a software application executed by a computer system, the software application including a plurality of executable code resources loaded in a memory of the computer system, said method comprising the steps of:
determining an address within the memory of the computer system associated with each of the plurality of executable code resources; and
intermittently relocating each of the plurality of executable code resources to a different address within the memory of the computer during execution of the software application.

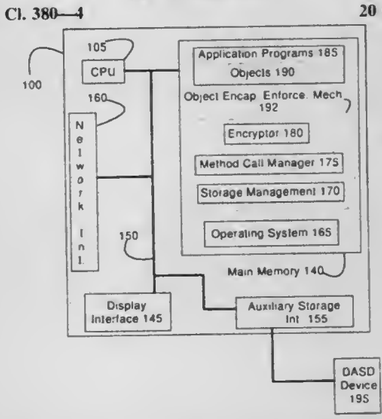
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5,745,570

## OBJECT-ORIENTED PROGRAMMING ENVIRONMENT THAT PROVIDES OBJECT ENCAPSULATION VIA ENCRYPTION

Erik Edward Voldal, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1996, Ser. No. 632,299
Int. Cl.[6] H04L 9/00
U.S. Cl. 380—4 20 Claims




6. A network of computer systems, said network comprising:
a first computer system, said first computer system comprising,
a first central processing unit;
a first bus;
first computer system memory connected to said first central processing unit via said first bus;
a storage management mechanism, said storage management mechanism being stored in said first computer system memory for execution on said first central processing unit, said storage management mechanism being used to allocate computer system memory for at least one instantiated object and to cause encryption of an object address that refers to said object;
a second computer system, said second computer system being connected to said first computer system, said second computer system comprising,
a second central processing unit;
a second bus;
second computer system memory connected to said central processing unit via said second bus; and
a method call manager, said method call manager being stored in said second computer system memory for execution on said second central processing unit, said method call manager being used to decrypt said encrypted object address of said at least one object when access by at least one application program is requested.

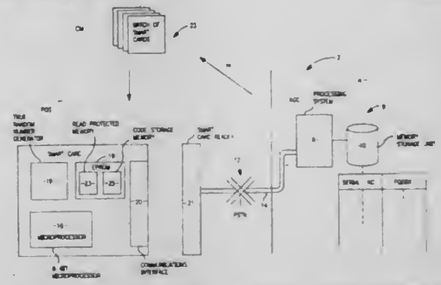
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5,745,571

## CRYPTOGRAPHIC COMMUNICATIONS METHOD AND SYSTEM

Edward Andrew Zuk, Elwood, Australia, assignor to Telstra Corporation Limited, Melbourne, Australia

PCT No. PCT/AU93/00137, § 371 Date Nov. 14, 1994, § 102(e) Date Nov. 14, 1994, PCT Pub. No. WO93/20538, PCT Pub. Date Oct. 14, 1993
PCT Filed Mar. 30, 1993, Ser. No. 313,214
Claims priority, application Australia, Mar. 30, 1992, PL1602
Int. Cl.[6] H04L 9/08;9/30;9/00
U.S. Cl. 380—21 39 Claims



15. A communications system comprising smart card means and a central processing station, said smart card means including:
means for storing a random key on a smart card,
means for encrypting said random key using a public key; and
means for decrypting data encrypted using said random key; and said central station including:
means for decrypting the encrypted random key using a secret key, and
means for encrypting data using said random key and transmitting the encrypted data to said smart card.

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5,745,572

## CRYPTOGRAPHIC KEY MANAGEMENT

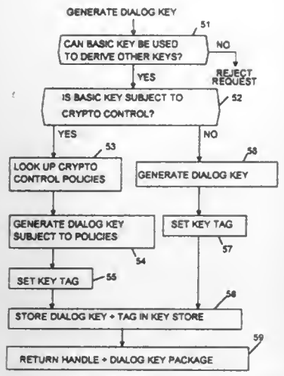
James Press, Biggleswade, England, assignor to International Computers Limited, Putney, United Kingdom

Filed Jan. 17, 1996, Ser. No. 588,072
Claims priority, application United Kingdom, Feb. 24, 1995, 9503738
Int. Cl.[6] H04L 9/08
U.S. Cl. 380—21 7 Claims

1. A cryptographic support facility for use in data processing system, said cryptographic support facility comprising:
(a) means for storing at least one cryptographic key:
(b) means for storing a tag for said cryptographic key, said tag including a code indicating whether it is permissible for said cryptographic key to be used as a basis for generating new keys;

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(c) means for receiving a request to generate a new key using said cryptographic key as a basis;

(d) means responsive to said request, for accessing the tag of said cryptographic key to check said code; and

(e) means for generating said new key in the event that said code indicates that it is permissible for said cryptographic key to be used as a basis for generating new keys.

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**5,745,573**

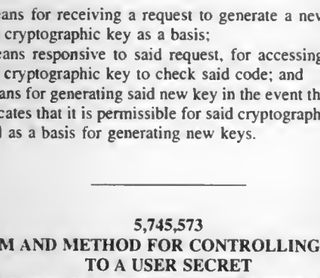
**SYSTEM AND METHOD FOR CONTROLLING ACCESS TO A USER SECRET**

**Steven B. Lipner, Oakton, Va.; David M. Balenson, Olney, Md.; Carl M. Ellison, Baltimore, Md., and Stephen T. Walker, Glenwood, Md., assignors to Trusted Information Systems, Inc., Glenwood, Md.**

**Continuation of Ser. No. 691,564, Aug. 26, 1996, abandoned, which is a division of Ser. No. 390,959, Feb. 21, 1995, Pat. No. 5,557,765, which is a continuation-in-part of Ser. No. 289,602, Aug. 11, 1994, Pat. No. 5,557,346. This application Jan. 10, 1997, Ser. No. 781,626**

**Int. Cl.[6] H04L** *9/08*

**U.S. Cl. 380—21** **35 Claims**



1. A data recovery center, comprising:

means for receiving an access rule from an access rule defining system in communication with the data recovery center, wherein said access rule includes an authentication test or a compound authorization rule, said access rule defining at least a portion of a procedure for authenticating an identity of an emergency decryptor, wherein emergency decryption comprises decryption using a data recovery field;

means for generating an access rule index and associating said access rule index with said access rule, wherein an access rule index is included within a data recovery field and allows the data recovery center to locate an access rule that control access, by an emergency decryptor, to a secret within a data recovery field; and

means for communicating said access rule index to said access rule defining system.

**5,745,574**

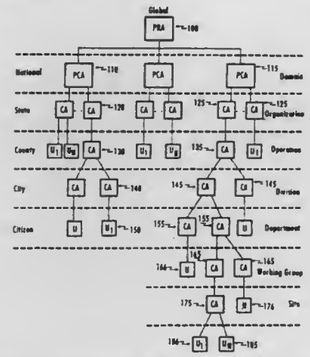
**SECURITY INFRASTRUCTURE FOR ELECTRONIC TRANSACTIONS**

**Sead Muftic, Hasselby, Sweden, assignor to Entegrity Solutions Corporation, San Jose, Calif.**

**Filed Dec. 15, 1995, Ser. No. 573,025**

**Int. Cl.[6] H04K** *1/00*

**U.S. Cl. 380—23** **34 Claims**



1. A certification system for issuance, distribution and verification of public key certificates which may be used for secure and authentic electronic transactions over open networks, comprising computer processes implementing certification servers, certification clients and certification protocols, in which:

a. one or more first computer processes are associated with at least one initial (root) registration authority,

b. one or more second computer processes are associated with policy certification authorities,

c. one or more third computer processes are associated with certification authorities, and

d. one or more end-user computer processes or application computer processes are associated with respective end-users or user applications, and

e. said one or more second computer processes hold a data structure certified by said registration authority, said one or more third computer processes hold a data structure certified either by one of said policy certification authorities or other certification authorities, and end-user or application computer processes hold a data structure certified by one or more of said certification authorities,

whereby users and applications of said system are logically located at end-points of certification chains in a certification infrastructure.

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**5,745,575**

**IDENTIFICATION-FRIEND-OR-FOE (IFF) SYSTEM USING VARIABLE CODES**

**William F. Otto, deceased, late of Huntsville, Ala.; William F. Otto, Jr., heir, Moorpark, Calif.; Lorinda R. Otto, heiress; Robert A. Otto, heir, both of Huntsville, Ala.; Debbee J. Jordan, Valhermoso Springs, Ala.; Miles E. Holloman, Decatur, Ala., and Stanley P. Patterson, Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed May 20, 1996, Ser. No. 668,608**

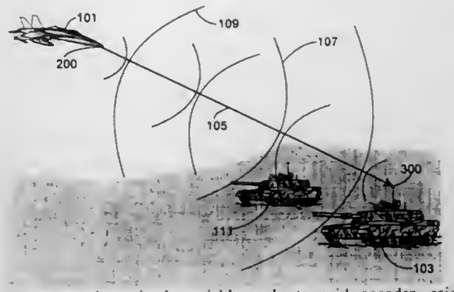
**Int. Cl.[6] H04L** *9/32; G01S 13/74*

**U.S. Cl. 380—23** **8 Claims**

1. An identification-friend-or-foe (IFF) system for identifying friendly entities on the battlefield so as to avoid fratricide, said system residing on a first entity and comprising:

a laser for emitting interrogation pulses toward a second entity on the battlefield to signify the initiation of interrogation; an encoder for encrypting and decrypting information input thereto; a means for inputting pre-selected identification information into said encoder; a means for communicating at least





one pre-determined, variable code to said encoder, said encoder selectively encrypting and decrypting the identification information using said code and producing outgoing digital data stream containing the encrypted identification information therein; a transmitting means coupled to said encoder for receiving said outgoing data stream from said encoder, said transmitting means being capable of generating outgoing RF energy, said outgoing RF energy being modulated by said outgoing data stream, and transmitting said outgoing, modulated RF energy toward the second entity; a receiving means coupled to said encoder for receiving incoming RF energy, said incoming RF energy having originated from the second entity, converting said incoming RF energy into incoming digital data stream and subsequently inputting said incoming data stream to said encoder to be decrypted thereby using said pre-determined code, the result of the decryption being indicative of the battlefield affiliation of the second entity; and a laser detector for detecting interrogation pulses that may be incident on the first entity from the second entity.

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**5,745,576**

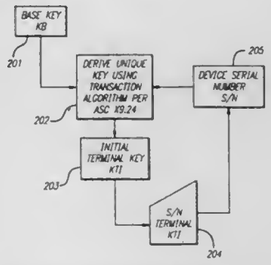
**METHOD AND APPARATUS FOR INITIALIZATION OF CRYPTOGRAPHIC TERMINAL**

**Dennis G. Abraham, Concord, N.C., and Richard K. Hite, Manteca, Calif., assignors to Visa International Service Association, Foster City, Calif.**

**Filed May 17, 1996, Ser. No. 650,888**

**Int. Cl.[6] H04L** *9/32*

**U.S. Cl. 380—25** **23 Claims**




1. A method for initializing a cryptographic terminal in a cryptographic system with an operational key comprising the steps of:

defining a base key for a cryptographic system;

storing said base key in a controller of said cryptographic system;

deriving an initial terminal key for a cryptographic terminal having a unique identifying number, said initial terminal key derived using said base key and said unique identifying number;

storing said initial terminal key in said cryptographic terminal;

establishing communication between said controller and said cryptographic terminal;

sending said unique identifying number from said cryptographic terminal to said controller;

at said controller, using a first processing means, deriving an expected initial terminal key using said unique identifying number and said base key;

encrypting a challenge message at said controller using said expected initial terminal key and transmitting said encrypted challenge message to said cryptographic terminal;

at said cryptographic terminal, using a second processing means, decrypting said encrypted challenge message using said initial terminal key;

encrypting a response message at said cryptographic terminal using said initial terminal key and transmitting said encrypted response message to said controller;

comparing said encrypted response message at said controller to an expected response message;

verifying said cryptographic terminal as an authentic cryptographic terminal when said response message matches said expected response message.

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**5,745,577**

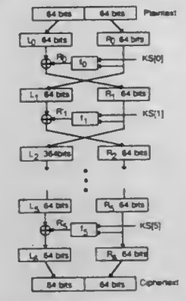
**SYMMETRIC CRYPTOGRAPHIC SYSTEM FOR DATA ENCRYPTION**

**Marcus D. Leech, Smiths Falls, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Jul. 25, 1996, Ser. No. 687,303**

**Int. Cl.[6] H04L** *9/28;9/06;9/00*

**U.S. Cl. 380—28** **16 Claims**




16. A data encryption system for cryptographically transforming between plaintext and ciphertext in data blocks of a predetermined bitlength by performing a plurality of consecutive transformation rounds of half of each data block, comprising:

a first set of a plurality of "m×n" s-boxes where m and n are different integers for processing each half data block to expand the same to a predetermined bitlength;

a first XOR gate for XORing a subkey and the expanded half data block to generate a first transformed half data block of the transformation round;

a second set of "p×q" s-boxes and a third set of "q×r" s-boxes where p, q and r are different integers for processing the first transformed half data block to generate a second transformed half data block; and

a second XOR gate for XORing the second transformed half data block to generate a transformed half data block of one of the consecutive transformation rounds.

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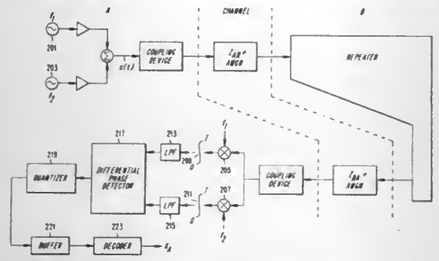


5,745,578

## APPARATUS AND METHOD FOR SECURE COMMUNICATION BASED ON CHANNEL CHARACTERISTICS

Amer Aref Hassan, Cary, N.C.; John Erik Hershey, Ballston Lake, N.Y., and Sandeep Chennakeshu, Cary, N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Jun. 17, 1996, Ser. No. 665,339
Int. Cl.[6] H04L *9/00;* H04B *7/00;17/00;* H04Q *3/02*
U.S. Cl. 380—44 10 Claims




1. A method of establishing a key sequence for secure communication through a communication channel between a first transceiver and a second transceiver, comprising the steps of:

in the first transceiver, transmitting a first plurality of tones, each tone having a respective predetermined frequency and a predetermined initial phase;

in the second transceiver, receiving the first plurality of tones transmitted by the first transceiver and transmitting the received first plurality of tones without substantial change back to the first transceiver;

in the second transceiver, transmitting a second plurality of tones, each tone having a respective predetermined frequency and a predetermined initial phase;

in the first transceiver, receiving the second plurality of tones and transmitting the received second plurality of tones without substantial change back to the second transceiver;

in the first transceiver, determining differences between phases of pairs of the received first plurality of tones, quantizing each difference into a respective one of a plurality of phase decision values; and decoding a plurality of the quantized differences into a key sequence according to a predetermined block code; and

in the second transceiver, determining differences between phases of pairs of the received second plurality of tones, quantizing each difference into a respective one of a plurality of phase decision values; and decoding a plurality of the quantized differences into the key sequence according to the predetermined block code.

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5,745,579

## CELLULAR TELEPHONE SECURITY ADAPTER AND METHOD

Marc Alan Newman, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

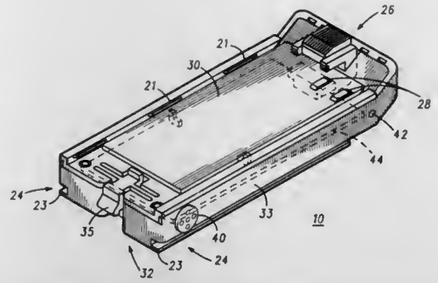
Filed Apr. 25, 1997, Ser. No. 840,923
Int. Cl.[6] H04L *9/10*
U.S. Cl. 380—52 9 Claims

7. An adapter for a cellular telephone, said adapter including:

a first coupling apparatus disposed on a first surface of said adapter, said first coupling apparatus for engaging said adapter to a rear surface of said cellular telephone;

an earpiece fixedly attached to a side of said adapter near a first end of said side;

a second coupling apparatus disposed on a second surface of said adapter, said second coupling apparatus for engaging said adapter to a power source; and




a microphone coupled to said side of said adapter at an end of said side remote from said first end.

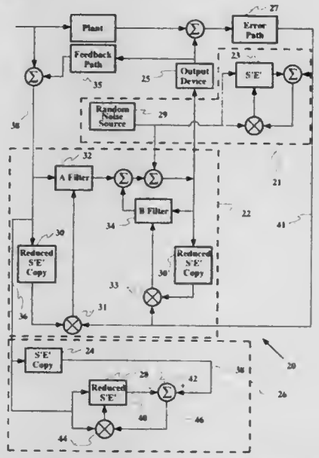
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5,745,580

## REDUCTION OF COMPUTATIONAL BURDEN OF ADAPTIVELY UPDATING CONTROL FILTER(S) IN ACTIVE SYSTEMS

Steve C. Southward, Cary, and Lane R. Miller, Fuquay-Varina, both of N.C., assignors to Lord Corporation, Cary, N.C.

Filed Nov. 4, 1994, Ser. No. 334,467
Int. Cl.[6] A61F *11/06;* H03B *29/00*
U.S. Cl. 381—71 20 Claims




1. A method of reducing the computational burden of an active system, comprising the steps of:

(a) obtaining an input signal indicative of characteristics of a source of disturbance, said input signal having dominant tones present therein to be canceled;

(b) extracting an error signal indicative of a residual disturbance at a selected location;

(c) inputting said input signal into an update model having a control filter for generating a control signal, said control filter having a plurality of control filter weights which are adaptively updated according to an update calculation method;

(d) determining coefficients of a long filter model which represents a frequency response of said system;

(e) transforming said long filter model into a shortened filter model;

(f) inputting said input signal into said shortened filter model to generate a shortened filter output;

(g) adaptively calculating said control filter weights of said control filter according to said update calculation method based upon said shortened filter output and said error signal; and



(h) driving an output device responsive to said control signal in order to reduce at least one of vibration and sound at said selected location.

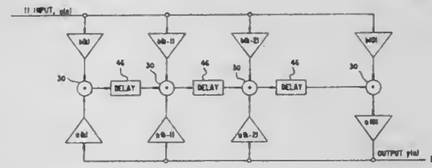
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5,745,581

## TRACKING FILTER FOR PERIODIC SIGNALS

Graham P. Eatwell, Cambridge, United Kingdom, and Yong J. Yan, Piscataway, N.J., assignors to Noise Cancellation Technologies, Inc., Linthicum, Md.

Continuation of Ser. No. 187,022, Jan. 27, 1994, abandoned.
This application Jul. 26, 1996, Ser. No. 694,806
Int. Cl.[6] A61F *11/06*
U.S. Cl. 381—71.11 22 Claims




1. A method for designing a frequency periodic filter with a frequency response which is substantially periodic in some bandwidths, said filter including filter coefficients and effective delay elements, said method comprising,

determining said filter coefficients by designing a first sampled data filter, said first filter including said filter coefficients and unity delay elements, such that the frequency response of said first filter corresponds to one period of the desired frequency response,

setting said effective delay elements to have an effective delay proportional to the reciprocal of the period of said frequency response.

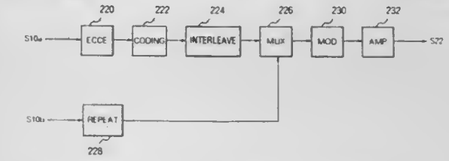
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5,745,582

## AUDIO SIGNAL TRANSMITTING APPARATUS AUDIO SIGNAL RECEIVING APPARATUS AND AUDIO SIGNAL TRANSMITTING AND RECEIVING SYSTEM

Yoshihide Shimpuku, Kanagawa; Yasuyuki Chaki; Norihito Mihota, both of Chiba, and Takatsuna Sasaki, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 13, 1996, Ser. No. 614,493
Claims priority, application Japan, Mar. 16, 1995, 7-057669
Int. Cl.[6] H04B *3/00*
U.S. Cl. 381—77 12 Claims




22

1. An audio signal transmitting apparatus comprising:

an audio transmission signal generating means for adding an error correction signal to a digital audio signal and encoding and interleaving the result to generate an audio transmission signal;

a continuous signal generating means which generates a continuous signal by repeating a predetermined number of times a digital control signal to be used for the reproduction of the digital audio transmission signal;

a multiplexing means for multiplexing the audio transmission signal and the continuous signal to generate a multiplexed signal;

a modulated signal generating means for modulating the multiplexed signal by a predetermined digital modulation method to generate a modulated signal within a predetermined frequency band; and

an optical signal transmitting means for converting the modulated signal to an optical transmission signal and transmitting the same.

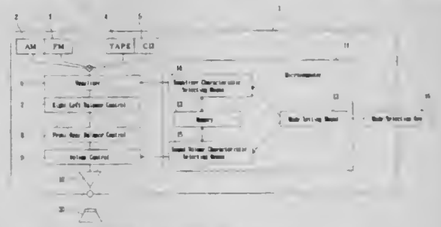
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5,745,583

## AUDIO PLAYBACK SYSTEM

Jun Koizumi, Wako, and Minoru Kobayashi, Yokohama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, and Matsushita Electric Industrial Co, Ltd, Kadoma, both of Japan

Continuation of Ser. No. 415,379, May 25, 1995, abandoned.
This application May 19, 1997, Ser. No. 858,766
Claims priority, application Japan, Apr. 4, 1994, 6-087250
Int. Cl.[6] H04B *1/00*
U.S. Cl. 381—86 6 Claims




1. An audio playback system including:

a memory means which stores a set of equalizer characteristics and a set of sound volume characteristics each optimum for a plurality of music genres respectively;

a mode selecting means for selecting a mode for each of said plurality of music genres by operation from an exterior;

a mode setting means for setting the mode in response to said mode selecting means;

an equalizer characteristic setting means for automatically selecting a corresponding optimum equalizer characteristic from said memory means on the basis of the mode set by said mode setting means and setting said equalizer according to said selected equalizer characteristic;

a sound volume characteristic setting means for automatically selecting a corresponding optimum sound volume characteristic from said memory means on the basis of the mode set by said mode setting means and setting said volume control according to said selected sound volume characteristic;

wherein a sound is reproduced in accordance with the equalizer characteristic automatically set by said equalizer characteristic setting means and the sound volume characteristic automatically set by said sound volume characteristic setting means.

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5,745,584

## SOUND BUBBLE STRUCTURES FOR SOUND REPRODUCING ARRAYS

Stephen F. Taylor, Santa Monica, Calif., assignor to Taylor Group of Companies, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 245,160, May 17, 1994, Pat. No. 5,590,207, which is a continuation-in-part of Ser. No. 166,463, Dec. 14, 1993, Pat. No. 5,517,570. This application Apr. 9, 1996, Ser. No. 631,705
Int. Cl.[6] H04R *1/02*
U.S. Cl. 381—90 17 Claims

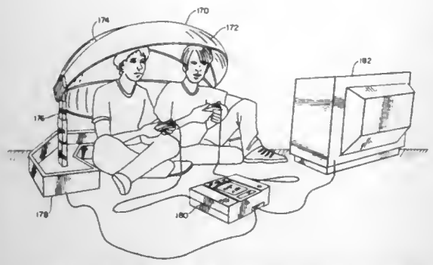
1. A sound bubble, comprising:

(a) a domed surface; and

(b) a plurality of sound pixels integrated into the domed surface, the sound pixels comprising addressable transducers for gen-

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erating acoustical energy, the sound pixels being arranged in a matrix having vertical and horizontal axes so as to support propagation and movement of the acoustical energy along the vertical and horizontal axes of the matrix, the sound pixels being coupled to a playback device for producing at least one data stream for each of the sound pixels, wherein the sound pixels are synchronized and interlinked by the data streams to reproduce a time line for the acoustical energy source radiating and moving through the vertical and horizontal axes of the matrix.

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**5,745,585**

**DYNAMIC EQUALIZATION METHOD AND DEVICE**

**Claude Carpentier, Courbevoie, France, assignor to S L X S.A.R.L., Courbevoie, France**

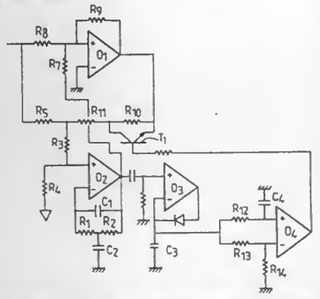
**PCT No. PCT/FR92/01043, § 371 Date May 9, 1994, § 102(e) Date May 9, 1994, PCT Pub. No. WO93/10646, PCT Pub. Date May 27, 1993**

**PCT Filed Nov. 10, 1992, Ser. No. 240,700**

**Claims priority, application France, Nov. 12, 1991, 91 13889**

**Int. Cl.[6] H03G** *5/00*

**U.S. Cl. 381—103** **11 Claims**



**1**. Equalizer device for an audio frequency amplifier system comprising:

first correction means for correcting a response curve of an audio frequency amplifier in said system for stable conditions, said first correction means having a gain (GS);

at least one second correction means for correcting the response curve of the audio frequency amplifier under transient conditions, said second correction means having a gain (GT) which is different from the gain (GS) of the first correction means;

a peak detector in communication with said first correction means;

transient discriminator means for discriminating a transient condition in the response curve, the transient discriminator being connected to the peak detector; and

means for switching from the first correction means to the second correction means in response to the discrimination of a transient condition by the transient discriminator means, and for switching from the second correction means to the first correction after the end of the transient condition.

**5,745,586**

**SOUND QUALITY CONTROL SYSTEM**

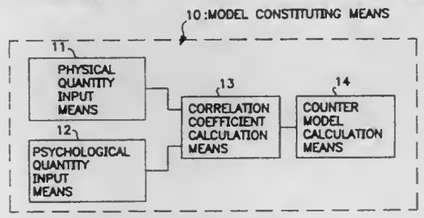
**Ryo Tagami, Katano, and Mitsuhiko Serikawa, Nishinomiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Filed Apr. 25, 1996, Ser. No. 657,930**

**Claims priority, application Japan, Apr. 25, 1995, 7-125977; Aug. 3, 1995, 7-198520**

**Int. Cl.[6] H03G** *5/00*

**U.S. Cl. 381—103** **32 Claims**




**1**. A sound quality control system comprising:

modeling means for mapping a plurality of user defined psychological values which each correspond to respective user defined sound qualities to a plurality of adjustment values which correspond to a respective plurality of frequency bands within a predetermined frequency range of a sound reproduction apparatus, wherein said modeling means comprises

physical quantity input means for inputting the adjustment values for the sound reproduction apparatus,

psychological quantity input means for inputting said plurality of user defined psychological values based on listener responses to a sound reproduced by said sound reproducing apparatus,

correlation coefficient calculation means for calculating a correlation coefficient between said adjustment values and said psychological values, and

counter model calculation means for calculating a quantitative counter-relationship between said adjustment values and said psychological values based on said calculated correlation coefficient

compensation characteristics extracting means for generating a further plurality of adjustment values to adjust an audio input signal based on a difference between a further user defined sound quality and said user defined sound qualities, and signal processing means for processing said audio input signal.

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**5,745,587**

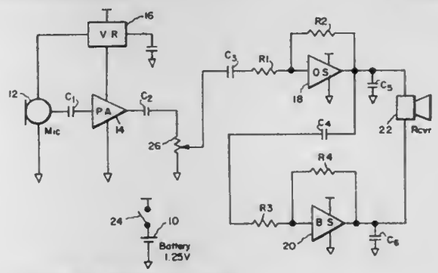
**HEARING AID AMPLIFIER CIRCUITRY**

**Timothy V. Statz, Minneapolis, and Thomas A. Scheller, Fridley, both of Minn., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.**

**Filed Jun. 7, 1995, Ser. No. 475,230**

**Int. Cl.[6] H03F** *21/00*; **H04R** *3/00*

**U.S. Cl. 381—120** **26 Claims**




**1**. A power amplifier comprising:

a. an interface stage having a first pair of current gain devices, each having a base connected to receive incoming voltage signals, and respective first and second outputs for current signals to which said voltage signals are converted by said interface stage;

b. a first current gain stage having a first input connected to receive said current signals from said first output, a third output connected to a load, and a first variable gain means connected between said first input and said third output for increasing current gain in response to increases in said current signals; and

c. a second current gain stage having a second input connected to receive said current signals from said second output, a fourth output connected to said load, and second variable gain means connected between said second input and said fourth output for increasing current gain in response to increases in said current signals.

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**5,745,588**

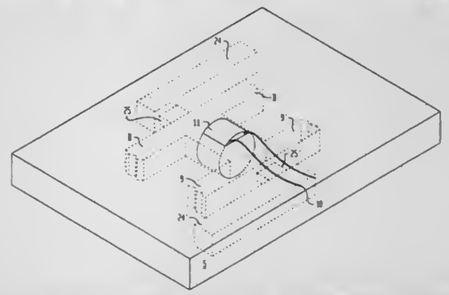
**DIFFERENTIAL MICROPHONE ASSEMBLY WITH PASSIVE SUPPRESSION OF RESONANCES**

**Charles Spurgeon Bartlett, Clinton, Md., and Michael Anthony Zuniga, Fairfax, Va., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed May 31, 1996, Ser. No. 655,781**

**Int. Cl.[6] H04R** *25/00*

**U.S. Cl. 381—170** **7 Claims**



**1**. Apparatus comprising a Second Order Differential (SOD) microphone of the kind in which a First Order Differential microphone element communicates with respective front and rear chambers, said front chamber communicates with respective first and fourth ports via two respective front conduits, and said rear chamber communicates with respective second and third ports via two respective rear conduits, CHARACTERIZED IN THAT

a) said SOD microphone further comprises first and second side chambers for dissipating acoustic energy of undesired resonances of the microphone;

b) the first side chamber communicates with the front conduits; and

c) the second side chamber communicates with the rear conduits.

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**5,745,589**

**RECORDING METHOD AND DECODING METHOD FOR DIGITAL INFORMATION USING MODULATION PATTERNS**

**Toshiyuki Iwai, Yamatokooriyama, and Masahiro Esashi, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 7, 1996, Ser. No. 612,303**

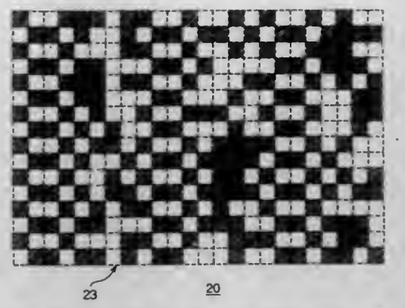
**Claims priority, application Japan, Mar. 10, 1995, 7-051445**

**Int. Cl.[6] G06K** *9/00*

**U.S. Cl. 382—100** **12 Claims**

**1**. A method of recording digital information, comprising the steps of:

defining a matrix of cells corresponding to bits in an information recording area provided within a flat recording surface, providing the cells with optically recognizable marks, each corresponding to a value of "0" or "1" to thereby record recording-object digital information as a two-dimensional pattern composed of the marks,



setting a small block composed of three or more adjoining cells to each of which the mark corresponding to a value "0" or the mark corresponding to a value of "1" is to be given, such that the small block has a pattern of the marks, said small block being configured such that when a plurality of said small blocks are arrayed together, the plurality of small blocks fill the information recording area without gaps therebetween;

selecting as a modulation pattern, from among a plurality of the patterns assumed by the small block, a pattern in which the marks in at least one column include one or more marks corresponding to a value of "0" and one or more marks corresponding to a value of "1", and in which the marks in at least one row include one or more marks corresponding to a value of "0" and one or more marks corresponding to a value of "1";

extracting the marks given to the cells of the information recording area as a primary pattern;

calculating exclusive-ORs of values of the extracted marks, in units of the small blocks, of the primary pattern and values of the marks of the modulation pattern, respectively; and

arraying the calculated exclusive-ORs in the information recording area as a secondary pattern.

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**5,745,590**

**CLOSED LOOP MAIL PIECE PROCESSING METHOD**

**Larry C. Pollard, Denver, Colo., assignor to U S West, Inc., Englewood, Colo.**

**Filed Aug. 8, 1996, Ser. No. 694,132**

**Int. Cl.[6] G06K** *9/00*

**U.S. Cl. 382—101** **3 Claims**

**1**. For use with a computer having a processor and memory, a method of generating a plurality of mail pieces in a predetermined order as specified in a print file, each mail piece corresponding to a data file stored in the computer memory, each data file having an identification field, including file number information identifying the file number, and an insert field, including insert information identifying the inserts to be included with the mail piece in an envelope, the method comprising:

a) generating each of the plurality of mail pieces in the order specified in the print file, each mail piece having a first scan code positioned at a first location on the mail piece and a second scan code positioned at a second location of the mail piece so that it is readable only when the mail piece is properly inserted in its envelope, the first scan code containing its file number information and insert information and the second scan code, containing its file number information;

b) receiving each mail piece at a first scanning station;

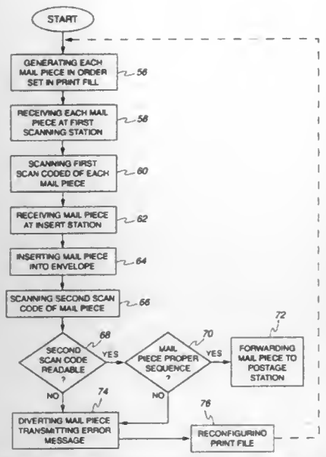
c) scanning the first scan code of each mail piece at the first scanning station to identify its corresponding file number and associated inserts;

d) receiving each mail piece at an insert station;

e) inserting each mail piece into its envelope with its corresponding inserts at the insert station;

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f) scanning the second scan code of each mail piece at a second scanning station;

g) diverting the corresponding mail piece and transmitting an orientation error message to the processor in response to the second scan code not being readable, the error message identifying the file number of the diverted mail piece;

h) determining if the mail piece was received at the second scanning station in the proper sequence;

i) forwarding the mail piece to a postage station in response to the second scanning station receiving the mail piece in the proper sequence;

j) diverting the mail piece and generating a sequence error message for receipt by the processor in response to the second scanning station not receiving the mail piece in the proper sequence;

k) reconfiguring the print file to comprise only the corresponding data files of the diverted mail pieces, the reconfigured print file specifying a predetermined order for printing the mail pieces;

l) repeating steps (a)–(k) until all mail pieces in the print file have been generated.

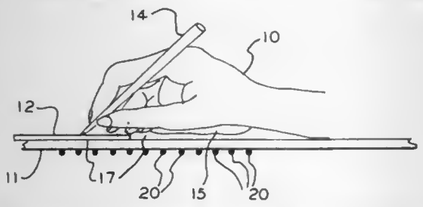
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**5,745,591**

**SYSTEM AND METHOD FOR VERIFYING THE IDENTITY OF A PERSON**

**Stephen E. Feldman, 301 E. 63rd St., New York, N.Y. 10021-7721**

**Filed Dec. 29, 1995, Ser. No. 581,435**
**Int. Cl.[6] G06K** *9/00*
**U.S. Cl. 382—115** **20 Claims**




**19**. A method for confirming the identity of a person including the steps of:

a) monitoring, from below a surface, a positional relationship between anatomic structures of a hand of a first person when said hand of said first person is holding a first instrument with said hand, and said hand is in contact with said surface;

b) generating a first data representing said positional relationship between anatomic structures of said hand while said hand is holding said first instrument and said hand is in contact with said surface;

c) storing said first data as a standard for said person;

d) monitoring, from below a second surface, a second positional relationship between anatomic structures of a hand of a second person when said hand of said second person is holding a second instrument with said hand, said second instrument substantially corresponding to said first instrument, and said hand is in contact with said second surface;

e) generating a second data representing said second positional relationship between anatomic structures of said hand of said second person, while said hand is holding said second instrument and said hand is in contact with said second surface;

f) retrieving said first data from storage; and

g) comparing said first data with said second data for confirming that said second person is said first person.

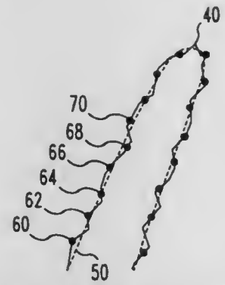
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**5,745,592**

**METHOD FOR DETECTING FORGERY IN A TRACED SIGNATURE BY MEASURING AN AMOUNT OF JITTER**

**Vishvjit Singh Nalwa, Middletown, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Jul. 27, 1995, Ser. No. 508,573**
**Int. Cl.[6] G06K** *9/00*
**U.S. Cl. 382—119** **5 Claims**




**1**. A method for detecting forgery in a traced signature by measuring an amount of jitter in the traced signature, comprising the steps of:

taking a plurality of samples of the traced signature;

forming a sum of distances between consecutive samples belonging to the plurality of samples;

fitting a curve to the traced signature;

measuring a length of the curve; and

detecting forgery in the traced signature by comparing the sum of distances to the length of the curve.

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**5,745,593**

**METHOD AND SYSTEM FOR INSPECTING INTEGRATED CIRCUIT LEAD BURRS**

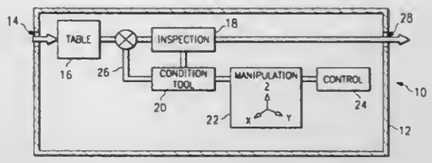
**Weerakiat Wahawisan, Carrollton, and Rajiv Roy, Plano, both of Tex., assignors to Semiconductor Technologies & Instruments, Inc., Dallas, Tex.**

**Continuation of Ser. No. 367,987, Jan. 3, 1995, abandoned. This application Jul. 25, 1996, Ser. No. 686,296**
**Int. Cl.[6] G06K** *9/00*
**U.S. Cl. 382—146** **22 Claims**

**1**. An electrical lead burr inspection method for automatically inspecting an electrical lead for a burr using a machine vision lead inspection system, comprising the steps of:

forming a pixel image of an electrical lead using the machine vision lead inspection system;






determining a plurality of vertical lead edges associated with the electrical lead by determining dark-to-light transitions associated with the lead pixel image;

establishing a plurality of vertical scan lines, each of the scan lines corresponding to the contour of a respective one of the lead edges, each of the scan lines further separated from the respective one of the lead edges by a preselected burr tolerance distance of at least two pixels; and

scanning along the scan lines to detect whether a burr image crosses the respective scan line for determining the presence of a burr on the electrical lead.

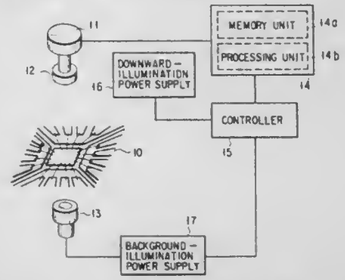
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**5,745,594**

**APPARATUS FOR TESTING A BONDING POSITION OF A BONDING WIRE**

**Yuichi Miyahara, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 159,310, Nov. 30, 1993, abandoned. This application Oct. 4, 1995, Ser. No. 538,648**
**Claims priority, application Japan, Dec. 28, 1992, 4-361243**
**Int. Cl.[6] G06J** *5/30*
**U.S. Cl. 382—150** **9 Claims**




**5**. An apparatus for determining a bonding position of a bonding wire in which the bonding wire is in contact with a lead, the apparatus comprising:

means for emitting light to an object from above and detecting the light reflected from the object to obtain a first image on the basis of the detected light, the object comprising the lead and the bonding wire;

means for emitting light to the object from below and detecting the light passing through an upper portion of the object to obtain a second image on the basis of the detected light;

means for obtaining a third image by performing on the second image an enlargement filtering process (X: a plural number) times to obtain a first intermediate image, and performing on the first intermediate image a reduction filtering process (X: a plural number) times;

means for combining the first image and the third image by one of a NOR process and a NAND process to obtain a fourth image;

means for obtaining a fifth image corresponding to the bonding position of the bonding wire, said fifth image being obtained by performing on the fourth image the reduction filtering process (X: a plural number) times to obtain a second intermediate image, and by performing on the second intermediate image the enlargement filtering process (X: a plural number) times; and

means for detecting the bonding position of the bonding wire on the basis of the fifth image by measuring a center of gravity of a wire collapse portion of the bonding wire.

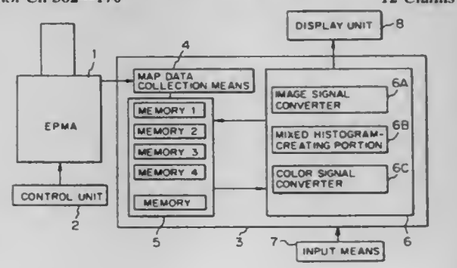
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**5,745,595**

**SURFACE ANALYSIS INSTRUMENT AND METHOD OF DISPLAYING IMAGES USING INFORMATION OBTAINED BY SURFACE ANALYSIS**

**Hiroyuki Yamada; Masaki Saito, and Masayuki Ohtsuki, all of Tokyo, Japan, assignors to JEOL Ltd., Tokyo, Japan**

**Filed Apr. 4, 1996, Ser. No. 628,245**
**Claims priority, application Japan, Apr. 11, 1995, 7-085294**
**Int. Cl.[6] G06K** *9/00*
**U.S. Cl. 382—170** **12 Claims**




**1**. A surface analysis instrument comprising:

a means for making surface analyses of different regions on a sample to obtain information about said regions in the format of a two dimension distribution of intensity data for each region;

a means for creating a mixed histogram of said intensity data for said regions from said information obtained by said surface analyses;

a means for determining the dynamic range of the mixed histogram and based thereon performing an assortment by intensity level from said mixed histogram;

a storage means in which information about said intensity level assortment is stored;

an assorting means for assorting images of said regions according to said intensity levels based on said information about said intensity level assortment; and

a display means having a viewing screen on which said images of said different regions are displayed at different positions.

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**5,745,596**

**METHOD AND APPARATUS FOR PERFORMING TEXT/IMAGE SEGMENTATION**

**Darrell E. Jefferson, San Jose, Calif., assignor to Xerox Corporation, Stanford, Conn.**

**Filed May 1, 1995, Ser. No. 432,215**
**Int. Cl.[6] G06K** *9/34;9/48*
**U.S. Cl. 382—176** **4 Claims**

**1**. A method of highlighting a text region within a first scan line signal including an image region, the method using a processor executing instructions stored in a memory, coupled to the processor, the first scan line signal including a multiplicity of pels, each pel having a value indicative of an intensity, the processor being coupled to a reproduction device for reproducing scan line signals, the method comprising the processor implemented steps of:

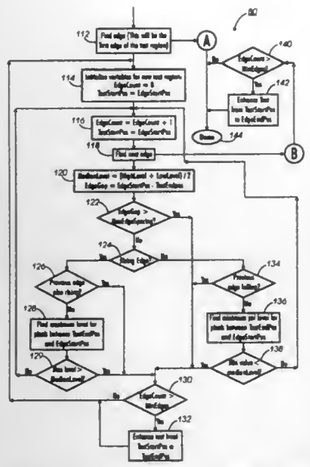
a) identifying a set of edges of a possible text region represented by the values of pels of the first scan line signal;

b) determining whether the set of edges of the possible text region within the first scan line signal form a text region without reference to a second scan line signal;

c) if the set of edges within the first scan line signal forms a text region:

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1) calculating an average intensity value of the text region;
2) changing the values of pels within the text region having values differing from the average intensity value of the text region to produce a modified scan line signal.

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**5,745,597**

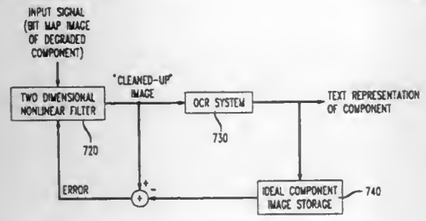
## METHOD OF NONLINEAR EQUALIZATION OF DEGRADED DOCUMENT IMAGES

**Oscar Ernesto Agazzi, Florham Park, and Kenneth Ward Church, Chatham, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Division of Ser. No. 281,955, Jul. 28, 1994, Pat. No. 5,647,023. This application Mar. 12, 1997, Ser. No. 814,893**

**Int. Cl.[6] G06K** *9/00;9/62;9/40;* **G06T** *5/10*

**U.S. Cl. 382—182** **8 Claims**




1. A method comprising the steps of:

receiving an input bit map image of a component, the image being characterized by a degradation; and

identifying said component based on a signal generated by a two dimensional filter wherein said filter is adapted as a function of the degradation of said input bit mapped image of said component,

wherein the step of identifying comprises the steps of:

applying said input bit mapped image of said component to said two dimensional filter to yield a filtered image of said component, and

identifying said filtered image of said component and outputting a text representation of said filtered image of said component.

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**5,745,598**

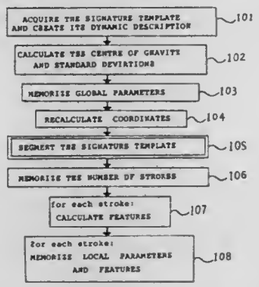
## STATISTICS BASED SEGMENTATION AND PARAMETERIZATION METHOD FOR DYNAMIC PROCESSING, IDENTIFICATION, AND VERIFICATION OF BINARY CONTOUR IMAGE

**Venson Ming Heng Shaw, 111 Reldyes Ave., Leonia, N.J. 07605, and Andrzej Stefan Sluzek, Nanyang Technological University, School of Applied Science Nanyang Avenue, Singapore, Singapore, 2263**

**Filed Mar. 11, 1994, Ser. No. 208,992**

**Int. Cl.[6] G06K** *9/62;9/34;9/00*

**U.S. Cl. 382—209** **5 Claims**




1. A method for the development of an image template from a template contour image for authentication and identification of incoming unknown contour images comprising:

(i) acquiring spatial and time domain information of said template contour image;

(ii) performing discrete cosine transform or orthogonal transform of the template contour image information;

(iii) computing a sequence of global parameters of said template contour image information, and dividing said template contour image into a plurality of of strokes according to segmentation parameters computed according to predetermined properties of said discrete cosine transform or orthogonal transform;

(iv) computing a sequence of feature measurements for each of said plurality of strokes;

(v) generating said image template from said global parameters, said segmentation parameters, and said feature measurement; and

(vi) storing said image template in an external portable memory device.

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**5,745,599**

## CHARACTER RECOGNITION METHOD

**Tadasu Uchiyama, Yokosuka; Noboru Sonehara, Zushi, and Akira Hiraiwa, Yokosuka, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan**

**Filed Jan. 18, 1995, Ser. No. 374,107**

**Claims priority, application Japan, Jan. 19, 1994, 6-004204; Jun. 27, 1994, 6-144654**

**Int. Cl.[6] G06K** *9/48*

**U.S. Cl. 382—217** **19 Claims**

1. A method for recognizing a handwritten input character by comparing said handwritten input character with a plurality of templates corresponding to a plurality of various types of characters based on time series information of points characterizing each stroke of said handwritten input character formed from at least one stroke, said handwritten character recognition method comprising the steps of:

expressing time series information of said points characterizing each stroke as coordinate points in a coordinate system;

calculating, with regard to a plurality of coordinate points within said coordinate system corresponding to a plurality of points characterizing a stroke of said handwritten input character, the relative angles formed by two straight lines formed by means of connecting a coordinate point, used as a reference, characterizing one stroke to two neighboring coordinate points from either a plurality of other coordinate points characterizing the same stroke as this reference coordinate point or a plurality of coordinate points characterizing another stroke, with regard to two neighboring coordinates of all of either of a plurality of other coordinate points characterizing the same said stroke or a plurality of coordinate points characterizing another stroke;

respectively calculating an angle the same as said relative angle using each coordinate point as a reference, with regard to all other coordinate points characterizing the same said stroke as said reference coordinate point of said handwritten input character or all of a plurality of coordinate points characterizing another stroke;

expressing a shape of said handwritten input character by means of a matrix consisting of elements comprising a quantity relating to each of said relative angles calculated with regard to said handwritten input character;

calculating, with regard to a plurality of coordinate points within said coordinate system corresponding to a plurality of points characterizing a stroke of each template, the relative angles formed by two straight lines formed by means of connecting a coordinate point, used as a reference, characterizing one stroke to each of two neighboring coordinate points of either other coordinate points characterizing the same stroke as this reference coordinate point or a plurality of coordinate points characterizing another stroke, with regard to all pairs of neighboring coordinate points of either a plurality of other coordinate points characterizing the same said stroke or a plurality of coordinate points characterizing another stroke;

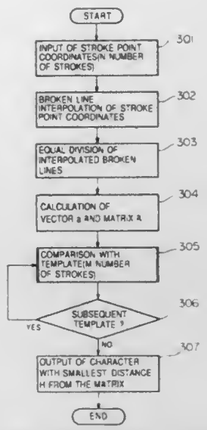
respectively calculating an angle the same as said relative angle using each coordinate point as a reference with regard to all other coordinate points characterizing the same said stroke as said reference coordinate point of said template or all of a plurality of coordinate points characterizing another stroke;

expressing a shape of each of said templates by means of a matrix consisting of elements comprising a quantity relating to each of said relative angles calculated with regard to said template;

calculating a distance between said handwritten input character and each of said plurality of templates using said matrix expressing a shape for said handwritten input character, and said matrix expressing a shape for each template; and

designating a character corresponding to a template selected based on said distance as a recognition result of said handwritten input character.






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**5,745,600**

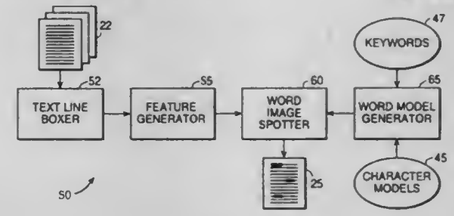
## WORD SPOTTING IN BITMAP IMAGES USING TEXT LINE BOUNDING BOXES AND HIDDEN MARKOV MODELS

**Francine R. Chen, Menlo Park; Lynn D. Wilcox, Portola Valley, and Dan S. Bloomberg, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Continuation of Ser. No. 992,358, Dec. 17, 1992, abandoned. This application Nov. 9, 1994, Ser. No. 336,727**

**Int. Cl.[6] G06K** *9/68*

**U.S. Cl. 382—218** **46 Claims**




1. A processor-based method of determining whether a keyword made up of characters is present in a bitmap input image containing words in lines of text, the words and lines of text being considered to extend horizontally, the method comprising the steps of:

providing a set of previously-trained single-character hidden Markov models (HMMs), each single-character HMM having a number of possible contexts, depending on whether the character has an ascender or a descender;

concatenating those single-character HMMs that correspond to the characters in the keyword so as to create a keyword HMM , the context of a given single-character HMM used to create the keyword HMM being determined on the basis of whether the keyword contains characters having ascenders or a descenders;

constructing an HMM network that includes a first path passing through the keyword HMM and a second path that does not pass through the keyword HMM;

locating a portion of the input image potentially containing a line of text;

providing an array of pixel values, referred to as a potential text line, representing the portion of the input image;

horizontally sampling the potential text line to provide a plurality of segments wherein each segment extends the entire height of the potential text line and the sampling to provide segments is performed in a manner that is independent of the values of the pixels in the potential textline;

for each segment, generating at least one feature that depends on the values of the pixels in the segment, thereby providing a set of features based on the potential text line, the set of features providing shape information regarding words in the line of text potentially contained in the portion of the input image;

applying the set of features to the HMM network;

finding a path through the network that maximizes the probability of the set of features as applied to the network; and

determining whether the path that maximizes the probability passes through the keyword HMM so as to provide an indication whether the portion of the input image contains the keyword.

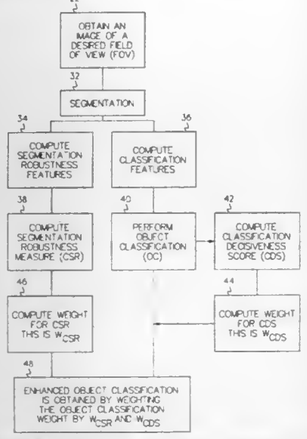
VOL 1209 ISS 4 AP 28 1998 UMI



## 5,745,601
## ROBUSTNESS OF CLASSIFICATION MEASUREMENT APPARATUS AND METHOD

**Shih-Jong J. Lee, Bellevue; Michael G. Meyer, Seattle; Chih-Chau L. Kuan, Redmond, and Paul S. Wilhelm, Kirkland, all of Wash., assignors to NeoPath, Inc., Redmond, Wash.**

**Filed Jul. 31, 1995, Ser. No. 509,181**
**Int. Cl.[6] G06K** *9/00*
**U.S. Cl. 382—225** **73 Claims**




1. A method for measuring information reliability in an image interpretation system comprising the steps of:

(a) obtaining at least one image;

(b) obtaining image information about said at least one image by interpreting said at least one image;

(c) extracting at least one reliability feature from said image information, said reliability feature representing at least one characteristic of the image content; and

(d) evaluating said at least one reliability feature against at least one predetermined criteria to obtain at least one information reliability measurement.

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## 5,745,602
## AUTOMATIC METHOD OF SELECTING MULTI-WORD KEY PHRASES FROM A DOCUMENT

**Francine R. Chen, Menlo Park; Steven B. Putz, Santa Clara, and Daniel C. Brotsky, Berkeley, all of Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Filed May 1, 1995, Ser. No. 432,383**
**Int. Cl.[6] G06K** *9/72*
**U.S. Cl. 382—229** **4 Claims**

1. An automatic method of selecting key phrases from a document presented in machine readable form to a processor, the document including a first multiplicity of words, some of the words forming phrases, the processor implementing the method by executing instructions stored in a memory device coupled to the processor, the method comprising the processor implemented steps of:

a) generating from the document a multiplicity of phrases not including stop words;

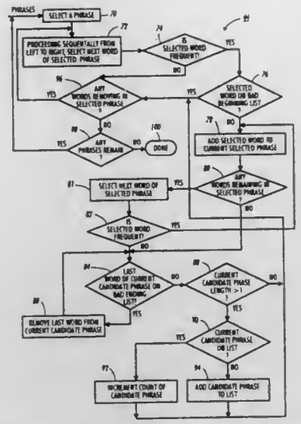
b) generating candidate phrases from the multiplicity of phrases, candidate phrases including more than one word and being composed of maximally long, non-overlapping subphrases, generating candidate phrases by the substeps of:

b1) selecting a one of the multiplicity of phrases as a selected phrase;

b2) selecting as a selected word a yet to be examined word of the selected phrase;

b3) determining whether the selected word is a frequent word;

b4) if the selected word is an infrequent:




A) if all words of the selected phrase have not been examined, repeating steps b2) through b3);

B) if all word of the selected phrase have been examined, repeating steps b1) through b3);

C) if the selected word is a frequent word:

C1) determining whether the selected word is an acceptable beginning for a key phrase by searching a list of bad beginning words;

C2) if the selected word is not an acceptable beginning for a key phrase:

i) determining whether all words of the selected phrase have been examined:

ii) if all words of the selected phrase have not been examined, repeating steps b2) through b3):

iii) if all words of the selected phrase have been examined, repeating steps b1) through b4);

C3) if the selected word is an acceptable beginning for a key phrase:

i) adding the selected word to a current phrase;

ii) if all words of the selected phrase have not been examined selecting as a selected word a yet to be examined word of the selected phrase;

iii) determining whether the selected word is a stop word; and

iv) if the selected word is not a stop word, repeating steps C3i) through C3iii)

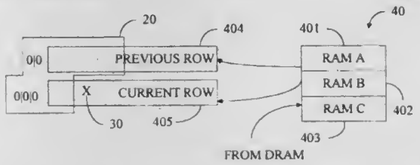
c) selecting as key phrases a subset of most frequently occurring of the candidate phrases.

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## 5,745,603
## TWO DIMENSIONAL CONTEXT MODEL OBTAINED WITHOUT A LINE BUFFER FOR ARITHMETIC CODING

**Robert A. Rust, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Aug. 26, 1996, Ser. No. 703,613**
**Int. Cl.[6] G06K** *9/00*
**U.S. Cl. 382—229** **8 Claims**




1. A method for encoding image data, said method comprising the steps of:



defining a context model, said context model using a plurality of bits of a previous row of said image data and a plurality of bits of a present row of said data;

retrieving a portion of said image data;

using said context model to compress said portion; and

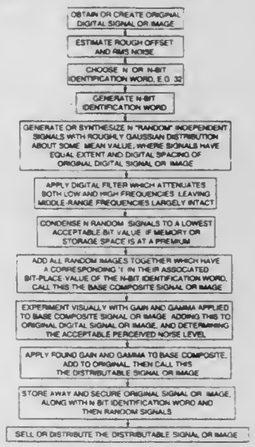
moving said context model to a next row in said image data.

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## 5,745,604
## IDENTIFICATION/AUTHENTICATION SYSTEM USING ROBUST, DISTRIBUTED CODING

**Geoffrey B. Rhoads, West Linn, Oreg., assignor to Digimarc Corporation, Portland, Oreg.**

**Continuation of Ser. No. 215,289, Mar. 17, 1994, abandoned, which is a continuation-in-part of Ser. No. 154,866, Nov. 18, 1993, abandoned. This application Mar. 15, 1996, Ser. No. 614,521**
**Int. Cl.[6] G06K** *9/36;* **H04L** *9/00*
**U.S. Cl. 382—232** **14 Claims**




1. In a method of image processing that includes processing an input image to steganographically encode a multi-bit message code therein, thereby yielding an encoded output image, and thereafter processing suspect data corresponding to said encoded output image to decode the message code therefrom, an improvement including:

encoding the message code redundantly through the image data, wherein the message code can be detected from first and second non-overlapping rectangular excerpts thereof; and

decoding the message code from said suspect data without reference to said input image, said decoding including performing a domain transformation on a first set of data related to said suspect data, said domain transformation producing transformed data in a spatial frequency domain, and analyzing said transformed data.

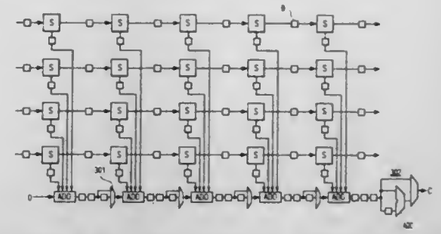
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## 5,745,605
## DEVICE FOR ESTIMATION OF MOVEMENT

**Jean-Michel Bard, Crolles; Alain Pirson, Moirans; Philppe Paul, Eybens, all of France, and Fathy Yassa, Troinex, Switzerland, assignors to Deutsche Thomson Brandt GmbH, Villinger.-Schwenningen, Germany**

**Filed Aug. 4, 1995, Ser. No. 511,483**
**Claims priority, application France, Aug. 19, 1994, 94 10158**
**Int. Cl.[6] G06K** *9/36;* **H04N** *7/12;5/14*
**U.S. Cl. 382—236** **24 Claims**

1. Device for estimation of movement by block matching in an image compression system based on pixel blocks, said device comprising:




N lines of M columns of means of calculation of an error function between two values,

N lines of M columns of first means of memorization adapted to store values representing a block of pixels whose movement is to be estimated;

N lines of M columns of second means of memorization adapted to propagate column by column values representing a band of pixels of a reference window, said first and second means of memorization being linked respectively to the means of calculation;

M adders adapted to totalize the values of the error function for each column of N means of calculation, an output of an adder associated with a given column of N means of calculation being coupled to an input of the adder associated with the next column of N means of calculation;

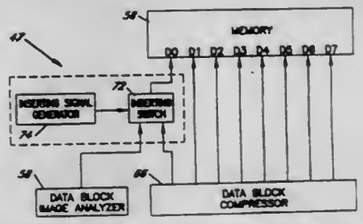
means for delaying the transmission of a result of the addition by an adder for a given column to a consecutive adder by a delay which is a function of the propagation of the values representing the reference window in said N lines of M columns of said second means of memorization.

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## 5,745,606
## METHOD AND SYSTEM FOR STORING INFORMATION IN COMPRESSED BLOCK DATA

**Kanda Yoshimichi, 20 Suenaga, Takatsuku, Kawasaki-shi, Kanagawa-ken, Japan**

**Filed Oct. 11, 1995, Ser. No. 540,709**
**Int. Cl.[6] G06K** *9/36;* **H04N** *1/40*
**U.S. Cl. 382—237** **28 Claims**




1. A method of combining block information with compressed data, comprising the steps of:

a) compressing a data block into a compressed data block based upon a predetermined data compression algorithm, said compression algorithm generating intermediate data;

b) generating data block characteristic information of said data block;

c) inserting said data block characteristic information into one of said intermediate data at a predetermined position near the least significant bit; and

d) storing a certain predetermined portion of said intermediate data after said step c) and said compressed data block whereby said data block characteristic information is stored without increasing memory storage space as well as without substantially affecting said compressed data block.

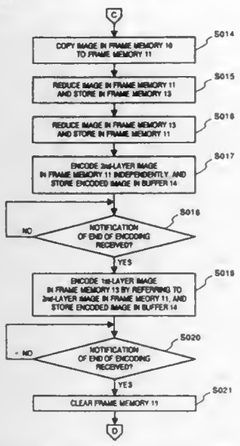
VOL 1209 ISS 4 AP 28 1998 UMI



### 5,745,607
### IMAGE ENCODING APPARATUS AND METHOD FOR GENERATING AND ENCODING REDUCED IMAGE DATA BY BIT PLANES

Mitsuru Maeda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 348,942, Nov. 25, 1994, abandoned.
This application Jan. 9, 1997, Ser. No. 781,063
Claims priority, application Japan, Dec. 1, 1993, 5-301654
Int. Cl.[6] H04N *1/417*
U.S. Cl. 382—240 26 Claims




1. An image encoding apparatus for encoding image data representing an image which consists of a plurality of pixels, each of pixels being represented by at least two bits of pixel data, comprising:

partitioning means for partitioning the image data to be encoded into a plurality of bit planes of pixel data;

constructing means for constructing one unit of image data by joining the plurality of bit planes of pixel data partitioned by said partitioning means, wherein a bit order in the one unit is different from a bit order in the plurality of bit planes;

generating means for generating reduced image data representing at least one reduced image layer by reducing the one unit; and

encoding means for encoding the reduced image data generated by said generating means, and for encoding the one unit such that at least some bits from one of the bit planes are encoded together with bits from at least one other of the bit planes.

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### 5,745,608
### STORING DATA COMPRESSED WITH ARITHMETIC CODING IN NON-CONTIGUOUS MEMORY

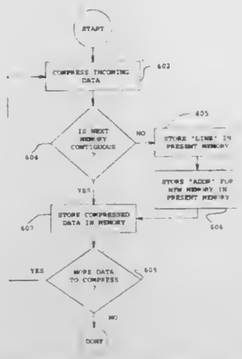
Robert A. Rust, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 293,229, Aug. 19, 1994, Pat. No. 5,574,953. This application May 15, 1996, Ser. No. 647,860
Int. Cl.[6] G06K *9/36;9/46*
U.S. Cl. 382—247 10 Claims

1. A method for storing data in non-contiguous memory, said method comprising the steps of:

compressing original data by an arithmetic compression means into a compressed data;

writing a portion of said compressed data in a block of said non-contiguous memory;




causing said compression means to store in a link sequence in said block of said non-contiguous memory after said portion of said compressed data; and

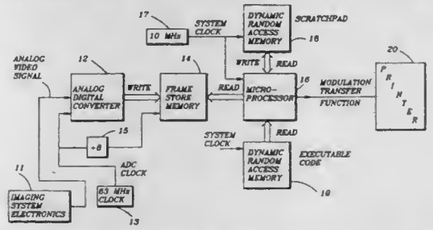
saving an address pointing to a next block of said non-contiguous memory in said block of said non-contiguous memory after said link sequence.

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### 5,745,609
### FIXED PATTERN COMPENSATION WITH ADAPTIVE WINDOW FOR MTF TESTING

Neil R. Nelson, Anaheim; Harold J. Orlando, Costa Mesa, and Marco A. Lopez, Villa Park, all of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Continuation of Ser. No. 399,116, Mar. 3, 1995, abandoned.
This application Jan. 29, 1997, Ser. No. 790,126
Int. Cl.[6] G06K *9/40*
U.S. Cl. 382—264 8 Claims




1. A method of producing a modulation transfer function in the presence of fixed pattern noise produced by imaging system electronics, said method comprising the steps of:

a) digitizing an electronic signal to provide input data produced by the imaging system electronics for an image, which image is expected to have edge features, said input data having a first bandwidth;

b) taking the derivative of an edge response of the image by a digital filter having plural filter coefficients and a second bandwidth less than said first bandwidth to obtain a low pass line spread function;

c) calculating a window from the width of the low pass line spread function to compensate for fixed pattern noise, the window being sized depending on the input data;

d) multiplying the window and the edge response line spread function; and

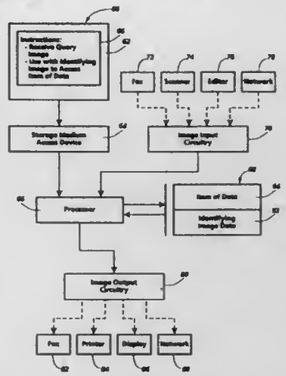
e) taking a discrete Fourier Transform of the product of the window and line spread function to obtain the modulation transfer function.



### 5,745,610
### DATA ACCESS BASED ON HUMAN-PRODUCED IMAGES

Walter A. L. Johnson, Santa Clara, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 96,198, Jul. 22, 1993, abandoned.
This application Oct. 13, 1995, Ser. No. 543,232
Int. Cl.[6] G06K *9/03*
U.S. Cl. 382—309 46 Claims




1. A method of operating a machine that includes:

image input circuitry for obtaining data defining images as input;

image output circuitry for providing data defining images as output;

image memory connected for receiving data defining images from the image input circuitry and for providing data defining images to the image output circuitry;

a processor connected for accessing data stored in the image memory; and

program memory storing instruction data indicating instructions the processor can execute; the processor further being connected for accessing the instruction data in the program memory;

the method comprising:

receiving from the image input circuitry and storing in the image memory first input image data; the first input image data defining a document image and a first form image; the first form image including an identifying image for the document image; the identifying image being a human-produced image;

operating the processor to use the first input image data to obtain document image data defining the document image and identifying image data defining the identifying image;

storing the document image data and the identifying image data in the image memory, associated so that the processor, upon subsequently accessing the identifying image data, can then access the document image data;

receiving from the image input circuitry and storing in the image memory second input image data; the second input image data defining a second form image; the second form image including a query image; the query image being a human-produced image;

operating the processor to use the second input image data to obtain query image data defining the query image;

operating the processor to use the query image data and the identifying image data to access the document image data in the image memory;

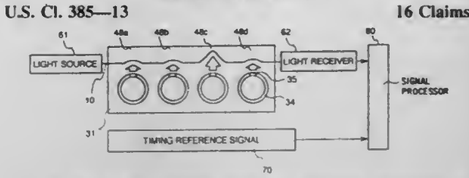
operating the processor to use the document image data to obtain output image data defining a version of the document image; and

providing the output image data to the image output circuitry.

### 5,745,611
### OPTICAL FIBER PRESSURE SENSOR

Masahiro Komachiya, Hitachi; Shigeru Oho, Hitachinaka; Satoshi Shimada, Hitachi; Takayuki Fumino; Tatsunori Sakaguchi, both of Hitachinaka, and Takao Sasayama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1996, Ser. No. 725,819
Claims priority, application Japan, Oct. 6, 1995, 7-259740
Int. Cl.[6] G02B *6/125*
U.S. Cl. 385—13 16 Claims




1. An optical fiber pressure sensor for measuring a pressure on the basis of an optical power loss depending on a configuration change of an optical fiber comprising a luminescence means optically connected with at least an optical fiber which is constructed with a main part for propagating a light and a protective coating member for protecting said main part, a light intercepting means for detecting a light passing through the optical fiber or a reflected light from the optical fiber and a bending means for bending at least a part of the optical fiber according to a measured pressure, wherein

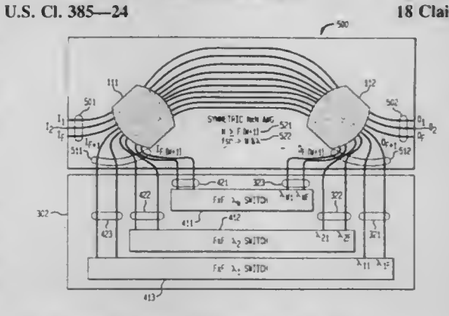
said optical fiber pressure sensor has a normalization frequency V value of said optical fiber smaller than 90% of a normalization cut-off frequency defining a single transmission mode condition of said optical fiber.

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### 5,745,612
### WAVELENGTH SORTER AND ITS APPLICATION TO PLANARIZED DYNAMIC WAVELENGTH ROUTING

Weyl-Kuo Wang; Franklin Fuk-Kay Tong, both of Stamford, Conn., and Karen Liu, Montclair, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1995, Ser. No. 574,474
Int. Cl.[6] G02B *6/28*
U.S. Cl. 385—24 18 Claims




16. A dynamic waveguide router, comprising:

a first integrated chip comprising a demultiplexer having on said first chip a plurality of input and output waveguides which are non-crossing and non-overlapping, said demultiplexer for receiving F optical streams on said input waveguides of said demultiplexer, each stream having at most W wavelength multiplexed channels of different wavelengths, said demultiplexer also for sorting said wavelength channels so that channels having the same wavelength appear on adjacent ones of said output waveguides of said demultiplexer, said first chip also comprising a multiplexer having on said first chip a plurality of input and output waveguides which are non-crossing and non-overlapping; and

a second integrated chip comprising an array of W optical space switches, each switch having on said second chip a plurality

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of input and output waveguides which are non-crossing and non-overlapping, said input and output waveguides on said second chip being butt coupled to said output and input waveguides of said demultiplexer and multiplexer, respectively, on said first chip, each of said switches receiving signals on only those of said wavelength channels using the same one of said W wavelengths, said array receiving at most said W wavelengths with signals from said wavelength channels from said outputs of said demultiplexer on said first chip, each said switch switching channels from any one of its said input waveguides to any one if its said output waveguides, said array thus having channels of the same wavelength adjacent to each other,

said multiplexer on said first chip for receiving said wavelength channels from said outputs of said array of switches and for multiplexing said wavelength channels on said outputs of said array of switches into F output streams, each output stream having at most W channels with at most said W different wavelengths, thereby routing any one of said wavelength channels from any one of said F optical input streams into any one of said F output optical streams, where F is an integer greater than one.

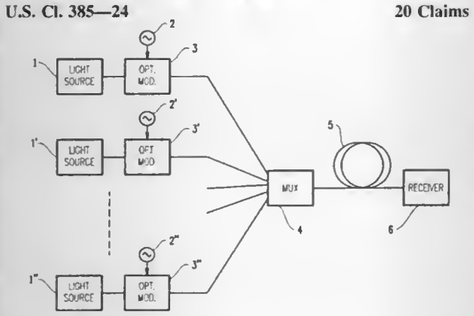
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**5,745,613**

## WAVELENGTH-DIVISION MULTIPLEXING OPTICAL COMMUNICATION APPARATUS AND METHOD THEREFOR

**Kiyoshi Fukuchi, and Takashi Ono, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Dec. 6, 1996, Ser. No. 759,689**
**Claims priority, application Japan, Dec. 15, 1995, 7-347682**
**Int. Cl.[6] G02B *6/28***
**U.S. Cl. 385—24** **20 Claims**




1. A wavelength-division multiplexing fiber optics communication apparatus, comprising:

a plurality of optical modulators for respectively modulating an intensity of light, each said light having a different wavelength from one another, with respective signals to be transmitted;

a wavelength-division multiplexer for combining the light from said plurality of optical modulators;

fiber optics for transmitting wavelength-division multiplexed light from said wavelength-division multiplexer; and

an optical receiver for separating said wavelength-division multiplexed light by wavelength and receiving the separated wavelength-division multiplexed light, respectively,

wherein a magnitude in one of a change of phase modulation and a phase modulation is different for each of said plurality of optical modulators.

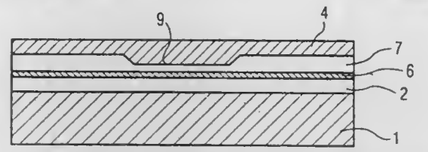
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**5,745,614**

## OPTICAL MODE FILTER

**Peter Kersten, Weissach; Johannes Koppenborg, Sersheim, both of Germany, and Jaakko Aarnio, Espoo, Finland, assignors to Alcatel N.V., Rijswijk, Netherlands**

**Filed Sep. 18, 1996, Ser. No. 715,416**
**Claims priority, application Germany, Sep. 26, 1995, 195 35 685.3**
**Int. Cl.[6] G02B *6/14***
**U.S. Cl. 385—29** **3 Claims**




1. A device for preventing the propagation of undesired modes in an integrated optical wave guide, in which, adjacent a medium carrying the modes, a radiation-absorbing layer is located which has an index of refraction which is at least equal to the index of refraction of the medium carrying the modes,

said device comprising

a flat substrate (**1**);

first and second buffer layers (**2**, **7**), said first buffer layer (**2**) being located on said substrate (**1**);

a wave guide core (**3**) forming said medium carrying the modes, located between said first and second buffer layers (**2**, **7**), and comprising a generally flat core layer (**6**);

at least one of said buffer layers, on at least one side of the wave guide core (**3**) being formed with a trench-like indentation (**5**), which indentation is filled with an absorbent optical material, or a material which has a higher index of refraction than that of the buffer layers;

an absorbent layer (**4**) on said second buffer layer (**7**) and having a higher index of refraction than said buffer layers (**2**, **7**); and

wherein one of the buffer layers is provided with a thinned portion (**9**) which functions as a filter for higher modes being transmitted through the wave guide core (**3**).

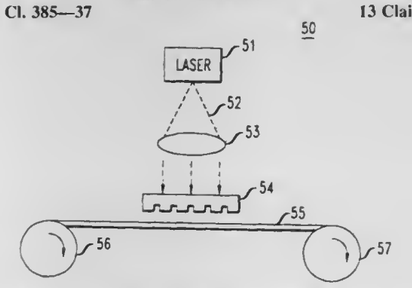
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**5,745,615**

## METHOD OF MAKING AN OPTICAL FIBER GRATING, AND ARTICLE MADE BY THE METHOD

**Robert Michael Atkins, Millington; Rolando Patricio Espindola, West Orange, and Debra Ann Simoff, South Plainfield, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Oct. 11, 1996, Ser. No. 730,531**
**Int. Cl.[6] G02B *6/34***
**U.S. Cl. 385—37** **13 Claims**




1. Method of making an article comprising an optical fiber refractive index grating, the method comprising

a) providing a sensitizer-loaded silica-based optical fiber having a Ge-doped core and a longitudinal axis; and

b) exposing the optical fiber to actinic radiation of varying intensity along the longitudinal axis of the optical fiber, the varying intensity selected such that the refractive index grating is formed in the core;

c) the optical fiber is exposed to the actinic radiation through a fiber coating; and

d) the optical fiber is selected to have a germanium-oxygen deficiency center content selected to provide the fiber with a photosensitivity that is at least twice as large as the photosensitivity of an otherwise identical, conventionally prepared, optical fiber, where "photosensitivity" is Δn/dose of actinic radiation, where An is the refractive index change that results from exposure of the fiber to a predetermined dose of the actinic radiation, and where the conventionally prepared optical fiber is an optical fiber that was drawn from a preform that was prepared by a method that did not comprise a step during which germanosilicate preform material is contacted with an atmosphere selected to favor reduction of $Ge^{4+}$ to $Ge^{2+}$ in the preform material.



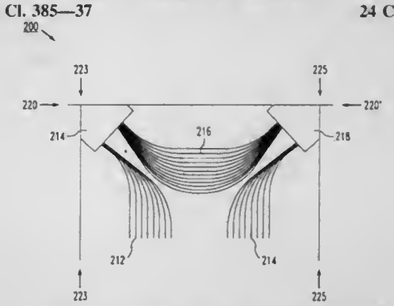
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**5,745,616**

## WAVEGUIDE GRATING ROUTER AND METHOD OF MAKING SAME HAVING RELATIVELY SMALL DIMENSIONS

**Martin Zirngibl, Middletown, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.**

**Filed Nov. 27, 1996, Ser. No. 758,623**
**Int. Cl.[6] G02B *6/34*; H04J *14/02***
**U.S. Cl. 385—37** **24 Claims**




1. A compact waveguide grating router comprising first and second free space regions, first and second sets of optical ports, and a grating array, wherein the first and second sets of optical ports and the grating array are integrated onto a substrate, such that the grating array is coupled to the first free space region and the second free space region, the waveguide router characterized by:

(a) first plane, defining a first optically reflective surface, and positioned in the first free space region;

(b) a second plane, defining a second optically reflective surface, and positioned in the second free space region;

wherein the first plane is oriented such that incident optical signals from the first set of optical ports are reflected to the grating array, and the second plane is oriented such that incident optical signals from the grating array are reflected to the second set of optical ports.

13. A method of fabricating a compact waveguide grating router including the steps of:

(a) using a substrate to form a first free space region, a second free space region, a first set of optical ports, a second sets of optical ports, and a grating array, wherein the first and second sets of optical ports and the grating array are integrated onto a substrate, such that the grating array is coupled to the first free space region and the second free space region;

(b) forming a first plane, defining a first optically reflective surface, and positioned in the first free space region;

(c) forming a second plane, defining a second optically reflective surface, and positioned in the second free space region;

wherein the first plane is oriented such that incident optical signals from the first set of optical ports are reflected to the grating array, and the second plane is oriented such that incident optical signals from the grating array are reflected to the second set of optical ports.

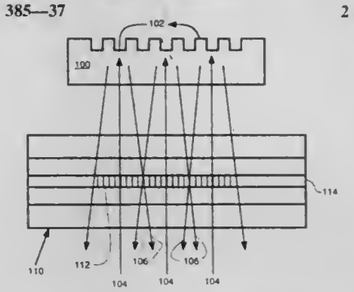
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**5,745,617**

## NEAR-ULTRA-VIOLET FORMATION OF REFRACTIVE-INDEX GRATING USING REFLECTIVE PHASE MASK

**Dmitry S. Starodubov, Moscow, Russian Federation, and Jack L. Feinberg, Manhattan Beach, Calif., assignors to D-STAR Technologies, LLC, Los Angeles, Calif.**

**Filed Dec. 30, 1996, Ser. No. 775,461**
**Int. Cl.[6] G02B *6/34***
**U.S. Cl. 385—37** **2 Claims**




1. A method of imposing a grating in an optical waveguide subject to changes in refractive index when exposed to light characterized by a spectral line having a wavelength greater than 275 nm, said method comprising the steps of:

disposing a mask for generating an interference pattern in said light, said mask having a spatially periodic surface depth with a spatial periodicity between 0.2 μm and 2.0 μm, said light reflected from said mask so that said interference pattern extends into said optical waveguide; and

reflecting said light from said mask so as to impose said grating in said optical waveguide.

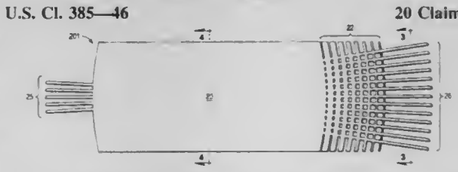
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**5,745,618**

## OPTICAL DEVICE HAVING LOW INSERTION LOSS

**Yuan P. Li, Duluth, Ga., assignor to Lucent Technologies, Inc., Murray Hill, N.J.**

**Filed Feb. 4, 1997, Ser. No. 794,711**
**Int. Cl.[6] G02B *6/26***
**U.S. Cl. 385—46** **20 Claims**



1. An optical device having at least one input waveguide coupled to one side of a slab waveguide and an array of output waveguides coupled to an other side of the slab waveguide,

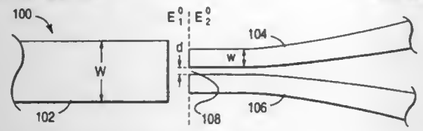
CHARACTERIZED BY

a transition region, which is immediately adjacent to the slab waveguide and which comprises a plurality (n) of silica paths that intersect the output waveguide array, the silica paths having widths that progressively decrease as they become further away from the slab waveguide.

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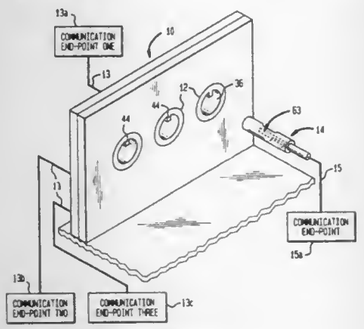
5,745,619
**LOW-LOSS OPTICAL POWER SPLITTER FOR HIGH-DEFINITION WAVEGUIDES**
**Yuan P. Li, Duluth, and Yan Wang, Chamblee, both of Ga., assignors to Lucent Technologies Inc., Murray Hill, N.J.**
**Filed Jun. 7, 1996, Ser. No. 660,245**
**Int. Cl.[6] G02B *6/26***
**U.S. Cl. 385—48** **20 Claims**




13. An optical power splitter comprising:
a input waveguide region having a predetermined width (W) and capable of transmitting optical energy;
at least two output waveguide regions positioned to receive at least a portion the optical energy from the input waveguide region wherein the output waveguide regions each have predetermined widths (w) for a predetermined distance along the path of energy travel and establish a gap of a predetermined width (d) for a predetermined distance along the path of energy travel between each pair of output waveguides; and
wherein the width of the input waveguide region is greater than the sum of the widths of the output waveguides and respective gap(s).

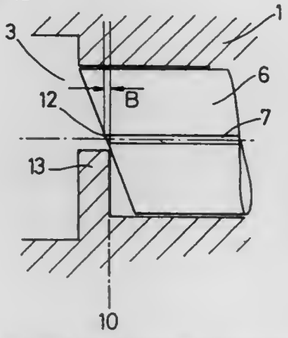
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5,745,620
**OPTICAL COUPLING**
**Ernest Eisenhardt Bergmann, Borough of Foutain Hill, Pa., assignor to Lucent Technologies, Inc., Murray Hill, N.J.**
**Filed Dec. 8, 1995, Ser. No. 569,267**
**Int. Cl.[6] G02B *6/00;6/36***
**U.S. Cl. 385—56** **17 Claims**




1. An optical coupling comprising
a receptacle having an opening;
a beam stop comprising a wall that encloses at least a portion of said opening;
an optical radiation source mounted in said receptacle; and
a connector plug adapted for engagement into said receptacle opening, said connector plug including a radiation receptor for receiving optical radiation from said optical radiation source when said connector plug is engaged in said receptacle opening, radiation from said radiation source engaging said beam stop when said connector plug is disengaged from said receptacle.

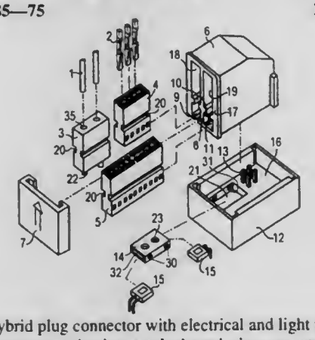
5,745,621
**OPTICAL CONNECTOR**
**Robert William Musk, Fieldings, England, assignor to Hewlett-Packard Company, Palo Alto, Calif.**
**Filed Oct. 3, 1996, Ser. No. 724,983**
**Claims priority, application United Kingdom, Oct. 16, 1995, 9521100**
**Int. Cl.[6] G02B *6/38***
**U.S. Cl. 385—72** **15 Claims**




1. An optical connector for receiving a ferrule containing an optical fibre, the optical connector comprising:
a housing defining a passage therethrough, and
a stop for abutment against a face of the ferrule,
characterised in that the stop is positioned and shaped so that in use the area of contact between the stop and the ferrule end face is less than 10% of the total area of the end face of the ferrule, and in that the area of contact between the stop and the ferrule end face is close to a central axis of the ferrule.

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5,745,622
**HYBRID PLUG-TYPE CONNECTOR WITH MODULAR ELECTRICAL AND LIGHT WAVEGUIDE CONNECTIONS**
**Roland Birnbaum, Aalen, and Guenter Dissen, Taufkirchen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**
**Filed Sep. 6, 1996, Ser. No. 708,975**
**Claims priority, application Germany, Sep. 8, 1995, 195 33 295.4**
**Int. Cl.[6] G02B *6/38***
**U.S. Cl. 385—75** **10 Claims**

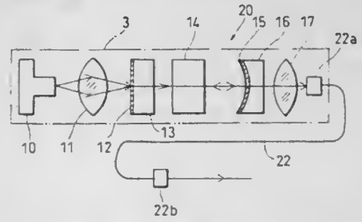


1. In a hybrid plug connector with electrical and light waveguide plug-type connectors having a tub-shaped pin connector housing and a socket connector housing which can be plugged into one another in an overlapping fashion with side walls situated opposite one another in a nearly parallel fashion, the improvements comprising at least one socket module being provided, said socket module having jack contacts arranged in a determined grid pattern; at least one light waveguide module being provided, said waveguide module having at least one single-mode fiber; said modules being insertable into an opening in a side wall of the socket connector housing with each module having an equal measurement of separation in their outer dimensions; and said pin connector housing having a tub base with a plurality of plug pins being arranged in a specific pattern therein and at least one light guide countermodule being integrated in the tub base.



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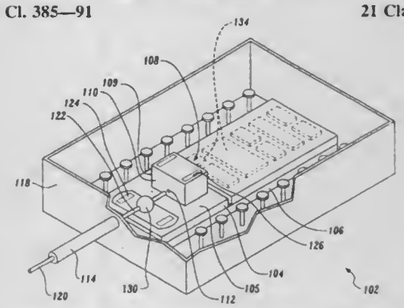
5,745,623
**LASER SYSTEM FOR SURVEYING**
**Fumio Ohtomo; Hiroshi Koizumi; Masayuki Momiuchi; Masahiro Ohishi, and Yoshiaki Goto, all of Tokyo-to, Japan, assignors to Kabushiki Kaisha TOPCON, Tokyo, Japan**
**Filed Aug. 2, 1996, Ser. No. 691,548**
**Claims priority, application Japan, Aug. 17, 1995, 7-231925; May 21, 1996, 8-149824; Jun. 19, 1996, 8-178510**
**Int. Cl.[6] G02B *6/26***
**U.S. Cl. 385—88** **15 Claims**




1. A laser system for surveying, comprising a laser light source unit, an optical system for irradiating a laser beam toward a given direction, and an optical fiber for guiding the laser beam toward the optical system, wherein the laser light source unit is an LD pumped solid-state laser comprising a light emitting unit and an optical resonator, and said optical resonator is provided in said optical system, and said optical fiber guides the laser beam from said light emitting unit toward said optical resonator so that said light emitting unit is thermally isolated from said optical system.

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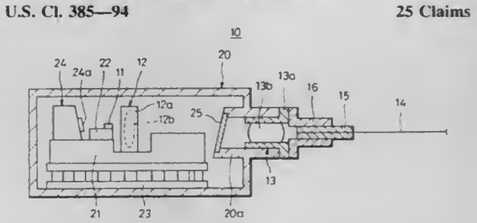
5,745,624
**AUTOMATIC ALIGNMENT AND LOCKING METHOD AND APPARATUS FOR FIBER OPTIC MODULE MANUFACTURING**
**Eric Yuen-Jun Chan, Mercer Island, and Mark William Beranek, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.**
**Filed Aug. 23, 1996, Ser. No. 701,889**
**Int. Cl.[6] G02B *6/00;6/36***
**U.S. Cl. 385—91** **21 Claims**




1. An alignment and locking system for aligning an optical fiber with an optoelectronic device secured to a substrate and locking the optical fiber in place, said system comprising:
a computer;
a thin metallic resistor/heater overlying the substrate;
a solder preform overlying said thin metallic resistor/heater, said optical fiber positioned adjacent said solder preform, said solder preform having a known melting temperature and the ability to form a chemical bond with said thin metallic resistor/heater;
a power source for supplying electrical power to said thin metallic resistor/heater suitable for causing said solder preform to melt based on power control signals received by said power source from said computer;
an instrument for determining the amount of light passing between said optical fiber and said optoelectronic device and supplying related received power signals to said computer; and
a manipulator for aligning said optical fiber with said optoelectronic device based on alignment control signals received from said computer, said alignment control signals being based on said received power control signals, said manipulator aligning said optical fiber while said solder preform is melted.

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5,745,625
**SEMICONDUCTOR LASER MODULE**
**Takeshi Aikiyo; Toshio Kimura, both of Ichihara, and Yusei Shirasaka, Chiba, all of Japan, assignors to The Furukawa Electric Co.,Ltd., Tokyo, Japan**
**Filed Sep. 10, 1996, Ser. No. 707,957**
**Claims priority, application Japan, Sep. 28, 1995, 7-251389**
**Int. Cl.[6] G02B *6/36***
**U.S. Cl. 385—94** **25 Claims**




1. A semiconductor laser module comprising a lens system having first and second lenses for coupling a beam emitted from a semiconductor laser with a core expanded fiber having a single-mode fiber end whose core diameter is expanded.
wherein said core expanded fiber is set so as to have a core expansion coefficient of 1.3 or more and an absolute value of change rate of mode field diameter smaller than $6.0\times10^{-4}$ $\mu m^{-1}$.

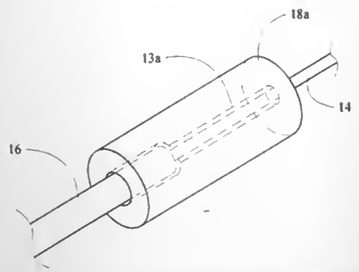
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5,745,626
**METHOD FOR AND ENCAPSULATION OF AN OPTICAL FIBER**
**Gary Stephen Duck, Nepean; Neil Teitelbaum, Ottawa, and Yihao Cheng, Kanata, all of Canada, assignors to JDS Fitel Inc., Nepean, Canada**
**Filed Jun. 20, 1996, Ser. No. 666,228**
**Int. Cl.[6] G02B *6/38***
**U.S. Cl. 385—96** **14 Claims**

1. A method of encapsulating at least a portion of a single optical fiber having a diameter of about 125 μm comprising the steps of:
providing a ferrule having a bore having a diameter of substantially about 126 μm or less, the ferrule at least about and defining the bore comprising a material that has essentially a same coefficient of expansion, is similar to and fusible with, the optical fiber sized to fit into the bore;

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inserting at least a portion of the optical fiber into the bore;

heating the ferrule sufficiently to fuse at least a portion of the optical fiber inserted into the bore with the ferrule.

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**5,745,627**

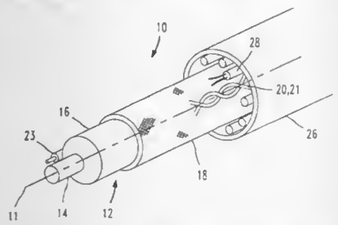
**COMPOSITE CABLE FOR FIBER-TO-THE-CURB ARCHITECTURE USING CENTRALIZED POWER**

**Candido John Arroyo, Lithonia, and Richard Lee Knight, Cumming, both of Ga., assignors to Lucent Technologies Inc., Murry Hill, N.J.**

**Filed Dec. 28, 1995, Ser. No. 583,145**

**Int. Cl.[6] G02B *6/44***

**U.S. Cl. 385—101** **5 Claims**




1. A composite communication cable having a longitudinal axis, comprising:

a longitudinally extending core member comprising a metallic conductor member encased within a dielectric member;

a second conductor member surrounding said core member and forming a coaxial cable along with said core member for transmitting broad band signals;

a jacket of insulating material surrounding said core member and second conductor member, said jacket being spaced from said core member.

first and second insulated electrical power conducting members disposed substantially adjacent each other and extending along one side of said cable axis spaced therefrom and between said core member and said jacket;

a twisted pair of individually insulated narrow band signal conductors disposed between said core member and said jacket on the oposite side of the cable axis from said power conducting members and extending longitudinally along said cable axis; and

a fiber optic cable extending longitudinally along said cable axis and between said core member and said jacket.

**5,745,628**

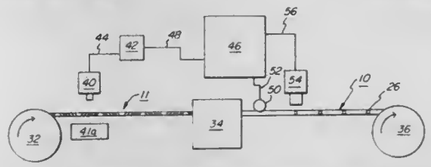
**METHOD AND APPARATUS FOR IDENTIFYING A REGION OF AN S-Z STRANDED CABLE CORE AND FOR MARKING AN OUTER SHEATH COVERING THE S-Z STRANDED CABLE CORE TO INDICATE A REGION THEREUNDER**

**David John Benzel, Neuilly sur Seine, France, and John R. Johnsen, Hickory, N.C., assignors to Alcatel NA Cable Systems, Inc., Claremont, N.C.**

**Filed Jan. 13, 1997, Ser. No. 782,950**

**Int. Cl.[6] G02B *6/44*; B32B *31/00*; H01B *7/36***

**U.S. Cl. 385—104** **14 Claims**




1. A method for identifying a transition region between a first lay orientation region and a second lay orientation region of a cable core having a reverse oscillating lay, the method comprising the steps of:

(a) providing a reverse oscillating lay cable core comprising a plurality of conductors alternatingly arranged in a first lay orientation region, a second lay orientation region, and a transition region between the first lay orientation region and the second lay orientation region, and wherein at least one of the conductors of the plurality is visually distinguishable from the remaining conductors of the plurality;

(b) passing a portion of the cable core within a field of view of an imaging means;

(c) acquiring an image of the portion of cable core within the field of view of the imaging means;

(d) comparing the quantity of visually distinguishable conductor in the acquired image to a reference value; and

(e) indicating that the portion of the cable core within the field of view of the imaging means contains a transition region if the quantity of visually distinguishable conductor in the acquired image exceeds the reference value.

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**5,745,629**

**OPTICAL DEVICE AND METHOD OF PRODUCING THE DEVICE**

**Keisuke Sasaki, 4-9, Minami-Shinozakicho 5-chome, Edogawa-ku, Tokyo, Japan**

**PCT No. PCT/JP96/00987, § 371 Date Dec. 11, 1996, § 102(e) Date Dec. 11, 1996, PCT Pub. No. WO96/32664, PCT Pub. Date Oct. 17, 1996**

**PCT Filed Apr. 10, 1996, Ser. No. 750,424**

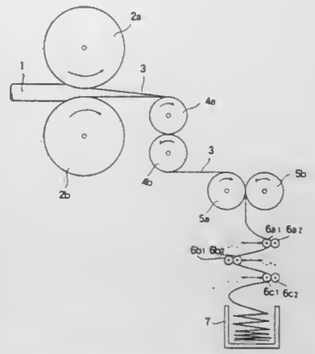
**Claims priority, application Japan, Apr. 11, 1995, 7-110069; Apr. 11, 1995, 7-110070; Jun. 23, 1995, 7-181142**

**Int. Cl.[6] G02B *6/10*; G02F *1/35***

**U.S. Cl. 385—122** **17 Claims**

1. A waveguide for a nonlinear optical device, comprising a periodic domain structure formed of a polymer laminate in which a plurality of polymer films are laminated, wherein each of the polymer films is formed of a rolled and drawn organic nonlinear optical material which is a polymer having a second order nonlinear optical dye moiety substituted for a side chain of the polymer, an end of the optical dye moiety being grafted to the polymer, the optical dye moiety being oriented in one direction by rolling and drawing the organic nonlinear optical material.






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**5,745,630**

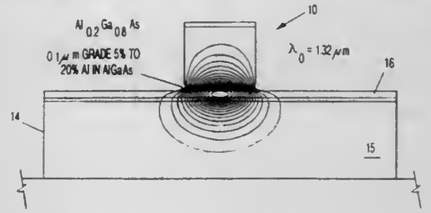
**CUTOFF-MESA ISOLATED RIB OPTICAL WAVEGUIDE FOR III-V HETEROSTRUCTURE PHOTONIC INTEGRATED CIRCUITS**

**Gregory A. Vawter, and Robert E. Smith, both of Albuquerque, N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.**

**Filed Feb. 22, 1996, Ser. No. 603,841**

**Int. Cl.[6] G02B *6/10***

**U.S. Cl. 385—129** **19 Claims**




1. A composite optical waveguide for use within a photonic integrated circuit with light of a particular wavelength comprising:

a cutoff mesa waveguide structure comprising a slab layer of thickness t at the upper surface of the mesa, said slab layer being underlain by a lower cladding layer, the mesa waveguide structure having a vertically asymmetric refractive index profile that is controlled by the thickness t and the chemical composition of the slab and the lower cladding layer such that the light does not propagate in a guided mode in the cutoff mesa waveguide structure by itself, the cutoff mesa being further defined by two parallel lateral walls to form an elongated structure; and

an elongated rib waveguide structure formed atop the cutoff mesa waveguide structure and aligned therewith, the rib waveguide structure having a width less than the width of the cutoff mesa with the width and the chemical composition of the rib waveguide being such that only the $TE_{00}$ and $TM_{00}$ modes of the light are guided by the combination of the cutoff mesa waveguide structure and the rib waveguide structure in the region beneath the rib waveguide structure and no modes of the light are permitted in other regions of the cutoff mesa waveguide.

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**5,745,631**

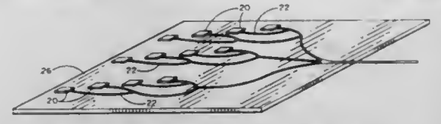
**SELF-ALIGNING OPTICAL BEAM SYSTEM**

**David M. Reinker, Yorba Linda, Calif., assignor to Irvine Sensors Corporation, Costa Mesa, Calif.**

**Filed Jan. 26, 1996, Ser. No. 592,691**

**Int. Cl.[6] G02B *6/10***

**U.S. Cl. 385—132** **13 Claims**




1. An optical beam alignment structure comprising:

a substantially flat substrate having formed in a portion thereof a plurality of optical channels extending in a plane parallel to the plane of the substrate, and having a plurality of sockets formed in a different portion of the substrate extending partially through the substrate; and

a plurality of laser chips supported by the substrate, each adapted to emit a laser beam into one of the optical channels, and each having formed thereon a plurality of plugs adapted to extend into aligned sockets of the substrate when the laser chip is in position on the substrate;

the plugs extending into their respective sockets in a direction at an angle from the plane of the substrate, so that the plugs inside the sockets prevent motion of the laser chips relative to the substrate in the plane of the substrate.

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**5,745,632**

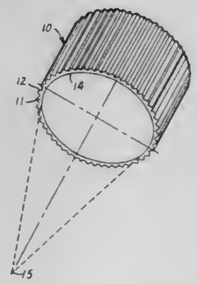
**TOTALLY INTERNALLY REFLECTING LIGHT CONDUIT**

**John F. Dreyer, Ramsey, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.**

**Continuation of Ser. No. 544,775, Oct. 18, 1995, abandoned. This application Mar. 25, 1997, Ser. No. 824,027**

**Int. Cl.[6] G02B *6/00***

**U.S. Cl. 385—133** **8 Claims**




1. A hollow tubular light conduit for distributing light therefrom comprising:

a cylindrical wall member of a transparent material, the wall member having an inner smooth surface and an outer structured surface, the structured surface having a linear array of isosceles prisms arranged side by side thereon with faces of adjacent prisms extending longitudinally along the cylindrical wall member and aligned at a selected prism angle of greater than 0 and less than 90 degrees wherein, depending on the selected prism angle, the wall member exhibits light distribution relative to radially aligned, high incident angle longitudinal light rays in planes parallel or near parallel to the prisms when the following condition is satisfied:

$N_0\beta+\beta/2=90$

where

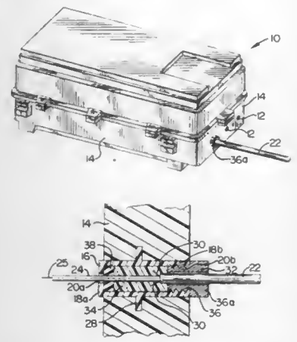
$\beta$=the selected prism angle

$N_0$=zero or any positive integer.

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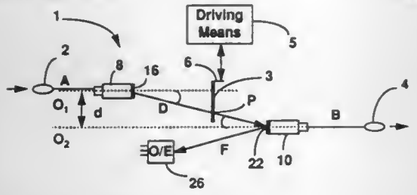
**5,745,633**
**FIBER OPTIC CABLE ASSEMBLY FOR SECURING A FIBER OPTIC CABLE WITHIN AN INPUT PORT OF A SPLICE CLOSURE**
**Markus A. Giebel, Hickory, and Charles K. Adams, Newton, both of N.C., assignors to Siecor Corporation, Hickory, N.C.**
**Filed Dec. 24, 1996, Ser. No. 773,040**
**Int. Cl.[6] G02B** *6/00*
**U.S. Cl. 385—136** **19 Claims**



1. A fiber optic cable assembly for providing a sealed junction within an input port of a splice closure, the fiber optic cable assembly comprising:
a fiber optic cable having an end portion adapted to extend through the input port and into the splice closure;
a plug encasing a portion of said fiber optic cable such that said fiber optic cable extends both forwardly from said plug into the splice closure and rearwardly from said plug away from the splice closure, said plug having a predetermined shape and size such that said plug can be disposed within the input port;
an annular grommet mounted about said fiber optic cable and adjacent said plug, said grommet also having a predetermined shape and size such that said grommet can also be disposed within the input port; and
a retaining member mounted about a portion of said fiber optic cable rearward of said plug for operably engaging the input port of the splice closure such that said grommet, said plug and the portion of said fiber optic cable encased by said plug are securely retained therein.

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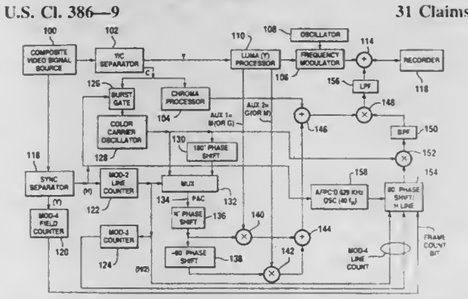
**5,745,634**
**VOLTAGE CONTROLLED ATTENUATOR**
**Carey Marcel Garrett, Kanata; Chenjun Fan, Nepean; Darko Cugalj, St. Ottawa, and David Gransden, Nepean, all of Canada, assignors to JDS Fitel Inc., Nepean, Canada**
**Filed Jul. 24, 1996, Ser. No. 685,620**
**Int. Cl.[6] G02B** *6/32*
**U.S. Cl. 385—140** **25 Claims**




1. An attenuating device comprising:
a first lens for receiving an incoming light beam and for directing said light beam along a first beam path;
a second lens disposed along said first beam path having an input face arranged so that substantially most of said light beam incident upon said input face passes therethrough said second lens as an outgoing light beam, while a smaller, predetermined portion of said light beam is reflected off an end face thereof along a reflected beam path;
optical detection means disposed to receive said predetermined portion for detecting the intensity of said predetermined portion; and controllable attenuating means located between said first lens and said second lens, and being in or movable in said optical path for varying the attenuation of said outgoing light beam.

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**5,745,635**
**ADAPTIVE DEEMPHASIS AND REEMPHASIS OF HIGH FREQUENCIES IN VIDEO TAPE RECORDING, UTILIZING A RECORDED CONTROL SIGNAL**
**Christopher H. Strolle, Glenside, Pa., and Raymond A. Schnitzler, Highland Park, N.J., assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**
**Continuation-in-part of Ser. No. 604,494, Oct. 26, 1990, abandoned. This application Jan. 25, 1993, Ser. No. 8,813**
**Int. Cl.[6] H01N** *5/76*
**U.S. Cl. 386—9** **31 Claims**



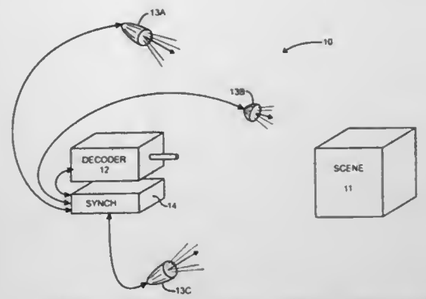

1. A recording system for recording a luminance signal having a high frequency portion and a low frequency portion on a recording medium, said recording system comprising:
means for generating a control signal representative of an amplitude level of said high-frequency portion of said luminance signal;
means for reducing the amplitude level of said high-frequency portion of said luminance signal relative to said low frequency portion in response to said control signal, thereby generating a reduced-highs luminance signal; and
means for generating a combined signal by combining said reduced-highs luminance signal with said control signal, and recording said combined signal on said recording medium.

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**5,745,636**
**SYSTEM AND METHOD FOR RENDERING IMAGES**
**Amnon Shashua, Cambridge, and Tomaso Poggio, Wellesley, both of Mass., assignors to GenTech Corp., Tokyo, Japan**
**Division of Ser. No. 293,742, Aug. 22, 1994, Pat. No. 5,550,641, which is a continuation of Ser. No. 700,703, May 15, 1991, abandoned. This application Aug. 19, 1996, Ser. No. 699,543**
**Int. Cl.[6] H04N** *5/91*
**U.S. Cl. 386—46** **10 Claims**

1. An image rendering system for generating a rendered image which reflects a desired light source position in response to frame image information relating to a series of frames recorded in response to a light sources having diverse positions, the image rendering system comprising:
A. a frame store for storing the frame image information for each of the series of frames, the frame image information having a specular component and a non-specular component;
B. a rendered image store for receiving rendered image information representing a rendered image; and
C. a rendered image information generator comprising:

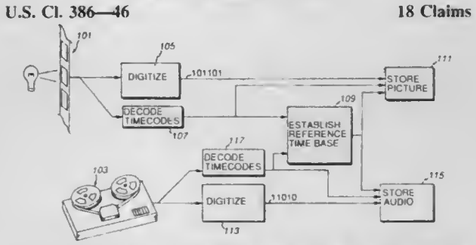





i. a specular correction portion for generating from the frame image information intermediate image information representing the non-specular component of the frame image information; and
ii. a non-specular rendered image information generator for generating rendered image information for storage in response to intermediate image information store related to frames of the series as recorded in synchrony with diverse ones of the light sources, the non-specular rendered image information generator generating the rendered image information in relation to the intermediate image information for each of the frames, as weighted in relation to the relationship between the position of the light sources with which each of the frame was recorded and the desired position of the light source for the rendered image.

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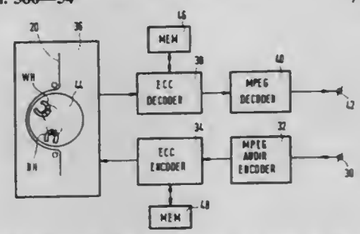
**5,745,637**
**SYNCHRONIZATION OF DIGITAL VIDEO WITH DIGITAL AUDIO**
**Michael E. Phillips, Brookline; Patrick O'Connor, Billerica, and Eric Peters, Carlisle, all of Mass., assignors to Avid Technology, Inc., Tewksbury, Mass.**
**Continuation of Ser. No. 344,409, Nov. 23, 1994, Pat. No. 5,557,423, which is a continuation of Ser. No. 48,645, Apr. 16, 1993, abandoned. This application Sep. 16, 1996, Ser. No. 713,107**
**Int. Cl.[6] H04N** *5/91;5/928*
**U.S. Cl. 386—46** **18 Claims**




1. A method for synchronizing an audio-visual clip including a stream of digitized picture data including a stream of picture timecodes and a stream of digitized audio data including a stream of audio timecodes, the stream of picture timecodes having a first time resolution and the stream of audio timecodes having a second time resolution, the method comprising the steps of:
creating a digital reference time base signal beginning at a reference time zero and including periodic timing information synchronous with one of the stream of picture timecodes and the stream of audio timecodes, the reference time base having a third time resolution;
creating an association of another of the stream of picture timecodes and the stream of audio timecodes with the reference time base; and
storing the clip as a track group synchronous over the range of time of coincidence, the digitized stream of picture data including the picture timecodes, the digitized stream of audio data including the audio timecodes and the reference time base signal including the association created.

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**5,745,638**
**RECORDING/REPRODUCING APPARATUS OF THE HELICAL SCAN TYPE**
**Albert M. A. Rijckaert, Eindhoven, Netherlands, and Ronald W. J. J. Saeijs, Nürnberg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.**
**Filed Jun. 20, 1996, Ser. No. 673,781**
**Claims priority, application European Pat. Off., Jun. 22, 1995, 95201688**
**Int. Cl.[6] H04N** *5/76*
**U.S. Cl. 386—54** **7 Claims**




1. Apparatus of the helical scan type, for reproducing a digital video signal from slant tracks on a record carrier, the digital video signal being recorded in first track portions of the tracks, the apparatus comprising:
read means comprising at least one read head for reading a first channel signal recorded in said first track portions of the tracks;
decoding means for decoding said first channel signal to form said digital video signal; and
output means for outputting the digital video signal, wherein the apparatus is adapted to reproduce, in an edit mode, said digital video signal and to record a digital audio signal in second track portions of the tracks, said apparatus further comprising:
input means for receiving the digital audio signal;
encoding means for encoding said digital audio signal so as to obtain a second channel signal; and
write means comprising at least one write head for writing the second channel signal in said second track portions, the at least one read head and the at least one write head being positioned on a rotatable head drum at such a location relative to each other that when the read head reads said first channel signal from a first track portion of a first track, the write head writes said second channel signal in a second track portion in a second track, said second track being spaced a specified number of tracks away from said first track, the apparatus further being adapted to reproduce, in a normal reproduction mode, said digital video signal and said digital audio signal from said first and second track portions, respectively, using said read means.

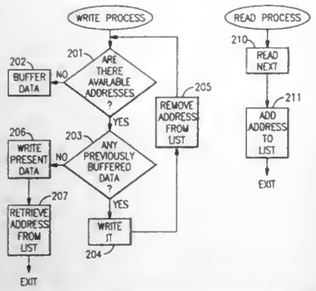
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**5,745,639**
**APPARATUS FOR IMPROVING THE CONTINUOUS SUPPLY OR DISPLAY TIME OF FULL-MOTION VIDEO AND OTHER DATA**
**Joseph Michael Gensheimer, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**
**Filed Jan. 4, 1995, Ser. No. 368,681**
**Int. Cl.[6] H04N** *5/781*
**U.S. Cl. 386—70** **1 Claim**

1. In a data processing system, an apparatus for increasing the length of time for continuous display of full-motion video data, said apparatus comprising:
(a) a disk drive having at least one magnetic disk, wherein the location of data on said at least one disk is tracked by clusters.

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said disk drive including an independently actuated write head and an independently actuated read head, said write and read heads being capable of accessing data on said at least one magnetic disk by an associated cluster address;

(b) a buffer for temporary storage of said video data which is to be written to said at least one disk;

(c) a cluster address list store;

(d) a write controller for writing said video data, if possible, to a location on said at least one disk which location is indicated in said address list store as having already been read, or, if not possible, to said buffer; and

(e) a read controller for updating said address list store to indicate as being available, cluster locations on said at least one disk from which associated video data have already been read.

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**5,745,640**

**AV DATA BASE FOR VTR**

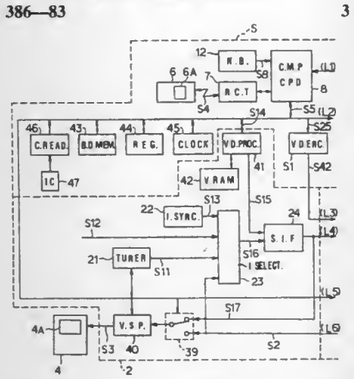
**Toshiyuki Ishii; Kousuke Misono, both of Kanagawa; Seiichi Misawa, Saitama; Joji Fukuda; Tetsuo Nishigaki, both of Kanagawa, and Kiyoshi Ota, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 383,614, Feb. 2, 1995, abandoned, which is a division of Ser. No. 643,207, Jan. 18, 1991, abandoned. This application May 17, 1995, Ser. No. 443,373**

**Claims priority, application Japan, Jan. 21, 1990, 2-010864**

**Int. Cl.**[6] **H04N** *5/91;7/00*

**U.S. Cl. 386—83** **3 Claims**




1. A video tape recorder for recording at least one program on a video tape, comprising:

recording/reproducing means for recording and reproducing signals on the video tape;

input means for receiving said at least one program;

display means for providing a display to a user;

user command input means for receiving recording commands from a user; and

control means for controlling the recording of said at least one program on said video tape by said recording/reproducing means;

said control means being operative to control said recording/reproducing means to record management data in a management database recording field formed at a predetermined position on said video tape, said management data including recording control data for subsequent display to a user carrying out a recording command input for indicating a recording condition of said video tape;

said control means being operative to control said recording/reproducing means to record data indicating an unused recording capacity of said video tape and to control said recording/reproducing means to record on said video tape data indicating a total number of programs recorded on said video tape and data identifying at least an identity and a total number of programs reserved to be recorded thereon as at least a portion of said data indicating an unused recording capacity of said video tape;

said control means being operative to control said recording/reproducing means to reproduce said recording control data from said management database recording field of said video tape and to control said display means to display a recording condition of said video tape based on the reproduced recording control data;

said user command input means being operative to input recording commands from a user responding to the display of said recording condition;

said control means being further operative to control the recording of said at least one program based on said recording commands.

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**5,745,641**

**FULL-MOTION VIDEO DISC WITH REFERENCE INFORMATION FOR SLOW-MOTION OR FREEZE PLAYBACK**

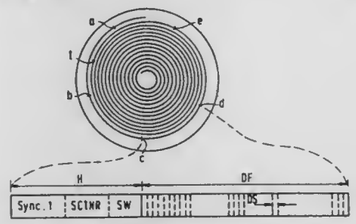
**Wiebe De Haan, and Jan Van Der Meer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Division of Ser. No. 269,941, Jun. 28, 1994, which is a continuation of Ser. No. 707,527, May 30, 1991, abandoned. This application Nov. 28, 1995, Ser. No. 563,799**

**Claims priority, application United Kingdom, Jun. 5, 1990, 9012538; Netherlands, Aug. 6, 1990, 9001771**

**Int. Cl.**[6] **H04N** *5/781*

**U.S. Cl. 386—95** **9 Claims**




1. An optically readable disc on which a sequence of pictures of a full-motion video scene is stored in the form of a series of video blocks,

characterized in that said video blocks have unpredictably differing respective lengths, each block including the entire encoded picture information for at least one picture of said sequence, and

each video block includes a header comprising reference information referring to the location of a predetermined video block in the series of video blocks.



**5,745,642**

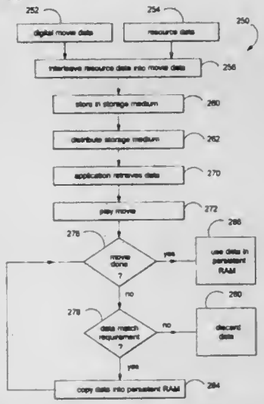
**SYSTEM TO ADD SELECTIVLEY PERSISTENT RESOURCE DATA TO UNUSED BANDWIDTH OF DIGITAL MOVIE**

**Esteban Ahn, San Francisco, Calif., assignor to Broderbund Software, Inc., Novato, Calif.**

**Continuation-in-part of Ser. No. 616,432, Mar. 15, 1996, abandoned. This application Jul. 26, 1996, Ser. No. 687,698**

**Int. Cl.**[6] **H04N** *5/76;7/00;11/00*

**U.S. Cl. 386—95** **12 Claims**




1. A method for recording data on a nonvolatile storage medium and playing said recorded data on a computer, said computer having a reader for reading said nonvolatile storage medium at a predetermined transfer rate and system RAM for temporary storage, said recorded data containing distal movie data and resource data to be used after playing said digital movie data, said method comprising the steps of:

recording said resource data, comprising the steps of:

encoding said digital movie data;

encoding said resource data such that said resource data is distinguishable from said encoded digital movie data;

determining an amount of encoded resource data that can be interleaved into said encoded digital movie data, said amount being related to an amount of encoded digital movie data needed for playing during a predetermined time interval;

interleaving said amount of encoded resource data into said encoded digital movie data; and

writing said interleaved data into said nonvolatile storage medium; and playing back said interleaved data, comprising the steps of:

retrieving said interleaved data from said nonvolatile storage medium;

recovering said resource data from said retrieved interleaved data while said digital movie data is played;

loading at least a portion of said recovered resource data in said system RAM; and upon completion of playing said digital movie data, using said loaded resource data.

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**5,745,643**

**SYSTEM FOR AND METHOD OF REPRODUCING PLAYBACK DATA APPROPRIATELY BY THE USE OF ATTRIBUTE INFORMATION ON THE PLAYBACK DATA**

**Masamitsu Mishina, Sagamihara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

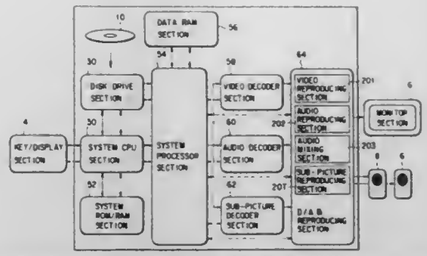
**Filed Apr. 5, 1996, Ser. No. 628,316**

**Claims priority, application Japan, Apr. 6, 1995, 7-081283**

**Int. Cl.**[6] **H04N** *5/91;5/917*

**U.S. Cl. 386—106** **64 Claims**

1. A system for reproducing playback data from a recording medium having a playback data area in which the playback data is stored and a playback management information area in which management information on said stored video data and playback




information on the procedure for reproducing the playback data is stored, said playback data including a combination of video data packs, audio data packs, and sub-picture data packs, each video data pack having video data compressed at a selected video compression mode, each audio data pack having audio data encoded at a selected audio encoding mode, and each sub-picture data pack having sub-picture data compressed at a selected sub-picture compression mode wherein the video data, the audio data, and the sub-picture data are compressed or encoded separately according to the selected compression or encoding mode, said management information including attribute information in which the video compression mode, the audio encoding mode, and the sub-picture compression mode are described, said system comprising:

searching means for searching said playback data and playback information area for to read out the attribute information describing the video compression mode, the audio encoding mode, and the sub-picture compression mode;

means for sending the information describing the video compression mode, the audio encoding mode, and the sub-picture compression mode to generate a video enabling signal, an audio enabling signal, and a sub-picture enabling signal, respectively;

video decoding means for decoding the compressed video data into an expanded video signal;

audio decoding means for decoding the encoded audio data into a decoded audio signal;

sub-picture decoding means for decoding the compressed sub-picture data into an expanded sub-picture signal;

enabling means for enabling the video decoding means, the audio decoding means, and the sub-picture decoding means in response to the video enabling signal, the audio enabling signal, and the sub-Picture enabling signal;

video output means for outputting the video signal with the sub-picture signal; and

audio output means for outputting the audio signal.

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**5,745,644**

**METHOD AND APPARATUS FOR ENCODING A DIGITAL VIDEO SIGNAL**

**Naofumi Yanagihara, and Masaki Oguro, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Oct. 27, 1992, Ser. No. 967,015**

**Claims priority, application Japan, Nov. 5, 1991, 3-317498**

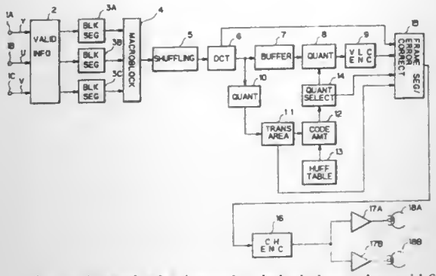
**Int. Cl.**[6] **H04N** *5/917;11/02*

**U.S. Cl. 386—109** **30 Claims**

1. A method of encoding a digital video signal provided as a plurality of blocks of video data, comprising the steps of:

performing a discrete cosine transformation of each of said blocks of video data to provide corresponding blocks of transformed video data, each of said corresponding blocks of transformed video data including a respective DC component and a respective plurality of AC components having respective different frequencies;

quantizing relatively lower frequency ones of the respective AC components in a block with the use of first quantization intervals and quantizing relatively higher frequency ones of the respective AC components in the same block with the use




of second quantization intervals relatively larger than said first quantization intervals;

variable-length encoding said respective plurality of AC components of each of said corresponding blocks of transformed video data;

arranging the respective DC component and the respective variable-length encoded AC components of each of said corresponding blocks of transformed video data in an order such that said respective DC component precedes said respective variable-length encoded AC components and said relatively lower frequency ones of said respective variable-length encoded AC components precede said relatively higher frequency ones of said respective variable-length encoded AC components; and

providing error correction codes for said corresponding blocks of transformed video data.

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**5,745,645**

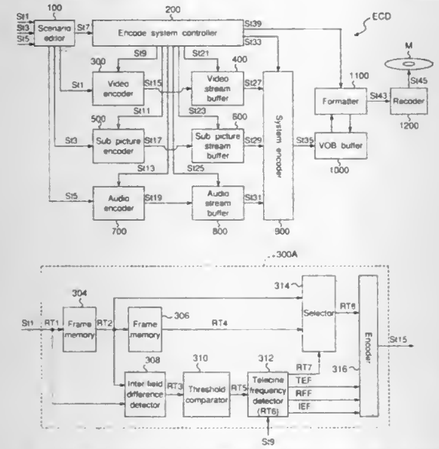
**METHOD AND AN APPARATUS FOR ENCODING TELECINE-CONVERTED VIDEO DATA FOR SEAMLESS CONNECTION**

**Kazuhiko Nakamura, Hirakata; Kazuhiro Tsuga, Takarazuka; Takumi Hasebe, Yawata; Yoshihiro Mori, Hirakata; Yasuhiko Yamane, Moriguchi, and Noboru Mizuguchi, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Sep. 27, 1996, Ser. No. 724,231**

**Int. Cl.[6] H04N** *5/76;5/781*

**U.S. Cl. 386—131** **2 Claims**







**1**. A signal conversion recording method applying a signal recording method whereby

a video signal converted to a frame rate greater than the frame rate of the signal source by repeating particular fields plural times is converted to an intermediate signal having a frame rate substantially equal to the frame rate of the original signal source by deleting these repeated redundant fields,

this intermediate signal is compression coded to obtain the recording signal, and

the recording signal is recorded to a recording medium together with a repeat first field flag RFF declaring whether a field was deleted, and a top field first flag TFF declaring which of the two fields in the each of the resulting frames is first on the time-base,

wherein when plural logical recording periods are provided on a single recording medium, said video signal is converted to the recording signal so that said flags hold particular values at the start and end of each recording period.

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**5,745,646**

**IMAGE PICK-UP APPARATUS FOR RECORDING WHEN RECORDING MEDIUM IS MOVED AT A STABLE SPEED**

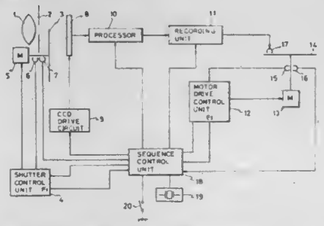
**Syuichiro Saito, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 965,687, Oct. 26, 1992, abandoned, which is a continuation of Ser. No. 731,383, Jul. 16, 1991, abandoned, which is a continuation of Ser. No. 630,734, Dec. 20, 1990, abandoned, which is a continuation of Ser. No. 438,944, Nov. 17, 1989, abandoned, which is a continuation of Ser. No. 201,292, May 27, 1988, abandoned, which is a continuation of Ser. No. 634,057, Jul. 25, 1984, abandoned. This application Nov. 8, 1994, Ser. No. 336,758**

**Claims priority, application Japan, Aug. 2, 1983, 58-142154; Aug. 2, 1983, 58-142158**

**Int. Cl.[6] H04N** *5/225*

**U.S. Cl. 386—117** **4 Claims**




**1**. An image pickup apparatus comprising:

image pickup means for converting an optical image into an electrical signal;

recording means for recording the electrical signal; said recording means reaches a predetermined stable speed after being supplied with power;

detecting means for producing a detection signal when said recording means reaches a predetermined stable speed after being supplied with power; and

control means for resetting an operation of said image pickup means in response to said detection signal and for starting a phase control of said recording means.

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**5,745,647**

**METHOD AND APPARATUS FOR AUTOMATICALLY CONTROLLING AND SCALING MOTOR VELOCITY**

**Kenneth W. Krause, Sandown, N.H., assignor to Smith & Nephew, Inc., Andover, Mass.**

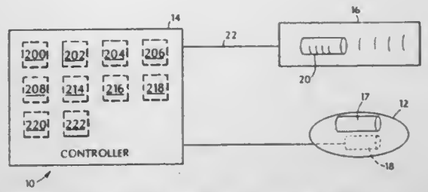
**Filed Sep. 15, 1995, Ser. No. 529,191**

**Int. Cl.[6] H02P** *7/18*

**U.S. Cl. 388—827** **30 Claims**

**1**. A method for automatically associating a sensed mechanical parameter to a transformed value in a range of motor velocity values for controlling the rotational velocity of a motor driving a medical instrument, said mechanical parameter having a value controlled by a human operator, comprising the steps of






measuring a value of the sensed mechanical parameter controlled by said operator,

automatically determining a user controlled maximum parameter value from measurements of said sensed parameter, and

scaling the measured values of said sensed parameter to said range of motor velocity values wherein a minimum value of said parameter corresponds to no rotation of said motor and said determined maximum value of said parameter corresponds to a maximum rotational velocity of said motor.

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**5,745,648**

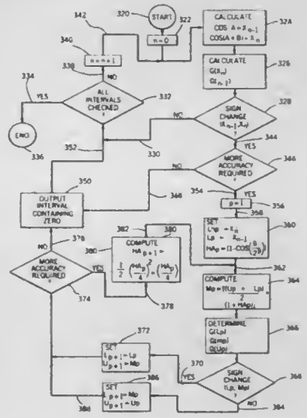
**APPARATUS AND METHOD FOR ANALYZING SPEECH SIGNALS TO DETERMINE PARAMETERS EXPRESSIVE OF CHARACTERISTICS OF THE SPEECH SIGNALS**

**Safdar M. Asghar, and Mark A. Ireton, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

**Continuation of Ser. No. 318,379, Oct. 5, 1994, abandoned. This application May 5, 1997, Ser. No. 851,411**

**Int. Cl.[6] G10L** *3/02*

**U.S. Cl. 395—2.13** **20 Claims**




**6**. A method for analyzing speech signals to determine parameters expressive of characteristics of the speech signals, comprising steps of:

converting speech signals to linear predictive coding (LPC) parameters;

transforming said LPC parameters to a corresponding line spectrum pair (LSP) expression; and

locating a plurality of roots of said LSP expression, said roots being the parameters expressive of the speech characteristics, including steps of:

receiving a representation of an initial value for locating a first site on a unit circle;

receiving a representation of a step value for defining an arc-distance on said unit circle;

generating a plurality of intervals on said unit circle, each interval of said plurality of intervals having a lower limit and an upper limit, said plurality of intervals including an initial interval and a plurality of succeeding intervals; said lower limit of said initial interval being said initial value, said upper limit of said initial interval being displaced on said unit circle from said initial value by said arc-distance; each respective succeeding interval of said plurality of succeeding intervals having its respective lower limit coincident with said upper limit of the next-preceding interval of said plurality of intervals, each said respective succeeding interval having its respective upper limit displaced on said unit circle from its respective lower limit by said arc-distance;

evaluating said line spectrum pair expression for at least said upper limit and said lower limit of each said respective interval of said plurality of intervals;

recognizing presence of a respective root of said plurality of roots when said line spectrum pair expression changes sign within a particular interval of said plurality of intervals;

designating each said particular interval as a solution interval; and

generating said lower limit and said upper limit of each said solution interval, wherein the plurality of roots present in said solution intervals express the characteristics of the speech signals.

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**5,745,649**

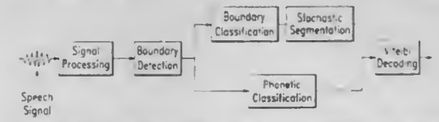
**AUTOMATED SPEECH RECOGNITION USING A PLURALITY OF DIFFERENT MULTILAYER PERCEPTION STRUCTURES TO MODEL A PLURALITY OF DISTINCT PHONEME CATEGORIES**

**David M. Lubensky, New Milford, Conn., assignor to NYNEX Science & Technology Corporation, White Plains, N.Y.**

**Continuation of Ser. No. 271,595, Jul. 7, 1994, abandoned. This application Mar. 19, 1997, Ser. No. 820,937**

**Int. Cl.[6] G10L** *5/04*

**U.S. Cl. 395—2.41** **7 Claims**




**1**. A method of performing speech recognition, said method comprising the steps of:

choosing a plurality of context dependent phonetic categories to model;

modeling each of the chosen context dependent phonetic categories, using at least one multilayer perceptron (MLP) structure that is separate from MLP structures used to model other phonetic categories, the modeling step including the use of a training database; and

using the models of each of the chosen context dependent phonetic categories to perform a speech recognition operation.

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**5,745,650**

**SPEECH SYNTHESIS APPARATUS AND METHOD FOR SYNTHESIZING SPEECH FROM A CHARACTER SERIES COMPRISING A TEXT AND PITCH INFORMATION**

**Mitsuru Otsuka; Yasunori Ohora; Takashi Aso, and Toshiaki Fukada, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 24, 1995, Ser. No. 448,982**

**Claims priority, application Japan, May 30, 1994, 6-116720**

**Int. Cl.[6] G10L** *9/04*

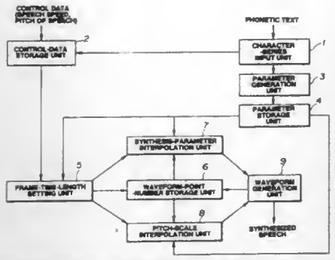
**U.S. Cl. 395—2.69** **26 Claims**

**1**. A speech synthesis apparatus for synthesizing speech from a character series comprising a text and pitch information input into the apparatus, said apparatus comprising:

input means for inputting the character series comprising the text and control information including the pitch information;

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parameter generation means for generating a parameter series of power spectrum envelopes of a speech waveform to be synthesized representing the input text in accordance with the input character series input by said input means;

parameter storage means for storing a parameter series of a frame to be processed generated by said parameter generation means;

frame-time-length setting means for calculating the time length of each frame from the control information and text input by said input means;

waveform-point-number storage means, connected to said frame-time-length setting means, for calculating and storing the number of waveform points of one frame;

synthesis-parameter interpolation means for interpolating synthesis parameters from the parameter series stored in said parameter storage means in accordance with the frame time length set by said frame-time-length setting means and the number of waveform points stored in said waveform-point-number storage means;

pitch waveform generation means for generating pitch waveforms, whose period equals the pitch period specified by the input pitch information, said pitch waveform generation means generating the pitch waveforms from the pitch information input by said input means and the power spectrum envelopes generated as the parameter series of the speech waveform by said parameter generation means, said pitch waveform generation means comprising pitch scale interpolation means for interpolating pitch scales using pitch scales received from said parameter storage means, the frame time length set by said frame-time length setting means, and the number of waveform points stored in said waveform-point-number storage means; and

speech waveform output means for generating pitch waveforms using the synthesis parameters interpolated by said synthesis parameter interpolation means and the interpolated pitch scales interpolated by said pitch scale interpolation means and for outputting the speech waveform by connecting the generated pitch waveforms.

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**5,745,651**

**SPEECH SYNTHESIS APPARATUS AND METHOD FOR CAUSING A COMPUTER TO PERFORM SPEECH SYNTHESIS BY CALCULATING PRODUCT OF PARAMETERS FOR A SPEECH WAVEFORM AND A READ WAVEFORM GENERATION MATRIX**

**Mitsuru Otsuka; Yasunori Ohora; Takashi Aso, and Toshiaki Fukada, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 30, 1995, Ser. No. 452,545**
**Claims priority, application Japan, May 30, 1994, 6-116733**
**Int. Cl.[6] G10L** *3/02*
**U.S. Cl. 395—2.77** **12 Claims**

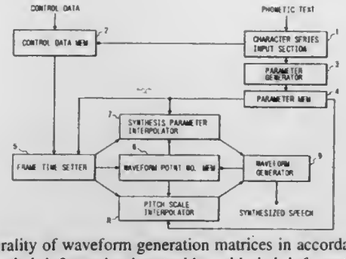
1. A speech synthesis apparatus comprising:

parameter generation means for generating parameters for a speech waveform in consonance with a character series;

pitch information input means for inputting pitch information:

waveform generation matrix read means for reading a waveform generation matrix from a table which stores in advance a plurality of waveform generation matrices in accordance with the pitch information inputted by said pitch information input means; and

pitch waveform output means for calculating products of the parameter generated by said parameter generation means and the waveform generation matrix read by said waveform generation matrix read means and for outputting the calculated products as pitch waveforms.



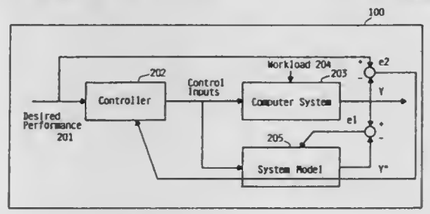

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**5,745,652**

**ADAPTIVE RESOURCE ALLOCATION USING NEURAL NETWORKS**

**Joseph Phillip Bigus, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Divisionof Ser. No. 134,953, Oct. 8, 1993, abandoned. This application May 31, 1995, Ser. No. 455,314**
**Int. Cl.[6] G06E** *1/00;3/00;* **G06F** *15/18;* **G06G** *7/00*
**U.S. Cl. 395—22** **13 Claims**




1. A computer system, comprising:

a plurality of resources for performing useful work on said computer system and capable of allocation by said system, wherein the useful work is divided into jobs, the jobs are categorized into a plurality of job classes, and the job classes require different amounts of the plurality of resources;

means for receiving a set of performance objectives from a user, wherein said set of performance objectives represent desired performance of the plurality of job classes in said computer system;

a resource allocation controller that allocates said resources within said computer system responsive to said performance objectives, said resource allocation controller having a plurality of adjustable parameters, wherein said resource controller changes allocation of said resources among the job classes based on said adjustable parameters being adjusted, wherein said resource allocation controller comprises a controller neural network having adjustable parameters, said neural network receiving said performance objectives as input and producing resource allocation information as output,

a performance monitor for monitoring performance of said computer system to produce performance data representing actual performance of said computer system;

comparison means for comparing said performance data produced by said performance monitor with said set of performance objectives to determine a difference between said objectives and said actual performance;

feedback means coupled to said comparison means for adjusting said parameters in said resource allocation controller to reduce said difference between said objectives and said actual performance for each of the plurality of classes of work, wherein said feedback means comprises means for training said controller neural network, thereby adjusting said adjustable parameters, using said difference between said objectives and said actual performance.

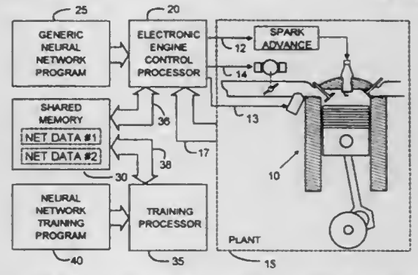
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**5,745,653**

**GENERIC NEURAL NETWORK TRAINING AND PROCESSING SYSTEM**

**Gerald Jesion, Woodhaven; James Calvey Carnes, Willis; Gintaras Vincent Puskorius, Redford, and Lee Albert Feldkamp, Plymouth, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.**

**Filed Feb. 5, 1996, Ser. No. 596,535**
**Int. Cl.[6] G06E** *1/00;3/00*
**U.S. Cl. 395—22** **10 Claims**




1. Apparatus for controlling an internal combustion engine comprising, in combination:

sensing means coupled to said engine for producing a plurality of input signal values, each of which is indicative of a particular engine operation condition,

data storage means for storing a plurality of neural network definition data structures, each of which includes:

data defining the values of signals being processed by said given neural network, and

weighting values governing the manner in which signals are combined within said given neural network,

processing means consisting of a electronic engine control microprocessor and program storage means for storing instructions executable by said processor, said processing means including:

means responsive to said input signal values for transferring input signals into at least selected ones of said neural network definition data structures for processing,

means responsive to the identification of a particular network definition data structure for performing a generic neural network routine for combining selected signal values in said particular data structure to produce and store new signal values in said particular data structure in accordance with said weighting values in said particular data structure, and

output means responsive to one or more of said new signal values for generating at least one output signal, and

actuation means responsive to said output signal for controlling the operation of said engine.

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**5,745,654**

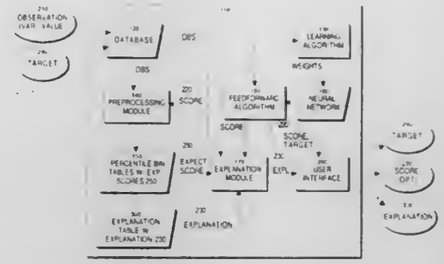
**FAST EXPLANATIONS OF SCORED OBSERVATIONS**

**Hari Titan, La Jolla, Calif., assignor to HNC Software, Inc., San Diego, Calif.**

**Filed Feb. 13, 1996, Ser. No. 600,858**
**Int. Cl.[6] G06E** *1/00;3/00;* **G06F** *15/18;* **G06G** *7/00*
**U.S. Cl. 395—22** **21 Claims**

1. A computer system for providing explanations of scored values for observations, comprising:






a database storing a plurality of observations, each observation having a value for each of a plurality of same input variables, and a score value for an output variable produced by a neural network;

a neural network that receives observations and produces an output score for the observation based on the values of the input variables;

a computer readable memory including:

a table including for each of the input variables, a set of a variable number of percentile bins, each percentile bin of an input variable associated with an expected score value for the output variable, the expected score value determined by an average of score values of observations having values for the input variable within the percentile bin, at least one percentile bin of each input variable associated with an explanation of the percentile bin;

a computer program that receives a new observation and score value from the neural network and determines from the table the percentile bin with an expected score value that is closest to the score value of the new observation, and provides the explanation, if any associated, with the determined percentile bin to a user.

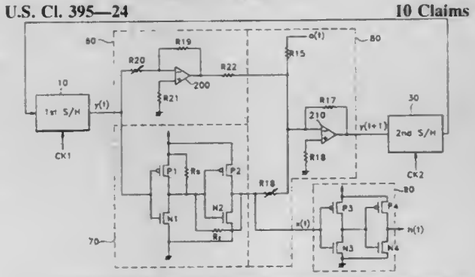
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**5,745,655**

**CHAOTIC NEURAL CIRCUIT AND CHAOTIC NEURAL NETWORK USING THE SAME**

**Ho-sun Chung, Sooseong-gu Taegu, and Ik-soo Lee, Kyungsangbuk-do, both of Rep. of Korea, assignors to Gold Star Electron Co., Ltd., Chungcheongbuk-Do, Rep. of Korea**

**Filed Jan. 19, 1995, Ser. No. 375,473**
**Claims priority, application Rep. of Korea, Feb. 2, 1994, 94-1915**
**Int. Cl.[6] G06F** *15/18*
**U.S. Cl. 395—24** **10 Claims**




1. A chaotic neural circuit for implementing a chaotic neuron in which a previous output of said neuron influences an external input signal at a current discrete time so that said neuron exhibits a chaotic response characteristic as an electronic circuit said chaotic neural circuit comprising:

linear means comprising an amplifier for amplifying an input signal linearly and for outputting the amplified input signal and a variable resistance whose first end receives said input signal and whose second end is connected to an input port of said amplifier for varying a gain of said amplifier, for linearly

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varying said input signal received by said first end of said variable resistance and outputting an output signal through an output port of said amplifier;

non-linear means comprising two inverters and a feedback variable resistance connected between output ports of said two inverters for grading a slope of an output function of a non-linear neuron, for non-linearly varying said input signal which is input to an input port of one of said two inverters and outputting an output signal through an output port of the other one of said two inverters; and

an adder for adding output signals of said linear means and non-linear means to said external input signal.

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**5,745,656**

**METHOD FOR DECODING TRANSMITTED INFORMATION UNITS**

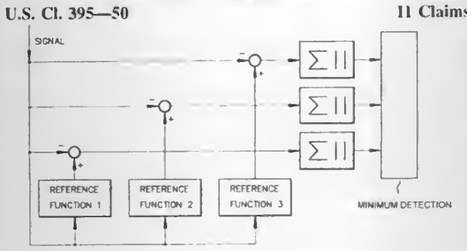
**Bernd Memmler, Rosengarten, and Gerhard Schäfer, Weinsberg, both of Germany, assignors to Temic Telefunken microelectronic GmbH, Heilbronn, Germany**

**Filed Jun. 21, 1996, Ser. No. 667,659**

**Claims priority, application Germany, Jun. 22, 1995, 195 22 621.6**

**Int. Cl.[6] G06F *17/00***

**U.S. Cl. 395—50** **11 Claims**




7. A method of decoding an information unit that has been transmitted by radio, the transmitted information unit being selected from a set of information units which are assigned respective reference functions, said method comprising the steps of:

(a) receiving a signal which carries the transmitted information unit in a signal section, the received signal having a signal curve in the signal section;

(b) modifying the assigned reference functions in accordance with the signal curve to provide modified reference functions;

(c) comparing the signal curve to the modified reference functions to determine a deviation value between the signal curve and each of the modified reference functions; and

(d) using the deviation values to recognize the transmitted information unit.

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**5,745,657**

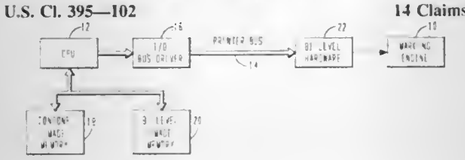
**METHOD AND APPARATUS FOR MULTI-MODAL PRINTING WITH ELECTROPHOTOGRAPHIC PRINT ENGINE**

**Michael W. Barry; Jack N. Bartholmae, both of Duluth, and E. Neal Tompkins, Atlanta, all of Ga., assignors to T/R Systems, Norcross, Ga.**

**Filed Jun. 22, 1994, Ser. No. 263,567**

**Int. Cl.[6] G06F *9/36***

**U.S. Cl. 395—102** **14 Claims**




1. A system for mapping images to an output image space in a marking engine, comprising:

a first mapping system for mapping a first portion of a first input image space having a first pixel format with a first bit depth and a first resolution into a first portion of the output image space;

a second system capable of mapping a second portion of a second input image space having a second pixel format and a second bit depth different from said second bit depth and a second resolution into a second portion of the output image space; and

said first and second portions of said first and second image spaces at least partially overlapping in said output image space in an overlapping region, with the overlapping portion of said first image space being above said corresponding overlapping portion of said first image space in said output image space such that the edge resolution of said first portion at the boundary of said overlapping region is defined over the edge resolution of said second portion and wherein the portion of said second image space overlapping said image space is not mapped into said output image space by said second system for mapping.

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**5,745,658**

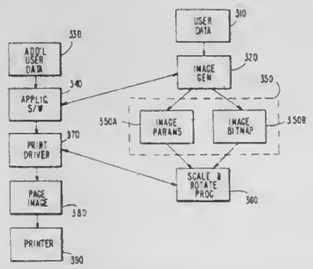
**METHOD OF ALIGNING ONE DIMENSIONAL OR TWO DIMENSIONAL CODES TO PRINTER PIXELS**

**Eugene P. Gerety, Seymour, Conn., assignor to Datastrip Products Inc., Waterbury, Conn.**

**Filed Nov. 16, 1995, Ser. No. 558,421**

**Int. Cl.[6] G06K *15/00***

**U.S. Cl. 395—102** **9 Claims**




1. A printer processor implemented method for printing machine-readable code images on a selected printer having reproduction characteristics known and available, each machine-readable code image being defined by a code bitmap and having rectilinear areal geometric characteristics, the method including the steps of:

introducing a code bitmap of a machine-readable code image to be printed into a printer output image bitmap by means of software which imposes a risk of inducing image bitmap distortion;

obtaining for the printer processor the known reproduction characteristics of said selected printer;

analyzing, by said printer processor, physical pixel array characteristics of said printer based on said known reproduction characteristics;

transforming the code bitmap of the machine-readable code image in the printer output image bitmap to resize and rotate the code image as required to align essentially exactly rectilinear areal geometric characteristics of the code image with integer multiples of said printer's physical pixel array characteristics; and

printing on the selected printer the code image defined by the transformed code bitmap in the printer output image bitmap.



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**5,745,659**

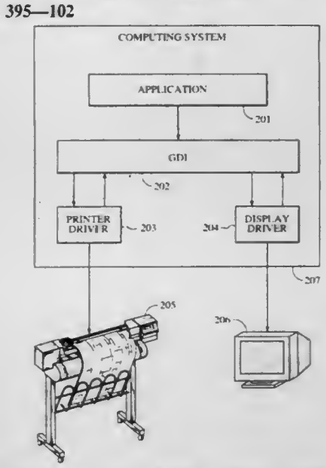
**VERSATILE SCALING OF DRAWINGS**

**Xavier Rigau Rigau; Rodolfo Jodra Barron; Sergio Jarne Casbas, and Xavier Fernandez-Diaz Mascort, all of Sant Cugat de Vallés, Spain, assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Apr. 25, 1996, Ser. No. 641,145**

**Int. Cl.[6] G06K *15/00***

**U.S. Cl. 395—102** **23 Claims**




1. A method for scaling a drawing, which is calibrated to fit a source print media with a first size, to fit a destination print media with a second size, the method performed by a computer and comprising the following steps:

(a) determining, by a printer driver, a total scaling factor by which the drawing is to be scaled in order to fit the destination print media;

(b) determining, by the printer driver, an integer scaling factor, which is to be used by a printer to scale the drawing before printing the drawing;

(c) determining, by the printer driver, a virtual resolution to be reported to an operating system as the resolution of the printer, the virtual resolution being equal to a true resolution used by the printer multiplied by a real scale factor, the real scale factor being equal to the total scaling factor divided by the integer scaling factor;

(d) reporting, by the printer driver to the operating system, the virtual resolution; and,

(e) when print output is received by the printer driver, scaling the print output by the integer scaling factor before the print output is sent to the printer.

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**5,745,660**

**IMAGE RENDERING SYSTEM AND METHOD FOR GENERATING STOCHASTIC THRESHOLD ARRAYS FOR USE THEREWITH**

**Bernd W. Kolpatzik, and Jay E. Thornton, both of Watertown, Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

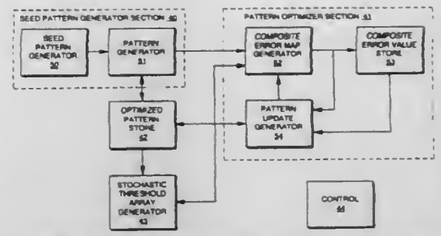
**Filed Apr. 26, 1995, Ser. No. 427,880**

**Int. Cl.[6] G06F *15/00*; H04N *1/40;1/41*; G06K *9/38***

**U.S. Cl. 395—108** **64 Claims**

1. An image rendering system for generating discrete tone image data of an image for representing continuous tone image data to be rendered by a rendering device, the image rendering system comprising:

A. a stochastic threshold array library for storing a plurality of stochastic threshold arrays generated from individual seed patterns each corresponding to a predetermined tone of the image, each said seed pattern optimized to reflect corresponding predetermined grain/mottle trade-off conditions and optimal visual tiling characteristics when said seed pattern is tiled with itself; and




B. an image data processing section for processing the continuous tone image data in relation to said stochastic threshold arrays, and for retrieving one said stochastic threshold array for one of the predetermined grain/mottle trade-off conditions, as selected by an operator, from said stochastic threshold array library, tiling the retrieved stochastic threshold array over the continuous-tone image data and generating the discrete tone image data in response to correspondingly positioned pixels of the continuous-tone image data and threshold values of the tiled stochastic threshold array.

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**5,745,661**

**COMPOSITE-IMAGE FORMING APPARATUS WITH CONTROL OF RECOVERY OPERATION FROM JAMMED STATE**

**Shokyo Koh, Kawasaki; Yoshihiko Suzuki, Tokyo; Hideto Kohtani, Yokohama; Satoru Kutsuwada, Kawasaki; Ken Kuroda, and Masahiro Iwadate, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

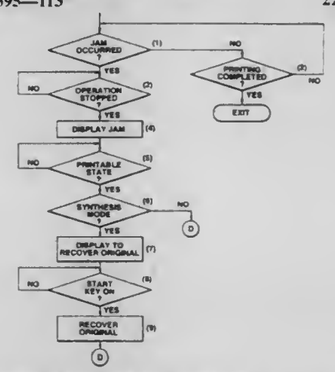
**Continuation of Ser. No. 274,851, Jul. 14, 1994, abandoned.**

**This application Mar. 27, 1996, Ser. No. 624,933**

**Claims priority, application Japan, Jul. 23, 1993, 5-202603**

**Int. Cl.[6] H04N *1/00***

**U.S. Cl. 395—113** **22 Claims**




1. An image forming apparatus comprising:

means for inputting image information from an external apparatus;

means for forming an image on a recording medium;

means for reading an original;

means for detecting a jam of the recording medium;

means for being manually operated by an operator; and

means for controlling a recovery operation from a jammed state,

wherein said apparatus includes a first mode for forming an image corresponding to the input image information, and a second mode for forming a composite image by synthesizing the image corresponding to the input image information with an image of the original read by said reading means, and

wherein said control means starts the recovery operation from the jammed state in response to release of the jam in the first

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mode, and starts the recovery operation from the jammed state in response to a manual operation of said operation means by the operator after release of the jam in the second mode.

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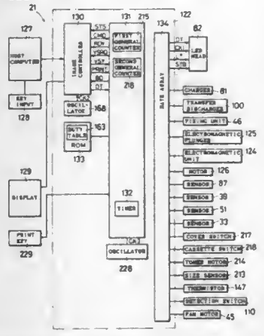
**5,745,662**

## SIGNAL PROCESSING APPARATUS OF A PRINTER UTILIZING INTERRUPTION SIGNALS

**Tomishi Nagata, and Makoto Maehara, both of Shizuoka, Japan, assignors to Star Micronics Co., Ltd., Shizuoka, Japan**

**Continuation of Ser. No. 136,251, Oct. 15, 1993, abandoned. This application Nov. 14, 1996, Ser. No. 748,718**
**Claims priority, application Japan, Oct. 19, 1992, 4-279803**
**Int. Cl.[6] G06F** *15/00*

**U.S. Cl. 395—113** **3 Claims**



1. A signal processing apparatus of a printer, comprising:
a memory for storing a plurality of programs to be executed successively at predetermined timings;
interruption signal generating means for generating an interruption signal at predetermined timings;
a single counter for counting the number of occurrences of the interruption signals at the predetermined timings from a start of transferring a print medium within the printer to at least a start of ejecting the print medium from the printer;
an event table for storing a head memory address of each of said plurality of programs stored in said memory, and for storing a plurality of count values, each count value representing a number of occurrences of interruption signals, and each count value corresponding to a head memory address of one of said plurality of programs; and
a microprocessor for reading a head memory address stored in said event table each time the number of occurrences of the interruption signal counted by said counter equals a count value stored in said event table, and for executing one of said plurality of programs stored in said memory according to the read head memory address.

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**5,745,663**

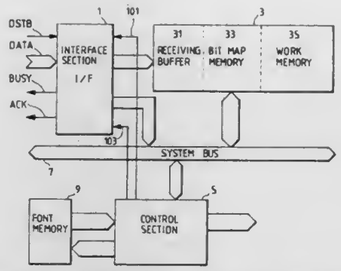
## DATA RECEIVING SYSTEM

**Eiji Takagi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan**

**Filed Jun. 2, 1995, Ser. No. 458,242**
**Claims priority, application Japan, Jun. 2, 1994, 6-121478**
**Int. Cl.[6] G06K** *15/00*

**U.S. Cl. 395—115** **3 Claims**

1. A data receiving system for receiving data from an external device, comprising:
an interface means for providing the external device with a communication interface;
a receiving buffer for temporarily storing data received from the external device until the received data is subjected to processing;



a transmitting capability judging means for judging a data transmitting capability of the external device by observing a response time of the external device with respect to the interface means; and
a buffer capacity control means for variably setting a capacity of the receiving buffer in accordance with the judged transmitting capability.

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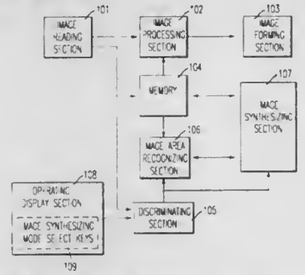
**5,745,664**

## IMAGE SYNTHESIZING METHOD AND IMAGE RECORDING APPARATUS WHICH ELECTRONICALLY SYNTHESIZES AN IMAGE WITH A PAGE OF INFORMATION

**Takakazu Nomura, Tokyo; Eiji Sawamura, Yokohama; Hiroshi Hosaka, Tokyo; Soukichi Araki, Yokohama; Yoshimasa Honda, Sagamihara; Shinji Imoto, Yokohama, and Ryuzo Nitta, Funabashi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 340,402, Nov. 15, 1994, abandoned. This application May 23, 1996, Ser. No. 653,701**
**Claims priority, application Japan, Nov. 15, 1993, 5-308756**
**Int. Cl.[6] H04N** *1/387*

**U.S. Cl. 395—117** **34 Claims**



17. An image synthesizing apparatus, comprising:
means for inputting a page containing a region designated as being for an image;
means for inputting image information which is to be incorporated into the page;
means for electronically synthesizing the image information with the page by including the image information into the region to form a synthesized image on the page; and
means for automatically designating the means for electronically synthesizing is to operate by detecting characteristics of the page.

32. An image synthesizing apparatus, comprising:
means for inputting a page containing a region designated as being for an image;
means for inputting image information which is to be incorporated into the page; and
means for electronically synthesizing the image information with the page by including the image information into the region to form a synthesized image on the page,
wherein:



said means for inputting a page containing a region designated for an image comprises means for inputting a page containing a plurality of regions designated as being for a plurality of images; and
said means for inputting image information inputs a plurality of images,
said apparatus further comprising:
means for determining positions on the page for said plurality of images of the image information which correspond to the plurality of regions.
wherein said means for electronically synthesizing includes means for electronically synthesizing the image information which includes said plurality of images using the positions determined by the means for determining to include the plurality of images into the positions, and
wherein said means for determining determines the positions of said plurality of images by recognizing positions and sizes of a plurality of image areas previously specified on the page.

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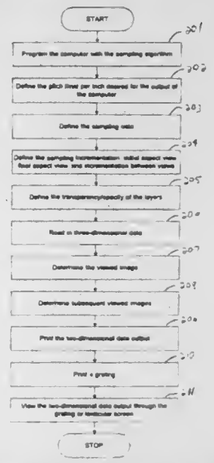
**5,745,665**

## METHOD FOR PROCESSING A THREE-DIMENSIONAL DATA SET INTO A COMPOSITE TWO-DIMENSIONAL IMAGE VIEWABLE AS A THREE-DIMENSIONAL IMAGE

**Michael H. Pasco, Carmel, Calif., assignor to Douglas F. Winnek, and Eleanor P. Winnek, both of Carmel, Calif.**

**Continuation of Ser. No. 277,872, Jul. 20, 1994, abandoned. This application Sep. 25, 1996, Ser. No. 719,731**
**Int. Cl.[6] G00T** *15/00*

**U.S. Cl. 395—127** **13 Claims**



1. In a computer system, a method for processing a three-dimensional data set into a composite two-dimensional image viewable as a three-dimensional image, comprising the steps of:
receiving as input the three-dimensional data set;
defining a sampling ratio;
sampling the three-dimensional data set to produce an initial two-dimensional view;
writing the initial two-dimensional view to a two-dimensional data set utilizing the sampling ratio;
sampling the three-dimensional data set to produce at least one subsequent two-dimensional view;
writing the at least one subsequent two-dimensional view to the two-dimensional data set utilizing the sampling ratio;
printing a composite two-dimensional image from the two-dimensional data set; and
printing a printed grating according to the sampling ratio, wherein the composite two-dimensional image is viewable as a three-dimensional image through the printed grating.

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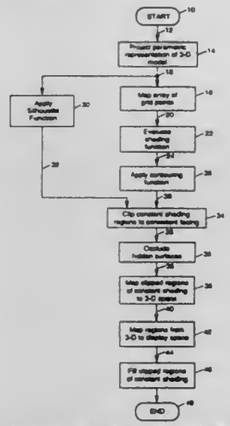
**5,745,666**

## RESOLUTION-INDEPENDENT METHOD FOR DISPLAYING A THREE-DIMENSIONAL MODEL IN TWO-DIMENSIONAL DISPLAY SPACE

**Glenn G. Gilley, Mountain View, Calif., and Brice W. Tebbs, Chapel Hill, N.C., assignors to Adobe Systems Incorporated, San Jose, Calif.**

**Continuation of Ser. No. 150,370, Nov. 10, 1993, Pat. No. 5,544,291. This application Feb. 21, 1996, Ser. No. 604,195**
**Int. Cl.[6] G06F** *15/00*

**U.S. Cl. 395—128** **14 Claims**



1. A method of rendering a three-dimensional model having a three-dimensional surface, comprising:
storing a resolution-independent three-dimensional model including a three-dimensional surface in a computer-readable form;
defining a resolution-independent two-dimensional parametric space on the three-dimensional surface by mapping the three-dimensional surface to the two-dimensional parametric space;
applying a shading function to an array of grid points defined on the resolution-independent two-dimensional parametric space to compute a grid point shading value at each of the grid points;
applying a contouring function to the computed grid point shading values to provide resolution-independent curves defining regions of constant shading in the parametric space;
projecting the three-dimensional model to a display space to create a resolution-independent two-dimensional representation of the model including visible portions of the curves defining regions of constant shading; and
rendering the resolution-independent representation of the model created in display space.

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**5,745,667**

## 3D GRAPHICS APPARATUS USING TEXTURE IMAGES WITH DISPLACEMENT INFORMATION

**Kei Kawase, Sagamihara; Fusashi Nakamura, Tokyo-to, and Yoshihisa Takatsu, Yamato, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.**

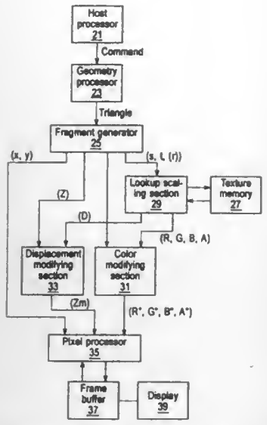
**Filed Feb. 13, 1996, Ser. No. 600,440**
**Claims priority, application Japan, Feb. 14, 1995, 7-025023**
**Int. Cl.[6] G06F** *15/00*

**U.S. Cl. 395—130** **10 Claims**

1. A graphics apparatus using texture images with displacement information, comprising:
a texture memory for storing color information of a surface of an object and displacement information of the object;
reading means for reading out from said texture memory said color information of a surface of an object and said displacement information of the object in response to receiving a

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command instructing said apparatus to draw the object according to a size and a position specified by the command;

size modifying means for modifying said color information and said displacement information read from said texture memory such that said color information and said displacement information correspond to the size specified in said command;

hidden surface processing means for performing a hidden surface removal for the drawing of the object by using said color information and said displacement information output from said size modifying means and said position specified in said command.

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**5,745,668**

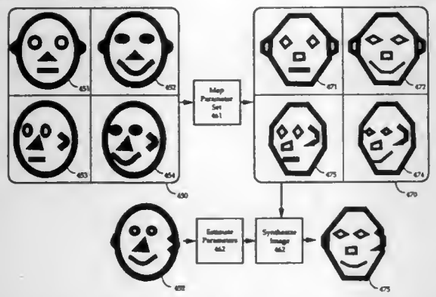
**EXAMPLE-BASED IMAGE ANALYSIS AND SYNTHESIS USING PIXELWISE CORRESPONDENCE**

**Tomaso Poggio, Wellesley; David J. Beymer, Cambridge, and Amnon Shashua, Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Continuation of Ser. No. 697,001, Aug. 16, 1996, abandoned, which is a continuation of Ser. No. 112,898, Aug. 27, 1993, abandoned. This application Feb. 12, 1997, Ser. No. 797,993**

**Int. Cl.[6] G06T** *1/40*

**U.S. Cl. 395—175** **20 Claims**




1. A method of synthesizing a new image from a plurality of example images, the example images and the new image each being comprised of a plurality of pixels and characterized by a parameter set, the method comprising:

analyzing said example images to determine pixelwise vector representations of said example images, the pixelwise vector representations providing pixel-by-pixel positions of said sample images with respect to a reference;

determining a desired parameter set for said new image; and

synthesizing said new image from said example images using said pixelwise vector representations and said desired parameter set.

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**5,745,669**

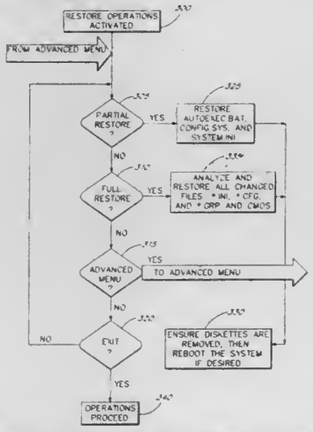
**SYSTEM AND METHOD FOR RECOVERING PC CONFIGURATIONS**

**James M. Hugard, Aliso Viejo, and Duane W. Cowgill, Tustin, both of Calif., assignors to AST Research, Inc., Irvine, Calif.**

**Continuation of Ser. No. 141,228, Oct. 21, 1993, abandoned. This application Jun. 21, 1996, Ser. No. 670,103**

**Int. Cl.[6] G06F** *11/00*

**U.S. Cl. 395—182.01** **19 Claims**




15. A method of monitoring and restoring a computer system configuration within a computer system having a computer, said computer system configuration comprising a plurality of data, said method comprising the steps of:

storing with the computer a first back-up of the computer system configuration to form a first back-up computer system configuration;

automatically comparing with the computer the first back-up computer system configuration with a current computer system configuration to detect whether the current computer system configuration differs from the first back-up computer system configuration; and

if differences between the first back-up computer system configuration and the current computer system configuration are detected, indicating that the current computer system configuration differs from the first back-up computer system configuration and querying a user with a first screen display whether to restore the computer system configuration to the first back-up computer system configuration.

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**5,745,670**

**FAULT TOLERANT POWER SUPPLY SYSTEM**

**Yoseph L. Linde, Needham, Mass., assignor to LANart Corporation, Needham, Mass.**

**Filed Jun. 11, 1996, Ser. No. 661,368**

**Int. Cl.[6] G06F** *11/00;* **H03M** *13/00*

**U.S. Cl. 395—182.2** **16 Claims**

1. A fault tolerant power supply system for supplying power to a plurality of devices, at least one device of said system comprising:

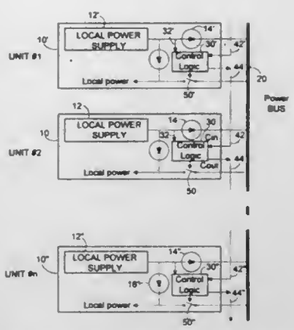
a local power supply means for supplying power to a local device of said plurality of devices;

means for coupling said local power supply means to a power distribution bus for distribution of power to other devices coupled to said power distribution bus;

switch means for selectively coupling said local device to said power distribution bus to control the flow of power to said local device from said power distribution bus;

sensing means for sensing a condition of said local power supply means;






control logic means for controlling said switch means in response to said sensed condition of said local power supply means and a signal from one of said other devices.

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**5,745,671**

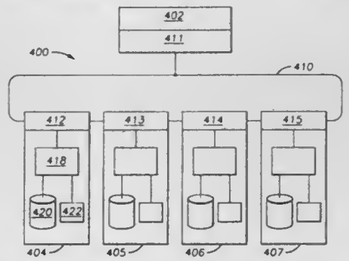
**DATA STORAGE SYSTEM WITH LOCALIZED XOR FUNCTION**

**Paul Hodges, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Feb. 28, 1995, Ser. No. 396,046**

**Int. Cl.[6] G06F** *11/00*

**U.S. Cl. 395—182.04** **17 Claims**




1. A data storage system configured to perform a task that requires performance of multiple XOR operations, said data storage system comprising:

a controller to transmit commands;

an array of DASDs, responsive to the commands to carry out the task while distributing performance of the XOR operations among the DASDs by operating the DASDs to sequentially transmit data among the DASDs in a selected order, wherein multiple ones of the DASDs perform XOR operations on the data prior to transmitting the data to another DASD in the selected order; and

a bus interconnecting the DASDs and the controller.

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**5,745,672**

**MAIN MEMORY SYSTEM AND CHECKPOINTING PROTOCOL FOR A FAULT-TOLERANT COMPUTER SYSTEM USING A READ BUFFER**

**Jack J. Stiffler, Hopkinton, Mass., assignor to Texas Micro, Inc., Houston, Tex.**

**Filed Nov. 29, 1995, Ser. No. 564,024**

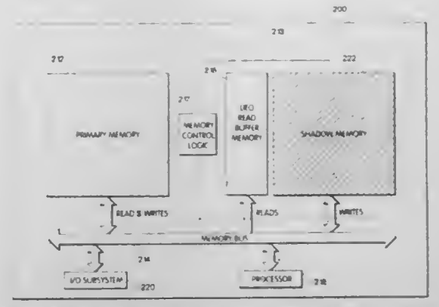
**Int. Cl.[6] G06F** *11/00*

**U.S. Cl. 395—182.04** **7 Claims**

1. A computer system comprising:

a processor; and

a main memory subsystem coupled to the processor wherein the main memory subsystem includes:




a primary memory element to which data is written and from which data is read;

a read buffer coupled to the primary memory element, that captures and stores data read from the primary memory element; and

a shadow memory, coupled to the main memory subsystem, that receives data written to the main memory subsystem and stores the data simultaneously with the primary memory element; and

means for copying the data from the read buffer to the primary memory element and the shadow memory in response to an instruction from the processor, so that the main memory subsystem can be returned to a consistent checkpoint state from which processing can resume without loss of data integrity or program continuity following a fault.

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**5,745,673**

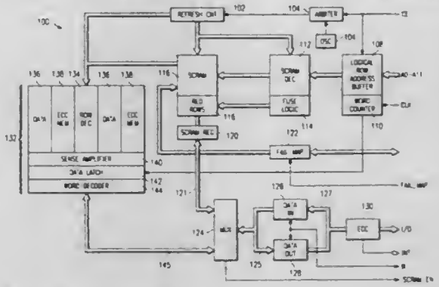
**MEMORY ARCHITECTURE FOR SOLID STATE DISCS**

**Maurizio Di Zenzo, Roccapriora, and Rodolfo Grimani, Rieti, both of Italy, assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Sep. 21, 1995, Ser. No. 531,984**

**Int. Cl.[6] G06F** *11/00;* **G06C** *7/00*

**U.S. Cl. 395—182.05** **14 Claims**



9. A memory comprising:

a first memory block in which data bytes are stored wherein redundant rows are included;

a second memory block which contains a transcoder table enabling reallocation of data addresses;

a block for decoding the addresses of the transcoder table;

a non-volatile fail map memory block, programmed during a test stage for storing addresses of non-useable rows in said first memory block for determining content of the transcoder table memory; and

a word counter block that is driven from a clock signal and counts the number of the addressed words and generates the word addresses.

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5,745,674

## MANAGEMENT OF UNITS OF WORK ON A COMPUTER SYSTEM LOG

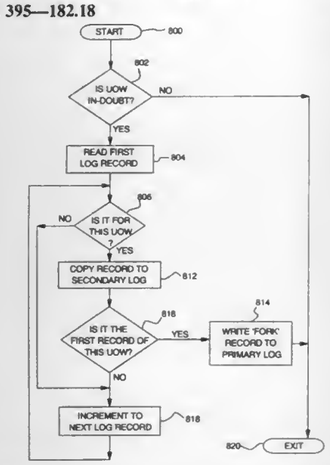
**Peter James Lupton; Robert Frank Buxton, both of Chandlers Ford; Ian Hunter, Winchester; Handel Glasnant Price, Chandlers Ford; Adam Richards, Southampton; John Simon Tilling, Eastleigh, and Dennis Jack Zimmer, Chandlers Ford, all of United Kingdom, assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed Jun. 4, 1996, Ser. No. 657,507**

**Claims priority, application United Kingdom, Jun. 7, 1995, 9511512**

**Int. Cl.[6] G06F** *11/14*

**U.S. Cl. 395—182.18** **18 Claims**




1. A method of managing records, associated with units of work, on a recovery log, the method comprising the steps of:

for each unit of work having records stored on the recovery log, checking whether that unit of work is in an in-doubt state;

for each of said units of work which is in an in-doubt state, scanning the recovery log for records associated with said in-doubt unit of work;

on finding a record associated with said in-doubt unit of work, copying said record to a secondary recovery log;

on finding the earliest-written record for said in-doubt unit of work, writing a further record on to the recovery log, associated with said in-doubt unit of work, the record having the effects of subtracting the log records currently on the recovery log associated with the indoubt unit of work from the recovery log and of referring to the copied log records associated with the in-doubt unit of work written on the secondary log.

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5,745,675

## OBJECT ORIENTED FRAMEWORK MECHANISM FOR PERFORMING COMPUTER SYSTEM DIAGNOSTICS

**Kyle David Herbig, Lafayette, Colo.; Mark Ambrose McKelvey, and Thomas Joseph Warne, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 23, 1996, Ser. No. 636,292**

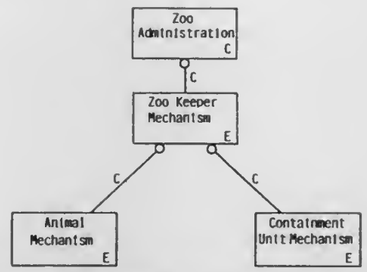
**Int. Cl.[6] G06F** *11/263*

**U.S. Cl. 395—183.14** **72 Claims**

**23**. A method for performing diagnostic testing of a targeted product, the method comprising the steps of:

providing an extensible object oriented framework mechanism that performs at least one test according to a diagnostic script customized to test the targeted product, the framework mechanism including a first level of extensibility to define a diagnostic application and a second level of extensibility to define the at least one test that the diagnostic application executes; and

executing the object oriented framework mechanism on a computer system in accordance with the diagnostic script.




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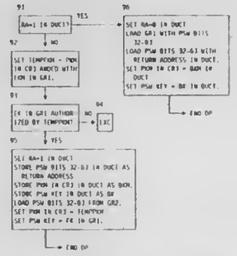
## AUTHORITY REDUCTION AND RESTORATION METHOD PROVIDING SYSTEM INTEGRITY FOR SUBSPACE GROUPS AND SINGLE ADDRESS SPACES DURING PROGRAM LINKAGE

**Stephen James Hobson, Middx, United Kingdom, and Kenneth Ernest Plambeck, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 4, 1995, Ser. No. 566,557**

**Int. Cl.[6] G06F** *11/00;12/14*

**U.S. Cl. 395—186** **15 Claims**




1. A method in a computer system executing a sequence of programs of instructions for a dispatchable unit (DU) (a process or task); with a predetermined set of address spaces associated with the DU, the set comprising a base space and one or more subspaces; with a secure (protected from a problem-state program) subspace-active indicator bit (SA) associated with the DU and indicating whether the program being executed for the DU is in the base space (SA=0) or in a subspace (SA=1); with a Branch in Subspace Group instruction (BSG) for branching from a program in the base space to a program in a subspace, or vice versa, and setting SA accordingly; and with the DU having a secure current-authority state(s) that authorizes program operations and that is equal to a base-authority state(s) when a program is being executed for the DU in the base space, a method used by BSG for changing the current-authority state(s) to a reduced-authority state(s) when branching from the base space to a subspace and then for changing the current-authority state(s) back to the base-authority state(s) when BSG is executed in a subspace, the method comprising the steps of:

saving a specified return address and the current-authority state(s) as values in a secure data area associated with the DU during a first branch by a first BSG when the program being executed for the DU is in the base space (as indicated by SA=0),

reducing the current-authority state(s) to the reduced-authority state(s) during said first branch,



branching to the base space and to the return address saved as a value in the secure data area during a second branch by a second BSG when the program being executed for the DU is in a subspace (as indicated by SA=1), and

restoring the current-authority state(s) to the value(s) saved in the secure data area during said second branch.

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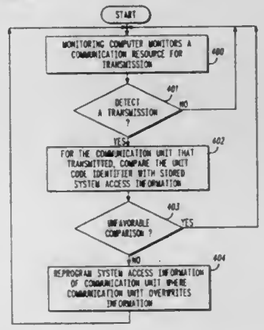
## METHOD FOR REPROGRAMMING A COMMUNICATON UNIT'S ACCESS TO A WIRELESS COMMUNICATION SYSTEM

**Gary W. Grube, Palatine; Timothy W. Markison, Hoffman Estates, and Thomas E. Weston, Marengo, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 506,945, Jul. 27, 1995, abandoned, which is a continuation of Ser. No. 155,408, Nov. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 106,018, Aug. 13, 1993, Pat. No. 5,388,212. This application May 8, 1996, Ser. No. 647,075**

**Int. Cl.[6] G06F** *11/08*

**U.S. Cl. 395—186** **6 Claims**




1. A method for correcting a communication unit's access to a wireless communication system, the method comprising the steps of:

a) monitoring, by a monitoring computer, a first communication resource of the wireless communication system to detect a transmission by the communication unit, wherein the transmission includes software application serial numbers, for non-permanent software applications presently contained in a programmable non-volatile memory of the communication unit, and a unique unit identifier;

b) upon detecting the transmission, comparing, by the monitoring computer, the software application serial numbers to stored software application serial numbers for the communication unit based on the unique unit identifier; and

c) when the comparison of step (b) is unfavorable, reprogramming, by the monitoring computer via a second communication resource of the wireless communication system, at least a portion of system access information contained in the communication unit;

wherein step (c) further comprises reprograming the at least a portion of the system access information, to prohibit the communication unit from the future access to the wireless communication system.

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5,745,678

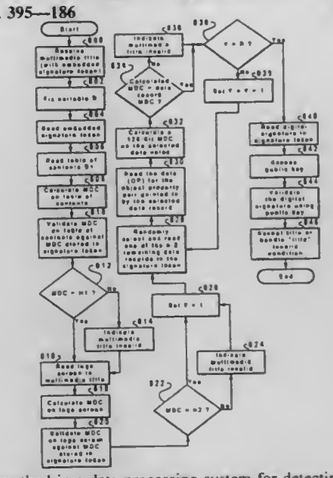
## METHOD AND SYSTEM FOR THE SECURED DISTRIBUTION OF MULTIMEDIA TITLES

**Amir Herzberg; Hugo Mario Krawczyk, both of Bronx, N.Y.; Shay Kutten, Rockaway, N.J.; An Van Le, Sunnyvale, Calif.; Stephen Michael Matyas, Poughkeepsie, and Marcel Mordechay Yung, New York, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 354,700, Dec. 13, 1994, abandoned. This application Aug. 18, 1997, Ser. No. 914,911**

**Int. Cl.[6] H04L** *9/00*

**U.S. Cl. 395—186** **38 Claims**




1. A method in a data processing system for detecting unauthorized programs within the data processing system, the method comprising:

creating a validation structure for validating a program including program data, wherein the structure includes data derived from data selected from a portion of the program data other than a lead-in section of the program data, which is used to determine whether the program is an unauthorized program;

imbedding the validation structure in the program; and

responsive to an initiation of the program, determining whether the program is an authorized program using the validation structure.

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5,745,679

## METHOD AND DEVICE FOR FILE TRANSFER BY CASCADE RELEASE

**Thomas J. Mercer, Meridian, Id., assignor to Micron Technology, Inc., Boise, Id.**

**Filed Mar. 6, 1996, Ser. No. 611,798**

**Int. Cl.[6] G06F** *9/44;9/46;17/30*

**U.S. Cl. 395—200.01** **6 Claims**

**3**. In a primary computer having a memory, a cascade release device for controlling the transfer of files from the primary computer on a network having a plurality of computers, the device comprising:

a cascade release program stored in the memory, wherein the cascade release program performs the tasks of:

storing a file on the primary computer to be distributed to the remaining plurality of computers in the computer system;

compiling a master list on the primary computer of the remaining plurality of computers in the computer system to which the file is to be distributed; and

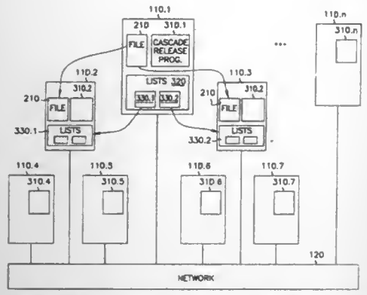
releasing the file based on the master list;

wherein releasing the file comprises the recursive steps of:

dividing the master list into a plurality of submaster lists, wherein a submaster list includes a top listed computer; and

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for each of the plurality of submaster lists performing the steps of:

storing the file to the top listed computer on the submaster list;

removing the top listed computer on the submaster list;

converting the submaster list to a master list; and

releasing the file based on the master list.

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**5,745,680**

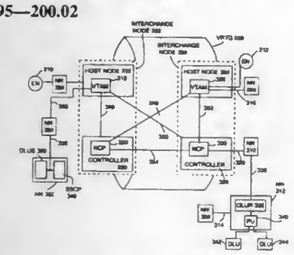
**INTERCONNECTED NETWORKS AND METHODS FOR COMMUNICATING THEREBETWEEN USING VIRTUAL COMMUNICATIONS LINKS**

**David Paul Brooks, Durham; Owen Hyunho Choi, Raleigh; James Corvin Fletcher, Cary; John Louis Klonowski, Durham, and David Andrew Jones, Raleigh, all of N.C., assignors to International Business Machine Corp., Armonk, N.Y.**

**Continuation of Ser. No. 336,948, Nov. 10, 1994. This application Aug. 2, 1996, Ser. No. 691,359**

**. Int. Cl.[6] G06F** *13/00*

**U.S. Cl. 395—200.02** **15 Claims**




1. A method of interconnecting first and second networks that use the same protocols for communications by a third network, comprising the steps of

a) in the first and second networks, defining the third network in a network topology database as a virtual communications link of the same type used in the first and second networks and being between a first node of the first network and a second node of the second network,

b) in response to requests from initiating nodes in the first and second networks to route messages to destination nodes in the other of said first and second networks, computing routes using the topology database through the first and second networks between the initiating nodes and the destination nodes, said routes including said third network as a single communications link between the first and second nodes and within the overall network comprising the first and second networks, and

c) translating between the protocol used by the first and second networks and that used by the third network at interchange nodes that connect the third network to the first and second networks.

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**5,745,681**

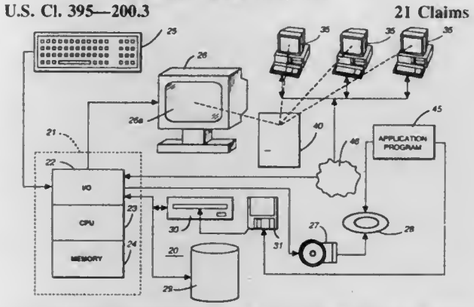
**STATELESS SHOPPING CART FOR THE WEB**

**Fredrick E. Levine, Boulder, Colo., and Bruce A. Carter, Los Angeles, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.**

**Filed Jan. 11, 1996, Ser. No. 583,877**

**Int. Cl.[6] G06F** *7/06;17/36*

**U.S. Cl. 395—200.3** **21 Claims**




7. A method of user shopping on a network having at least one computer-server for interactively communicating with users employing browser programs on terminal/computers at locations remote from said computer-server, said method comprising the steps of:

transmitting a request from said browser program to said computer-server for a shopping page;

invoking a market application program at said computer-server in response to said request and generating and transmitting a shopping page file to said browser program;

building, by said browser program, from said shopping page file, a shopping page;

sending from said browser program to the computer-server for operation thereon by said market application program a request having a first field containing new selected items selected from the shopping page and, if there are previously selected items, a second field containing the previously selected items;

if said second field was sent by said sending step, generating a shopping list containing identification of items previously selected by said user, and if not, creating a shopping list;

adding new selected items from the first field to the shopping list;

returning the shopping list of items in a shopping field of a shopping page file to said browser program;

storing at least the shopping list by said browser program at a terminal computer; and

continuing cyclical transmitting, invoking, building, receiving, and generating the shopping list and adding items to the shopping list and returning to and storing the shopping list at the terminal/computer until termination by the browser program.

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**5,745,682**

**METHOD AND APPARATUS FOR UTILIZING LOCATION CODES TO IDENTIFY A PHYSICAL LOCATION OF A COMPUTER STATION ON A NETBIOS COMPUTER NETWORK**

**David L. Keenan, Tinton Falls, N.J., assignor to NCR Corporation, Dayton, Ohio**

**Filed Dec. 4, 1995, Ser. No. 566,767**

**Int. Cl.[6] G06F** *15/177*

**U.S. Cl. 395—200.5** **19 Claims**

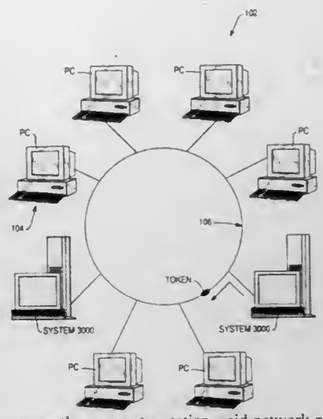
1. A method for determining a physical location of a computer station on a computer network, wherein each computer station on said computer network includes an address identifying said computer station and a name table for storing names, said method comprising the steps of:

selecting a network name for each said computer station, said network name permitting data transfer from one computer station to another computer station, said network name being posted on said name table if said network name is unique;

specifying a location code for said computer station on said computer network, said location code indicative of a physical location of said computer station for which said location code is being specified; and

posting said location code as a name in said name table of said computer station for which said location code is being specified, said step of posting only occurring if said location codes is unique, said location code being unique if said location code is not stored in name tables of any other said computer stations on said computer network.






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**5,745,683**

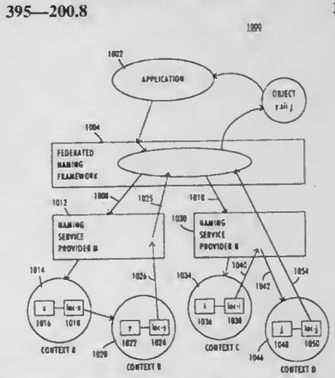
**SYSTEM AND METHOD FOR ALLOWING DISPARATE NAMING SERVICE PROVIDERS TO DYNAMICALLY JOIN A NAMING FEDERATION**

**Rosanna K. Lee, Palo Alto, and Rangaswamy Vasudevan, Los Altos Hills, both of Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.**

**Filed Jul. 5, 1995, Ser. No. 498,155**

**Int. Cl.[6] G06F** *3/00;13/00*

**U.S. Cl. 395—200.8** **29 Claims**




1. A Federated Naming Framework System for use in a distributed computer system, having at least one computer having a central processing unit, a memory, a display and an input/output mechanism, to provide an interface system between a client application configured to use a composite name spanning two or more naming systems and at least one naming service mechanism for use in resolving the composite name, said Federated Naming Framework System comprising:

a federated naming framework mechanism in a computer memory, coupled to said client application and configured to resolve a composite name, received from a client application, of an object by use of a naming service mechanism; and

one or more naming service mechanisms configured to conform to a federated naming service provider interface type and coupled to the federated naming framework mechanism;

the one or more naming service mechanism configured to indicate support for strong or weak separation in said one or more respective naming systems,

in which additional naming service mechanisms can be made available to a client application without interruption of service provided by the federated naming framework mechanisms.

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**5,745,684**

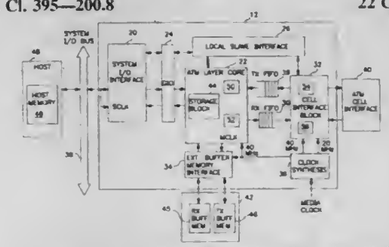
**APPARATUS AND METHOD FOR PROVIDING A GENERIC INTERFACE BETWEEN A HOST SYSTEM AND AN ASYNCHRONOUS TRANSFER MODE CORE FUNCTIONAL BLOCK**

**Rasoul M. Oskouy, Fremont, and Louise Yeung, Redwood City, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.**

**Filed Nov. 6, 1995, Ser. No. 554,074**

**Int. Cl.[6] H04L** *12/00*

**U.S. Cl. 395—200.8** **22 Claims**




1. A method for coordinating data transfer between a System Input/Output (IO) functional block and an Asynchronous Transfer Mode (ATM) functional block, comprising the steps of:

(a) providing a first signal from the ATM functional block to the System IO functional block, for requesting the reading of data from the System IO functional block to the ATM functional block;

(b) providing locational information related to the data to be transferred, from the ATM functional block to the System IO functional block; and

(c) providing a second signal from the System IO functional block to the ATM functional block, for acknowledging the request for reading of data, step (b) being independent from step (c),

wherein the System IO functional block is synchronous to a first clock, the ATM functional block is synchronous to a second clock which has a clock rate that is different from the clock rate of the first clock and wherein the first and second signals are synchronous to the second clock.

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**5,745,685**

**PROTOCOL EXTENSION IN NSPP USING AN ACKNOWLEDGMENT BIT**

**Michael Kirchner; Sridhar Krishnaswamy; Norman Reed, and Greg Young, all of Cedar Rapids, Iowa, assignors to MCI Communications Corporation, Washington, D.C.**

**Filed Dec. 29, 1995, Ser. No. 581,745**

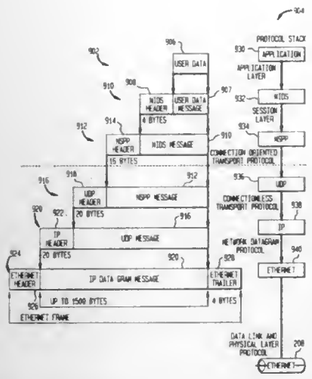
**Int. Cl.[6] H04L** *1/14*

**U.S. Cl. 395—200.14** **21 Claims**

1. A method for acknowledging receipt of a data transfer between a client and a server in a NSPP environment, said method steps comprising:

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(1) sending a packet from a source location to a destination location, wherein said packet includes an acknowledgment bit and a first sequence number stored in a NSPP header of said packet;

(2) receiving said packet at said destination location, wherein said acknowledgment bit triggers NSPP software;

(3) sending a control packet generated by said NSPP software from said destination location to said source location, wherein said control packet includes a second sequence number; and

(4) receiving said control packet at said source location and comparing said first sequence number and said second sequence number,

wherein receipt of said packet at said destination location is confirmed when said first sequence number matches said second sequence number.

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**5,745,686**

**INFORMATION TRACING SYSTEM AND INFORMATION TRACING METHOD**

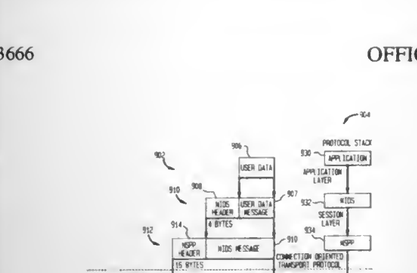
**Kazuo Saito; Juhei Nakagaki, both of Nakai-machi; Yasuko Toju, Tokyo, and Noriyuki Kamibayashi, Nakai-machi, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Filed Jun. 5, 1996, Ser. No. 658,376**

**Claims priority, application Japan, Juo. 7, 1995, 7-140167; Apr. 1, 1996, 8-079003**

**Int. Cl.[6] G06F** *13/00;* **H04L** *9/32*

**U.S. Cl. 395—200.15** **9 Claims**




1. An information tracing system comprising:

distribution sensing means for sensing distribution of information, a size of the distributed information, and a distribution time of the information from a first information processing system of an information distribution source to a second information processing system of an information distribution destination;

distribution history storage means for adding the information distribution, the distributed information size, and the information distribution time sensed by said distribution sensing means to the distributed information for storing them;

calculation means for calculating a distribution route, size, and required time for distribution of the information from the information distribution, the distributed information size, and the information distribution time added to the information stored by said distribution history storage means;

display selection means for allowing an operator to specify whether or not either or both of the distributed information size and the required time for distribution of the information calculated by said calculation means are to be displayed; and

display means for displaying the distribution route calculated by said calculation means and the distributed information size and the required time for distribution of the information related to the distribution route specified through said display selection means.

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**5,745,687**

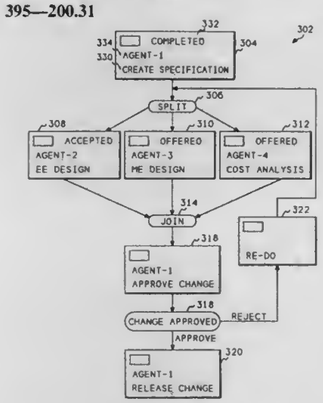
**SYSTEM FOR DISTRIBUTED WORKFLOW IN WHICH A ROUTING NODE SELECTS NEXT NODE TO BE PERFORMED WITHIN A WORKFLOW PROCEDURE**

**Jim Randell, Clifton, United Kingdom, assignor to Hewlett-Packard Co, Palo Alto, Calif.**

**Continuation of Ser. No. 315,390, Sep. 30, 1994, abandoned. This application May 20, 1997, Ser. No. 858,956**

**Int. Cl.[6] G06F** *13/00;17/60*

**U.S. Cl. 395—200.31** **14 Claims**




1. A computer implemented workflow system for distributing and controlling work in a computer system, said work being defined by a workflow procedure having at least one node, said workflow system comprising:

a coordination service system for executing a workflow procedure to cause nodes of said workflow procedure to be performed in a predetermined order, and for allowing a routing node within said workflow procedure to select at least one of a plurality of nodes to be performed within said workflow procedure after said routing node is performed;

an information service system, attached to said coordination service, for storing said workflow procedure and for retrieving nodes of said workflow procedure when requested by said coordination service system;

an organization service system, attached to said coordination service system, for identifying an agent for performing a node of said workflow procedure; and



a transport service system connected between said coordination service system and each agent within said computer system for transferring data to and from each agent.

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**5,745,688**

**TELEWRITING TERMINAL SYSTEM PERFORMING ADDING/DELETING OPERATION OF AN IMAGE BASED ON CONTROL INFORMATION**

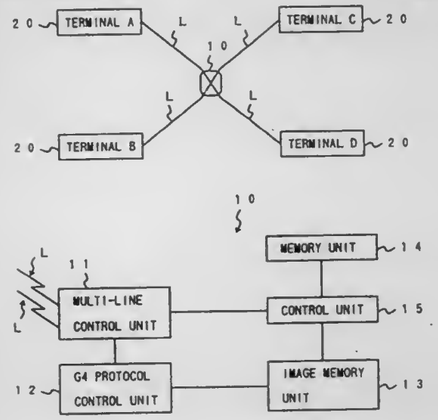
**Kouji Oka, Isehara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jan. 23, 1996, Ser. No. 590,332**

**Claims priority, application Japan, Feb. 28, 1995, 7-040545; Jul. 27, 1995, 7-191411**

**Int. Cl.[6] G06F** *15/16;15/173;* **H04N** *1/32*

**U.S. Cl. 395—200.34** **15 Claims**




1. A telewriting system comprising:

a plurality of telewriting terminals connected with a communication line, each of said telewriting terminals having a display unit so as to display an image thereon, the image displayed on said display unit being changed in accordance with instruction information transmitted via the communication line; and

a server unit connected to each of said telewriting terminals by the communication line, said server unit comprising,

communication means for communicating the instruction information and image information with each of said telewriting terminals via the communication line,

an image memory for storing image information corresponding to an image displayed on said display unit at of each of said telewriting terminals,

change means for changing the image information to be stored in said image memory, when the instruction information requesting a change of the image is received from at least one of said telewriting terminals, in accordance with the received instruction information,

differential information extraction means for extracting differential information between the image information before the change and the image information after the change, and

distribution means for distributing the differential information to each of said plurality of telewriting terminals, wherein said plurality of telewriting terminals are configured to adjust said image displayed on said display unit based on said differential information provided from said distribution means.

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**5,745,689**

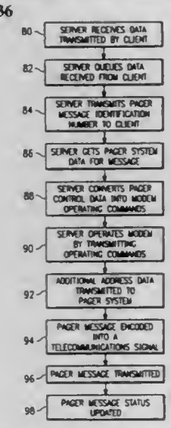
**SYSTEM AND METHOD FOR PROVIDING PAGER SERVICES TO USERS OF A COMPUTER NETWORK**

**Jeffrey Yeager, Spring Hill; Alan F. Rosenhauer, and Joel R. Jensen, both of Franklin, all of Tenn., assignors to Electronic Data Systems Corporation, Plano, Tex.**

**Filed May 23, 1996, Ser. No. 652,066**

**Int. Cl.[6] G06F** *13/00;* **H04M** *11/00*

**U.S. Cl. 395—200.36** **22 Claims**




1. A method for providing pager services to users of a computer network, comprising the steps of:

transmitting pager address data and pager message data from a client node on a network to a primary pager server on the network;

transmitting the pager address data and pager message data from the primary pager server to a back-up pager server;

polling the primary pager server from the back-up pager server;

changing the back-up pager server to the primary pager server if the primary pager server does not respond to the poll;

controlling an external communications medium interface device with the pager address data to interface with a pager system via an external communications medium; and

transmitting the pager message data from the primary pager server to the pager system over the external communications medium.

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**5,745,690**

**DATA PROCESSING SYSTEM AND METHOD**

**Robert R. Holland, and Stephen M. Fahey, both of Charlotte, N.C., assignors to Electronic Data Systems Corporation, Plano, Tex.**

**Filed Feb. 29, 1996, Ser. No. 609,141**

**Int. Cl.[6] G06F** *11/34*

**U.S. Cl. 395—200.41** **10 Claims**

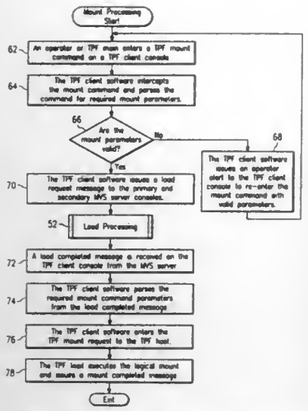
1. A data processing system comprising:

a Transaction Processing Facility (TPF) mainframe computer coupled to a TPF console and at least one TPF tape drive serviced by a tape handling system;

a Multiple Virtual Storage (MVS) mainframe computer coupled to an MVS console, the MVS mainframe computer coupled to and operable to control the tape handling system; and

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the MVS console and the TPF console coupled to and operable to communicate through a network bus, the MVS console operable to execute server software which is operable to receive requests for tape handling operations from client software running in the TPF console.

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**5,745,691**

**Patent Not Issued For This Number**

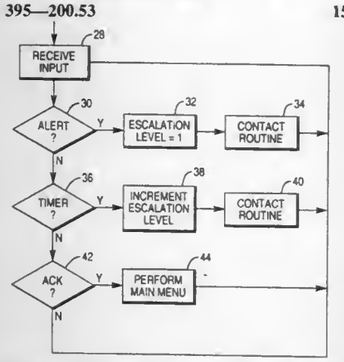
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**5,745,692**

## AUTOMATED SYSTEMS ADMINISTRATION OF REMOTE COMPUTER SERVERS

**David Peter Lohmann, II, San Diego; Steven Michael Hurlbut, Ramona; John Carl Shumate, and Jeffrey Scott Shelton, both of San Diego, all of Calif., assignors to NCR Corporation, Dayton, Ohio**

**Filed Oct. 23, 1995, Ser. No. 547,092**
**Int. Cl.[6] G06F *13/00***
**U.S. Cl. 395—200.53** **15 Claims**




**10**. An apparatus for remotely administrating a computer server, comprising:

(a) a processor having a memory and an electronic storage device coupled thereto, wherein the processor is coupled to one or more telephone lines;

(b) means, performed by the processor, for receiving an alert message from a remote server;

(c) means, performed by the processor, for matching the alert message to a contact person for the server stored in the electronic storage device;

(d) means, performed by the processor, for transmitting a message to the contact person via electronic communications;

(e) means, performed by the processor, for receiving a call from the contact person;

(f) means, performed by the processor, for matching the call from the contact person to the alert message;

(g) means, performed by the processor, for receiving one or more commands from the contact person;

(h) means, performed by the processor, for transmitting the received commands from the central support site to the remote server;

(i) means, performed by the processor, for transmitting status queries to the remote server;

(j) means, performed by the processor, for receiving one or more responses to the status queries from the remote server; and

(k) means, performed by the processor, for transmitting the responses to the contact person via electronic communications.

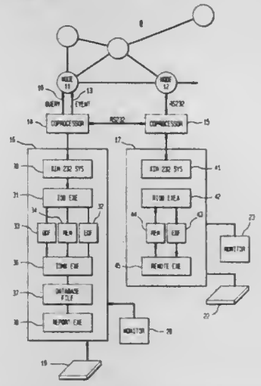
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**5,745,693**

## SYSTEM FOR GATHERING AND REPORTING REAL TIME DATA FROM AN IDNX COMMUNICATIONS NETWORK

**William Knight, Plano; Stephen W. Davies, Austin, both of Tex., and J. Gene Cannata, Cary, N.C., assignors to MCI Corporation, Washington, D.C.**

**Continuation of Ser. No. 906,861, Jul. 1, 1992, abandoned. This application Dec. 19, 1996, Ser. No. 769,384**
**Int. Cl.[6] G06F *15/177***
**U.S. Cl. 395—200.54** **8 Claims**



**1**. A system for analyzing communications network performance comprising:

a first communications co-processor connected to a node of said network, said communications co-processor having a query channel and event channel connected to said node; and

a data processing system connected to said communications co-processor for monitoring said event channel, said data processing system including a first program for initiating a command over said query channel when event data is received from said event channel to identify configuration changes in said communications network, said event data is received asynchronously as events occur, said data processing system storing in a database, information for identifying each new configuration of said network and the time said configuration occurred, said data processing system including a second program to generate reports from said data base identifying configurations of said network at different times.

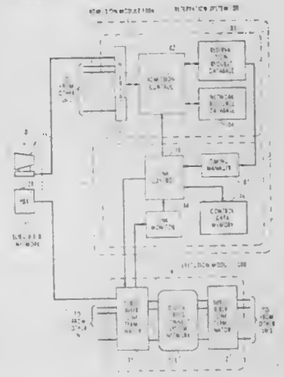


**5,745,694**

## NETWORK RESOURCE RESERVATION WITH ADMISSION AND LINK CONTROL FUNCTIONS SEPARATED FOR EXPANDABILITY AND HIGH-SPEED OPERATION

**Takashi Egawa; Makiko Yoshida, and Hiroyuki Okazaki, all of Tokyo, Japan, assignors to NEC Corporation, Japan**

**Filed Aug. 30, 1995, Ser. No. 521,193**
**Claims priority, application Japan, Aug. 30, 1994, 6-204081; Jun. 12, 1995, 7-144440**
**Int. Cl.[6] H04M *11/00*; G06F *13/00***
**U.S. Cl. 395—200.55** **23 Claims**



**1**. A network resource reservation system for a reconfigurable transmission network which comprises a plurality of parallel circuits each comprising a series of links interconnected by one or more interconnection switches, at least one of the links of one of said circuits being commonly assigned to multiple user networks, each of said user networks transmitting a reservation request indicating a circuit assigned to the user network, a network resource desired to be allocated from the resource of the assigned circuit, and start and end times of a reservation, comprising:

an interface connected to said user networks for receiving said request;

a first database;

a second database for storing resources respectively assigned to said user networks;

an admission controller connected to the interface, the admission controller being responsive to a reservation request received by the interface for accessing said first and second databases, informing the requesting user network from which the request was transmitted that the request is denied if the network resource desired by the request is greater than an amount remaining in the resource assigned to the requesting user network and informing the requesting user network of grant of the request and storing the request into said first database if the desired network resource is equal to or smaller than said amount, said admission controller being responsive to the end time of the stored request for removing the stored request from said first database; and

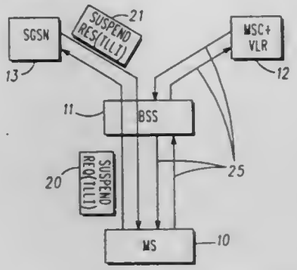
link control means connected to an associated one of said interconnection switches, the link control means being responsive to the start time of the stored request for operating the associated interconnection switch to establish the desired network resource, and responsive to the end time of the stored request for releasing the associated interconnection switch to clear the established network resource.

**5,745,695**

## RADIO SYSTEM WITH SUSPENSION OF PACKET DATA SERVICE DURING NON-DATA SERVICE CONNECTION

**Philip Gilchrist, Bonn, Germany, and Hans Petter Naper, Oslo, Norway, assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Jan. 16, 1996, Ser. No. 587,073**
**Int. Cl.[6] G06F *13/00***
**U.S. Cl. 395—200.57** **15 Claims**




**1**. In a radio system with data capability comprising a remote station, a base station subsystem, a mobile switching center and a serving data service support node, a method of operation comprising the steps of:

logging on to the radio system by the remote station;

establishing packet data service between the remote station and the serving data service support node;

suspending packet data service while remaining logged on to the radio system by sending a suspend service message from the mobile switching center to the serving data service support node; and

signalling from the serving data service support node to the mobile switching center that packet data service is suspended.

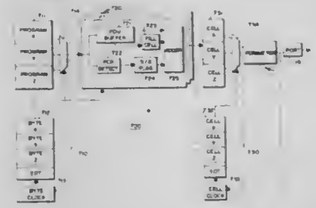
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**5,745,696**

## TRANSPORT CONTROLLER FOR TIMED PROGRAM DATA

**Jeffrey B. Mendelson, Shrewsbury; Matthew S. Goldman, Marlborough, and David E. Morris, Lexington, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.**

**Filed Apr. 10, 1995, Ser. No. 419,205**
**Int. Cl.[6] H04J *14/08;3/22***
**U.S. Cl. 395—200.63** **5 Claims**



**1**. A method for conditioning program data for transport, the program dam having a real time expressed in an encoding rate of the program dam, and the program data to be transported from a source over a network to a destination, comprising:

writing the program data to a cell queue at the encoding rate of the program data;

organizing the program data into transport cells;

reading said transport cells from said cell queue at a transport rate, said transport rate determined by a network clock, and said transport rate chosen to have said transport cells transported faster than the real time of the encoding rate of the program data;

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supplying idle cells if said cell queue is empty to have the program data arrive at the destination in the real time of the encoding rate.

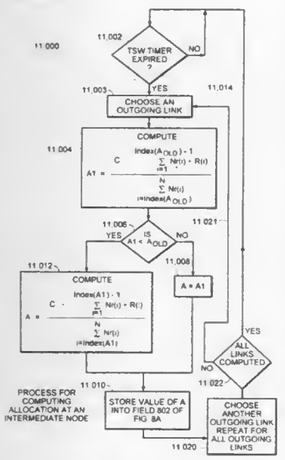
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**5,745,697**

**NETWORK FLOW CONTROL HAVING INTERMEDIATE NODE SCALABILITY TO A LARGE NUMBERS OF VIRTUAL CIRCUITS**

**Anna Charny, Sudbury, Mass., and K. K. Ramakrishnan, Berkley Heights, N.J., assignors to Digital Equipment Corporation, Maynard, Mass.**

**Filed Mar. 27, 1996, Ser. No. 622,801**
**Int. Cl.[6] G06F** *13/00*
**U.S. Cl. 395—200.63** **9 Claims**




1. An apparatus to control the transmission rate of a plurality of source end stations in a computer network, and the network having at least one intermediate node, comprising:

a. a plurality of virtual circuits established between said source end stations and said destination end stations, said plurality of virtual circuits passing through said intermediate node;

b. said source end stations transmitting data packets at a plurality of discrete transmission rates;

c. means, responsive to a source time interval, for said source end station to transmit said data packets containing a field having transmission rate information at least once during said source time interval;

d. means for signalling to said intermediate node said transmission rate information for each said virtual circuit by said intermediate node detecting said transmission rate information in said field of a data packet received by said intermediate node;

e. means in said intermediate node for counting the number of virtual circuits using each said discrete transmission rate;

f. means in said intermediate node for maintaining an indication that a selected virtual circuit has been counted in step e, and for not counting said virtual circuit more than once during a switch time interval;

g. means in said intermediate node, responsive to said counting the number of virtual circuits using each said discrete transmission rate, for calculating a rate allocation value for said plurality of virtual circuits, said calculating done periodically during said switch time interval;

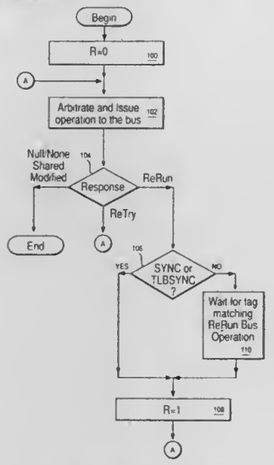
h. means for writing said rate allocation value into said field of said data packet in order to signal to said source end station, and any intervening intermediate node, said rate allocation value calculated in step g.

**5,745,698**

**SYSTEM AND METHOD FOR COMMUNICATING BETWEEN DEVICES**

**Michael Scott Allen, Austin; Ravi Kumar Arimilli, Round Rock; John Michael Kaiser, Cedar Park, and William Kurt Lewchuk, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y., and Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 298,873, Aug. 31, 1994, abandoned. This application Aug. 28, 1996, Ser. No. 704,035**
**Int. Cl.[6] G06F** *15/16;13/00*
**U.S. Cl. 395—200.67** **42 Claims**




1. A method of communicating between devices, comprising the steps of:

outputting a signal from a first device;

in response to said signal, initiating at least one action by a second device; and

outputting an indication from said second device to said first device of whether said second device completed said action and of whether future operation of said second device is independent of said first device reoutputting said signal, wherein said indication is of a first type if said second device completed said action, of a second device if said second device failed to complete said action and future operation of said second device is dependent upon said first device reoutputting said signal, and of a third type if said second device failed to complete said action and future operation of said second device is independent of said first device reoutputting said signal.

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**5,745,699**

**DYNAMIC ADDRESS ASSIGNMENT IN AN ARBITRARILY CONNECTED NETWORK**

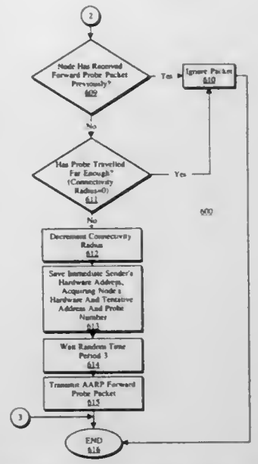
**Kerry Eugene Lynn, Redwood City; Alan Oppenheimer, Cupertino; Michael Walker Ritter, Los Altos; Jonathan Marcus Zweig, Cupertino, and Jeffery L. Mullins, San Jose, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.**

**Continuation of Ser. No. 126,313, Sep. 24, 1993, abandoned. This application Oct. 18, 1996, Ser. No. 733,540**
**Int. Cl.[6] G06F** *12/00*
**U.S. Cl. 395—200.75** **41 Claims**

1. In a network comprising a first node and a second node in wireless communication, a method of assigning a unique network address within said network to said first node, comprising the following steps:

a. said first node in said network determining a first provisional network address for use in assigning said unique network address;






b. said first node broadcasting a first probe containing said first provisional network address until a first probe response to said first probe is received or a first interval of time has transpired;

c. if said first probe response to said first probe is received, then said first node determining a second provisional network address and repeating steps b and c, said second provisional network address becoming said first provisional network address, until no said first probe response is received in said first interval of time;

d. using said first provisional network address, broadcasting by said second node, a second probe in said network until a second probe response to said second probe is received by said first node or a second period of time has transpired, wherein said second probe comprises a forward probe that includes a radius remaining number indicating whether another node in said network may re-broadcast said forward probe;

e. if said second probe response to said second probe is received, then said first node determining a third provisional network address and repeating steps b through e, said third provisional network address becoming said first provisional network address, until no said second probe response is received in said second interval of time; and

f. using said first provisional network address as said unique network address for said first node.

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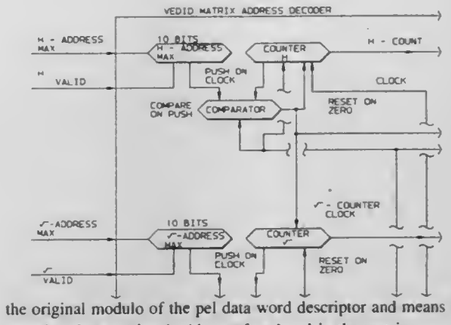
**5,745,700**

**MULTI MEDIA VIDEO MATRIX ADDRESS DECODER**

**Joseph Claude Caci, Owego, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 13, 1996, Ser. No. 648,637**
**Int. Cl.[6] H04N** *9/80*
**U.S. Cl. 395—200.77** **10 Claims**

1. Video decoder apparatus for receiving compressed, weighted, and encoded input video data in matrix form produced from the original difference vector of each pel and transmitted as a bitstream including compressed pel data word descriptors, comprising means for reconstituting the bitstream into matrix format and calculating individual pel values, said means comprising means for restoring




the original modulo of the pel data word descriptor and means for restoring the associated address of each pel in the matrix.

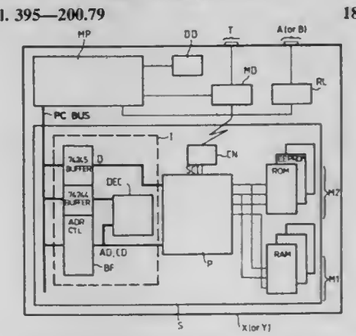
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**5,745,701**

**SECURITY PROTECTED SYSTEM FOR INTERCONNECTION OF LOCAL NETWORKS VIA A PUBLIC TRANSMISSION NETWORK**

**Binh Nguyen-Thai, Lannion; Marc Girault, Caen, and Bruno Millan, Braon Sur Odon, all of France, assignors to France Telecom, Paris, and La Poste, Boulogne Billancourt, both of France**

**Filed Feb. 13, 1995, Ser. No. 388,104**
**Claims priority, application France, Feb. 14, 1994, 9401645**
**Int. Cl.[6] G06F** *15/16*
**U.S. Cl. 395—200.79** **18 Claims**




1. A system for interconnecting a plurality of local networks via a public transmission network, in which a first plurality of stations, connected to a first local network, are capable of being connected to the public network by a first router in order to communicate with one or more of a second plurality of stations connected to a second local network, the second plurality of stations being capable of being linked to the public network by a second router, and the first and second local networks being included among the plurality of local networks, the system comprising

a first security device which protects the establishment of the communications between the first and second local networks over the public network, the first security device implementing an authentication certificate exchange mechanism, and

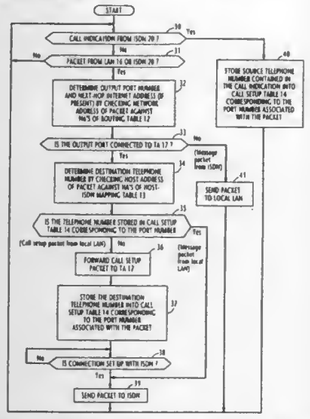
a second security device which protects the establishment of the communications between the first and second local networks over the public network the second security device implementing the authentication certificate exchange mechanism in cooperation with the first security device; and

wherein the first and second security devices are respectively placed in the first and second routers.

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5,745,702
**APPARATUS AND METHOD FOR INTERCONNECTING ISDN/INTERNETWORK USERS**
**Hisashi Morozumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**
**Filed Aug. 22, 1995, Ser. No. 518,074**
**Claims priority, application Japan, Aug. 22, 1994, 6-196870**
**Int. Cl.[6] G06F** *15/16;* **H04L** *12/46*
**U.S. Cl. 395—200.79** **2 Claims**

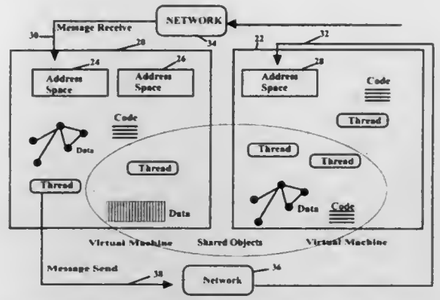



1. An apparatus for interconnecting a LAN (local area network) and remote stations through an integrated services digital network (ISDN), each of said LAN and remote stations being a user of an internetwork and being assigned a network address and a host address of the internetwork and a telephone number of the ISDN, the apparatus comprising:
a first port connected to the LAN and a second port connected to the ISDN, said first and second ports being respectively identified by a port number;
a database having a plurality of entries associating network addresses with said port numbers and a plurality of entries associating host addresses with telephone numbers;
a lookup table having a plurality of entries corresponding to said port numbers; and
control means for (a) receiving a call indication signal through the second port and storing a source telephone number contained in the call indication signal into an entry of the lookup table corresponding to the port number of the second port, (b) receiving a packet from the LAN, detecting a port number in an entry of the database corresponding to a network address contained in the received packet, detecting a telephone number in an entry of the database corresponding to a host address contained in the packet and forwarding the received packet as a message packet to the port of the detected port number if the detected telephone number is stored in an entry of the lookup table corresponding to the detected port number, and storing the detected telephone number into an entry of the lookup table corresponding to the detected port number if the detected telephone number is not stored in said entry of the lookup table and forwarding the received packet as a call setup packet to the port of the detected port number.

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5,745,703
**TRANSMISSION OF HIGHER-ORDER OBJECTS ACROSS A NETWORK OF HETEROGENEOUS MACHINES**
**Henry Cejtin; Suresh Jagannathan, and Richard A. Kelsey, all of Princeton, N.J., assignors to NEC Research Institute, Inc., Princeton, N.J.**
**Filed Jul. 18, 1995, Ser. No. 503,566**
**Int. Cl.[6] G06F** *15/173*
**U.S. Cl. 395—200.68** **16 Claims**

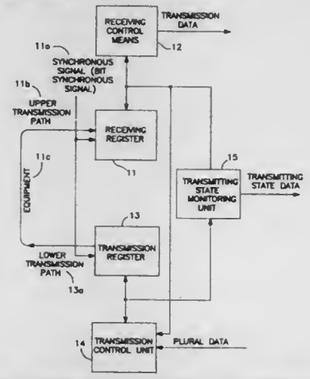
1. An apparatus for sending messages across machines comprising:




a plurality of data objects, code objects, threads and globally unique identifiers in at least one virtual machine in a network of machines; and
a plurality of address spaces in said at least one virtual machine, each address space having a unique identifier and a list of pairs of input and output channels, said address spaces being capable of creating and destroying said channels;
whereby a thread sends data objects, code objects, thread objects or global unique identifiers in the form of a message to a selected address space, said selected address space intercepts and reconstructs incoming messages.

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5,745,704
**DATA COMMUNICATION CONTROL DEVICE**
**Seiichi Yasukawa, Yotsukaido, Japan, assignor to Nikon Corporation, Tokyo, Japan**
**Filed Sep. 1, 1995, Ser. No. 522,661**
**Claims priority, application Japan, Oct. 28, 1994, 6-265672**
**Int. Cl.[6] G06F** *15/16;13/42;* **H04L** *12/60*
**U.S. Cl. 395—200.8** **12 Claims**

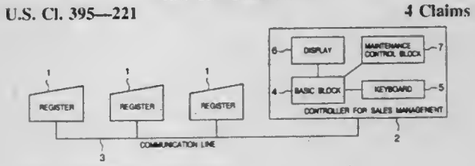



1. A data communication control device comprising:
a receiving register, synchronized with a synchronous signal, which receives input data via an upper transmission path from a facing equipment and performs a serial-parallel conversion on the input data;
a receiving control unit which detects the completion of the serial-parallel conversion and restores transmitted data, delivered on the upper transmission path from the facing equipment, by sequentially combining the serial-parallel converted input data;
a transmitting register which receives data transmission of predetermined word length and parallel-serial converts the transmission data in synchronization with the synchronous signal and delivers the parallel-serial converted output data to a lower transmission path;
a transmission control unit responsive to interrupts which generates plural data formed by dividing, at intervals based on the predetermined word length, the transmission data, said transmission control unit sequentially providing the plural data to said transmission register when the completion of the parallel-serial conversion is detected, said transmission control unit delaying transmission of plural data in response to an external interrupt; and
a transmission state monitoring unit which determines whether delivery of the parallel-serial converted output data has been completed after the serial-parallel converted in-put data has been restored, the transmission state monitoring unit outputs the result as a transmission state signal.



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5,745,705
**POS SYSTEM**
**Kesayoshi Iguchi, Fujisawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**
**Filed Dec. 13, 1995, Ser. No. 571,491**
**Claims priority, application Japan, May 12, 1995, 7-114159**
**Int. Cl.[6] G06F** *17/60*
**U.S. Cl. 395—221** **4 Claims**

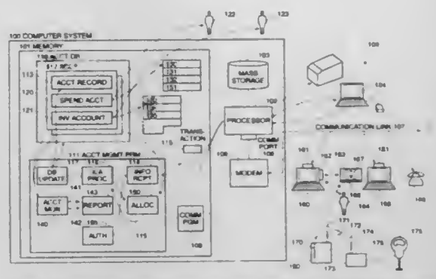



1. A POS system comprising:
a plurality of registers each for entering data on items to be sold and processing accounts on the basis of a control program and various setting data; and
a controller for sales management, connected through a communication line to said plurality of registers, for managing sales of a whole store, and setting at least kinds and unit prices of items dealt in said store, said controller for sales management comprising a maintenance control block, including:
means for entering and storing maintenance data for updating said control program and/or said various setting data of said registers;
means for detecting that a power supply to said registers is turned on to execute an opening process of said store; and
means for, after detecting that the power supply to said registers is turned on, sending said maintenance data to said store when there is said maintenance data, and updating said control program and/or said various setting data of said registers.

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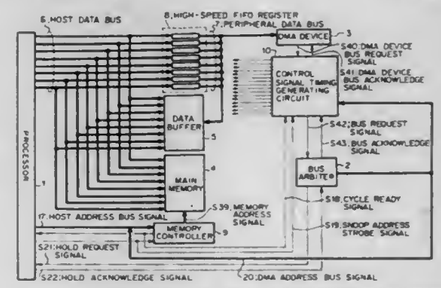
5,745,706
**COMPUTER SYSTEM AND RELATED EQUIPMENT FOR SPENDING AND INVESTMENT ACCOUNT MANAGEMENT**
**Larry Wolfberg, 10702 Levico Dr., Los Angeles, Calif. 90077, and Brent Wolfberg, 575 S. Barrington Ave., Suite 206, Los Angeles, Calif. 90049**
**Filed Dec. 30, 1994, Ser. No. 367,505**
**Int. Cl.[6] G06F** *17/60*
**U.S. Cl. 395—235** **76 Claims**

1. A computer system for managing and tracking an investment and spending account, said system comprising
a memory comprising account information, said account information beings associated with an investment account and a spending account;
a process or coupled to said memory, said processor being disposed to process said account information and to process at least one transaction associated with either or both said investment account or said spending account;
said memory comprising a set of investment guidelines associated with said investment account and a set of spending flexibility guidelines associated with said spending account, said investment guidelines and said spending flexibility guidelines coordinated to obtain a selected rate of return;
a program for directing said processor to determine, responsive to said account information, a first condition for raising a first signal associated with said investment guidelines, for directing said processor to determine, responsive to said account information a second condition for raising a second signal associated with said spending flexibility guidelines, and
for directing said processor to raise said first signal or said second signal, responsive to said account information and said at least one transaction.




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5,745,707
**BUS CONTROL DEVICE FOR COMPUTER SYSTEM HAVING COMPUTER AND DMA DEVICE**
**Akira Takahashi, Niigata, Japan, assignor to NEC Corporation, Tokyo, Japan**
**Filed Jul. 20, 1995, Ser. No. 504,957**
**Claims priority, application Japan, Jul. 20, 1994, 6-168236**
**Int. Cl.[6] G06F** *13/00*
**U.S. Cl. 395—290** **4 Claims**




1. A bus control system for DMA processing/external master transfer in a personal computer having a write-back cache, comprising:
a processor for controlling said bus control system said processor containing a cache memory therein for a write-back cache system;
a main memory connected to said processor for storing read and write data of said processor,
a data buffer for serving as a buffer for data from said processor;
a high-speed buffer for performing a high-speed write-in and read-out operation for data from said processor;
a DMA device that is a data delivery target of said processor, for directly performing data transfer with an external device;
a host data bus connecting said processor, said high-speed buffer, said main memory and said data buffer;
a peripheral data bus connecting said high-speed buffer, said data buffer and said DMA device; and
a bus arbiter for arbitrating use of said data bus between said processor and said DMA device, wherein, at a read-access time of said DMA device to said cache memory, data written back through a write-back operation are supplied to and stored in both of said main memory and said high-speed

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buffer, said arbiter allowing said DMA device to perform data access to said high-speed buffer by means of said peripheral bus upon completion of said write-back operation, and a control signal timing generating circuit for transmitting a bus request signal to said bus arbiter in response to a DMA device bus request signal from said DMA device, said bus arbiter instructing said processor to separate said host data bus and said peripheral data bus from each other upon receipt of said bus request signal from said control signal timing generating circuit.

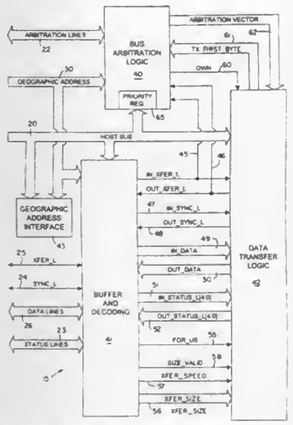
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**5,745,708**

## METHOD FOR AND APPARATUS FOR OPERATING A LOCAL COMMUNICATIONS MODULE IN ARBITRATING FOR MASTERSHIP OF A DATA TRANSFER ACROSS A BACK PLANE BUS IN INDUSTRIAL AUTOMATION CONTROLLER

**Robert C. Weppler, Mayfield Heights; Timothy J. Murphy, Hudson; Margarita M. Hutz, Auburn; Alan C. Cribbs, North Canton, and Kendal R. Harris, Mentor, all of Ohio, assignors to Allen-Bradley Company, Inc.**

**Filed Sep. 29, 1995, Ser. No. 536,535**
**Int. Cl.[6] G06F** *13/36*
**U.S. Cl. 395—299** **18 Claims**




1. A method for operating a local communications module in arbitrating for mastership of a data transfer across a backplane bus, the method comprising the steps of:

(a) asserting a wired-or arbitration strobe line on the backplane bus to initiate a competition between the local communications module and other modules connected to the backplane bus which are all contending for data transfer mastership of the backplane bus;

(b) asserting a local weight code onto a set of wired-or weight code lines on the backplane bus, the local weight code being encoded to uniquely identify the local communications module on the backplane bus;

(c) continuously examining an aggregate weight code obtained as a set of actual logic levels appearing on the wired-or weight code lines of the backplane bus, and determining if the local weight code is numerically less than the aggregate weight code;

(d) if the examination performed in step (c) indicates that the local weight code is numerically less than the aggregate weight code, then releasing the weight code lines and the arbitration strobe line;

(e) if the examination performed in step (c) indicates that the local weight code is numerically at least as great as the aggregate weight code, then maintaining assertion of the local weight code on the weight code lines and maintaining assertion of the arbitration strobe line;

(f) releasing the arbitration strobe line after a predetermined time period following the assertion thereof in step (a); and

(g) monitoring for termination of the competition as indicated by release of the wired-or arbitration strobe line by all modules on the backplane bus, and thereupon latching an indication that the local communications module is awarded data transfer bus mastership for a succeeding data transfer cycle if the continuous examination performed in step (c) indicates that the local weight code is numerically at least as great as the aggregate weight code.

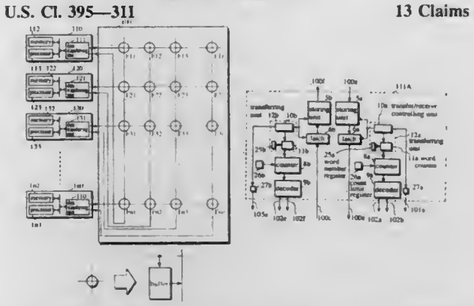
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**5,745,709**

## DATA TRANSFER APPARATUS AND SYSTEM PROVIDING HIGH SPEED SWITCHING TO ALLOW FOR HIGH SPEED DATA TRANSFER BETWEEN ONE DEVICE AND MULTIPLE DEVICES

**Ichiro Okabayashi, Takatsuki; Katsuyuki Kaneko, Moriguchi, and Hiroshi Kadota, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial C., Ltd., Osaka-fu, Japan**

**Filed Jul. 3, 1995, Ser. No. 497,864**
**Claims priority, application Japan, Jul. 5, 1994, 6-153969**
**Int. Cl.[6] G06F** *13/00*
**U.S. Cl. 395—311** **13 Claims**



7. A data transfer apparatus to be provided to each of a plurality of processor elements in a parallel computer having $2^n$ processor elements, n being an integer greater than 0, for transferring data between a memory in a processor element having said data transfer apparatus and any of a plurality of devices connected to said plurality of processor elements, wherein said plurality of devices consists of $2^{2n}$ FIFO memories, arrayed in $2^n$ rows×$2^n$ columns of a matrix, such that FIFO memories in a row are connected to a corresponding grow bus and FIFO memories in a column are connected to a corresponding column bus, said data transfer apparatus comprising:

a first buffer means for temporarily storing data;

a first counting means for counting each time a sequence of data is transferred from said memory to any of said plurality of devices;

a first selecting means for decoding a count value output from said first counting, means to select one of said plurality of devices corresponding to said count value;

a first transferring means for transferring data from said memory to said device selected by said first selecting means via said first buffer means, wherein:

said first counting means includes an n-bit binary counter, a transmitting register for storing a number of showing how many times data is to be transferred successively from or to any of said plurality of devices, a first transmitting counter for counting a each time said first transferring means transfers data, and for outputting a clock pulse each time said first transmitting counter counts said number stored in said transmitting register, and a second transmitting counter for counting each time said clock pulse is output from said first transmitting counter, and for outputting a count value to said first selecting means, wherein said count value is said count value output from said first counting means;

said first selecting means includes an n-bit-input/$2^n$-bit-output decoder, wherein each of said $2^n$-bit outputs is output as a selection signal being exclusively for one of said FIFO memories in a predetermined row, such that said first selecting means selects one of said $2^n$ FIFO memories in said predetermined row;

a second buffer means for temporarily storing data;

a second counting means for counting each time a sequence of data is transferred from any one of said plurality of devices to said memory;

a second selecting means for decoding a count value output from said second counting means to select one of said plurality of devices corresponding to said count value;

a second transferring means for transferring data from said one of said plurality of devices selected by said second selecting means to said memory via said second buffer means, wherein:

said second counting means includes an n-bit binary counter, a receiving register for storing a number of showing how many times data is to be transferred successively from or to any one of said plurality of devices, a first receiving counter for counting each time said second transferring means transfers data, and for outputting a clock pulse each time said first receiving counter counts said number stored in said receiving register, and a second receiving counter for counting each time said clock pulse is output from said first receiving counter, and for outputting a count value to said second selecting means, wherein said count value is said count value output from said second counting means;

said second selecting means includes an n-bit-input/$2^n$-bit-output decoder, wherein each of said $2^n$-bit outputs is output as a selection signal being exclusively for one of said FIFO memories in a predetermined column, such that said second selecting means selects one of said $2^n$ FIFO memories in said predetermined column.



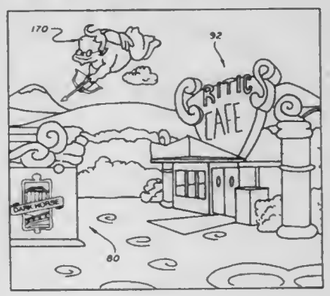
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**5,745,710**

## GRAPHICAL USER INTERFACE FOR SELECTION OF AUDIOVISUAL PROGRAMMING

**Charles H. Clanton, III, San Francisco, Calif.; Emilie Young, Boulder, Colo.; Joseph M. Palrang, and Marcel Dominicus Janssens, both of Sunnyvale, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.**

**Continuation of Ser. No. 206,749, Mar. 4, 1994, Pat. No. 5,524,195, which is a continuation-in-part of Ser. No. 67,574, May 24, 1993, abandoned. This application Jan. 11, 1996, Ser. No. 585,419**
**Int. Cl.[6] G06F** *3/00*
**U.S. Cl. 395—327** **34 Claims**




1. A display system for the display of audiovisual programming, comprising:

a receiver for receiving said audiovisual programming from an audiovisual program source;

a user interface for the display of said audiovisual programming on a display, said user interface incorporating a metaphor having a plurality of Spaces, wherein at least one of said Spaces displays representations of available audiovisual programming for display on said display, and further wherein said Spaces are arranged in said user interface such that each of said Spaces is disposed relative to one another within said metaphor;

an element to permit a user to interact with said Spaces using a user input device, said interaction allowing said user to select a desired audiovisual program, such that said selection results in said selected audiovisual program being displayed on said display;

an element enabling said user to navigate between said Spaces in said metaphor;

wherein upon said selection of one of said representations by said user using said input device, said user interface displays a video viewing space on said display.

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**5,745,711**

## DISPLAY CONTROL METHOD AND APPARATUS FOR AN ELECTRONIC CONFERENCE

**Chiho Kitahara, Kawasaki; Takeshi Ishizaki, Sagamihara; Shigeaki Kinoshita, Hachioji; Toshimitsu Hayashi; Masami Kameda, both of Yokohama; Tomomi Suzuki, Ebina; Yoshiyuki Nakayama, Kawasaki, and Kenjiro Mori, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 965,153, Oct. 22, 1992, abandoned. This application May 27, 1994, Ser. No. 250,661**
**Claims priority, application Japan, Oct. 23, 1991, 3-275250; May 27, 1993, 5-125759; Sep. 10, 1993, 5-225447**
**Int. Cl.[6] G06F** *3/00*
**U.S. Cl. 345—330** **16 Claims**



1. In an electronic conference system including a plurality of data processing units, each of which includes an input unit and a display unit, and a communication network for inter-connecting said data processing units to each other, said system realizes an electronic conference by providing communication between said processing units through said communication network, a method of controlling said display units comprises the steps of:

providing at least one of said data processing units with information indicating whether or not respective ones of said data processing units are participating in the electronic conference;

selecting a window on a display unit corresponding to a particular data processing unit which participates in the electronic conference in accordance with said information;

displaying, on said selected display unit, a participant object representing said particular data processing unit participating in the electronic conference, a first area defined in said window corresponding to said participant object and a second area defined in said window corresponding to said particular data processing unit associated with said selected display unit;

displaying, on said first area, a data object representing data associated with said participant object; and

moving said data object among a plurality of said first area and said second area in response to an input from said input unit, thus creating virtual views representing a virtual conference formed in terms of computers and networks, wherein each of said data processing units participating in the electronic con-

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ference is provided with a correspondingly unique virtual perspective of the electronic conference.

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**5,745,712**

## GRAPHICAL PROGRAMMING SYSTEM AND METHODS FOR ASSISTING A USER WITH CREATING SCREEN OBJECTS ON A SCREEN DEVICE

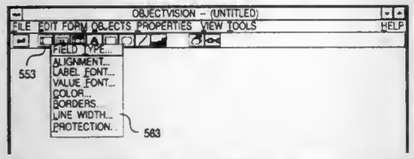
**William Monroe Turpin, Santa Cruz; Kevin Lane Brown, Scotts Valley, and Steven Ward Bogrett, Campbell, all of Calif., assignors to Borland International, Inc., Scotts Valley, Calif.**

**Division of Ser. No. 975,302, Nov. 12, 1992, Pat. No. 5,608,898, which is a continuation-in-part of Ser. No. 606,537, Oct. 31, 1990, abandoned. This application Dec. 28, 1995, Ser. No. 580,224**

**Int. Cl.[6] G06F** *3/14*

**U.S. Cl. 395—333** **27 Claims**




1. In a computer system, a method for assisting a user with creating screen objects on a screen device, the method comprising:

(a) displaying an object bar on the screen device, said object bar having a plurality of icons for representing a respective plurality of types of objects to be created, each type of object having a set of properties;

(b) receiving a first request for inspecting and setting the default values for the set of properties for a desired type of object, said first request including a first signal from a pointing device for selecting the icon which represents the desired type of object;

(c) in response to said first request, (i) displaying a list of properties for the desired type of object and (ii) setting at least one default value for the set of properties for the desired type of object to user-specified values;

(d) receiving at least one second request for creating a screen object of said desired type of object, said second request including a second signal from a pointing device for selecting the icon which represents said desired type of object; and

(e) for each said at least one second request received in step (d), creating an object of said desired type on the screen device, each object being created with said at least one of the default values for the set of properties set equal to said user-specified values that were set in step (c).

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**5,745,713**

## MOVIE-BASED FACILITY FOR LAUNCHING APPLICATION PROGRAMS OR SERVICES

**Gregory J. Ferguson, Hunt Valley, Md., and Bryan D. Clapper, Fort Collins, Colo., assignors to Silicon Graphics, Inc., Mountain View, Calif.**

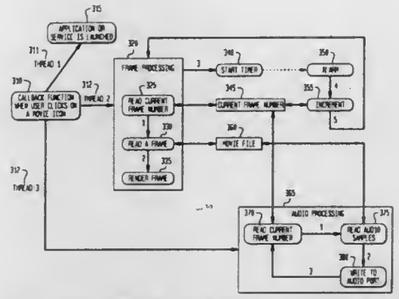
**Filed Aug. 3, 1995, Ser. No. 511,051**

**Int. Cl.[6] G06F** *3/14*

**U.S. Cl. 395—339** **22 Claims**

7. In a computer-based system having a graphical user interface, a movie-based facility for launching applications or services for use with the graphical user interface, comprising:

a first application program that displays a movie and;




an icon, located within the graphical user interface that permits a user to launch said first application program and a second application program concurrently, said icon having a border and a display region, wherein said display region is located within said border and said movie is displayed within said display region.

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**5,745,714**

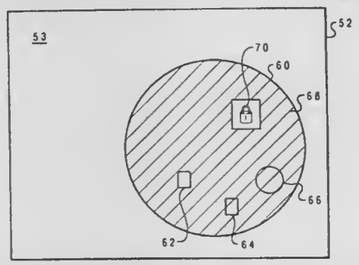
## METHOD AND SYSTEM IN A DATA PROCESSING SYSTEM FOR THE ASSOCIATION AND DISPLAY OF A PLURALITY OF OBJECTS

**David Wayne Glass, Georgetown, Ky.; Michael David Hocker, Staatsburg, N.Y.; Gregory Tad Kishi, Oro Valley, Ariz.; James Gordon McLean, Fuguay-Varina, N.C.; Clifford Alan Pickover, Yorktown Heights, N.Y., and Daniel James Winarski, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jul. 19, 1996, Ser. No. 683,946**

**Int. Cl.[6] G06F** *15/00*

**U.S. Cl. 395—339** **20 Claims**




11. A data processing system having a graphical user interface for associating and displaying a plurality of objects, comprising:

means for specifying a creation of a visually perceptible enclosure having a translucent surface;

means for specifying said plurality of objects within said graphical user interface;

means for associating each of said plurality of objects with said visually perceptible enclosure;

means for creating said enclosure; and

means for displaying said enclosure and each of said plurality of objects within said graphical user interface, each of said plurality of objects being displayed within said enclosure so that each of said plurality of objects is partially visible through said translucent surface.



**5,745,715**

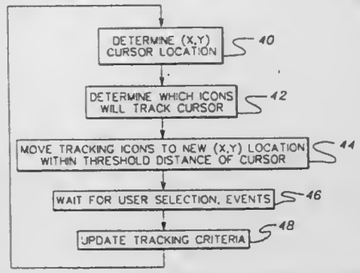
## METHOD AND SYSTEM FOR FACILITATING THE SELECTION OF ICONS

**Clifford A. Pickover, Yorktown Heights, and Michael Stephen Schwartz, Bronx, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 227,149, Apr. 13, 1994, Pat. No. 5,564,004. This application Sep. 17, 1996, Ser. No. 714,819**

**Int. Cl.[6] G06F** *15/00*

**U.S. Cl. 395—348** **13 Claims**




1. A method for graphically linking one or more of a plurality of icons located on a computer display, said method comprising the steps of:

determining, independent of user intervention, which of said plurality of icons are to be linked by determining for said plurality of icons a likeliness probability that one or more icons will be selected after at least one other icon, and selecting those icons which have a likeliness probability greater than a predetermined probability as those icons to be linked with said at least one other icon; and

drawing a graphical representation between said icons to be linked, wherein appearance variations within the graphical representation indicate the nature of a relationship between said linked icons.

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**5,745,716**

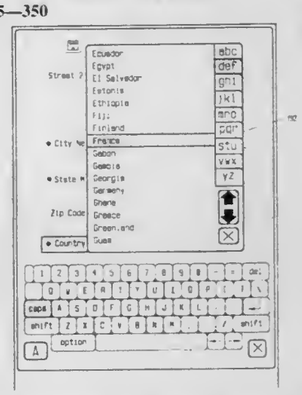
## METHOD AND APPARATUS FOR TAB ACCESS AND TAB CYCLING IN A PEN-BASED COMPUTER SYSTEM

**Michael C. Tchao, Palo Alto, and Stephen P. Capps, San Carlos, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.**

**Filed Aug. 7, 1995, Ser. No. 512,028**

**Int. Cl.[6] G06F** *3/00*

**U.S. Cl. 395—350** **29 Claims**




1. A method implemented in a computer system for tab access to a desired portion of a list of items, the list of items having a predetermined order, the method comprising:

displaying on a display screen of the computer system a first displayed portion of the list of items;

displaying on the display screen a plurality of tabs, each tab displaying a series of at least two associated reference characters, the reference characters on the plurality of tabs indexing items throughout the list;

receiving a selection input with a pointer on one of the plurality of tabs;

replacing the first displayed portion of the list with a second displayed portion of the list which second displayed portion has as a first displayed item an item with a first character that corresponds to one of the at least two associated reference characters displayed on the selected tab; and

cycling through the series of at least two associated reference characters when at least two successive selection inputs are received on the selected tab.

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**5,745,717**

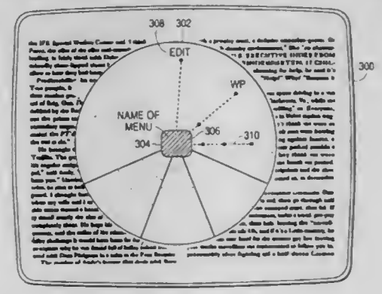
## GRAPHICAL MENU PROVIDING SIMULTANEOUS MULTIPLE COMMAND SELECTION

**Mark Vayda, 1515 Great Falls St. #334, and Nancy Weyl, 1330 Mercer La., both of McLean, Va. 22101**

**Filed Jun. 7, 1995, Ser. No. 486,238**

**Int. Cl.[6] G06F** *3/100*

**U.S. Cl. 395—352** **27 Claims**




1. A computer system comprising:

a processor means;

a program memory means, coupled to the processor means, for storing programs executed by the processor;

a display means, coupled to the processor means, for displaying images under control of the programs executed by the processor means;

the programs stored in the program memory including at least one menu driven program for creating a graphical display on the display means;

a menu generating means, cooperating with the at least one menu driven program, for displaying at least one menu on the display means;

each menu comprising:

a focus position;

a first menu bar extending through the focus position having a first plurality of commands distributed therein, one of the first plurality of commands being located substantially at the focus position; and

a second menu bar extending through the focus position having a second plurality of commands distributed horizontally therein, one of the second plurality of commands being located substantially at the focus position.

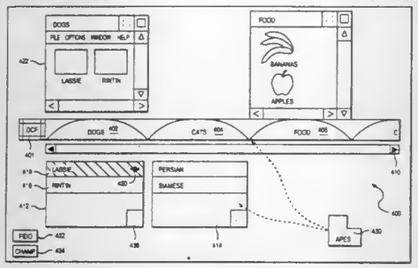
VOL 1209 ISS 4 AP 28 1998 UMI



### 5,745,718
### FOLDER BAR WIDGET

**Troy Lee Cline; John Anthony Moore, both of Cedar Park; Ricky Lee Poston, Austin, all of Tex., and Jon Harald Werner, Oceanside, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jul. 31, 1995, Ser. No. 509,676**
**Int. Cl.[6] G06F *15/00***
**U.S. Cl. 395—352** **19 Claims**




1. A computer-implemented method for simultaneously viewing and manipulating a plurality of sub-containers of a container displayed in a folder bar widget on a display screen, comprising the steps of:

displaying a plurality of adjacent tabs within the folder bar widget, each tab representing a sub-container of the container;

displaying a first menu listing first contents of a first sub-container in response to a pointing device activating a first tab representing the first sub-container at a point adjacent to said first tab; and

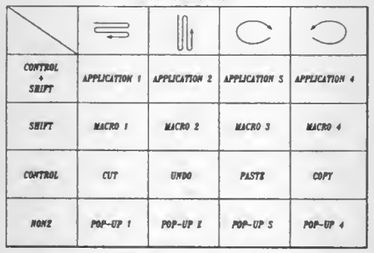
concurrently displaying a second menu listing second contents of a second sub-container in response to the pointing device activating a second tab representing the second sub-container at a point adjacent to said second tab, wherein the first contents and second contents are concurrently displayed in a non-overlapping manner.

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### 5,745,719
### COMMANDS FUNCTIONS INVOKED FROM MOVEMENT OF A CONTROL INPUT DEVICE

**Fernando D. Falcón, Fray Justo Santa Maria de Oro 2511 10B (1425), Buenos Aires, Argentina**

**Filed Jan. 19, 1995, Ser. No. 375,119**
**Int. Cl.[6] G06F *3/00***
**U.S. Cl. 395—358** **23 Claims**




1. A method for controlling the operation of a computer system using a pointing device, the computer system including a keyboard having a plurality of keys, a display for displaying visual information, a processor to generate and manage the visual information, and a storage medium, the pointing device being coupled to the computer system and including means for generating movement information to effect the movement of a cursor to any of a plurality of cursor positions at different coordinates on the display, the method comprising the steps of:

(a) storing in the storage medium a representation of the pointing device movement information indicative of a cursor trajectory caused by movement of the pointing device;

(b) calculating a cursor-heading, time variation-profile from the stored representation of the pointing device movement information; and

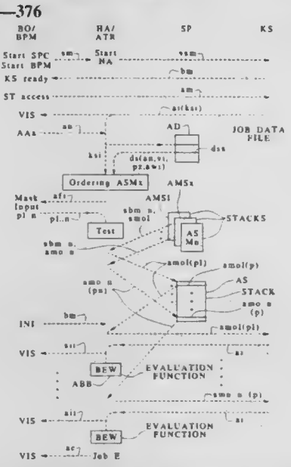
(c) comparing the cursor-heading, time variation-profile with a pre-defined characteristic cursor-heading, time variation-profile and controlling said computer system to execute a predetermined command when the cursor-heading, time variation-profile substantially matches the pre-defined characteristic cursor-heading, time variation-profile.

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### 5,745,720
### METHOD AND PERSONAL SERVICE COMPUTER FOR THE ADMINISTRATION AND MAINTENANCE OF COMMUNICATION SYSTEMS

**Wolfgang Kaufel, and Christine Vogt-Wingerath, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed May 22, 1995, Ser. No. 445,765**
**Claims priority, application Germany, May 25, 1994, 44 18 208.2**
**Int. Cl.[6] G06K *15/00***
**U.S. Cl. 395—376** **16 Claims**




1. A method for administration and maintenance of communication systems, comprising the steps of:

providing a personal service computer;

establishing a job data file in which a job-associated data set is stored for each initializable administration job in the personal service computer;

storing stacks of administration and maintenance instructions individually associated with the communication systems for every administration job in the personal service computer, job identification information and communication-associated parameters being insertable in the administration and maintenance instructions;

interrogating information individually associated with a communication system within an initialization of a communication relationship between the personal service computer and the communication system;

after a selection of an administration job controlled from a user surface, selecting the stack of administration and maintenance instructions with the assistance of a job-associated data set and of information individually associated with the communication system;

interrogating, checking, and inserting the communication-associated parameters into the selected administration and maintenance instructions and compiling to form a current job stack with assistance of user program modules under control of the user surface and of an instruction processing program module; and

successively communicating the administration and maintenance instructions of the current job stack to the communication system following every such communication, interpreting, visualizing, and evaluating a reply information from the communication system with the assistance of the user program module and of the instruction processing program module, and, dependent on a result of the evaluation, continuing or ending the successive communication of the administration and maintenance instructions or interrogating control information under control of the user surface and, dependent on an informational content of the interrogated control information, ending or continuing communication of the administration and maintenance instructions of the job stack.

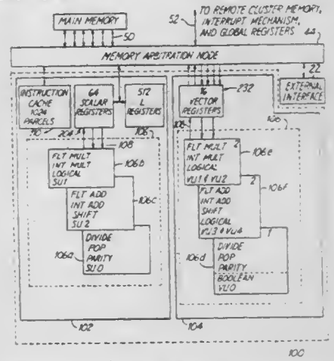


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### 5,745,721
### PARTITIONED ADDRESSING APPARATUS FOR VECTOR/SCALAR REGISTERS

**Douglas R. Beard, Eleva; Andrew E. Phelps; Michael A. Woodmansee, both of Eau Claire; Richard G. Blewett, Altoona; Jeffrey A. Lohman, Eau Claire; Alexander A. Silbey, Eau Claire; George A. Spix, Eau Claire; Frederick J. Simmons, Neillsville, all of Wis., and Don A. Van Dyke, Pleasanton, Calif., assignors to Cray Research, Inc., Eagan, Minn.**

**Continuation of Ser. No. 395,320, Feb. 28, 1995, Pat. No. 5,640,524, which is a continuation of Ser. No. 536,409, Jun. 11, 1990, Pat. No. 5,430,884, which is a continuation-in-part of Ser. No. 459,083, Dec. 29, 1989, Pat. No. 5,197,130. This application Jun. 7, 1995, Ser. No. 485,017**
**Int. Cl.[6] G06F *9/00***
**U.S. Cl. 395—384** **2 Claims**




1. A scalar/vector processor capable of concurrent scaler and vector operations comprising:

scalar resources for processing scalar instructions, wherein the scalar resources including scalar registers;

vector resources adapted to be operated concurrently with the scalar resources and with one another to process vector instructions, wherein the vector resources include vector registers;

means for selecting a moveable address boundary from a range of address value encompassed by each of a number of address fields, each address field representing a register address of one of the scalar or vector registers; and

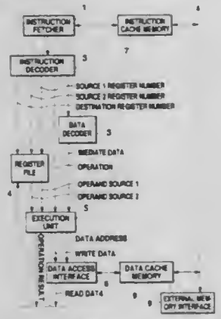
means for decoding each of the number of address fields to access alternatively one of the scalar registers or one of the vector registers depending on a value of the register address being above or below the selected moveable address boundary.

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### 5,745,722
### APPARATUS FOR DECODING INSTRUCTION IMMEDIATE DATA TO PRODUCE A STRING HAVING A SINGLE BIT DIFFERENT FROM OTHER BIT THEREOF

**Kenshi Matsumoto, Koshigaya; Yasuhito Koumura, Tokyo, and Hiroki Miura, Warabi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan**

**Filed Jun. 10, 1996, Ser. No. 661,084**
**Claims priority, application Japan, Jun. 15, 1995, 7-148511**
**Int. Cl.[6] G06F *9/308***
**U.S. Cl. 395—386** **8 Claims**




1. A program execution apparatus, comprising:

a fetch section for sequentially fetching instructions, including an immediate instruction;

a decoding section for decoding fetched instructions;

an execution section for executing decoded instructions, wherein said decoding section includes a judgement section for judging whether a fetched immediate instruction includes immediate data which has been encoded; and

a data decoding section for decoding immediate data which has been encoded, wherein said data decoding section decodes encoded immediate data by expanding the encoded immediate data into a binary string according to a value of the encoded immediate data, wherein said value of the encoded immediate data is N, and wherein said data decoding section generates a binary string in which only an (N+1)th bit of the string is different from other bits thereof.

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### 5,745,723
### DATA PROCESSING SYSTEM CAPABLE OF EXECUTION OF PLURAL INSTRUCTIONS IN PARALLEL

**Masahito Matsuo; Toru Shimizu, and Toyohiko Yoshida, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 461,274, Jun. 5, 1995, Pat. No. 5,615,349. This application Sep. 26, 1996, Ser. No. 721,305**
**Claims priority, application Japan, Sep. 4, 1989, 1-229679**
**Int. Cl.[6] G06F *9/30***
**U.S. Cl. 395—388** **1 Claim**

1. A data processor for executing a preceding and a following instruction in parallel comprising:

a first decoder, coupled to receive the preceding instruction, for outputting a first decoded result decoded from said preceding instruction;

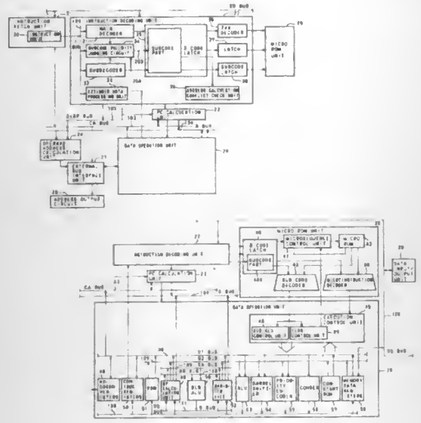
a second decoder, coupled to receive the following instruction, for outputting a second decoded result decoded from said following instruction;

judging means, coupled to receive said first decoded result and said second decoded result, for outputting validity information when said preceding and following instructions can be executed in parallel;

means for storing a mode field indicating whether parallel-execution of said preceding and said following instructions is prohibited; and

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means, included in said judging means, for preventing the judging means from generating the validity information when the mode field indicates that parallel execution is prohibited.

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**5,745,724**

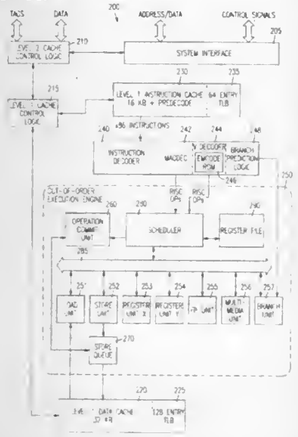
## SCAN CHAIN FOR RAPIDLY IDENTIFYING FIRST OR SECOND OBJECTS OF SELECTED TYPES IN A SEQUENTIAL LIST

**John G. Favor, San Jose; Amos Ben-Meir, Cupertino, and Jeffrey E. Trull, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

**Filed Jan. 26, 1996, Ser. No. 592,722**

**Int. Cl.[6] G06F** *9/30*

**U.S. Cl. 395—389** **19 Claims**



1. A superscalar processor comprising:

a first execution unit capable of executing a first class of operations;

a second execution unit capable of executing a second class of operations, wherein the second class overlaps the first class;

a set of entries which store information describing a set of operations for execution by the processor, the entries being ordered sequentially; and

a scan chain comprising:

generation circuitry in each entry which generates a scan bit if that entry contains information describing an operation in the first class;

propagation circuitry which propagates the scan bit from a first entry to entries which follow the first entry in sequential order, the first entry being first in sequential order of any entries which identify information describing an operation in the first class; and

selection circuitry in each entry to select the operation in that entry for execution by the second execution unit if the propagation circuitry propagates the scan bit to the entry and the entry stores information describing an operation in the second class.

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**5,745,725**

## PARALLEL INSTRUCTION EXECUTION WITH OPERAND AVAILABILITY CHECK DURING EXECUTION

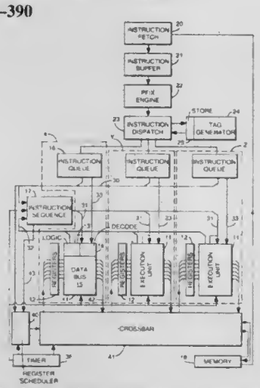
**Robert John Simpson, Bristol, United Kingdom, assignor to SGS-Thomson Microelectronics Limited, Almondsbury Bristol, Great Britain**

**Filed Jul. 12, 1996, Ser. No. 678,889**

**Claims priority, application United Kingdom, Jul. 14, 1995, 9514433**

**Int. Cl.[6] G06F** *9/30*

**U.S. Cl. 395—390** **21 Claims**



1. A method of executing a plurality of instructions in a computer system, said method comprising:

(a) fetching the plurality of instructions in a required sequence;

(b) establishing for each instruction in the sequence a first identifier of a position of the instruction in the sequence and a second identifier of a selected one of a plurality of parallel execution units for use in executing the instruction;

(c) supplying successive instructions in the sequence to said plurality of parallel execution units so that each instruction in the sequence is supplied to an execution unit corresponding to said second identifier, each execution unit having respective registers; and

(d) executing each instruction in the sequence, at least some of said instructions in the sequence being executed in a multi-cycle execution operation in which availability of operands is checked during execution, wherein execution of at least one instruction of the at least some of said instructions includes

(1) execution of the at least one instruction in one of said execution units by transferring into at least one register of said one execution unit a register value of a corresponding register of another of said execution units which executes an immediately preceding instruction in the sequence prior to completion of execution of said immediately preceding instruction, together with a status indicator of the validity of said values

(2) checking said status indicator after the transfer, and

(3) completing execution in dependence on the status check.



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**5,745,726**

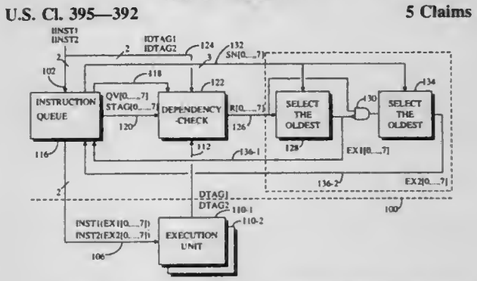
## METHOD AND APPARATUS FOR SELECTING THE OLDEST QUEUED INSTRUCTIONS WITHOUT DATA DEPENDENCIES

**Michael C. Shebanow, Plano, Tex.; John Gmuender, San Jose, Calif.; Michael A. Simone, Sunnyvale, Calif.; John R. F. S. Szeto, Oakland, Calif.; Takumi Maruyama, and Deforest W. Tovey, both of Los Gatos, Calif., assignors to Fujitsu, Ltd, Kawasaki, Japan**

**Continuation of Ser. No. 397,891, Mar. 3, 1995, abandoned. This application Sep. 5, 1995, Ser. No. 523,384**

**Int. Cl.[6] G06F** *9/30*

**U.S. Cl. 395—392** **5 Claims**



1. A method for selecting the two oldest instructions from a plurality of instructions waiting to be executed, each of the plurality of instructions indicating at least one register, the method comprising the steps of:

receiving a plurality of instructions;

setting bits of a first eligible instructions vector, each bit of the first eligible instructions vector being indicative of a corresponding one of the received plurality of instructions that have said indicated registers available for such execution;

setting bits of a second eligible instructions vector, each bit being indicative of a corresponding one of the plurality of instructions waiting to be executed that have said indicated registers available for such execution;

if one of said bits of the second eligible instructions vector is set, selecting a first oldest instruction from said ones of the plurality of instructions waiting to be executed corresponding to said set bits of the second eligible instructions vector;

if one of said bits of the second eligible instructions vector is not set, selecting a first oldest instruction from said received instructions;

resetting the bit of the eligible instructions vector corresponding to the first oldest instruction;

if one of said bits of the second eligible instructions vector is set, selecting a second oldest instruction from said ones of the plurality of instructions waiting to be executed corresponding to said set bits of the eligible instructions vector;

if one of said bits of the second eligible instructions is not set, selecting a second oldest instruction from said received instructions; and

resetting the bit of the eligible instructions vector corresponding to the second oldest instruction.

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**5,745,727**

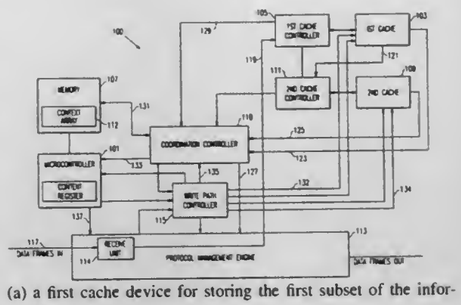
## LINKED CACHES MEMORY FOR STORING UNITS OF INFORMATION

**Vi Chau, Laguna Niguel; Stuart Berman, Newport Beach, and Peter Fiacco, Yorba Linda, all of Calif., assignors to Emulex Corporation, Costa Mesa, Calif.**

**Continuation of Ser. No. 452,274, May 26, 1995, abandoned. This application Apr. 15, 1997, Ser. No. 843,315**

**Int. Cl.[6] G06F** *12/08*

**U.S. Cl. 395—449** **14 Claims**



1. A linked cache memory for storing units of information, the units of information being a first and second subset of units of information stored in a related memory device, including:

(a) a first cache device for storing the first subset of the information;

(b) a second cache device for storing the second subset of the information;

(c) a cache controller, coupled to the first and second cache devices for:

(1) receiving from an external device a first index;

(2) searching the first cache device for a first unit of information associated with the first index;

(3) outputting a first indication that the first unit of information was found, if the first unit of information is presently stored within the first cache device;

(4) receiving from the first cache device a second index embedded within the first unit of information;

(5) searching the second cache device for a second unit of information associated with the second index; and

(6) outputting a second indication that the second unit of information was found, if the second unit of information is present within the second cache device;

(d) a coordination controller, coupled to the cache controller, for receiving from the cache controller the first and second indications that the first and second cache devices have found the first and second units of information, and in response to such receipt of such indications, enabling outputting of the first and second units of information; and

(e) a write path controller, coupled to the coordination controller and the first and second cache devices, for coupling input signals from one of a plurality of sources to inputs of the first or the second cache, and for indicating to the source of the input signal that input data represented by the input signal has been stored in a cache device.

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**5,745,728**

## PROCESS OR RENDERS REPEAT OPERATION INSTRUCTIONS NON-CACHEABLE

**Thomas Basilio Genduso, Apex, N.C., and Edward Robert Vanderslice, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 13, 1995, Ser. No. 572,233**

**Int. Cl.[6] G06F** *12/08*

**U.S. Cl. 395—453** **8 Claims**

1. A processor, comprising:

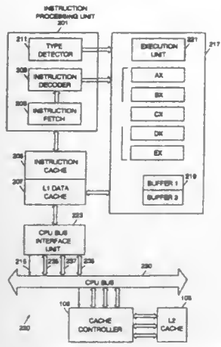
a cache for storing instructions and associated data, said cache having an associated cache line size;

an instruction type detector for detecting cacheable repeat instructions, wherein a repeat instruction is one of a class of instructions that are automatically repeated a predetermined number of times; and

an execution unit for generating a do-not-cache (DNC) signal in response to the detection of a cacheable repeat instruction by said instruction type detector, wherein the data associated

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with a cacheable repeat instruction is not cached in response to said signal.

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**5,745,729**

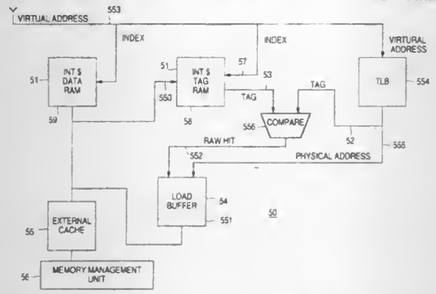
**METHODS AND APPARATUSES FOR SERVICING LOAD INSTRUCTIONS**

**Dale Greenley, Los Gatos; Leslie Kohn, Fremont; Ming Yeh, and Greg Williams, both of Palo Alto, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.**

**Filed Feb. 16, 1995, Ser. No. 389,636**

**Int. Cl.[6] G06F *9/312***

**U.S. Cl. 395—458** **10 Claims**




1. A method of servicing load instructions in a system having a cache, a second memory system, and a load buffer, wherein the load buffer is a first-in-first-out queue which holds load instructions while the load instructions await access to either the cache or the second memory system as required, wherein the load buffer has a head of the queue position, wherein access to the cache occurs with a first latency, and wherein access to the second memory system occurs with a second latency which is greater than the first latency, the method comprising the steps of:

when a first load instruction reaches the head of the queue position, accessing the second memory system for the first load instruction when data requested by the first load instruction is not in the cache;

when the first load instruction reaches the head of the queue position, accessing the cache for the first load instruction when it has been calculated that the data requested by the first load instruction is in the cache; and

accessing the second memory system for a second load instruction not yet in the head of the queue position when the first load instruction is in the head of the queue position and the first load instruction is accessing the cache, such that the cache and second memory system are simultaneously being accessed by the first and second load instructions, respectively, and such that completion of all load instructions occur in the same order as their order in the load buffer.

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**5,745,730**

**APPARATUS AND METHODS FOR IMPLEMENTING DEDICATED CACHE FLUSHING**

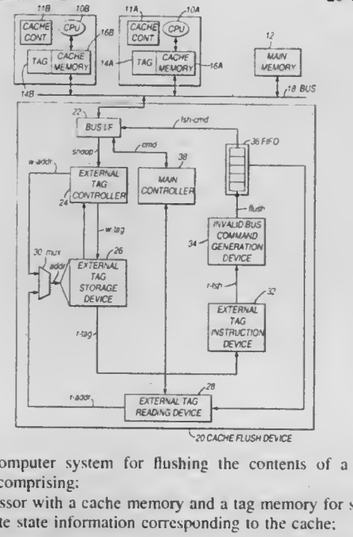
**Hiroshi Nozue, Chiba-ken, and Yoshio Masubuchi, Kanagawa-ken, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan**

**Filed May 28, 1996, Ser. No. 653,909**

**Claims priority, application Japan, Jun. 19, 1995, 7-151732**

**Int. Cl.[6] G06F *12/12***

**U.S. Cl. 395—462** **20 Claims**




1. A computer system for flushing the contents of a cache memory, comprising:

a processor with a cache memory and a tag memory for storing update state information corresponding to the cache;

a main memory;

a system bus for connecting the processor to the main memory;

monitor means, connected to the system bus, for monitoring a bus command on the system bus;

storage means, responsive to the monitor means, for storing the update state information;

reading means for reading the state information stored in the storage means; and

command output means, connected to the system bus, for outputting on the system bus an invalid bus command requesting transmission of the updated data from the cache memory to the main memory if the update state information in the storage means indicates that the data in the cache memory has been modified by the processor.

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**5,745,731**

**DUAL CHANNEL FIFO CIRCUIT WITH A SINGLE PORTED SRAM**

**Min Hwahn Kim, and Dong Woo Shin, both of Ichonkun, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungkido, Rep. of Korea**

**Filed Mar. 22, 1996, Ser. No. 621,061**

**Claims priority, application Rep. of Korea, Mar. 23, 1995, 1995-6195**

**Int. Cl.[6] G06F *13/00***

**U.S. Cl. 395—476** **7 Claims**

1. A dual channel first-in first-out (FIFO) circuit to perform bidirectional data transfer under the control of a host computer between a host interface and a small computer system interface, comprising:

a first multiplexing means for selecting one of the data from said host interface and the data from said small computer system interface;

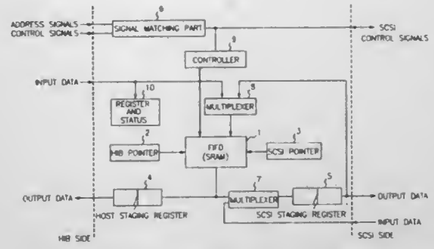
a single ported SRAM for storing the selected data by said first multiplexing means and outputting the data, which are indicated by pointers, according to the requests from said host interface or said small computer system interface;

a second multiplexing means for selecting one of the data from said single ported SRAM and the data from said small computer system interface;

a first staging memory means for storing the data to be outputted to said host interface; and

a second staging memory means for storing the selected data by said second multiplexing means and transferring them to said second multiplexing means and said small computer system interface.






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**5,745,732**

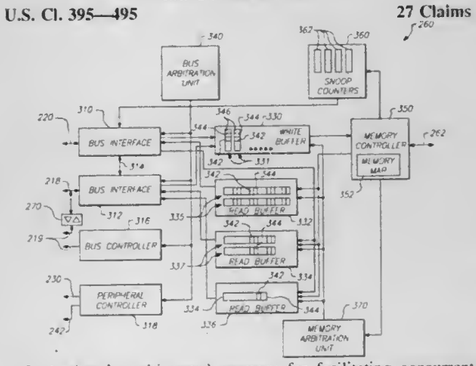
**COMPUTER SYSTEM INCLUDING SYSTEM CONTROLLER WITH A WRITE BUFFER AND PLURAL READ BUFFERS FOR DECOUPLED BUSSES**

**Ravikrishna V. Cherukuri, 952 Big Bear Ct., Milpitas, Calif. 95035, and Ranjit J. Rozario, 555 E. El Camino Real #611, Sunnyvale, Calif. 94087**

**Filed Nov. 15, 1994, Ser. No. 340,132**

**Int. Cl.[6] G06F *13/00***

**U.S. Cl. 395—495** **27 Claims**




1. A virtual, multi-ported memory for facilitating concurrent operations in a computer system having multiple buses, the virtual, multi-ported memory comprising:

a single-ported main memory device;

a memory controller coupled to the main memory device for reading and writing memory locations in the main memory device responsive to signals from buffers;

a write buffer coupled between the memory controller and the multiple buses of the computer system, for buffering write signals between the multiple buses and the memory controller;

a first read buffer coupled between the memory controller and a first bus of the multiple buses for buffering read signals between the first bus and the memory controller and for snooping write signals to the write buffer; and

a second read buffer coupled between the memory controller and a second bus of the computer system for buffering read signals between the second bus and the memory controller and for snooping write signals to the write buffer.

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**5,745,733**

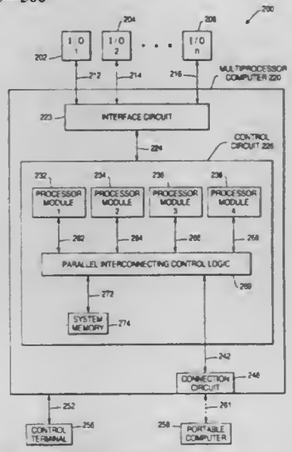
**COMPUTER SYSTEM INCLUDING A PORTABLE PORTION AND A STATIONARY PORTION PROVIDING BOTH UNI-PROCESSING AND MULTIPROCESSING CAPABILITIES**

**Michael G. Robinson, Kettering, Ohio, assignor to NCR Corporation, Dayton, Ohio**

**Filed Aug. 9, 1995, Ser. No. 513,108**

**Int. Cl.[6] G06F *15/16***

**U.S. Cl. 395—500** **10 Claims**




1. A computer system comprising:

a stationary portion including a plurality of stationary processor modules;

a portable portion including a portable processor module; and

interface circuitry for connecting said plurality of stationary processor modules to enable said stationary processor modules to be operated in a parallel fashion when said portable processor module is disconnected from said stationary processor modules, and for connecting said plurality of stationary modules and portable module to enable said stationary processor modules and said portable processor model to be operated in a parallel fashion when said portable processor module is connected to said stationary portion;

wherein said portable portion is able to operate independently after being disconnected from said stationary portion.

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**5,745,734**

**METHOD AND SYSTEM FOR PROGRAMMING A GATE ARRAY USING A COMPRESSED CONFIGURATION BIT STREAM**

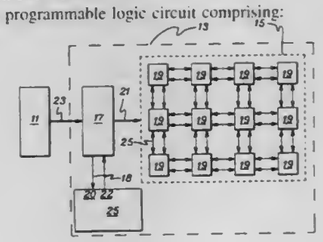
**David John Craft, Austin, Tex.; Scott Whitney Gould, So. Burlington, Vt.; Frank Ray Keyser, III, Colchester, Vt., and Brian Worth, Milton, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 29, 1995, Ser. No. 536,901**

**Int. Cl.[6] H03M *7/46***

**U.S. Cl. 395—500** **39 Claims**

1. A programmable logic circuit comprising:



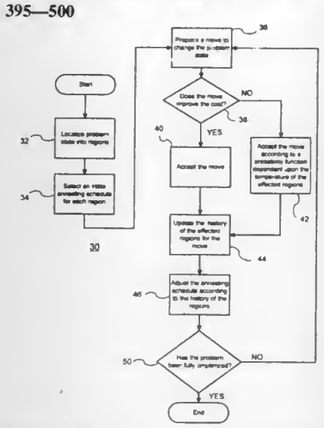
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a plurality of programmable logic resources;
a configuration input; and
a generalized data decompression engine having a compressed input and a decompressed output, said compressed input being coupled to said configuration input and said decompressed output being coupled to said plurality of programmable logic resources to provide programming thereof,
wherein said generalized data decompression engine comprises a Lempel-Ziv decompression engine.

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**5,745,735**
**LOCALIZED SIMULATED ANNEALING**
**John Maxwell Cohn, Richmond, and David James Hathaway, Underhill Center, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**
**Filed Oct. 26, 1995, Ser. No. 549,405**
**Int. Cl.[6] G06F** *17/00*
**U.S. Cl. 395—500** **18 Claims**

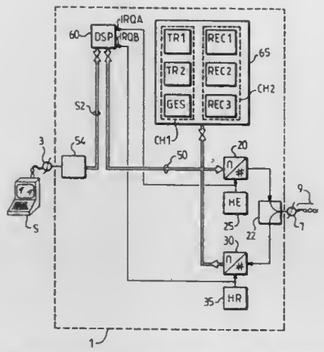



1. An adaptive method for creating a simulated annealing schedule to solve an optimization problem by simulated annealing, wherein the optimization problem is represented by a global cost function, and wherein the simulated annealing solves said problem by proposing and selecting a plurality of moves from a move set, the method comprising the steps of:
a) localizing said problem represented by said global cost function into a plurality of regions;
b) maintaining an annealing history for each said region; and
c) determining a simulated annealing temperature for each of said plurality of regions, each of said simulated annealing temperatures being a function of its associated annealing history.

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**5,745,736**
**INFORMATION PROCESSING SYSTEM WHEREIN PROCESSING TASKS ARE PRIORITIZED AND PERFORMED IN ORDER OF PRIORITY**
**Catherine Picart, Wissous, France, assignor to U.S. Philips Corporation, New York, N.Y.**
**Filed Mar. 6, 1996, Ser. No. 611,704**
**Claims priority, application France, Mar. 15, 1995, 95 03013**
**Int. Cl.[6] G06F** *13/372;13/24*
**U.S. Cl. 395—500** **4 Claims**

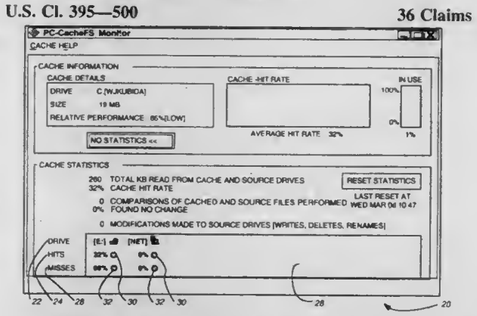
1. A method of processing a stream of information in accordance with at least two series of sequential processing tasks, each of said series being executed in order of priority based on occurrence in said stream of priority determinative events respectively assigned to the respective series; said method comprising:
detecting the presence in said stream of a priority determinative event during execution of one of said series, and in response




thereto interrupting execution of tasks in said one series and initiating execution of one or more of the tasks in an other of said series to which the detected event is assigned;
detecting in said one series an interrupt code indicative of the position therein at which said interruption occurred; and
following execution of one or more of the tasks in said other series, resuming execution of tasks in said one series commencing at the position therein indicated by said interrupt code.

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**5,745,737**
**SYSTEM AND METHOD FOR VISUALLY INDICATING CACHE ACTIVITY IN A COMPUTER SYSTEM**
**Kevin W. Kayes, Colorado Springs; Paul A. Weiler, Monument, and Brian Berliner, Colorado Springs, all of Colo., assignors to Sun Microsystems, Inc., Mountain View, Calif.**
**Filed Mar. 28, 1996, Ser. No. 623,627**
**Int. Cl.[6] G06F** *7/00*
**U.S. Cl. 395—500** **36 Claims**

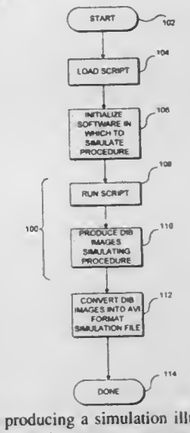



1. A method for visually indicating data cache activity in a computer system comprising the steps of:
providing for monitoring said data cache for a first predetermined time period;
providing for determining a first number of data access requests which are satisfied from said data cache and a second number of data access requests which are satisfied from at least one other data source during said predetermined time period;
providing for computing a percentage of the lesser of said first and second number of data access requests to the larger of said first and second number of data access requests; and
providing for visually displaying at least one simulated indicator during a second predetermined time period substantially equal to said first predetermined time period, said at least one simulated indicator corresponding to said larger of said first and second number of data access requests.



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**5,745,738**
**METHOD AND ENGINE FOR AUTOMATING THE CREATION OF SIMULATIONS FOR DEMONSTRATING USE OF SOFTWARE**
**Douglas Alan Ricard, Bellevue, Wash., assignor to Microsoft Corporation, Redmond, Wash.**
**Filed May 29, 1996, Ser. No. 654,924**
**Int. Cl.[6] G06F** *9/455*
**U.S. Cl. 395—500** **37 Claims**

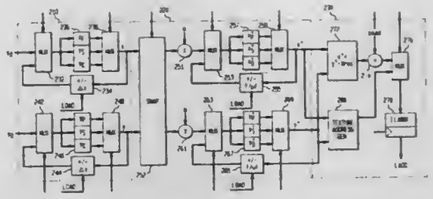



I. A system for producing a simulation illustrating a procedure in a software program using a computer, comprising:
(a) a display on which images are displayed;
(b) a memory for storing machine instructions comprising the software program and used for effecting production of the simulation, and for storing a script comprising a plurality of commands that define actions to be implemented during the simulation; and
(c) a central processor for executing the machine instructions, said machine instructions, when executed by the central processor, causing the central processor to:
(i) execute the software program;
(ii) execute the commands of the script to effect the plurality of actions defined by the script within the software program; and
(iii) capture and store a plurality of images in the memory, said images showing the actions that are implemented within the software program in accord with the commands of the script.

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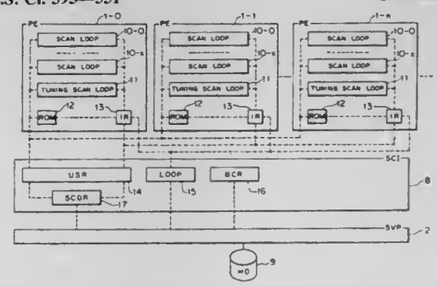
**5,745,739**
**VIRTUAL COORDINATE TO LINEAR PHYSICAL MEMORY ADDRESS CONVERTER FOR COMPUTER GRAPHICS SYSTEM**
**Erh-Chiao Wang, Taoyuan; Wei-Kuo Chia, Hsinchu, and Chun-Yang Cheng, Taipei, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan**
**Filed Feb. 8, 1996, Ser. No. 598,522**
**Int. Cl.[6] G06F** *12/06*
**U.S. Cl. 395—516** **12 Claims**

1. An address generator for converting a two dimensional virtual coordinate, on a display screen of a display device, of a pixel to a linear physical address, in a memory, comprising:
an edge walking circuit, receiving a two-dimensional virtual coordinate of a first pixel on a first edge of an object displayed on said display screen, and selectively outputting a two dimensional virtual coordinate of a second pixel which intercepts said first edge of said object at an adjacent row to that of said first pixel,
a span expansion circuit, receiving said two-dimensional virtual coordinate of said second pixel, and selectively expanding said two-dimensional virtual coordinate of said second pixel, according to the number of bits used to represent each pixel and the amount of information which can be accessed at a time from said memory, to produce first and second expanded coordinates of said second pixel, and
a linear address circuit, receiving said first and second expanded coordinates of said second pixel and outputting a linear physical address of said second pixel in a memory,
wherein pixels displayed on said screen are sequentially stored in said memory at linear addresses beginning with the lowest two-dimensional virtual coordinate of said display screen and ending with the highest two-dimensional virtual coordinate of said display screen.



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**5,745,740**
**PARALLEL PROCESSING COMPUTER SYSTEM, CONSTITUENT UNITS FOR USE THEREIN, AND CLOCK TUNING METHOD FOR A PARALLEL PROCESSING COMPUTER SYSTEM**
**Shinichi Yamasaki, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**
**Filed Jun. 11, 1996, Ser. No. 661,827**
**Claims priority, application Japan, Oct. 6, 1995, 7-260540**
**Int. Cl.[6] G06F** *1/04*
**U.S. Cl. 395—551** **14 Claims**




1. A parallel processing computer system having a plurality of constituent units which include a processing unit, and a service processor for carrying out control for maintenance and operation of these constituent units,
wherein each of the constituent units comprises a tuning scan loop formed as a result of continuously connecting together a plurality of clock tuning latches into which predetermined clock tuning data are set; a non-volatile memory into which the clock tuning data inherent to each constituent unit is stored; and a connecting mechanism which responds to an instruction from said service processor so as to connect said non-volatile memory to said tuning scan loop and successively send said clock tuning data from said non-volatile memory to said tuning scan loop, and
said service processor is provided with a broadcast designating mechanism for simultaneously designating a plurality of constituent units which are to be subjected to clock tuning processing.

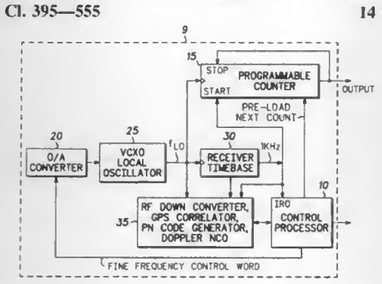
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## 5,745,741
## FREQUENCY STABLE PERIODIC PULSE GENERATION APPARATUS AND METHOD

**Thomas Michael King, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Apr. 10, 1996, Ser. No. 624,674**
**Int. Cl.[6] G06F *1/04***
**U.S. Cl. 395—555** **14 Claims**




1. An apparatus for providing a periodic pulse comprising:

a voltage controlled oscillator controlled by a voltage input signal and said voltage controlled oscillator producing a frequency output signal;

a programmable counter for providing a periodic pulse, said programmable counter coupled to said voltage controlled oscillator;

a processor for measuring an error in said periodic pulse and for producing a frequency control signal, said processor coupled to said programmable counter;

a digital-to-analog converter for converting said frequency control signal to said voltage input signal to produce an integer frequency output signal by said voltage controlled oscillator, said digital-to-analog converter coupled to said processor and to said voltage controlled oscillator; and

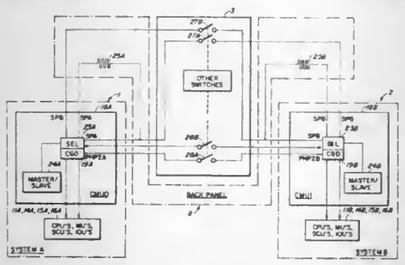
said programmable counter further operating in response to said integer frequency output signal and to a pre-load count to maintain said pre-load count and said integer frequency output signal as integer multiples, said programmable counter producing said periodic pulse at a stable first frequency, said programmable counter coupled to said processor and to said voltage controlled oscillator.

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## 5,745,742
## APPARATUS FOR COORDINATING CLOCK DISTRIBUTION IN A FULLY REDUNDANT COMPUTER SYSTEM

**David W. Selway, Phoenix; David A. Bowman, Glendale; Donald R. Kesner, and James H. Phillips, both of Phoenix, all of Ariz., assignors to Bull HN Information Systems Inc., Billerica, Mass.**

**Filed Dec. 19, 1995, Ser. No. 574,804**
**Int. Cl.[6] G06F *1/10***
**U.S. Cl. 395—556** **9 Claims**




1. A redundant computer system comprising:

A) first and second computer systems, each said first and second computer system including:

1) at least one central processing unit;

2) a clock unit including:

a) a clock generating and distribution unit adapted to generate a clock signal having a predetermined frequency and a definer signal having a frequency which is half said predetermined frequency, said clock generating and distribution unit further including time alignment means for delaying one of said clock and definer signals such that successive definer signal half cycles at logic "1" and logic "0" levels temporally bracket said clock signal full cycles at a first logic level, selected from logic "1" and logic "0" levels, to define successive clock pulses at said first logic level as first and second phases thereof,

b) selection circuit means for selecting said clock and definer signals from only one of said first system and said second system for transfer to said central processing unit as local clock and definer signals; and

c) bus means for conveying said local clock and definer signals to said central processor unit to coordinate the data manipulation operations therein;

B) means coupling said clock and definer signals generated in each of said first and second computer systems to said selection circuit means in each of said first and second computer systems; and

C) said selection circuit means in each said clock unit further including:

1) clock mode selection means for selecting slave mode operation for the system in which said clock unit is resident;

2) first hold means responsive to the selection of said slave mode of operation for invoking a hold on said local clock and definer signals at a first logic level when said local clock and definer signals are both at said first logic level;

3) first sensing means for sensing when said clock and definer signals in said system in which said clock unit is not resident are both at said first logic level; and

4) first switchover means responsive to said first sensing means sensing that said clock and definer signals in said system in which said clock unit is not resident are both at said first logic level to:

i) release said hold invoked by said first hold means; and

ii) issue said clock and definer signals in said system in which said clock unit is not resident as said local clock and definer signals.

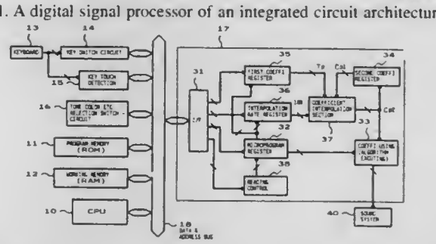
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## 5,745,743
## DIGITAL SIGNAL PROCESSOR INTEGRALLY INCORPORATING A COEFFICIENT INTERPOLATOR STRUCTURED ON A HARDWARE BASIS

**Masahiro Kakishita, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan**

**Continuation of Ser. No. 908,223, Jul. 2, 1992, abandoned. This application Nov. 20, 1996, Ser. No. 747,434**
**Claims priority, application Japan, Jul. 4, 1991, 3-189472**
**Int. Cl.[6] G10H *1/12*; G06F *9/00***
**U.S. Cl. 395—561** **22 Claims**

1. A digital signal processor of an integrated circuit architecture




comprising:

microprogram memory means for storing a microprogram including a plurality of program steps defining a signal processing algorithm relating to at least one of synthesis and control of a digital sound signal;

reading means for reading out the program steps of said microprogram stored in said memory means;

coefficient supply means for supplying a first coefficient to be used as a target value, said first coefficient being supplied for each of the read out program steps;

interpolation rate supply means for supplying rate data representative of an interpolation rate for each of the read out program steps;

interpolation means for performing an interpolation operation, in correspondence with each of said plurality of program steps, between an initial value and said target value on the basis of an interpolation algorithm and producing a time-varying interpolated coefficient having a value which approaches a value of said first coefficient in accordance with said rate data supplied from said interpolation rate supply means, wherein said coefficient supply means, said interpolation rate supply means and said interpolation means are structured on a hardware basis; and

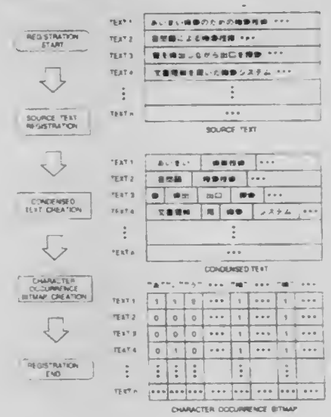
signal processing means for receiving step-by-step microprogram data of said signal processing algorithm read out by said reading means from said microprogram memory means and input data to be used for at least one of synthesis and control of said digital sound signal and performing digital signal processing on a step-by-step basis which corresponds to said signal processing algorithm on the basis of the step-by-step microprogram data by use of said interpolated coefficient, thereby producing a digitally processed sound signal.



## 5,745,745
## TEXT SEARCH METHOD AND APPARATUS FOR STRUCTURED DOCUMENTS

**Katsumi Tada, Yokohama; Atsushi Hatakeyama, Kawasaki; Hisamitsu Kawaguchi, Sagamihara; Natsuko Mizutani, Kawasaki; Kanji Kato, Tokorazawa, and Satoshi Asakawa, Hirakata, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 27, 1995, Ser. No. 495,232**
**Claims priority, application Japan, Jun. 29, 1994, 6-147399; Nov. 17, 1994, 6-308201**
**Int. Cl.[6] G06F *17/30***
**U.S. Cl. 395—601** **22 Claims**




1. A text search method for searching structured documents, each structured document having a plurality of logical structures, each logical structure being enclosed by predetermined markers and having a unique discriminator for identifying the logical structure, comprising the steps of:

preparing each of the structured documents to be searched, each structured document being identified by a document identifier, the preparing step for each structured document including:

a) storing the structured document in a database;

b) creating, and storing in the database, condensed texts and the corresponding unique discriminators for each of the respective logical structures, each of the condensed texts being formed by segmenting the structured document according to the predetermined markers and including all words within the respective logical structure without duplication; and

c) creating, and storing in the database, a character occurrence bitmap including all characters without duplication in the structured document;

inputting a search term and a discriminator identifying a logical structure;

searching the character occurrence bitmap for each of the structured documents and identifying a plurality of first document identifiers corresponding to the character occurrence bitmaps indicated as including each character contained in the inputted search term; and

searching the condensed texts corresponding to the input discriminator and identified by the first document identifiers and identifying a plurality of second document identifiers corresponding to the condensed texts which include each word contained in the inputted search term;

wherein if the search term includes a plurality of words and indicates a positional relationship between the words, the method further comprises the step of:

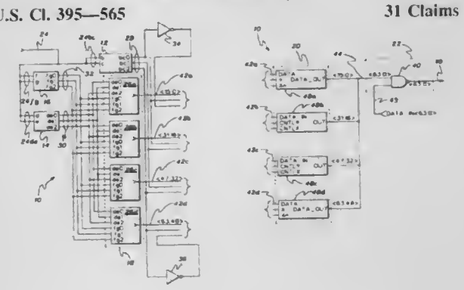
searching the structured documents identified by the second document identifiers and identifying a plurality of third document identifiers corresponding to the structured docu-

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## 5,745,744
## HIGH SPEED MASK GENERATION USING SELECTION LOGIC

**Roland Albert Béchade, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 12, 1995, Ser. No. 542,478**
**Int. Cl.[6] G06F *7/00***
**U.S. Cl. 395—565** **31 Claims**



1. A method for generating a mask from an input string in a computer system, said input string including at least first and second portions, said method comprising:

decoding the first portion of the input string into an intermediate string having a first length; and

positioning the intermediate string at a position in a first mask according to a value of the second portion of the input string, the first mask having a second length, the second length being greater than the first length.

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ments containing all the words having the positional relationship defined in the inputted search term.

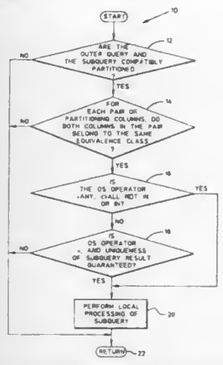
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**5,745,746**

## METHOD FOR LOCALIZING EXECUTION OF SUBQUERIES AND DETERMINING COLLOCATION OF EXECUTION OF SUBQUERIES IN A PARALLEL DATABASE

**Anant D. Jhingran, Elmsford, N.Y.; Lubor J. Kollar, North York, Canada; Timothy R. Malkemus, Round Rock, Tex., and Sriram K. Padmanabhan, Briarcliff Manor, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 24, 1996, Ser. No. 672,013**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 395—602** **13 Claims**




1. A method for determining locality for execution of subqueries for queries in a relational database management system, wherein said queries comprise an outer query and a subquery having a query-subquery operator and wherein partitioning columns for the query and subquery are provided, said method comprising the steps of:

(a) determining if said outer query and said subquery are compatibly partitioned;

(b) if said outer query and said subquery are compatibly partitioned then for each pair of partitioning columns in said outer query and said subquery determining an equivalence class for each of said columns in said pair;

(c) determining if the partitioning column for said subquery belongs to the same equivalence class as the partitioning column for said outer query;

(d) determining if said query-subquery operator comprises a selected operator; and

(e) if said steps (c) and (d) are true, determining locality for said subquery so that said subquery is locally executable with respect to said outer query by the relational database management.

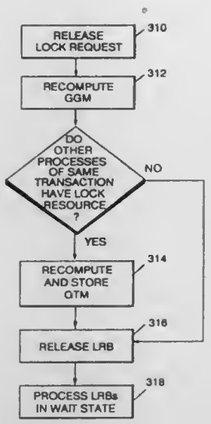
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**5,745,747**

## METHOD AND SYSTEM OF LOCK REQUEST MANAGEMENT IN A DATA PROCESSING SYSTEM HAVING MULTIPLE PROCESSES PER TRANSACTION

**Amy Chang, Cortlandt Manor, and Hui-I Hsiao, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 384,503, Feb. 6, 1995, abandoned. This application Dec. 20, 1996, Ser. No. 769,845**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 395—608** **16 Claims**




1. A method, of managing a request for a lock to a resource in a data processing system which processes a plurality of transactions having a plurality of processes per transaction wherein each process generates a lock request, comprising the steps of:

creating a lock request block for each process;

storing mode data in each lock request block to indicate the mode of the requested lock;

calculating, in a processor, a granted transaction mode for each lock request block;

storing, in a memory, the granted transaction mode in each lock request block;

performing the following steps when a second process of a transaction generates a lock request for a lock to a resource granted to a first process of said transaction:

comparing the granted transaction mode with the mode data in the lock request block corresponding to the second process to determine if the lock request is compatible with the granted transaction mode; and

granting, by the first process, the lock to the second process if the granted transaction mode is compatible with the lock request; and

recalculating, in the processor, the granted transaction mode each time the lock is granted to a process of said transaction to prevent said transaction from deadlocking.

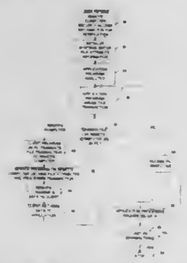
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**5,745,748**

## SYSTEM AND METHOD FOR DIRECT ACCESSING OF REMOTE DATA

**Nauman Ahmad, Shawnee, and Joseph Arthur Burnett, Overland Park, both of Kans., assignors to Sprint Communication Co. L.P., Kansas City, Mo.**

**Filed Dec. 9, 1994, Ser. No. 352,942**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 395—610** **85 Claims**



17. A system for accessing a data file on a remote computer by an application program within a COBOL application development system executing on a local computer, said system comprising:



a remote computer containing the data file;

a local computer;

a communication link enabling the transfer of data between said remote computer and said local computer;

an attribute file stored on a predetermined computer, said attribute file containing file attributes for the data file;

a data access server program adapted to run on said remote computer, to communicate over said communication link, to obtain said file attributes and to access the data file; and

a data access client program adapted to run on said local computer, said data access client program being adapted to communicate with said data access server program over said communication link and with the application program within the COBOL application development system on said local computer, thereby enabling the application program to access the data file.

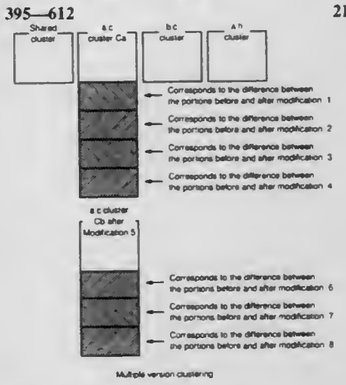
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**5,745,749**

## METHOD AND SYSTEM OF FILE VERSION CLUSTERING OF OBJECT BLOCKS USING A COMPILER AND DATABASE AND HAVING A PREDETERMINED VALUE

**Tamiya Onodera, Yokyo-to, Japan, assignor to International Business Machines Corp., Armonk, N.Y.**

**Filed Jun. 21, 1995, Ser. No. 493,087**
**Claims priority, application Japan, Jun. 27, 1994, 6-414443**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 395—612** **21 Claims**




1. A method for clustering in computer accessible storage media, said method comprising the step of;

(a) storing a content of a file in a single cluster of said storage media;

(b) in response to chance or modification of said file, storing a differences in storage space used by said file resulting from said change or modification in said cluster, so as to accumulate a sum of said differences in said cluster; and

(c) in response to said accumulated sum of said differences exceeding a predetermined values generating a new cluster and storing the total content of said file in said new cluster of said storage media.

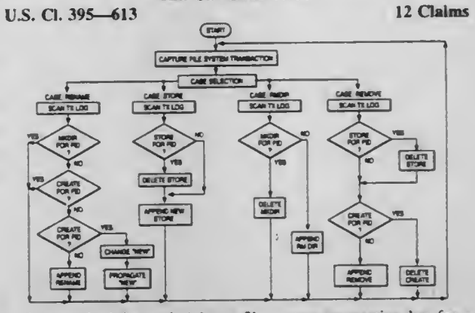
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**5,745,750**

## PROCESS AND ARTICLE OF MANUFACTURE FOR CONSTRUCTING AND OPTIMIZING TRANSACTION LOGS FOR MOBILE FILE SYSTEMS

**Thomas Joseph Porcaro, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 15, 1995, Ser. No. 572,923**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 395—613** **12 Claims**




1. A method for optimizing a file system transaction log for a computer file system, the computer system having a processor means and memory means, the method comprising the steps of:

capturing file system transactions;

testing each of said file system transaction for transaction type;

inserting each object rename transaction as a rename transaction log entry having a dynamic path identifier into a transaction log following other object rename transactions and before all other transactions;

appending all other non-rename object transactions as a file system transaction log entry having a dynamic path identifier at the end of said transaction log.

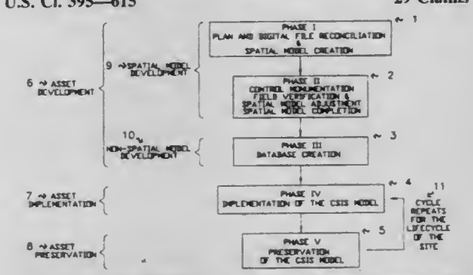
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**5,745,751**

## CIVIL SITE INFORMATION SYSTEM

**Robert W. Nelson, 21675 Hazelnut Sq., Sterling, Va. 20164, and Lawrence E. Ireland, 4912 Casimir St., Annandale, Va. 22003**

**Filed Apr. 12, 1996, Ser. No. 631,122**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 395—615** **29 Claims**




1. A method for designing a civil site information system model, the method comprising the steps of:

generating a coordinate geometry digital spatial database representative of a civil site by the following steps:

gathering physical civil site information in both digital and hard copy formats;

reconciling the digital and hard copy information;

defining a common coordinate system;

generating a coordinate geometry property drawing indicative of property boundaries and storing said property drawing in a computer in a digital file;

generating a coordinate geometry building drawing indicative of buildings on said property and storing said building drawing in a computer in a digital file;

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generating a coordinate geometry basemap drawing indicative of capital asset investments on said property and storing said basemap drawing in a computer in a digital file;

generating a coordinate geometry topographic contour drawing indicative of contours on said property and storing said topographic contour drawing in a computer in a digital file;

generating at least one coordinate geometry utility drawing indicative of utility easements and utility structures on said property and storing said utility drawing in a computer in a digital file;

utilizing said common coordinate system in each of said property, building, basemap, topographic contour, and utility drawings; and generating a non-spatial database representative of elements in said civil site by the following steps:

identifying spatial entities in said spatial database which have non-spatial attributes;

defining said non-spatial attributes for each spatial entity;

linking said non-spatial attributes to each spatial entity;

storing said non-spatial attributes and said links in a computer in a database management system; and

manipulating any of said spatial entities in said property, building, basemap, topographic contour, and utility drawings in said digital files to automatically update said links in said database management system.

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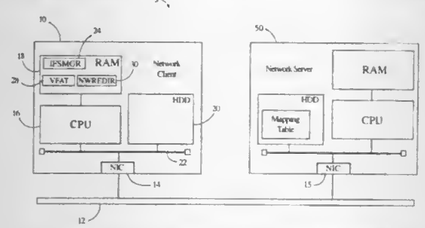
**5,745,752**

## DUAL NAMESPACE CLIENT HAVING LONG AND SHORT FILENAMES

**Hans Hurvig, Kirkland, and Thomas R. Reardon, Seattle, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.**

**Filed Dec. 13, 1994, Ser. No. 354,625**
**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 395—616** **12 Claims**




1. In a computer system supporting multiple namespaces containing multiple names for a single entry, a method of resolving a select entry having a path of mixed names, comprising the following steps:

determining each of the intermediate entries reached along the path by locating the transition points from the root where the path components change from the syntax of one namespace that contains a name for each of said intermediate entries to the syntax of another namespace that also contains a name for each of said intermediate entries;

obtaining identifier information for the intermediate entry closest to the root by accessing the namespace associated with the syntax of the intermediate entry name; and

obtaining identifier information for any remaining intermediate entries by utilizing the identifier information of the preceding intermediate entries and accessing the namespace associated with the syntax of the intermediate entry name, thereby identifying the select entry.

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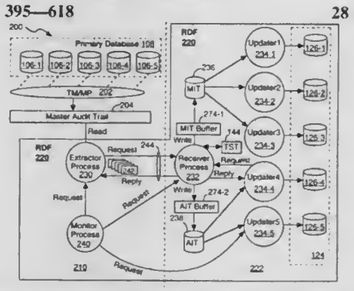
**5,745,753**

## REMOTE DUPLICATE DATABASE FACILITY WITH DATABASE REPLICATION SUPPORT FOR ONLINE DDL OPERATIONS

**Malcolm Mosher, Jr., Los Gatos, Calif., assignor to Tandem Computers, Inc., Cupertino, Calif.**

**Filed Jan. 24, 1995, Ser. No. 377,881**
**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 395—618** **28 Claims**




1. A distributed computer database system, comprising:

a local computer system having a local database stored on local memory media, application programs that modify the local database, and a transaction manager that stores audit records in a local audit trail reflecting those application program modifications to the local database; each audit record having an associated audit trail position in said local audit trail;

a remote computer system, remotely located from the local computer system, said remote computer system having a backup database stored on memory media associated with the remote computer system;

a communication channel for sending messages between said local computer system and said remote computer system; and

a remote data duplication facility, partially located in said local computer system and partially located in said remote computer system, for maintaining virtual synchronization of said backup database with said local database, including:

an extractor process executed by said local computer system that extracts audit records from said local audit trail and transmits said extracted audit records to said remote computer system;

a receiver process executed by said remote computer system that receives said audit records transmitted by said extractor process and distributes said audit records to one or more image trail files in said remote computer system; and

one or more updater processes executed by said remote computer system, wherein each updater process reads said audit records in an assigned one of said image trail files and initiates redo operations of database modifications denoted in at least a subset of said read audit records against said backup database,

said local computer system including a manager for performing database restructurings while said application programs continue to modify portions of said local database;

said transaction manager storing a Stop Updaters audit record in said local audit trail when each said database restructuring successfully completes;

said extractor process including instructions for transmitting said Stop Updaters audit record to said remote computer system;

said receiver process including instructions for moving a copy of each received Stop Updaters audit record into all of said image trail files; and

said updater processes each including instructions for stopping execution when said Stop Updaters audit record is read in said assigned one of said image trail files after which one or more of said database restructurings are applied to said backup database.



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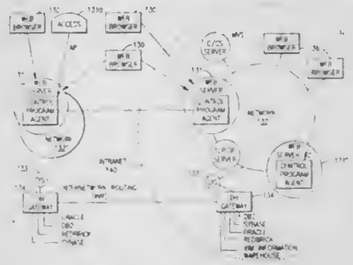
**5,745,754**

## SUB-AGENT FOR FULFILLING REQUESTS OF A WEB BROWSER USING AN INTELLIGENT AGENT AND PROVIDING A REPORT

**Konrad Charles Lagarde, Milford, Conn., and Richard Michael Rogers, Beacon, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 7, 1995, Ser. No. 474,575**
**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 395—615** **29 Claims**



1. A sub-agent service agent for fulfilling requests of a web browser client coupled to a network; comprising: a command file agent tangibly embodying a program set of instructions for use during execution of a command file which is executable by a supporting machine environment for performing method steps required by a request initiated at a web browser client and fulfilling the request by providing a result, said method steps comprising:

receiving at said command file agent, a submit command from a control program agent in preparation for a report and variables associated with a report to pass to the command file as a command file variable for use in naming a report which will be created by the command file, which as a result the command file will create a report file with a unique file name during execution of said command file agent.

processing by said command file agent, a series of linked objects according to a specified flow sequence within a distributed data environment specified by said command file, including executing functions specified in said command file agent for including data retrieval and processing, and for creating said report file with said unique file name and storing the result of said processing by said command file agent in said report file having said unique file name during execution of said command file agent.

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**5,745,755**

## METHOD FOR CREATING AND MAINTAINING A DATABASE FOR A DYNAMIC ENTERPRISE

**Peter J. Covey, 34548 Falls Ter., Fremont, Calif. 94555**

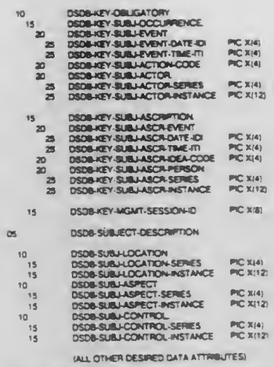
**Continuation of Ser. No. 177,611, Jan. 5, 1994, abandoned. This application Apr. 19, 1996, Ser. No. 636,773**
**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 395—619** **3 Claims**

1. A method for creating and maintaining a data file in a data processing system having a data storage unit for an enterprise defined by a plurality of subjects subject to events to be memorialized, comprising the steps of:

establishing in said data storage unit a data record token structure of a single predefined format for the subjects and events to be memorialized, said token structure having a fixed location for identification data for the subject to which the token relates and a plurality of locations for recordation of subject dimension data in the form of association and aspect information affiliated with said subject and said event;

entering and permanently storing a data token record for each of said subjects of said structure bearing subject and dimension data for the subject of the token with reference to an initial state upon said data storage unit by writing said data onto said data storage unit in the form of a fixed length data record




having predefined locations thereon for said subject and dimension data, said record including a first data location for receipt of data corresponding to the time of writing the data onto the storage unit and a second data location for receipt of data corresponding to the time of creation of the subject of the data record having the association and aspect information to be recorded;

writing onto said first data location the time of writing of the data onto the storage unit;

creating a new token of said predefined format for one of said subjects bearing subject and dimension data corresponding to a subsequent event in which said token subject is a participant, said data including data corresponding to the occurrence time of the event; and

updating said data file by storing therein said new token data, including said occurrence time data, in said fixed length record form without destroying previously stored tokens for said subject and by writing into the data record for said new token data reflecting the time of writing said new token data upon the storage unit.

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**5,745,756**

## METHOD AND SYSTEM FOR MANAGING MOVEMENT OF LARGE MULTI-MEDIA DATA FILES FROM AN ARCHIVAL STORAGE TO AN ACTIVE STORAGE WITHIN A MULTI-MEDIA SERVER COMPUTER SYSTEM

**Martha Rose Henley, Morgan Hill, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 24, 1996, Ser. No. 669,663**
**Int. Cl.[6] G06F** *7/00;7/06*

**U.S. Cl. 395—620** **18 Claims**

1. A method for efficiently managing the movement of large multimedia data files from an archival storage medium to an active storage medium within a computer server, said method comprising the computer server-implemented steps of:

producing a storage list, wherein each item in said storage list represents a multimedia data file stored within said active storage medium;

producing a lookahead list, wherein each item in said lookahead list includes a date and time for a multimedia data file to be played;

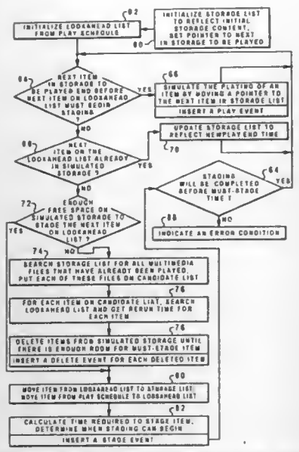
producing a candidate list, wherein each item in said candidate list represents a candidate multimedia data file for removal from said active storage medium;

simulating a plurality of events utilizing said storage list, said lookahead list and said candidate list to determine the time required for the execution of each of said plurality of events, wherein said plurality of events includes a play event, a delete event, and a staging event; and

developing an output schedule file based on the results from said simulating step, wherein said output schedule file includes a date and time for the future execution of each of said plurality

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of events such that each staging begins at the earliest possible time and ends before the next staging begins.

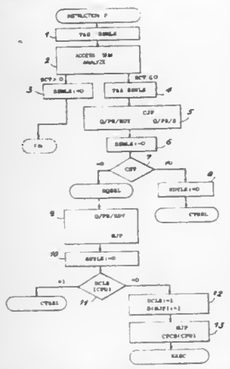
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**5,745,757**

## MULTIPROCESSOR SYSTEM WITH MICROPROGRAMMED MEANS FOR DISPATCHING PROCESSES TO PROCESSORS

**Georges Lecourtier, Versailles, France, assignor to Bull S.A., Paris, France**

**Continuation of Ser. No. 964,292, Oct. 21, 1992, abandoned. This application May 15, 1995, Ser. No. 441,648**
**Claims priority, application France, Oct. 30, 1991, 91 13431**
**Int. Cl.[6] G06F** *9/46*
**U.S. Cl. 395—672** **20 Claims**



1. A multiprocessor information processing system, having a plurality of processors (CPU), each having microprogrammed means (CP) for performing dispatching of processes (JP) to the processors (CPU) of the system, means for activating said microprogrammed means (CP) in one of said processors (CPU) in response to an event detected by said processor (CPU) for causing a modification in selecting processes (JP) to be run and of processors (CPU) that run said processes, said microprogrammed means (CP) including at least one specialized microprogram module means (CHSEL, DQSEL, EQSEL) for determining said dispatching in response to a category of particular events by use of a pointer to a link of a last active process having a lowest priority, and central microprogram module means (CTSEL) for determining said dispatching for events other than those processed by said specialized microprogram module means (CHSEL, DQSEL, EQSEL).

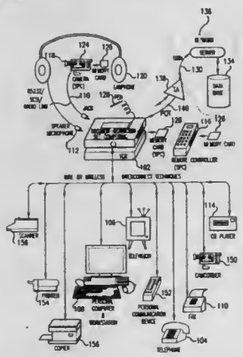
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**5,745,758**

## SYSTEM FOR REGULATING MULTICOMPUTER DATA TRANSFER BY ALLOCATING TIME SLOT TO DESIGNATED PROCESSING TASK ACCORDING TO COMMUNICATION BANDWIDTH CAPABILITIES AND MODIFYING TIME SLOTS WHEN BANDWIDTH CHANGE

**Venson M. Shaw, and Steven M. Shaw, both of 111 Reldyes Ave., Leonia, N.J. 07605**

**Continuation-in-part of Ser. No. 763,451, Sep. 20, 1991, abandoned, which is a division of Ser. No. 43,625, Apr. 5, 1993, Pat. No. 5,600,844. This application Jan. 10, 1997, Ser. No. 781,243**
**Int. Cl.[6] G06F** *13/14*
**U.S. Cl. 395—672** **6 Claims**



1. An improved object oriented transaction computing system for controlling multicomputer data flow and regulating data transfer which compiles, links and manages a single or plurality of objects, classes, and method library through set-up, managing, and termination of corresponding procedural call modules, said computing system comprising:

object means for defining and uniquely identifying an object which corresponds with a single or plurality of application modules or submodules, said object representing a particular subject of interest for selective user, application, and/or network;

said object means further comprising:

a pointer means for defining and identifying a sub-object which represents a more detailed subject of interest, wherein said sub-object is located at next lower level of object hierarchy;

a pointer library means for listing all available objects and sub-objects with proper hierarchy level identifier; and

a pointer register for recording a properly selected execution path from said user, said application, and/or said network, as well as identifying a sequence of said objects and sub-objects that each with a corresponding said hierarchy level identifier;

class means for defining a class, wherein the defined of said class corresponds with a high level behavioral descriptor;

said class means further comprising:

means for defining a plurality of subclasses which selectively inherits a complete or sub-set of global properties from its parent, wherein each subclass corresponds to a particular user, application and/or network run-time environment specification;

means for overriding said global properties inherited from its parent during run-time environmental condition changes,



and a class library means for listing all the available class which can be selected by said application, user, and/or said network;

method library meas for defining a method library, wherein said method library corresponds with a single or plurality of functions, procedure and/or subroutines which can be invoked by said user, application, and/or network request in order to manipulate said object;

said method library means further including:

referencing means which corresponds with a system lookup table that can be updated and downloaded according to run-time application, user, and/or network requirement;

message pointer means for defining a single or plurality of message interface ports corresponding with a single or plurality of internal or external procedural calls which can be established to interface between said objects;

said message pointer means further including a logic means for looking ahead, preparing and prefetching a value or a reference location for selective set of parameters and/or arguments required to be transported from a caller to a callee;

an application specific compiler means for selecting an appropriate assembly of class, object, methods, and messages from said method library means, corresponding to an application specific run-time requirement;

said application specific compiler means further including a logic means for selecting a particular set of system lookup tables for meeting real-time performance requirement; and

circuit switch transaction control means comprising:

means for allocating a single or plurality of time slots for a designated transaction processing task that corresponding with said object, class, methods, and messages;

means for cooperating with a run-time attribute control means for prefetching and determining appropriate system lookup table;

means for maintaining data persistency wherein a permanent data set will not be updated or modified until said designated transaction is completed; and

scheduler means for monitoring and scheduling said circuit switch transaction control means though continuously monitoring a beginning and ending time of each of said designated transaction processing tasks.

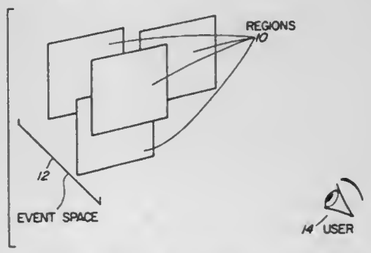
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**5,745,759**

## WINDOW KERNEL

**Patrick M. Hayden, Nepean, and Robin A. Burgener, Ottawa, both of Canada, assignors to QNX Software Systems, Ltd., Ontario, Canada**

**Filed Oct. 14, 1994, Ser. No. 323,354**
**Int. Cl.[6] G06F** *9/40*
**U.S. Cl. 395—680** **21 Claims**




1. A system for managing an interaction of a plurality of programs, comprising:

means for storing a plurality of sets of characteristics, a set of characteristics for each program to be managed, each set of characteristics including an input signal type characteristic and a signal modification characteristic, said input signal type characteristic indicative of input signal types to which a corresponding program is responsive, said signal modification characteristic indicative of input signal types that can be modified by said program;

means, responsive to an input signal received from a first program of said plurality of programs, said input signal having a set properties, for

interrogating each set of characteristics in a predetermined sequence,

determining whether each program corresponding to each set of characteristics is responsive to said input signal,

determining whether said set of properties are to be modified by each program that is responsive to said input signal,

modifying said set of properties responsive to said determining whether said set of properties are to be modified, and

communicating one or more output signals, each output signal being each program determined to be responsive to said input signal, said output signal corresponding to said input signal; and

means defining an event space, said event space having at least three dimensions and representing an operating environment of said plurality of programs, said event space having a root plane at a first end of said event space,

and wherein, each set of characteristics includes a dimensions characteristic and a position characteristic, said dimensions characteristic indicative of a set of dimensions of a planar area within said event space, said position characteristic indicative of a position of said planar area within said event space and relative to at least a second planar area within said event space.

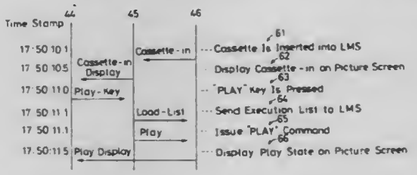
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**5,745,760**

## APPARATUS FOR STORING UP SOCKET COMMUNICATION LOG

**Kazuhiko Kawamura, and Takashi Tsuboi, both of Kanagawa, Japan, assignors to Sony Corporation, Japan**

**Filed Aug. 20, 1992, Ser. No. 932,680**
**Claims priority, application Japan, Aug. 30, 1991, 3-220731**
**Int. Cl.[6] G06F** *9/00*
**U.S. Cl. 395—680** **8 Claims**




1. An apparatus for storing a socket communication log of communications between a plurality of processes in a multi-task support system, comprising:

a plurality of communication use libraries connected to a corresponding number of said plurality of processes, each of said communication use libraries including a communication use library function for performing a socket communication between said plurality of processes; and

means for storing information describing said socket communication in a log, wherein said information is stored in a storing unit each time a socket communication is performed with said library function between plurality of processes.

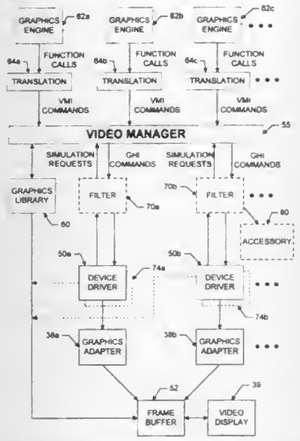
VOL 1209 ISS 4 AP 28 1998 UMI



## 5,745,761
## ADVANCED GRAPHICS DRIVER ARCHITECTURE WITH EXTENSION CAPABILITY

**Joseph Celi, Jr., Boynton Beach; Jonathan M. Wagner, Coral Springs, and Roger Louie, Deerfield Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 15, 1994, Ser. No. 356,101**
**Int. Cl.[6] G06F** *9/40*
**U.S. Cl. 395—681** **15 Claims**




1. An apparatus for facilitating extension of processing capabilities associated with a device driver in a data processing system, the apparatus comprising:

a graphics adapter configured to process driver-output signals;

a device driver, associated with the graphics adapter, for (1) receiving graphics commands, said graphics commands including a function call belonging to either a first set or a second set of function calls, (2) processing function calls within said first set of function calls into driver-output signals, and (3) outputting function calls within said second set of function calls;

a device driver expansion module, uniquely associated with the device driver, wherein said device driver expansion module receives function calls within said second set of function calls from said device driver and processes said function calls within said second set of function calls into driver-output signals;

a video manager for (1) receiving graphics commands from a graphics engine, and (2) routing the graphics commands to the device driver for processing; and

a library of graphic functions, the video manager being configured to (1) locate, in the library, graphic functions corresponding to function calls, specified within graphic commands, that are not supported by any device driver in said data processing system, and (2) cause processing of the graphic functions into driver-output signals for processing by the graphics adapter.

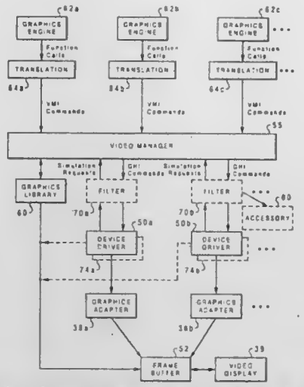
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## 5,745,762
## ADVANCED GRAPHICS DRIVER ARCHITECTURE SUPPORTING MULTIPLE SYSTEM EMULATIONS

**Joseph Celi, Jr., Boynton Beach; Jonathan M. Wagner, Coral Springs, and Roger Louie, Deerfield Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 15, 1994, Ser. No. 356,525**
**Int. Cl.[6] G06F** *9/44*
**U.S. Cl. 395—681** **22 Claims**

1. Apparatus for transforming graphics engine function calls into graphics hardware interface signals that drive at least one graphics adapter device driver, the apparatus comprising:




a. a plurality of graphics adapter device drivers each associated with a graphics adapter, each device driver being capable of transforming a set of graphics hardware interface commands into graphics adapter signals; and

b. means for transforming graphics engine function calls into graphics hardware interface signals, said means including

i. means for receiving function calls from a graphics engine;

ii. means for selecting one of said plurality of device drivers to receive the transformed function calls; and

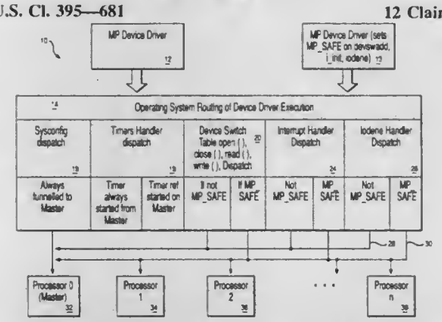
iii. means for transforming the function calls into graphics hardware interface signals and routing said signals to the selected device drivers for processing.

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## 5,745,763
## METHOD AND APPARATUS FOR DEVICE DRIVER FUNNELLING

**Bruce Gerard Mealey; Jeffrey Scott Peek; Mark Douglass Rogers, all of Austin; Randal Craig Swanberg, Round Rock, and Michael Stephen Williams, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 29, 1995, Ser. No. 536,879**
**Int. Cl.[6] G06F** *15/16*
**U.S. Cl. 395—681** **12 Claims**




1. A method for executing device drivers on a multiprocessor platform having a plurality of processors including a master processor, wherein said device drivers were created for execution on a uniprocessor platform, comprising:

receiving an interrupt for a selected one of said device drivers into said multiprocessor platform;

determining if the selected one of said device drivers is created for execution on said uniprocessor platform by the presence or absence of a flag on said selected one of said device drivers;

executing the selected one of said device drivers only on said master processor of said multiprocessor platform when the selected one of said device drivers is determined to be created for said uniprocessor platform; and

executing said device drivers on any one of said plurality of processors in said multiprocessor platform when not created for said uniprocessor platform.

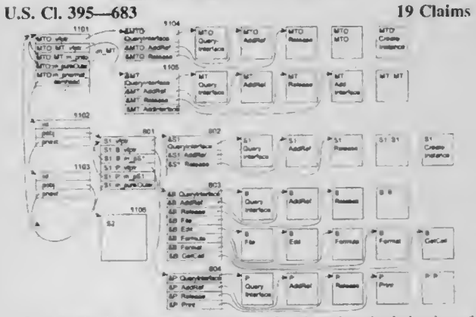


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## 5,745,764
## METHOD AND SYSTEM FOR AGGREGATING OBJECTS

**Paul Leach, Seattle; Antony S. Williams, Redmond; Edward Jung, Seattle; C. Douglas Hodges; Srinivasa R. Koppolu, both of Redmond; Barry B. MacKichan, Bainbridge Island, and Craig Wittenberg, Mercer Island, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.**

**Continuation of Ser. No. 185,465, Jan. 24, 1994, which is a continuation-in-part of Ser. No. 996,552, Dec. 24, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 480,465**
**Int. Cl.[6] G06F** *15/163;9/00;9/46*
**U.S. Cl. 395—683** **19 Claims**



1. A method in a computer system for changing the behavior of an object, the method comprising the steps of:

creating an instance of an enclosing object, the enclosing object having a query function member for retrieving a reference to an interface instance and an add rule function member for adding rules after object instantiation time for determining to which interface instance to retrieve a reference;

adding a plurality of interface instances to the enclosing object after object instantiation time; and

invoking the add rule function member of the enclosing object to add a rule for determining to which interface instance to retrieve a reference, thereby affecting the behavior of the query function member when invoked to retrieve a reference to an interface instance.

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## 5,745,765
## METHOD AND APPARATUS FOR AUTOMATIC AND INTERACTIVE CONFIGURATION OF CUSTOM PRODUCTS

**William Gerhard Paseman, San Jose, Calif., assignor to Calico Technology, Inc., San Jose, Calif.**

**Filed Oct. 23, 1995, Ser. No. 547,025**
**Int. Cl.[6] G06F** *9/455;9/44*
**U.S. Cl. 395—701** **14 Claims**

1. A computer implemented method for configuring a product from a plurality of selectable components comprising the steps of:

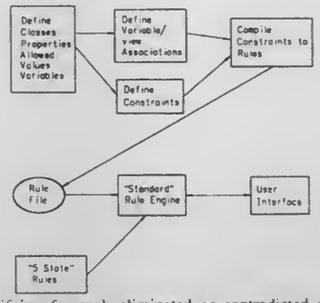
a) establishing for each component a list of available classes,

b) defining specific properties for each class of each component,

c) defining constraints among components based on said specific properties, including establishing Boolean relationships between components using said specific properties as constrained variables,

d selecting a first plurality of components for a product configuration,

e) identifying each of said first plurality of components as selectable, eliminated, or contracted based on said constraints,




f) identifying for each eliminated or contradicted component specific properties of other components which contradict or eliminate said each component, including identifying selectable components versus eliminated components as specific properties as other components are altered thereby guiding in product reconfiguration, and

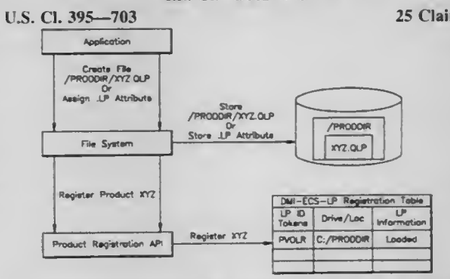
g) altering said product configuration to avoid eliminated or contradicted components.

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## 5,745,766
## PC PRODUCT REGISTRATION AND TRACKING

**Arnold H. Bramnick, Boca Raton, Fla.; Nathaniel Calvert, Rochester, Minn.; Thomas Marcus McBride, Rochester, Minn.; Arthur Frank Snyder, III, Rochester, Minn., and John Robert Ure, Coral Springs, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 19, 1994, Ser. No. 308,190**
**Int. Cl.[6] G06F** *9/45*
**U.S. Cl. 395—703** **25 Claims**




1. A method of automatically tracking a plurality of computer software application packages in a computer file system, including an operating system and operating system file directories, comprising:

uniquely identifying said plurality of computer software application packages by a suffix value in said computer file system, said computer software application packages having a plurality of linked replaceable units;

creating a tracking directory recognizing said uniquely identified computer software application packages by said suffix value in said operating system;

monitoring said computer file system for operating system instructions to said operating system file directories;

detecting operating system instructions in said operating system file directories involving said uniquely identified computer software application packages by said suffix value; and

updating said tracking directory in said operating system to reflect said operating system instructions in said uniquely identified computer software application packages having said suffix value.

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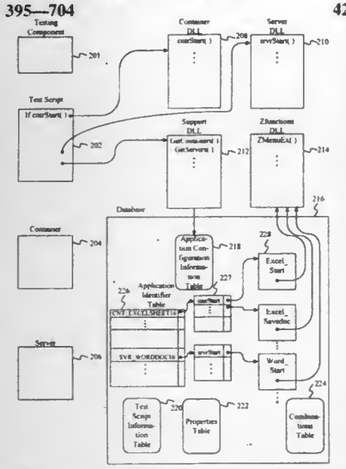


**5,745,767**

## METHOD AND SYSTEM FOR TESTING THE INTEROPERABILITY OF APPLICATION PROGRAMS

**Douglas Jay Rosen, Kirkland, and Ross Faulkner Smith, Jr., Redmond, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.**

**Filed Mar. 28, 1995, Ser. No. 411,534**
**Int. Cl.[6] G06F** *9/45*
**U.S. Cl. 395—704** **42 Claims**




**1**. A method in a computer system for testing a plurality of application programs, each of the application programs having low-level commands, each of the low-level commands indicating a task to be performed by the application program, the computer system having a test script containing a description of a test to be performed on each of the application programs, the test script having a plurality of application-independent high-level commands, each of the high-level commands specifying a task to be performed by the application program being tested, each of the application programs having an implementation of each of the high-level commands for the application program, each of the implementations having an associated plurality of low-level commands for directing the application program to perform the task of an associated one of the high-level commands, the method comprising the steps of:

selecting each of the high-level commands in the test script;

retrieving the implementation of each of the selected high-level commands for the application program being tested;

selecting each of the low-level commands in each retrieved implementation; and

directing the application program being tested to perform the task of each of the selected low-level commands to effect the performance of the task of each of the selected high-level commands.

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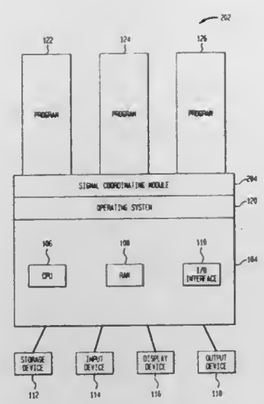
**5,745,768**

## COMPUTER PROGRAM PRODUCT AND PROGRAM STORAGE DEVICE FOR SUPPORTING NATIVE AND NON-NATIVE SIGNALS TRANSFERRED BETWEEN PROCESSING ENTITIES OF A COMPUTER PROGRAM

**Laurence Edward England, Morgan Hill; Tsuneo Horiguchi, San Jose, both of Calif.; Richard Tallman, Saugerties, N.Y., and Lawrence C. Weber, Toronto, Canada, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 195,718, Feb. 14, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 475,609**
**Int. Cl.[6] G06F** *9/46*
**U.S. Cl. 395—706** **20 Claims**

**18**. A computer program product for use in a computer system, said computer program product comprising a computer readable




medium having computer program readable code means embodied in said medium for causing the computer system to process a first type of interprocess signals and a second type of interprocess signals, said first type of signals conforming to a first signal handling standard and said second type of signals conforming to a second signal handling standard, said computer program readable code means comprising:

computer readable program code means for enabling said computer system to execute a first processing entity;

computer readable program code means for enabling said computer system to execute a second processing entity concurrently with said first processing entity;

computer readable program code means for enabling said computer system to originate an interprocess signal from said first processing entity when said second processing entity is executing concurrently with said first processing entity;

computer readable program code means in the second processing entity for enabling said computer system to receive the interprocess signal;

first computer readable program code means for enabling said computer system to determine whether said interprocess signal is a synchronous signal or an asynchronous signal;

first signal processing computer readable program code means for enabling said computer system to process said interprocess signal in the second processing entity using signal handling semantics defined by said first signal handling standard if said interprocess signal is an asynchronous signal; and

second signal processing computer readable program code means for enabling said computer system to process said interprocess signal in the second processing entity using signal handling semantics defined by said first signal handling standard and said second signal handling standard if said interprocess signal is a synchronous signal.

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**5,745,769**

## MULTIPLE CONNECTION METHOD USING A SINGLE CONTROL LINK

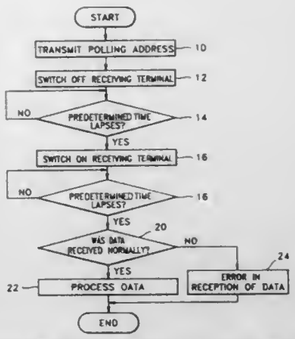
**Young-Gon Choi, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**

**Filed May 24, 1996, Ser. No. 653,478**
**Claims priority, application Rep. of Korea, May 24, 1995, 1995-13076**
**Int. Cl.[6] H04J** *3/16*
**U.S. Cl. 395—727** **11 Claims**

**1**. A multiple connection method using a single channel, for a multiple connection between at least one master and a plurality of slaves in a data transmission and reception apparatus adopting a polling method, comprising the steps of:

(a) transmitting polling addresses from the master in a predetermined sequence using said single channel;






(b) receiving the polling addresses by each of the slaves using said single channel; and

(c) switching on transmitting terminal of only one of the slaves which corresponds to the currently received polling address, and switching off the transmitting terminals of other slaves.

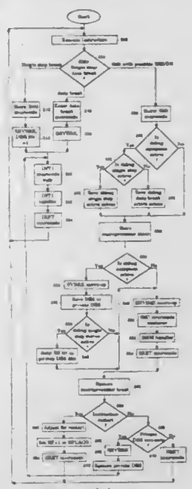
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**5,745,770**

## METHOD AND APPARATUS FOR SERVICING SIMULTANEOUS I/O TRAP AND DEBUG TRAPS IN A MICROPROCESSOR

**George Thangadurai, Folsom, and Chih-Hung Chung, Santa Clara, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.**

**Continuation of Ser. No. 174,032, Dec. 27, 1993, abandoned. This application Feb. 1, 1996, Ser. No. 595,187**
**Int. Cl.[6] G06F** *9/46*
**U.S. Cl. 395—733** **18 Claims**



**17**. A computer system comprising:

at least one I/O peripheral device;

a bus coupled to said at least one I/O peripheral device;

a system management mode module (SMM) that generates a system management interrupt (SMI) upon occurrence of an I/O trap based on said at least one I/O peripheral device;

a microprocessor coupled to said bus and said SMM module, said microprocessor comprising

a microprocessor core that generates an SMI and a debug exception during execution of a single program instruction, wherein the SMI has a higher service priority than the debug exception,

a status register coupled to the microprocessor core,

a private debug status register coupled to the microprocessor core, and

a microcode execution block coupled to the microprocessor core, the microcode execution block including microcode for servicing and SMI and a debug exception that occur during the execution of the single program instruction, wherein the microcode execution block performs the steps of

beginning service of the SMI by storing a microprocessor state,

determining whether a debug exception occurred during execution the single program instruction in which the SMI occurred and prior to beginning service of the SMI,

copying breakpoint status information from a status register to a private breakpoint status register prior to continuing service of the SMI, if a debug exception occurred during execution of the single program instruction in which the SMI occurred and prior to beginning service of the SMI,

completing service of the SMI,

restoring the state of the microprocessor,

restarting the single program instruction,

copying the breakpoint status information from the private breakpoint status register to the status register, and

servicing the debug exception.

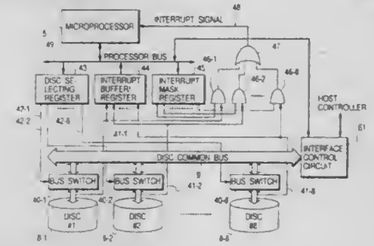
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**5,745,771**

## DISC ARRAY DEVICE AND DISC CONTROL METHOD

**Mitsuo Ohyama, Hachioji; Yoshihisa Kamo, Musashimurayama; Akihiko Ohba; Hitoshi Kakuta, both of Tokyo; Toyohiko Kagimasa, Sagamihara, and Hiroki Kanai, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 6, 1995, Ser. No. 499,004**
**Claims priority, application Japan, Jul. 8, 1994, 6-156975; Jul. 19, 1994, 6-166552**
**Int. Cl.[6] G06F** *13/24*
**U.S. Cl. 395—735** **8 Claims**




**1**. A disc array device, comprising:

a plurality of disc units;

an array control unit for storing data from a host controller or a host computer, a common bus connected to said plurality of disc units and said array control unit; and signal lines for transferring interrupts to said array control unit from said plurality of disc units, said array control unit including:

means for detecting the interrupts individually via said signal lines from said plurality of disc units, for every disc unit;

means for masking said interrupts individually for every disc unit;

means for taking a logical OR of the masking result by said masking means, for every disc unit, to make an interrupt request; and

means for connecting said plurality of disc units selectively to said common bus;

wherein the order of occurrence of interrupt requests made by said plurality of disc units is recognized to judge the data transfer request order of said disc units from the order of occurrence of the interrupt requests, thereby to connect said plurality of disc units to said common bus in said data transfer request order; and

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a host controller connecting mechanism for connecting said array control unit to said host controller or said host computer through a system bus or a system interface,

wherein said plurality of disc units, said array control unit, and said host control unit connecting mechanism are mounted on the same board.

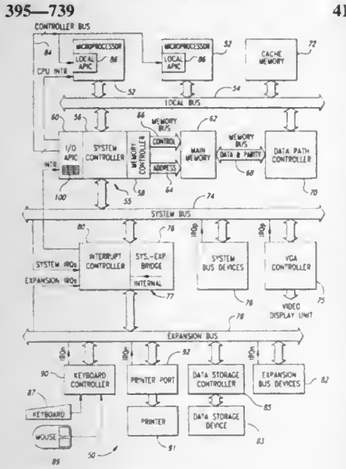
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5,745,772

## ADVANCED PROGRAMMABLE INTERRUPT CONTROLLER

**Dean A. Klein, Eagle, Id., assignor to Micron Electronics, Inc., Nampa, Id.**

**Filed Aug. 2, 1996, Ser. No. 693,510**
**Int. Cl.[6] G06F 9/46**
**U.S. Cl. 395—739** **41 Claims**




1. A computer system, comprising:

a processor;

a processor bus connected to the processor and operable to transfer data, address and control signals to and from the processor;

system interface circuitry connected to the processor bus, the system interface circuitry including a system bus controller coupling a system bus with the processor bus and controlling the transfer of data and address signals between the processor bus and the system bus;

expansion interface circuitry coupling an expansion bus with the system bus and controlling the transfer of data and address signals between the expansion bus and the system bus;

an expansion bus device connected to the expansion bus and operable to transfer data to and from the processor, the expansion bus device operable to assert a first interrupt request signal requesting service from the processor;

an interrupt controller connected to the expansion bus and operable to receive the first interrupt request signal and to provide a corresponding first interrupt vector; and

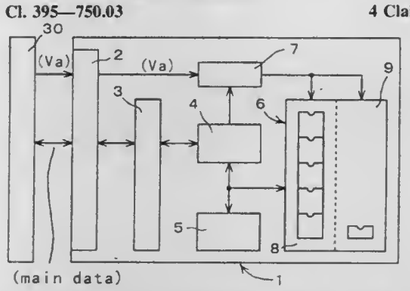
a system request controller connected to the system bus and coupled with the processor by a controller bus, the system request controller operable to receive the first interrupt vector and to provide a corresponding first interrupt number to the processor on the controller bus to initiate the service requested by the expansion bus device.

5,745,773

## MEMORY CARDS WITH SRAM USABLE FOR A PC CARD IN CONFORMITY WITH PCMCIA STANDARD

**Masaharu Mizuta, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 13, 1996, Ser. No. 713,645**
**Claims priority, application Japan, Mar. 8, 1996, 8-051526**
**Int. Cl.[6] G06F 1/32**
**U.S. Cl. 395—750.03** **4 Claims**




1. A memory card, with improved reliability by means of an ECC and in conformity with the ATA standard, used as a PC card in conformity with the PCMCIA standard comprising:

a memory portion employing SRAM;

a detection portion for detecting frequency of the data access operations to said memory portion and producing a predetermined detection signal when the detected frequency is lower than a predetermined value; and

a power supply voltage converter for converting the power supply voltage provided by an external information processing device while receiving the predetermined detection signal from said detection portion and for supplying the converted voltage as a power supply voltage to said memory portion,

wherein said power supply voltage converter lowers the power supply voltage for said memory portion when receiving the predetermined detection signal from said detection portion.

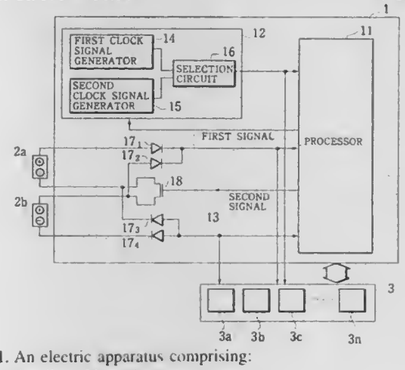
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5,745,774

## INTEGRATED CIRCUIT HAVING SOFTWARE CONTROLLABLE INTERNAL CLOCK GENERATOR AND SWITCH CONNECTING BATTERIES IN SERIES OR PARALLEL FOR POWER CONSERVATION

**Eiichi Munetsugu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 965,854, Oct. 23, 1992, abandoned.**
**This application Nov. 22, 1996, Ser. No. 757,951**
**Claims priority, application Japan, Oct. 25, 1991, 3-279097**
**Int. Cl.[6] G06F 1/08**
**U.S. Cl. 395—750.04** **4 Claims**




1. An electric apparatus comprising:

a plurality of batteries;



an integrated circuit connected to said plurality of batteries and including,

a processor for executing a program and outputting a first signal and a second signal,

a clock generator connected to said processor for selectively generating a first clock signal and a second clock signal having a frequency lower than said first clock signal in response to said first signal, a

a connection circuit connected to said batteries and said processor for changing a serial and parallel connection between said batteries in response to said second signal for supplying said processor with a selected voltage from said batteries through said connection circuit;

an optional circuit connected to said integrated circuit for receiving one of said first clock signal and said second clock signal from said clock generator and said selected voltage from said batteries which are coupled in parallel or in series in accordance with said second signal,

wherein said integrated circuit outputs either one of said first clock signal and said second clock signal together with said selected voltage in accordance with execution of the program in order that said first clock signal and said selected voltage are supplied to said processor and said optional circuit at the same time that said batteries are coupled in series while said second clock signal and said selected voltage are supplied to said processor and said optional circuit at the same time that said batteries are coupled in parallel.

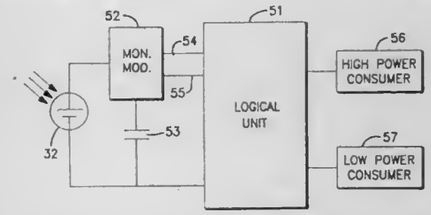
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5,745,775

## REMOTELY ADJUSTABLE PRICE DISPLAY MODULE

**Roger Ahlm, Motala; Ola Ödmark, and Björn Nilsson, both of Upsala, all of Sweden, assignors to Pricer Inc., Norwalk, Conn.**

**Continuation of Ser. No. 436,209, Jul. 18, 1995, abandoned.**
**This application Jun. 9, 1997, Ser. No. 871,434**
**Claims priority, application Sweden, Nov. 13, 1992, 9203409**
**Int. Cl.[6] G06F 1/26**
**U.S. Cl. 395—750.08** **9 Claims**




1. A method for supplying power from a photoelectric converter to a detached price display unit lacking powering battery, the detached price display unit having high power consuming portions and low power consuming portions, said high power consuming portions and said low power consuming portions including a number of functional units, comprising the steps of:

providing a monitoring module;

providing an energy storing unit;

providing the detached price display unit in such a way that when said detached price display unit is in a high level driving state said detached price display unit will have all said functional units connected, while in a low level driving state functional units, of said number of functional units, being most energy demanding will be disconnected;

connecting via said monitoring module said photoelectric converter parallel to said energy storing unit and said energy storing unit via said high power consuming portions to the detached price display unit if said photoelectric converter delivers at least the same voltage level as said energy storing unit; and

disconnecting by means of said monitoring module said photoelectric converter and connecting said energy storing unit to the detached price display unit via said low power consuming portions if said photoelectric converter does not deliver at least the same voltage level as said energy storing unit.

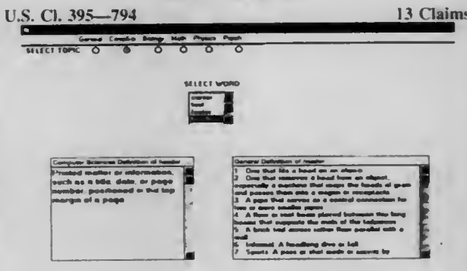
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5,745,776

## ENHANCED ELECTRONIC DICTIONARY

**Charles Bradford Sheppard, II, 170 Woodland Rd., Huntingdon Valley, Pa. 19006**

**Filed Apr. 19, 1995, Ser. No. 424,817**
**Int. Cl.[6] G06F 9/00**
**U.S. Cl. 395—794** **13 Claims**




1. An enhanced electronic dictionary for retrieving a topical definition corresponding to a selected topic and corresponding to a selected word and for communicating to a user said topical definition separately from other definitions that may correspond to said selected word, said enhanced electronic dictionary comprising:

(A) a database of dictionary entries stored in a memory, said database comprising:

(i) general dictionary entries each comprising a general dictionary word, a general definition assigned to said general dictionary word and a general tag assigned to said general definition, and

(ii) topic dictionary entries each comprising a topic dictionary word, a topic definition assigned to said topic dictionary word, a topic tag assigned to said topic definition to identify a topic corresponding to said topic definition, and an objective rating assigned to said topic dictionary word, said objective rating being an objective measure of importance of said topic dictionary word as compared to another said topic dictionary word, wherein said objective rating assigned to each said topic dictionary word selected for inclusion in said database is within a pre-determined objective rating range;

(B) commands stored in a memory for manipulating said database of dictionary entries, said commands including a retrieval command configured to retrieve said general definition, said topic definition or said general definition and said topic definition corresponding to said selected topic and assigned to said selected word, said commands also including a communication command configured to communicate to such user said general definition, said topic definition or said general definition and said topic definition corresponding to said selected topic and assigned to said selected word;

(C) a processor connected to said memory to execute said commands;

(D) an input device connected to said processor to receive said selected topic and said selected word; and

(E) an output device connected to said processor to communicate to such user said general definition, said topic definition or said general definition and said topic definition corresponding to said selected topic and assigned to said selected word, wherein said topic definition is communicated to such user separately from said general definition.

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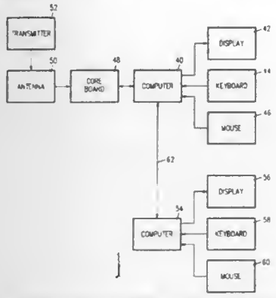


5,745,777

## ANALYZER FOR FREQUENCY MODULATED SIGNALS

James David English, Aloha; Daniel J. Park, Portland; Jeffrey R. Owen, Portland, and Garth Upshaw, Portland, all of Oreg., assignors to Seiko Communications Holding N.V., Netherlands

Continuation of Ser. No. 240,349, May 10, 1994, abandoned. This application Aug. 9, 1996, Ser. No. 695,254
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—800 3 Claims




1. A system for analyzing FM radio subcarrier signals that transmit a paging data bit stream in accordance with a predefined protocol, said paging data bit stream including data packets, said system including

a first personal computer which includes,

plug in slots for special purpose circuit cards, and a windows operating system,

means connecting said first personal computer to a network,

a plurality of plug in circuit cards plugged into said plug in slots, each of said plug in cards including,

radio receiver means for receiving radio signals of a selected frequency and digital signal processing means for analyzing radio signals received by said radio receiver, said digital signal processing means including,

first and second Digital Signal Processing (DSP) circuit means,

said first DSP circuit means including means to recover said paging data bit stream from said subcarrier signal,

said second DSP circuit means including means to recover data packet information from the paging data bit stream recovered by said first DSP circuit means,

a second personal computer which includes a windows operating system, means connecting said second personal computer to said network, means for receiving and displaying the data packet information received by said second DSP circuit means,

whereby said second personal computer can display data packet information recovered by each of said second DSP circuit means.

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5,745,778

## APPARATUS AND METHOD FOR IMPROVED CPU AFFINITY IN A MULTIPROCESSOR SYSTEM

Robert A. Alfieri, Chapel Hill, N.C., assignor to Data General Corporation, Westboro, Mass.

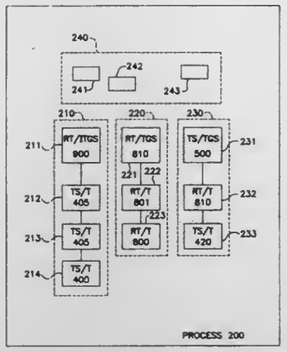
Filed Jan. 26, 1994, Ser. No. 187,665
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—800.01 32 Claims

1. A data processing system for simultaneously executing a plurality of processing tasks, the system comprising:

a plurality of processors, each processor having first cache means;

a plurality of second cache means, each second cache means being connected to a subset of the processors;

shared memory means connected to each second cache means; and




means for retaining a plurality of run queues, including a plurality of Level 0 run queues, each Level 0 run queue being associated with one of the processors and containing the processing tasks currently affined to its associated processor; a plurality of Level 1 run queues, each Level 1 run queue being associated with one of the subsets of processors and containing the processing tasks currently affined to its associated subset of processors, and a Level 2 run queue associated with all processors and containing the processing tasks currently affined to all processors in the system, each processing task being included in only one of the run queues.

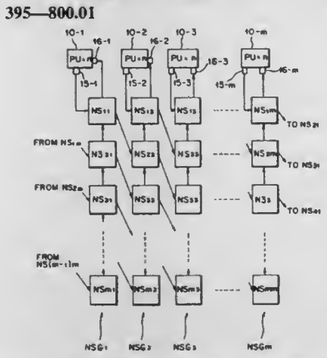
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5,745,779

## NETWORK SUBSYSTEM FOR PARALLEL PROCESSOR SYSTEM AND NETWORK SYSTEM FOR PARALLEL PROCESSOR SYSTEM

Masayuki Katori, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 28, 1994, Ser. No. 313,903
Claims priority, application Japan, Dec. 28, 1993, 5-338574
Int. Cl.[6] G06F *15/16*
U.S. Cl. 395—800.01 48 Claims




1. A network system for a parallel processor system comprising:

m×m network subsystems $NS_{ij}$ for the parallel processor system, where i and j are natural numbers from 1 to m, being configured into a matrix, each of which network subsystems comprises:

a first input port receiving a destination undecided data to be transmitted from one of a plurality of processor units included in a processor unit set belonging to its own group or another network subsystem for the parallel processor system to another processor unit belonging to its own group or a processor unit belonging to another group;

a second input port receiving a destination decided data from another network subsystem for the parallel processor system;



a group address judging unit making a judgement on said destination undecided data inputted through the first input port as to whether said destination undecided data is addressed to a processor unit belonging to its own group or not;

a network switch unit conducting a switching to the processor unit to which said destination undecided data are addressed when the group address judging unit judges that said destination undecided data is addressed to said processor unit belonging to its own group to output said destination undecided data as a destination decided data;

a destination decided data contention unit having applied said destination decided data fed from the network switch unit and said another destination decided data from the second input port to solve contention when said two destination decided data have the same destination so that the contention generates between said two destination decided data, and outputting said two destination decided data;

a first output port outputting said destination decided data supplied from the destination decided data contention unit to said addressed processor unit or another network subsystem for the parallel processor system; and

a second output port outputting said destination undecided data as it is to another network subsystem for the parallel processor system when said destination undecided data is judged by the group address judging unit to be addressed to a processing unit belonging to another group;

the m network subsystems $NS_{i1}$, $NS_{i2}$, . . . , $NS_{im}$ forming a network subgroup $NSG_i$, and m sets of the network subgroups $NSG_j$ being formed in said network system;

the first input ports of the network subsystems $NS_{11}$, $NS_{12}$, . . . , $NS_{1m}$ belonging to the respective m network subgroups $NSG_1$–$NSG_m$ each being connected to data output ports of n processor units;

the first output ports of the network subsystems $NS_{11}$, $NS_{12}$, . . . , $NS_{1m}$ each being connected to processor unit data input ports of the n processor units;

the first output ports of network subsystems $NS_{ij}$ except the network subsystems $NS_{11}$, $NS_{12}$, . . . , $NS_{1m}$ being connected to the second input ports of the network subsystems $NS_{(i-1)j}$ except the network subsystems $NS_{m1}$, $NS_{m2}$, . . . , $NS_{mm}$, respectively;

the second output ports of the network subsystems $NS_{ij}$ except the network subsystems $NS_{m1}$, $NS_{m2}$, . . . , $NS_{mm}$ and the network subsystems $NS_{1m}$, $NS_{2m}$, . . . , $NS_{(m-1)m}$ being connected to the first input ports of the network subsystems $NS_{(i+1)(j-1)}$, except the network subsystems $NS_{11}$, $NS_{12}$, . . . , $NS_{1m}$, respectively;

the second output ports of the network subsystems $NS_{1m}$, $NS_{2m}$, . . . , $NS_{(m-1)m}$ being connected to the first input ports of the network subsystems $NS_{21}$, $NS_{31}$, . . . , $NS_{m1}$, respectively.

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5,745,780

## METHOD AND APPARATUS FOR SOURCE LOOKUP WITHIN A CENTRAL PROCESSING UNIT

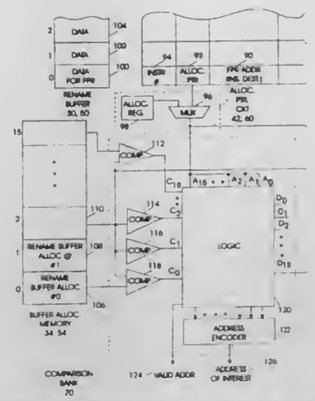
James Edward Phillips, Round Rock, and George Quyen Phan, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1996, Ser. No. 622,965
Int. Cl.[6] G06F *9/00*
U.S. Cl. 355—800.23 19 Claims

1. A source look-up method comprising the steps of:

a) determining a comparison window between an allocation pointer and a deallocation pointer, wherein the allocation pointer points to an entry in a buffer to be allocated next and wherein the deallocation pointer points to an entry in the buffer to be deallocated next;

b) for each entry in the buffer between the allocation pointer and the deallocation pointer, comparing a stored value in the each entry with a source value to produce a comparison output;




c) flagging each match of the comparison of the stored value in the each entry with the source value to produce flagged matches; and

d) identifying, from the flagged matches, an entry having source information of interest based on the allocation pointer.

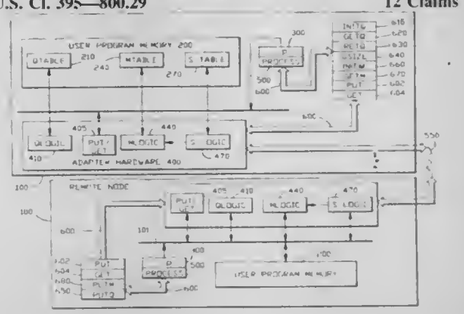
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5,745,781

## MEMORYLESS COMMUNICATIONS ADAPTER INCLUDING QUEUEING AND MATCHING PRIMITIVES FOR SCALABLE DISTRIBUTED PARALLEL COMPUTER SYSTEMS

Kattamuri Ekanadham, Yorktown Heights; Hubertus Franke, Croton-on-Hudson, both of N.Y.; Douglas James Joseph, New Fairfield, Conn.; Pratap Pattnaik, Ossining, and Marc Snir, Briarcliff Manor, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 9, 1996, Ser. No. 598,931
Int. Cl.[6] G06F *3/00*
U.S. Cl. 395—800.29 12 Claims




1. In a distributed parallel computer network including a plurality of nodes, each node including a non-shared program memory coupled to a memoryless communications adapter which interfaces the network, a communications adapter-based method for communicating between the nodes, comprising the steps of:

executing a process in parallel on a plurality of the nodes;

issuing a queue table initialization request from the process in a resident node to a queue logic incorporated in hardware of the memoryless communications adapter in the resident node and the queue logic instantiating, responsive to the queue table initialization request, a queue table for storing a plurality of data identifiers in the program memory of the resident node;

communicating a put queue request which includes a data identifier from the queue logic in a remote node to the queue logic

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in the resident node, and remotely copying, responsive to the put queue request, a data item associated with the put queue request from the program memory in the remote node to the queue table; and

issuing a get queue request from the process in a resident node to the queue logic in the resident node and the queue logic in the resident node retrieving the data item associated with the get queue request from the queue table.

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**5,745,782**

**METHOD AND SYSTEM FOR ORGANIZING AND PRESENTING AUDIO/VISUAL INFORMATION**

**Lynn Conway, Ann Arbor, Mich., assignor to Regents of the University of Michigan, Ann Arbor, Mich.**

**Continuation of Ser. No. 127,809, Sep. 28, 1993, abandoned. This application Jul. 3, 1996, Ser. No. 674,981**

**Int. Cl.[6] G06F** *17/21*

**U.S. Cl. 395—806** **20 Claims**




1. A method for organizing media identification data in a text-based document file within a digital computer, the media identification data indicative of locations of desired information stored on a media storage device within a media presentation system in communication with the digital computer, the media presentation system including a media presentation device, the method including the steps of:

receiving at the digital computer a signal indicating a command to position a marker within a desired text area of the file;

presenting audio/visual information at the media presentation device;

receiving at the digital computer an operator selection signal associating the position of the marker with the presented audio/visual information;

automatically transmitting from the digital computer to the media presentation system a request signal indicating a request for the media identification data based on the operator selection signal, the media identification data identifying the presented audio/visual information;

automatically transmitting from the media presentation system to the digital computer a signal representing the media identification data based on the request signal; and

automatically storing the media identification data at the position of the marker within the desired text area of the file wherein an address of the presented audio/visual information is automatically placed at the desired text area in response to operator selection of the presented audio/visual information.

**5,745,783**

**SYSTEM FOR RECORDING AND/OR REPRODUCING DATA BY DISCONNECTING THE RECORDING AND/OR REPRODUCING DEVICE FROM THE DATA PROCESSING DEVICE UPON REPRODUCTION OF THE DATA**

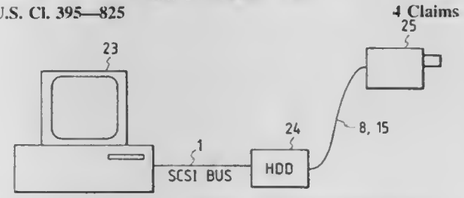
**Takatoshi Suzuki, Kawasaki, and Satoshi Sakai, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 23, 1995, Ser. No. 546,984**

**Claims priority, application Japan, Oct. 26, 1994, 6-262518**

**Int. Cl.[6] G06F** *15/40*

**U.S. Cl. 395—825** **4 Claims**




1. A recording and/or reproducing system comprising data processing means of a computer, and recording and/or reproducing means connected to the data processing means, said system comprising:

image processing means for processing image data; and

connecting means for disconnecting the recording and/or reproducing means from the data processing means upon reproduction of the image data, and for connecting the recording and/or reproducing means with said image processing means.

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**5,745,784**

**METHOD FOR CHANGING AN EXTERNAL STORAGE MEDIUM IN AN INFORMATION PROCESSING SYSTEM**

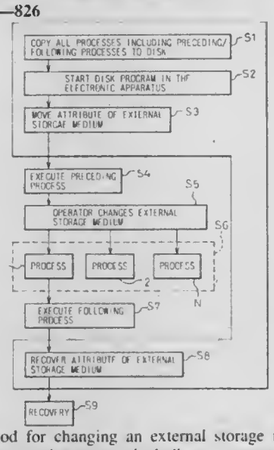
**Junichi Tsuda, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Mar. 3, 1995, Ser. No. 398,523**

**Claims priority, application Japan, Mar. 17, 1994, 6-047424**

**Int. Cl.[6] H01J** *3/00*

**U.S. Cl. 395—826** **3 Claims**




3. A method for changing an external storage medium in an information processing system including a computer and at least one external storage medium linked to the computer, comprising:

providing an internal storage in the computer;

delivering a control operation from the computer to the external storage medium in a mounting process;

starting an internal program stored in the internal storage, to store copied processes in the computer;

copying processes of the external storage medium, including a preceding process, necessary to start a main process, and a following process necessary to complete the main process,



from the external storage medium to a memory of the computer allowing the external storage medium to be changed to another one during an access operation;

transferring a mounting attribute indicating the mounting process from the computer to the external storage medium by using the internal program on the internal storage;

wherein the step of allowing the external storage medium to be changed to another external storage medium during the access operation further comprises:

executing only the main process of said another external storage medium matching the mounting attribute;

recovering the mounting attribute from said another external storage medium and executing the following process after completion of all processes;

returning the control operation to an initial state before the mounting process.

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**5,745,785**

**SYSTEM FOR ALTERNATIVELY TRANSFERRING DATA FROM EXTERNAL MEMORY TO MEMORY DEVICE AND FROM MEMORY DEVICE TO INTERNAL MEMORY DEPENDING UPON PROCESSING UNIT'S OPERATIONAL**

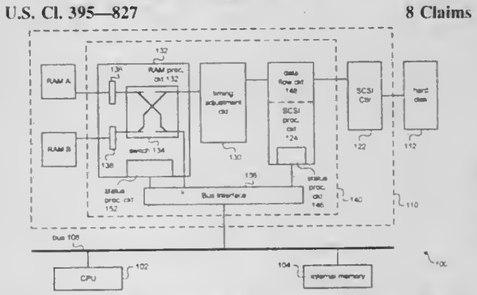
**Wataru Shoji; Daisuke Tabuchi, and Ichiro Nakajima, all of Tokyo, Japan, assignors to Sofmap Future Design, Inc., Tokyo, Japan**

**Filed May 2, 1996, Ser. No. 643,131**

**Claims priority, application Japan, May 9, 1995, 7-134683**

**Int. Cl.[6] G06F** *13/14;13/38*

**U.S. Cl. 395—827** **8 Claims**




1. A system for transferring data between an external memory device and internal memory in a computer having a CPU, said CPU executing at least one application program, comprising:

a first memory device;

a second memory device;

a first circuit for communicating data with said external memory device;

a status signal circuit for generating status signals in response to activities in said first and said second memory devices and said first circuit;

a data switching circuit for alternatively coupling said first memory device to one of said first circuit and said internal memory and for alternatively coupling said second memory device to one of said first circuit and said internal memory; and

a software routine executable by said CPU, comprising:

means responsive to a first one of said status signals for determining a time period when said CPU is available to process said data and for causing said data switching circuit to couple one of said first and said second memory devices to said internal memory when said CPU is available so that said data can be processed by said CPU; and

means responsive to a second one of said status signals for causing said one application program to be executed by said CPU during a portion of time when data is transferred between said external memory device and one of said first and said second memory devices.

**5,745,786**

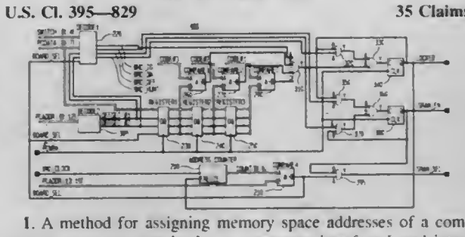
**METHOD AND APPARATUS FOR ASSIGNING MEMORY SPACE ADDRESSES TO MEMORY ON COMPUTER INTERFACE BOARDS**

**Chester Juall, Hawthorne, N.J., assignor to Dialogic Corporation, Parsippany**

**Filed Jan. 27, 1994, Ser. No. 188,555**

**Int. Cl.[6] G06F** *13/00*

**U.S. Cl. 395—829** **35 Claims**



1. A method for assigning memory space addresses of a computer to memory contained on a computer interface board interfaced to the computer which comprises the steps of:

setting a computer interface board identification at the computer interface board;

causing the computer to transmit to predetermined addresses of memory space in the computer, which predetermined addresses are assigned to the memory contained on the computer interface board, a predetermined pattern of data and other data from which the computer interface board identification can be derived; and

at the computer interface board, determining addresses assigned to the memory contained on the computer interface board from information received from the computer as a result of the step of causing the computer to transmit.

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**5,745,787**

**SYSTEM FOR INHIBITING BY AN AS YET NOT INITIALIZED PERIPHERAL EQUIPMENT THAT ADDRESSED BY PERMISSION SIGNAL TO FORWARD PERMISSION SIGNAL TO A FOLLOWING PERIPHERAL EQUIPMENT**

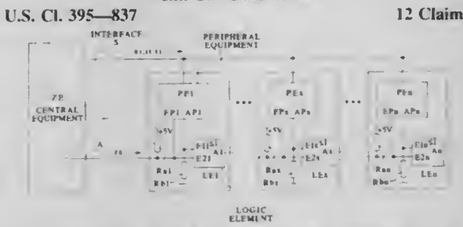
**Daniel Martschin, Bochum, and Juergen Moschner, Dortmund, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Jan. 31, 1996, Ser. No. 594,435**

**Claims priority, application Germany, Feb. 10, 1995, 195 04 488.6**

**Int. Cl.[6] G06F** *15/40*

**U.S. Cl. 395—837** **12 Claims**




1. A method for initializing peripheral equipments with a program-controlled central equipment of a communication system having an interface for reading and writing data, for synchronization of the peripheral equipment, for signalling a message, and for signalling an interrupt, the interface connected in parallel to all of said peripheral equipments, comprising the steps of:

arranging the peripheral equipments in succession according to a priority chain with reference to an access permission signal;

evaluating the access permission signal in a respective peripheral equipment, that receives the access permission signal, and forwarding the access permission signal to a respective following peripheral equipment dependent on a result of the evaluation;

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requesting by at least one peripheral equipment, following an inquiry by the program-controlled central equipment, initialization information via the interface;

offering by the program-controlled central equipment initialization information at the interface that identifies said at least one peripheral equipment;

activating the access permission signal; and

inhibiting by an as yet not initialized peripheral equipment, that is addressed by the access permission signal, forwarding of the access permission signal to a following peripheral equipment until the access of said at least one peripheral equipment to the interface for accepting the initialization information has ended.

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**5,745,788**

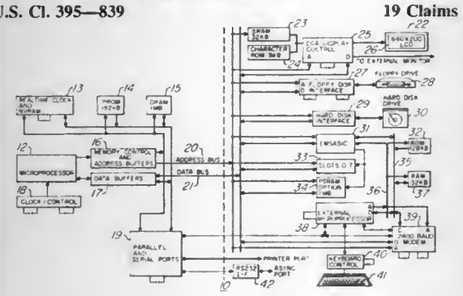
## METHOD AND APPARATUS FOR DYNAMICALLY INTERFACING WITH A PLURALITY OF PERIHERAL PORTS

**Steven J. Wallace, and LaVaughn Ferguson Watts, Jr., both of Temple, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 196,046, Feb. 14, 1994, abandoned, which is a continuation of Ser. No. 424,853, Oct. 20, 1989, Pat. No. 5,317,707. This application Jun. 26, 1995, Ser. No. 494,863**

**Int. Cl.[6] G06F** *13/00*

**U.S. Cl. 395—839** **19 Claims**



1. A method of interfacing an application processor with a plurality of peripheral ports, comprising the steps of:

monitoring the plurality of peripheral ports with an external processor;

communicating a status change in at least one of the plurality of peripheral ports to the application processor;

evaluating the status change with the application processor;

executing a response with the application processor in response to the status change; and

communicating the status change evaluation and execution from the application processor to the external processor.

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**5,745,789**

## DISC SYSTEM FOR HOLDING DATA IN A FORM OF A PLURALITY OF DATA BLOCKS DISPERSED IN A PLURALITY OF DISC UNITS CONNECTED BY A COMMON DATA BUS

**Hitoshi Kakuta, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Jan. 19, 1993, Ser. No. 5,822**

**Claims priority, application Japan, Jan. 23, 1992, 4-010367**

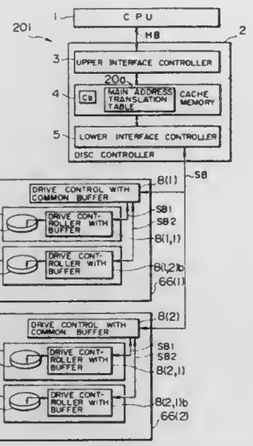
**Int. Cl.[6] G06F** *13/12*

**U.S. Cl. 395—841** **16 Claims**

1. A disc subsystem comprising:

a disc controller;

a plurality of disc units which are classified into a plurality of disc unit groups;



a plurality of transfer controllers each of which is provided in correspondence to each of said disc unit group;

a plurality of individual buses each of which is provided in correspondence to each of said disc units and is used to connect each corresponding one of the disc units to one of said plurality of transfer controllers provided in correspondence to the disc unit group to which said disc unit belongs; and

a common bus to connect said plurality of transfer controllers to the disc controller,

wherein said disc controller has

means for dividing data whose writing operation was requested from an external apparatus into a plurality of data blocks and for deciding the disc unit into which each of the data blocks should be written,

means for translating, by using a table, a logical address designated by said external apparatus into a physical address in the disc unit into which a given data block is to be written,

means for determining data block groups in which each data block group comprises data blocks to be written into different disc units belonging to the same disc unit group, and

means for transferring through said common bus a data block group to be written into a disc unit group to the transfer controller provided in correspondence to said disc unit group, whereby said means sequentially transfers different data block groups to said plurality of transfer controllers while data blocks in a previously transferred data block group are dispersed in parallel to the disc units by the corresponding transfer controller through the individual buses provided in correspondence to the disc units,

and each of the transfer controllers has

a buffer, and

means for writing the plurality of data blocks belonging to the data block group transferred through the common bus into said buffer and for transferring in parallel said plurality of written data blocks to the plurality of disc units connected to said transfer controller through the individual buses provided in correspondence to the disc units,

and each of the disc units has

a disc drive,

a buffer, and

means for writing the data block transferred from the transfer controller to which the disc unit is connected into said buffer and for writing said written data block into the disc drive.



**5,745,790**

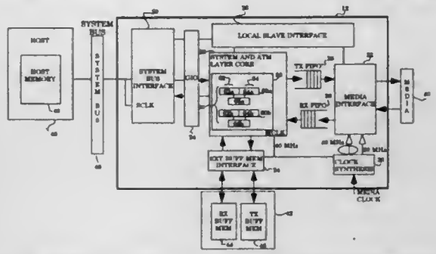
## METHOD AND APPARATUS FOR REPORTING THE STATUS OF ASYNCHRONOUS DATA TRANSFER

**Rasoul M. Oskouy, Fremont, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.**

**Continuation of Ser. No. 499,283, Jul. 7, 1995, abandoned. This application Mar. 6, 1997, Ser. No. 812,445**

**Int. Cl.[6] G06F** *9/28;13/14*

**U.S. Cl. 395—853** **20 Claims**



1. A computer system in a network for transferring data, comprising:

a host device having a host memory, the host memory having at least one data structure having a plurality of entries for posting data, each entry including an entry number;

a core circuit for transferring and tracking transfer of data between the host device and the network, in response to one of a condition and a command from the host device;

a storage location coupled to the host device, the storage location having a first storage field and a second storage field, the first storage field for storing the entry number corresponding to an entry which is available for posting data by the host device, the second storage field for storing an entry number corresponding to an entry posted by the core circuit upon the transfer of data; and

a circuit coupled to the storage location, for generating the condition by comparing the content of the first storage field to the content of the second storage field.

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**5,745,791**

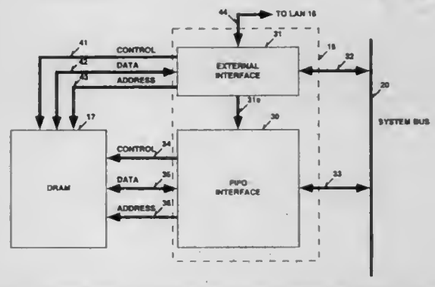
## SYSTEM FOR INTERFACING FIRST AND SECOND COMPONENTS HAVING DIFFERENT DATA PATH WIDTH BY GENERATING FIRST AND SECOND COMPONENT ADDRESS TO READ DATA INTO BUFFER

**Greg A. Peek; Craig D. Cedros, both of Beaverton, and Dick Reohr, Jr., Aloha, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.**

**Continuation of Ser. No. 945,668, Sep. 16, 1992, abandoned. This application Jul. 17, 1995, Ser. No. 503,329**

**Int. Cl.[6] G06F** *15/40*

**U.S. Cl. 395—872** **45 Claims**



13. An apparatus for interfacing a first component with a second component having a data path width different from that of the first component, comprising:

(A) a first buffer coupled to the first and second components and having an input data path width equal to the data path width of the first component and an output data path width equal to the data path width of the second component, wherein the input data path width of the first buffer is not equal to the output data path width of the first buffer; and

(B) an address generation circuit coupled to the first and second components, wherein the address generation circuit receives a first address from the second component and generates a first and a second component address to cause a first and a second portion of a first data to be read from the first component into the first buffer.

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**5,745,792**

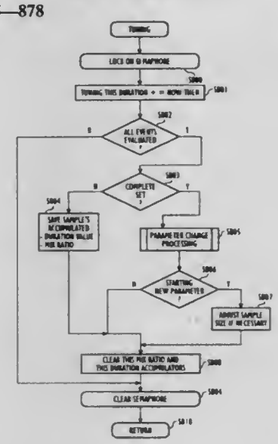
## SYSTEM FOR AUTOMATICALLY AND CONTINUOUSLY TUNING TUNABLE PARAMETERS BY SETTING TUNING MECHANISM TO TUNE A NEXT TUNABLE PARAMETER AFTER MAINTAINING MEANS MAINTAINED PARAMENTER CHANGE

**Larry T. Jost, St. Louis, Mo., assignor to SBC Technology Resources, Inc., Austin, Tex.**

**Continuation-in-part of Ser. No. 53,655, Apr. 29, 1993, abandoned. This application Apr. 29, 1994, Ser. No. 235,857**

**Int. Cl.[6] G06F** *13/10*

**U.S. Cl. 295—878** **84 Claims**



1. A data processing system comprising:

a processor that operates on various data, said processor comprising a processor memory and means for specifying an address that corresponds to a requested data block located within another memory to be accessed by said processor;

a hierarchical memory system comprising a cache and a long-term storage; and

a storage control processor comprising:

means for providing processor access to said requested data block within said cache;

means for transferring data between said processor memory and said cache; and

means for transferring data between said cache and said long-term storage;

said data processing system further comprising a tuning mechanism for automatically and continuously tuning tunable parameters of said storage control processor, said tuning mechanism comprising:

means for measuring durations of I/O processing events being performed by said storage control processor to obtain sample sets based upon the measured durations;

means for obtaining a first sample set;

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means for changing a parameter of said storage control processor by incrementing or decrementing the value of said parameter by a pre-defined delta value after the first sample set is obtained;

means for obtaining a second sample set after the parameter has been changed by said changing means;

means for comparing the I/O processing events measured to obtain the first sample set to the I/O processing events measured to obtain the second sample set in order to determine if the mixtures of I/O processing events are similar;

means, operable when the first and second sample sets have similar I/O processing event mixtures, for determining if there was an overall decrease in the lengths of I/O processing event durations being measured after the parameter was changed;

means for maintaining the parameter change, if it is determined that there was an overall decrease in the lengths of I/O processing event durations after the parameter was changed; and

means for setting the tuning mechanism to tune a next tunable parameter of said storage control processor after said maintaining means has maintained a parameter change.

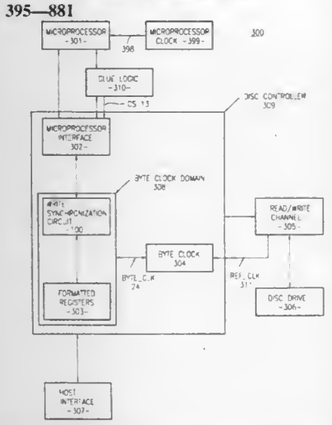
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**5,745,793**

**APPARATUS HAVING A CIRCULAR BUFFER THAT MAINTAINS A ONE ENTRY GAP BETWEEN ELEMENTS WRITTEN TO THE MICROPROCESSOR AND ELEMENTS OPERATED ON BY THE CLOCK**

**Sean R. Atsatt, Santa Cruz, and John M. Wright, Campbell, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.**

**Filed Jun. 7, 1995, Ser. No. 485,965**
**Int. Cl.[6] G06F *13/00***
**U.S. Cl. 395—881** **1 Claim**




1. Apparatus comprising:

a hard disc drive including disc media for storing data;

a disc controller connected for controlling said hard disc drive;

a clock connected for running said disc controller, said clock running at a relatively slow variable rate;

a microprocessor connected for providing writes into said disc controller, said microprocessor having a maximum operating rate higher than the rate of said clock; and

an interface circuit for interfacing said microprocessor to said disc controller, said interface circuit employing a circular buffer having a plurality of elements to be written to, said circular buffer maintaining a one entry gap between ones of said elements which are being written to by said microprocessor and those of said elements which are being operated on by said clock;

whereby said interface circuit allows a limited number of back-to-back writes of said microprocessor with zero wait states of said microprocessor at the maximum rate of said microprocessor;

whereby said interface circuit allows an unlimited number of writes of said microprocessor with zero wait states of said microprocessor at a rate equal to or less than the rate of said clock;

whereby said interface circuit provides a ready line to throttle back the writes of said microprocessor to a rate equal to the current rate, if the writes of said microprocessor occur at a rate faster than said clock.

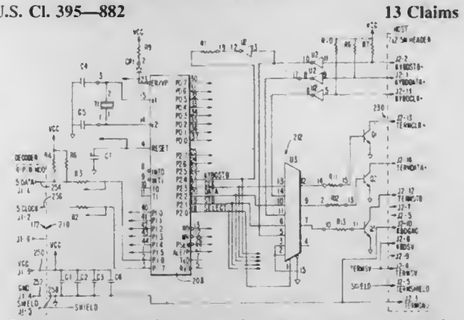
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**5,745,794**

**SYSTEM FOR CONVERTING SIGNALS INTO A PREDETERMINED DATA EXCHANGE FORMAT WITH PLUG-IN MODULAR CONNECTOR HAVING VOLTAGE, GROUND, DATA, AND CLOCK TERMINALS FOR A SCANNING HEAD**

**Paul R. Polonlewicz, East Setauket; Anthony D. Biuso, South Setauket, and Nicholas Buongervino, Hauppauge, all of N.Y., assignors to Symbol Technologies, Inc., Holtsville, N.Y.**

**Continuation of Ser. No. 443,851, May 18, 1995, abandoned.**
**This application Sep. 30, 1996, Ser. No. 723,721**
**Int. Cl.[6] G06F *13/00***
**U.S. Cl. 395—882** **13 Claims**



1. In a data processing system including a scanning head for electro-optically reading and decoding coded symbols into digital decoded signals for transmission along a head cable connected to the head, and a selected one of a plurality of host devices having a data processor with a predetermined data exchange format for receiving and transmitting data with peripheral equipment, an independent interface arrangement for interconnecting the selected host device and the scanning head in a condition of use, comprising:

first connection means for detachable connection to the selected host device;

second connection means for detachable connection to the head cable, said second connection means being a plug-in modular connector having a voltage terminal for connection to a power source, a ground terminal for connection to ground a data terminal for connection to a serial data output of the scanning head, and a clock terminal for connection to a clock line of the scanning head;

conversion means connected to both connection means, said conversion means including a microprocessor operative for controlling a communications circuit operative for converting the digital decoded signals from the scanning head into digital data signals having a format compatible with the predetermined data exchange format of the selected host device; and

a housing for containing the conversion means at a location external to the scanning head and the selected host device, said housing and both connection means being mechanically interconnected as a portable, unitary assembly separate from the scanning head and the selected host device when not in said condition of use.

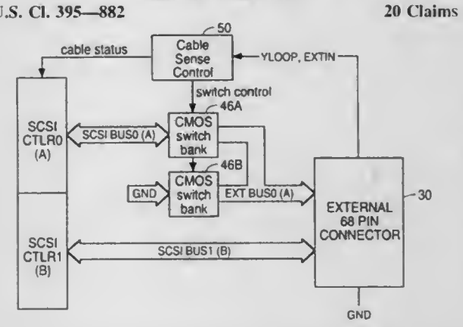


**5,745,795**

**SCSI CONNECTOR AND Y CABLE CONFIGURATION WHICH SELECTIVELY PROVIDES SINGLE OR DUAL SCSI CHANNELS ON A SINGLE STANDARD SCSI CONNECTOR**

**Victor Pecone, and Jay Lory, both of Austin, Tex., assignors to Dell USA, L.P., Round Rock, Tex.**

**Continuation of Ser. No. 352,254, Dec. 8, 1994, abandoned.**
**This application Nov. 4, 1996, Ser. No. 743,091**
**Int. Cl.[6] G06F *13/00***
**U.S. Cl. 395—882** **20 Claims**




1. A computer system including a connector which can support either one or two small computer systems interface (SCSI) channels, comprising:

a connector which is adapted to receive either a standard single channel SCSI cable or a dual channel SCSI cable;

a first SCSI controller coupled to said connector which provides first SCSI signals to a first plurality of pins of said connector;

a second SCSI controller which generates second SCSI signals; and

switching logic coupled to said connector and said second SCSI controller which receives said second SCSI signals and selectively provides said second SCSI signals to a second plurality of pins of said connector if said dual channel SCSI cable is detected, said second SCSI signals being provided to said second plurality of pins concurrently with said first SCSI signals from said first SCSI controller.

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**5,745,796**

**METHOD FOR COMPACTING AND STORING DATE INFORMATION BY CONVERTING ALPHANUMERIC DATA INTO BASE ELEVEN NUMBERS WHICH CONSISTS OF NUMBERS AND CHARACTERS REPRESENTATIVE OF UNKNOWN DIGITS**

**Daniel W. Hancock, Culver City, Calif., assignor to Adventures in Ancestry, Inc., Culver City, Calif.**

**Filed Apr. 7, 1995, Ser. No. 418,405**
**Int. Cl.[6] G06F *13/00***
**U.S. Cl. 395—885** **4 Claims**

| Year Input | Base eleven Value | Binary Value |
|---|---|---|
| 0??? | $(1000)_{11}$ | 0000000000001 |
| 0?? | $(100A)_{11}$ | 0000000001010 |
| 0?9 | $(10AA)_{11}$ | 0000001111001 |
| 6065 | $(7176)_{11}$ $=[(AAA)_{11}$ $+(8191)_{10}$ | 1111111111111 |

1. A method for compacting and storing date information in a memory of a data processing system comprising the steps of:

entering alphanumeric data corresponding to a date year, wherein the date year data thus entered comprises a character set corresponding to the numerals 0–9 and a character representative of an unknown digit;

converting the entered alphanumeric data to a corresponding base eleven number;

converting said base eleven number to a corresponding binary number for compaction; and

storing said compacted binary number in a data field withing said memory.

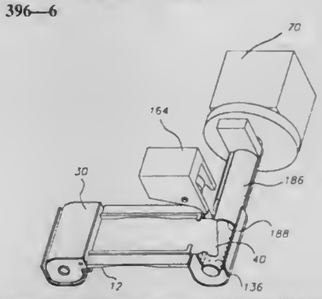
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**5,745,797**

**CAMERA ASSEMBLY USING MANDREL TO ROLL FILM IN CHAMBER**

**Joseph A. Watkins, Rochester; Jude A. SanGregory, Spencerport; Duane B. Kirk, Hilton, and Mark D. Garlock, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Apr. 21, 1997, Ser. No. 840,482**
**Int. Cl.[6] G03B *17/02***
**U.S. Cl. 396—6** **31 Claims**




23. A camera assembling apparatus, for use with a camera frame assembly including a frame having a cartridge chamber, a supply chamber, and an intermediate section between said chambers, and a film cartridge disposed in said cartridge chamber, said film cartridge having a case and a filmstrip; said apparatus comprising:

a receiver for the camera frame assembly, said receiver defining sites for said chambers, said openings and said intermediate section;

means for transporting a leading portion of the filmstrip from said film cartridge site to said supply chamber site;

a mandrel having an axis of rotation;

a guide coaxial with said mandrel;

said mandrel and said guide each being independently displaceable relative to said supply chamber site along said axis of rotation, between a non-use position displaced from said supply chamber site and a use position within said supply chamber site, said guide in said use position being disposed to curl said leading portion about said mandrel; and

a mandrel drive for rotating said mandrel about said axis of rotation.

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**5,745,798**

**ELECTRONIC APPARATUS**

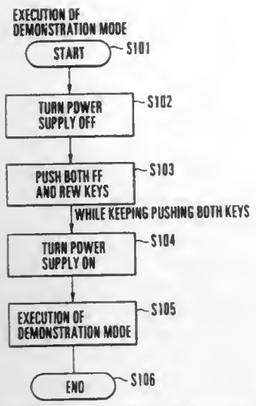
**Masahide Hirasawa, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 22, 1996, Ser. No. 635,704**
**Claims priority, application Japan, Apr. 27, 1995, 7-104021; May 31, 1995, 7-133737**
**Int. Cl.[6] G03B *17/00***
**U.S. Cl. 396—51** **23 Claims**

1. An electronic apparatus arranged to permit switching between a first control mode for an image sensing operation and a second control mode for for a demonstration operation, comprising:

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monitor means for permitting recognition by visual sensation of an operating state of said electronic apparatus;

detecting means for detecting that an operator of said electronic apparatus is viewing said monitor means; and

control means for selectively switching and effecting the first control mode and the second control mode on the basis of an output of said detecting means.

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**5,745,799**

**IMAGE BLUR PREVENTION APPARATUS**

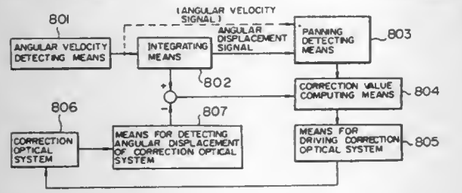
**Tsuyoshi Morofuji, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 980,615, Nov. 23, 1992, abandoned. This application Sep. 19, 1994, Ser. No. 305,938**

**Claims priority, application Japan, Nov. 22, 1991, 3-332866**

**Int. Cl.[6] G03B** *17/00*

**U.S. Cl. 396—55** **32 Claims**




1. An apparatus adapted for a device having a direction of aiming and an image shake prevention device which prevents an image shake caused by a fluctuation, and which is used with a signal processing circuit that forms an annular displacement signal in accordance with an angular velocity signal corresponding to the fluctuation, said apparatus comprising:

a determination device which (1) detects whether the angular displacement signal crosses a predetermined value indicating non-displacement and (2) determines that an aiming direction changing operation for changing a direction of aiming of an object, the image of which is formed, is performed in accordance with a detection that the angular displacement signal does not cross the predetermined value.

**5,745,800**

**CAMERA SHAKE COMPENSATION DEVICE**

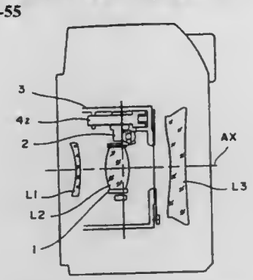
**Tetsuro Kanbara, Sakai, and Masayuki Ueyama, Takarazuka, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan**

**Filed Nov. 6, 1995, Ser. No. 553,977**

**Claims priority, application Japan, Nov. 8, 1994, 6-273757**

**Int. Cl.[6] G03B** *1/18;* **H04N** *5/228*

**U.S. Cl. 396—55** **18 Claims**




1. A camera shake compensation device for a photo-taking optical system, comprising:

a shake compensation optical element having an optical axis;

a first holding member that holds said shake compensation optical element in a plane that is substantially perpendicular to the optical axis;

a drive source that drives said first holding member in order to cause said shake compensation optical element to move such that the optical axis of the shake compensation optical element becomes eccentric with respect to an optical axis of the photo-taking optical system, said drive source arranged in the plane of the shake compensation optical element; and

a second holding member that holds said first holding member by means of said drive source so that the second holding element can move along a photo-taking optical axis together with said first holding member and drive source during focusing or zooming by said photo-taking optical system.

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**5,745,801**

**CAMERA HAVING A MOTION COMPENSATION DEVICE**

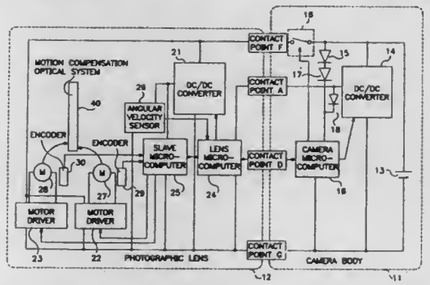
**Fumiya Taguchi, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Filed Sep. 10, 1996, Ser. No. 709,830**

**Claims priority, application Japan, Sep. 11, 1995, 7-232716; Sep. 14, 1995, 7-262586**

**Int. Cl.[6] G03B** *5/00*

**U.S. Cl. 396—55** **20 Claims**




1. A camera having a photographic lens for producing an image of a photographic subject and a camera body, attached to the photographic lens, for receiving the image from the photographic lens, the camera comprising:

a motion detection unit to detect motion of one of the photographic lens and the camera body and, in response, generate operating instructions;



a motion compensation unit to move the optical axis of the photographic lens in a direction to negate the motion detected by said motion detection unit in response to the operating instructions;

a communication unit to transmit the operating instructions from said motion detection unit to said motion compensation unit;

a monitoring unit to monitor the operating instructions and determine whether the operating instructions are unidentifiable, and thereby determine whether an anomaly exists; and

an electric supply unit to stop operation of said motion compensation unit in response to receiving an indication that the anomaly exists in the operating instructions.

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**5,745,802**

**CAMERA WITH VIBRATION COMPENSATION DEVICE HAVING ANTI-VIBRATION LENS URGING MECHANISM AND FEED SCREW MECHANISM**

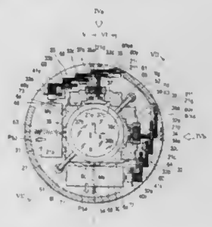
**Yoshio Imura, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 702,843, Aug. 27, 1996, abandoned, which is a continuation of Ser. No. 564,918, Nov. 30, 1995, abandoned, which is a division of Ser. No. 377,728, Jan. 25, 1995, abandoned. This application Apr. 25, 1997, Ser. No. 847,636**

**Claims priority, application Japan, Apr. 27, 1994, 6-090307; Apr. 27, 1994, 6-090324**

**Int. Cl.[6] G03B** *17/00*

**U.S. Cl. 396—55** **13 Claims**



1. A lens apparatus comprising:

an optical system which is shiftable to compensate for vibrations affecting the lens apparatus;

a first shift mechanism which shifts the optical system along a first axis; and

a first urging mechanism which provides an urging force along the first axis to urge the optical system and to assist the first shift mechanism in shifting the optical system, the urging force of the first urging mechanism being approximately 1.5 to 5 times the weight of the optical system.

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**5,745,803**

**VARIABLE ZOOM LENS HOOD**

**Naoki Ito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 626,546, Apr. 2, 1996, abandoned. This application Apr. 28, 1997, Ser. No. 841,753**

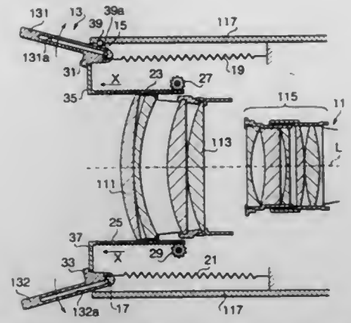
**Claims priority, application Japan, Apr. 5, 1995, 7-104837**

**Int. Cl.[6] G03B** *17/00;11/04*

**U.S. Cl. 396—83** **38 Claims**

1. A lens hood device for a zoom lens of a camera, said zoom lens of said camera having a zoom lens drive for driving said zoom lens between a plurality of zooming positions, each zooming position having a corresponding focal length of said zoom lens, comprising:

a variable position lens hood including at least one hood member, said at least one hood member being continuously extendable from said zoom lens and swingable with respect to an optical axis of said zoom lens;




first guiding means for guiding said at least one hood member to extend from said zoom lens in a direction of the optical axis of said zoom lens;

second guiding means for guiding said at least one hood member to swing away from the optical axis of said zoom lens to a predetermined opening angle;

driving means for driving said first guiding means and said second guiding means; and

control means for controlling said drive means to selectively extend and swing said at least one hood member, said control means comprising:

means for sensing said zooming position of said zoom lens drive;

extension control means for controlling said drive means to extend said at least one hood member to a hood position corresponding to said sensed zooming position, each hood position having a corresponding zooming position of said zoom lens;

swinging control means for controlling said drive means to swing said at least one hood member away from the optical axis of said zoom lens to an opening angle corresponding to said sensed zooming position, each opening angle having a corresponding zooming position of said zoom lens; and

means for selectively driving one of said extension control means and said swinging control means according to said sensed zooming position.

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**5,745,804**

**AUTOMATIC FOCUS DEVICE**

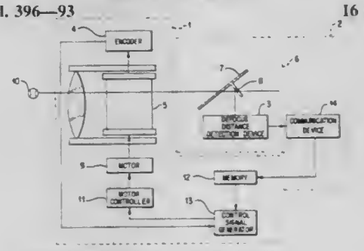
**Toru Iwane, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 441,936, May 16, 1995, abandoned. This application Dec. 11, 1996, Ser. No. 763,341**

**Claims priority, application Japan, May 31, 1994, 6-154109**

**Int. Cl.[6] G03B** *3/00*

**U.S. Cl. 396—93** **16 Claims**




1. An automatic focus device comprising:

a focus lens,

a focus lens drive actuator coupled to the focus lens such that the focus lens is moved according to a drive signal, and

a controller sending a non-linear drive signal to the focus lens drive actuator, detecting a position of the focus lens and detecting a distance the focus lens must move to focus an image on a composition plane.

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wherein the controller non-linearly controls the focus lens drive actuator, the controller controls the focus lens drive actuator based on a non-linear function.

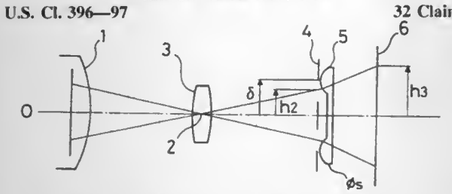
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**5,745,805**

## FOCUS DETECTING DEVICE

**Noriyuki Iyama, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed May 9, 1994, Ser. No. 239,535**
**Claims priority, application Japan, May 14, 1993, 5-113197**
**Int. Cl.[6] G03B** *3/00;13/36*
**U.S. Cl. 396—97** **32 Claims**




1. A focus detecting device for cameras, comprising:
a photographic lens;
a condenser lens disposed adjacent to a preset imaging plane of said photographic lens;
an aperture stop having a pair of aperture arranged with sufficient space for ensuring focus accuracy;
a reimaging lens having a pair of lens elements arranged to correspond to individual apertures;
a photoelectric converting means,
having two light beams which pass through different areas of said photographic lens being received by said photoelectric converting means, a phase difference between the two light beams being detected from intensity distribution of light on a light-receiving surface of said photoelectric converting means so that a focusing state of said photographic lens can be recognized; and
wherein said focus detecting device satisfies the following condition:

$$0.67 \leqq h_2/\delta \leqq 0.87$$

where $h_2$ is a distance from an optical axis of said condenser lens to a centroidal position of an aperture of said aperture stop and $\delta$ is a distance from the optical axis of said condenser lens to an optical axis of said reimaging lens.

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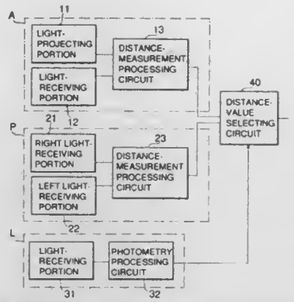
**5,745,806**

## DISTANCE MEASURING APPARATUS

**Tatsuo Saito, Saitama, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan**

**Filed Jun. 11, 1996, Ser. No. 661,547**
**Claims priority, application Japan, Jun. 15, 1995, 7-149141; Jun. 15, 1995, 7-149144; Jun. 15, 1995, 7-149151**
**Int. Cl.[6] G03B** *13/20;13/18*
**U.S. Cl. 396—106** **12 Claims**

2. A distance measuring apparatus comprising:
first distance measuring means of an active method for projecting distance measuring light on an object to calculate a distance to the object based on a condensed position of reflected light reflected by the object;
second distance measuring means of a passive method for receiving natural light reflected by the object through two optical systems to calculate the distance to the object based on two optical images obtained through the respective optical systems;
distance value selecting means for selecting and outputting distance measurement results obtained by one of said first and second distance measuring means, wherein said distance-value selecting means further comprises selecting means for




selecting the distance measurement result of said second distance measuring means when said detecting means detects setting of the self-timer mode; and
detecting means for detecting setting of a self-timer mode.

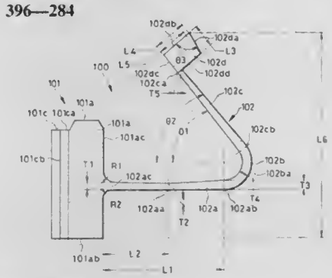
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**5,745,807**

## SHEET FILM PACK

**Taro Okutsu; Katsumasa Okada; Masafumi Fukugawa, and Yoshio Hara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Division of Ser. No. 679,711, Jul. 12, 1996. This application Nov. 20, 1996, Ser. No. 752,794**
**Claims priority, application Japan, Jul. 14, 1995, 7-178813; Jul. 14, 1995, 7-201598**
**Int. Cl.[6] G03B** *17/36;17/26*
**U.S. Cl. 396—284** **8 Claims**




1. A sheet film pack comprising:
a pack housing containing a plurality of sheet film units in a stack therein;
a counter disc held in a cavity of said pack housing so as to be rotated stepwise by an external counter advancing mechanism to indicate the number of sheet film units exposed in said sheet film pack; and
a pressing member having a stem portion and a spring arm extending from a vertical side of said stem portion and having a curved portion and a free distal end, said pressing member being mounted on said counter disc in said cavity with said spring arm compressed in a vertical direction to apply a pressure to said counter disc, said spring arm having different cross-sectional areas in different portions thereof so that a substantially equal stress may be set up in the different portions of said spring arm under the compressed condition, and wherein said curved portion of said spring arm has a larger cross-sectional area than other portions of said spring arm.



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**5,745,808**

## CAMERA EXPOSURE CONTROL SYSTEM USING VARIABLE-LENGTH EXPOSURE TABLES

**Anthony L. Tintera, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Nov. 30, 1995, Ser. No. 565,371**
**Int. Cl.[6] G03B** *7/097*
**U.S. Cl. 396—236** **17 Claims**

'AUTO' MODE EXPOSURE PROGRAM USING VARIABLE-LENGTH EXPOSURE TABLE

| EV (IN 1/100 EV) | EXPOSURE TIME (STEPS)* | APERTURE STEP | GAIN STEP |
|---|---|---|---|
| 1248 | 358 | 5 | 0 |
| 1178 | 357 | 4 | 0 |
| 1147 | 356 | 4 | 1 |
| 1120 | 358 | 4 | 2 |
| 1098 | 357 | 4 | 3 |
| 1078 | 357 | 4 | 4 |
| 1062 | 357 | 4 | 5 |
| 1047 | 356 | 4 | 6 |
| 884 | 460 | 4 | 7 |
| 965 | 357 | 3 | 7 |
| 922 | 356 | 2 | 7 |
| 890 | 358 | 1 | 7 |
| 882 | 356 | 0 | 7 |
| 859 | 358 | 0 | 7 |
| 800 | 460 | 0 | 8 |

*CALCULATED DURING RUNTIME

1. A photographic camera including a photosensitive image receiver for generating an image, said camera comprising:
an optical system for focusing incident light representative of the image upon the receiver;
an exposure level determination section responsive to the incident light for generating a measured exposure value;
an exposure table containing values that regulate at least one photographic acquisition parameter that controls the image, said table including a sequence of table entries for exposure values and corresponding values of at least one of an optical aperture value and a receiver gain value that: provide for each table entry a correct image exposure for the corresponding exposure value, wherein the sequence of table entries are selected such that increments between the exposure values represented in the table are variable in length, thereby providing a continuous series of said at least one of the optical aperture values and gain values represented in the table; and
an exposure control section for accessing a table entry based on the measured exposure value in order to regulate the photographic acquisition parameters of the image.

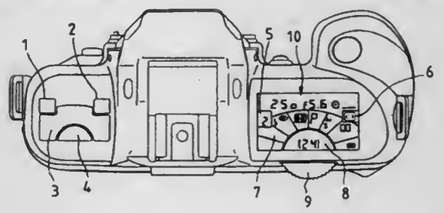
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**5,745,809**

## CAMERA WITH CORRESPONDINGLY SHAPED OPERATION MEMBERS AND DISPLAY AREAS

**Nobuya Kawahata, Yokosuka, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 357,197, Dec. 13, 1994, abandoned. This application Sep. 6, 1996, Ser. No. 709,114**
**Claims priority, application Japan, Dec. 16, 1993, 5-317029; Dec. 27, 1993, 5-330458**
**Int. Cl.[6] G03B** *17/18;17/00*
**U.S. Cl. 396—287** **10 Claims**




1. A camera, comprising:
a plurality of display areas forming an LCD device for displaying control contents of said camera, said display areas including at least two different shapes; and
an operation section formed of operation members formed in said at least two different shapes, such that the shapes of said display areas respectively correspond to the shapes of corresponding ones of said operation members.

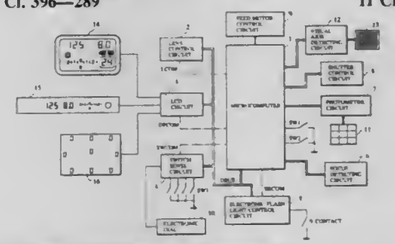
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**5,745,810**

## IMAGE TAKING APPARATUS

**Hiroshi Matsushima, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 327,401, Oct. 21, 1994, abandoned. This application Mar. 17, 1997, Ser. No. 823,876**
**Claims priority, application Japan, Oct. 29, 1993, 5-292479**
**Int. Cl.[6] G03B** *7/28;17/20*
**U.S. Cl. 396—289** **11 Claims**



1. An image taking apparatus comprising:
an image recording device that records an image of an object;
a finder through which a user views said object, said finder having a field of view;
a photometry device that divides an area in the field of view of said finder into a plurality of divided areas and detects a luminance of each of said plurality of divided areas;
a detecting device that detects a specific one of the plurality of divided areas which includes a visual axis of a user; and
a display device that respectively displays in each of the plurality of divided areas a difference between the luminance of each of said plurality of divided areas and the luminance of the specific one of the plurality of divided areas.

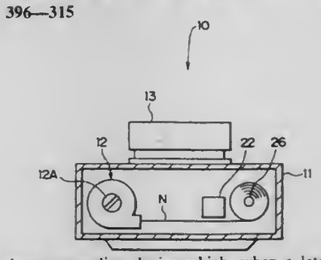
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**5,745,811**

## IMAGE RECORDING DEVICE, DEVELOPING DEVICE AND IMAGE RECORDING SYSTEM

**Yoshiharu Okino, and Masahiro Asami, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Mar. 21, 1997, Ser. No. 823,311**
**Claims priority, application Japan, Mar. 27, 1996, 8-072913**
**Int. Cl.[6] G03B** *17/24;* **G03D** *13/00;15/04*
**U.S. Cl. 396—315** **19 Claims**




1. An image recording device which, when a latent image is formed by exposure in a frame on a silver halide photosensitive material, records optically recognizable information relating to

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exposure at a position corresponding to the frame by light of an exposure amount which is sufficient to generate a silver image without developing.

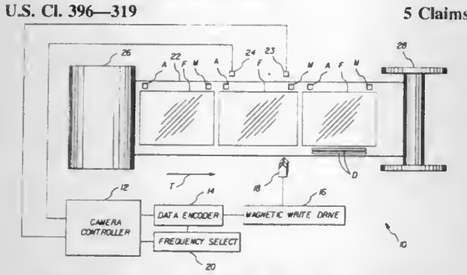
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**5,745,812**

## METHOD AND APPARATUS FOR RECORDING DATA ON PHOTOGRAPHIC FILM IN A LOW COST CAMERA

**Paul Lee Taillie, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Apr. 16, 1996, Ser. No. 632,989**
**Int. Cl.[6] G03B** *17/24*
**U.S. Cl. 396—319** **5 Claims**




1. A method of recording digital data blocks on photographic film in a camera, the data blocks being recorded in elongated tracks during a predetermined length of transport of the film at a film transport velocity falling within a range of possible film transport velocities, the method comprising the steps of iterative recording of the same data block in an elongated track and recording each same data block in said track at a respectively different data recording frequency each time independent of film transport velocity.

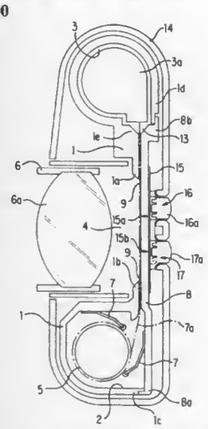
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**5,745,813**

## CAMERA PROVIDED WITH A REAR SURFACE SWITCH

**Noriyasu Kotani, Tokyo; Kiyosada Machida, Urawa; Minoru Katoh; Junichi Omi, both of Kawasaki, and Hiroshi Wakabayashi, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Filed Apr. 22, 1996, Ser. No. 635,645**
**Claims priority, application Japan, Apr. 21, 1995, 7-097297**
**Int. Cl.[6] G03B** *17/00*
**U.S. Cl. 396—440** **9 Claims**



1. A camera for use with film and having a film exposure region, comprising:
a pressure plate having a rear that maintains the film in a substantially flattened alignment within the film exposure region of the camera;
a cover that encloses the rear of the pressure plate;
a switch that includes a movable operational member that protrudes from the cover; and
an electrical conductive member at the rear of the pressure plate;
whereby an electrical signal is output in accordance with the movement of the operational member, and operational force resulting from the movement of the operational member is supported by said pressure plate.

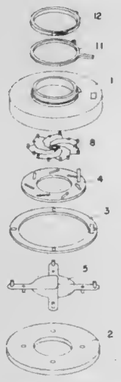
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**5,745,814**

## CAMERA LENS SHUTTER UNIT HAVING A STRUCTURE WHICH REDUCES THE SHUTTER UNIT THICKNESS

**Hideki Kanbayashi, Kawasaki; Kenji Tazaki, Mito, and Masanori Hasuda, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Filed May 29, 1996, Ser. No. 654,749**
**Claims priority, application Japan, May 29, 1995, 7-153893; Jun. 23, 1995, 7-180982**
**Int. Cl.[6] G03B** *9/08*
**U.S. Cl. 396—460** **22 Claims**



21. A drive device to drive members for covering an exposure aperture, comprising:
a first member to cover the exposure aperture;
a first circular cam to drive the first member;
a second member to cover the exposure aperture;
a second circular cam to drive the second member,
wherein the one of the first circular cam and the second circular cam has an inner diameter which is larger than an outer diameter of the other cam.

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**5,745,815**

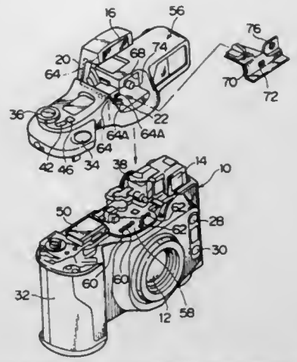
## CAMERA COVER

**Nobuhiro Aoki, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan**

**Filed Jun. 28, 1996, Ser. No. 672,921**
**Claims priority, application Japan, Jun. 28, 1995, 7-162089**
**Int. Cl.[6] G03B** *15/03;17/02*
**U.S. Cl. 396—541** **7 Claims**

1. A camera comprising:
a main body having electrical contacts on a surface thereof;
a camera cover having electrical parts with lead wires therein, said camera cover being attached over said surface of the main body and the electrical contacts thereof;
an opening formed in a portion of said cover at a position which corresponds to that of said electrical contacts and which provides access to the contacts for connecting of said lead wires to said contacts even with the cover being attached over said surface of the main body and the electrical contacts thereof;
and a lid member mountable in said opening for preventing foreign matter from entering the main body via said opening.





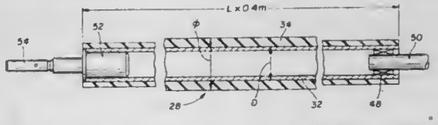
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**5,745,816**

## ROLLER FOR USE IN A PHOTOGRAPHIC SHEET MATERIAL PROCESSING APPARATUS

**Bartholomeus Verlinden, Tongeren; Bart Verhoest, Wilrijk; Jan Claes, Mortsel, and Ludo Van Schepdael, Herent, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium**

**Filed Dec. 12, 1996, Ser. No. 766,191**
**Claims priority, application European Pat. Off., Dec. 13, 1995, 95203466**
**Int. Cl.[6] G03B** *3/13*
**U.S. Cl. 396—614** **9 Claims**



1. In an apparatus for the wet processing of photographic sheet material, the provision of at least one small diameter, light weight roller having sufficient stiffness to avoid wrinkling of sheet material in use and enabling high processing quality to be achieved, said roller comprising a core (**32**) provided with a covering (**34**) of relatively soft material, having a length (L) of from 0.4 to 2.0 m, said core having a maximum diameter (D) of less than 0.04*L m, characterised by being so constructed that the deflection (Δ) of the roller (m) as measured by ASTM D 790M is given by the following boundary condition formula:

$$\Delta < \frac{L^3 C|W - LF|}{\kappa_{23} - \kappa_{24} D} + \frac{\kappa_{22} L^4}{G} \qquad (1)$$

wherein:

$$C = \frac{\kappa_3 D^3 - \kappa_4 D^2 + \kappa_5 D - \kappa_6}{\kappa_7 D^6 - \kappa_8 D^5 + \kappa_9 D^4 - \kappa_{10} D^3 + \kappa_{11} D^2 - \kappa_{12} D + \kappa_{13}};$$

$F = (\kappa_{14} T + \kappa_{15}) D + \kappa_{16} T^2 - \kappa_{17}$;
$G = \kappa_{18} D^4 - \kappa_{19} D^2 + \kappa_{20} D - \kappa_{21}$; and
$T$ = the maximum thickness of said relatively soft covering (m);
$W$ = the weight of the roller (kg);
and $\kappa_3 = 4.0 * 10^8$; $\kappa_4 = 4.2 * 10^6$; $\kappa_5 = 1.48 * 10^4$; $\kappa_6 = 17.5$; $\kappa_7 = 1.92 * 10^{18}$; $\kappa_8 = 2.02 * 10^{16}$; $\kappa_9 = 9.98 * 10^{13}$; $\kappa_{10} = 2.86 * 10^{11}$; $\kappa_{11} = 4.92 * 10^8$; $\kappa_{12} = 4.84 * 10^5$; $\kappa_{13} = 207$; $\kappa_{14} = 2.69 * 10^3$; $\kappa_{15} = 34.9$; $\kappa_{16} = 2.69 * 10^3$; $\kappa_{17} = 5.24 * 10^{-2}$; $\kappa_{18} = 1.2 * 10^9$; $\kappa_{19} = 5.4 * 10^6$; $\kappa_{20} = 1.08 * 10^4$; and $\kappa_{21} = 8.1$, $\kappa_{22} = 38.4$; $\kappa_{23} = 1.06 * 10^{-3}$; and $\kappa_{24} = 3.03 * 10^{-1}$.

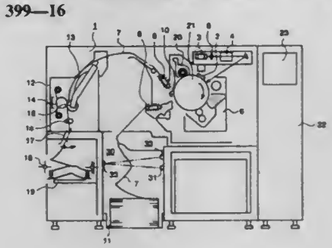
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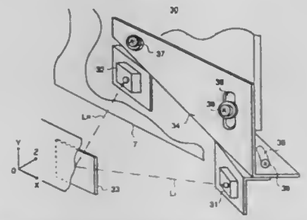
**5,745,817**

## ELECTROPHOTOGRAPHIC APPARATUS AND PAPER DETECTOR THEREOF AND PAPER DETECTING METHOD THEREOF

**Akihiko Yamazaki, Hitachinaka; Shuho Yokokawa, Mito; Kunitomo Takahashi, Hitachinaka; Youji Hirose, Mito, and Hidenori Iwanaga, Hitachinaka, all of Japan, assignors to Hitachi Koki Co., Ltd., Japan**

**Filed Nov. 7, 1996, Ser. No. 745,053**
**Claims priority, application Japan, Nov. 17, 1995, 7-299693**
**Int. Cl.[6] G03G** *15/00*
**U.S. Cl. 399—16** **8 Claims**





6. A paper detector for use in an electrophotographic apparatus comprising a light projector; a reflecting member reflecting a primary light beam emitted from said light projectors a light receiver positioned to receive a secondary light beam reflected by said reflecting member; and a holder for holding said light projector and said light receiver at predetermined positions in such a way that the installation angles of each of said light projector and said light receiver to said holder are arbitrarily variable, and an installation angle of said holder to electrophotographic apparatus is variable.

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**5,745,818**

## IMAGE FORMATION METHOD AND IMAGE FORMATION APPARATUS

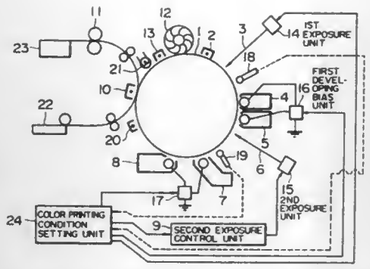
**Takao Kumasaka, Takahagi; Hisao Okada, Hitachi; Noboru Tokuyasu, Hitachi; Yuzuru Simazaki, Hitachi, and Susumu Tateyama, Hitachi, all of Japan, assignors to Hitachi, Ltd., and Hitachi Koki Co., Ltd., both of Tokyo, Japan**

**Filed Mar. 17, 1994, Ser. No. 214,302**
**Claims priority, application Japan, Mar. 17, 1993, 5-056749**
**Int. Cl.[6] G03G** *15/01*
**U.S. Cl. 399—40** **34 Claims**

1. An image formation method comprising:
a charging step for charging a surface of a latent image support to a predetermined potential;
an image exposing step for forming a charge latent image on said latent image support by image exposure;
a developing step for forming a plurality of toner images of a plurality of colors from said charge latent image with a plurality of developing means; and
a transferring step for collectively transferring said toner images of said colors to a to-be-transferred member;
wherein said image exposing step includes a plurality of image exposing steps;
wherein said charging step consists of a single charging step performed before all of said image exposing steps;

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wherein said developing step includes a plurality of developing steps;

wherein at least a first developing step of said developing steps is carried out after a first image exposing step of said image exposing steps to form a toner image area including at least a first toner image of said toner images of at least a first color of said colors; and

wherein at least one of said image exposing steps other than said first image exposing step is carried out after said at least a first developing step to expose at least a Portion of said toner image area formed by said at least a first developing step to shift a potential of said at least a portion of said toner image area, and to expose at least a portion of a background area on said latent image support to form at least one charge latent image for at least one of said colors other than said at least a first color.

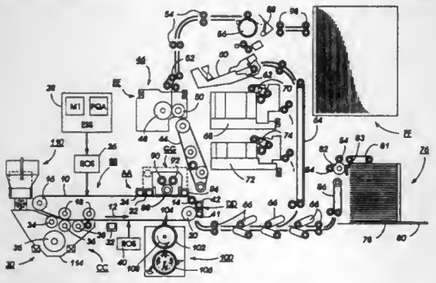
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**5,745,819**

## REPRODUCTION MACHINE HAVING IMAGE DELETIONS REDUCING CONTROL SYSTEM AND METHOD

**Patricia J. Donaldson, Pittsford, and Darryl L. Pozzanghera, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jan. 21, 1997, Ser. No. 787,187**
**Int. Cl.[6] G03G** *15/00;15/18*
**U.S. Cl. 399—43** **10 Claims**



1. A digital reproduction machine comprising:

(a) a movable image bearing member having an image bearing surface including image frame portions;

(b) means for electrostatically forming, in image frame portions of on said image bearing surface, latent solid image patterns, and latent halftone image patterns, each having image areas and background areas;

(c) a development housing containing developer material consisting of charged carrier beads, charged fragments of said charged carrier beads that undesirably cause image deletions in halftone toner images, and charged toner particles for developing image areas of image patterns to form solid toner images and halftone toner images;

(d) means for transferring the toner images onto sheets of paper;

(e) means for fusing the toner images on the sheets of paper to form hard copy images; and

(f) an electronic control subsystem including:

(i) means for distinguishing latent solid image patterns from latent halftone image patterns;

(ii) counting means for counting a number of solid toner images formed on said image bearing surface;

(iii) a memory area for storing usable control data, said memory area including a stress image stored data comprising an electrostatic halftone stress image pattern for electrostatically forming and developing on said image bearing surface; and

(iv) a programmed routine for automatically forming and developing a number of said halftone stress image pattern on said image bearing surface under certain machine operating conditions, so as to attract charged fragments of said charged carrier beads out of said development housing, thereby reducing halftone image deletions undesirably being caused by said carrier bead fragments.

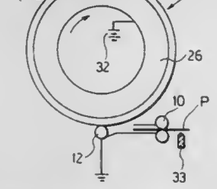
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**5,745,820**

## IMAGE FORMING APPARATUS WITH A POTENTIAL GENERATING DEVICE

**Yoshie Iwakura, Narashino, and Fumio Shimazu, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Oct. 18, 1996, Ser. No. 733,573**
**Claims priority, application Japan, Oct. 24, 1995, 7-275757; Jun. 12, 1996, 8-149632**
**Int. Cl.[6] G03G** *15/16;15/01*
**U.S. Cl. 399—45** **40 Claims**



1. An image forming apparatus comprising:

an image carrier on which a toner image is formed;

transfer means for transferring the toner image formed on said image carrier onto a transfer material by bringing the transfer material into contact with said image carrier, said transfer means having a dielectric layer and a first conductive layer laminated in this order from a contact surface side of the transfer material;

voltage applying means, connected to the conductive layer, for applying a predetermined voltage to the conductive layer; and

potential difference generating means, which is brought into contact with the surface of the dielectric layer through the transfer material and is made of at least a semiconductive body having elasticity, for generating a potential difference between the conductive layer to which the voltage is applied and the transfer material, said potential difference generating means being provided on an upper stream side of a feeding direction of the transfer material from a transfer position on the surface of the dielectric layer wherein said potential difference generating means is a grounded semiconductive belt at least including a semiconductive layer made of the semiconductive body having elasticity.

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**5,745,821**

**Patent Not Issued For This Number**

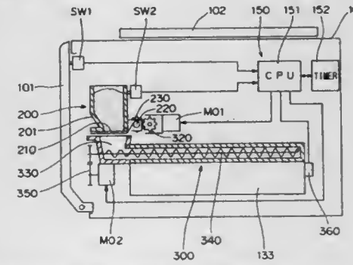


**5,745,822**

## IMAGE FORMING APPARATUS INCORPORATING MECHANISM FOR AUTOMATICALLY UNSEALING TONER CARTRIDGE

**Toshinori Nishimura; Hiroaki Ohashi; Mitsuharu Okada, and Tohru Katamoto, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan**

**Filed Jul. 22, 1996, Ser. No. 685,949**
**Claims priority, application Japan, Jul. 31, 1995, 7-195351**
**Int. Cl.[6] G03G** *15/08*
**U.S. Cl. 399—106** **14 Claims**




1. An image forming apparatus comprising:

a developing device;

a toner supplying device for supplying toner to the developing device, the toner supplying device being capable of removably mounting a toner cartridge containing toner and having a discharge opening for taking out the toner, the discharge opening being unsealably sealed;

unsealing means for unsealing the discharge opening of the toner cartridge mounted on the toner supplying device;

toner cartridge mounting detecting means for detecting that the toner cartridge is mounted on the toner supplying device;

unsealing detecting means for outputting a signal indicating whether the toner cartridge mounted on the toner supplying device has not yet been unsealed or already unsealed;

unsealing controlling means for operating the unsealing means in order to unseal the discharge opening of the toner cartridge, provided that the toner cartridge mounting detecting means detects that the toner cartridge is mounted, and the unsealing detecting means outputs a signal indicating that the toner cartridge has not yet been unsealed;

a door opened when the toner cartridge is removed or mounted;

opening/closing detecting means for detecting whether the door is in an opened state or a closed state; and

means for starting control of the unsealing means by the unsealing controlling means in response to a detection that the door is changed from the opened state to the closed state by the opening/closing detecting means.

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**5,745,823**

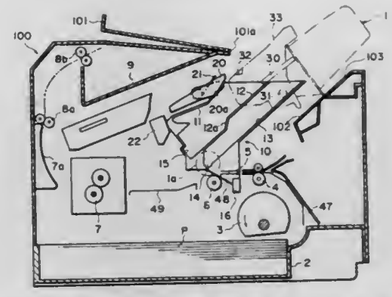
## PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS USABLE WITH THIS PROCESS CARTRIDGE

**Shinji Goto, Yokohama; Jun Saito, Kawasaki; Hiroyuki Ishii, Yokohama; Masao Ando, Yokohama; Yoshiaki Watanabe, Yokohama; Yuzo Isoda, Yokohama; Masahide Tanoue, Yokohama, and Ryukichi Inoue, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 25, 1992, Ser. No. 905,552**
**Claims priority, application Japan, Jun. 28, 1991, 3-183933; Feb. 28, 1992, 4-079243; Jun. 4, 1992, 4-144484**
**Int. Cl.[6] G03G** *21/16*
**U.S. Cl. 399—111** **183 Claims**

35. A method of mounting a process cartridge to an image forming apparatus, said method comprising the steps of:

providing a guiding means for guiding the process cartridge toward a predetermined mounting position;



providing an urging means for resiliently urging the process cartridge;

guiding the process cartridge toward the predetermined mounting position using the guiding means, while the process cartridge is being urged by the urging means; and

mounting the process cartridge to the predetermined mounting position while rotating the process cartridge.

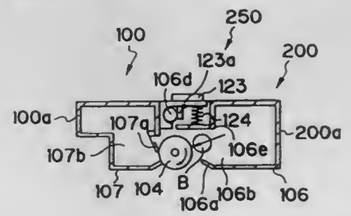
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**5,745,824**

## CONNECTING PART FEATURE FOR A PROCESS CARTRIDGE

**Masahiko Yashiro, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 545,168, Oct. 19, 1995, abandoned, which is a continuation of Ser. No. 432,588, May 1, 1995, abandoned, which is a division of Ser. No. 949,866, Nov. 23, 1992, Pat. No. 5,450,166. This application Feb. 13, 1997, Ser. No. 800,760**
**Claims priority, application Japan, Apr. 10, 1991, 3-77606; Apr. 10, 1992, 4-00450**
**Int. Cl.[6] G03G** *21/18*
**U.S. Cl. 399—113** **37 Claims**



1. A connecting part for assembling a process cartridge having first and second frames and which is detachably mountable on a main body of a recording apparatus, said connecting part comprising:

a base member;

a protrusion provided on said base member; and

a compression spring attachment portion disposed on said base member adjacent to said protrusion for attaching a compression spring thereto,

wherein a hole is formed in said base member for allowing penetration of a screw used for fastening said base member to the first frame of the process cartridge, and

wherein said protrusion locks a rotation shaft provided on the second frame to the first frame such that the first frame and the second frame are rockable relative to each other, the compression spring presses the second frame in a direction to urge a developing roller in the second frame toward a photosensitive member supported in the first frame, and said base member is fastened to the first frame.

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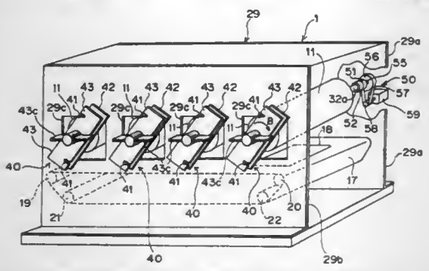


5,745,825

## COLOR IMAGE FORMING DEVICE

Yukinari Okawa, and Masato Kawashima, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Nov. 27, 1996, Ser. No. 753,599
Claims priority, application Japan, Dec. 22, 1995, 7-335533
Int. Cl.[6] G03G *15/01*
U.S. Cl. 399—117 22 Claims



1. A color image forming device wherein a color image is formed on a sheet-like medium by transferring sequentially a manifest image of each color developed on each of image forming carriers to said sheet-like medium, said color image forming device having a housing in which said image forming carriers are arranged so as to make rotational shafts of said image forming carriers substantially parallel, said image forming carriers being driven respectively and rotatably, comprising:

a plurality of positioning and fixing implements, each positioning and fixing implement independently and removably coupled to the front end of a corresponding rotational shaft of each of said image forming carriers in the axial direction, respectively, for positioning and fixing to said housing while the front end of said corresponding rotational shaft is supported rotatably; and

a plurality of couplings, each coupling independently and detachably coupling the base end of said corresponding rotational shaft of each of said image forming carriers with a corresponding drive system of a plurality of drive systems fixed to said housing in the axial direction.

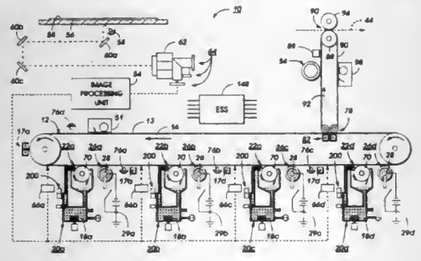
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5,745,826

## LIQUID TONER IMAGE CONDITIONING ROLL HAVING IMAGE PROTECTION SURFACE LAYER

Shu Chang, Webster; Lawrence Floyd, Jr., Rochester; Santokh S. Badesha, Pittsford; Donald S. Sypula, Penfield, and John F. Knapp, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1997, Ser. No. 785,108
Int. Cl.[6] G03G *15/10*
U.S. Cl. 399—237 8 Claims



1. A liquid immersion development (LID) reproduction machine comprising:

(a) a movable image forming member having an image forming surface defining a path of movement of said image forming member;

(b) means mounted along said path of movement for forming a latent image onto said image forming surface;

(c) development means mounted along said path of movement and containing liquid developer material consisting of a clear liquid carrier and solid charged toner particles at a desired concentration level for developing the latent image to create a visible low solids content liquid toner image;

(d) an intermediate transfer member mounted along said path of movement, downstream of said development means and into contact with said image forming surface for receiving a high solids content liquid toner image from said image forming surface; and

(e) an image protecting conditioning roll mounted along said path of movement downstream of said development means for conditioning the liquid toner image, said image protecting conditioning roll including:

(i) a rigid porous core;

(ii) an absorbent layer formed over said rigid porous core; and

(iii) an inelastic image protecting top outer layer formed over said absorbent layer for contacting and protecting an image being conditioned, by preventing undesirable offset and smearing of such image being conditioned.

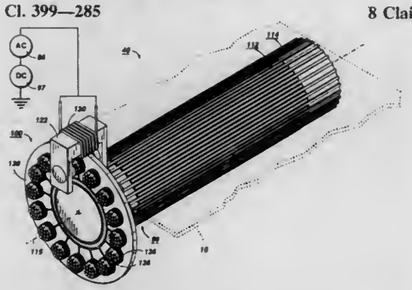
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5,745,827

## BUNDLED STEEL WIRE SED COMMUNICATOR SECONDARY CORES

Steven C. Hart, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1997, Ser. No. 829,645
Int. Cl.[6] G03G *15/08*
U.S. Cl. 399—285 8 Claims



1. A donor roll for transporting marking particles to an electrostatic latent image recorded on a surface, comprising:

a rotatably mounted body;

an electrode member mounted on said body;

a core external to said body and rotatable therewith said core comprising a plurality of wires; and

an electrically conductive material positioned on said core, said material electrically connected to said electrode member.

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5,745,828

**Patent Not Issued For This Number**

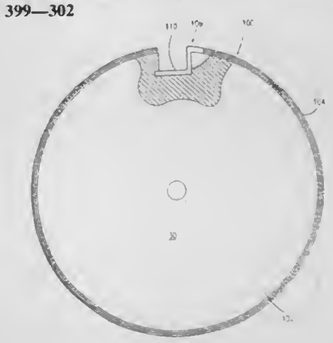


5,745,829

## IMAGING APPARATUS AND INTERMEDIATE TRANSFER BLANKET THEREFOR

Alon Gazit, Nes Ziona; David Idan, Rehoyot; Hanni Inbar, Holon; Ilan Kander, Ranaana; Eli Kritchman, Tel-Aviv, all of Israel; Benzion Landa, Edmonton, Canada; Amiran Lavon, Bat Yam, Israel; Moshe Levanon, Nes Tziona, Israel; Ishalau Lior, Nes Ziona, Israel; Jan Van Mil, Givat Nili, Israel; Yehuda Niv; Avner Schneider, both of Nes Ziona, Israel; Aron Shmaiser, Rishon Lezion, Israel, and Hani Younes, Mesholash, Israel, assignors to Indigo N.V., Maastricht, Netherlands

Continuation-in-part of Ser. No. 400,717, Aug. 30, 1989, Pat. No. 5,555,185, Ser. No. 115,803, Sep. 3, 1993, Pat. No. 5,572,274, Ser. No. 116,198, Sep. 3, 1993, Pat. No. 5,636,349, Ser. No. 128,149, Sep. 29, 1993, Pat. No. 5,592,269, Ser. No. 249,984, May 27, 1994, and Ser. No. 321,538, Oct. 11, 1994, abandoned, which is a continuation-in-part of Ser. No. 400,717, Ser. No. 115,803, Ser. No. 116,198, Ser. No. 128,149, and Ser. No. 249,984, which is a continuation of Ser. No. 17,410, Feb. 11, 1993, Pat. No. 5,335,054, which is a continuation of Ser. No. 777,008, Oct. 16, 1991, abandoned, which is a continuation of Ser. No. 393,631, Aug. 14, 1989, Pat. No. 5,089,856, which is a continuation-in-part of Ser. No. 306,065, Feb. 6, 1989, Pat. No. 4,984,025, said Ser. No. 400,717 is a continuation-in-part of Ser. No. 293,456, Jan. 4, 1989, abandoned, said Ser. No. 115,803 is a continuation of Ser. No. 446,877, Dec. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 293,456, said Ser. No. 116,198 is a continuation of Ser. No. 293,456. This application Jan. 11, 1995, Ser. No. 371,117
Claims priority, application Israel, Dec. 1, 1994, 111846
Int. Cl.[6] G03G *15/01*
U.S. Cl. 399—302 74 Claims



1. Imaging apparatus comprising:

an imaging surface having a toner image formed thereon; and

an intermediate transfer member, which receives the toner image from the imaging surface and from which it is subsequently transferred, comprising:

a drum having mounting recesses formed therein; and

an intermediate transfer blanket mounted on the drum, the blanket comprising:

a layered transfer portion having a transfer surface on one face thereof which receives the toner image; and

a mounting fixture, attached to only one edge of the layered transfer portion and adapted to mate with the mounting recesses in the drum,

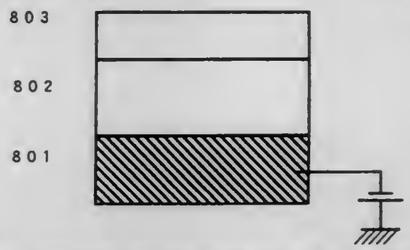
whereby the transfer blanket is removably mounted on the drum.

5,745,830

## INTERMEDIATE TRANSFER MEMBER FOR IMAGE FORMING APPARATUS

Toshimitsu Fujiwara, Kobe; Shuji Iino, Muko, and Hidetoshi Miyamoto, Takatsuki, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Dec. 1, 1995, Ser. No. 566,054
Claims priority, application Japan, Dec. 2, 1994, 6-299621
Int. Cl.[6] G03G *15/16*
U.S. Cl. 399—308 9 Claims




8. An intermediate transfer member for use in image forming apparatus which produce images by transferring a toner image formed on an image-bearing member to an intermediate transfer member, and transferring the toner image held on said intermediate member to a recording medium, wherein said intermediate transfer member comprises at least three layers of a conductive substrate, intermediate layer having the volume resistivity of $10^6$~$10^{10}$ Ωcm, and surface layer, and the volume resistivity of said surface layer is lower than the volume resistivity of said intermediate layer.

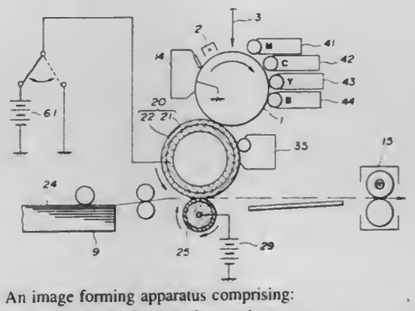
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5,745,831

## IMAGE FORMING APPARATUS HAVING AN INTERMEDIATE TRANSFER MEMBER AND METHOD OF FORMING OF IMAGE USING THE TRANSFER MEMBER

Akihiko Nakazawa, Shiroyama-machi; Hiroyuki Kobayashi, Fuji; Atsushi Tanaka; Tsunenori Ashibe, both of Yokohama, and Takashi Kusaba, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1995, Ser. No. 566,176
Claims priority, application Japan, Dec. 6, 1994, 6-301856
Int. Cl.[6] G03G *15/16*
U.S. Cl. 399—308 16 Claims



1. An image forming apparatus comprising:

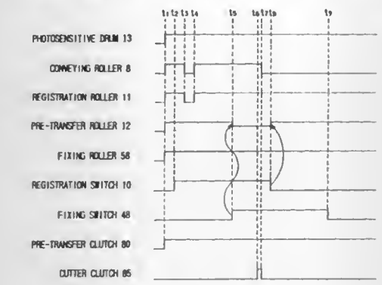
a first image supporting member; and

an intermediate transfer member comprising an outermost layer containing particles of conductive material, wherein a ratio of a maximum diameter to a minimum diameter of the particles is 4 or more, and the maximum diameter is 1 to 80 μm.

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**5,745,832**
**IMAGE RECORDING APPARATUS HAVING SPEED CONTROL MEANS**
**Katsuhiro Yoshiuchi, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan**
**Filed Dec. 30, 1996, Ser. No. 775,184**
**Claims priority, application Japan, Jan. 8, 1996, 8-001062**
**Int. Cl.[6] G03G *15/00***
**U.S. Cl. 399—384** **12 Claims**

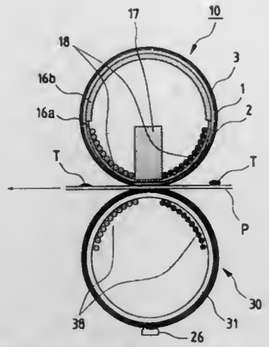



1. An image recording apparatus comprising:
a conveying path for guiding a paper sheet;
a rotating drum provided in a predetermined position on the conveying path and rotated at a predetermined peripheral speed, an image to be transferred being formed thereon;
a pre-transfer roller provided on the upstream side of the rotating drum in a direction of paper conveyance on the conveying path and rotated at the same peripheral speed as the peripheral speed of the rotating drum in order to convey the paper sheet to the rotating drum,
a fixing roller provided on the downstream side of the rotating drum in the direction of paper conveyance on the conveying path and rotated at the same peripheral speed as the peripheral speed of the rotating drum in order to convey the paper sheet and fix to the paper sheet the Image transferred to the paper sheet; and
peripheral speed control means for controlling the pre-transfer roller so that the peripheral speed of the pre-transfer roller is lower than the peripheral speed of the rotating drum over a predetermined time period after a leading end of the paper sheet reaches the fixing roller when the image is transferred to the paper sheet the length of which is longer than the distance of the conveying path from the pre-transfer roller to the fixing roller, and
wherein said predetermined time period is a time period elapsed from the time when the leading end of the paper sheet reaches the fixing roller until a trailing end of the paper sheet reaches a predetermined positional relationship with the pre-transfer roller.

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**5,745,833**
**IMAGE HEATING DEVICE**
**Atsuyoshi Abe, and Toru Saitou, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**
**Continuation of Ser. No. 600,518, Feb. 13, 1996, abandoned. This application May 19, 1997, Ser. No. 848,724**
**Claims priority, application Japan, Feb. 15, 1995, 7-016746; Feb. 7, 1996, 8-021152**
**Int. Cl.[6] G03G *15/20***
**U.S. Cl. 399—330** **37 Claims**

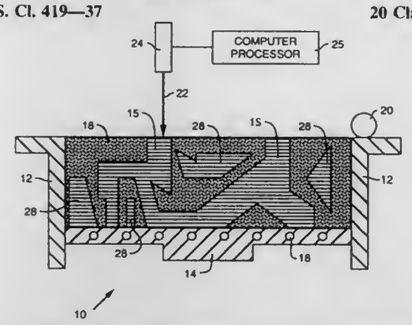
1. An image heating device comprising:
a movable member including an electroconductive layer and adapted to move with a recording member;
a magnetizing coil for generating a magnetic flux, provided continuously over an entire width of said movable member in a direction perpendicular to a moving direction of said movable member; and




a core member for guiding the magnetic flux,
wherein the magnetic flux generated by said magnetizing coil induces an eddy current in said movable member, thereby heating an image supported on the recording member by heat generated in said movable member by said eddy current, and
at least a part of said magnetizing coil is provided along said movable member not along said core member.

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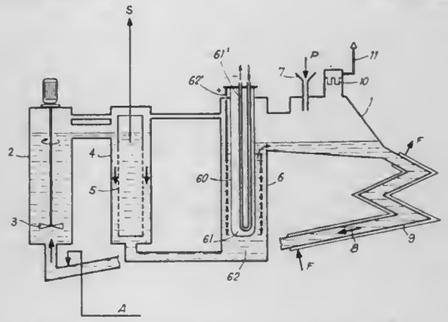
**5,745,834**
**FREE FORM FABRICATION OF METALLIC COMPONENTS**
**Clifford C. Bampton, Thousand Oaks; Robert Burkett, Simi Valley, and Hong-Son Ryang, Camarillo, all of Calif., assignors to Rockwell International Corporation, Thousand Oaks, Calif.**
**Filed Sep. 19, 1995, Ser. No. 530,770**
**Int. Cl.[6] B22F *1/00***
**U.S. Cl. 419—37** **20 Claims**




1. A method of selective sintering of a powder, comprising the steps of:
mixing powders of a base metal, a lower melting temperature metal, and a polymer binder to form a powder blend;
spreading a layer of said powder blend on a platform;
directing a beam of energy onto selected areas of said layer of said powder blend to melt said polymer binder, said polymer binder resolidifying to bind said metal powders in said selected areas; and
heating said selected areas of bound metal powders to eliminate said polymer binder and to densify said selected areas by transient liquid sintering and isothermal resolidification at a temperature sufficient to melt said lower melting temperature powder but not said base metal powder.



**5,745,835**
**PROCESS AND APPARATUS FOR DISSOLVING A MIXTURE OF OXIDES OF URANIUM AND OF PLUTONIUM**
**Marie-Hélène Mouliney, Voiron, and Claude Bernard, Saint Remy Les Chevreuse, both of France, assignors to Compagnie Generale Des Matieres Nucleaires, Velizy-Villacoublay, France**
**Filed Sep. 6, 1996, Ser. No. 711,951**
**Claims priority, application France, Sep. 6, 1995, 95 10428**
**Int. Cl.[6] B01F *1/00***
**U.S. Cl. 423—20** **14 Claims**

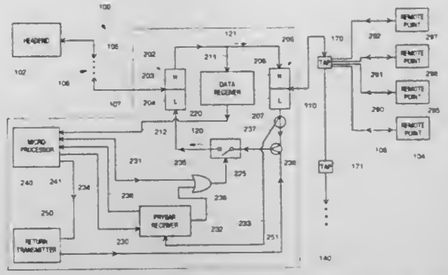



1. A process for dissolving a powder selected from the group consisting of a mixture of uranium and plutonium oxides, mixed oxides of uranium and plutonium and mixtures thereof, comprising the steps of:
continuously adding said powder and nitric acid to a chamber of a dissolving apparatus to obtain a solution comprising uranium oxide;
circulating the solution from the chamber through a circuit of said dissolving apparatus and passing a portion of the solution through a filter in the circuit;
removing at least a portion of the filtered solution containing dissolved uranium from the apparatus, while returning non-filtered, circulating solution containing non-dissolved plutonium oxide in suspension to the chamber, the rate of said removing being adjusted to maintain a constant concentration of uranium oxide in the circulating solution;
terminating said removing and said continuous adding, and adding a monovalent silver salt to the circulating solution;
generating divalent silver in situ in the circuit by electrolysis of the monovalent silver salt, divalent silver causing dissolution of the non-dissolved plutonium oxide in the circulating solution; and
removing a solution containing dissolved plutonium oxide from the apparatus.

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**5,745,836**
**UNDESIRABLE ENERGY SUPPRESSION SYSTEM IN A CONTENTION BASED COMMUNICATION NETWORK**
**Thomas H. Williams, Longmont, Colo., assignor to Cable Television Laboratories, Inc., Louisville, Colo.**
**Continuation-in-part of Ser. No. 522,630, Sep. 1, 1995. This application Feb. 8, 1996, Ser. No. 598,333**
**Int. Cl.[6] H04N *1/00;7/14***
**U.S. Cl. 455—5.1** **31 Claims**

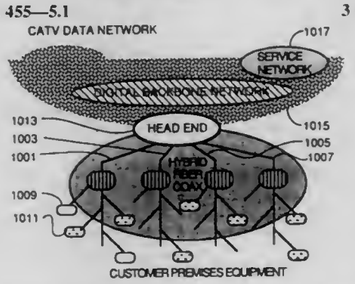
1. An undesirable energy suppression system in a contention based communication network wherein said contention based communications network includes a communication path between at least one remote point and a headend, said system comprising:
a gate means in said communication path wherein said gate means connects said communication path when said gate means is closed and said gate means disconnects said communication path when said gate means is open;
means for transmitting a signal on said communication path wherein said signal includes a gate enabling signal; and



means for closing said gate means only in response to said gate enabling signal.

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**5,745,837**
**APPARATUS AND METHOD FOR DIGITAL DATA TRANSMISSION OVER A CATV SYSTEM USING AN ATM TRANSPORT PROTOCOL AND SCDMA**
**Amir Michael Fuhrmann, Santa Clara, Calif., assignor to Terayon Corporation, Santa Clara, Calif.**
**Continuation-in-part of Ser. No. 588,650, Jan. 19, 1996, which is a continuation-in-part of Ser. No. 519,630, Aug. 25, 1995. This application Mar. 14, 1996, Ser. No. 616,071**
**Int. Cl.[6] H04N *7/173***
**U.S. Cl. 455—5.1** **3 Claims**




1. A process for transmitting ATM protocol format cells over a CATV network providing point-to-multipoint coupling between a head end modem and a plurality of customer premises equipment (hereafter CPE) modems for communicating with one or more peripheral devices coupled to each CPE modem, comprising:
receiving data bytes from one or more data sources directed to a plurality of destination software processes in execution on a plurality of computing devices coupled to a plurality of destination CPE modems;
converting said data so received into a plurality of ATM cells, each having payload data and a standard ATM cell header which includes a destination address identifying the destination software process to which the payload data is to be delivered, and each having a virtual link header which includes virtual link address data identifying the particular destination CPE modem to which said ATM cell is to be delivered;
encoding the data in said ATM cells so that said destination CPE modem can locate the beginning and end of each ATM cell directed to it by examining the data of the ATM cell itself;
encoding the data of each ATM cell with one or more synchronous code division multiplexing spreading code(s)(hereafter SCDMA code(s)) which are assigned to only the virtual link assigned to the destination CPE modem of the particular ATM cell being so encoded, each of the SCDMA codes assigned to a particular virtual link being mathematically orthogonal to all the other SCDMA codes, all said SCDMA codes defining an SCDMA code matrix, so as to generate SCDMA encoded data for every ATM cell;

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controlling modulation of one or more radio frequency carriers with said SCDMA encoded data to generate one or more RF signals carrying the data of all said ATM cells and transmitting said RF signals to all destination CPE modems;

receiving and demodulating said RF signals in each destination CPE modem to recover said SCDMA encoded data;

decoding said SCDMA encoded data using a decoding matrix which is the transpose of said SCDMA code matrix to recover all said ATM cell data in each destination CPE modem;

decoding said recovered ATM cell data in each destination CPE modem to locate the ATM cell boundaries in each said destination CPE modem;

in each destination CPE modem, comparing the virtual link address data in the virtual link header of each said ATM cell to the virtual link number assigned to that particular destination CPE modem, and, in each destination CPE modem, discarding any ATM cell not addressed to that particular CPE modem;

in each destination CPE modem, examining the destination address data in each ATM cell not discarded which identifies the particular destination software process to which the ATM cell is directed, disassembling the ATM cell and transmitting the payload data of the ATM cell to the destination software process to which the payload data is addressed.

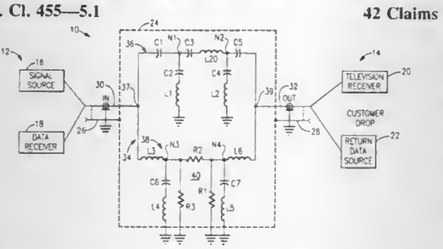
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**5,745,838**

## RETURN PATH FILTER

**Andrew F. Tresness, Manlius, and Martin L. Zelenz, DeWitt, both of N.Y., assignors to Tresness Irrevocable Patent Trust, Syracuse, N.Y.**

**Filed Mar. 14, 1997, Ser. No. 818,231**
**Int. Cl.[6] H04H** *1/00;* **H04N** *7/14*
**U.S. Cl. 455—5.1** **42 Claims**




1. An apparatus for controlling the return path loss in a two-way communication system, said apparatus comprising:

an input terminal and an output terminal;

forward path filter means, coupled to said input and said output terminals, for passing signals in a forward path frequency band of the communication system, said forward path filter means including a resonant circuit component; and

return path filter means, coupled to said input and said output terminals, for passing signals in a return path frequency band of the communication system, said return path filter means including a resonant circuit which is coupled to the resonant circuit component of said forward path filter means,

a combined resonant circuit being formed, at least in part, by the resonant circuit of said return path filter means and the resonant circuit component of said forward path filter means,

said return path filter means further including attenuator means for attenuating the signals in the return path frequency band as they pass through said return path filter means.

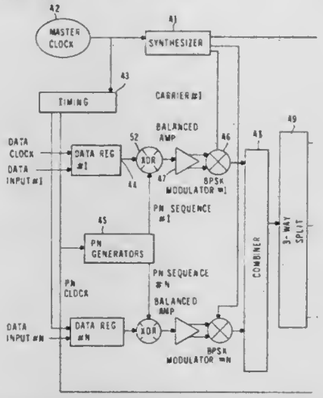
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**5,745,839**

## SATELLITE MULTIPLE ACCESS SYSTEM WITH DISTORTION CANCELLATION AND COMPRESSION COMPENSATION

**Daniel Lieberman, Washington, D.C., assignor to CD Radio, Inc., Washington, D.C.**

**Filed Sep. 1, 1995, Ser. No. 523,012**
**Int. Cl.[6] H04B** *1/62*
**U.S. Cl. 455—10** **27 Claims**




16. A multicarrier satellite communications system comprises at least one satellite and at least one transmitter at a generally terrestrial location that transmits a plurality of synchronous CDMA composite signal carriers to said at least one satellite, said signal carriers generating signal compression in said at least one satellite, said system also including means for generating and for adding to said signal carriers, at said terrestrial location, compression compensation signals that minimize said signal compression in said at least one satellite.

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**5,745,840**

## EQUALIZATION IN A SIMULCAST COMMUNICATION SYSTEM

**Stuart Hugh Gordon, Christchurch, New Zealand, assignor to Tait Electronics Limited, New Zealand**

**Continuation of Ser. No. 216,672, Mar. 22, 1994, abandoned. This application Dec. 8, 1995, Ser. No. 574,468**
**Int. Cl.[6] H04B** *7/005*
**U.S. Cl. 455—51.2** **8 Claims**



1. In a simulcast communication system having a control site, a plurality of base sites and at least one monitor site, a method of equalizing signal characteristics in transmission overlap regions between a series of adjacent base sites, comprising:



(a) transmitting a training signal from the control site to a first base site in the series, the first base site being associated with a first signal sampling means and a first signal equalizing means, from the first base site to a monitor site, and from the monitor site to a second signal sampling means associated with a second base site, to determine reference signal characteristics;

(b) transmitting the training signal from the control site to the second base site, from the second base site to the monitor site, and from the monitor site to the second sampling means associated with the second base site, to determine test signal characteristics;

(c) comparing the test signal characteristics with the reference signal characteristics and adjusting a signal equalizing means associated with the second case site to compensate for deviation of the test characteristics from the reference characteristics; and

(d) repeating steps (a), (b) and (c) generally using the second base site in step (b) as the first base site in a subsequent step (a) and using a third base site adjacent to the second base site in step (b) as the second base site in a subsequent step (b), each such third base site having associated third signal sampling means and third signal equalizing means, until signal characteristics have been substantially equalized in the transmission overlap regions between each pair of consecutive adjacent base sites in the series.

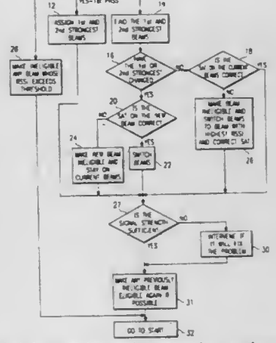
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**5,745,841**

## SYSTEM AND METHOD FOR CELLULAR BEAM SPECTRUM MANAGEMENT

**Douglas O. Reudink, and Mark Reudink, both of Bellevue, Wash., assignors to Metawave Communications Corporation, Redmond, Wash.**

**Filed May 20, 1996, Ser. No. 651,981**
**Int. Cl.[6] H04B** *15/00*
**U.S. Cl. 455—62** **80 Claims**




1. A method for continuously managing a plurality of antenna beams to service wireless communications in progress on one channel of a plurality of channels, said method comprising the steps of:

continuously monitoring signal reception conditions on ones of the antenna beams;

detecting commencement of a wireless communication on the channel, said wireless communication thereupon becoming a managed communication;

assigning ones of the antenna beams to the managed communication according to a regime of predetermined beam assignment rules, said regime responsive to currently monitored signal reception conditions in applying said beam assignment rules; and

periodically updating said beam assignments in accordance with the regime in light of subsequently monitored signal reception conditions including a comparison of at least one of said subsequently monitored signal reception conditions to a preselected threshold.

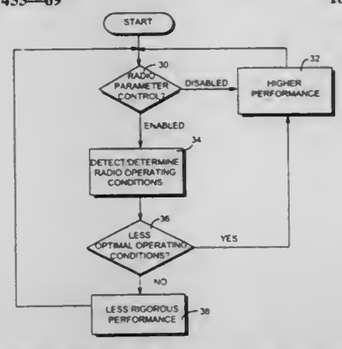
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**5,745,842**

## METHOD AND APPARATUS FOR CONTROLLING OPERATION OF A PORTABLE OR MOBILE BATTERY-OPERATED RADIOS

**Mark D. Priest, Rustburg, Va., assignor to Ericsson Inc., Research Triangle Park, N.C.**

**Division of Ser. No. 443,662, May 18, 1995. This application Mar. 14, 1997, Ser. No. 814,995**
**Int. Cl.[6] H04B** *1/00;7/00*
**U.S. Cl. 455—69** **18 Claims**




1. In a radio communications system wherein radio communications over radio frequency communications channels are coordinated from a base station having an associated geographical coverage area, a method for optimizing the performance of a portable or mobile battery-operated radio comprising the steps of:

establishing operating parameter values of the radio at various performance levels corresponding to particular radio operating conditions;

determining at the radio a current radio operating condition; and

adjusting the radio operating parameter value based on the determined radio operating condition,

wherein the operating parameter is a receiver settling time period during which a receiver in the radio changes to a different radio frequency communications channel such that as the current radio operating condition determined by the radio changes, the radio adjusts the receiver settling time period.

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**5,745,843**

## SELECTIVE CALL RECEIVERS WITH INTEGER DIVIDE SYNTHESIZERS FOR ACHIEVING FAST-LOCK TIME

**John David Wetters, Coral Springs, and Raul Salvi, Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg**

**Filed Aug. 4, 1995, Ser. No. 511,159**
**Int. Cl.[6] H04B** *1/50*
**U.S. Cl. 455—76** **9 Claims**

1. A selective call receiver for receiving and transmitting paging signals, comprising:

a transceiver having an integer divide synthesizer for achieving a fast lock time, the transceiver comprising:

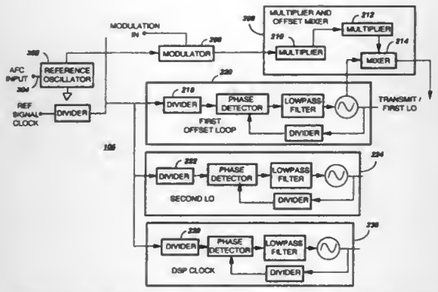
a reference oscillator for generating a low frequency reference signal in a direct injection path for deriving a time base signal;

a modulator coupled in the direct injection path for modulating the low frequency reference signal to generate a modulated reference signal;

a phase locked offset loop coupled to the direct injection path for dividing the time base signal to a low frequency signal

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derived from the reference signal to generate a fast lock time offset loop signal, the phase locked loop further comprises an integer divider that generates a low current drain feed back loop signal;

a multiplier coupled to the modulator for multiplying the modulated reference signal; and

a mixer coupled to the multiplier for receiving the modulated reference signal in the direct injection path and an output signal from the phase locked offset loop to generate an agile high frequency first local oscillator output signal and a modulated transmit carrier.

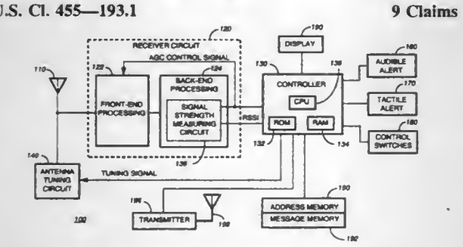
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**5,745,844**

**RECEIVER CONTROL IN A COMMUNICATION DEVICE BY ANTENNA DE-TUNING IN STRONG SIGNAL CONDITIONS, AND METHOD THEREFOR**

**Jonathan William Joseph Kromer, Roanoke, and Gregory Lewis Cannon, Keller, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Oct. 4, 1996, Ser. No. 720,887**
**Int. Cl.[6] H04B *1/18***
**U.S. Cl. 455—193.1** **9 Claims**




1. A communication device comprising:

an antenna for receiving a signal;

a receiver circuit having an input coupled to the antenna and an output, the receiver circuit demodulating the signal which is received by the antenna and having a signal strength measuring circuit for generating a signal strength indicator signal representing a strength of the signal received by the antenna;

a controller coupled to the receiver circuit for receiving as input the signal strength indicator signal and generating a tuning signal in response thereto; and

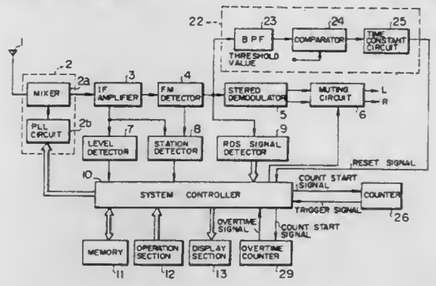
an antenna tuning circuit coupled to the controller and responsive to the tuning signal for tuning the antenna to a reduced gain level when the strength of the signal received by the antenna is indicative of strong signal conditions, wherein the controller comprises a micro-controller having a memory for storing a table of tuning signal voltages for tuning the antenna to a range of gain values at a given operating frequency dependent on the signal strength of the signal received by the antenna.

**5,745,845**

**RECEIVER WITH AUTOMATIC RECEIVING-STATION SWITCHING FUNCTION**

**Shoji Suenaga; Yuji Yamamoto; Toshihito Ichikawa, and Takashi Miyake, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed May 31, 1995, Ser. No. 454,676**
**Claims priority, application Japan, Jun. 6, 1994, 6-124009**
**Int. Cl.[6] H04B *1/16***
**U.S. Cl. 455—194.1** **6 Claims**




1. A receiver with an automatic receiving-station switching function for automatically switching a current receiving frequency from a reception frequency of a broadcast wave in reception to a reception frequency of a broadcast wave of another station, which is in a good reception condition, when a reception condition of the former broadcast wave becomes poor, said receiver comprising:

detection means for detecting a signal obtained by receiving a broadcast wave;

detection level detecting means for generating a reset signal when a level of the detected signal is higher than a threshold value;

reception condition detecting means for detecting deterioration of a reception condition of the received signal;

first timer means for starting measuring a first predetermined time when said deterioration of said reception condition is detected and for restarting measuring said first predetermined time in response to said reset signal during time measurement of said first predetermined time;

mute-ON instruction signal generating means for generating a mute-ON instruction signal when said first timer means finishes measuring said first predetermined time;

muting means, inserted in a low-frequency stage to which said detected signal is supplied, for becoming a signal cutoff state in response to said mute-ON instruction signal; and

means for activating said automatic receiving-station switching function after said muting means becomes said signal cutoff state.

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**5,745,846**

**CHANNELIZED APPARATUS FOR EQUALIZING CARRIER POWERS OF MULTICARRIER SIGNAL**

**Robert Evan Myer, Denville, and Jack Chi-Chieh Wen, Parsippany, both of N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.**

**Filed Aug. 7, 1995, Ser. No. 512,003**
**Int. Cl.[6] H04B *1/16***
**U.S. Cl. 455—209** **14 Claims**

1. An apparatus for processing a multi-carrier input signals, comprising:

a power splitter connected to receive said input signal, for splitting said input signal into a plurality of electrical paths;

a plurality of signal modifiers, with each one of said signal modifiers connected in one of said electrical paths and operable to isolate down-converted signal energy associated with a given carrier of said multi-carrier signal and to control said signal energy to within a predetermined power level range, wherein a plurality of signal modifier output signals are provided; and

a power combiner for combining said signal modifier output signals to provide a multi-carrier output signal with each carrier of said multi-carrier output signal being within a predefined power level range;

wherein each said signal modifier includes:

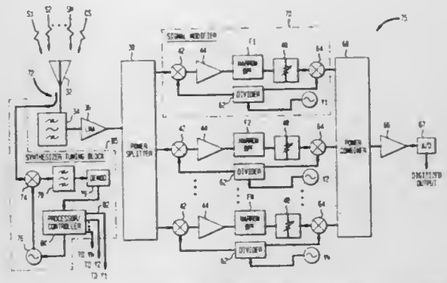
a tunable frequency synthesizer for providing a local oscillating (L.O) signal at a tunable frequency;

a down-converting mixer for mixing said multi-carrier input signal with said local oscillating signal to provide a multi-carrier intermediate frequency (IF) signal having a signal bandwidth at a translated frequency range of said given carrier;

a bandpass filter for passing a predetermined band of IF signal energy within said translated frequency range to provide a filtered IF signal; and

an automatic gain control (AGC) circuit coupled between said bandpass filter and said power combiner, for controlling the power level of said filtered IF signal to within said predetermined power level range to provide a level controlled IF output signal.





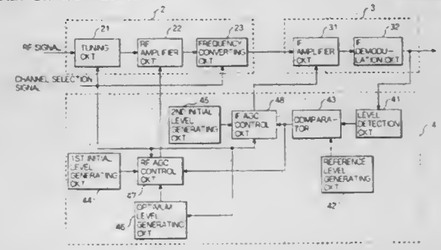
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**5,745,847**

**AUTOMATIC GAIN CONTROL CIRCUIT CAPABLE OF COMPENSATING VARIATION OF RECEPTION LEVEL WITH WIDE RANGE**

**Tomohide Matsuo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jul. 24, 1996, Ser. No. 686,090**
**Claims priority, application Japan, Jul. 27, 1995, 7-192240**
**Int. Cl.[6] H04B *1/06; 1/16***
**U.S. Cl. 455—234.1** **4 Claims**




1. An automatic gain control circuit comprising a level detection circuit for detecting a reception level by utilizing an output signal produced from a demodulation circuit of a television signal, said automatic gain control circuit producing an automatic gain control voltage signal according to said reception level and further comprising:

a reference level generating circuit for generating a reference voltage signal having a predetermined reference level;

a comparator for comparing said reception level with said predetermined reference level to produce a first level difference signal representative of a first level difference between said reception level and said predetermined reference level;

a first initial level generating circuit for generating a first initial voltage signal having a first initial level;

a second initial level generating circuit for generating a second initial voltage signal having a second initial level;

an optimum level generating circuit supplied with a channel selection signal designating a reception channel for generating a channel reference level signal having a preselected level that corresponds to the reception channel designated by said channel selection signal;

an RF AGC control circuit connected to said comparator, said first initial level generating circuit, and said optimum level generating circuit for delivering said first initial voltage signal, as an RF AGC voltage which serves as a part of said automatic gain control signal, during a predetermined time duration on reception of said channel selection signal or when power supply is turned to on, said RF AGC control circuit delivering a second level difference signal, as said RF AGC voltage, representative of a second level difference between said preselected level and said first level difference after lapse of said predetermined time duration; and

an IF AGC control circuit connected to said comparator and said second initial level generating circuit for delivering said second initial voltage signal, as an IF AGC voltage which serves as another part of said automatic gain control signal, during said predetermined time duration on reception of said channel selection signal or when said power supply is turned to on, said IF AGC control circuit delivering said first level difference signal, as said IF AGC voltage, after lapse of said predetermined time duration.

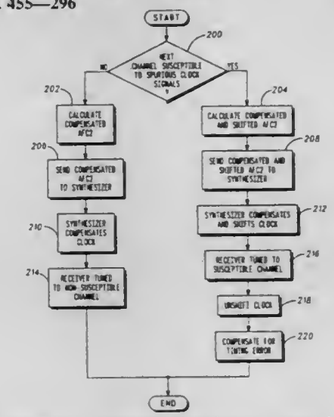
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**5,745,848**

**METHOD AND APPARATUS FOR ELIMINATING INTERFERENCE CAUSED BY SPURIOUS SIGNALS IN A COMMUNICATION DEVICE**

**John F. Robin, Westmont, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 4, 1996, Ser. No. 610,028**
**Int. Cl.[6] H04B *1/10***
**U.S. Cl. 455—296** **17 Claims**




1. A method for eliminating interference caused by spurious signals in communication signals communicated via a communication device on any one of a plurality of different channels, the communication device operating at a rate set by a system clock signal, the method comprising the steps of:

generating the system clock signal at a first frequency, the first frequency generating spurious signals on at least one of the plurality of different channels;

shifting the system clock signal by a first predetermined amount to a second frequency when the communication device is to be tuned to said at least one of the plurality of different

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channels so as to remove the spurious signals from said at least one of the plurality of different channels;

tuning the communication device to said at least one of the plurality of different channels; and

compensating the rate of the communication device when the communication device has been tuned to said at least one of the plurality of different channels to prevent timing error.

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**5,745,849**

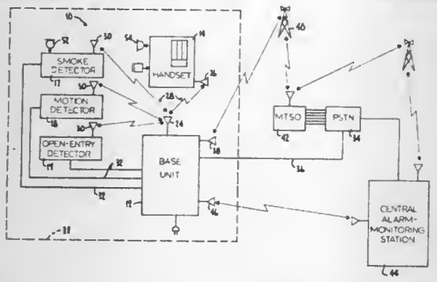
## COMBINATION CORDLESS TELEPHONE AND PREMISE-MONITORING ALARM SYSTEM

**Rick A. Britton, Springfield, Mo., assignor to Digital Monitoring Products, Inc., Springfield, Mo.**

**Filed Feb. 9, 1996, Ser. No. 599,023**

**Int. Cl.[6] H04Q** *7/20*

**U.S. Cl. 455—404** **19 Claims**




1. A combination cordless telephone and premise-monitoring alarm system, the combination comprising:

a base unit, a cordless handset, and, at least one remote sensor for generating data in response to a given alarm event;

the base unit including a telecommunications interface for establishing a telecommunications link with a public switched telecommunications network (PSTN), a radio interface for establishing a radio link with the handset, a data interface for establishing a data link with the remote sensor, and, processor circuitry for processing intercommunication of control and message data among the interfaces;

the handset including a radio interface, a keypad, a speaker, a microphone, and processing circuitry for processing intercommunication of control and message data among the radio interface thereof, the keypad, the speaker and the microphone;

the remote sensor including means for completing the data link between the remote sensor and the base unit;

wherein the processing circuitry of the base unit further processes alarm system functions such as monitoring the data link for data of the given alarm event and, in response thereto, transmitting control and message data via the telecommunications interface to a central alarm-monitoring station.

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**5,745,850**

## APPARATUS AND METHOD FOR MOBILE (E.G. CELLULAR OR WIRELESS) TELEPHONE CALL HANDOVER AND IMPERSONATION

**Hrair Aldermeshian, Holmdel; James Francis Day, Colts Neck; Richard H. Janow, South Orange, and David B. Menist, Little Silver, all of N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.**

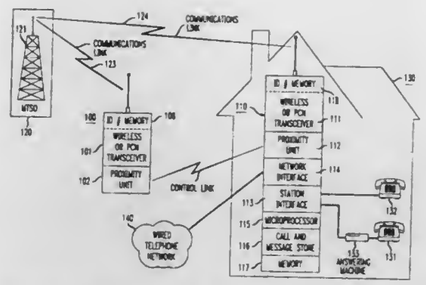
**Filed Oct. 24, 1994, Ser. No. 327,765**

**Int. Cl.[6] H04Q** *7/38*

**U.S. Cl. 455—417** **36 Claims**

1. A system for completing wireless telephone calls, comprising:

first and second transceivers arranged to originate and receive wireless telephone calls using a first communications channel;




means for determining that said first transceiver is in close proximity to said second transceiver using a second communications channel different from the first communications channel; and

means responsive to said determining means for altering the operation of each of said first and second transceivers so that calls directed to and normally answered by said first transceiver are completed to said second transceiver and for deactivating said first transceiver.

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**5,745,851**

## APPARATUS AND METHOD FOR MESSAGE RECORDING AND RECEIPT-OF-MESSAGE NOTIFICATION TO CORDLESS STATION OPERATING AS CELLULAR TELEPHONE

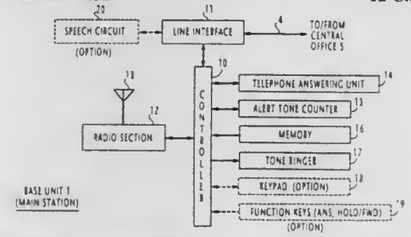
**Masataka Goto, Tokyo, Japan, assignor to Nec Corporation, Tokyo, Japan**

**Filed Jan. 18, 1996, Ser. No. 588,318**

**Claims priority, application Japan, Jan. 26, 1995, 7-028936**

**Int. Cl.[6] H04Q** *7/20;7/22*

**U.S. Cl. 455—432** **12 Claims**




1. An apparatus comprising:

a cordless station operable in a local mode when the cordless station is in a local area and in a global mode when the cordless station is outside of the local area, the cordless station being assigned a cellular telephone number of a cellular mobile telephone network for establishing a connection with the cellular mobile telephone network when the cordless station is operating in the global mode;

a memory for storing the cellular telephone number;

a telephone answering unit for recording a message in a recording mode and reproducing the recorded message in a playback mode;

means for setting the telephone answering unit in the recording mode; and

a controller connected to a public switched telephone network for receiving an incoming call therefrom, forwarding the call to the cordless station when the cordless station is operating in the local mode, operating the telephone answering unit to record a message of a call if the call is received during the period the telephone answering unit is set in the recording mode, originating a call to the public switched telephone network using the cellular telephone number stored in the memory to establish a connection through said networks to the cordless station operating in the global mode, and transmitting a prerecorded announcement to the cordless station via the established connection indicating that a message has been recorded in said telephone answering unit.



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**5,745,852**

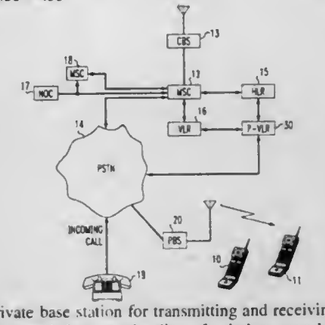
## LAND-LINE SUPPORTED PRIVATE BASE STATION OPERABLE IN A CELLULAR SYSTEM

**Muzibul H. Khan, Marlboro, and Robert Thomas Saizan, Holmdel, both of N.J., assignors to Lucent Technologies, Murray Hill, N.J.**

**Filed Jul. 31, 1995, Ser. No. 509,403**

**Int. Cl.[6] H04M** *11/00*

**U.S. Cl. 455—433** **15 Claims**




1. A private base station for transmitting and receiving communications to and from a plurality of wireless portable stations configured for operation in a public cellular telephone system, the base station comprising:

means for registering the plurality of portable stations for enabling said portable stations to communicate through said base station, said private base station generating a local unique address during registration and providing said unique address to a private base station location register located in said public cellular telephone system;

means for connecting both said private base station and said private base station location register to a telephone switch in the public switched telephone network; and

means for receiving over said public switched telephone network from said private base station location register said unique address during receipt of an incoming telephone call also over said public switched telephone network for routing said call to an identified portable station.

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**5,745,853**

## METHOD FOR ALLOCATING RADIO CHANNELS IN A QUASI-TRANSMISSION-TRUNKED MOBILE COMMUNICATION SYSTEM

**Leo Hippeläinen, Helsinki, Finland, assignor to Nokia Telecommunication Oy, Espoo, Finland**

**PCT No. PCT/FI95/00368, § 371 Date Feb. 27, 1996, § 102(e) Date Feb. 27, 1996, PCT Pub. No. WO96/00482, PCT Pub. Date Jan. 4, 1996**

**PCT Filed Jun. 26, 1995, Ser. No. 602,837**

**Claims priority, application Finland, Jun. 27, 1994, 943087**

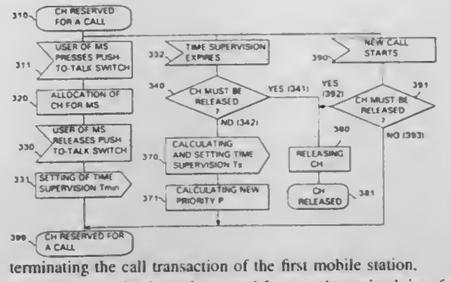
**Int. Cl.[6] H04Q** *7/20;* **H04B** *7/00*

**U.S. Cl. 455—450** **8 Claims**

1. A method for allocating radio channels in a quasi-transmission trunked mobile communication system comprising base stations and a first mobile station communicating with the base stations by means of radio channels, and at least one other mobile station requiring a radio channel, the method comprising the steps of

keeping a radio channel reserved for such a call in which the first mobile station is participating,

allocating said radio channel for the first mobile station for the duration of its call transaction,




terminating the call transaction of the first mobile station,

keeping said radio channel reserved for a predetermined time for said call,

checking whether said radio channel may still be kept reserved for said call,

if said radio channel may still be kept reserved for said call, calculating time-out time for a call transaction depending on the traffic load of the radio channels and keeping said channel reserved for the duration of the calculated time-out time, subsequent to which the radio channel is released, and

if, again, said radio channel may no longer be kept reserved for said call, releasing said radio channel;

the step of checking whether said radio channel may still be kept reserved for said call being carried out by comparing the priority of said call in which the first mobile station is participating with the priorities of other calls awaiting a free radio channel; and

the step of checking whether said radio channel may still be kept reserved for said call being carried out after the expiry of the time supervision initiated at said terminating of the call transaction of the first mobile station.

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**5,745,854**

## METHOD AND APPARATUS FOR DYNAMICALLY ADJUSTING A MAXIMUM NUMBER OF USERS ON A CHANNEL UTILIZING A VOICE ACTIVITY FACTOR

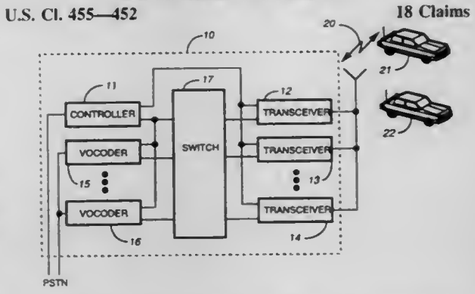
**Eric Reed Schorman, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 71,091, Jun. 4, 1993, abandoned.**

**This application Mar. 14, 1995, Ser. No. 403,550**

**Int. Cl.[6] H04B** *7/00;* **H04J** *3/17*

**U.S. Cl. 455—452** **18 Claims**




1. In a resource limited cellular communication system having a physical channel shared by a plurality of users, a method of dynamically adjusting a maximum number of users allowed access to the physical channel comprising the steps of:

periodically determining a voice activity factor for each traffic channel user of the physical channel based, at least in part, upon a predetermined measure of vocoder activity for each said traffic channel user; and

dynamically setting a maximum number of users for the physical channel based upon the determined voice activity factors.

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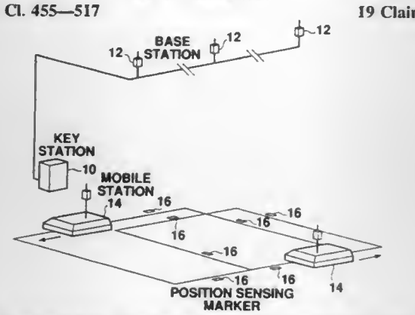


5,745,855

## MOBILE RADIO COMMUNICATION SYSTEM PERMITTING A MOBILE STATION TO SPECIFY A BASE STATION USED BY THE SAME

Yoshisumi Futamura, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 28, 1995, Ser. No. 519,728
Claims priority, application Japan, Aug. 26, 1994, 6-202175; Aug. 8, 1995, 7-202633
Int. Cl.[6] H04B 7/26
U.S. Cl. 455—517 19 Claims




1. A mobile radio communication system configured to perform a polling operation, comprising:

a key station that communicates with a plurality of mobile stations through a plurality of base stations, wherein one of said mobile stations sends to the key station identification information of a base station to be used next in said polling operation,

the key station then switching a polling path so as to include said base station to be used next when communicating with said mobile station as identified by said identification information,

said mobile station switching the polling path such that a polling response will be returned therefrom to the key station through said base station to be used next,

said mobile station being configured to send to said key station in the polling response said identification information of the base station to be used next, and

said key station determining the polling path in accordance with the identification information and adding said base station to be used next to said polling path if said base station to be used next is not in currently in said polling path.

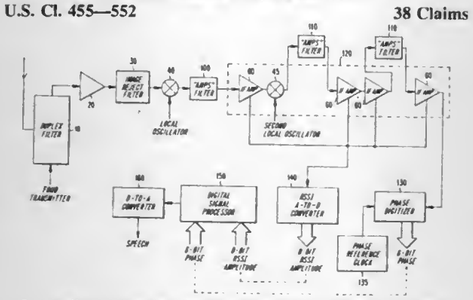
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5,745,856

## RADIO RECEIVER FOR DEMODULATING BOTH WIDEBAND AND NARROWBAND MODULATED SIGNALS

Paul W. Dent, Stehag, Sweden, assignor to Telefoanktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 135,542, Oct. 14, 1993, abandoned. This application Feb. 28, 1997, Ser. No. 807,773
Int. Cl.[6] H04B 1/38; H04M 1/00
U.S. Cl. 455—552 38 Claims




1. A radio receiver for demodulating both wideband and narrowband modulated signals comprising:

superheterodyne frequency means for converting a received modulated signal to a fixed intermediate frequency signal;

means for wideband filtering said intermediate frequency signal with a first filter bandwidth to produce a first filtered signal, wherein said first filter bandwidth spans at least one wideband information channel and a plurality of narrowband information channels;

means for demodulating said first filtered signal to extract information;

means for digitizing said first filtered signal while preserving a complex vector value of said fixed intermediate frequency signal to produce a stream of complex-valued samples;

means for narrowband filtering said stream of complex-valued samples using a digital filter to produce a second filtered signal, wherein said digital filter has an adjustable filter bandwidth which is set to a second filter bandwidth or a third filter bandwidth in dependence upon a level of signal interference; and

means for demodulating said second filtered signal to extract information.

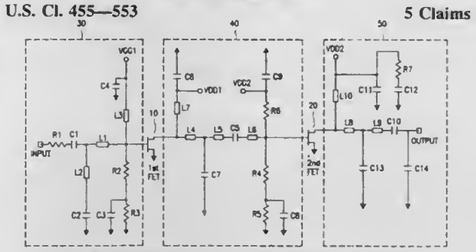
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5,745,857

## GAAS POWER AMPLIFIER FOR ANALOG/DIGITAL DUAL-MODE CELLULAR PHONES

Sung-Jae Maeng; Chang-Seok Lee, and Hyung-Moo Park, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Nov. 22, 1995, Ser. No. 562,370
Claims priority, application Rep. of Korea, Dec. 21, 1994, 94-35472
Int. Cl.[6] H04B 1/40
U.S. Cl. 455—553 5 Claims




1. Analog/Digital dual-mode power amplifier comprising:

a first and a second power Field Effect Transistor (FET) for amplifying an input signal;

an input stage having means for receiving said input signal through an input terminal and means for applying a first gate bias voltage, appropriately controlled in response to an analog operating mode or a digital operating mode, to said first power FET so as to directly vary a second gate bias voltage;

a middle stage having means for applying a first drain bias voltage to said first power FET, means for applying a second gate bias voltage, appropriately controlled in response to an analog operating mode or a digital operating mode, to said second power FET so as to directly vary the gate bias voltage; and

an output stage having means for applying a second drain bias voltage to said second power FET, means for matching the impedance of said second power FET at a center frequency and having the impedance of less than 2 Ω for a second harmonic frequency and a third harmonic frequency and means for outputting the amplified input signal through an output terminal.

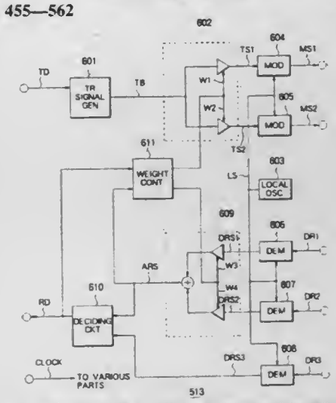


5,745,858

## BASE STATION TRANSMITTER/RECEIVER CAPABLE OF VARYING COMPOSITE DIRECTIVITY OF ANTENNAS

Toshifumi Sato, and Yukitsuna Furuya, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 8, 1994, Ser. No. 337,835
Claims priority, application Japan, Nov. 8, 1993, 5-278606
Int. Cl.[6] H04Q 7/30
U.S. Cl. 455—562 9 Claims




1. A base station used in a cellular system and installed in a cell of a service area, the cell being divided into a Plurality of sectors, said base station comprising:

a transmitter/receiver designated for a selected sector for transmitting radio transmission signals in said selected sector and receiving radio reception signals in said selected sector to produce an output reception signal;

a plurality of directivity antennas which are oriented in said selected sector for radiating said radio transmission signals and for receiving said radio reception signals to produce received signals, each of said plurality of directivity antennas being connected to said transmitter/receiver unit and each of said directivity antennas receiving said radio transmission signal from said transmitter/receiver unit;

first controllable weighting means for weighting said input transmission signal with each of transmission weight coefficients determined in relation to said radio reception signals to produce weighted transmission signals as said radio transmission signals;

second controllable weighting means for weighting said received signals with reception weight coefficients determined in relation to said radio reception signals into weighted reception signals to add said weighted reception signals to one another and to produce an added signal; and

weight control means connected to said first weighting means and said second weighting means for controlling said transmission weight coefficients and said reception weight coefficients in response to said added signal;

wherein composite transmission and reception directivity of said plurality of directivity antennas is varied depending on the transmission weight coefficients and reception weight coefficients, respectively.

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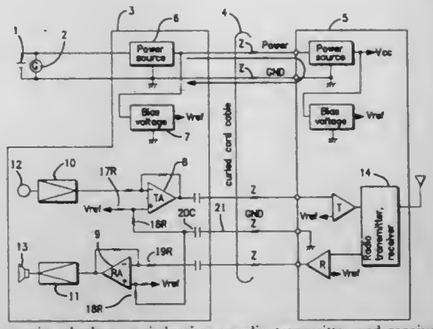
5,745,859

## PORTABLE RADIO TELEPHONE HEADPHONE

Hidetoshi Takenaka, Saitama, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 3, 1996, Ser. No. 627,064
Claims priority, application Japan, Apr. 11, 1995, 7-085137
Int. Cl.[6] H04Q 7/32
U.S. Cl. 455—568 2 Claims

1. A portable radio telephone device comprising:




a main telephone unit having a radio transmitter and receiver; and

a microphone-speaker/headphone set connected to said main telephone unit by a curled cord cable;

said microphone-speaker/headphone set comprising:

a power source connected to a car battery for supplying electric energy to said main telephone unit;

a bias voltage circuit connected to said power source;

a transmitter amplifier having an output terminal connected to a transmitted voice signal input terminal of said main telephone unit, said transmitter amplifier receiving a reference output voltage from said bias voltage circuit;

a receiver amplifier having an inverting input terminal connected to a received voice signal output terminal of said main telephone unit, said receiver amplifier receiving the reference output voltage from said bias voltage circuit;

a microphone amplifier having an input terminal connected to a microphone and an output terminal connected to an inverting input terminal of said transmitter amplifier; and

a speaker amplifier having an output terminal connected to a speaker and an input terminal connected to an output terminal of said receiver amplifier;

said power source, said transmitter amplifier, said receiver amplifier, and a power source ground terminal being connected through said curled cord cable to said main telephone unit;

said curled cord cable including a voice signal ground line connected to a ground terminal of said main telephone unit, for adding an AC component thereon to the reference output voltage from said bias voltage circuit, said voice signal ground line being connected to non-inverting input terminal of said transmitter amplifier and said receiver amplifier.

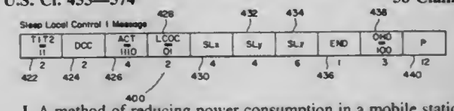
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5,745,860

## METHOD AND SYSTEM OF DATA TRANSMISSION AND RECEPTION IN A MOBILE STATION WITHIN A RADIO TELECOMMUNICATIONS SYSTEM

Harald Kallin, Sollentuna, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 16, 1994, Ser. No. 357,668
Int. Cl.[6] H04B 1/38; H04M 1/00
U.S. Cl. 455—574 58 Claims




1. A method of reducing power consumption in a mobile station operating within a radio telecommunications system having a base station and a plurality of mobile stations assigned to a plurality of sleep groups, said method comprising the steps of:

receiving at said mobile station, a repetitively broadcast overhead message train transmitted on a base station control channel, said message train including a sleep message containing one or more data fields, said data fields including information indicating when mobile stations assigned to each

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sleep group of said plurality of sleep groups are to switch to a sleep mode and to an awake mode effective during a time period until a start of a next repetition of said broadcast message train; and

operating said receiving mobile station in said sleep mode and said awake mode in accordance with said information contained in said data fields during the time period until the start of the next repetition of said broadcast message train.

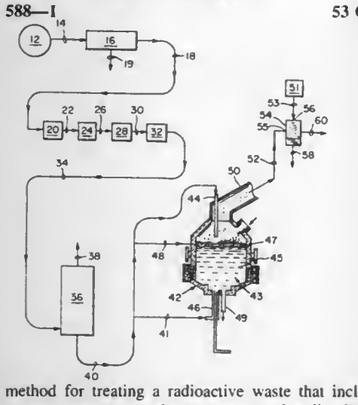
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**5,745,861**

## METHOD FOR TREATING MIXED RADIOACTIVE WASTE

**Jimmy T. Bell, Kingston, and James W. Snider, Oak Ridge, both of Tenn., assignors to Molten Metal Technology, Inc., Waltham, Mass.**

**Filed Mar. 11, 1996, Ser. No. 613,924**
**Int. Cl.[6] G21F *9/00***
**U.S. Cl. 588—I** **53 Claims**



**48**. A method for treating a radioactive waste that includes a radioactive component, a metal component, and a dissolved salt component, comprising the steps of:

a) settling the radioactive waste to form a supernate layer that includes the radioactive component and the dissolved salt component, and a sludge layer that includes the heavy metal component;

b) directing the supernate layer through at least one ion-exchange medium that binds at least a portion of the radioactive component, thereby form a liquid discharge stream that includes the dissolved salt component;

c) directing said liquid discharge stream into a first molten bath, said first molten bath causing at least a portion of at least one dissolved salt component of the liquid discharge stream to dissociate and form at least one dissociation product, whereby a gaseous discharge stream is formed that includes at least one said dissociation product; and

d) directing said sludge layer into a second molten bath, whereby at least a portion of the metal component vaporizes and is discharged from second molten bath.

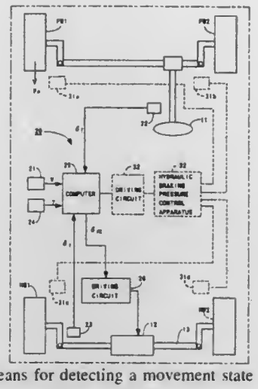
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**5,745,862**

## MOVEMENT STATE CONTROL APPARATUS FOR WHEELED VEHICLE

**Yutaka Hirano, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Filed Aug. 4, 1995, Ser. No. 511,364**
**Claims priority, application Japan, Aug. 8, 1994, 6-186118**
**Int. Cl.[6] B62D *6/00***
**U.S. Cl. 701—1** **2 Claims**



**1**. A movement state control apparatus for a wheeled vehicle having a control system for controlling a movement state of the vehicle, comprising:

detection means for detecting a movement state variable of the vehicle;

determination means for determining a target movement state variable of the vehicle;

calculation means for calculating a feedback control amount by multiplying a difference between the detected movement state variable and the target movement state variable with a feedback gain determined to be decreased to a lesser value at least in a higher frequency region than in a lower frequency region, whereby reducing the effect of noise in the detection means; and

control means for controlling the control system of the vehicle in accordance with the calculated feedback control amount to make the movement state variable of the vehicle coincide with the target movement state variable.

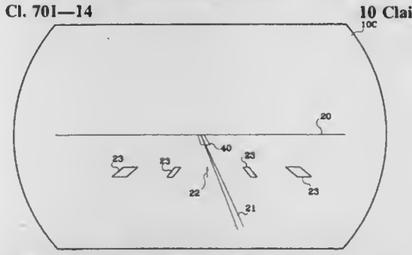
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**5,745,863**

## THREE DIMENSIONAL LATERAL DISPLACEMENT DISPLAY SYMBOLOGY WHICH IS CONFORMAL TO THE EARTH

**Dale A. Uhlenhop, and Dean Richard Wilkens, both of Glendale, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Sep. 22, 1995, Ser. No. 532,187**
**Int. Cl.[6] G01C *23/00***
**U.S. Cl. 701—14** **10 Claims**



**1**. A navigation display system for aircraft comprising:

a) navigation means for generating vertical position data and lateral position data indicative of the position of said aircraft; and,

b) symbol generating means, in communication with said navigation means, for generating symbology signals from said vertical and lateral position data, said symbology signals representative of an extended course centerline; and,

c) electronic display means, in communication with said symbol generating means, for displaying said symbology signals to an operator, said electronic display means including,

1) a display screen on which symbols representative of said symbology signals are displayed.

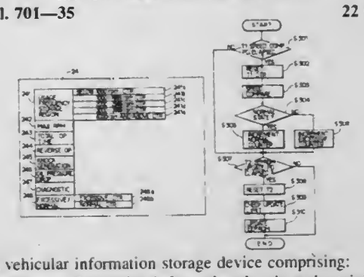


**5,745,864**

## VEHICULAR INFORMATION STORAGE DEVICE AND POWER OUTAGE-RESISTANT STORAGE SYSTEM AND METHOD FOR THE SAME

**Katsuharu Hosoe, Okazaki; Teruyoshi Itoh, Kaizu-gun, and Toshihisa Yamamoto, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Oct. 3, 1995, Ser. No. 538,234**
**Claims priority, application Japan, Oct. 4, 1994, 6-240400; Oct. 26, 1994, 6-262294**
**Int. Cl.[6] G06F *17/00*; G01M *15/00***
**U.S. Cl. 701—35** **22 Claims**



**1**. A vehicular information storage device comprising:

storage means for storing information therein and retaining said stored information even during electric power cut-off;

extracting means for processing information needed for analysis and maintenance of vehicular and internal combustion engines, said processed information relating to a predetermined period of time, and for extracting said information at a predetermined time interval;

determining means for determining from among regions set beforehand a region of information to which information extracted by said extracting means belongs;

counting means for incrementing a counter in a predetermined storage region of said storage means in correspondence with a region determined by said determining means; and

data restoration means for restoring a count value of said counter in said predetermined storage region based on count values of other storage regions after an irregularity is determined in data of said predetermined region through comparison of data stored in said storage regions.

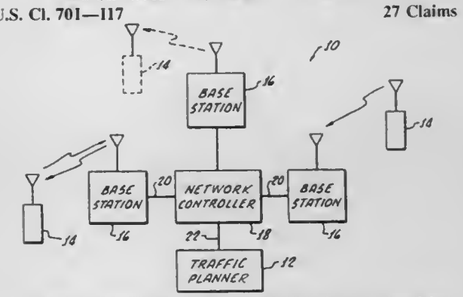
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**5,745,865**

## TRAFFIC CONTROL SYSTEM UTILIZING CELLULAR TELEPHONE SYSTEM

**Michael D. Rostoker, Boulder Creek; John Daane, Saratoga, and Sandeep Jaggi, San Jose, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.**

**Filed Dec. 29, 1995, Ser. No. 580,579**
**Int. Cl.[6] G01S *1/02*; G05D *1/00*; G08G *1/07***
**U.S. Cl. 701—117** **27 Claims**




**1**. A traffic control system for a geographical area, comprising:

at least one computer that controls traffic lights in the area; and

a cellular communication system including a plurality of base stations covering the area, a plurality of subscriber units capable of establishing RF links with the plurality of base stations, and at least one processor that processes signals transmitted by the subscriber units to determine the locations of the subscriber units, whereby the location of a vehicle carrying a subscriber unit can be determined;

the locations being sent by the cellular communication system to the at least one computer, wherein the locations can be processed to control the traffic lights.

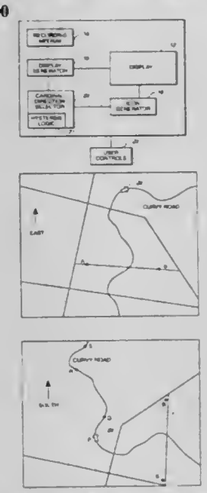
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**5,745,866**

## CARDINAL-UP GRAPHIC MAP DISPLAY SYSTEM

**Glenn C. Steiner, Los Altos, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.**

**Filed Jan. 9, 1996, Ser. No. 584,347**
**Int. Cl.[6] G06F *165/00*; G09G *5/32***
**U.S. Cl. 701—200** **6 Claims**



**1**. An apparatus for graphically displaying navigational information comprising:

a display;

a database containing navigational information;

a display generator coupled to said database and said display, said display generator generating a graphical display of said navigational information on said display;

an icon generator coupled to said display, said icon generator providing on said graphical display of said navigational information an icon representing the position and heading of an item; and

a cardinal direction selector coupled to said icon generator and said display generator, said cardinal direction selector causing said graphical display of said navigational information to be displayed in a cardinal direction-up setting wherein said cardinal direction-up setting corresponds to said heading of said icon, said cardinal direction selector including hysteresis logic regulating which cardinal direction is displayed in an upward orientation as said heading of said icon changes, said hysteresis logic preventing said graphical display of said navigational information from changing to a different cardinal direction-up setting until said heading of icon is directed greater than 60 degrees in a clockwise direction from the cardinal direction presently being displayed in an upward orientation or until said heading of said icon is directed greater than 60 degrees in a counter-clockwise direction from said cardinal direction presently being displayed in an upward orientation.

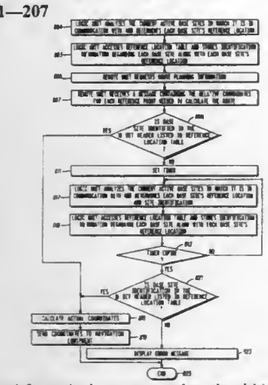
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## 5,745,867
## METHOD AND APPARATUS FOR REDUCING MESSAGE LENGTH WITHIN A COMMUNICATION SYSTEM

**Donald C. Mills, Glenview, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Oct. 9, 1996, Ser. No. 731,108**
**Int. Cl.[6] G06F** *165/00*
**U.S. Cl. 701—207** **10 Claims**



6. A method for reducing message length within a communication system, the method comprising the steps of:

determining a latitude and a longitude of a reference point;

determining a reference geographic location of a base site;

subtracting the reference geographic location of the base site from the latitude and longitude of the reference point to produce a relative coordinate of the reference point;

transmitting a message comprising the relative coordinate of the reference point and a base site identification wherein a length of the message comprising the relative coordinate of the reference point is shorter than a similar message comprising the latitude and longitude of the reference point

receiving, by the remote unit the message comprising the relative coordinate of the reference point and the base site identification;

determining the reference geographic location of the base site based on the transmitted base site identification; and

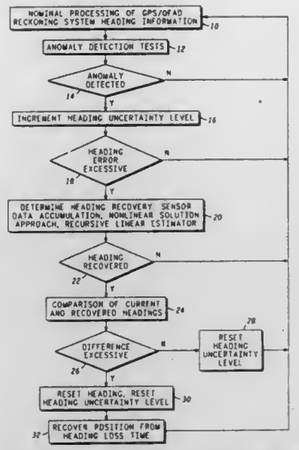
adding the reference geographic location of the base site to the relative coordinate of the reference point to produce the latitude and the longitude of the reference point wherein a length of the message comprising the relative coordinate of the reference point is shorter than the similar message comprising the latitude and longitude of the reference point.

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## 5,745,868
## METHOD FOR RAPID RECOVERY FROM DEAD RECKONING SYSTEM HEADING LOSS

**George J. Geier, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Dec. 26, 1995, Ser. No. 578,401**
**Int. Cl.[6] G06G** *7/78*
**U.S. Cl. 701—216** **25 Claims**




1. A method of recovering a heading of a vehicle having a navigation system installed thereon, the navigation system including a Global Positioning System (GPS) receiver and a dead reckoning system whereby the dead reckoning system includes a heading rate sensor, the method comprising the steps of:

determining heading change information from the navigation system;

running anomaly detection tests to determine if a current heading from the dead reckoning system is in error;

incrementing a heading uncertainty in response to positive anomaly detection test results;

determining whether the heading uncertainty is excessive;

if the heading uncertainty is excessive, determining a recovered heading in response to information from both the GPS receiver and the dead reckoning system and when the GPS receiver is unable to determine a reliable heading; determining if a difference between the current heading and the recovered heading is excessive;

resetting the current heading and the heading uncertainty if the difference is excessive; and

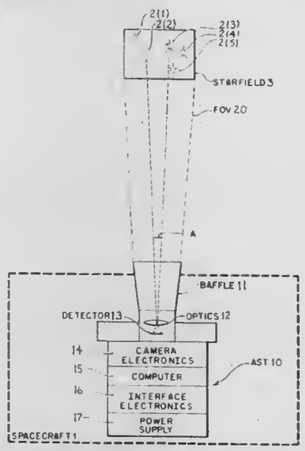
resetting a position of the vehicle in response to the reset current heading.

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## 5,745,869
## TECHNIQUES FOR OPTIMIZING AN AUTONOMOUS STAR TRACKER

**Roelof W.H. van Bezooijen, El Granada, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.**

**Continuation of Ser. No. 534,378, Sep. 28, 1995, abandoned. This application Jun. 2, 1997, Ser. No. 867,603**
**Int. Cl.[6] G05D** *1/00*
**U.S. Cl. 701—222** **9 Claims**




1. A method for determining the attitude of a spacecraft by observing stars, the method comprising the steps of:

at a first time, observing a set of stars within a preselected field of view by a camera on board the spacecraft to obtain a first set of observations;

matching said first set of observations against original guide stars within a guide star database stored on board the spacecraft;



deriving a first approximation of the attitude of the spacecraft from positions of original guide stars that matched with observed stars from the first set of observations;

selecting a first set of additional stars from the guide star database and predicting the location of said first set of additional guide stars within the field of view;

deriving an improved approximation of the attitude of the spacecraft from positions of the original guide stars and the first set of additional guide stars;

using an angular rate of the spacecraft and a needed time for star identification and attitude determination to predict which stars from the first time, called propagation guide stars, will be present in the field of view of the camera at a subsequent time;

selecting several of said propagation guide stars;

at said subsequent time, determining which stars in the field of view correspond to the selected propagation guide stars;

deriving a first approximation of the attitude of the spacecraft from positions of the propagation guide stars so determined in the previous step;

selecting a second set of additional guide stars from the guide star database and predicting the location of said second set of additional guide stars within the field of view;

deriving an improved approximation of the attitude of the spacecraft from positions of the determined propagation guide stars and the second set of additional guide stars; and

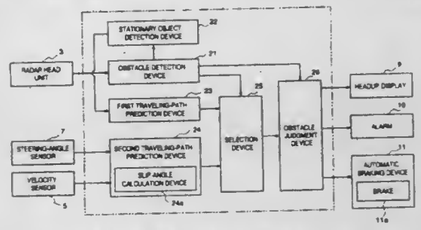
selecting a second set of propagation guide stars from among stars that are expected to be within the field of view at yet another future time.

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## 5,745,870
## TRAVELING-PATH PREDICTION APPARATUS AND METHOD FOR VEHICLES

**Yasunori Yamamoto, Higashi-Hiroshima; Ayumu Doi, Hatsukaichi, and Tohru Yoshioka, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Sep. 13, 1995, Ser. No. 527,635**
**Claims priority, application Japan, Sep. 14, 1994, 6-220353**
**Int. Cl.[6] G06F** *165/00;* **G01S** *7/41*
**U.S. Cl. 701—301** **33 Claims**




1. A vehicle traveling-path prediction apparatus which detects an obstacle in front of a vehicle and predicts a traveling path of the vehicle based on the detected obstacle, comprising:

obstacle detection means for emitting a radar wave forward from the vehicle and detecting an obstacle existing in front of the vehicle;

stationary-status judgment means for judging whether the obstacle in front of the vehicle is in a stationary status or not, based on the result from detection by said obstacle detection means; and

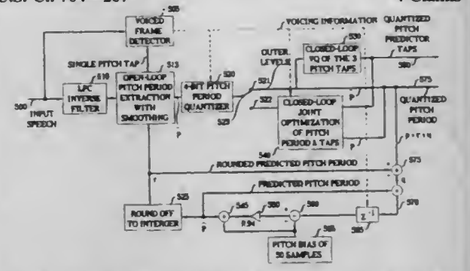
traveling-path prediction means for predicting a traveling path of the vehicle from data indicative of running conditions of the vehicle with respect to the obstacle, if said stationary-status judgment means judges that the obstacle is in the stationary status.

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## 5,745,871
## PITCH PERIOD ESTIMATION FOR USE WITH AUDIO CODERS

**Juin-Hwey Chen, Neshanic Station, N.J., assignor to Lucent Technologies, Murray Hill, N.J.**

**Division of Ser. No. 57,068, May 3, 1993, which is a continuation of Ser. No. 757,168, Sep. 10, 1991, Pat. No. 5,233,660. This application Nov. 29, 1995, Ser. No. 564,610**
**Int. Cl.[6] G10L** *9/14*
**U.S. Cl. 704—207** **4 Claims**




1. A method of quantizing a pitch period signal relating to the pitch period for one of a sequence of frames of sampled input speech signals to one of a plurality, N, of quantizing values comprising the steps of

determining whether said one frame of input speech signals corresponds to voiced speech or to other than voiced speech,

when said one frame of input speech signals corresponds to other than voiced speech

assigning a particular non-zero one of said N quantizing values to said pitch period signal, said non-zero quantizing value comprising a bias value for said pitch period,

when said one frame of input speech signals corresponds to a voiced speech signal,

extracting from said one frame of input speech signals a first signal representative of the pitch period for said one frame of input speech signals,

generating a prediction signal corresponding to a prediction of the pitch period for said one frame based on the value of the pitch period signal for at least one preceding frame of sampled input speech signals,

comparing the value of said first signal with the value of said prediction signal to form a difference signal, and

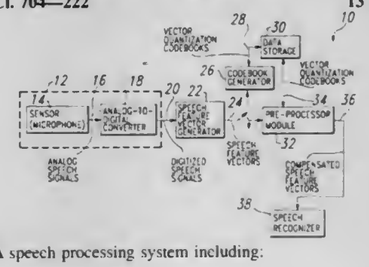
assigning a value, other than the bias value, to said pitch period signal for said one frame based on said difference signal.

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## 5,745,872
## METHOD AND SYSTEM FOR COMPENSATING SPEECH SIGNALS USING VECTOR QUANTIZATION CODEBOOK ADAPTATION

**Mustafa Kemal Sönmez, Silver Springs, Md., and Periagaram K. Rajasekaran, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed May 7, 1996, Ser. No. 646,192**
**Int. Cl.[6] G10L** *3/02;9/00*
**U.S. Cl. 704—222** **13 Claims**




1. A speech processing system including:

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collector means for collecting speech signals from a plurality of environments, said plurality of environments including a reference environment and at least one secondary environment;

a speech feature vector generator coupled to said collector means for generating speech feature vectors from said collected speech;

a codebook generator operable to be coupled to said speech feature vector generator for using said speech feature vectors to generate a reference vector quantization codebook describing speech collected from said reference environment and to generate at least one secondary vector quantization codebook describing speech collected from said at least one secondary environment;

storage means coupled to said codebook generator for storing said reference vector quantization codebook and said at least one secondary vector quantization codebook;

a pre-processor coupled to said storage means and operable to be coupled to said speech feature vector generator for generating a codebook adaptation using said reference vector quantization codebook and said at least one secondary vector quantization codebook and for using said codebook adaptation to transform speech feature vectors collected from an unknown environment to generate compensated speech feature vectors; and

a speech recognizer for processing said compensated speech feature vectors, said speech recognizer including speech models trained using said reference vector quantization codebook.

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**5,745,873**

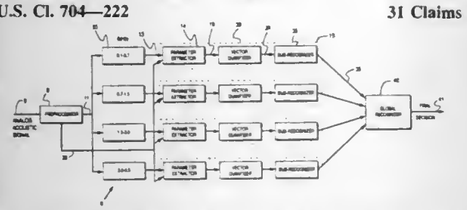
## SPEECH RECOGNITION USING FINAL DECISION BASED ON TENTATIVE DECISIONS

**Louis D. Braida, Arlington, and Paul Duchnowski, Brookline, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Continuation of Ser. No. 400,677, Mar. 8, 1995, abandoned, which is a continuation of Ser. No. 877,465, May 1, 1992, abandoned. This application Mar. 21, 1997, Ser. No. 821,509**

**Int. Cl.[6] G10L *5/00***

**U.S. Cl. 704—222** **31 Claims**



1. A method for making a decision on a speech element in a signal representing an utterance, from among a set of possible speech elements, comprising

generating one representation of said utterance based on one range of acoustic frequencies,

generating at least one separate representation of said utterance based on a different range of acoustic frequencies,

deriving one tentative decision on said speech element from the one representation based on the one range of acoustic frequencies, said one tentative decision being at least one of said speech elements,

deriving at least one separate tentative decision on said speech element from the at least one separate acoustic representation based on the different range of acoustic frequencies, said at least one separate tentative decision being at least one of said speech elements, and

generating a final decision on said speech element from said one tentative decision and said at least one separate tentative decision, said final decision being one of said speech elements.

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**5,745,874**

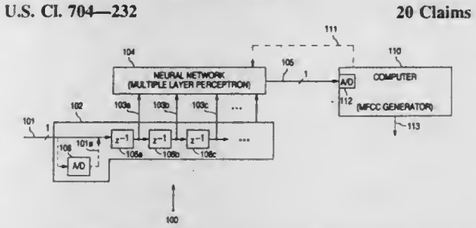
## PREPROCESSOR FOR AUTOMATIC SPEECH RECOGNITION SYSTEM

**William Shields Neely, Campbell, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Mar. 4, 1996, Ser. No. 610,725**

**Int. Cl.[6] G10L *7/00***

**U.S. Cl. 704—232** **20 Claims**




1. An apparatus including a preprocessor for automatic speech recognition based upon auditory modeling, said preprocessor comprising:

a first signal processor for receiving a speech signal corresponding to an acoustic stimulus and having a speech spectrum envelope associated therewith and in accordance therewith providing a plurality of sequential time interval samples of said speech signal; and

a second signal processor, coupled to said first signal processor, for receiving and processing said plurality of sequential time interval samples of said speech signal together simultaneously and in accordance therewith providing a single processed signal which represents a sequence of preprocessed acoustic feature vectors corresponding to said speech spectrum envelope.

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**5,745,875**

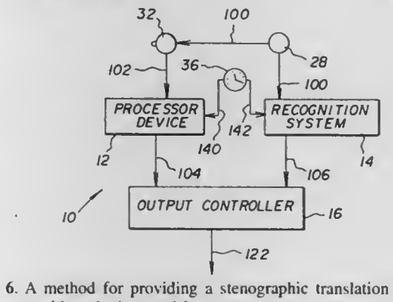
## STENOGRAPHIC TRANSLATION SYSTEM AUTOMATIC SPEECH RECOGNITION

**Johnny Jay Jackson, Charleston, W. Va., and Brian Keith Bennett, Marietta, Ohio, assignors to Stenovations, Inc., Parkersburg, W. Va.**

**Filed Apr. 14, 1995, Ser. No. 422,025**

**Int. Cl.[6] G10L *3/00***

**U.S. Cl. 704—235** **8 Claims**




6. A method for providing a stenographic translation of utterances, said method comprising:

(a) providing stenographic key strokes corresponding to said utterances,

(b) translating said strokes into first units comprising words in language text format and undefined lexical stroke sets,

(c) providing word models corresponding to said utterances,

(d) translating said word models into second units comprising words in language text formats an textual symbols to indicate undefined utterances,

(e) matching said first units with said second units to provide pairs of corresponding units,

(f) outputting a word from each pair comprising a word.



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**5,745,876**

## SINGLE-COUNT BACKING-OFF METHOD OF DETERMINING N-GRAM LANGUAGE MODEL VALUES

**Reinhard Kneser, and Hermann Ney, both of Aachen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed May 2, 1996, Ser. No. 642,012**

**Claims priority, application Germany, May 5, 1995, 195 16 099.1**

**Int. Cl.[6] G10L *5/06***

**U.S. Cl. 704—255** **3 Claims**

1. A method of determining the language model values for deriving word sequences from a speech signal by deriving training signals from the speech signal, comparing the training signals with sequences of reference signals which each correspond to a respective word of a predetermined vocabulary in order to derive scores, and incrementing each score by a language model value for each transition from one word to another word, the language model value indicating the relative probability of word sequences of a predetermined number of defined, successive words, the method comprising:

(a) in a training phase, determining the language model values of at least a part of all feasible word sequences from a predetermined training speech signal by counting the frequency of occurrence of individual word sequences, and

(b) deriving the language model values for complete word sequences which are not present in the training speech signal from the frequencies of word sequences which have been reduced by the first word and which are present in complete word sequences which have occurred at least once in the training speech signal, in such a manner that each different, complete word sequence is taken into account no more than once for determining the frequency of the reduced word sequences present therein, irrespective of the actual frequency of occurrence.

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**5,745,877**

## METHOD AND APPARATUS FOR PROVIDING A HUMAN-MACHINE DIALOG SUPPORTABLE BY OPERATOR INTERVENTION

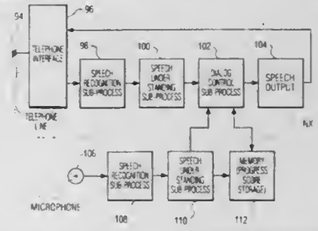
**Aloijsius J. Nijmam, Riethoven, Netherlands; Harald Aust; Peter Besting, both of Aachen, Germany, and Martin Oerder, Herzogenrath, Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jan. 16, 1996, Ser. No. 587,190**

**Claims priority, application European Pat. Off., Jan. 18, 1995, 95200120**

**Int. Cl.[6] G10L *5/06***

**U.S. Cl. 704—270** **14 Claims**




1. A method of carrying out a human-machine dialog whilst executing successive sections of a computer program of a user interactive system in accordance with successive verbal user items presented by a user as reacting to successive verbal system items presented by the system to the user, each such verbal system item corresponding to a respective program section, said method comprising successive steps of:

a. presentation by the system to the user of a verbal system item corresponding to a program section;

b. recognition by the system of a verbal user item presented by the user to the system;

characterized by:

c. evaluation of a result of said recognition, and reverting to part a, whilst on the basis of said recognition, selecting among a plurality of such program sections each associated to a subsequent verbal system item, and on the basis of said evaluation keeping a progress score pertaining to said dialog, and under control of a particular progress score level enabling a system operator to intervene in said dialog in an unobtrusive manner.

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**5,745,878**

## BUSINESS REQUIREMENT HANDLING APPARATUS

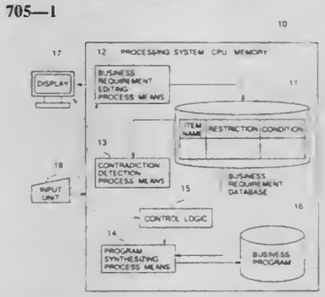
**Keiji Hashimoto; Yasuyuki Fujikawa; Akihiko Yoshioka; Jun Ginbayashi; Kazuo Yabuta, and Yukio Imazu, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 177,856, Jan. 5, 1994, abandoned. This application Apr. 10, 1995, Ser. No. 419,768**

**Claims priority, application Japan, Feb. 23, 1993, 5-032347**

**Int. Cl.[6] G06F *17/60;17/30***

**U.S. Cl. 705—1** **7 Claims**




1. A business requirement handling apparatus, comprising:

a business requirement database to accumulate and manage business requirements of businesses to be programmed, the business requirements described as attributes with respect to data types which include domains, record items and processing items as three kinds of abstractions, the domains being common data types used in common by the record items and not being modified by record types, the record items being modified by the data types but not being modified by processes, the processing items indicating a relation as to when the record items are processed in a program and being modified by the processes;

business requirement editing unit to edit business requirements, and to store edited business requirements in said business requirement database in units of the data types;

a contradiction detection unit to detect whether a contradiction exists among the business requirements stored in said business requirement database based on attributes including at least one of a restricting expression, a calculation expression and a conditional expression annexed to the record items of the business requirements, and to notify a user of a content of the contradiction when the contradiction is detected; and

program synthesizing process means for generating program parts from the requirements of each record item based on the business requirements stored in said business requirement database, and for generating a business program which is executable in a user environment by synthesizing the program parts with a given control logic.

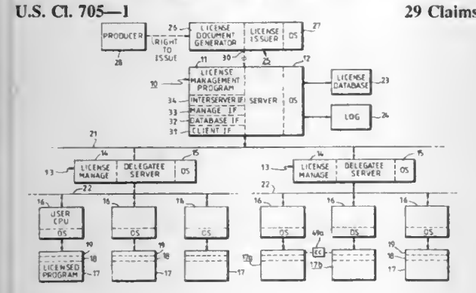
VOL 1209 ISS 4 AP 28 1998 UMI



## 5,745,879
## METHOD AND SYSTEM FOR MANAGING EXECUTION OF LICENSED PROGRAMS

**Robert M. Wyman, Waltham, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Continuation of Ser. No. 361,884, Dec. 22, 1994, abandoned, which is a continuation of Ser. No. 697,652, May 8, 1991, abandoned. This application Sep. 6, 1995, Ser. No. 523,919**
**Int. Cl.[6] G06F *17/60***
**U.S. Cl. 705—1** **29 Claims**




1. A method executed in a computer system for managing access to software items, the method comprising the steps of:

maintaining a store of license authorizations for software items, each of said license authorizations including an identification of a corresponding software item and one or more policy components used to define a license management policy for said corresponding software item, each of said license authorizations including a number of units of license use, and wherein said policy components defining said license management policy include a policy component identifying an allocative policy and a consumptive policy, said allocative policy permitting return of units allocated to a client after the client completes a requested use making said units returned available for use by another client, and said consumptive policy not permitting return of units;

sending a request from a client executing in said computer system to a server to obtain access to said software item, said request including data identifying said client and said software item;

retrieving from said store, in response to said request, a license authorization corresponding to said software item;

determining whether to grant or refuse said request in accordance with said license authorization; and

sending a response to said client indicating whether said request has been granted or refused.

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## 5,745,880
## SYSTEM TO PREDICT OPTIMUM COMPUTER PLATFORM

**Russell L. Strothmann, Broken Arrow, Okla., assignor to The Sabre Group, Inc., Fort Worth, Tex.**

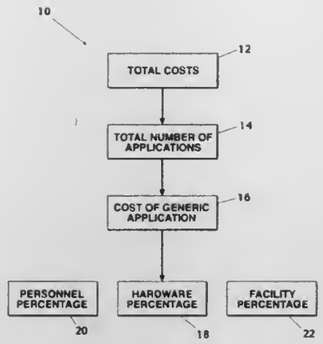
**Filed Oct. 3, 1994, Ser. No. 316,890**
**Int. Cl.[6] G06F *17/60***
**U.S. Cl. 705—7** **8 Claims**

1. A process to evaluate movement from an existing computer system platform to an alternate computer system platform for at least one application function, which process comprises:

a. determining the cost of a generic computing unit by dividing the total costs of said existing computer system platform for a predetermined period of time by the total number of application functions;

b. determining the percentage of costs of said generic computing unit attributable to at least one category;

c. projecting percentage cost changes for said existing computer system platform for selected time periods in each said category;




d. estimating training costs per generic computing unit for said alternate computer system platform;

e. estimating conversion costs per generic computing unit;

f. estimating on a percentage of said existing platform basis applied to said generic computing unit, the cost of each said category in said alternate computer system; and

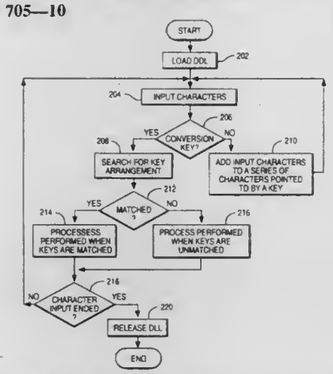
g. applying step c., d., e., and f. to said generic computing unit to produce comparative cost of said alternate platform.

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## 5,745,881
## KANA-KANJI CONVERSION SYSTEM AND A METHOD FOR PRODUCING A KANA-KANJI CONVERSION DICTIONARY

**Masami Tada, Sagamihara; Seiji Yuge, Yokohama, and Shichiro Miyashita, Yamato, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 28, 1995, Ser. No. 563,815**
**Claims priority, application Japan, Nov. 29, 1994, 6-294087**
**Int. Cl.[6] G06F *17/28***
**U.S. Cl. 705—10** **11 Claims**




1. A method, for preparing a dictionary program for a Kana-Kanji conversion system, comprising the steps of:

(a) describing in source code entries for a Kana-Kanji conversion dictionary that at least include phonemic characters and corresponding phrases as a data arrangement or a list in a predetermined programming language;

(b) searching said data arrangement or said list in said Kana-Kanji conversion dictionary in consonance with determined phonemic characters, and describing, in said source code in said predetermined programming language, a search function for providing a corresponding phrase or a pointer to said phrase; and

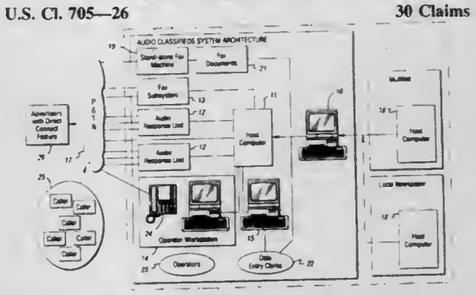
(c) compiling said source code by using a compiler for said predetermined programming language and preparing a Kana-Kanji conversion dictionary program.



## 5,745,882
## ELECTRONIC CLASSIFIED ADVERTISING INTERFACE METHOD AND INSTRUCTIONS WITH CONTINUOUS SEARCH NOTIFICATION

**Matthew J. Bixler, Denver, and Terry F. Trader, Castle Rock, both of Colo., assignors to US WEST Marketing Resources Group, Inc., Englewood, Colo.**

**Filed Jan. 9, 1995, Ser. No. 370,065**
**Int. Cl.[6] G06F *17/40;17/60***
**U.S. Cl. 705—26** **30 Claims**




1. A method, utilizing a DTMF telephone keypad, to dynamically allow a user to request automatic notification from an electronic classified advertising system coupled to a public switched telephone network (PSTN) comprising the steps of:

calling said electronic classified advertising system via said PSTN;

prompting said user to press one or more preselected DTMF keys to define search criteria;

searching for ads in said electronic classified advertising system as a function of said criteria;

determining the number of ads in said electronic classified advertising system matching said criteria; and

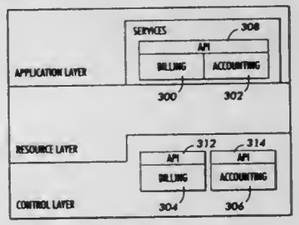
as a function of said number of ads, prompting said user to press a predetermined key on said DTMF keypad to request a notification to said user from said electronic classified advertising system when an item meeting said criteria has entered said electronic classified advertising system.

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## 5,745,883
## BILLING SYSTEM FOR USE WITH DOCUMENT PROCESSING SYSTEM

**Peter M. Krist, Rochester, and Atashi C. Sonty, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed May 30, 1996, Ser. No. 657,716**
**Int. Cl.[6] G03G *21/02***
**U.S. Cl. 705—34** **20 Claims**




1. In a printing system for processing a job with one or more events occurring, relative to the job, as a result of processing the job, a billing system for generating billing information by reference to the events, comprising:

a configurable billing information file including a plurality of current incrementable billing meters with each current incrementable billing meter corresponding with a set of one or more attribute values;

an information set including event related information with the event related information indicating that a new incrementable billing meter is to be added to the plurality of current incrementable billing meters or that one of the plurality of current incrementable billing meters is to be deleted; and

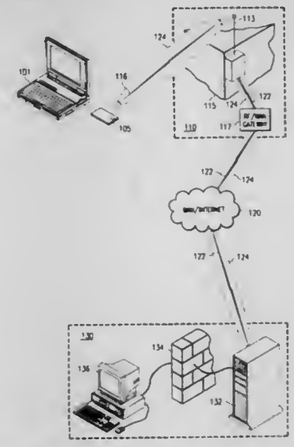
a billing meter manager, responsive to said information set, for causing the new incrementable billing meter to be added to said configurable billing information file or for causing one of the plurality of current incrementable billing meters to be deleted from said configurable billing information file.

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## 5,745,884
## SYSTEM AND METHOD FOR BILLING DATA GRADE NETWORK USE ON A PER CONNECTION BASIS

**John Carnegie, Plano, and William J. Reid, Dallas, both of Tex., assignors to Mobile Area Networks, Inc., Heathrow, Fla.**

**Filed Oct. 21, 1996, Ser. No. 733,942**
**Int. Cl.[6] G06F *19/00***
**U.S. Cl. 705—34** **7 Claims**




1. A method for billing for data grade network use on a per-connection basis, comprising the steps of:

establishing a data grade connection between a portable computing device and a destination server over a data grade Wide Area Network (WAN), wherein said establishing step includes the substeps of:

initiating the data grade connection by causing the portable computing device to communicate with a publicly-available, unrestricted intermediate access point, said communication including signature information identifying a remote user associated with the portable computing device, said communication further including a data grade WAN address of the destination server;

locating the destination server according to the data grade WAN address; and

completing the data grade connection by linking the access point to the destination server over the data grade WAN;

enabling a tunnelled Internet Protocol (IP) over the data grade connection;

upon completing said enabling step, identifying a responsible party to bill for charges associated with executing said establishing step; and

billing for said charges.

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**5,745,885**

## DATA STORAGE MEDIUM FOR FUNDING EDUCATION BY ACQUIRING SHARES OF STUDENTS' FUTURE EARNINGS

**Anthony J. Mottola, Massapequa; Julius Cherny, Monsey, and Roy C. Chapman, Woodbury, all of N.Y., assignors to Human Capital Resources, Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 422,766, Apr. 14, 1995, abandoned, which is a continuation of Ser. No. 134,314, Oct. 8, 1993, abandoned. This application May 24, 1995, Ser. No. 449,095**

**Int. Cl.[6] G06F** *17/60*

**U.S. Cl. 705—38** **25 Claims**



1. A machine-readable data storage medium encoded with a set of machine-executable instructions for carrying out, with a machine capable of executing said instructions, a data processing method for administering a plan for funding education of a plurality of students, each of said students studying in one or more fields of study at one or more educational institutions, said method comprising the steps of:

projecting earnings of said plan by (1) at least one of (a) projecting employment and earnings opportunities for students in said fields of study, and (b) projecting employment and earnings opportunities for graduates of said educational institutions, and (2) at least one of (i) limiting projection of earnings to projections for students in one or more particular fields of study, (ii) limiting projection of earnings to projections for students in one or more particular educational institutions, and (iii) creating at least one set of application criteria for acceptance of students into said plan, said application criteria being for predicting success of individual students in one or more of said fields of study;

reading and storing application responses from each of said students;

accepting students into said plan based at least in part on results of said projecting and reading and storing steps;

processing collection and receipt from investors of sufficient funds to fund at least a portion of said education of each of said accepted students;

automatically generating and printing a document to be executed by each student for purchasing an amount of student earnings on behalf of said investors, said purchased earnings comprising a predetermined percentage of earnings of each respective accepted student; and

determining an amount of said purchased earnings to be paid to said investors after subtracting costs from total purchased earnings received from accepted students.

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**5,745,886**

## TRUSTED AGENTS FOR OPEN DISTRIBUTION OF ELECTRONIC MONEY

**Sholom S. Rosen, New York, N.Y., assignor to Citibank, N.A., New York, N.Y.**

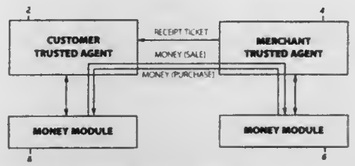
**Filed Jun. 7, 1995, Ser. No. 488,248**

**Int. Cl.[6] G06F** *17/60*

**U.S. Cl. 705—39** **23 Claims**

1. A system for the open distribution of electronic money comprising:

**Trusted Agent/Money Module Interaction**




a tamper proof customer trusted agent;

a tamper proof first money module associated with said customer trusted agent that securely communicates with said customer trusted agent;

a tamper proof merchant trusted agent that establishes a first cryptographically secure session with said customer trusted agent;

a tamper proof second money module associated with said merchant trusted agent that securely communicates with said merchant trusted agent, and that establishes a second cryptographically secure session with said first money module;

where said customer trusted agent provides electronic money purchase information and an account credential to said merchant trusted agent, and said merchant trusted agent provides a receipt ticket to said customer trusted agent;

where said merchant trusted agent accesses an authorization network and initiates an authorization process using information from said electronic money purchase information and said account credential;

where upon receiving authorization, said merchant trusted agent initiates a transfer of electronic money from said second money module to said first money module.

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**5,745,887**

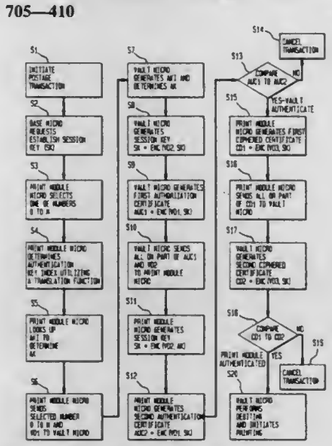
## METHOD AND APPARATUS FOR REMOTELY CHANGING SECURITY FEATURES OF A POSTAGE METER

**Joseph L. Gargiulo, Trumbull, and Charles F. Murphy, III, Milford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.**

**Filed Aug. 23, 1996, Ser. No. 701,903**

**Int. Cl.[6] G06F** *17/00*; **G07B** *17/04*

**U.S. Cl. 705—410** **10 Claims**



1. A value printing system comprising:

a printing mechanism;



means for moving the printing mechanism in a first predetermined manner during printing by the printing mechanism to record an indication of value on a recording medium; and

means, remote from the printing mechanism and the moving means, for effecting the moving means to change the movement of the printing mechanism from the first predetermined manner to a second predetermined manner different from the first predetermined manner during printing by the printing mechanism to record the indication of value on the recording medium.

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**5,745,888**

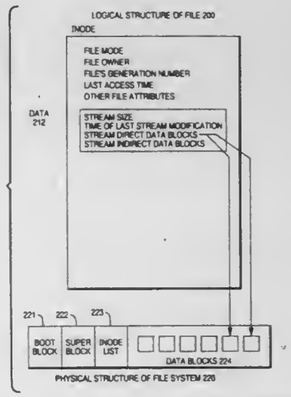
## ADVANCED FILE SERVER APPARATUS AND METHOD

**Eric J. Bauer, Freehold, and Elena Nesvetaeva, Matawan, both of N.J., assignors to NCR Corporation, Dayton, Ohio**

**Continuation of Ser. No. 549,499, Oct. 27, 1995, abandoned. This application Jul. 28, 1997, Ser. No. 901,381**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 707—1** **23 Claims**




1. A method of computing a unique filename for files shared among users of a network, wherein said network includes a file server in a host computer running a host operating system and client computers which utilize a client operating system different from said host operating system, said method including the steps of:

providing a filename of a file from said file server, said filename being native to said host computer;

accessing an inode number assigned to said file by said file server of said host computer; and

on-the-fly combining of said filename and said inode number to create said unique filename, wherein said unique filename is a valid filename for said client operating system, said unique filename operating as a name space mapping between said host computer and said client computers.

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**5,745,889**

## METHOD FOR PARSING INFORMATION OF DATABASES RECORDS USING WORD-LOCATION PAIRS AND METAWORD-LOCATION PAIRS

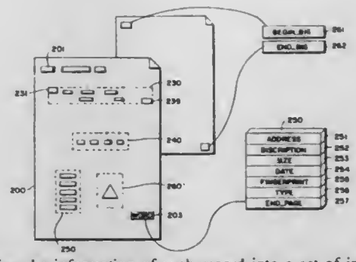
**Michael Burrows, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Filed Aug. 9, 1996, Ser. No. 694,793**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 707—2** **21 Claims**

1. A computer implemented method for parsing information stored as a plurality of records in a database, each of the plurality of records having a unique record address in the database, comprising:




parsing the information of each record into a set of individual words, each word of the set representing a portion of the information of a particular record;

assigning a unique sequential location to each word of the sets so that the location of a first word of a next record sequentially following the location of a last word of a previous record;

forming a pair from each word and its assigned location;

identifying attributes common to the set of words;

generating record metawords representing the attributes common to the set of words;

assigning the location of the last word of the set to the record metawords to form pairs;

identifying attributes common a subset of words;

generating a first field metaword and a second field metaword representing the attributes common to the subset of words;

assigning the location of the first word of the subset to the first field metaword and assigning the location of the last word of the subset to the second field metaword to form pairs;

sorting the pairs in a memory first according to the words and metaword and second according to their locations so that each unique word and metaword is immediately followed by a sequential list of locations where the unique word and metaword occurs in the database.

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**5,745,890**

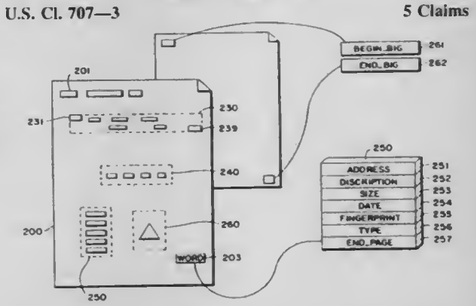
## SEQUENTIAL SEARCHING OF A DATABASE INDEX USING CONSTRAINTS ON WORD-LOCATION PAIRS

**Michael Burrows, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Filed Aug. 9, 1996, Ser. No. 694,912**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 707—3** **5 Claims**




1. A computer implemented method for constrained searching of an index of a database, the information of the database stored as a plurality of records;

sequentially assigning a unique location to each indexable portion of information of the database;

writing index entries in a memory, each index entry including a word entry representing a unique indexable portion of information, and one or more location entries for each occurrence of the unique indexable portion information;

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sorting the index entries according to a collating order of the word entries, and sequentially according to the location entries of each index entry;

parsing a query to generate a first term and a second term related by an AND logical operator, the AND operator requiring that a first index entry corresponding to the first term and a second index entry corresponding to the second term must both have locations in the same record to satisfy query; and

sequentially searching the first and second index entries subject to one or more constraints which must be satisfied.

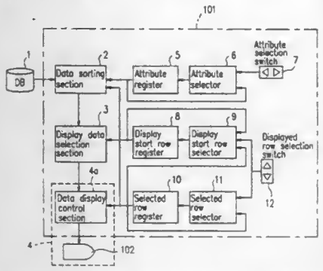
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**5,745,891**

## APPARATUS FOR REARRANGING THE ROWS OF INFORMATION IN A DISPLAYED TABLE BY HIGHLIGHTING A DIFFERENT COLUMN ATTRIBUTE

**Mitsuru Minakuchi, Soraku-gun; Koichi Kashiwagi, Tenri, and Toshiyuki Masui, Meguro-ku, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Sep. 27, 1996, Ser. No. 721,823**
**Claims priority, application Japan, Sep. 28, 1995, 7-251383**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 707—3** **2 Claims**




1. A data search apparatus which is provided with a body device for processing information, an input device for inputting the information to the body device and a display device for displaying the processed information on a display screen, thereby searching for a desired data item from a data set including a plurality of data items, comprising:

data storage means for holding and storing data about all of the plurality of data items in a state where each of the plurality of data items is represented as a row, on which a plurality of attribute values about the data item are arranged in line, and the rows corresponding to the plurality of data items are sorted in a predetermined order decided by a designated attribute;

display control means for selectively displaying a predetermined number of data items from the plurality of data items in the predetermined order decided by the designated attribute on the display screen of the display device such that the attribute values of each of the displayed data items are arranged in line and that a designated data item row and a designated attribute value column are displayed in a different state from the other data item rows and the other attribute value columns;

designation change means for changing the designated row and the designated attribute value column in accordance with an input from the input device for newly designating another row and another attribute value column to be displayed on the display screen; and

data item sorting means for sorting all of the plurality of data items which are stored in the data storage means in a new order determined by the newly designated attribute when the attribute is changed,

whereby the plurality of data items are sorted while maintaining a state where the designated data item row remains displayed on the display screen.

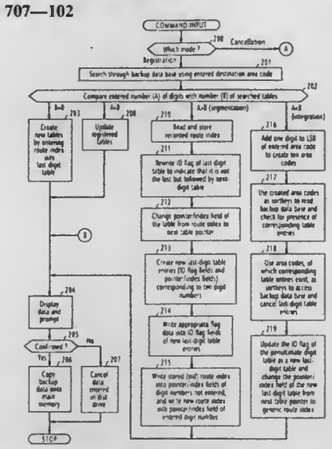
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**5,745,892**

## SWITCHING SYSTEM WITH OAM PROCESSOR CAPABLE OF AUTOMATICALLY UPDATING DIRECTORY TRANSLATION DATA BASE

**Naohito Miyata, and Manabu Inohara, both of Tokyo, Japan, assignors to NEC Corporation, Japan**

**Filed Jul. 23, 1996, Ser. No. 685,201**
**Claims priority, application Japan, Jul. 26, 1995, 7-190305**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 707—102** **4 Claims**




1. A telephone switching system comprising:

a data base having a plurality of tables linked digit-by-digit by next table pointers in a tree structure to allow routing data stored in the last-digit table to be read out in response to a sortkey;

a video display terminal for manually entering an area code and routing data; and

a processor for (a) making a search through the data base for a corresponding tree structure using the entered area code as a sortkey and comparing the number of digits in the entered area code with the number of digits in the corresponding tree structure, (b) creating, in said data base, an (N+1)th table, rewriting an N-th table of the corresponding tree structure with a next table pointer to link the N-th table to the (N+1)th table and writing the entered routing data into the (N+1)th table if the number of digits in the entered area code is N+1 and the number of digits in the corresponding tree structure is N, and (c) removing an (N+1)th table of the corresponding tree structure and rewriting an Nth table of the corresponding tree structure with the entered routing data if the number of digits in the entered area code is N and the number of digits in the corresponding tree structure is N+1.

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**5,745,893**

## PROCESS AND SYSTEM FOR ARRANGEMENT OF DOCUMENTS

**Joe R. Hill, Austin, and Gregory J. Thompson, Round Rock, both of Tex., assignors to Electronic Data Systems Corporation, Plano, Tex.**

**Filed Nov. 30, 1995, Ser. No. 565,806**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 707—5** **15 Claims**

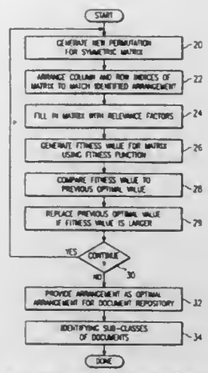
1. A system for arrangement of documents, comprising:

a document repository storing a plurality of documents; and

an arrangement engine coupled to the document repository, the arrangement engine operable to:

build a plurality of symmetric matrices based upon a plurality of identified arrangements of the plurality of documents in the document repository, each symmetric matrix structured






such that each row and corresponding column are associated with a particular document;

fill each cell of each symmetric matrix with a relevance value representing a relevance between a document associated with the row of the cell and a document associated with the column of the cell;

generate a fitness value for each symmetric matrix based upon a magnitude and a position of each relevance value by analyzing each symmetric matrix using a fitness function;

identify an optimal arrangement of the plurality of documents based upon the fitness value of each symmetric matrix; and

provide an optimal arrangement of documents as system output.

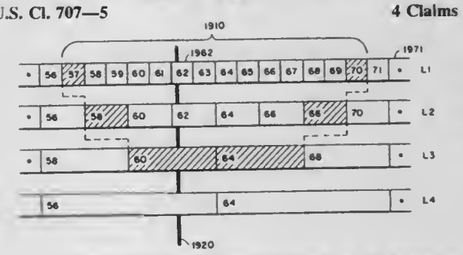
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**5,745,894**

## METHOD FOR GENERATING AND SEARCHING A RANGE-BASED INDEX OF WORD-LOCATIONS

**Michael Burrows, Palo Alto, and Andrew L. Hisgen, Mountain View, both of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.**

**Filed Aug. 9, 1996, Ser. No. 696,408**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 707—5** **4 Claims**




1. A computer implemented method for indexing a database to locate records including values within a range selected from an interval of values, the values representing numeric quantities, comprising:

indexing each record of the database by storing index entries in a memory to create an index, each index entry including a literal word entry representing a unique portion of information of the database and one or more numeric location entries indicating where the unique portion of information represented by the word entry occurs in the records of the database;

generating a plurality of sets of subintervals from the interval of values, each set of subintervals including all the values of the interval, a first set including one subinterval for each value of the interval, each next set including one interval for a group of adjacent subintervals of a previous set, a last set including one subinterval equal to the interval;

representing each subinterval by a unique literal which can be indexed as a word entry in the index;

identifying particular portions of information of the database as range-based values; and

indexing the range-based values in corresponding word and location entries, there being one word entry for each subinterval which includes the range-based values, the locations associated with the word entries representing the subintervals being the locations of the range-based portions of information.

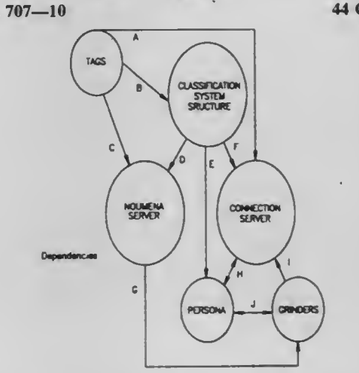
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**5,745,895**

## METHOD FOR ASSOCIATION OF HETEROGENEOUS INFORMATION

**Ronald E. Bingham, Capitola; Harry R. Campbell, Los Gatos; Michael J. Dockter, Hollister; Joel F. Farber, San Jose, all of Calif., and Kevin D. Seppi, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 21, 1994, Ser. No. 262,838**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 707—10** **44 Claims**




1. A computerized system for creating an interrelationship between a plurality of local and/or remote-computer-coded datasets, comprising any of text, audio, video, images, database entries or combinations thereof, for use in developing knowledge comprising:

a. a globally unique identifier,

b. means incorporating said identifier to uniquely identify at least a first and second dataset from said plurality of computer-coded datasets,

c. means for storing said unique identifiers in memory,

d. means for interrelating said at least first and second datasets to include a connection between said first and second datasets and one or more attributes describing said connection,

e. means incorporating said identifier for uniquely identifying both said connection and said one or more attributes,

f. means for storing said connection and attribute(s) identifiers,

g. means for repeatedly creating said interrelationships by invoking a-d for a plurality of datasets,

h. data accessing means for storing and retrieving a canonical form of said at least first and second datasets,

i. interface means for providing to a user of said system a list of prioritized linked datasets based on a profile related to said user or said datasets, and

wherein said list is developed based on said created interrelationships as they relate to said profile.

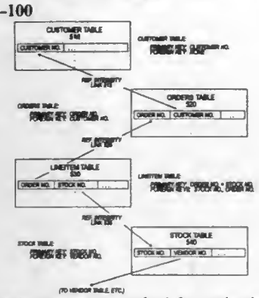
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## 5,745,896
## REFERENTIAL INTEGRITY IN A RELATIONAL DATABASE MANAGEMENT SYSTEM

**Narayanan Vijaykumar, 109 Felix St. #5, Santa Cruz, Calif. 95060**

**Continuation of Ser. No. 183,619, Jan. 18, 1994, Pat. No. 5,499,359. This application Mar. 8, 1996, Ser. No. 612,638**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 707—100** **31 Claims**




1. In a computer system, a method for maintaining referential integrity among a plurality of data tables stored in a relational database system, the method comprising:

(a) receiving from a user a request specifying a desired referential integrity link between two data tables, said request designating a master table having at least one field whose values are to serve as a reference, said at least one field serving as a unique key for said master table, and said request designating a detail table having at least one field whose values are required to match reference values in the master table, said at least one field of the detail table serving as a foreign key linking said detail table to the unique key of said master table;

(b) associating with said detail table a first referential integrity descriptor, said first referential integrity descriptor storing information specifying which index of the detail table supports said foreign key, which table is said master table for the referential integrity link, and which fields of the detail table contribute to said foreign key, said first referential integrity descriptor being stored such that a transfer of said detail table to a remote location includes transfer of said first referential integrity descriptor; and

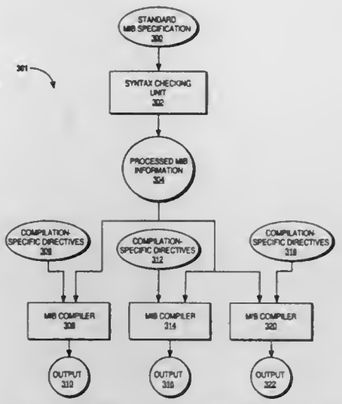
(c) associating with said master table a second referential integrity descriptor, said second referential integrity descriptor storing information specifying which fields of said master table contribute to said unique key and further specifying said detail table for the referential integrity link, said second referential integrity descriptor being stored such that a transfer of said master table to a remote location includes transfer of said second referential integrity descriptor.

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## 5,745,897
## METHOD AND SYSTEM FOR COMPILING MANAGEMENT INFORMATION BASE SPECIFICATIONS

**David Theodore Perkins, and Gregory Allen Foster, both of Santa Clara, Calif., assignors to Bay Networks Group, Inc., Santa Clara, Calif.**

**Filed Nov. 21, 1994, Ser. No. 342,856**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 707—101** **20 Claims**




1. A method for generating a plurality of output files based on a MIB specification, the method including the steps of:

performing a first MIB compilation operation by causing a first MIB compiler to read one or more files containing the MIB specification;

causing the first MIB compiler to read a first plurality of directives from one or more directive files separate from the one or more files containing the MIB specification, the first plurality of directives specifying modifications to the MIB specification;

causing the first MIB compiler to generate a first output file based on the MIB specification as modified as specified by said first plurality of directives;

performing a second MIB compilation operation by causing a second MIB compiler to read the one or more files containing the MIB specification;

causing the second MIB compiler to read a second plurality of directives from one or more directive files separate from the one or more files containing the MIB specification, the second plurality of directives specifying modifications to the MIB specification; and

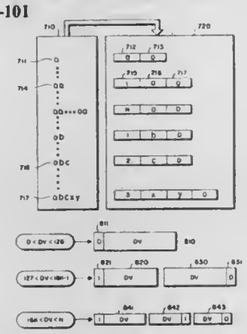
causing the second MIB compiler to generate a second output file based on the MIB specification as modified as specified by said second plurality of directives.

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## 5,745,898
## METHOD FOR GENERATING A COMPRESSED INDEX OF INFORMATION OF RECORDS OF A DATABASE

**Michael Burrows, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Filed Aug. 9, 1996, Ser. No. 695,906**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 707—101** **1 Claim**




1. A computer implemented method for generating a compressed index of information stored as a plurality of records in a database, comprising:

sequentially parsing indexable portions of information to generate words and metawords, the words representing the parsed indexable portions of information, the metawords representing attributes of the indexable portions of information;

sequentially assigning a location to each word and metaword in the order that the portions of information are parsed to form pairs;



sorting the pairs first according to the words and metawords, and for each word and metaword, second according to the locations;

writing index entries to a memory for each unique word and metaword, each index entry including a word entry or a metaword entry, and one or more location entries, the word and metaword entries using a prefix encoding, the prefix encoding indicating the number of bytes that the unique word or metaword of a next index entry has in common with the unique word or metaword of a previous index entry, and the prefix encoding indicating the bytes which are different between the unique word or metaword of the previous and next index entries, the prefix encoding of the word immediately followed by a termination byte; and

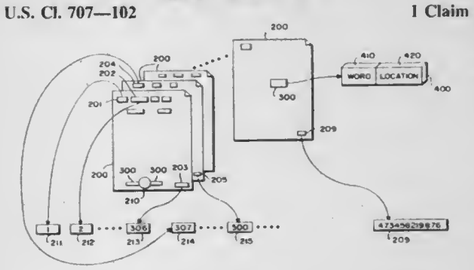
sequentially storing the location entries following the word and metaword entries using a delta value encoding, the last location entry of each index entry immediately followed by the termination byte to fully populate the compressed index.

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## 5,745,899
## METHOD FOR INDEXING INFORMATION OF A DATABASE

**Michael Burrows, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Filed Aug. 9, 1996, Ser. No. 689,541**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 707—102** **1 Claim**




1. A computer implemented method for indexing information stored as a plurality of records in a database, each of the plurality of records having a record address in the database, comprising:

generating, for each record, a set of pairs, each pair including a word representing a portion of the information of the record and an associated location of the portion of the information, the locations of the words assigned sequentially such that the location of a first word of a next record sequentially follows the location of a last word of a previous record;

identifying for each set of pairs common record attributes;

generating for each identified common record attribute another pair including a record metaword representing the common record attribute and the location of the last word of the set of pairs, one of the common record attributes being the record address;

identifying subsets of pairs of each record having common field attributes;

generating, for each common field attribute, a first field metaword and a second field metaword representing the common field attributes; and

assigning the location of the first word of the subset of pairs to the first field metaword, and assigning the location of the last word of the subset of pairs to the second field metaword;

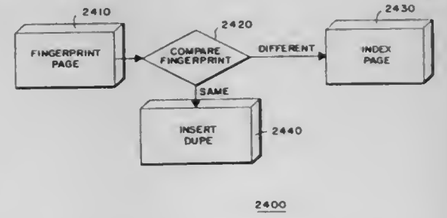
sequentially writing index entries to an index stored in a memory, there being one index entry for each unique word and for each unique metaword, the index entries written in a collation order of the words and metawords, each index entry including a particular unique word or a particular unique metaword written in a prefix notation, the prefix notation of the particular unique word or metaword immediately followed by a word terminator, the terminator immediately followed by all of the locations assigned to the particular unique word or metaword in a collating order of the locations, each location written as a delta value, and the last location of the index entry followed by a location terminator to fully populate the compressed data structure.

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## 5,745,900
## METHOD FOR INDEXING DUPLICATE DATABASE RECORDS USING A FULL-RECORD FINGERPRINT

**Michael Burrows, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Filed Aug. 9, 1996, Ser. No. 711,192**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 707—102** **3 Claims**




1. A computer implemented method for indexing duplicate information stored in records of a database, each record having a unique address in the database, comprising:

generating a fingerprint for each record, the fingerprint being a singular value derived from all of the information of the record according to a predetermined combination of the information of the record;

storing the fingerprint in the index as a unique fingerprint if the fingerprint is different than a previously stored fingerprint of the index along with a reference to the unique address of the record;

indexing the record having the unique fingerprint as a master record; and

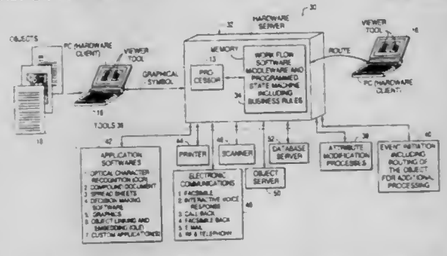
storing a reference to the unique address of the record with the reference to the address of a previously stored unique fingerprint if the fingerprint is identical to the previously stored unique fingerprint.

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## 5,745,901
## WORKFLOW INITIATED BY GRAPHICAL SYMBOLS

**Diane T. Entner, Fairfax; Phyllis J. Wormington, Vienna, and Chih Ru Lin, Fairfax, all of Va., assignors to Kodak Limited, Harrow, England**

**Filed Nov. 8, 1994, Ser. No. 337,388**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 707—103** **24 Claims**




1. A method for workflow processing of objects stored in a memory of a computer system comprising:

storing an object, which is to be processed, in the memory of the computer system;

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reading the object, which is to be processed, from the memory and adding a graphical symbol to the object;

processing the graphical symbol and object with middleware, with the middleware being a program module providing a service to a client application allowing the client application to communicate with a server application; and

in response to the processing of the graphical symbol with the middleware, initiating actions to process the object in accordance with business rules, with the business rules being at least one of a set of controls or procedures by which a computer implemented business process is conducted; and wherein

the graphical symbol is an object which, when interpreted by the middleware into a computer readable format, initiates an action resulting in the use of at least one tool to process the object with each tool performing a different operation on the object or at least one additional event or changing at least one attribute of the object, based on the business rules.

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**5,745,902**

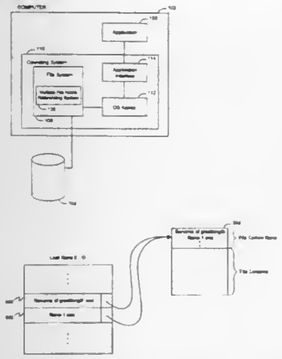
## METHOD AND SYSTEM FOR ACCESSING A FILE USING FILE NAMES HAVING DIFFERENT FILE NAME FORMATS

**Thomas J. Miller, Bellevue, and Gary D. Kimura, Kirkland, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.**

**Filed Jul. 6, 1992, Ser. No. 909,984**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 707—200** **24 Claims**



1. A method in a computer system for accessing a file using a tree structure, the computer system having a memory, the tree structure having a plurality of file entries, each file entry for storing a file name identifying a file and a file storage indicator indicating a location of the file in the memory, the file name being either a long file name in a long file name format or a short file name in a short file name format, the method comprising:

when creating a file,

receiving a long file name in a long file name format;

storing the received long file name in a first file entry of the tree structure along with a file storage indicator indicating the location of the file in the memory;

automatically generating a short file name in a short file name format; and

storing the generated short file name in a second file entry of the tree structure along with the file storage indicator indicating the location of the file in the memory, the second file entry being different from the first file entry; and

when accessing the file,

upon receiving the long file name,

locating the first file entry in the tree structure in which the received long file name is stored;

retrieving the file storage indicator stored in the located first file entry; and

accessing the file in the memory using the retrieved file storage indicator; and

upon receiving the short file name,

locating the second file entry in the tree structure in which the received short file name is stored;

retrieving the file storage indicator stored in the located second file entry; and

accessing the file in the memory using the retrieved file storage indicator.

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**5,745,903**

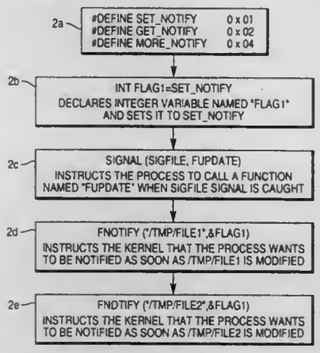
## METHOD AND APPARATUS FOR FILE CHANGE NOTIFICATION

**Fang-Fei S. Huan, Marlboro, N.J., assignor to NCR Corporation, Dayton, Ohio**

**Filed Oct. 6, 1995, Ser. No. 540,231**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 707—201** **20 Claims**




1. A method for notifying a process in a computer system of modifications to selected files of interest comprising the steps of:

specifying by means of a system call instruction file modification events to a kernel of an operating system in said computer system for said selected files of interest, said file modification event being a condition which when satisfied prompts said kernel to transmit to said process a signal indicative of occurrence of said file modification event, said condition being satisfied upon modification to said selected file of interest;

determining in said kernel whether said condition has been satisfied; and

transmitting said signal from said kernel indicative of occurrence of said file modification event being specified.

wherein said system call instruction is operative to set a flag in said kernel which prompts the kernel to transmit said signal upon occurrence of said file modification event.

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**5,745,904**

## BUFFERED TABLE USER INDEX

**John Wesley King, Kirkland; Geoffrey Minard Kizer, Seattle, and Gregory R. Smith, Bellevue, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.**

**Filed Jan. 12, 1996, Ser. No. 586,612**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 707—200** **10 Claims**

1. A computer database management system, comprising:

a database table containing a plurality of data records;

a table buffer containing any currently uncommitted modifications to the data records of the database table;

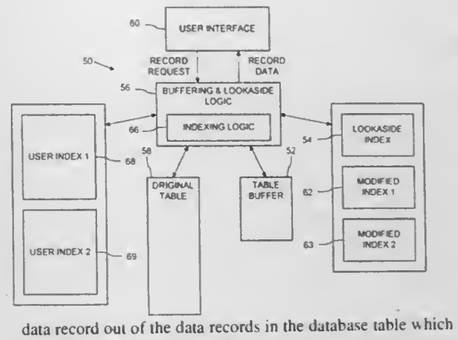
a user index for performing any of a set of index functions on the database table and returning a result value indicative of a data record out of the data records in the database table which results from that index function;

a modifications index for performing any of a set of index functions on the table buffer and returning a result value indicative of a modified data record out of the modifications in the table buffer which results from that index function;

a user interface control for invoking a user-requested index function; and

an index handler responsive to the user interface control for causing the user index and the modifications index to perform the user-requested index function and for retrieving a resulting data record indicated by a selected one of the result values returned by the user index and the modifications index that satisfies the user-requested index function.






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**5,745,905**

## METHOD FOR OPTIMIZING SPACE IN A MEMORY HAVING BACKUP AND DATABASE AREAS

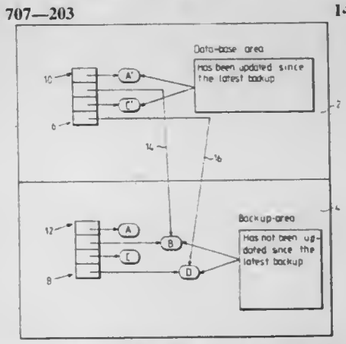
**Bo Erik Stefan Larsson, Huddinge, and Iván Maria Sanchez, Stockholm, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**

**Filed Dec. 8, 1993, Ser. No. 162,774**

**Claims priority, application Sweden, Dec. 8, 1992, 9203692**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 707—203** **14 Claims**




1. A method for storing backup data for a data base in a primary memory having a backup area and a database area comprising the steps of:

storing in the backup area only objects which have not been updated since a latest backup;

storing only updated objects in the data-base area;

copying only an access structure from the backup area to the data-base area when reloading the data base; and

accessing objects in the backup area.

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**5,745,906**

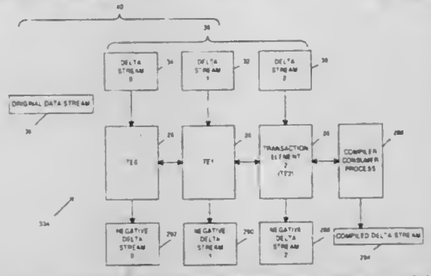
## METHOD AND APPARATUS FOR MERGING DELTA STREAMS TO RECONSTRUCT A COMPUTER FILE

**Mark Squibb, Republic, Mo., assignor to DeltaTech Research, Inc., Montreal, Canada**

**Filed Nov. 14, 1995, Ser. No. 557,586**

**Int. Cl.[6] G06F** *17/30*

**U.S. Cl. 707—203** **56 Claims**




1. In a programmable computer, a method of merging an original data stream with a sequential plurality of delta streams to build an updated data stream, the method comprising the steps of:

a) initiating a search request, within the sequential plurality of delta streams, for a number of data bytes to transfer to the updated data stream;

b) fulfilling the search request with data bytes provided by the last delta stream in the sequential plurality of delta streams which is capable of supplying data bytes;

c) if the sequential plurality of delta streams is incapable of fulfilling the search request, fulfilling the search request with data bytes provided by the original data stream; and

d) repeating steps a)–c) until a search request cannot be fulfilled, and the updated data stream is complete.

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**5,745,907**

## IMAGE REGISTERING APPARATUS, IMAGE REGISTERING METHOD, AND ITS SYSTEM

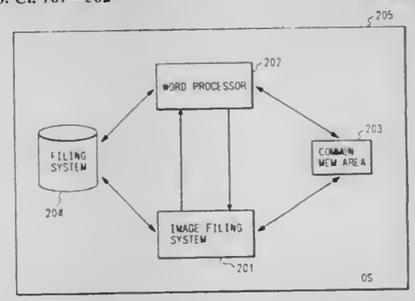
**Kunihiro Yamamoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 16, 1995, Ser. No. 543,344**

**Claims priority, application Japan, Oct. 18, 1994, 6-278448; Oct. 20, 1994, 6-255184**

**Int. Cl.[6] G06T** *1/00*

**U.S. Cl. 707—502** **51 Claims**




1. An image registering method of registering an image formed by another system into an image filing system, comprising the steps of:

making the other system operative from the image filing system;

developing image data previously registered by the other system into a developed image that can be processed by the image filing system; and

registering the developed image into the image filing system.

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## 5,745,908

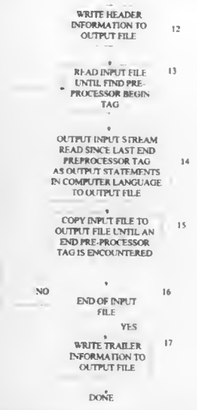
### METHOD FOR CONVERTING A WORD PROCESSING FILE CONTAINING MARKUP LANGUAGE TAGS AND CONVENTIONAL COMPUTER CODE

**Charles Anderson, Newbury; Stewart Barr, Maidenhead; Clive Beavis, Wilts; David Cleland, Reading, and Raymond Obin, Newbury, all of United Kingdom, assignors to Systems Focus International, Aruba, Netherlands**

**Filed Mar. 29, 1996, Ser. No. 625,743**

**Int. Cl.[6] G06F** *17/00*

**U.S. Cl. 707—513** **6 Claims**




1. A method for operating a computer to convert a word processing file, which comprises a linear sequence of characters, said linear sequence of characters comprising segments of said linear sequence marked by beginning and ending tags, into a source file comprising computer language statements, said source file defining a computer program that will generate an output stream in a format recognizable by a word processing program adapted to read said output stream, said method comprising the steps of:

reading a linear sequence of characters from said word processing file;

translating a segment of said linear sequence of characters that is not surrounded by said beginning and ending tags to computer language output statements and outputting said computer language output statements to said source file,

wherein said output statements cause a computer program generated from said source file, when said generated computer program is executed, to reproduce said linear sequence of characters in an output stream generated by said computer program; and

providing computer source language statements in said source file corresponding to a segment of said linear sequence of characters that is surrounded by said beginning and ending tags.

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## 5,745,909

### METHOD AND APPARATUS FOR REDUCING FLICKER WHEN DISPLAYING HTML IMAGES ON A TELEVISION MONITOR

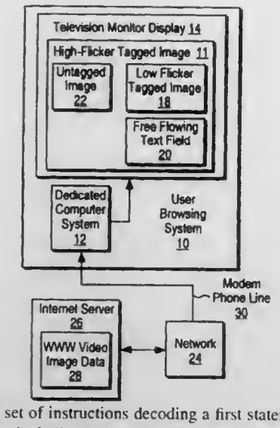
**Stephen G. Perlman, Mountain View, and Bruce Leak, Palo Alto, both of Calif., assignors to WebTV Networks, Inc., Palo Alto, Calif.**

**Filed Jul. 9, 1996, Ser. No. 677,915**

**Int. Cl.[6] G06T** *5/00*

**U.S. Cl. 707—513** **16 Claims**

1. A computer implemented method for filtering object data contained in a first set of instructions during and execution of the first set of instructions, the first set of instructions provided for processing a World Wide Web (WWW) document, the method comprising the steps of:




a) the first set of instructions decoding a first statement, the first statement including at least one filtering command for reducing flickering of an image and object data;

b) the first set of instructions issuing a first command to be executed; and

c) in response to an execution of said filtering command, the first set of instructions decoding the object data and determining whether to filter the object data.

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## 5,745,910

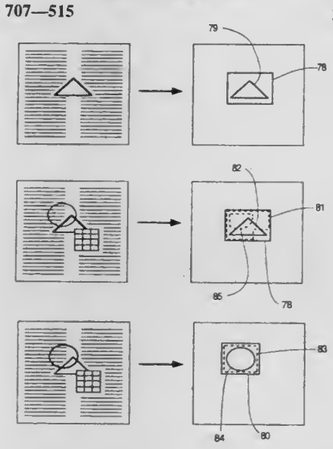
### FRAME STRUCTURE WHICH PROVIDES AN INTERFACE BETWEEN PARTS OF A COMPOUND DOCUMENT

**Kurt W. Piersol; Joshua B. Susser, both of Santa Cruz, and Richard C. Rodseth, Saratoga, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.**

**Continuation of Ser. No. 175,549, Dec. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 58,260, May 10, 1993. This application Apr. 17, 1996, Ser. No. 633,350**

**Int. Cl.[6] G06T** *1/00*

**U.S. Cl. 707—515** **26 Claims**




1. In a computer system for the creation and/or manipulation of compound documents, wherein a first component of a document is embedded in a second, containing component of the document and each component includes associated contents and a manipulator for those contents, an interface arrangement for defining the relationship between said first and second components, said arrangement comprising:

means storing a first data structure containing information that is shared between said first and second components, said stored information including a first shape that is determined by said second component and which defines an area within said second component that is available for the placement of the contents of said first component, and a second shape that is determined by said first component and which defines the portion of said area in which the contents of said first component are actually located; and

means storing a second data structure associated with the first data structure and containing information regarding the geometric relationship between said first and second components, said information stored in the second data structure including a third shape that is determined by said second component and which defines a portion of said area in which the contents of said first component can be displayed.



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## 5,745,911

### SYSTEM FOR PERFORMING SPELL CHECK FUNCTIONS ON A PRINTING DEVICE WITHOUT OPERATOR INTERVENTION

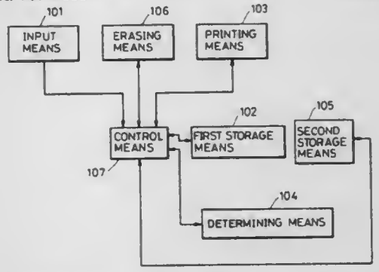
**Noriyuki Sugiyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 125,142, Sep. 23, 1993, abandoned, which is a continuation of Ser. No. 780,379, Oct. 23, 1991, abandoned, which is a continuation of Ser. No. 299,027, Jan. 19, 1989, abandoned. This application May 22, 1995, Ser. No. 445,791**

**Claims priority, application Japan, Jan. 20, 1988, 63-8480**

**Int. Cl.[6] B41J** *5/30;3/42*

**U.S. Cl. 707—533** **15 Claims**




1. A printing device comprising:

input means for inputting information, comprising a plurality of characters comprising words and a plurality of symbols;

output means for printing or erasing characters or symbols;

determining means for determining whether the information indicating the end of a word is inputted each time one character or one symbol is inputted by said input means;

dictionary means for storing a plurality of correctly-spelled words;

checking means for checking the correctness of the spelling of a word which has been inputted each time a whole word is inputted by said input means in response to said determining means determining that the information indicating the end of the input word has been inputted by said input means;

recognizing means for recognizing a correctly spelled word corresponding to an input word if the input word is determined to be a misspelled word as the result of the checking by said checking means;

discriminating means for discriminating whether the number of characters in the misspelled word accords with the number of characters in the corresponding correctly spelled word; and

control means for controlling said output means to selectively erase correct characters in the misspelled word, depending on whether the number of characters of the misspelled word is discriminated to accord with that of the corresponding correctly spelled word by erasing only wrong characters in the misspelled word if the number of characters of the misspelled word is discriminated to accord with that of the corresponding correctly spelled word, and erasing a first wrong character which is the first wrong character to appear in the misspelled word and to always erase all the characters subsequent to the first wrong character in the misspelled word even if some or all of the subsequent characters are correct and match the corresponding characters of the corresponding correctly spelled word if the number of characters of the misspelled word is discriminated not to accord with the number of characters of the corresponding correctly spelled word.

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## 5,745,912

### MEMORY CARD APPARATUS INCLUDING A LINK TABLE FOR MANAGING THE CORRESPONDENCY BETWEEN THE RECORDED CONTENTS IN THE MEMORY CARD AND THAT IN THE LINK TABLE

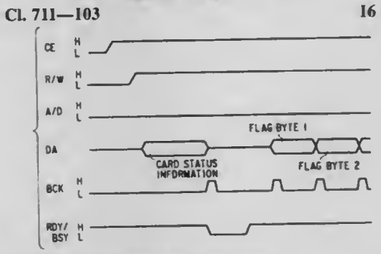
**Kazuo Konishi; Shimpei Yoshioka; Koji Maruyama; Tomoyuki Maekawa, all of Yokohama, and Toshiaki Sato, Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 41,251, Apr. 1, 1993, abandoned. This application Aug. 28, 1996, Ser. No. 704,354**

**Claims priority, application Japan, Apr. 2, 1992, 4-080931; Apr. 3, 1992, 4-082258; May 8, 1992, 4-116017**

**Int. Cl.[6] G06F** *12/16*

**U.S. Cl. 711—103** **16 Claims**




1. A memory card apparatus comprising:

a link table for managing link data;

an EEPROM, an external address for writing data in the EEPROM being associated with an actual address of the EEPROM via the link data in the link table, the link data being written and managed in the link table when data has been completely written in the EEPROM; and

a flag region that indicates whether writing of the link data in the link table is incomplete, wherein a flag of the flag region is set when a data write in the EEPROM is requested, and wherein the flag of the flag region is reset when the link data has been completely written in the link table,

wherein card status information is output when an address/data switch signal represents an address input and a read/write switch signal is set in a data read-out state, and

wherein a bus clock is transmitted by a card connector during a card status information output state, and a flag byte representing an internal condition of the memory card apparatus, which cannot be found in the card status information, is output in place of card status information in response to the bus clock.

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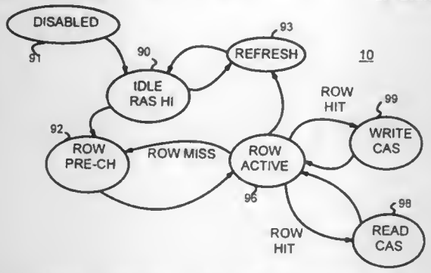


**5,745,913**

## MULTI-PROCESSOR DRAM CONTROLLER THAT PRIORITIZES ROW-MISS REQUESTS TO STALE BANKS

**Jay C. Pattin, Redwood City, and James S. Blomgren, San Jose, both of Calif., assignors to Exponential Technology, Inc., San Jose, Calif.**

**Filed Aug. 5, 1996, Ser. No. 691,005**
**Int. Cl.[6] G06F** *12/00*
**U.S. Cl. 711—105** **19 Claims**




**1**. A memory controller for accessing an external memory in response to requests from a plurality of general-purpose processors, the memory controller comprising:

a plurality of bank controllers, each bank controller for accessing a bank of the external memory, each bank controller comprising:

a state machine for sequencing control signals for timing access of the external memory, the state machine outputting a row-active indication of a RAS signal line coupled to the bank of the external memory when the last access to the bank occurred;

a row address register for storing a last row address of a last-accessed row of the bank of the external memory;

a counter, including reset means for resetting the counter upon completion of a data-transfer access to the bank of the external memory, the counter periodically incrementing when the row is active and no data-transfer access occurs, the counter outputting a stale-row indication when a count from the counter exceeds a predetermined count;

a request queue for storing requests from the plurality of general-purpose processors for accessing the external memory, the request queue storing row-status bits including:

a) a row-hit indication when the last row address matches a row address of a request,

b) the row-active indication from the state machine, and

c) the stale-row indication from the counter; and

a request prioritizer, coupled to the request queue, for determining a next request from the request queue for generating a data-transfer access to the external memory, the request prioritizer re-ordering the requests into an order other than the order the requests are loaded into the request queue,

whereby requests from the plurality of processors are re-ordered for accessing the external memory.

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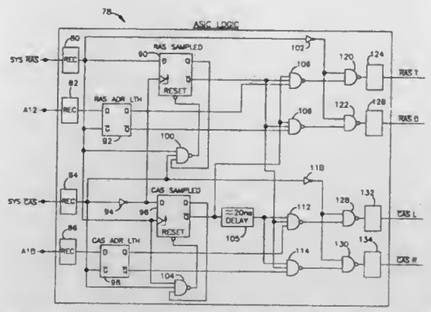
**5,745,914**

## TECHNIQUE FOR CONVERTING SYSTEM SIGNALS FROM ONE ADDRESS CONFIGURATION TO A DIFFERENT ADDRESS CONFIGURATION

**Brian J. Connolly, Williston; Timothy Jay Dell, Colchester; Bruce Gerard Hazelzet, and Mark William Kellogg, both of Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation-in-part of Ser. No. 598,857, Feb. 9, 1996. This application Dec. 20, 1996, Ser. No. 770,924**
**Int. Cl.[6] G06F** *12/00*
**U.S. Cl. 711—105** **8 Claims**

**5**. A computer system comprising:




a memory controller which outputs Y row address bits and a single system RAS signal per address space or pluggable socket, and X column address bits and a single CAS signal;

memory including DRAM chips having Y−1 bit row addresses and X−1 bit column addresses;

logic circuitry to receive said master RAS signal and the high order address bit of said row address from said memory controller and generate a first memory active RAS signal responsive to said master RAS signal becoming active when and only when said high order bit of said row address has a first value during read/write operations, and generate a second memory RAS active signal when said master RAS is active and when and only when said high order bit of said row address is a second value during read/write operations;

providing said system CAS signal to said memory during a read or write operation as an active memory CAS signal when and only when the high order address bit of said column address signal is a first value;

providing the high order bit of said X address as a second memory CAS signal which becomes active during a read or write operation when and only when said high order bit of said column address is a second value;

providing both said first and second memory RAS signals and first and second CAS signals to memory during a refresh operation;

to receive said master CAS signal and the high order address bit of said column address from said memory controller and generate a first memory active CAS signal responsive to said master CAS signal becoming active when and only when said high order bit of said column address has a first value during read/write operations, and generate a second memory CAS active signal when said master CAS is active and when and only when said high order bit of said column address is a second value during read/write operations; and

said logic circuit having circuitry to generate both memory RAS signals and both memory CAS signals active during a refresh cycle when said system RAS is active.

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**5,745,915**

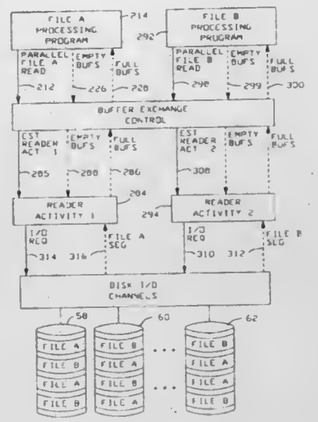
## SYSTEM FOR PARALLEL READING AND PROCESSING OF A FILE

**Thomas P. Cooper, New Brighton, Minn.; James A. Elke, Thornton, Colo.; John R. Jordan, St. Paul, Minn.; Lester Y. Lee, Arden Hills, Minn.; James R. Mettling, Forest Lake, Minn.; Ralph E. Sipple, Shoreview, Minn., and Ronald Q. Smith, St. Paul, Minn., assignors to Unisys Corporation, Blue Bell, Pa.**

**Continuation of Ser. No. 407,470, Mar. 17, 1995, abandoned. This application May 14, 1997, Ser. No. 856,026**
**Int. Cl.[6] G06F** *12/00*
**U.S. Cl. 711—114** **22 Claims**

**1**. In a data processing system capable of processing data at a






predetermined rate, a subsystem for providing optimized access to a data file, comprising:

a plurality of input-output channel means for transmitting selected portions of the data file to or from the data processing system;

a plurality of direct access storage means coupled to the data processing system via said plurality of input-output channel means, for reading said selected portions of the data file stored in a predetermined placement on predetermined ones of said plurality of direct access storage means;

selection means operable on the data processing system for selecting said selected portions of the data file to read wherein each of said selected portions of the data file is associated with a logical relative address indicative of the position of said selected portion of the data file within the data file; and

parallel read means for reading in parallel said selected portions of the data file in an optimal order as determined by said predetermined placement irrespective of said logical relative address and for providing said selected portions of the data file in parallel to the data processing system at a rate to optimally match the predetermined rate.

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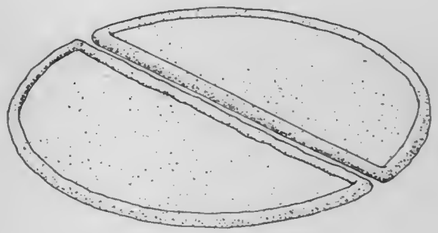
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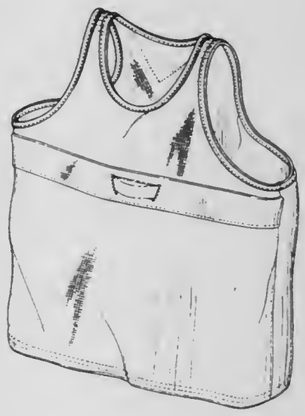
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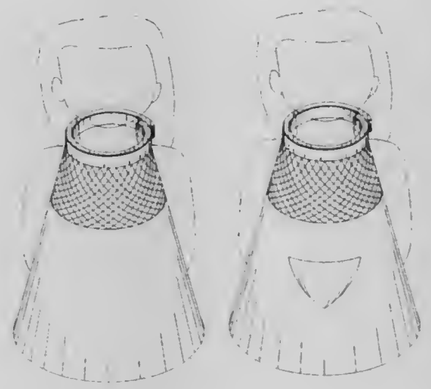
393,735
DIVIDED PIZZA CRUST
Jeno F. Paulucci, 201 W. First St., Sanford, Fla. 32771, assignor to Jeno F. Paulucci, Sanford, Fla.
Filed Jun. 28, 1996, Ser. No. 56,430
Term of patent 14 years
LOC (6) Cl. 01 - *01*
U.S. Cl. D1—130



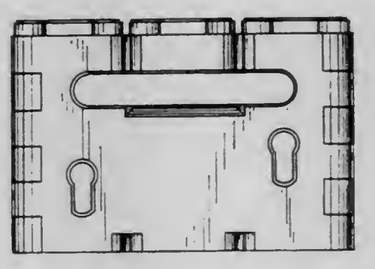
393,736
MAN'S GARMENT WITH MONITOR ACCOMMODATION
Michael Rubin, Colts Neck, N.J., assignor to Attitudes In Dressing, Elizabeth, N.J.
Filed Sep. 24, 1996, Ser. No. 60,206
Term of patent 14 years
LOC (6) Cl. 02 - *01*
U.S. Cl. D2—717



393,737
NURSING BLANKET
Karen Jean Tymous, 2016 6th Ave., Beaver Falls, Pa. 15010
Filed Mar. 17, 1997, Ser. No. 69,242
Term of patent 14 years
LOC (6) Cl. 02 - *02*
U.S. Cl. D2—864



393,738
CAP WITH HEADSCARF
Rom Doul Eng, 14 rue Mario Capra, 94400, Vitry sur Seine, France
Filed Sep. 16, 1996, Ser. No. 59,772
Claims priority, application France, Mar. 15, 1996, 96 1602
Term of patent 14 years
LOC (6) Cl. 02 - *03*
U.S. Cl. D2—865



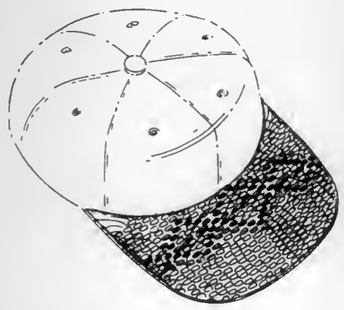
VOL 1209 ISS 4 AP 28 1998 UMI



393,739
INTERCHANGEABLE HAT
Steven R. Dudson, and Roy W. Dudson, both of P.O. Box 1240, Hamilton, North Island, New Zealand
Filed Feb. 26, 1997, Ser. No. 67,123
Term of patent 14 years
LOC (6) Cl. 02 - *03*
U.S. Cl. D2—889

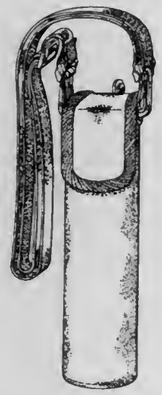


393,740
RATTLESNAKE SKIN BASEBALL HAT
Kenneth M. Stevens, 7215 W. Sahuaro Dr., Peoria, Ariz. 85345
Filed Feb. 25, 1997, Ser. No. 67,074
Term of patent 14 years
LOC (6) Cl. 02 - *03*
U.S. Cl. D2—893

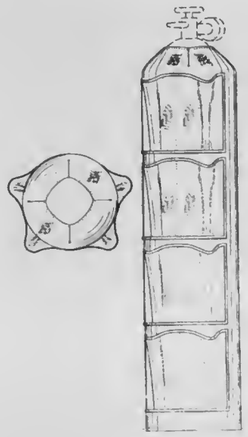


393,741
Patent Not Issued For This Number

393,742
UMBRELLA CASE
Magda El-Edwy, Duluth, Ga., assignor to CUI International Inc., Norcross, Ga.
Filed Apr. 8, 1997, Ser. No. 70,023
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—11

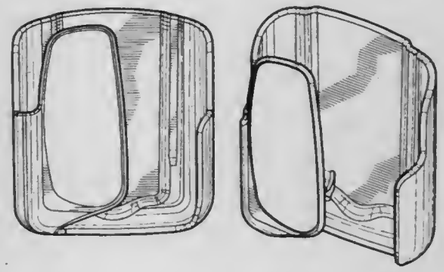


393,743
BALLOON ORGANIZER
Stephen A. Serniotti, 265 NE. 186th, Portland, Oreg. 97230
Filed May 30, 1997, Ser. No. 71,505
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—201



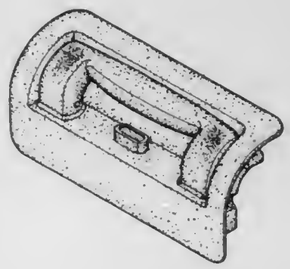


393,744
HOLSTER FOR A PAGER
Henry Wandt, Boca Raton, Fla.; Michael Ye, Beijing; Zhihong Memphis Yin, Tianjin, both of China; Tek Choy Kok, Singapore, Singapore; Mark Palm, Margate, Fla.; Daniel Troutman, and Donald Guthan, both of Boynton Beach, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 30, 1996, Ser. No. 59,717
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—218

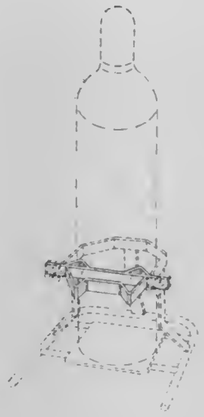


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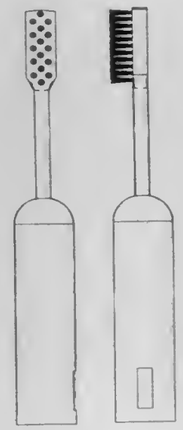
393,746
HANDLE AND MOUNTING FRAME FOR BAGGAGE
King-Sheng Wang, No. 569, Ching-Kuo Rd., Ta-Chia Chen, Taichung Hsien, Taiwan
Filed Jan. 6, 1997, Ser. No. 64,548
Term of patent 14 years
LOC (6) Cl. 03 - *99*
U.S. Cl. D3—318



393,747
CYLINDER STAND STRAP
Frank S. Salvucci, Sr., 2300 Haggin Oaks Blvd., Bakersfield, Calif. 93311, assignor to Frank S. Salvucci, Sr., Delano, Calif.
Filed Dec. 6, 1996, Ser. No. 63,356
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—323



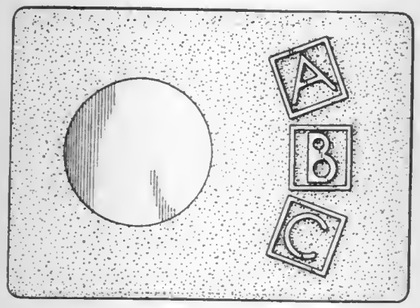
393,748
TOOTHPASTE DISPENSING BRUSH
Mike Peltier, 303 Cook St., St. Paul, Minn. 55101
Filed May 29, 1997, Ser. No. 71,382
Term of patent 14 years
LOC (6) Cl. 04 - *02*
U.S. Cl. D4—108



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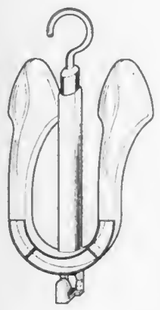


393,749
BABY PICTURE FRAMES
Robert J. Krohn, Port Richey, Fla., assignor to You/Nique Picture Frames, Inc., Port Richey, Fla.
Filed Jun. 2, 1997, Ser. No. 71,575
Term of patent 14 years
LOC (6) Cl. 06 - *07*
U.S. Cl. D6—307



393,750
Patent Not Issued For This Number

393,751
SHOE HANGER
Juan Liang, 1,Alley 14-1, Shern-Guang Lane, Tai-Ping Country, Taichung County, Taiwan
Filed Apr. 16, 1997, Ser. No. 69,443
Term of patent 14 years
LOC (6) Cl. 06 - *08*
U.S. Cl. D6—315



393,752
SEAT
Peter Maly, Hamburg, Germany, assignor to Roset S.A., France
Filed May 20, 1997, Ser. No. 70,963
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—334



393,753
CHAIR
Pascal Mourgue, Paris, France, assignor to Cinna, France
Filed May 22, 1997, Ser. No. 71,162
Claims priority, application WIPO, Jan. 9, 1997, DM/038 756
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—334





393,754
LOUNGE
David S. Marks, 3322 N. Flagler Dr., Palm Beach, Fla. 33407
Filed Apr. 3, 1997, Ser. No. 68,413
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—361



393,755
CHAIR
Steve J. Nemeth, Jr., Park Township, Ottawa County, Mich., assignor to Haworth, Inc., Holland, Mich.
Filed Mar. 6, 1997, Ser. No. 67,661
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—366



393,756
CHAIR
James Glenn Mohundro, 1101, Block C, Menara Glomac Kelana Business Centre, 97, Jalan SS72/2, 47301 Kelana Jaya, Selangor, Malaysia
Filed Dec. 10, 1996, Ser. No. 63,778
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—370



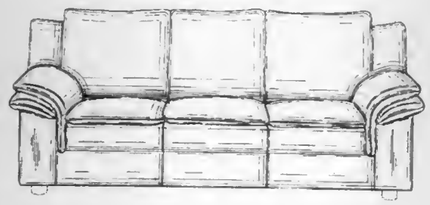
393,757
STACKING CHAIR
William R. Breen, Ontario, Canada, assignor to Nightingale Inc., Mississauga, Canada
Filed Apr. 21, 1997, Ser. No. 70,004
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—373



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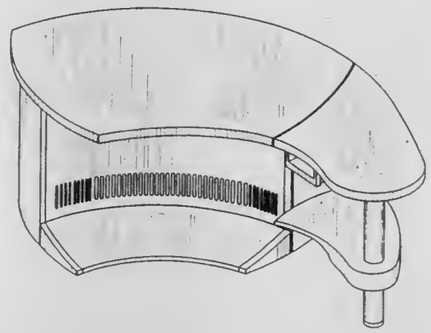
393,758
SEAT
Pasquale Natuzzi, Santeramo I Colle, and Arcangelo Scarati, Talsano, both of Italy, assignors to Industrie Natuzzi, Spa, Bari, Italy
Filed Sep. 5, 1996, Ser. No. 59,245
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—381



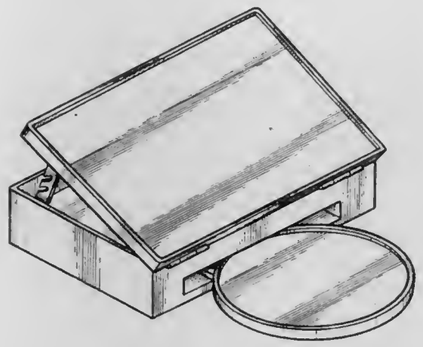
393,759
SEAT
Pasquale Natuzzi, Santeramo In Colle, and Domenico Abbruzzese, Gioia del Colle, both of Italy, assignors to Industrie Natuzzi, Spa, Santeramo, Italy
Filed Dec. 20, 1996, Ser. No. 63,976
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—381



393,760
WORK STATION
Noam S. Allon, Haifa, Israel, assignor to Medivision, Medical Imaging Ltd., Yokneam Elit, Israel
Filed Mar. 1, 1996, Ser. No. 51,006
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—422

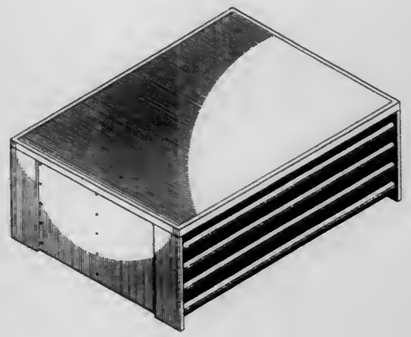


393,761
ADJUSTABLE TABLE FOR ASSEMBLING JIGSAW PUZZLES
Carlos Hinton, 1515 Forest Nelson Blvd., M-103, Port Charlotte, Fla. 33952
Filed Dec. 3, 1996, Ser. No. 63,248
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—425

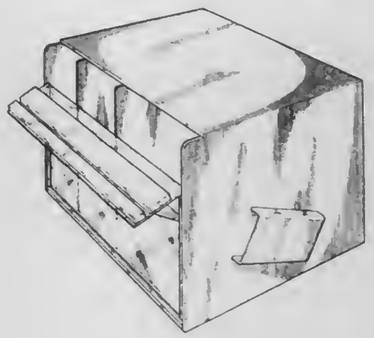




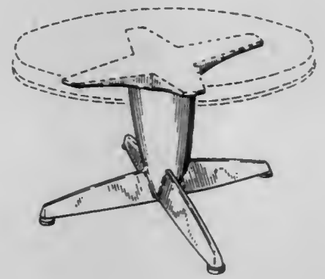
393,762
FLAT FILE WITH TUBULAR DRAWER PULLS
Sina Khajavi, 15 Coral Tree La., Rolling Hills Estates, Calif. 90274
Filed Apr. 30, 1996, Ser. No. 53,816
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—445



393,763
DISPLAY CABINET
Thamas D. Darcey, Mooresville, and Ronald L. Kelley, Huntersville, both of N.C., assignors to Smith & Nephew, Inc., Charlotte, N.C.
Filed Apr. 9, 1997, Ser. No. 68,455
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—470



393,764
TABLE PEDESTAL
Volker Hundertmark, Raddestorf, Germany, assignor to Bemis Manufacturing Co., Sheboygan Falls, Wis.
Filed Feb. 21, 1997, Ser. No. 66,628
Claims priority, application Hague Agreement, Aug. 23, 1996, DMA/003434
Term of patent 14 years
LOC (6) Cl. 06 - *06*
U.S. Cl. D6—498



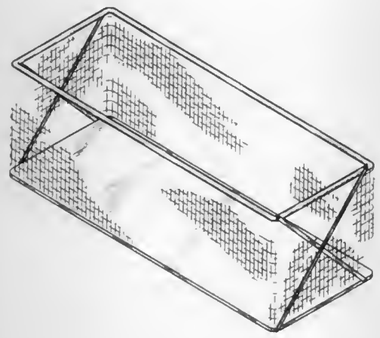
393,765
CHAIR ARM
Zooey C. Chu, Grand Rapids, Mich., assignor to Globe Business Furniture of Tennessee, Inc., Hendersonville, Tenn.
Filed Mar. 5, 1997, Ser. No. 66,988
Term of patent 14 years
LOC (6) Cl. 06 - *06*
U.S. Cl. D6—501



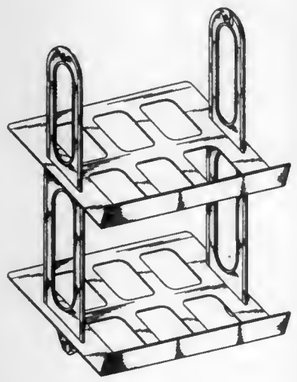
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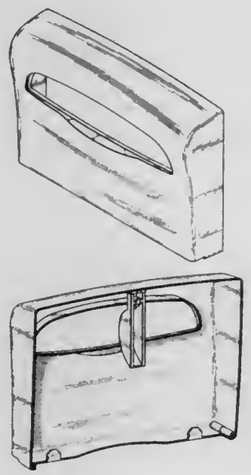
393,766
GROCERY BAG STORAGE DEVICE
JoAnn Mazzola, and Joseph Mazzola, both of 2827 Amboy Rd., Staten Island, N.Y. 10306
Filed Oct. 15, 1996, Ser. No. 61,050
Term of patent 14 years
LOC (6) Cl. 07 - *99*
U.S. Cl. D6—513



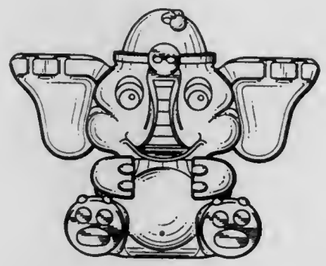
393,767
SUSPENDED DISPLAYS
Paul Belokin; Martin P. Belokin, both of 7801 1-35 North, Denton, Tex. 76202, and Norman P. Belokin, 3341 Evers Pkwy., Denton, Tex. 76207
Filed Nov. 7, 1996, Ser. No. 62,101
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—514



393,768
SEAT COVER DISPENSER
Robert Mervar, Hillsboro, Oreg.; Ronald Vish, Somerville, Mass., and Manoj Mistry, Leicester, United Kingdom, assignors to James River Corporation of Virginia, Richmond, Va.
Filed Oct. 10, 1996, Ser. No. 60,898
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D6—518

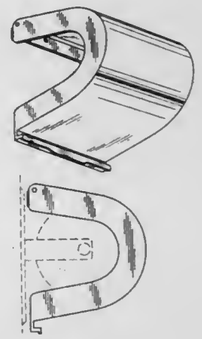


393,769
TOILETRY ARTICLE STORAGE UNIT
Gail B. Frankel, 5710 Glen Heather Dr., Dallas, Tex. 75252
Filed Sep. 24, 1996, Ser. No. 62,978
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—527

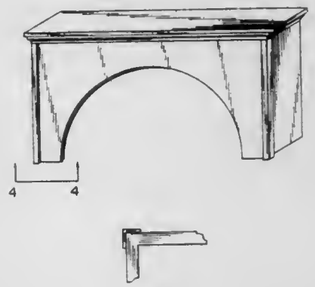




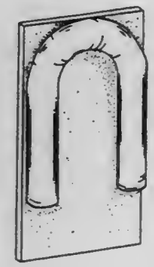
393,770
TOILET PAPER PROTECTOR
Susan M. Daly, 526 N. Baldwin, Portland, Oreg. 97217, assignor to Susan M. Daly, Glen Arbor, Mich.
Filed Oct. 7, 1996, Ser. No. 60,771
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D6—523



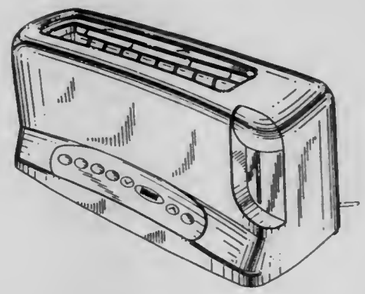
393,771
WINDOW CORNICE
Lawrence C. Saffels, 3310 Gloria Ave., Plant City, Fla. 33567
Filed Jul. 29, 1996, Ser. No. 57,600
Term of patent 14 years
LOC (6) Cl. 06 - *10*
U.S. Cl. D6—579




393,772
INFANT SUPPORT PADDING
Lora Vingino, 9827 Karmont Ave., South Gate, Calif. 90280
Filed Apr. 8, 1997, Ser. No. 70,747
Term of patent 14 years
LOC (6) Cl. 06 - *09*
U.S. Cl. D6—601



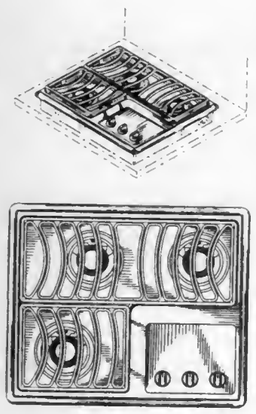
393,773
TOASTER
Duncan P. Copland, Newtown, Pa., assignor to Conair Corporation, Stamford, Conn.
Filed Mar. 20, 1997, Ser. No. 68,206
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—330



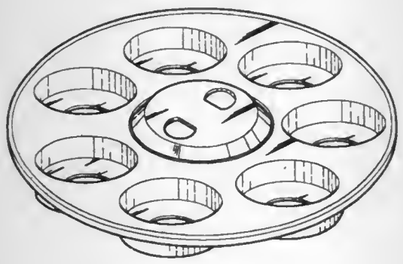
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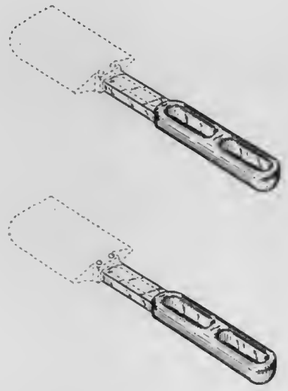
393,774
COMBINED THREE BURNER COOK TOP WITH OPEN BURNERS
Walter M. Ashcraft, Schaumburg, Ill., and David Steele, Beloit, Wis., assignors to Atwood Mobile Products, Rockford, Ill.
Filed Jan. 9, 1997, Ser. No. 64,724
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—346



393,775
CUSTARD MOLDS STAND, APPLICABLE IN MICROWAVE OVENS
Domingo Villar Otero, Vigo, Spain, assignor to Plasticos de Galicia S.A., Vigo, Spain
Filed Mar. 3, 1997, Ser. No. 67,459
Claims priority, application Spain, Feb. 3, 1997, 139301
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—357



393,776
UTENSIL
William I. Kessler, Sheboygan, Wis., assignor to The Vollrath Company, L.L.C., Sheboygan, Wis.
Filed May 15, 1997, Ser. No. 71,010
Term of patent 14 years
LOC (6) Cl. 07 - *03*
U.S. Cl. D7—401.2



393,777
SET OF DINNERWARE
Claire Alison Bernard, Derbys, England, assignor to The Denby Pottery Co. Ltd., Denby, England
Filed Sep. 29, 1995, Ser. No. 44,789
Claims priority, application United Kingdom, Mar. 29, 1995, 2046320
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—505

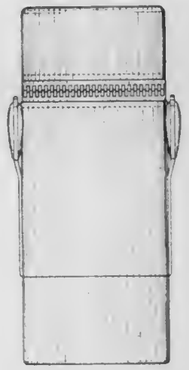




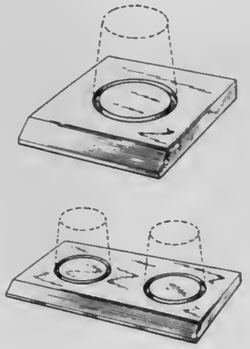
393,778
BEVERAGE COOLER
Steven J. Ochs, Sr., Roswell, Ga., assignor to Kooler Kraft International Corp., Roswell, Ga.
Continuation of Ser. No. 57,305, Jul. 22, 1996, abandoned.
This application Feb. 11, 1997, Ser. No. 66,391
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—606



393,779
INSULATED WATER BOTTLE HOLDER
Bernard Lewis Cabey, 1066 Clay Ave.-Grd. Floor, Bronx, N.Y. 10456
Filed Sep. 25, 1995, Ser. No. 44,496
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—607



393,780
CUP HOLDER
Gerard M. Stocco, 2233 Glenview Rd., Glenview, Ill. 60025
Filed May 20, 1997, Ser. No. 70,943
Term of patent 14 years
LOC (6) Cl. 07 - *06*
U.S. Cl. D7—619



393,781
EATING UTENSIL
Peter R. Iacovelli, Fountain Inn, S.C., assignor to Dispoz-O-Plastics, Inc., Fountain Inn, S.C.
Filed Feb. 19, 1997, Ser. No. 67,720
Term of patent 14 years
LOC (6) Cl. 07 - *03*
U.S. Cl. D7—653



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393,782
STRAINER DEVICE FOR CLIPPING TO A BEVERAGE CONTAINER
Carl B. Langford, Brunswick, Ga., assignor to Carl Langford, Brunswick, Ga.
Filed Oct. 28, 1996, Ser. No. 61,677
Term of patent 14 years
LOC (6) Cl. 07 - *04*
U.S. Cl. D7—667

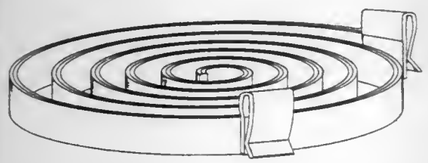
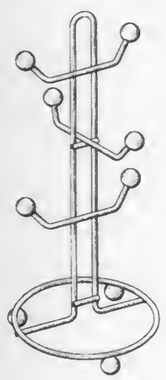
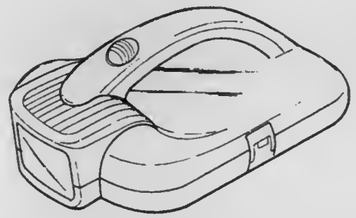


FIG. 1 IS A PERSPECTIVE VIEW OF STRAINER FOR CLIPPING TO A BEVERAGE CONTAINER.

393,783
CUP TREE
Sheldon H. Goodman, 30905 Stratford, Solon, Ohio 44139
Filed May 8, 1997, Ser. No. 70,410
Term of patent 14 years
LOC (6) Cl. 07 - *06*
U.S. Cl. D7—704



393,784
LUNCH BOX WITH AN ELECTRIC TORCH
Wen-Sung Lee, 58, Ma Yuan West St., Taichung, Taiwan
Filed Jun. 1, 1997, Ser. No. 71,867
Term of patent 14 years
LOC (6) Cl. 11 - *02*
U.S. Cl. D7—709



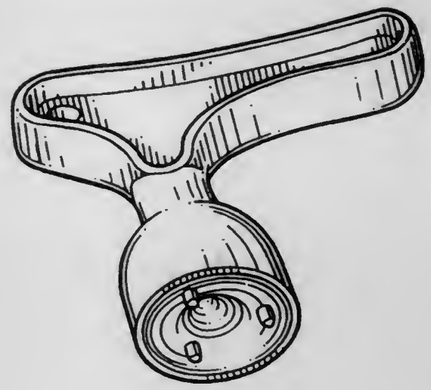
393,785
Patent Not Issued For This Number

393,786
POLY LEAF RAKE
Michelle Hession, Shoemakersville, Pa., assignor to True Temper Hardware Company, Camp Hill, Pa.
Filed Apr. 14, 1997, Ser. No. 69,106
Term of patent 14 years
LOC (6) Cl. 08 - *01*
U.S. Cl. D8—13





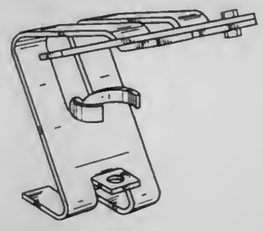
393,787
CLEAT WRENCH
Armand J. Savoie, Gardner, Mass., assignor to MacNeill Engineering Company, Inc., Marlborough, Mass.
Continuation-in-part of Ser. No. 774,585, Dec. 23, 1996. This application Mar. 26, 1997, Ser. No. 68,650
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—21



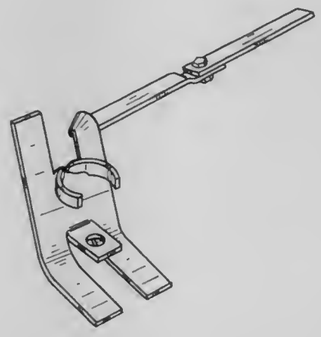
393,788
COMBINED BASEBALL HAT BOTTLE OPENER AND KEY CHAIN HOLDER
Kurt Arne Petersen, Laguna Niguel, and Christopher Michael Arroyo, Seal Beach, both of Calif., assignors to Kurt Petersen, and Christopher Arroyo, both of Laguna Niguel, Calif.
Filed Apr. 30, 1996, Ser. No. 53,792
Term of patent 14 years
LOC (6) Cl. 07 - *99*
U.S. Cl. D8—38



393,789
LEFT HANDED FORTY FIVE DEGREE CUT TORCHFOOT
Fate King, Jr., 329 Diamond St., Mound City, Ill. 62963
Filed Sep. 6, 1996, Ser. No. 59,273
The portion of the term of this patent subsequent to Feb. 10, 2012, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—71



393,790
RIGHT HANDED FLAT CUT TORCHFOOT
Fate King, Jr., 329 Diamond St., Mound City, Ill. 62963
Filed Sep. 6, 1996, Ser. No. 59,735
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—71



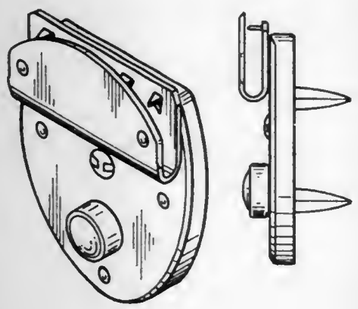
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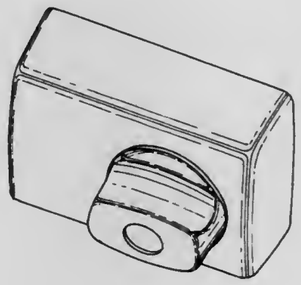
393,791
TOOL HANDLE
Kenneth Halls, 6972 W. 76th Ave., Arvada, Colo. 80003, and Daniel J. Cisneros, 5401 W. 10th Ave., Lakewood, Colo. 80104
Filed May 30, 1997, Ser. No. 71,479
Term of patent 14 years
LOC (6) Cl. 08 - *03*
U.S. Cl. D8—107



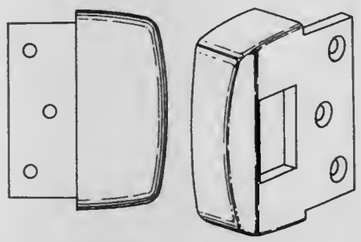
393,792
LOCK
Urs Gisiger, Weissensteinstrasse 146, CH-4515 Oberdorf, Switzerland
Filed Sep. 9, 1996, Ser. No. 59,367
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—331



393,793
LATCH HOUSING AND TURN KNOB ASSEMBLY
David Garfield Blanch, Notting Hill, Australia, assignor to Lockwood Australia Pty Ltd., Victoria, Australia
Filed Jul. 1, 1996, Ser. No. 56,478
Claims priority, application Australia, Jan. 25, 1996, 182/96
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—341

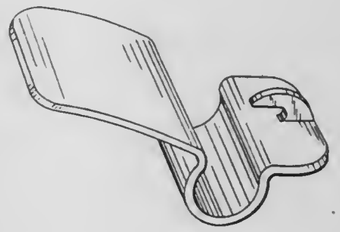


393,794
LATCH STRIKE
David Garfield Blanch, Notting Hill, Australia, assignor to Lockwood Australia Pty Ltd, Huntingdale, Australia
Filed Jul. 1, 1996, Ser. No. 56,479
Claims priority, application Australia, Jan. 25, 1996, 181/96
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—344





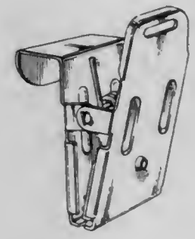
393,795
FASTENING AND HANGING BRACKET
Patrik L. T. Bernsteln, Torekov, Sweden, assignor to Spotlight Enterprises Incorporated, Woodland Hills, Calif.
Filed Dec. 13, 1996, Ser. No. 63,737
Claims priority, application Sweden, Jun. 27, 1996, 96-1448
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—373



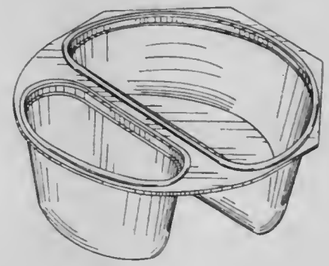
393,796
PENDANT HANGER
Tusng-Wen Chen, No. 6, Tinghu 2nd St., Kweishan Hsiang, Taoyuan Hsien, Taiwan
Filed Mar. 25, 1997, Ser. No. 68,598
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—373



393,797
CARPET HANGER ATTACHMENT CLIP
John V. Kostigian, 39 Elgin St.,S., Cambridge Ontario, Canada, N1R 5G3
Filed Oct. 25, 1996, Ser. No. 61,587
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D8—395



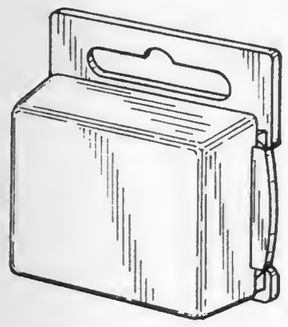
393,798
TWO-COMPARTMENT CONTAINER
Donald G. Joswick, Gurnee, Ill., assignor to Kraft Foods, Inc., Northfield, Ill.
Filed May 23, 1997, Ser. No. 71,205
Term of patent 14 years
LOC (6) Cl. 09 - *03*
U.S. Cl. D9—347



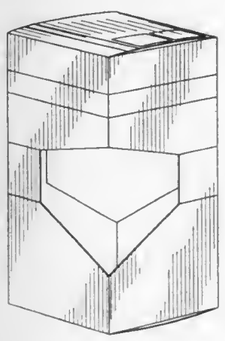
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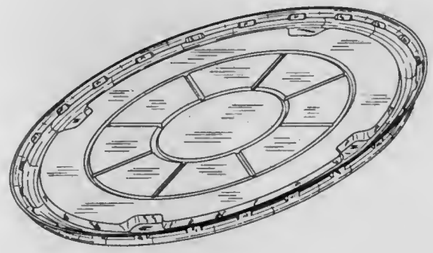
393,799
BATTERY PACKAGE
Peter Pope, Balcombe; Michael Pearse, East Grinstead; Martin Marshall, Huntington, and Richard Edward Pytches, Farndon, all of England, assignors to Duracell Batteries Inc., Fardon, England
Filed Jun. 25, 1997, Ser. No. 72,730
Claims priority, application United Kingdom, May 1, 1997, 2065436
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—415



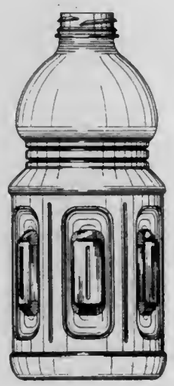
393,800
PACKAGING FOR LIGHT BULBS AND LAMPS
Guy Nicholas Peter Harrison, Bentley, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 22, 1996, Ser. No. 62,968
Claims priority, application WIPO, Apr. 22, 1996, DMA/003304
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—418



393,801
BASE FOR A PLASTIC FOOD CONTAINER
Thomas J. Hayes, Wauconda; Tom Rowe, Palatine, and Stephen A. Smith, Naperville, all of Ill., assignors to Tenneco Packaging Inc., Evanston, Ill.
Filed Oct. 29, 1996, Ser. No. 61,736
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—429



393,802
CONTAINER WITH WAIST RIBS
Wayne N. Collette, Merrimack; Suppayan M. Krisnnakumar, Nashua, and David Piccioli, Auburn, all of N.H., assignors to Continental PET Technologies, Inc., Florence, Ky.
Continuation of Ser. No. 549,477, Oct. 27, 1995, abandoned. This application Jan. 2, 1997, Ser. No. 64,486
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—502





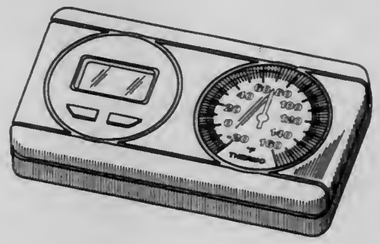
393,803
BOTTLE WITH WAVY SIDES
Karl-Heinz Walter, Bingen-Kempten, Germany, assignor to Demptos Glass Company, Louisville, Ky.
Filed Apr. 23, 1997, Ser. No. 69,012
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—543



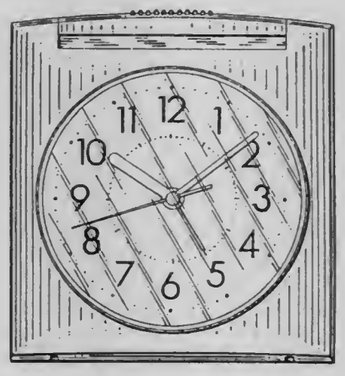
393,804
COMBINED BOTTLE AND CAP
Ellen Gavin, Atlantic Highlands, N.J., assignor to L'Oreal S.A., France
Filed Aug. 20, 1996, Ser. No. 58,678
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—558



393,805
CLOCK/THERMOMETER COMBO
Thomas R. Steinhagen, West Des Moines; Charles A. Haas, Des Moines, and John S. Schenken, West Des Moines, all of Iowa, assignors to Cobbs Manufacturing Company, Des Moines, Iowa
Division of Ser. No. 57,618, Jul. 29, 1996. This application Dec. 9, 1996, Ser. No. 63,749
Term of patent 14 years
LOC (6) Cl. 10 - *01*
U.S. Cl. D10—4



393,806
CLOCK
Keiko Yoshida, Tokyo, Japan, assignor to Seiko Clock Inc., Japan
Filed Sep. 30, 1996, Ser. No. 60,540
Term of patent 14 years
LOC (6) Cl. 10 - *01*
U.S. Cl. D10—28



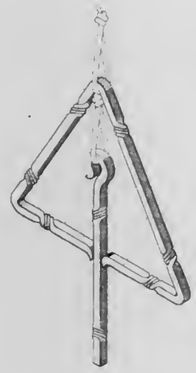
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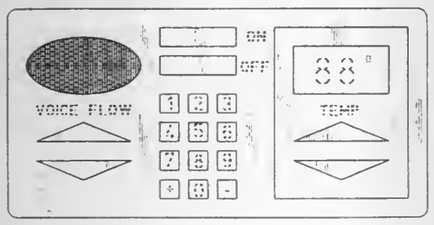
393,807
WATCH AND STRAP
John T. Houlihan, Southbury, and Aurelie E. Krauss, Danbury, both of Conn., assignors to Timex Corp., Middlebury, Conn.
Continuation-in-part of Ser. No. 53,008, Mar. 27, 1996. This application Feb. 7, 1997, Ser. No. 67,273
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—32



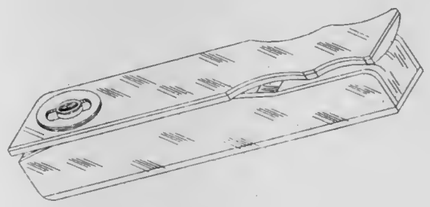
393,809
DINNER BELL
Michael L. Thornton, Gold Bar, Wash., assignor to The Mountain Forge, Inc., Gold Bar, Wash.
Filed Apr. 8, 1997, Ser. No. 70,736
Term of patent 14 years
LOC (6) Cl. 10 - *05*
U.S. Cl. D10—116



393,808
VOICE ACTIVATED WATER FAUCET CONTROL UNIT
Kenneth R. Lindsey, 3210 Teakwood Cir., Louisville, Ky. 40216, and Cindy Hutcheson, 619 Drummond Way, Fairdale, Ky. 40118
Filed Dec. 16, 1996, Ser. No. 63,801
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—103




393,810
SLIDEABLE CHAMBERED TURKEY CALL
Max E. Richardson, 515 Woodslope Cir., Kodak, Tenn. 37764
Filed Dec. 10, 1996, Ser. No. 63,542
Term of patent 14 years
LOC (6) Cl. 10 - *05*
U.S. Cl. D10—119

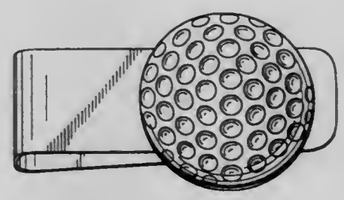




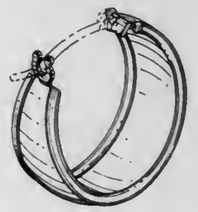
393,811
FINGER RING
Jerry Morrison, Austin, Tex., assignor to Commemorative Brands, Inc., Austin, Tex.
Filed Jul. 23, 1996, Ser. No. 57,357
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—34



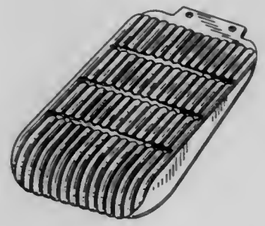

393,813
MONEY HOLDER
Bruno Herdt, Fruthwilen, Switzerland, assignor to Cash-Clip GmbH, Fruthwilen, Switzerland
Division of Ser. No. 16,190, Dec. 9, 1993, Pat. No. Des. 363,453. This application Apr. 22, 1996, Ser. No. 63,106
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—78.1



393,812
HOOP EARRING
Greg Silveri, Airmont, N.Y., assignor to Jacmel Jewelry Inc., Long Island City, N.Y.
Filed Nov. 22, 1996, Ser. No. 62,719
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—40



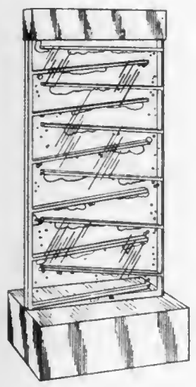
393,814
MEDALLION
Branislav Stojanovic, Dragoslava Stojanovica No. 6, Novi Sad 2100, Yugoslavia
Filed Oct. 7, 1996, Ser. No. 60,794
Claims priority, application Yugoslavia, Apr. 5, 1996, M-62/69
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—79



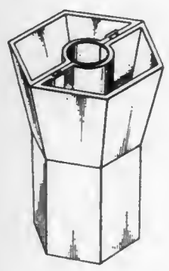
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393,815
VISUAL DISPLAY
John C. Johnson, and George S. Johnson, both of 365 Bonair St. #14, La Jolla, Calif. 92037
Filed Apr. 29, 1997, Ser. No. 70,377
Term of patent 14 years
LOC (6) Cl. 11 - *02*
U.S. Cl. D11—131



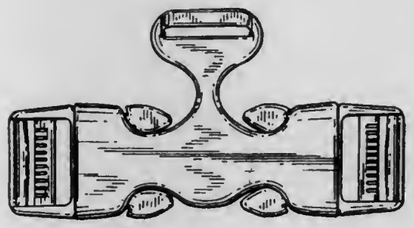
393,816
TWO-PART FLOWER VASE
Patricia Conner, 4419 Roma Ct., Marina del Rey, Calif. 90292
Filed Apr. 2, 1997, Ser. No. 69,464
Term of patent 14 years
LOC (6) Cl. 11 - *02*
U.S. Cl. D11—143



393,817
PLANT BOWL
Roy Alexander Folley, Brighton, Australia, assignor to Gale Australia Pty. Ltd., Victoria, Australia
Filed Aug. 30, 1995, Ser. No. 43,453
Term of patent 14 years
LOC (6) Cl. 11 - *02*
U.S. Cl. D11—153

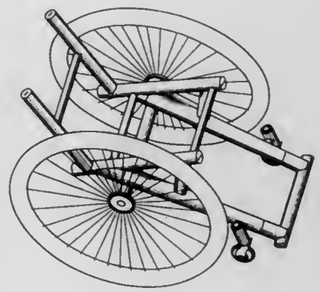


393,818
BUCKLE
Mark J. Krauss, E. Greenwich, R.I., assignor to American Cord & Webbing Co., Inc., Woonsocket, R.I.
Filed Feb. 11, 1997, Ser. No. 66,300
Term of patent 14 years
LOC (6) Cl. 02 - *07*
U.S. Cl. D11—216

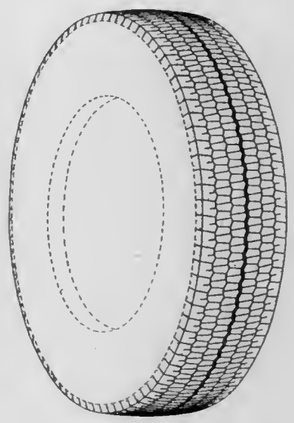




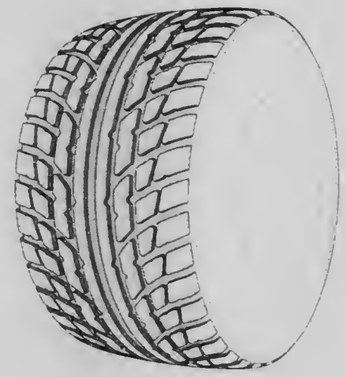
393,819
WHEELCHAIR FRAME
Ronald George Litke, Naugatuck, Conn., assignor to Cannondale Corporation, Georgetown, Conn.
Filed Apr. 18, 1997, Ser. No. 69,478
Term of patent 14 years
LOC (6) Cl. 12 - *12*
U.S. Cl. D12—131



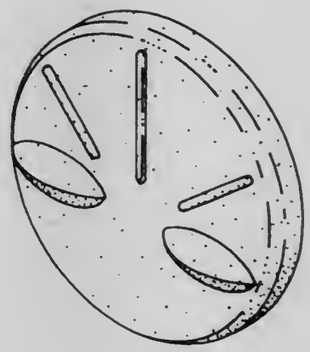
393,820
TREAD FOR A TIRE
Jose Merino Lopez, Riom, France, assignor to Compagnie Generale des Etablissements Michelin—Michelin & Cie, France
Filed Jan. 13, 1997, Ser. No. 64,853
Claims priority, application France, Jul. 11, 1996, 964137
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—143



393,821
TIRE TREAD
Randall Raymond Brayer, North Canton, and Christopher Paul Johenning, Wadsworth, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 7, 1997, Ser. No. 66,231
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147



393,822
MIRROR HOUSING
William P. Schmidt, 20950 Woodruff, Rockwood, Mich. 48173
Filed Nov. 6, 1996, Ser. No. 62,038
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—189



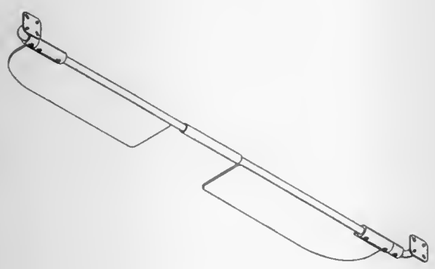
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393,823
SAFETY MIRROR FENDER GUIDE
Edward J. Phillips, 915 E. 68th, Kansas City, Mo. 64131
Filed Mar. 7, 1997, Ser. No. 67,453
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—189



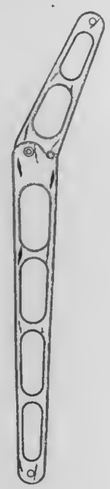
393,824
VEHICLE SUN VISOR WITH ALTERNATE MOUNTING BRACKETS
Martin Satrustegui, 6356 Ventura Canyon Ave., Apt. #1, Van Nuys, Calif. 91401
Filed Mar. 19, 1996, Ser. No. 51,831
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—191



393,825
VEHICLE WHEEL
Douglas W. Fike, Lake Elsinore, Calif., assignor to Ultra Wheel Co., Buena Park, Calif.
Filed Oct. 31, 1996, Ser. No. 61,807
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—209



393,826
AUTOMOBILE HOOD AND TRUNK PROP
Jeffrey Wayne Carter, 540 Lake Lynn Rd., Concord, N.C. 28025
Filed Jan. 13, 1997, Ser. No. 64,860
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D12—223

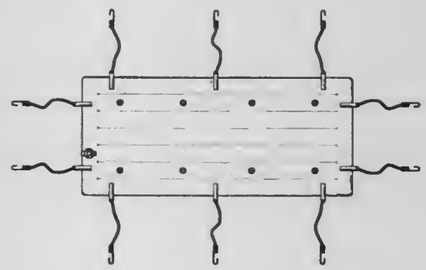




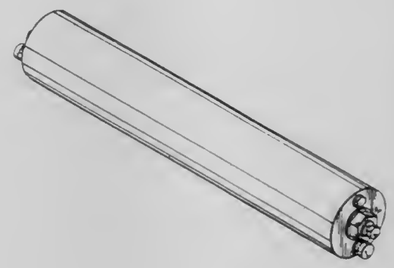
393,827
ROLL-BAR PAD
Dennis A. Taylor, 611 Menno Ave., Placentia, Calif. 92670
Filed Jan. 3, 1996, Ser. No. 48,534
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—400



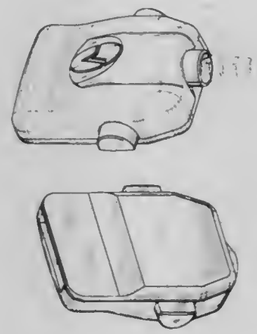
393,828
VEHICLE COVER
John R. Threats, Sr., 4682 Anaheim Ct., Denver, Colo. 80239
Filed Dec. 31, 1996, Ser. No. 64,419
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—401



393,829
RECHARGEABLE BATTERY
Tatsuo Shimizu, Fukushima, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Mar. 26, 1996, Ser. No. 52,194
Claims priority, application Japan, Sep. 27, 1995, 7-28792
Term of patent 14 years
LOC (6) Cl. 13 - *02*
U.S. Cl. D13—103



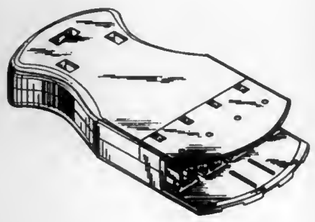
393,830
PATIENT CABLE CONNECTOR
David R. Tobler, Westminister; Thomas J. Gerhardt, Littleton; Eugene E. Mason, Boulder, and Mike A. Mills, Golden, all of Colo., assignors to Masimo Corporation, Irvine, Calif.
Filed Oct. 16, 1995, Ser. No. 45,258
Term of patent 14 years
LOC (6) Cl. 13 - *03*
U.S. Cl. D13—133



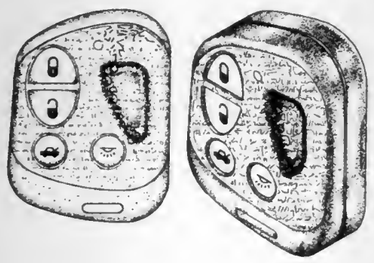
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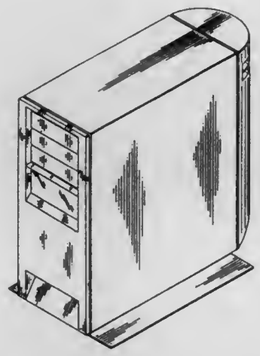
393,831
FOUR PAIR PATCH CONNECTOR
John A. Siemon, Woodbury; Robert C. Carlson, Jr., Torrington, and Carl H. Weymouth, Riverton, all of Conn., assignors to The Siemon Company, Watertown, Conn.
Continuation of Ser. No. 488,126, Jun. 7, 1995, Pat. No. 5,634,817, which is a continuation-in-part of Ser. No. 144,768, Oct. 28, 1993, Pat. No. 5,460,545. This application Dec. 9, 1996, Ser. No. 63,461
Term of patent 14 years
LOC (6) Cl. 13 - *03*
U.S. Cl. D13—146



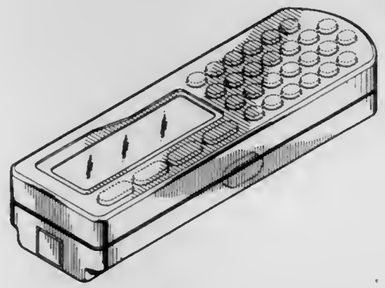
393,832
PALM HELD REMOTE CONTROLLER
Michael Chen, Taipei Hslen, Taiwan, assignor to Advance Security Inc., Taipei Hsin, Taiwan
Filed Jan. 7, 1997, Ser. No. 64,641
Term of patent 14 years
LOC (6) Cl. 13 - *03*
U.S. Cl. D13—168



393,833
DESKSIDE DATA PROCESSING SYSTEM
Wayne Lowell Aderman, Zumbro Falls, and Tim Kerry Murphy, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 4, 1996, Ser. No. 60,734
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—100

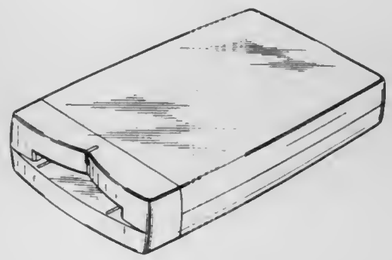


393,834
DATA TERMINAL
Eli Margalit, Raanana, and Yona Newman, Ra-amana, both of Israel, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 16, 1997, Ser. No. 64,150
Claims priority, application United Kingdom, Jul. 19, 1996, 2057777
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—100

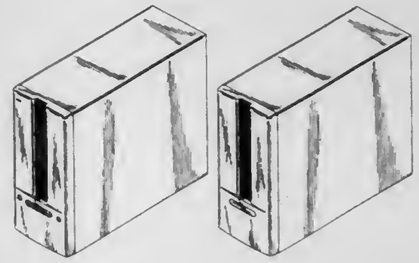




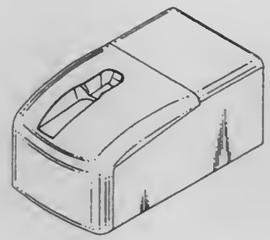
393,835
SMART CARD READER/WRITER
Masayuki Ohki, Kodaira; Atsuhiko Urushihara, Kokubunji, and Kotaro Yamashita, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed May 13, 1997, Ser. No. 70,642
Claims priority, application Japan, Nov. 15, 1996, 8-34405
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—105



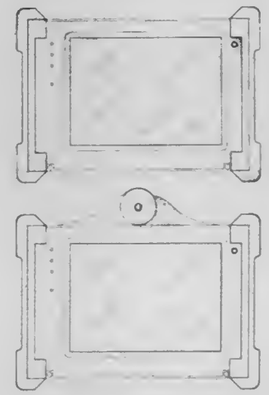
393,836
EDITING MACHINE FOR GRAPHIC IMAGE AND SOUND
Toshiyuki Hisatsune, and Tetsu Sumii, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Mar. 29, 1996, Ser. No. 52,433
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—107



393,837
FINGERPRINT DISTINCTION READER
Hitoshi Umetsu, and Tetsuya Iino, both of Kawasaki, Japan, assignors to Fujitsu Denso, Ltd., Kanagawa-ken, Japan
Filed Jun. 4, 1996, Ser. No. 55,341
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—107



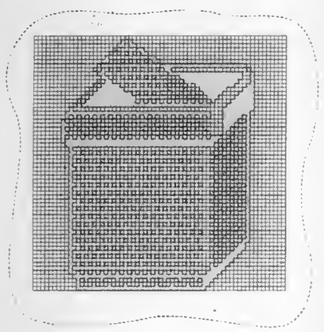
393,838
HAND-HELD DISPLAY
Richard Pandolfi, Smithtown, N.Y., assignor to IV Phoenix Group Inc., Hauppauge, N.Y.
Filed May 9, 1997, Ser. No. 70,506
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—113



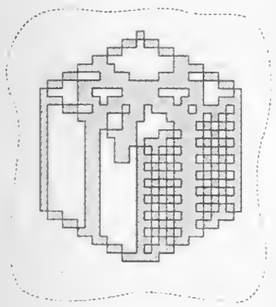
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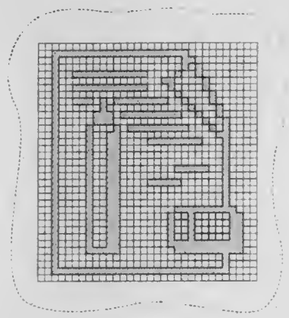
393,839
DUSTBIN REPRESENTATION INDICATING DELECTION OF A USELESS ICON FROM THE SCREEN ICON FOR A DISPLAY SCREEN
Makoto Morioka, Kawasaki; Hiroshi Matsuda, Yokohama; Daisaburo Murai, Tokyo; Masato Ikemori, Kawasaki; Makoto Wanishi, Tokyo; Kazuo Hattori, Yokohama, and Hiroshi Suzuki, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Division of Ser. No. 588,820, Sep. 29, 1990. This application May 27, 1997, Ser. No. 71,267
Term of patent 14 years
LOC (6) Cl. 14 - *99*
U.S. Cl. D14—114.3



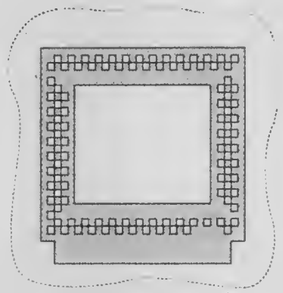
393,840
SELECT A SPECIAL FUNCTION ICON FOR A DISPLAY SCREEN
Hitoshi Sakazume, Musashino, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Division of Ser. No. 592,902, Oct. 4, 1990. This application May 27, 1997, Ser. No. 71,269
Term of patent 14 years
LOC (6) Cl. 14 - *99*
U.S. Cl. D14—114.3



393,841
RENEWAL OF DOCUMENT TO MAKE ALTERATIONS ICON FOR A DISPLAY SCREEN
Makoto Wanishi, Tokyo; Masato Ikemori, Kawasaki; Kaeko Kariya, Inagi; Hiroshi Matsuda, Yokohama; Makoto Morioka, Kawasaki; Kazuo Hattori, Yokohama; Hiroshi Suzuki, Kawasaki, and Daisaburo Murai, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Division of Ser. No. 592,317, Oct. 1, 1990. This application May 27, 1997, Ser. No. 71,273
Term of patent 14 years
LOC (6) Cl. 14 - *99*
U.S. Cl. D14—114.3

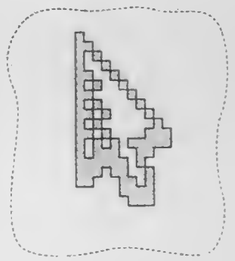


393,842
CRT ICON FOR A DISPLAY SCREEN
Hitoshi Sakazume, Musashino, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Division of Ser. No. 592,902, Oct. 4, 1990. This application May 27, 1997, Ser. No. 71,280
Term of patent 14 years
LOC (6) Cl. 14 - *99*
U.S. Cl. D14—114.3

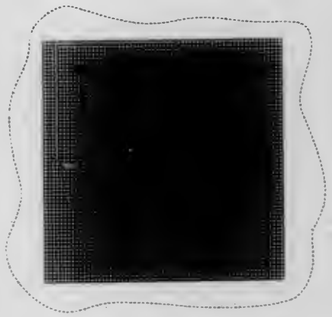




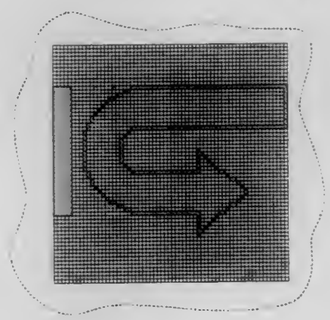
393,843
"AVAILABILITY OF FUNCTION SELECTION" ICON FOR A DISPLAY SCREEN
Hitoshi Sakazume, Musashino, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Division of Ser. No. 592,902, Oct. 4, 1990. This application May 27, 1997, Ser. No. 71,282
Term of patent 14 years
LOC (6) Cl. 14 - *99*
U.S. Cl. D14—114.3



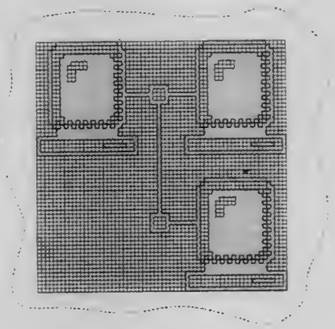
393,844
"COPY ONTO A CLIPBOARD " ICON FOR A DISPLAY SCREEN
Makoto Wanishi, Tokyo; Masato Ikemori, Kawasaki; Kaeko Kariya, Inagi; Hiroshi Matsuda, Yokohama; Makoto Morioka, Kawasaki; Kazuo Hattori, Yokohama; Hiroshi Suzuki, Kawasaki, and Daisaburo Murai, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Division of Ser. No. 592,317, Oct. 1, 1990. This application May 27, 1997, Ser. No. 71,285
Term of patent 14 years
LOC (6) Cl. 14 - *99*
U.S. Cl. D14—114.3



393,845
"CANCEL" ICON FOR A DISPLAY SCREEN
Makoto Wanishi, Tokyo; Masato Ikemori, Kawasaki; Kaeko Kariya, Inagi; Hiroshi Matsuda, Yokohama; Makoto Morioka, Kawasaki; Kazuo Hattori, Yokohama; Hiroshi Suzuki, Kawasaki, and Daisaburo Murai, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Division of Ser. No. 592,317, Oct. 1, 1990. This application May 27, 1997, Ser. No. 71,302
Term of patent 14 years
LOC (6) Cl. 14 - *99*
U.S. Cl. D14—114.3



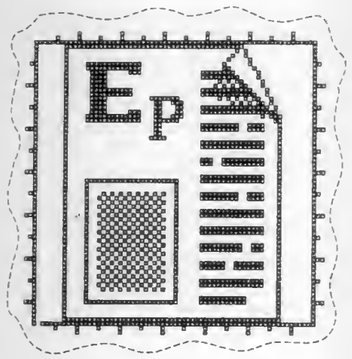
393,846
"LOCAL AREA NETWORK" ICON FOR A DISPLAY SCREEN
Makoto Wanishi, Tokyo; Masato Ikemori, Kawasaki; Kaeko Kariya, Inagi; Hiroshi Matsuda, Yokohama; Makoto Morioka, Kawasaki; Kazuo Hattori, Yokohama; Hiroshi Suzuki, Kawasaki, and Daisaburo Murai, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Division of Ser. No. 592,317, Oct. 1, 1990. This application May 27, 1997, Ser. No. 71,303
Term of patent 14 years
LOC (6) Cl. 14 - *99*
U.S. Cl. D14—114.3



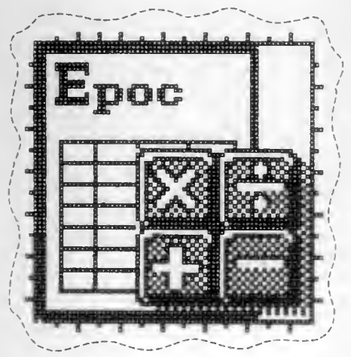
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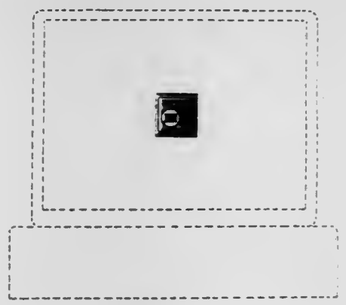
393,847
"DATA " ICON FOR A DISPLAY SCREEN
Makoto Wanishi, Tokyo; Kazuo Hattori, Yokohama, and Daisaburo Murai, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Division of Ser. No. 588,819, Sep. 27, 1990. This application May 27, 1997, Ser. No. 71,327
Term of patent 14 years
LOC (6) Cl. 14 - *99*
U.S. Cl. D14—114.3



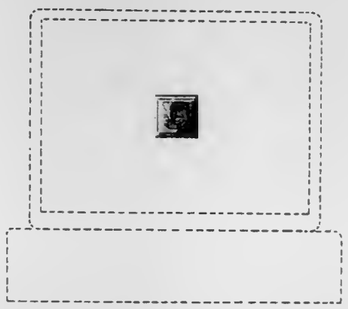
393,848
"ACTIVATION" ICON FOR A DISPLAY SCREEN
Makoto Wanishi, Tokyo; Kazuo Hattori, Yokohama, and Daisaburo Murai, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Division of Ser. No. 588,819, Sep. 27, 1990, Pat. No. Des. 385,864. This application May 27, 1997, Ser. No. 71,329
Term of patent 14 years
LOC (6) Cl. 14 - *99*
U.S. Cl. D14—114.3




393,849
ICON FOR A COMPUTER DISPLAY
Marcia Rough, Bolton, Mass., assignor to Boston Technology, Inc., Wakefield, Mass.
Division of Ser. No. 34,430, Feb. 6, 1995. This application Jun. 12, 1997, Ser. No. 72,053
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114.5

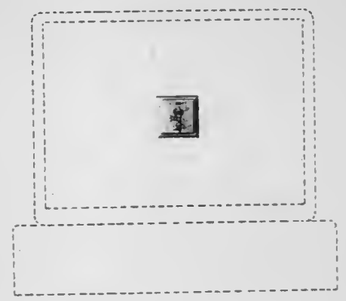


393,850
ICON FOR A COMPUTER DISPLAY
John Norton, Merrimack, N.H., assignor to Boston Technology, Inc., Wakefield, Mass.
Division of Ser. No. 33,203, Jan. 6, 1995. This application Jun. 12, 1997, Ser. No. 72,007
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114.7

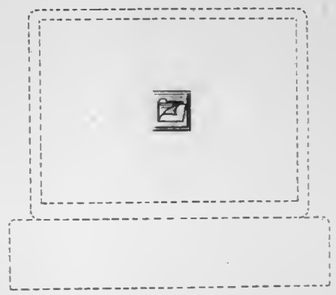




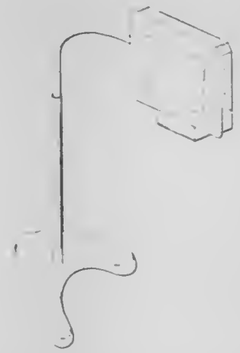
393,851
ICON FOR A COMPUTER DISPLAY
John Norton, Merrimack, N.H., assignor to Boston Technology, Inc., Wakefield, Mass.
Division of Ser. No. 33,203, Jan. 6, 1995. This application Jun. 12, 1997, Ser. No. 72,008
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114.7



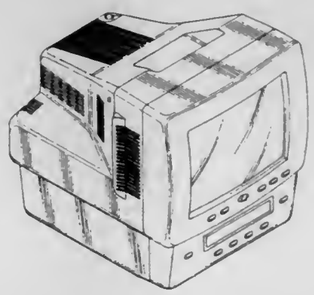
393,852
ICON FOR A COMPUTER DISPLAY
John Norton, Merrimack, N.H., assignor to Boston Technology, Inc., Wakefield, Mass.
Division of Ser. No. 33,203, Jan. 6, 1995. This application Jun. 12, 1997, Ser. No. 72,004
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114.8



393,853
VIDEO ENTERTAINMENT SYSTEM
David Robert Maas, Alpharetta, Ga., assignor to General Electric Company, Milwaukee, Wis.
Filed Apr. 21, 1997, Ser. No. 69,484
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—126



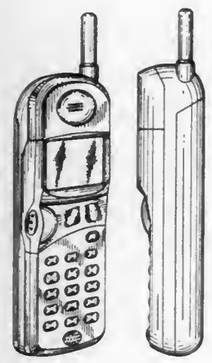
393,854
EDUCATIONAL-INSTRUCTIONAL/ENTERTAINMENT CENTER
Robert G. Harrison, 2120 - 8th Ave. North, #102, Seattle, Wash. 98109, and Robert D. Lamson, 2611 Eastlake Ave. East, #405, Seattle, Wash. 98102
Filed Sep. 24, 1996, Ser. No. 60,219
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—129



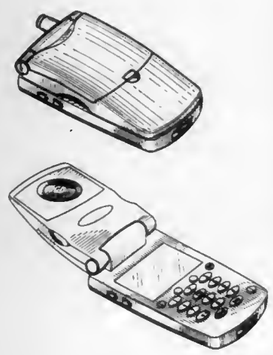
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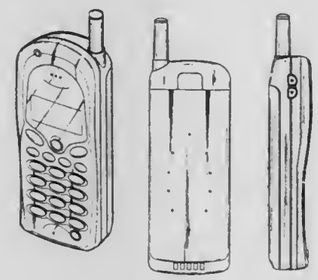
393,855
WIRELESS TELEPHONE
James Wicks, San Francisco, Calif., assignor to Sony America, New York, N.Y.
Filed Feb. 28, 1997, Ser. No. 67,119
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—138



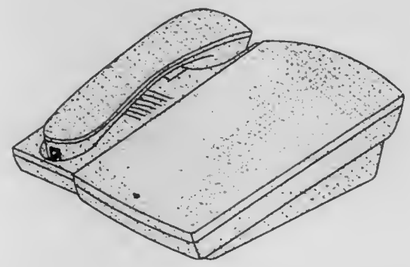
393,856
FOLDABLE WIRELESS TELEPHONE HOUSING
John K. M. Lee, Ramona; John E. Maloney, San Diego, both of Calif.; William R. George, Evanston, and Scott H. Wilson, Chicago, both of Ill., assignors to Qualcomm Incorporated, San Diego, Calif.
Filed Feb. 28, 1997, Ser. No. 67,171
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—138



393,857
PORTABLE RADIO TELEPHONE
Tae-sub Park, Seoul, Rep. of Korea, assignor to LG Information & Communications, Ltd., Seoul, Rep. of Korea
Filed Apr. 9, 1997, Ser. No. 68,898
Claims priority, application Rep. of Korea, Feb. 15, 1997, 97-2675
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—138

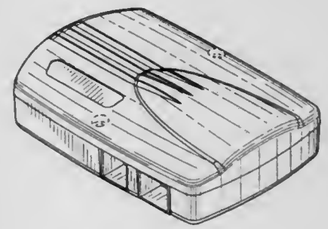


393,858
TELEPHONE SET
Jochen Philipp Backs, San Francisco, Calif.; Stephen Edward Bennett, Succasunna, N.J.; Mark Biasotti, San Jose, Calif.; Reed Scott Brown; Mark B. Larew, both of Indianapolis, Ind.; John Matthew Law, Carmel, Ind.; Everett Wayne Mathis, Greenwood, Ind.; Raymond Motluck, Noblesville, Ind.; Michael John Nuttall, Portola Valley, Calif., and John Henry Schaffeld, New Vernon, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.
Filed Jan. 4, 1996, Ser. No. 33,038
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—149

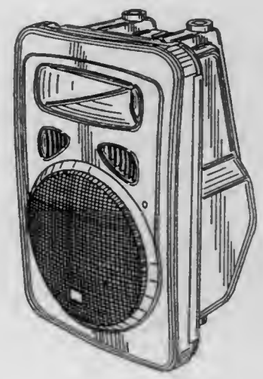




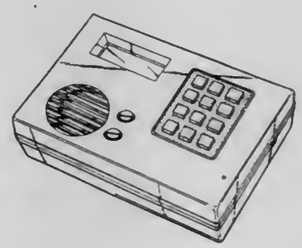
393,859
SELECTIVE CALL TRANSCEIVER
Huy Phuong Nguyen, Fort Worth, and Thomas Glenn Beaumont, Bedford, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 12, 1997, Ser. No. 70,617
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—191



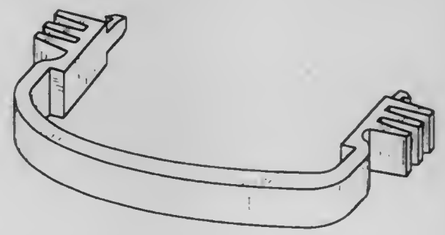
393,860
LOUDSPEAKER ENCLOSURE
Richard C. Watson, Boston, and Ronald J. Vish, Somerville, both of Mass., assignors to Harman International Industries, Inc., Northridge, Calif.
Division of Ser. No. 43,618, Sep. 7, 1995, Pat. No. Des. 379,629. This application Dec. 12, 1996, Ser. No. 63,659
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—215



393,861
AUTOMATIC VOICE DIALER
Erno Lutz, Redding, and Ted R. Greene, San Diego, both of Calif., assignors to United Security Products, Inc., San Diego, Calif.
Filed Nov. 7, 1996, Ser. No. 63,350
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—245



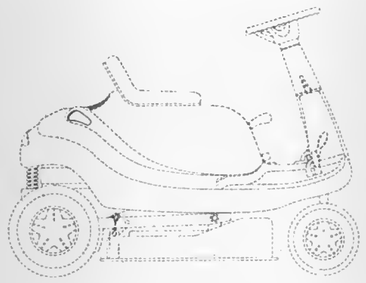
393,862
TELEPHONE CONNECTOR
Ian McInnes, Brunswick, Australia, assignor to Portia Industries Pty Ltd, Australia
Filed Oct. 17, 1996, Ser. No. 61,158
Claims priority, application Australia, Apr. 18, 1996, 116396
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—256



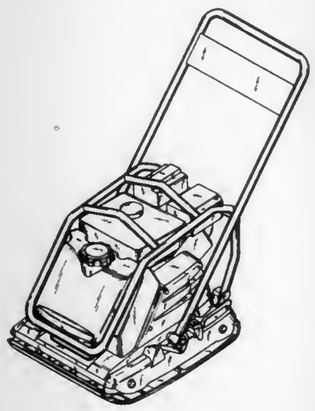
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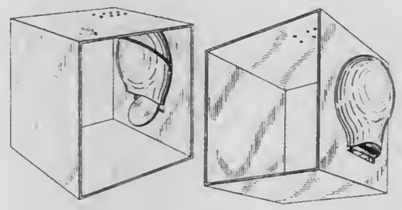
393,863
SURFACE ORNAMENTATION FOR RIDING LAWNMOWER
Bradley John Wolf, N. Royalton, Ohio, assignor to MTD Products Inc, Cleveland, Ohio
Filed Sep. 5, 1996, Ser. No. 59,238
Term of patent 14 years
LOC (6) Cl. 15 - *03*
U.S. Cl. D15—17



393,864
VIBRATORY ASPHALT PLATE
David J. Waldenberger, Menomonee Falls, and Scott H. Micoley, Cedarburg, both of Wis., assignors to Wacker Corporation, Menomonee Falls, Wis.
Filed Jan. 28, 1997, Ser. No. 65,533
Term of patent 14 years
LOC (6) Cl. 15 - *04*
U.S. Cl. D15—20



393,865
REAR PROJECTOR
Philippe Starck, Moulineaux, France, assignor to Thomson Multimedia (Societe Anonyme), Courbevoie, France
Filed Feb. 20, 1996, Ser. No. 51,025
Claims priority, application France, Aug. 18, 1995, 954569
Term of patent 14 years
LOC (6) Cl. 16 - *02*
U.S. Cl. D16—221



393,866
EYEGLASS FRAME ASSEMBLY
Jeannie Cohen, and Mitchell N. Cohen, both of 1046 S. Robertson, Suite 1, Los Angeles, Calif. 90035
Filed Apr. 1, 1997, Ser. No. 68,608
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—315

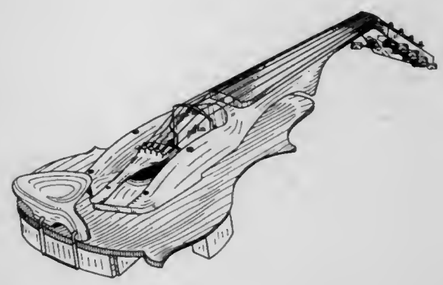




393,867
SUNGLASS
Jerome Jacques Marie Mage, Carlsbad, Calif., assignor to Spy Optic, Inc., Carlsbad, Calif.
Filed Dec. 19, 1996, Ser. No. 63,967
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—326



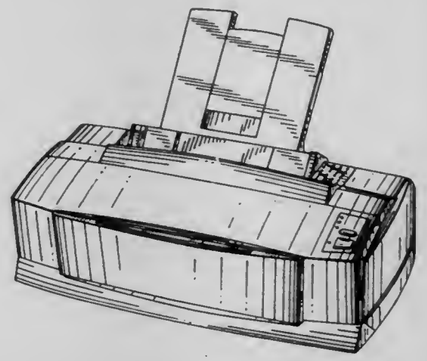
393,868
ELECTRIC VIOLIN
William B. Welling, P.O. Box 285, Averill Park, N.Y. 12018
Filed Nov. 12, 1996, Ser. No. 62,228
Term of patent 14 years
LOC (6) Cl. 17 - *03*
U.S. Cl. D17—17



393,869
RATTLE
Joseph C. Agu, P.O. Box 70883, Sunnyvale, Calif. 94086
Filed Mar. 16, 1995, Ser. No. 36,231
Term of patent 14 years
LOC (6) Cl. 17 - *04*
U.S. Cl. D17—22



393,870
INK JET PRINTER
Masahiko Kobayashi, and Hiromi Shishiuchi, both of c/o Seiko Epson Corporation 3-5, Owa 3-chome, Suwa-shi, Nagano-ken, Japan
Filed Dec. 27, 1996, Ser. No. 64,330
Claims priority, application Japan, Jun. 27, 1996, 8-19142
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D18—55



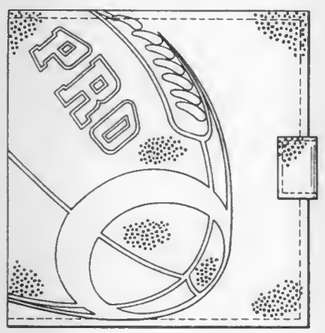
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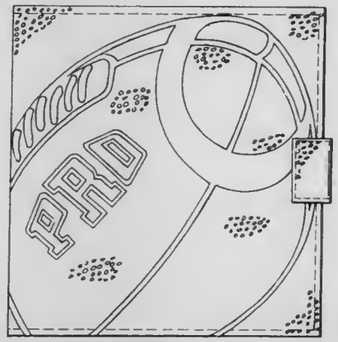
393,871
EXTERIOR OF A BINDER COVER
Alan Hodes, Front Royal, Va., assignor to Pen-Tab Industries, Inc., Front Royal, Va.
Filed Apr. 30, 1996, Ser. No. 53,805
Term of patent 14 years
LOC (6) Cl. 19 - *04*
U.S. Cl. D19—26



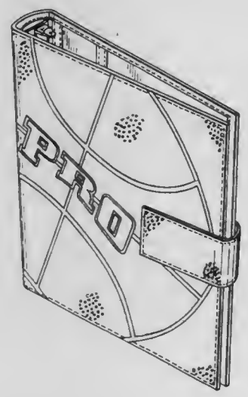

393,872
EXTERIOR OF A BINDER COVER
Alan Hodes, Front Royal, Va., assignor to Pen-Tab Industries, Inc., Front Royal, Va.
Filed May 7, 1996, Ser. No. 54,112
Term of patent 14 years
LOC (6) Cl. 19 - *04*
U.S. Cl. D19—26




393,873
EXTERIOR OF A BINDER COVER
Alan Hodes, Front Royal, Va., assignor to Pen-Tab Industries, Inc., Front Royal, Va.
Filed May 7, 1996, Ser. No. 54,124
Term of patent 14 years
LOC (6) Cl. 19 - *04*
U.S. Cl. D19—26

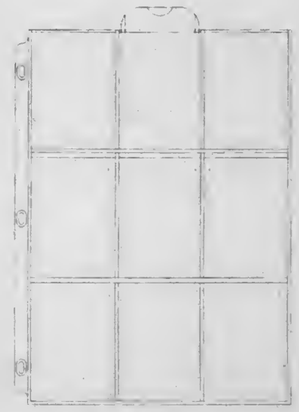



393,874
LOOSE-LEAF BINDER
Alan Hodes, Front Royal, Va., assignor to Pen-Tab Industries, Inc., Front Royal, Va.
Filed Dec. 22, 1995, Ser. No. 48,290
Term of patent 14 years
LOC (6) Cl. 19 - *04*
U.S. Cl. D19—27





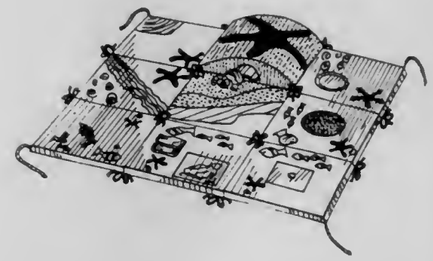

393,875
TRADING CARD STORAGE SYSTEM WITH INDIVIDUAL CARD STORING COMPONENTS
Kenneth R. Brooks, P.O. Box 3369, West Chester, Pa. 19381
Filed Oct. 11, 1996, Ser. No. 62,959
Term of patent 14 years
LOC (6) Cl. 19 - *04*
U.S. Cl. D19—33



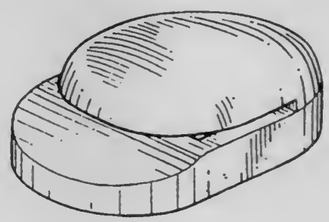
393,876
WRITING INSTRUMENT HAVING LIGHT REFLECTIVE SURFACES
Curtis Gray, Stratford; Michael J. McKenna, Shelton, and Christine Weigand, Milford, all of Conn., assignors to BIC Corporation, Milford, Conn.
Filed Jan. 3, 1997, Ser. No. 64,538
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—50



393,877
MAT FOR THE EARLY LEARNING OF BABIES
Jean-Paul Allegre, Saint-Etienne, France, assignor to Allegre Puericulture Hygiene S.A., France
Filed Nov. 2, 1995, Ser. No. 45,902
Claims priority, application France, May 2, 1995, 952669
Term of patent 14 years
LOC (6) Cl. 19 - *07*
U.S. Cl. D19—59



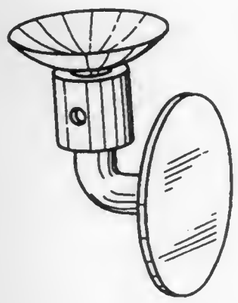
393,878
SHEET CLIP
Takatoshi Suzuki, 1848-36 Abiko, Abiko-shi, Chiba-ken, Japan
Continuation-in-part of Ser. No. 42,932, Aug. 21, 1995, abandoned. This application Oct. 17, 1996, Ser. No. 61,212
Term of patent 14 years
LOC (6) Cl. 19 - *02*
U.S. Cl. D19—65



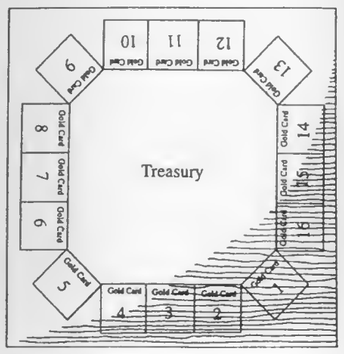
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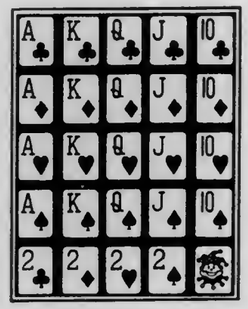
393,879
CONTENT INDICATOR
Jay Veto, 6505 Cote St. Luc Rd. #518, Montreal, Que., Canada, H4V 1G3
Filed Jul. 3, 1996, Ser. No. 56,740
Term of patent 14 years
LOC (6) Cl. 20 - *02*
U.S. Cl. D20—43



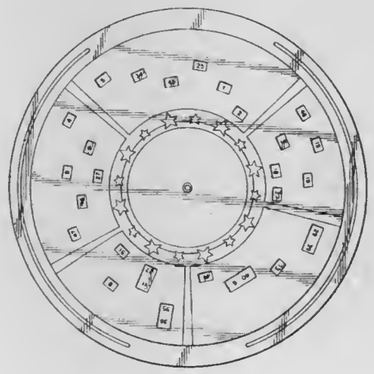
393,880
GAME BOARD
Robert Germain Gagnon, 69 Bridge St., Salem, Mass. 01970-4130, assignor to Robert Germain Gagnon, Salem, Mass.
Filed Apr. 21, 1997, Ser. No. 69,986
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—34




393,881
PLAYING SURFACE FOR A GAME BOARD
Vincent Fodera, 405 Pumpkin Way, Henderson, Nev. 89015
Filed Nov. 9, 1995, Ser. No. 49,579
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—37

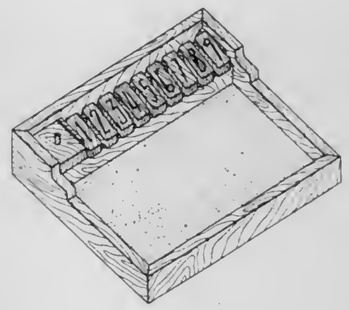


393,882
RANDOM NUMBER SELECTOR GAME DEVICE
Anthony Nino Alimonti, 932½ Squires Ave., Endicott, N.Y. 13760
Filed Apr. 28, 1997, Ser. No. 70,071
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—39

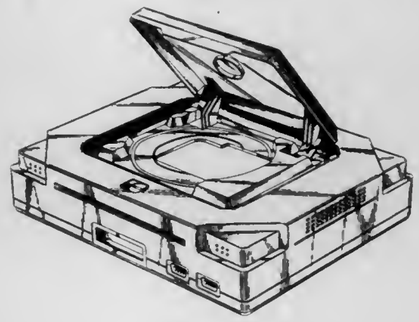




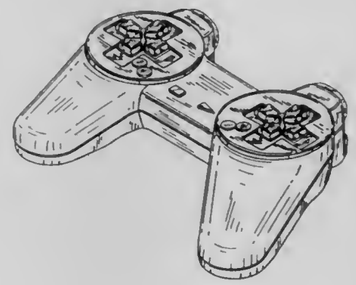
393,883
DICE GAME BOX
Nolan H. Haygood, 82 Carolyn La., Dawsonville, Ga. 30534
Filed May 13, 1997, Ser. No. 70,691
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—41



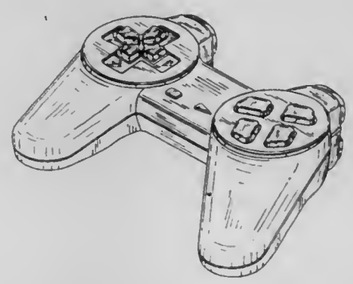
393,884
TV GAME MACHINE
Takayuki Hayami, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan
Filed Mar. 31, 1997, Ser. No. 69,148
Claims priority, application Japan, Oct. 8, 1996, 8-30452
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—48



393,885
CONTROLLER FOR COMPUTER GAME
Teiyu Goto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Division of Ser. No. 42,706, Jun. 16, 1995, Pat. No. Des. 382,603, which is a continuation-in-part of Ser. No. 30,017, Oct. 3, 1994, abandoned. This application Jun. 12, 1997, Ser. No. 72,012
Claims priority, application Japan, Apr. 11, 1994, 6-9793; Dec. 16, 1994, 6-38241; Dec. 16, 1994, 6-38242; Dec. 16, 1994, 6-38243; Dec. 16, 1994, 6-38244; Dec. 16, 1994, 6-38245; Dec. 16, 1994, 6-38246; Dec. 16, 1994, 6-38247; Dec. 16, 1994, 6-38248; Dec. 16, 1994, 6-38249; Dec. 16, 1994, 6-38250
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—48



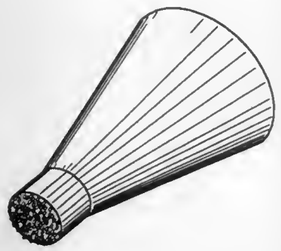
393,886
CONTROLLER FOR COMPUTER GAME
Teiyu Goto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Division of Ser. No. 42,706, Jun. 16, 1995, Pat. No. Des. 382,603, which is a continuation-in-part of Ser. No. 30,017, Oct. 3, 1994, abandoned. This application Jun. 12, 1997, Ser. No. 72,014
Claims priority, application Japan, Apr. 11, 1994, 6-9793; Dec. 16, 1994, 6-38241; Dec. 16, 1994, 6-38242; Dec. 16, 1994, 6-38243; Dec. 16, 1994, 6-38244; Dec. 16, 1994, 6-38245; Dec. 16, 1994, 6-38246; Dec. 16, 1994, 6-38247; Dec. 16, 1994, 6-38248; Dec. 16, 1994, 6-38249; Dec. 16, 1994, 6-38250
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—48



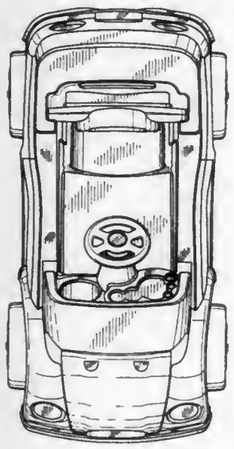
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393,887
TUBE DART
Kenneth F. Guinn, 4117 Cimarron Trial, Granbury, Tex. 76049
Filed Dec. 18, 1996, Ser. No. 63,908
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—49



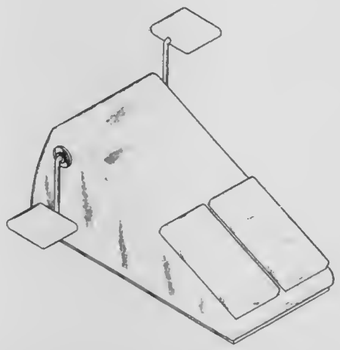
393,888
CHILDREN'S RIDE-ON VEHICLE
Adam W. Callif, East Aurora, N.Y., assignor to Mattel, Inc., El Segundo, Calif.
Filed Feb. 10, 1997, Ser. No. 66,295
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—78



393,889
WIRE SPIRAL TOY
Mark Chesler, 4535 Encino Ave., Encino, Calif. 91316
Filed Feb. 12, 1997, Ser. No. 66,398
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—106

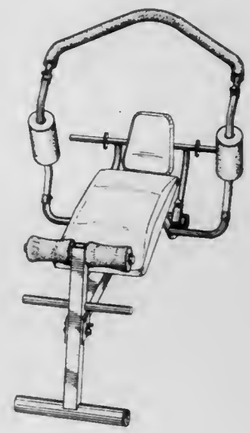


393,890
COMBINATION BICYCLE EXERCISER AND HEALTH FOOTREST
Jean A. Billiouris, 741 Albany Ave., Ventura, Calif. 93004
Filed Jan. 29, 1996, Ser. No. 49,557
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—194

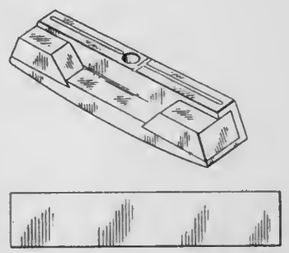




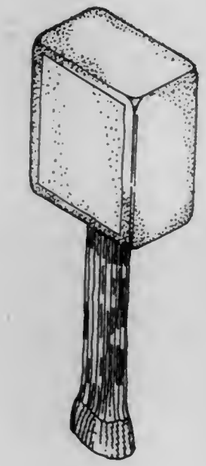
393,891
FOLDABLE BENCH EXERCISER
Martin A. Van Der Hoeven, 4646 Rancho Reposo, Del Mar, Calif. 92014, and Francois H. Van Der Hoeven, 1404 E. View Ct., Oceanside, Calif. 92056
Filed Sep. 23, 1996, Ser. No. 60,136
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—195



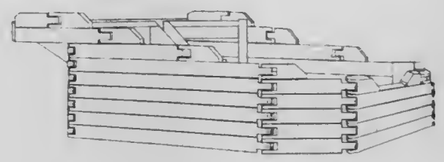
393,892
GOLF PUTTER HEAD
Clovis R. Duclos, 3622 Rebel Cir., Huntington Beach, Calif. 92649
Filed Dec. 23, 1996, Ser. No. 64,116
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—219



393,893
GOLF CLUB HEAD COVER
Owen Craig Pollard, 1260 Activity Dr., Unit B, Vista, Calif. 92083
Filed Nov. 19, 1996, Ser. No. 62,593
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—221



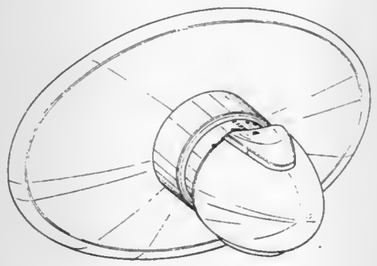
393,894
INTEGRATED HANDICAP ACCESSIBLE AND CONVENTIONAL SANDBOX
Jesse W. Swafford, HCR 31, Box 74E, Jasper, Ark. 72641
Filed Mar. 27, 1997, Ser. No. 68,299
Term of patent 14 years
LOC (6) Cl. 21 - *99*
U.S. Cl. D21—252



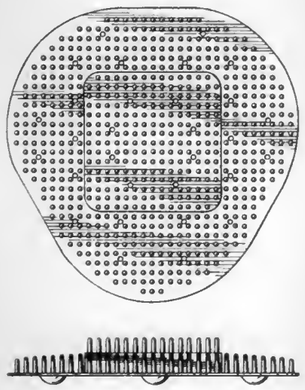
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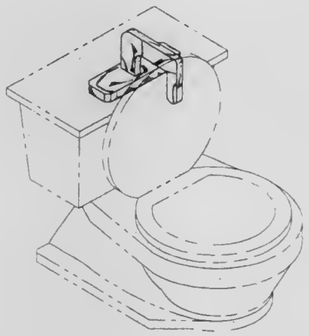
393,895
WALL-MOUNT FAUCET HANDLE ASSEMBLY
Adolf Gottwald, Iserlohn, Germany, assignor to Friedrich Grohe AG, Hemer, Germany
Filed Jun. 10, 1997, Ser. No. 71,941
Claims priority, application Germany, Jan. 16, 1997, M 97 00 386.7
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—254



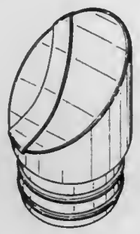
393,896
URINAL ANTI-SPLASH DEVICE
Leonard E. Wagner, 408 Fairview Drive, Whitby, Ontario, Canada, L1N 3A8, and Dana S. Marshall, 63 Bennett Road, West Hill, Ontario, Canada, M1E 3Y2
Filed Dec. 5, 1996, Ser. No. 62,938
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—261



393,897
TOILET SEAT HOLDING APPARATUS
Dev Padhi, 205-789 Drake St., Vancouver, British Columbia, Canada, V6Z 2N7
Filed May 22, 1997, Ser. No. 71,182
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—303

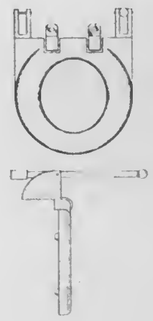


393,898
DECORATIVE CAP FOR A SANITARY FIXTURE
Adolf Gottwald, Iserlohn, Germany, assignor to Friedrich Grohe AG, Hemer, Germany
Filed Jun. 13, 1997, Ser. No. 72,274
Claims priority, application Germany, Jan. 29, 1997, M9700838.9
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—303

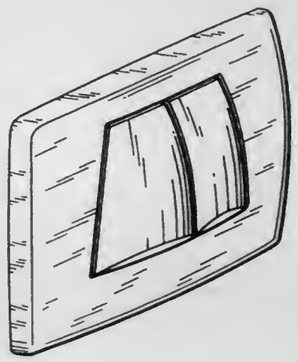




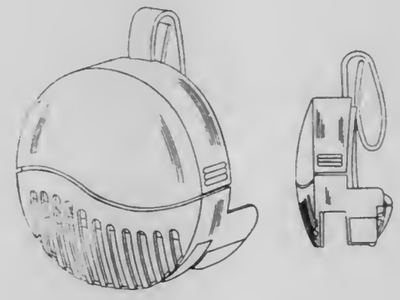
393,899
SANITARY TOILET SEAT APPARATUS
Jeffrey J. Berring, 635 Stonequarry Rd., Dayton, Ohio 45414
Filed Feb. 28, 1997, Ser. No. 67,232
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—311



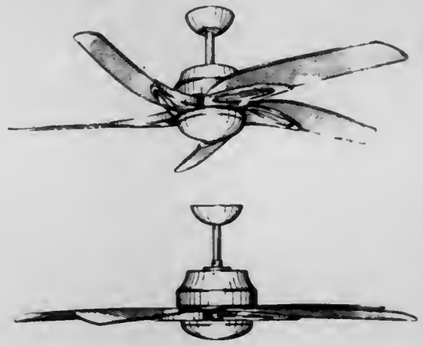
393,900
COVER FOR FLUSHING TANK
Ulrich Witzig, Wolfhausen, Switzerland, assignor to Geberit Technick AG, Jona, Switzerland
Filed Feb. 11, 1997, Ser. No. 66,442
Claims priority, application Hague Agreement, Aug. 12, 1996, DMA/003414
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—313



393,901
COMBINED SANITARY CLEANING AND AIR-DEODORIZING APPARATUS
Petrus Henrikus Aloysius Nicolaas Kuhn, Den Haag, Netherlands, assignor to Sara Lee Corporation, Winston-Salem, N.C.
Filed Sep. 4, 1996, Ser. No. 59,153
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—368



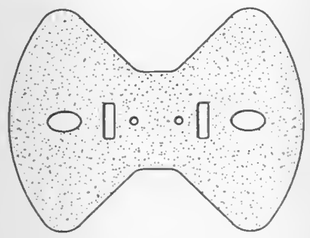
393,902
COMBINED CEILING FAN AND LIGHT FIXTURE
Mark Pickett, Rancho Palos Verdes, Calif., assignor to Minka Lighting Inc., Corona, Calif.
Filed Oct. 28, 1996, Ser. No. 61,624
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—377



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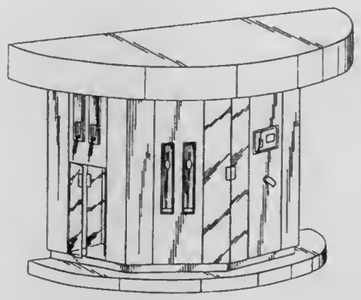
393,903
ANCHOR PAD
Steven F. Bierman, Del Mar, Calif., assignor to Venetec International, Inc., Mission Viejo, Calif.
Division of Ser. No. 22,528, May 6, 1994, Pat. No. Des. 364,922, which is a continuation-in-part of Ser. No. 121,942, Sep. 15, 1993, Pat. No. 5,456,671, which is a continuation-in-part of Ser. No. 34,340, Mar. 19, 1993, Pat. No. 5,354,282.
This application Aug. 24, 1995, Ser. No. 43,069
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—128



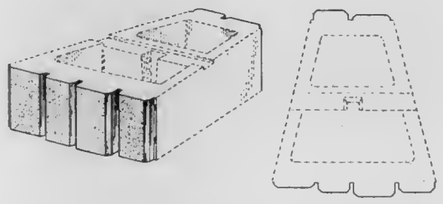
393,904
MASK FOR MAINTAINING WARMTH IN NASAL AND LACRIMAL AREAS
Masuo Miura, 190-13, Ooaza Kasanui, Hannoh-shi, Saitama-ken, Japan
Filed Dec. 15, 1995, Ser. No. 47,955
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—206



393,905
MULTIPURPOSE UTILITY STATION FOR USE AT A PETROL STATION
Stein Alvern, Oslo, and Øyvind Alvern, Hjellestad, both of Norway, assignors to Alvern Norway A/S, Norway
Filed Oct. 16, 1996, Ser. No. 61,133
Claims priority, application Norway, Apr. 24, 1996, 960271
Term of patent 14 years
LOC (6) Cl. 25 - *03*
U.S. Cl. D25—16

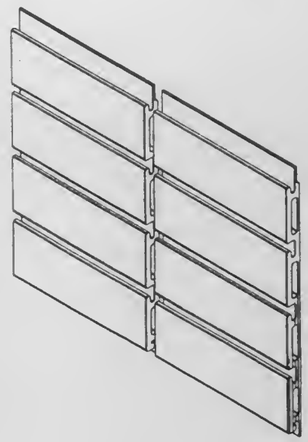


393,906
CONSTRUCTION BLOCK FACES
Lawrence W. Sumerlin, 3852 Woodglen Blvd., Thornton, Colo. 80233
Filed Mar. 7, 1997, Ser. No. 67,583
Term of patent 14 years
LOC (6) Cl. 25 - *01*
U.S. Cl. D25—114

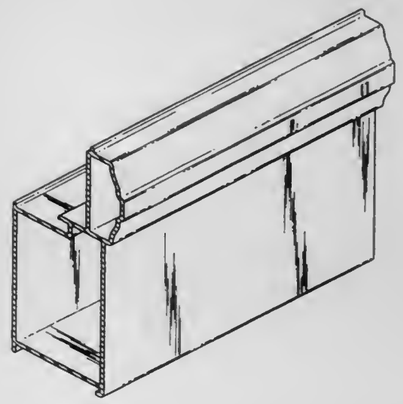




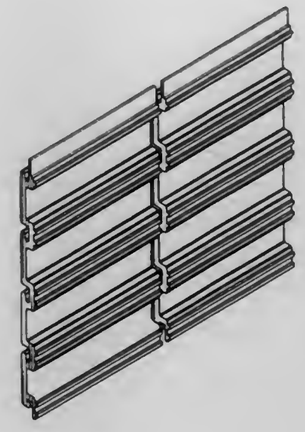
393,907
EXTRUDED SLATWALL SECTION
Wayne A. Current, Holmdel, N.J., assignor to International Visual Corporation, Port Washington, N.Y.
Filed May 16, 1997, Ser. No. 71,049
Term of patent 14 years
LOC (6) Cl. 25 - *01*
U.S. Cl. D25—122



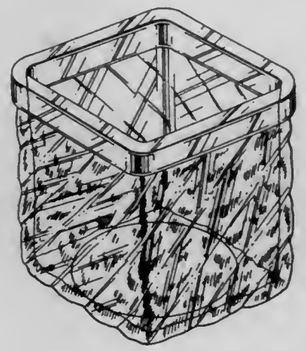
393,908
DOOR FRAME EXTRUSION
Terry J. Kenkel, Des Moines, Iowa, assignor to Emco Enterprises, Inc., Des Moines, Iowa
Filed May 8, 1997, Ser. No. 70,460
Term of patent 14 years
LOC (6) Cl. 25 - *01*
U.S. Cl. D25—124



393,909
EXTRUDED SLATWALL SECTION
Wayne A. Current, Holmdel, N.J., assignor to International Visual Corporation, Port Washington, N.Y.
Filed May 23, 1997, Ser. No. 71,212
Term of patent 14 years
LOC (6) Cl. 25 - *01*
U.S. Cl. D25—123



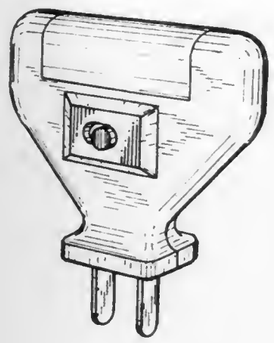
393,910
CANDLE HOLDER
Gregory V. Chambers, Scottsdale, Ariz.; Robert D. Colchagoff, and Eldred Edward Lloyd Martin, both of Tulsa, Okla., assignors to The Dial Corporation, Phoenix, Ariz.
Filed Apr. 3, 1997, Ser. No. 68,329
Term of patent 14 years
LOC (6) Cl. 26 - *01*
U.S. Cl. D26—9



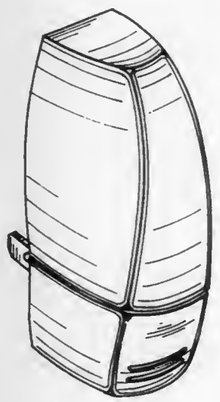
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1998
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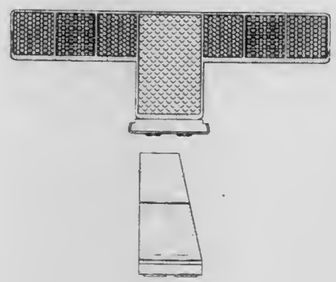
393,911
NIGHT LIGHT
Albert Stekelenburg, Taipei, Taiwan, assignor to All-Line Inc., Taipei, Taiwan
Filed Dec. 5, 1996, Ser. No. 62,935
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—26



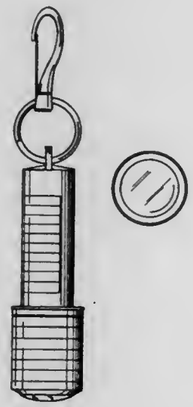
393,912
SENSOR NIGHT LIGHT
Se Kit Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Apr. 18, 1997, Ser. No. 69,955
Claims priority, application United Kingdom, Dec. 4, 1996, 2061460
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—26



393,913
AUXILIARY BRAKE LIGHT FOR VEHICLES
Gwendolyn F. Edsall, 997 Appel La., Dowell, Md. 20629
Filed Jun. 12, 1997, Ser. No. 72,190
Term of patent 14 years
LOC (6) Cl. 26 - *06*
U.S. Cl. D26—28

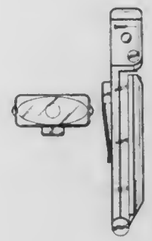


393,914
LIGHT FOR ATTACHMENT TO DOG
Denise B. Novros, 150 Amann Rd., Honeoye Falls, N.Y. 14472
Filed Jun. 18, 1997, Ser. No. 72,077
Term of patent 14 years
LOC (6) Cl. 26 - *02*
U.S. Cl. D26—39





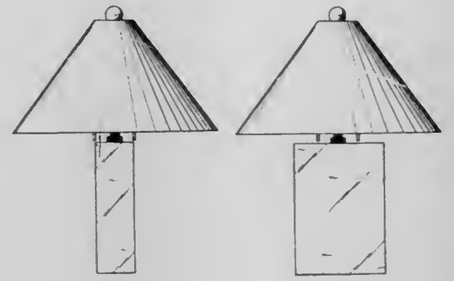
393,915
RECHARGEABLE LANTERN
Se Kit Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Division of Ser. No. 47,326, Dec. 1, 1995. This application Jul. 30, 1996, Ser. No. 57,711
Claims priority, application United Kingdom, Aug. 1, 1995, 2049176
Term of patent 14 years
LOC (6) Cl. 26 - *02*
U.S. Cl. D26—42



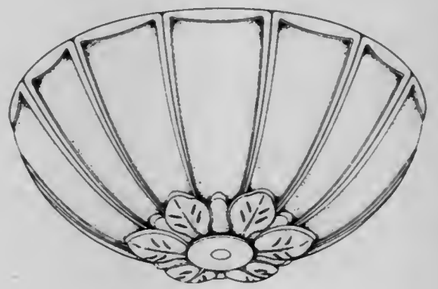
393,916
FLOOR LAMP
Hsuan-Yu Lee, No. 8-2, Tin-Sin-Tzu, Sin-Hwa Chung, San-Chih Hsiang, Taipei Hsien, Taiwan
Filed Oct. 29, 1996, Ser. No. 61,696
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—63



393,917
TABLE LAMP
John Hutton, New York, N.Y., assignor to Donghia Furniture Co., Ltd., New York, N.Y.
Filed May 7, 1996, Ser. No. 53,730
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—106



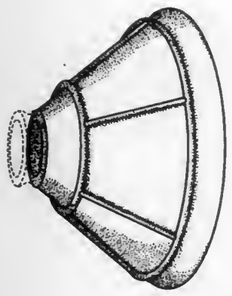
393,918
LIGHTING SHADE
Kuo-Kuang Lin, 4th Fl, No. 1, Lane 9 Ming Sheng E. Rd., Sec. 3, Taipei, Taiwan
Filed Sep. 23, 1996, Ser. No. 60,129
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—134



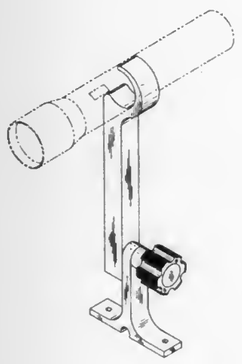
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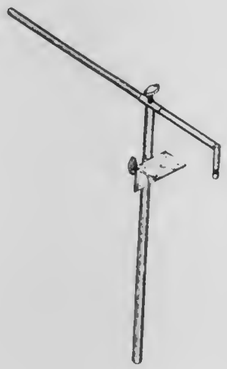
393,919
LAMP GLASS SHADE WITH WIRE CAGE
Patrick S. Dolan, 1901 NW. Upshur, Portland, Oreg. 97209
Filed May 14, 1997, Ser. No. 70,710
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—136



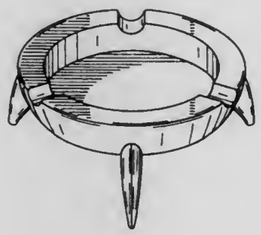
393,920
BRACKET FOR HOLDING A FLASHLIGHT
Gary L. Palmer, Vinton, Va., assignor to ITT Industries, Inc., White Plains, N.Y.
Filed Dec. 24, 1996, Ser. No. 64,204
Term of patent 14 years
LOC (6) Cl. 26 - *99*
U.S. Cl. D26—138



393,921
ADJUSTABLE STUDIO LIGHT BRACKET
Albert Cicolello, 1807 Ridgegate La., Simi Valley, Calif. 93065, and George G. Welch, 11435 Tiara St., North Hollywood, Calif. 91601
Filed Dec. 31, 1996, Ser. No. 64,431
Term of patent 14 years
LOC (6) Cl. 26 - *99*
U.S. Cl. D26—138

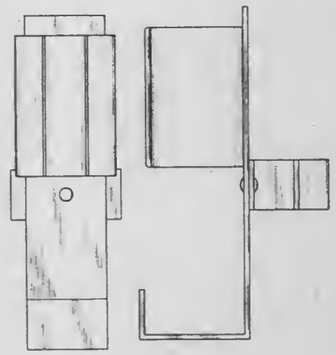


393,922
THREE LEGGED ASHTRAY
Devin Lee Moore, Decatur, and Leslie Lowe Brown, Atlanta, both of Ga., assignors to InterDesign, Inc., Solon, Ohio
Filed Feb. 19, 1997, Ser. No. 66,942
Term of patent 14 years
LOC (6) Cl. 27 - *03*
U.S. Cl. D27—133

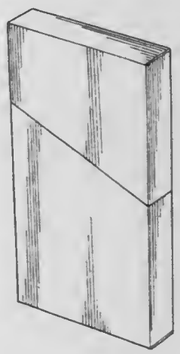




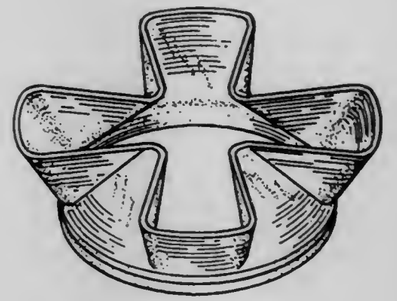
393,923
CIGAR HOLDER ATTACHABLE TO A GOLF CART OR BAG
James N. Dimonekas, 235 E. 87th St., Apt. 5J, New York, N.Y. 10128
Filed Jan. 31, 1997, Ser. No. 65,640
Term of patent 14 years
LOC (6) Cl. 27 - *06*
U.S. Cl. D27—183



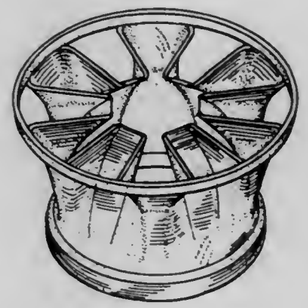
393,924
PACK FOR SMOKING ARTICLES
Clive Graham Wright, Bristol, United Kingdom, assignor to Imperial Tobacco Limited, England
Filed Apr. 19, 1993, Ser. No. 7,242
Claims priority, application United Kingdom, Oct. 17, 1992, 2026526; Oct. 17, 1992, 2026527
Term of patent 14 years
LOC (6) Cl. 27 - *06*
U.S. Cl. D27—189



393,925
HAIR DRYER ATTACHMENT
Björn Kling, Frankfurt, Germany, assignor to Braun Aktiengesellschaft, Frankfurt, Germany
Filed May 2, 1996, Ser. No. 53,942
Claims priority, application Hague Agreement, Nov. 6, 1995, DM/035399
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—18



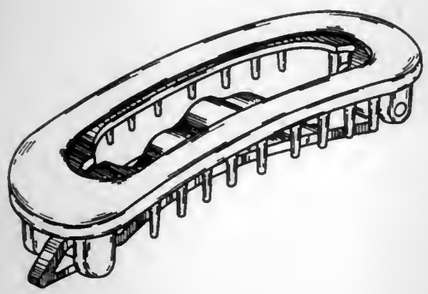
393,926
HAIR DRYER ATTACHMENT
Björn Kling, Frankfurt, United Kingdom, assignor to Braun Aktiengesellshaft, Frankfurt, Germany
Filed May 2, 1996, Ser. No. 53,943
Claims priority, application Germany, Nov. 6, 1995, DM/035399
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—18



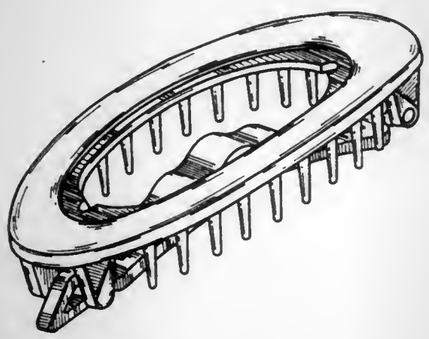
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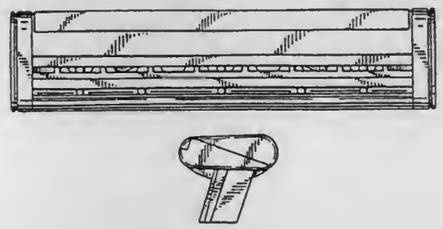
393,927
HAIR COMBING CLIP
Kuo-Hua Chou, No. 17, Alley 10, Lane 118, Su-Wei Rd., Wu-Ku Hsiang, Taipei County, Taiwan
Filed Dec. 29, 1995, Ser. No. 48,472
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—42



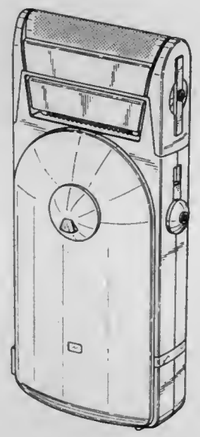
393,928
HAIR COMBING CLIP
Kuo-Hua Chou, No. 17, Alley 10, Lane 118, Su-Wei Rd., Wu-Ku Hsiang, Taipei County, Taiwan
Filed Dec. 29, 1995, Ser. No. 48,500
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—42



393,929
RAZOR BLADE ASSEMBLY
Frank H. Prochaska, Waynesboro, Va., assignor to American Safety Razor Company, Verona, Va.
Filed Mar. 21, 1996, Ser. No. 52,028
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—47

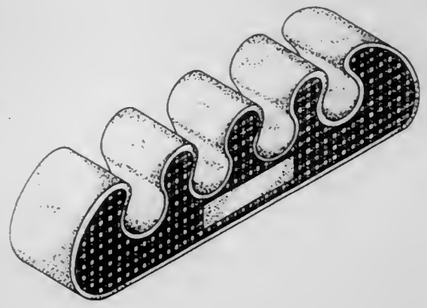


393,930
DRY SHAVER
Roland Ullmann, Offenbach, Germany, assignor to Braun Aktiengesellschaft, Frankfurt, Germany
Filed Feb. 19, 1997, Ser. No. 66,736
Claims priority, application Germany, Aug. 19, 1996, 9607005
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—49

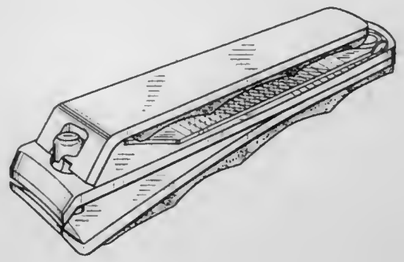




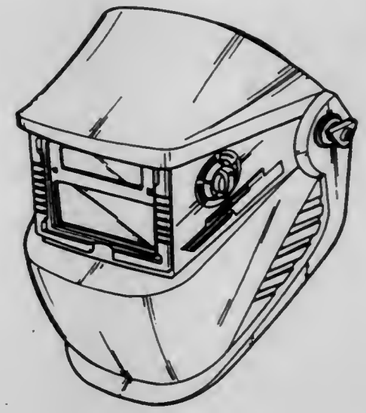
393,931
TOE SPACER DEVICE
Marilyn Christine Rue, 6121 Abrams Rd., Apt. #1112, Dallas, Tex. 75231
Filed Apr. 21, 1997, Ser. No. 69,970
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—57



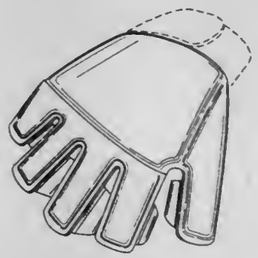
393,932
TOENAIL CLIPPER
Garfield Litton, Glenrock, N.J., assignor to Revlon Consumer Products Corporation, New York, N.Y.
Filed Aug. 28, 1996, Ser. No. 59,709
The portion of the term of this patent subsequent to Mar. 17, 2012, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—60



393,933
WELDING MASK
Moon Young Huh, Seoul, Rep. of Korea, assignor to Otos Optical Co., Ltd., Seoul, Rep. of Korea
Filed Apr. 10, 1996, Ser. No. 52,930
Term of patent 14 years
LOC (6) Cl. 29 - *02*
U.S. Cl. D29—110



393,934
GLOVE
Dean M. Harvey, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Dec. 17, 1996, Ser. No. 63,874
Term of patent 14 years
LOC (6) Cl. 29 - *02*
U.S. Cl. D29—113



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# LIST OF PATENTEES

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## PATENTS WERE ISSUED ON THE 28th DAY OF APRIL, 1998

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AAF International: *See*—
Choi, Kyung-Ju, 5,744,036, Cl. 210-493.500.

Aarnio, Jaakko: *See*—
Kersten, Peter; Koppenborg, Johannes; and Aarnio, Jaakko, 5,745,614, Cl. 385-29.000.

Aarnio, Olavi; and Östnaes, Erik. Shock-absorbing device for a skate. 5,743,564, Cl. 280-811.000.

Aaron, Albert. Automatic occupant sensing anti-carjacking system. 5,745,030, Cl. 340-426.000.

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Abbott Laboratories: *See*—
Alcock, Alan J.; Pan, Jeffrey Y.; Egan, Karen A.; and Huang, Tung-Ming, 5,743,295, Cl. 137-599.000.
Barker, Craig S.; and Bell, Gordon E., 5,745,378, Cl. 364-510.000.
Columbus, Richard L.; Palmer, Harvey J.; Barclay, John Brian; Hanagan, Ted J.; Lowery, Michael G.; Gutierrez, Edward J.; Hansmann, Douglas Duroux; and Schmidt, Daniel Patrick, 5,743,861, Cl. 600-577.000.

Abe, Akira: *See*—
Irite, Naoko; Abe, Akira; and Yoshida, Kiyohide, 5,744,112, Cl. 423-236.000.
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Abe, Atsuyoshi; and Saitou, Toru, to Canon Kabushiki Kaisha. Image heating device. 5,745,833, Cl. 399-330.000.

Abe, Kenichiro: *See*—
Terada, Akihiro; and Abe, Kenichiro, 5,743,145, Cl. 74-409.000.

Aberle, Daniel W.: *See*—
Saxton, Gregory J.; Zaerr, Jon B.; and Aberle, Daniel W., 5,743,192, Cl. 105-355.000.

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Mansuri, Muzammil M.; Martin, John C.; Hudyma, Thomas W.; Bronson, Joanne J.; and Ferrara, Louis M., 5,744,600, Cl. 544-243.000.

Accord Semiconductor Equipment Group: *See*—
Dyer, Timothy Scott, 5,744,400, Cl. 438-631.000.

Accorsi, Marco, to Trimat S.r.l. Method for producing containers with a film made of thermoplastic synthetic material. 5,743,988, Cl. 156-267.000.

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Chang-Fa, Hsieh, 5,744,904, Cl. 313-479.000.
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Liao, Pin-Chien, 5,743,386, Cl. 200-512.000.
Shen-Long, Chiang; and Meng-Tsan, Kuan, 5,745,020, Cl. 336-92.000.

Ackerly, Anne C.: *See*—
Luchetti, Robert J.; Ackerly, Anne C.; Houda, James D.; Imrich, Steven; and Miles, Michael E., 5,743,054, Cl. 52-220.700.

AcroMed Corporation: *See*—
Asher, Marc A.; Stripggen, Walter E.; Heinig, Charles F.; and Carson, William L., 5,743,907, Cl. 606-61.000.

ACT Medical, Inc.: *See*—
Tolkoff, M. Joshua; and Alvarez de Toledo, Fernando, 5,743,891, Cl. 604-282.000.

Actel Corporation: *See*—
McGowan, John E.; Plants, William C.; Landry, Joel D.; Kaptanoglu, Sinan; and Miller, Warren K., 5,744,980, Cl. 326-40.000.

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Lutz, Mitchell E., 5,744,549, Cl. 525-129.000.

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Hanafy, Amin M.; Maslak, Samuel H.; and Plugge, Jay S., 5,743,855, Cl. 600-459.000.

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Muehllehner, Gerd; Countryman, Peter; and Braymer, William K., 5,744,802, Cl. 250-363.030.

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McFarland, Robert W., 5,743,575, Cl. 292-336.300.

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Sawahashi, Mamoru; and Adachi, Fumiyuki, 5,745,531, Cl. 375-345.000.

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Adachi, Shigeo; and Yoshimura, Masaaki, to Suzuki Kabushiki Kaisha. Exhaust structure of outboard motor. 5,743,774, Cl. 440-89.000.

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Giebel, Markus A.; and Adams, Charles K., 5,745,633, Cl. 385-136.000.

Adams, David Robert; and Philby, Jonathan David, to AE PLC. Piston and piston ring. 5,743,012, Cl. 29-888.043.

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Zurawin, Michael, 5,742,970, Cl. 15-121.000.

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Adermann, Knut: *See*—
Forssmann, Wolf-Georg; Herbst, Franz; Schulz-Knappe, Peter; Adermann, Knut; and Gagelmann, Michael, 5,744,444, Cl. 514-12.000.

Adger, Brian: *See*—
Tarbit, Brian; Adger, Brian; and Willett, Paul, 5,744,615, Cl. 548-462.000.

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Behtash, Saman; Flores, Christopher; and Ghanem, Adel, 5,745,480, Cl. 370-252.000.

Adkins, Courtney W.; Carter, Thurman B.; Blizzard, William A., Jr.; and Ward, Richard M., to Weatherford/Lamb, Inc. Wellbore milling system. 5,743,331, Cl. 166-55.700.

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Gay, Jonathan L.; and Tatsumi, Robert B., 5,745,122, Cl. 345-433.000.
Gilley, Glenn G.; and Tebbs, Brice W., 5,745,666, Cl. 395-128.000.

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Kruse, Lawrence I.; Chang, An-Chih; DeHaven-Hudkins, Diane L.; Farrar, John J.; Gaul, Forrest; Kumar, Virendra; Marella, Michael Anthony; Maycock, Alan L.; and Zhang, Wei Yuan, 5,744,458, Cl. 514-91.000.

Advanced Cardiovascular Systems, Inc.: *See*—
Sirhan, Motasim M.; Fernando, Jovito L., Sr.; Thornton, Troy L.; Campbell, Patrick K.; Williams, Eric; and Wasicek, Lawrence D., 5,743,875, Cl. 604-96.000.

Advanced Micro Devices, Inc.: *See*—
Asghar, Safdar M.; and Ireton, Mark A., 5,745,648, Cl. 395-2.130.
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Hancock, Daniel W., 5,745,796, Cl. 395-885.000.

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Adams, David Robert; and Philby, Jonathan David, 5,743,012, Cl. 29-888.043.

Aeration Industries International, Inc.: *See*—
Karliner, Rudolf R., 5,744,072, Cl. 261-87.000.

Aeroquip Corporation: *See*—
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Lassalle, Martine, 5,745,293, Cl. 359-614.000.

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Slocum, Alexander H., 5,743,326, Cl. 165-47.000.

Affymax Technologies N.V.: *See—*
Fodor, Stephen P. A.; Stryer, Lubert; Winkler, James L.; Holmes, Christopher P.; and Solas, Dennis W., 5,744,101, Cl. 422-131.000.

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Fodor, Stephen P.A.; Stryer, Lubert; Read, J. Leighton; and Pirrung, Michael C., 5,744,305, Cl. 435-6.000.

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Fröjd, Christer, 5,744,806, Cl. 250-370.090.

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Shim, Woo-Jeon; Koo, Bon-Soon; Lim, Beom-Soo; and Hong, Kil-Ho, 5,744,745, Cl. 89-1.806.

Agency of Industrial Science and Technology: *See—*
Fujishima, Shizu; Yamano, Naoko; Maruyama, Akihiko; and Higashihara, Takanori, 5,744,325, Cl. 435-71.200.

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Elsaesser, Andreas; Frass, Werner; Grabley, Fritz-Feo; and Jerling, Gábor, 5,744,272, Cl. 430-96.000.

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Hebenstreit, Jörk; Reichel, Wilfried; and Bock, Helmut, 5,745,261, Cl. 358-501.000.
Rauh, Hans-Juergen; Treiber, Helmut; and Schindler, Hans-Georg, 5,745,252, Cl. 358-302.000.

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De Baer, Dirk; and Govaert, René, 5,745,120, Cl. 345-431.000.
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Ziegeler, Wesley B. Removable working surface for a common desk drawer. 5,743,194, Cl. 108-157.130.

Ziegelmaier, Robert: *See—*
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Ziegler, Carl Bernard: *See—*
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Zimmanck, Jack. Note pad holder. 5,743,565, Cl. 281-44.000.

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Zimmer, Dennis Jack: *See—*
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Zimmer, Inc.: *See—*
Bertin, Kim C.; Burke, Dennis W.; Stalcup, Gregory C.; and Bays, Rodney, 5,743,915, Cl. 606-88.000.

Zimmerman, Leonard. Adjustable tip caulking tube. 5,743,668, Cl. 401-265.000.

Zimron, Ohad; Hatzir, Shimon; Regal, Meir; and Amir, Nadav, to Ormat Industries Ltd. Method of and apparatus for cooling a seal for machinery. 5,743,094, Cl. 60-646.000.

Zinnen, Herman A.; McGonegal, Charles P.; Dandekar, Hemant W.; Funk, Gregory A.; and Gillespie, Ralph D., to UOP. Process for alkane isomerization using reactive chromatography and reactive desorbent. 5,744,684, Cl. 585-737.000.

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Zircon Corporation: *See—*
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Zirngibl, Martin, to Lucent Technologies Inc. Waveguide grating router and method of making same having relatively small dimensions. 5,745,616, Cl. 385-37.000.

Zirngibl, Martin: *See—*
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Zitta, Heinz: *See—*
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Zoeller, Joseph Robert, to Eastman Chemical Company. Catalyst system and process for benzyl ether fragmentation and coal liquefaction. 5,744,026, Cl. 208-430.000.

Zongrone, Nicoletta Assaro: *See—*
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Zorab, James: *See—*
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Zouev, Valerii Pavlovich: *See—*
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Zuk, Edward Andrew, to Telstra Corporation Limited. Cryptographic communications method and system. 5,745,571, Cl. 380-21.000.

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Baska, Douglas A.; Becker, Darryl J.; Bielick, James D.; Isaacs, Phillip D.; and Zumbrunnen, Michael L., 5,745,344, Cl. 361-705.000.

Zumwalt, Frank E. Filing system. 5,743,036, Cl. 40-359.000.

Zuniga, Michael Anthony: *See—*
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Zwack, Frank, Sr.: *See—*
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3COM Corporation: *See—*
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TO WHOM

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NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alferness, Clifton A.; Ayers, Gregory M.; Griffin, Jerry C.; and Infinger, Kenneth R., to InControl, Inc. Post-heart surgery cardioverting system and method. RE. 35,779, Cl. 607-5.000.

Ayers, Gregory M.: *See*—
Alferness, Clifton A.; Ayers, Gregory M.; Griffin, Jerry C.; and Infinger, Kenneth R., RE. 35,779, Cl. 607-5.000.

Brunswick Bowling & Billiards: *See*—
Stirling, Michael F.; Gautraud, Michael G.; and Murphy, William C., RE. 35,778, Cl. 428-63.000.

Gautraud, Michael G.: *See*—
Stirling, Michael F.; Gautraud, Michael G.; and Murphy, William C., RE. 35,778, Cl. 428-63.000.

Givin, William R., to Huyck Licensco, Inc. Self stitching multilayer papermaking fabric. RE. 35,777, Cl. 139-383.00A.

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Alferness, Clifton A.; Ayers, Gregory M.; Griffin, Jerry C.; and Infinger, Kenneth R., RE. 35,779, Cl. 607-5.000.

Hitachi Engineering Co., Ltd.: *See*—
Sugano, Akira; and Yamanobe, Sachio, RE. 35,776, Cl. 60-665.000.

Hitachi, Ltd.: *See*—
Sugano, Akira; and Yamanobe, Sachio, RE. 35,776, Cl. 60-665.000.

Huyck Licensco, Inc.: *See*—
Givin, William R., RE. 35,777, Cl. 139-383.00A.

InControl, Inc.: *See*—
Alferness, Clifton A.; Ayers, Gregory M.; Griffin, Jerry C.; and Infinger, Kenneth R., RE. 35,779, Cl. 607-5.000.

Infinger, Kenneth R.: *See*—
Alferness, Clifton A.; Ayers, Gregory M.; Griffin, Jerry C.; and Infinger, Kenneth R., RE. 35,779, Cl. 607-5.000.

Murphy, William C.: *See*—
Stirling, Michael F.; Gautraud, Michael G.; and Murphy, William C., RE. 35,778, Cl. 428-63.000.

Stirling, Michael F.; Gautraud, Michael G.; and Murphy, William C., to Brunswick Bowling & Billiards. Structure for resurfacing bowling lanes. RE. 35,778, Cl. 428-63.000.

Sugano, Akira; and Yamanobe, Sachio, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Automatic control system for thermal power plant. RE. 35,776, Cl. 60-665.000.

Yamanobe, Sachio: *See*—
Sugano, Akira; and Yamanobe, Sachio, RE. 35,776, Cl. 60-665.000.

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Aderman, Wayne Lowell; and Murphy, Tim Kerry, to International Business Machines Corporation. Deskside data processing system. 393,833, Cl. D14-100.000.

Advance Security Inc.: *See*—
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Agu, Joseph C. Rattle. 393,869, Cl. D17-22.000.

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All-Line Inc.: *See*—
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Allegre, Jean-Paul, to Allegre Puericulture Hygiene S.A. Mat for the early learning of babies. 393,877, Cl. D19-59.000.

Allegre Puericulture Hygiene S.A.: *See*—
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Allon, Noam S., to Medivision, Medical Imaging Ltd. Work station. 393,760, Cl. D6-422.000.

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Alvern, Øyvind: *See*—
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Alvern, Stein; and Alvern, Øyvind, to Alvern Norway A/S. Multipurpose utility station for use at a petrol station. 393,905, Cl. D25-16.000.

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American Safety Razor Company: *See*—
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Bernstein, Patrik L. T., to Spotlight Enterprises Incorporated. Fastening and hanging bracket. 393,795, Cl. D8-373.000.

Berring, Jeffrey J. Sanitary toilet seat apparatus. 393,899, Cl. D23-311.000.

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Cabey, Bernard Lewis. Insulated water bottle holder. 393,779, Cl. D7-607.000.

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Current, Wayne A., to International Visual Corporation. Extruded slatwall section. 393,909, Cl. D25-123.000.

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166 5,743,124
201 5,743,125
237 5,743,126
250 5,743,127
319 5,743,128
391.4 5,743,129
409.1 5,743,130
5,743,131

**CLASS 73**
1.35 5,744,695
23.25 5,744,696
31.06 5,744,697
35.11 5,744,698
38 5,744,699
40.5 A 5,744,700
49.2 5,744,701
53.01 5,744,702
54.01 5,744,703
105 5,744,704
116 5,744,705
5,744,706
118.2 5,744,132
121 5,744,707
146 5,744,708
152.18 5,744,709
168 5,743,133
170.11 5,744,710
170.21 5,744,711
204.26 5,744,713
290 V 5,743,134
293 5,743,135
313 5,743,136
322.5 5,743,137
5,743,138
431 5,744,714
432.1 5,744,715
453 5,744,716
514.18 5,744,717
514.32 5,744,719
514.33 5,744,718
514.39 5,744,720
579 5,744,721
659 5,744,722
660 5,744,723
665 5,744,724
724 5,744,725
727 5,744,726
733 5,744,727
862.542 5,744,728
864.25 5,744,729
864.63 5,744,731
864.74 5,744,730
865 5,744,732
865.6 5,744,733

**CLASS 74**
6 5,743,140
6 E 5,743,139
331 5,743,141
5,743,142
335 5,743,143
405 5,743,144
409 5,743,145
475 5,743,146
477 5,743,147
5,743,148
490.05 5,743,149
493 5,743,150
5,743,151
545 5,743,152
551.8 5,743,153
558 5,743,154
568 R 5,743,155
606 R 5,743,156

**CLASS 75**
249 5,744,734
403 5,743,936
414 5,743,937
532 5,743,938

**CLASS 76**
107.6 5,743,157

**CLASS 81**
58.5 5,743,158

**CLASS 82**
168 5,743,159

**CLASS 83**
276 5,743,160
435.11 5,743,161
839 5,743,162
851 5,743,163
862 5,743,164

**CLASS 84**
327 5,744,735
402 5,744,736
411 P 5,744,737
421 5,744,738
603 5,744,739
615 5,744,740
622 5,744,741
623 5,744,742
630 5,744,743
650 5,744,744

**CLASS 89**
1.806 5,744,745

**CLASS 91**
419 5,743,165

**CLASS 92**
42 5,743,166
48 5,743,167
80 5,743,168
100 5,743,169
103 F 5,743,170
208 5,743,171

**CLASS 95**
214 5,743,939
285 5,743,940

**CLASS 96**
10 5,743,941
118 5,743,942
126 5,743,943
181 5,743,944

**CLASS 99**
323.7 5,743,172
331 5,743,173
404 5,743,174
408 5,743,175
512 5,743,176

**CLASS 100**
47 5,743,177
127 5,743,178
325 5,743,179

**CLASS 101**
35 5,743,180
93 5,743,181
129 5,743,182
147 5,743,183
181 5,743,184
327 5,743,185
334 5,743,186
415.1 5,743,187
467 5,743,188
487 5,743,189

**CLASS 102**
476 5,744,746
5,744,747
523 5,744,748

**CLASS 104**
263 5,743,190

**CLASS 105**
355 5,743,191
5,743,192

**CLASS 106**
31.58 5,743,945
31.95 5,743,946
162.7 5,743,947
244 5,743,948
271 5,743,949
281.1 5,743,950
287.11 5,743,951
416 5,743,952
600 5,743,953
783 5,743,954

**CLASS 108**
147 5,743,193
157.13 5,743,194

**CLASS 110**
194 5,743,195
240 5,743,196
245 5,743,197

**CLASS 112**
63 5,743,198
66 5,743,199
80.01 5,743,200
80.73 5,743,201
470.31 5,743,202

**CLASS 114**
85 5,743,203
219 5,743,204
266 5,743,205
270 5,743,206
294 5,743,207
361 5,743,208

**CLASS 117**
2 5,743,955
89 5,743,956
929 5,743,957

**CLASS 118**
264 5,743,959
308 5,743,958
620 5,743,961
643 5,743,962
680 5,743,963
683 5,743,960
712 5,743,964
5,743,965
718 5,743,966
724 5,743,967

**CLASS 119**
14.08 5,743,209
51.5 5,743,210
58 5,743,211
69.5 5,743,212
172 5,743,213
601 5,743,214
708 5,743,215
793 5,743,216
846 5,743,217

**CLASS 123**
41.82 R 5,743,218
54.4 5,743,219
56.9 5,743,220
90.11 5,743,221
90.16 5,743,226
90.48 5,743,222
5,743,223
90.51 5,743,224
90.65 5,743,225
179.3 5,743,227
195 A 5,743,229
195 H 5,743,230
195 P 5,743,228
196 S 5,743,231
320 5,743,232
425 5,743,233
446 5,743,234
468 5,743,235
491 5,743,236
496 5,743,237
506 5,743,238
514 5,743,239
518 5,743,240
531 5,743,241
549 5,743,242
569 5,743,243
674 5,743,244

**CLASS 124**
44.5 5,743,245
56 5,743,246

**CLASS 125**
12 5,743,247

**CLASS 126**
25 B 5,743,248
512 5,743,249

**CLASS 128**
200.14 5,743,250
5,743,251
5,743,252
200.24 5,743,253
200.26 5,743,254
201.18 5,743,256
205.24 5,743,257
207.15 5,743,258
632 5,743,259

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5,743,262
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653.2 5,743,264
662.02 5,743,266
673 5,743,267
691 5,743,268
706 5,743,269
724 5,743,270
845 5,743,271
846 5,743,272
849 5,743,273
898 5,743,274

**CLASS 131**
84.1 5,743,275
329 5,743,276

**CLASS 132**
200 5,743,277
210 5,743,278
218 5,743,279

**CLASS 134**
2 5,743,968
10 5,743,969
56 R 5,743,280
57 D 5,743,281
117 5,743,282

**CLASS 135**
16 5,743,283

**CLASS 136**
251 5,743,970

**CLASS 137**
74 5,743,285
119.04 5,743,286
268 5,743,287
315 5,743,288
341 5,743,289
403 5,743,290
454.2 5,743,291
489.5 5,743,293
493.9 5,743,292
588 5,743,294
599 5,743,295
614.21 5,743,296
636.2 5,743,297

**CLASS 138**
31 5,743,298
98 5,743,299
107 5,743,300
109 5,743,301
113 5,743,302
126 5,743,303
137 5,743,304

**CLASS 139**
1 E 5,743,305
7 A 5,743,306
110 5,743,307
383 A RE. 35,777
455 5,743,308

**CLASS 140**
119 5,743,309
123.6 5,743,310

**CLASS 141**
31 5,743,311
329 5,743,312
330 5,743,313

**CLASS 144**
24.12 5,743,314
334 5,743,315

**CLASS 148**
247 5,743,971
330 5,743,972

**CLASS 152**
12 5,743,316
152.1 5,743,973
269 R 5,743,974
527 5,743,975
543 5,743,976

**CLASS 156**
67 5,743,977
73.1 5,743,978
79 5,743,979
99 5,743,980
182 5,743,981
212 5,743,982
214 5,743,983
242 5,743,984
243 5,743,985
244.11 5,743,986
5,743,987
267 5,743,988
273.9 5,743,989
344 5,743,990
351 5,743,991
358 5,743,992
406.2 5,743,993
495 5,743,994
499 5,743,995
581 5,743,996
583.3 5,743,997
628.1 5,743,998

**CLASS 160**
10 5,743,317
168.1 V 5,743,318
173 R 5,743,319
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**CLASS 162**
113 5,743,999
140 5,744,000
164.3 5,744,001
174 5,744,002
199 5,744,003
246 5,744,004
251 5,744,005
358.1 5,744,006
374 5,744,007

**CLASS 164**
44 5,743,321
98 5,743,322
415 5,743,323
504 5,743,324

**CLASS 165**
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47 5,743,326
55 5,743,327
144 5,743,328
174 5,743,329
183 5,743,330

**CLASS 166**
55.7 5,743,331
85.4 5,743,332
122 5,743,333
250.07 5,743,334
285 5,743,335
380 5,743,336

**CLASS 169**
16 5,743,337

**CLASS 172**
28 5,743,338
272 5,743,339
371 5,743,340
451 5,743,341
781 5,743,342

**CLASS 174**
49 5,744,750
52.1 5,744,751
52.4 5,744,752
58 5,744,753
65 SS 5,744,754
108 5,744,755
110 N 5,744,756
113 R 5,744,757
255 5,744,758
260 5,744,759

**CLASS 175**
20 5,743,343
259 5,743,344
401 5,743,345
420.2 5,743,346

**CLASS 178**
19 5,744,760

**CLASS 180**
65.1 5,743,347
65.6 5,743,348
272 5,743,349
444 5,743,350
446 5,743,351
5,743,352

**CLASS 181**
167 5,744,761
254 5,744,762
286 5,744,763

**CLASS 182**
92 5,743,353
100 5,743,354
195 5,743,355
214 5,743,356

**CLASS 184**
1.5 5,743,357
5,743,358
102 5,743,359

**CLASS 188**
24.19 5,743,360
24.22 5,743,284
250 G 5,743,361
277 5,743,362

**CLASS 190**
18 A 5,743,363

**CLASS 192**
3.29 5,743,365
3.3 5,743,364
12 C 5,743,366
70.2 5,743,367
85 AA 5,743,368
85 CA 5,743,369
5,743,370
208 5,743,371

**CLASS 194**
318 5,743,372
5,743,373

**CLASS 198**
403 5,743,374
463.3 5,743,375
778 5,743,376
803.9 5,743,377
806 5,743,378
839 5,743,379

**CLASS 200**
1 R 5,744,764
6 A 5,744,765
16 A 5,744,766
17 R 5,744,767
43.08 5,743,380
50.01 5,744,768
61.54 5,744,769
83 A 5,744,770
83 J 5,744,771
310 5,743,381
315 5,743,382
344 5,743,383
5,743,384
401 5,743,385
512 5,743,386
571 5,743,387

**CLASS 202**
83 5,744,008

**CLASS 203**
42 5,744,009
43 5,744,010

**CLASS 204**
192.12 5,744,011
192.34 5,744,012
242 5,744,013
266 5,744,014
295 5,744,015
298.11 5,744,016
298.41 5,744,017

**CLASS 205**
94 5,744,018
96 5,744,019
408 5,744,020
441 5,744,021
554 5,744,022
697 5,744,023

**CLASS 206**
77.1 5,743,388
216 5,743,389
232 5,743,390
303 5,743,391
315.1 5,743,392
319 5,743,393
378 5,743,394
5,743,395
388 5,743,396
391 5,743,397
423 5,743,398
5,743,399
428 5,743,400
447 5,743,401
459.5 5,743,402
482 5,743,403
524.3 5,743,404
541 5,743,405
565 5,743,406
575 5,743,407
5,743,408
710 5,743,409

**CLASS 208**
236 5,744,024
253 5,744,025
430 5,744,026

**CLASS 209**
213 5,743,410

**CLASS 210**
96.2 5,744,027
181 5,744,028
198.2 5,744,029
235 5,744,030
238 5,744,032
282 5,744,033
321.71 5,744,031
411 5,744,034
490 5,744,035
493.5 5,744,036
602 5,744,041
620 5,744,037
634 5,744,038
644 5,744,039
645 5,744,042
664 5,744,040
705 5,744,043
719 5,744,045
749 5,744,046
767 5,744,047
803 5,744,048

**CLASS 211**
20 5,743,411
59.2 5,743,412
60.1 5,743,413
69.1 5,743,414
70.6 5,743,415
5,743,416
119 5,743,417
206 5,743,418

**CLASS 215**
217 5,743,419
270 5,743,420

**CLASS 216**
67 5,744,049

**CLASS 218**
40 5,744,772

**CLASS 219**
50 5,744,773
56.1 5,744,774
69.12 5,744,775
121.47 5,744,777
121.67 5,744,778
121.7 5,744,776
121.71 5,744,779
121.73 5,744,780
121.84 5,744,781
146.1 5,744,782
497 5,744,783
674 5,744,784
707 5,744,785
711 5,744,786

**CLASS 220**
4.28 5,743,421
4.33 5,743,422
23.86 5,743,423
203.13 5,743,424
254 5,743,425
522 5,743,426
791 5,743,427

**CLASS 221**
6 5,743,428
7 5,743,429
97 5,743,430

**CLASS 222**
1 5,743,431
5,743,432
64 5,743,433
103 5,743,434
105 5,743,435
137 5,743,436
147 5,743,437
181.1 5,743,438
185.1 5,743,439
209 5,743,440
212 5,743,441
382 5,743,442
490 5,743,443
521 5,743,444
541.9 5,743,445
603 5,744,050

**CLASS 223**
112 5,743,446

**CLASS 224**
153 5,743,447
5,743,448
191 5,743,449
220 5,743,450
268 5,743,451
275 5,743,452

**CLASS 227**
109 5,743,453
120 5,743,454
142 5,743,455
176.1 5,743,456

**CLASS 228**
33 5,743,457
180.21 5,743,459

**CLASS 229**
87.03 5,743,458
5,743,460
125.39 5,743,461
227 5,743,462

**CLASS 235**
380 5,744,787
454 5,744,788
472 5,744,789
5,744,790
5,744,791
492 5,744,792

**CLASS 236**
12.2 5,743,463
46 R 5,743,464
51 5,743,465

**CLASS 237**
12.3 B 5,743,466
12.3 R 5,743,467

**CLASS 239**
115 5,743,468
518 5,743,469
533.4 5,743,470

**CLASS 241**
16 5,743,471
32 5,743,472
33 5,743,473
46.06 5,743,474
57 5,743,475
101.73 5,743,476

**CLASS 242**
231 5,743,478
312 5,743,479
374 5,743,480
5,743,481
533.4 5,743,482
533.6 5,743,483
557 5,743,484
597.7 5,743,485
608.5 5,743,486

**CLASS 244**
1 R 5,743,487
53 B 5,743,488
62 5,743,489
75 R 5,743,490
104 FP 5,743,491
118.2 5,743,492
130 5,743,493
134 E 5,743,494

**CLASS 246**
121 5,743,495
463 5,743,496

**CLASS 248**
68.1 5,743,497
74.4 5,743,498
118 5,743,499
146 5,743,500
201 5,743,501
231.31 5,743,502
284.1 5,743,503
311.2 5,743,504
346.01 5,743,505
346.11 5,743,506
495 5,743,507
527 5,743,508
635 5,743,509

**CLASS 249**
155 5,743,510

**CLASS 250**
222.1 5,744,793
227.16 5,744,794
234 5,744,795
282 5,744,796
287 5,744,797
288 5,744,798
306 5,744,799
311 5,744,800
349 5,744,801
363.03 5,744,802
369 5,744,803
5,744,804
370.01 5,744,805
370.09 5,744,806
5,744,807
461.1 5,744,809
492.21 5,744,812
492.23 5,744,810
492.3 5,744,811
505.1 5,744,813
559.27 5,744,814
566 5,744,815

**CLASS 251**
129.04 5,743,511
307 5,743,512
335.2 5,743,513

**CLASS 252**
62 5,744,051
67 5,744,052
68 5,744,053
70 5,744,054
182.18 5,744,816
186.27 5,744,055
186.39 5,743,514
188.28 5,744,056
299.01 5,744,057
299.61 5,744,058
5,744,059
299.63 5,744,060
301.65 5,744,061
312 5,744,062
356 5,744,063
358 5,744,064
5,744,065
5,744,066
373 5,744,067
394 5,744,069
586 5,744,070

**CLASS 254**
334 5,743,515

**CLASS 257**
29 5,744,817
57 5,744,818
59 5,744,819
5,744,820
66 5,744,821
68 5,744,822
74 5,744,823
77 5,744,824
5,744,825
94 5,744,826
5,744,828
5,744,829
140 5,744,830
225 5,744,831
295 5,744,832
308 5,744,833
321 5,744,834
336 5,744,835
344 5,744,836
355 5,744,837
356 5,744,838
5,744,839
360 5,744,840
5,744,841
362 5,744,842
369 5,744,843
5,744,844
371 5,744,845
380 5,744,846
397 5,744,847
433 5,744,848
438 5,744,849
5,744,850
487 5,744,851
506 5,744,852
532 5,744,853
565 5,744,854
588 5,744,855
618 5,744,856
622 5,744,857
666 5,744,858
668 5,744,859
683 5,744,860
686 5,744,827
691 5,744,861
693 5,744,862
712 5,744,863
749 5,744,864
750 5,744,865
752 5,744,866
767 5,744,868
778 5,744,869
786 5,744,870



**CLASS 260**
665 R 5,744,071

**CLASS 261**
87 5,744,072

**CLASS 264**
1.21 5,744,073
8 5,744,074
29.6 5,744,075
35 5,744,076
46.6 5,744,077
82 5,744,078
109 5,744,079
167 5,744,080
211.14 5,744,089
219 5,744,081
238 5,744,082
272.14 5,744,083
276 5,744,084
296 5,744,085
5,744,086
297.2 5,744,087
5,744,088
427 5,744,090
508 5,744,091
572 5,744,092

**CLASS 266**
45 5,744,093

**CLASS 267**
30 5,743,516

**CLASS 270**
45 5,743,517

**CLASS 271**
4.1 5,743,518
10.11 5,743,519
189 5,743,520
263 5,743,521
265.02 5,743,522

**CLASS 273**
138.1 5,743,523
139 5,743,524
5,743,525
144 R 5,743,526
150 5,743,527
249 5,743,528
256 5,743,529
274 5,743,530
278 5,743,531
292 5,743,532
371 5,743,533
5,743,534

**CLASS 277**
165 5,743,535
235 A 5,743,536
236 5,743,537

**CLASS 279**
2.17 5,743,538
58 5,743,539

**CLASS 280**
11.2 5,743,540
43.13 5,743,541
47.26 5,743,542
231 5,743,543
249 5,743,544
250.1 5,743,545
259 5,743,546
277 5,743,547
507 5,743,548
5,743,549
612 5,743,550
634 5,743,551
642 5,743,552
707 5,743,553
730.1 5,743,554
731 5,743,555
736 5,743,556
737 5,743,557
739 5,743,558
741 5,743,559
5,743,560
756 5,743,561
767 5,743,562
806 5,743,563
811 5,743,564

**CLASS 281**
44 5,743,565

**CLASS 283**
36 5,743,566
61 5,743,567
65 5,743,568

**CLASS 285**
3 5,743,569
8 5,743,570
39 5,743,571
331 5,743,572

**CLASS 290**
55 5,744,871

**CLASS 292**
1.5 5,743,573
315 5,743,574
336.3 5,743,575

**CLASS 294**
1.1 5,743,576
19.1 5,743,577
19.2 5,743,578
50.8 5,743,579
51 5,743,580
97 5,743,581
99.2 5,743,582

**CLASS 295**
878 5,745,792

**CLASS 296**
3 5,743,583
37.12 5,743,585
37.6 5,743,584
100 5,743,586
108 5,743,587
146.6 5,743,588
180.5 5,743,589
194 5,743,590

**CLASS 297**
216.1 5,743,591
216.2 5,743,592
238 5,743,593
354.13 5,743,594
411.38 5,743,595
463.1 5,743,596
474 5,743,597

**CLASS 303**
11 5,743,598
20 5,743,599
116.1 5,743,600
187 5,743,601

**CLASS 307**
10.1 5,744,872
5,744,873
5,744,874
10.2 5,744,875
66 5,744,876
103 5,744,877
130 5,744,878

**CLASS 310**
12 5,744,879
58 5,744,880
67 R 5,744,881
5,744,882
68 E 5,744,883
80 5,744,884
89 5,744,885
91 5,744,886
156 5,744,887
185 5,744,888
239 5,744,889
248 5,744,890
5,744,891
251 5,744,892
259 5,744,893
261 5,744,894
266 5,744,895
268 5,744,896
316 5,744,897
334 5,744,898
360 5,744,902

**CLASS 312**
140.1 5,743,602
195 5,743,603
211 5,743,605
223.2 5,743,606
265.2 5,743,607
348.1 5,743,608

**CLASS 313**
110 5,744,899
112 5,744,900
113 5,744,901
414 5,744,903
479 5,744,904
491 5,744,905
493 5,744,906
497 5,744,907
533 5,744,908
585 5,744,909

**CLASS 315**
5.35 5,744,910
94 5,744,911
127 5,744,912
158 5,744,913
169.1 5,744,914
209 R 5,744,915
308 5,744,916
382.1 5,744,917
411 5,744,918
505 5,744,919

**CLASS 318**
139 5,744,920
254 5,744,921
293 5,744,922
563 5,744,923
568.17 5,744,924
590 5,744,925
5,744,926
599 5,744,927
610 5,744,928
696 5,744,929

**CLASS 320**
2 5,744,930
5,744,935
43 5,744,931
48 5,744,932
110 5,744,933
111 5,744,934
120 5,744,936
125 5,744,937
134 5,744,938
153 5,744,939

**CLASS 322**
1 5,744,940
28 5,744,941

**CLASS 323**
277 5,744,942
282 5,744,943
284 5,744,944

**CLASS 324**
71.6 5,744,945
73.1 5,744,946
106 5,744,947
158.1 5,744,948
5,744,949
166 5,744,950
173 5,744,951
207.16 5,744,952
207.17 5,744,953
234 5,744,954
240 5,744,955
253 5,744,956
318 5,744,957
5,744,958
319 5,744,959
320 5,744,960
403 5,744,961
426 5,744,962
427 5,744,963
537 5,744,964
538 5,744,965
5,744,966
540 5,744,967
608 5,744,968
614 5,744,969
636 5,744,970
643 5,744,971
649 5,744,972
707 5,744,973
758 5,744,974
760 5,744,975
761 5,744,976
5,744,977

**CLASS 326**
31 5,744,978
39 5,744,979
40 5,744,980
48 5,744,981
83 5,744,982

**CLASS 327**
3 5,744,983
89 5,744,984
94 5,744,985
95 5,744,986
103 5,744,987
111 5,744,988
143 5,744,990
158 5,744,991
241 5,744,992
307 5,744,993
374 5,744,994
382 5,745,003
407 5,744,995
534 5,744,996
537 5,744,997
5,744,998
543 5,744,999
5,745,000
553 5,745,001
554 5,745,002

**CLASS 329**
308 5,745,004
311 5,745,005

**CLASS 330**
149 5,745,006
253 5,745,007
255 5,745,008
277 5,745,009
294 5,745,010

**CLASS 331**
44 5,745,011
68 5,745,012
179 5,745,013

**CLASS 333**
1.1 5,745,014
5,745,015
17.1 5,745,016
116 5,745,017
202 5,745,018

**CLASS 335**
222 5,745,019

**CLASS 336**
92 5,745,020
196 5,745,021

**CLASS 337**
104 5,745,022
160 5,745,023
166 5,745,024

**CLASS 338**
167 5,745,025

**CLASS 340**
286.01 5,745,026
310.01 5,745,027
323 R 5,745,028
5,745,029
426 5,745,030
439 5,745,031
506 5,745,032
539 5,745,033
541 5,745,035
572 5,745,036
573 5,745,037
574 5,745,034
575 5,745,038
590 5,745,039
628 5,745,040
635 5,745,041
657 5,745,042
815.4 5,745,043
825.31 5,745,044
5,745,045
5,745,046
853.1 5,745,047
870.01 5,745,048
870.17 5,745,049
903 5,745,050
905 5,745,051
932.2 5,745,052
970 5,745,053
972 5,745,054

**CLASS 341**
20 5,745,055
22 5,745,056
35 5,745,057
51 5,745,058
120 5,745,060
131 5,745,061
135 5,745,062
143 5,745,063
144 5,745,064
5,745,065
155 5,745,066
156 5,745,067
176 5,745,068

**CLASS 342**
25 5,745,069
70 5,745,070
90 5,745,071
104 5,745,072
179 5,745,073
357 5,745,074
367 5,745,075
372 5,745,076
374 5,745,077
446 5,745,078

**CLASS 343**
700 MS 5,745,079
5,745,080
705 5,745,081
753 5,745,082
771 5,745,083
781 P 5,745,084

**CLASS 345**
63 5,745,085
5,745,086
85 5,745,088
89 5,745,087
5,745,089
90 5,745,090
95 5,745,092
103 5,745,093
107 5,745,094
114 5,745,095
120 5,745,096
121 5,745,097
5,745,098
145 5,745,099
157 5,745,100
185 5,745,101
5,745,102
199 5,745,103
5,745,104
212 5,745,105
213 5,745,106
330 5,745,711
332 5,745,107
340 5,745,109
5,745,110
348 5,745,111
349 5,745,112
5,745,113
352 5,745,114
5,745,115
358 5,745,116
420 5,745,117
430 5,745,118
431 5,745,119
5,745,120
433 5,745,121
5,745,122
439 5,745,123
441 5,745,124
503 5,745,125
952 5,745,126

**CLASS 346**
136 5,745,127
140.1 5,745,128

**CLASS 347**
12 5,745,129
14 5,745,130
5,745,132
15 5,745,131
16 5,745,135
33 5,745,133
36 5,745,134
50 5,745,136
85 5,745,137
5,745,138
86 5,745,139
100 5,745,140
104 5,745,141
116 5,745,142
139 5,745,143
151 5,745,144
183 5,745,145
192 5,745,146
200 5,745,147
201 5,745,148
208 5,745,149
212 5,745,151
238 5,745,152
241 5,745,153
242 5,745,150
250 5,745,154
256 5,745,155
5,745,156
262 5,745,157
364 5,745,158

**CLASS 348**
8 5,745,159
15 5,745,160
5,745,161
16 5,745,162
46 5,745,163
60 5,745,164
65 5,745,165
143 5,745,166
153 5,745,167
191 5,745,168
192 5,745,169
208 5,745,173
217 5,745,170
234 5,745,171
241 5,745,172
333 5,745,174
345 5,745,175
370 5,745,176
373 5,745,177
405 5,745,178
5,745,179
409 5,745,180
415 5,745,181
416 5,745,182
5,745,183
468 5,745,184
513 5,745,185
562 5,745,186
607 5,745,187
5,745,188
700 5,745,190
725 5,745,191
734 5,745,192
771 5,745,193

**CLASS 349**
38 5,745,194
39 5,745,195
77 5,745,197
90 5,745,198
95 5,745,199
99 5,745,200
110 5,745,201
5,745,202
113 5,745,203
117 5,745,204
125 5,745,205
129 5,745,206
141 5,745,207
153 5,745,208

**CLASS 351**
41 5,745,210
153 5,745,209
169 5,745,211
219 5,745,212

**CLASS 352**
27 5,745,213

**CLASS 353**
25 5,743,609
31 5,743,610
5,743,611
97 5,743,612
119 5,743,613
122 5,743,614
5,743,615

**CLASS 355**
18 5,745,214
38 5,745,215
40 5,745,217
5,745,218
5,745,219
54 5,745,220
71 5,745,216
5,745,221
72 5,745,222
800.23 5,745,780

**CLASS 356**
4.01 5,745,223
5,745,224
5,745,225
28 5,745,226
39 5,745,227
53 5,745,228
73 5,745,229
124 5,745,230
128 5,745,231
153 5,745,232
229 5,745,233
236 5,745,234
371 5,745,236
375 5,745,235
5,745,237
376 5,745,238
380 5,745,239
382 5,745,240
384 5,745,241
401 5,745,242
419 5,745,243
429 5,745,244

**CLASS 358**
262.1 5,745,245
296 5,745,246
5,745,247
5,745,248
298 5,745,249
5,745,250
302 5,745,252
408 5,745,253
412 5,745,254
426 5,745,251
5,745,255
434 5,745,256

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440 5,745,257
444 5,745,258
456 5,745,260
457 5,745,259
501 5,745,261
504 5,745,262
518 5,745,263

**CLASS 359**

15 5,745,265
34 5,745,266
35 5,745,267
110 5,745,268
119 5,745,269
124 5,745,270
130 5,745,271
137 5,745,272
181 5,745,273
187 5,745,274
5,745,275
189 5,745,276
207 5,745,277
224 5,745,278
233 5,745,279
290 5,745,280
5,745,281
322 5,745,282
341 5,745,283
344 5,745,284
356 5,745,285
359 5,745,286
428 5,745,287
457 5,745,288
565 5,745,289
583 5,745,290
586 5,745,291
613 5,745,292
614 5,745,293
618 5,745,294
631 5,745,295
641 5,745,296
651 5,745,297
683 5,745,298
684 5,745,299
5,745,300
689 5,745,301
5,745,302
691 5,745,303
719 5,745,304
725 5,745,305
745 5,745,306
5,745,307
818 5,745,308
843 5,745,310
846 5,745,309
896 5,745,311

**CLASS 360**

46 5,745,312
48 5,745,313
51 5,745,314
65 5,745,315
70 5,745,316
73.06 5,745,318
73.11 5,745,317
78.05 5,745,319
105 5,745,325
106 5,745,326
126 5,745,329
128 5,745,320

**CLASS 361**

38 5,745,321
45 5,745,322
56 5,745,323
5,745,324
111 5,745,327
119 5,745,328
120 5,745,330
234 5,745,331
5,745,332
313 5,745,333
5,745,334
5,745,335
321.5 5,745,336
627 5,745,337
637 5,745,338
679 5,745,339
681 5,745,340
682 5,745,341
683 5,745,342
689 5,745,343
705 5,745,344
741 5,745,345
769 5,745,346
813 5,745,347
815 5,745,348
818 5,745,349

**CLASS 362**

31 5,743,616
61 5,743,617
5,743,618
82 5,743,619
101 5,743,620
105 5,743,621
153.1 5,743,622
190 5,743,623
198 5,743,624
216 5,743,625
217 5,743,626
222 5,743,627
228 5,743,628
293 5,743,629
294 5,743,630
5,743,631
331 5,743,633
341 5,743,634
385 5,743,635

**CLASS 363**

15 5,745,350
20 5,745,351
41 5,745,352
56 5,745,353
60 5,745,354
71 5,745,355
5,745,356
84 5,745,357
95 5,745,358
5,745,359

**CLASS 364**

140 5,745,360
148 5,745,361
162 5,745,362
468.28 5,745,363
5,745,364
469.01 5,745,365
479.12 5,745,366
482 5,745,367
483 5,745,368
487 5,745,369
488 5,745,370
489 5,745,371
5,745,372
490 5,745,373
491 5,745,374
492 5,745,375
508 5,745,376
509 5,745,377
510 5,745,378
514 A 5,745,379
514 R 5,745,380
551.01 5,745,381
5,745,382
554 5,745,383
574 5,745,384
578 5,745,385
5,745,386
5,745,387
5,745,388
580 5,745,389
5,745,390
707 5,745,391
715.02 5,745,392
715.08 5,745,393
724.1 5,745,394
724.17 5,745,395
724.19 5,745,396
745.03 5,745,397
746.1 5,745,398
771 5,745,399

**CLASS 365**

45 5,745,400
104 5,745,401
145 5,745,402
5,745,403
154 5,745,404
5,745,405
158 5,745,406
159 5,745,407
173 5,745,408
185.03 5,745,409
185.09 5,745,411
185.1 5,745,412
185.17 5,745,413
185.2 5,745,414
185.28 5,745,416
185.29 5,745,417
185.3 5,745,410
185.33 5,745,418
201 5,745,415
5,745,419
5,745,420
203 5,745,421
5,745,422
5,745,423
226 5,745,425
5,745,426
230.01 5,745,427
230.03 5,745,428
230.06 5,745,432
230.08 5,745,429
233 5,745,424
5,745,430
233.5 5,745,431

**CLASS 366**

1 5,743,636
163.2 5,743,637
5,743,638
182.1 5,743,639
194 5,743,640

**CLASS 367**

1 5,745,434
13 5,745,435
20 5,745,436
100 5,745,437
181 5,745,438

**CLASS 368**

10 5,745,439
27 5,745,440
100 5,745,441
118 5,745,442

**CLASS 369**

13 5,745,443
32 5,745,444
5,745,445
5,745,446
44.15 5,745,447
44.27 5,745,450
44.29 5,745,451
5,745,452
44.32 5,745,449
48 5,745,453
5,745,454
5,745,455
50 5,745,456
5,745,457
54 5,745,458
5,745,459
58 5,745,460
5,745,461
5,745,462
59 5,745,463
5,745,464
110 5,745,465
112 5,745,466
116 5,745,467
124 5,745,468
5,745,469
219 5,745,470
263 5,745,471
5,745,472
275.1 5,745,473
275.3 5,745,474
275.4 5,745,475

**CLASS 370**

222 5,745,476
230 5,745,477
234 5,745,478
245 5,745,479
252 5,745,480
313 5,745,481
327 5,745,482
335 5,745,483
342 5,745,485
347 5,745,484
352 5,745,486
5,745,487
395 5,745,488
5,745,489
397 5,745,490
428 5,745,491
435 5,745,492
438 5,745,493
452 5,745,494
498 5,745,495
515 5,745,496

**CLASS 371**

2.2 5,745,497
21.1 5,745,498
21.4 5,745,499
22.4 5,745,500
27 5,745,501
35 5,745,502
37.1 5,745,503
5,745,504
37.4 5,745,505
37.9 5,745,506
40.1 5,745,507
5,745,508
43.1 5,745,509
47.1 5,745,510

**CLASS 372**

19 5,745,511
20 5,745,512
34 5,745,513
43 5,745,514
45 5,745,515
5,745,516
47 5,745,517
70 5,745,518
101 5,745,519

**CLASS 374**

32 5,743,641
45 5,743,642
121 5,743,643
126 5,743,644
137 5,743,645
148 5,743,646
151 5,743,647
5,743,648

**CLASS 375**

200 5,745,520
5,745,521
208 5,745,522
216 5,745,523
244 5,745,524
285 5,745,525
297 5,745,526
308 5,745,527
316 5,745,528
5,745,529
342 5,745,530
345 5,745,531
347 5,745,532
354 5,745,533
5,745,534
355 5,745,535

**CLASS 376**

114 5,745,536
5,745,537
153 5,745,538
259 5,745,539

**CLASS 377**

8 5,745,540
69 5,745,541

**CLASS 378**

4 5,745,542
45 5,745,543
56 5,745,544
65 5,745,545
143 5,745,546
145 5,745,547
207 5,745,548

**CLASS 379**

34 5,745,549
52 5,745,550
58 5,745,551
61 5,745,552
67 5,745,553
91.02 5,745,554
95 5,745,555
127 5,745,556
177 5,745,557
189 5,745,558
199 5,745,559
210 5,745,561
215 5,745,562
399 5,745,563
410 5,745,564
433 5,745,566
5,745,567
446 5,745,565

**CLASS 380**

4 5,745,568
5,745,569
5,745,570
21 5,745,571
5,745,572
5,745,573
23 5,745,574
5,745,575
25 5,745,576
28 5,745,577
44 5,745,578
52 5,745,579

**CLASS 381**

71 5,745,580
71.11 5,745,581
77 5,745,582
86 5,745,583
90 5,745,584
103 5,745,585
5,745,586
120 5,745,587
170 5,745,588

**CLASS 382**

100 5,745,589
101 5,745,590
115 5,745,591
119 5,745,592
146 5,745,593
150 5,745,594
170 5,745,595
176 5,745,596
182 5,745,597
209 5,745,598
217 5,745,599
218 5,745,600
225 5,745,601
229 5,745,602
5,745,603
232 5,745,604
236 5,745,605
237 5,745,606
240 5,745,607
247 5,745,608
264 5,745,609
309 5,745,610

**CLASS 383**

6 5,743,649
16 5,743,650
33 5,743,651
89 5,743,652

**CLASS 384**

43 5,743,653
100 5,743,654
107 5,743,655
124 5,743,656
312 5,743,657
406 5,743,658
573 5,743,659
577 5,743,660

**CLASS 385**

13 5,745,611
24 5,745,612
5,745,613
29 5,745,614
37 5,745,615
5,745,616
5,745,617
5,745,618
48 5,745,619
5,745,620
72 5,745,621
75 5,745,622
88 5,745,623
91 5,745,624
94 5,745,625
96 5,745,626
101 5,745,627
104 5,745,628
122 5,745,629
129 5,745,630
132 5,745,631
133 5,745,632
136 5,745,633
140 5,745,634

**CLASS 386**

9 5,745,635
46 5,745,636
5,745,637
54 5,745,638
70 5,745,639
83 5,745,640
95 5,745,641
5,745,642
106 5,745,643
109 5,745,644
117 5,745,646
131 5,745,645

**CLASS 388**

827 5,745,647

**CLASS 395**

2.13 5,745,648
2.41 5,745,649
2.69 5,745,650
2.77 5,745,651
22 5,745,652
5,745,653
5,745,654
24 5,745,655
50 5,745,656
102 5,745,657
5,745,658
5,745,659
108 5,745,660
113 5,745,661
5,745,662
115 5,745,663
117 5,745,664
127 5,745,665
128 5,745,666
130 5,745,667
175 5,745,668
182.01 5,745,669
182.04 5,745,671
5,745,672
182.05 5,745,673
182.18 5,745,674
182.2 5,745,670
183.14 5,745,675
186 5,745,676
5,745,677
5,745,678
200.01 5,745,679
200.02 5,745,680
200.14 5,745,685
200.15 5,745,686
200.3 5,745,681
200.31 5,745,687
200.34 5,745,688
200.36 5,745,689
200.41 5,745,690
200.5 5,745,682
200.53 5,745,692
200.54 5,745,693
200.55 5,745,694
200.57 5,745,695
200.63 5,745,696
200.67 5,745,698
200.68 5,745,703
200.75 5,745,699
200.77 5,745,700
200.79 5,745,701
5,745,702
200.8 5,745,683
5,745,684
5,745,704
221 5,745,705
235 5,745,706
290 5,745,707
299 5,745,708
311 5,745,709
327 5,745,710
333 5,745,712
339 5,745,713
5,745,714
348 5,745,715
350 5,745,716
352 5,745,717
5,745,718
358 5,745,719
376 5,745,720
384 5,745,721
386 5,745,722
388 5,745,723
389 5,745,724
390 5,745,725
392 5,745,726
449 5,745,727
453 5,745,728
458 5,745,729
462 5,745,730
476 5,745,731
495 5,745,732
500 5,745,733
5,745,734
5,745,735
5,745,736
5,745,737
5,745,738
516 5,745,739
551 5,745,740
555 5,745,741
556 5,745,742
561 5,745,743
565 5,745,744
601 5,745,745
602 5,745,746
608 5,745,747
610 5,745,748
612 5,745,749
613 5,745,750
615 5,745,751
5,745,754
616 5,745,752
618 5,745,753
619 5,745,755
620 5,745,756
672 5,745,757
5,745,758
680 5,745,759
5,745,760
681 5,745,761
5,745,762
5,745,763
683 5,745,764
701 5,745,765
703 5,745,766
704 5,745,767
706 5,745,768
727 5,745,769
733 5,745,770
735 5,745,771
739 5,745,772
750.03 5,745,773
750.04 5,745,774
750.08 5,745,775
794 5,745,776
800 5,745,777



800.01 5,745,778
5,745,779
800.29 5,745,781
806 5,745,782
825 5,745,783
826 5,745,784
827 5,745,785
829 5,745,786
837 5,745,787
839 5,745,788
841 5,745,789
853 5,745,790
872 5,745,791
881 5,745,793
882 5,745,794
5,745,795
885 5,745,796

**CLASS 396**

6 5,745,797
51 5,745,798
55 5,745,799
5,745,800
5,745,801
5,745,802
83 5,745,803
93 5,745,804
97 5,745,805
106 5,745,806
236 5,745,808
284 5,745,807
287 5,745,809
289 5,745,810
315 5,745,811
319 5,745,812
440 5,745,813
460 5,745,814
541 5,745,815
614 5,745,816

**CLASS 399**

16 5,745,817
40 5,745,818
43 5,745,819
45 5,745,820
106 5,745,822
111 5,745,823
113 5,745,824
117 5,745,825
237 5,745,826
285 5,745,827
302 5,745,829
308 5,745,830
5,745,831
330 5,745,833
384 5,745,832

**CLASS 400**

55 5,743,661
62 5,743,662
120.04 5,743,663
249 5,743,664
323 5,743,665
485 5,743,666

**CLASS 401**

9 5,743,667
265 5,743,668

**CLASS 403**

131 5,743,669
296 5,743,670
316 5,743,671
403 5,743,672

**CLASS 404**

25 5,743,673

**CLASS 405**

52 5,743,674
180 5,743,675
184 5,743,676
227 5,743,677
259.1 5,743,678
296 5,743,679

**CLASS 407**

19 5,743,680
114 5,743,681

**CLASS 408**

79 5,743,682
97 5,743,683
115 R 5,743,684

**CLASS 409**

131 5,743,685
181 5,743,686
225 5,743,687
268 5,743,688

**CLASS 410**

30 5,743,689
401 5,744,145
5,744,146
5,744,147
5,744,148
402 5,744,149
404 5,744,150
405 5,744,151
408 5,744,152
426 5,744,153
427 5,744,154
434 5,744,155
445 5,744,156
450 5,744,157
5,744,158
5,744,159
464 5,744,161
486 5,744,162
489 5,744,163
496 5,744,164
499 5,744,165
501 5,744,166
650 5,744,167
653 5,744,168

**CLASS 425**

47 5,744,169
77 5,744,170
110 5,744,171
113 5,744,172
144 5,744,173
347 5,744,357
390 5,744,175
526 5,744,176
589 5,744,177

**CLASS 426**

2 5,744,178
41 5,744,179
99 5,744,180
106 5,744,181
316 5,744,182
330.4 5,744,183
506 5,744,184
516 5,744,185
5,744,186
599 5,744,187
629 5,744,188
636 5,744,189

**CLASS 427**

8 5,744,190
64 5,744,191
99 5,744,192
162 5,744,193
163.2 5,744,194
249 5,744,195
328 5,744,197
356 5,743,722
376.6 5,744,198
387 5,744,200
389 5,744,199
393.4 5,744,201
527 5,744,202

**CLASS 428**

1 5,744,203
5,744,204
34.2 5,744,205
36.3 5,744,206
41.8 5,744,207
63 RE. 35,778
64.1 5,744,208
96 5,744,209
106 5,744,210
122 5,744,211
131 5,744,212
5,744,213
137 5,744,214
141 5,744,215
5,744,216
152 5,744,217
192 5,744,218
195 5,744,219
5,744,220
196 5,744,221
5,744,222
206 5,744,223
209 5,744,224
212 5,744,225
5,744,226
216 5,744,227
292.4 5,744,228
297.4 5,744,229
305.5 5,744,230
318.6 5,744,231
323 5,744,232
328 5,744,233
332 5,744,234
364 5,744,235
372 5,744,236
373 5,744,237
411.1 5,744,238
5,744,239
5,744,240
422 5,744,241
427 5,744,242
447 5,744,243
5,744,244
457 5,744,245
474.4 5,744,246
475.5 5,744,247
482 5,744,248
516 5,744,249
5,744,250
536 5,744,251
594 5,744,252
611 5,744,253
614 5,744,254
654 5,744,255
694 T 5,744,256
703 5,744,257

**CLASS 429**

3 5,744,258
59 5,744,259
99 5,744,260
131 5,744,261
197 5,744,262
206 5,744,263
218 5,744,264
5,744,265
224 5,744,266

**CLASS 430**

1 5,744,267
5 5,744,268
18 5,744,269
25 5,744,270
58 5,744,271
96 5,744,272
97 5,744,273
106.6 5,744,274
108 5,744,275
109 5,744,276
110 5,744,277
5,744,278
264 5,744,279
270.1 5,744,280
5,744,281
284.1 5,744,282
313 5,744,283
5,744,284
318 5,744,285
326 5,744,286
363 5,744,287
383 5,744,288
465 5,744,289
503 5,744,290
504 5,744,291
510 5,744,292
512 5,744,293
521 5,744,294
527 5,744,295
567 5,744,296
5,744,297

**CLASS 431**

8 5,743,723
126 5,743,724
153 5,743,725
157 5,743,726
328 5,743,727

**CLASS 432**

151 5,743,728
238 5,743,729

**CLASS 433**

26 5,743,730
29 5,743,731
55 5,743,732
57 5,743,733
77 5,743,734
91 5,743,735
96 5,743,736
141 5,743,737
149 5,743,738

**CLASS 434**

128 5,743,740
205 5,743,741
236 5,743,742
5,743,743
258 5,743,744
307 5,743,745
332 5,743,746

**CLASS 435**

5 5,744,298
5,744,299
6 5,744,300
5,744,301
5,744,302
5,744,303
5,744,304
5,744,305
5,744,306
5,744,307
5,744,308
5,744,309
5,744,310
5,744,311
5,744,312
5,744,313
7.1 5,744,314
7.2 5,744,316
7.24 5,744,317
7.4 5,744,358
7.9 5,744,315
7.92 5,744,318
7.94 5,744,319
8 5,744,320
34 5,744,321
39 5,744,322
69.1 5,744,323
5,744,324
69.4 5,744,327
5,744,328
71.2 5,744,325
105 5,744,330
116 5,744,331
121 5,744,332
123 5,744,333
172.3 5,744,326
5,744,334
5,744,335
5,744,336
178 5,744,337
183 5,744,338
184 5,744,339
189 5,744,340
5,744,341
190 5,744,342
193 5,744,343
196 5,744,344
207 5,744,345
226 5,744,346
240.2 5,744,347
252.3 5,744,348
5,744,349
254.11 5,744,350
290.2 5,744,351
325 5,744,353
5,744,354
5,744,355
334 5,744,356
366 5,744,360
372 5,744,361
375 5,744,362
378 5,744,363
419 5,744,364
696 5,744,329

**CLASS 436**

6 5,744,365
63 5,744,366
172 5,744,367
501 5,744,368

**CLASS 437**

4 5,744,370
24 5,744,371
34 5,744,372
59 5,744,373
60 5,744,374
133 5,744,375
190 5,744,376
195 5,744,378
208 5,744,379

**CLASS 438**

14 5,744,380
16 5,744,381
106 5,744,382
111 5,744,383
152 5,744,384
238 5,744,385
245 5,744,386
253 5,744,387
5,744,388
5,744,389
254 5,744,390
264 5,744,391
275 5,744,392
5,744,393
5,744,394
305 5,744,395
501 5,744,396
516 5,744,397
592 5,744,398
622 5,744,399
631 5,744,400
674 5,744,377
693 5,744,401
734 5,744,402
761 5,744,403

**CLASS 439**

67 5,743,747
71 5,743,748
72 5,743,749
76.1 5,743,750
79 5,743,751
142 5,743,752
143 5,743,753
349 5,743,754
354 5,743,755
364 5,743,756
419 5,743,757
5,743,758
462 5,743,759
489 5,743,760
595 5,743,761
5,743,762
598 5,743,763
607 5,743,764
608 5,743,765
630 5,743,766
682 5,743,767
723 5,743,768
751 5,743,769
752.5 5,743,770
5,743,771

**CLASS 440**

28 5,743,772
53 5,743,773
89 5,743,774

**CLASS 442**

63 5,744,404
71 5,744,405
77 5,743,775
121 5,744,406
5,744,407
383 5,744,408
414 5,743,776

**CLASS 445**

7 5,743,777
8 5,743,778

**CLASS 446**

85 5,743,786
93 5,743,779
136 5,743,780
315 5,743,781
485 5,743,782

**CLASS 450**

155 5,743,783

**CLASS 451**

21 5,743,784
28 5,743,785
41 5,743,787
5,743,788
57 5,743,789
326 5,743,790
356 5,743,791

**CLASS 452**

37 5,743,792

**CLASS 454**

52 5,743,793
184 5,743,794

**CLASS 455**

5.1 5,745,836
5,745,837
5,745,838
10 5,745,839
51.2 5,745,840
62 5,745,841
69 5,745,842
76 5,745,843
193.1 5,745,844
194.1 5,745,845
209 5,745,846
234.1 5,745,847
296 5,745,848
404 5,745,849
417 5,745,850
432 5,745,851
433 5,745,852
450 5,745,853
452 5,745,854
517 5,745,855
552 5,745,856
553 5,745,857
562 5,745,858
568 5,745,859
574 5,745,860

**CLASS 460**

62 5,743,795

**CLASS 463**

9 5,743,796
11 5,743,797
17 5,743,798
25 5,743,799
26 5,743,800
44 5,743,801

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**CLASS 472**

118 5,743,802

**CLASS 473**

48 5,743,803
132 5,743,804
213 5,743,805
214 5,743,806
234 5,743,807
280 5,743,808
300 5,743,809
305 5,743,810
319 5,743,811
327 5,743,812
329 5,743,813
353 5,743,815
374 5,743,814
376 5,743,816
377 5,743,817
378 5,743,818
386 5,743,819
429 5,743,820
441 5,743,821
533 5,743,822

**CLASS 475**

120 5,743,823
276 5,743,824
278 5,743,825

**CLASS 477**

98 5,743,826
169 5,743,828
174 5,743,829

**CLASS 482**

44 5,743,830
52 5,743,831
5,743,832
54 5,743,833
57 5,743,834
5,743,835
66 5,743,836
124 5,743,837
5,743,838

**CLASS 492**

20 5,743,839

**CLASS 494**

13 5,743,840

**CLASS 501**

65 5,744,409
97.2 5,744,410
98.5 5,744,411
127 5,744,412
128 5,744,413

**CLASS 502**

103 5,744,414
121 5,744,415
152 5,744,416
155 5,744,417
160 5,744,418
326 5,744,419
415 5,744,420
416 5,744,421

**CLASS 503**

227 5,744,422

**CLASS 504**

116 5,744,423
241 5,744,424
269 5,744,425
282 5,744,426

**CLASS 505**

433 5,744,427

**CLASS 507**

110 5,744,428

**CLASS 508**

221 5,744,429
295 5,744,430
410 5,744,431
431 5,744,432
454 5,744,433
485 5,744,434

**CLASS 510**

101 5,744,435
178 5,744,436
204 5,744,437
207 5,744,438
247 5,744,439
362 5,744,440
433 5,744,441

**CLASS 514**

2 5,744,442
12 5,744,444
5,744,445
5,744,446
5,744,447
5,744,448
14 5,744,449
15 5,744,450
18 5,744,451
19 5,744,452
26 5,744,453
34 5,744,454
5,744,455
44 5,744,456
5,744,460
56 5,744,457
91 5,744,458
114 5,744,459
141 5,744,461
177 5,744,462
5,744,463
179 5,744,464
210 5,744,465
5,744,466
5,744,467
220 5,744,468
5,744,469
5,744,470
248 5,744,471
253 5,744,472
262 5,744,473
274 5,744,475
284 5,744,476
288 5,744,477
291 5,744,478
301 5,744,479
305 5,744,480
311 5,744,481
316 5,744,482
318 5,744,485
5,744,486
320 5,744,483
321 5,744,484
326 5,744,487
339 5,744,488
340 5,744,489
341 5,744,491
357 5,744,474
359 5,744,492
5,744,493
388 5,744,494
409 5,744,495
412 5,744,496
492 5,744,497
557 5,744,498
639 5,744,499
647 5,744,500
649 5,744,501
725 5,744,502

**CLASS 521**

48 5,744,503
50 5,744,504
60 5,744,505
64 5,744,506
86 5,744,507
99 5,744,508
125 5,744,509
181 5,744,510

**CLASS 522**

25 5,744,511
34 5,744,512
42 5,744,514
116 5,744,513

**CLASS 523**

113 5,744,515
124 5,744,516
136 5,744,517
143 5,744,518
160 5,744,519
334 5,744,520
404 5,744,521
442 5,744,522
523 5,744,523

**CLASS 524**

70 5,744,524
84 5,744,525
90 5,744,526
99 5,744,527
265 5,744,528
5,744,529
427 5,744,530
432 5,744,531
440 5,744,532
5,744,533
442 5,744,534
451 5,744,535
492 5,744,536
520 5,744,537
539 5,744,538
546 5,744,539
558 5,744,540
588 5,744,541
590 5,744,542
728 5,744,543
832 5,744,544

**CLASS 525**

54.1 5,744,545
57 5,744,546
62 5,744,547
106 5,744,548
129 5,744,549
162 5,744,550
240 5,744,551
332.6 5,744,552
333.8 5,744,553
391 5,744,068
439 5,744,554

**CLASS 526**

67 5,744,555
135 5,744,556
171 5,744,557
175 5,744,558
219 5,744,559
221 5,744,560
255 5,744,561
279 5,744,562
307.3 5,744,563
317.1 5,744,564
318.4 5,744,565
336 5,744,566
348.6 5,744,567

**CLASS 528**

58 5,744,568
73 5,744,569
170 5,744,570
272 5,744,571
286 5,744,572
310 5,744,573
315 5,744,574
353 5,744,575
388 5,744,576
392 5,744,577
492 5,744,578

**CLASS 530**

324 5,744,579
377 5,744,580
388.1 5,744,584
388.15 5,744,585
394 5,744,586
399 5,744,587

**CLASS 534**

581 5,744,588
634 5,744,589
780 5,744,590
836 5,744,591

**CLASS 536**

22.1 5,744,592
23.1 5,744,593
23.2 5,744,594
26.23 5,744,595
27.11 5,744,596
55.3 5,744,597
119 B1 043,438

**CLASS 540**

472 5,744,598

**CLASS 544**

193.1 5,744,599
243 5,744,600
330 5,744,601
346 5,744,602
5,744,603

**CLASS 546**

14 5,744,604
70 5,744,605
133 5,744,606
146 5,744,607
329 5,744,608

**CLASS 548**

209 5,744,609
217 5,744,610
232 5,744,611
250 5,744,612
324.1 5,744,613
377.1 5,744,614
462 5,744,615
960 5,744,616

**CLASS 549**

315 5,744,618
408 5,744,617
523 5,744,619
533 5,744,620
553 5,744,621

**CLASS 552**

232 5,744,622
297 5,744,623
299 5,744,624

**CLASS 554**

105 5,744,625
227 5,744,626

**CLASS 558**

315 5,744,627

**CLASS 560**

19 5,744,628
29 5,744,630
39 5,744,631
41 5,744,632
115 5,744,633
174 5,744,634
183 5,744,635
204 5,744,636
238 5,744,637

**CLASS 562**

28 5,744,629
456 5,744,638
572 5,744,639

**CLASS 564**

51 5,744,640
228 5,744,641
278 5,744,642
417 5,744,643
444 5,744,644

**CLASS 565**

695 5,744,645

**CLASS 568**

1 5,744,646
41 5,744,647
362 5,744,648
454 5,744,649
5,744,650
560 5,744,651
671 5,744,652
720 5,744,653
750 5,744,654
841 5,744,655

**CLASS 570**

147 5,744,656
150 5,744,657
166 5,744,658
167 5,744,659
169 5,744,660
177 5,744,661
180 5,744,662
250 5,744,663

**CLASS 585**

12 5,744,664
15 5,744,665
23 5,744,666
241 5,744,668
257 5,744,667
310 5,744,669
320 5,744,670
430 5,744,671
440 5,744,672
474 5,744,673
489 5,744,674
506 5,744,675
510 5,744,676
512 5,744,677
513 5,744,678
526 5,744,679
640 5,744,680
709 5,744,681
728 5,744,682
736 5,744,683
737 5,744,684
811 5,744,685
823 5,744,686
829 5,744,687

**CLASS 588**

1 5,745,861
205 5,744,688
207 5,744,689
209 5,744,690
214 5,744,691
254 5,743,841
256 5,743,842

**CLASS 600**

9 5,743,843
14 5,743,844
16 5,743,845
166 5,743,846
5,743,847
178 5,743,848
186 5,743,849
204 5,743,850
5,743,851
207 5,743,852
210 5,743,853
409 5,743,854
459 5,743,855
493 5,743,856
496 5,743,857
522 5,743,859
544 5,743,860
577 5,743,861

**CLASS 601**

2 5,743,862
5,743,863
41 5,743,864

**CLASS 602**

26 5,743,865
63 5,743,866
65 5,743,867

**CLASS 604**

8 5,743,868
9 5,743,869
22 5,743,870
35 5,743,871
49 5,743,872
93 5,743,873
96 5,743,874
5,743,875
5,743,876
131 5,743,878
132 5,743,879
164 5,743,880
5,743,881
168 5,743,882
169 5,743,883
5,743,884
180 5,743,885
191 5,743,886
192 5,743,887
198 5,743,888
211 5,743,889
218 5,743,890
282 5,743,891
283 5,743,892
317 5,743,893
320 5,743,894
377 5,743,895
385.1 5,743,896
389 5,743,897

**CLASS 606**

1 5,743,899
7 5,743,900
9 5,743,901
18 5,743,902
31 5,743,903
32 5,743,904
5,743,905
51 5,743,906
54 5,743,898
61 5,743,907
5,743,911
64 5,743,908
65 5,743,912
69 5,743,913
73 5,743,914
88 5,743,909
5,743,915
99 5,743,910
102 5,743,916

**CLASS 607**

5 RE. 35,779

**CLASS 623**

11 5,743,917
21 5,743,918

**CLASS 701**

1 5,745,862
14 5,745,863
35 5,745,864
117 5,745,865
200 5,745,866
207 5,745,867
216 5,745,868
222 5,745,869
301 5,745,870

**CLASS 704**

207 5,745,871
222 5,745,872
5,745,873
232 5,745,874
235 5,745,875
255 5,745,876
270 5,745,877

**CLASS 705**

1 5,745,878
5,745,879
7 5,745,880
10 5,745,881
26 5,745,882
34 5,745,883
5,745,884
38 5,745,885
39 5,745,886
410 5,745,887

**CLASS 707**

1 5,745,888
2 5,745,889
3 5,745,890
5,745,891
5 5,745,893
5,745,894
10 5,745,895
100 5,745,896
101 5,745,897
5,745,898
102 5,745,892
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| | 5,745,735 | | 5,745,751 | | 5,744,354 | 54 : | 5,743,992 | | 5,743,514 | | |

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| 06 : | 393,747 | | 393,902 | | 393,883 | 29 : | 393,823 | 37 : | 393,763 | | 393,859 |
| | 393,762 | | 393,903 | | 393,922 | 32 : | 393,881 | | 393,826 | | 393,887 |
| | 393,772 | | 393,921 | 17 : | 393,774 | 33 : | 393,802 | 39 : | 393,783 | | 393,931 |
| | 393,788 | 08 : | 393,791 | | 393,780 | | 393,850 | | 393,821 | 51 : | 393,871 |
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| | 393,824 | | 393,906 | | 393,798 | 34 : | 393,736 | 41 : | 393,743 | | 393,874 |
| | 393,825 | 09 : | 393,807 | | 393,801 | | 393,804 | | 393,768 | | 393,920 |
| | 393,827 | | 393,819 | 19 : | 393,805 | | 393,907 | | 393,770 | | 393,929 |
| | 393,855 | | 393,831 | | 393,908 | | 393,909 | | 393,919 | 53 : | 393,809 |
| | 393,856 | | 393,876 | 21 : | 393,808 | | 393,932 | | 393,934 | | 393,854 |
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| | 393,861 | | 393,744 | 25 : | 393,787 | | 393,779 | | 393,773 | | 393,864 |
| | 393,866 | | 393,749 | | 393,849 | | 393,812 | | 393,786 | | |
| | 393,867 | | 393,754 | | 393,860 | | 393,838 | | 393,875 | | |
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| | 393,890 | 13 : | 393,742 | | 393,765 | | 393,888 | 47 : | 393,810 | | |

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| 25 : | 10,352 | 41 : | 10,363 | | | | | | | | |

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❑ GPO Deposit Account ☐☐☐☐☐☐–☐
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***Thank you for your order!***

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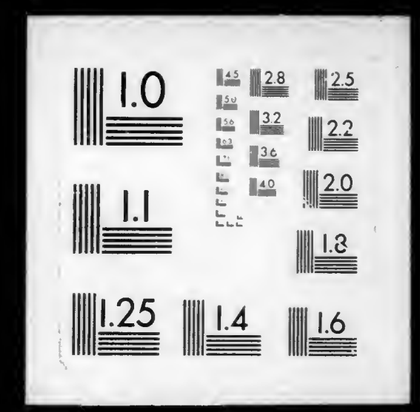
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U.S. DEPARTMENT OF COMMERCE
William Daley, *Secretary*
PATENT AND TRADEMARK OFFICE
Bruce Lehman, *Commissioner*

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